Science Fiction Roleplaying Game

TRAVELLER

The New Era



willie teal (order #936741)

Marc Miller

Science Fiction Roleplaying Game

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The New Era







GDW

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Science Fiction Roleplaying Game

TRAVELLER®
The New Era

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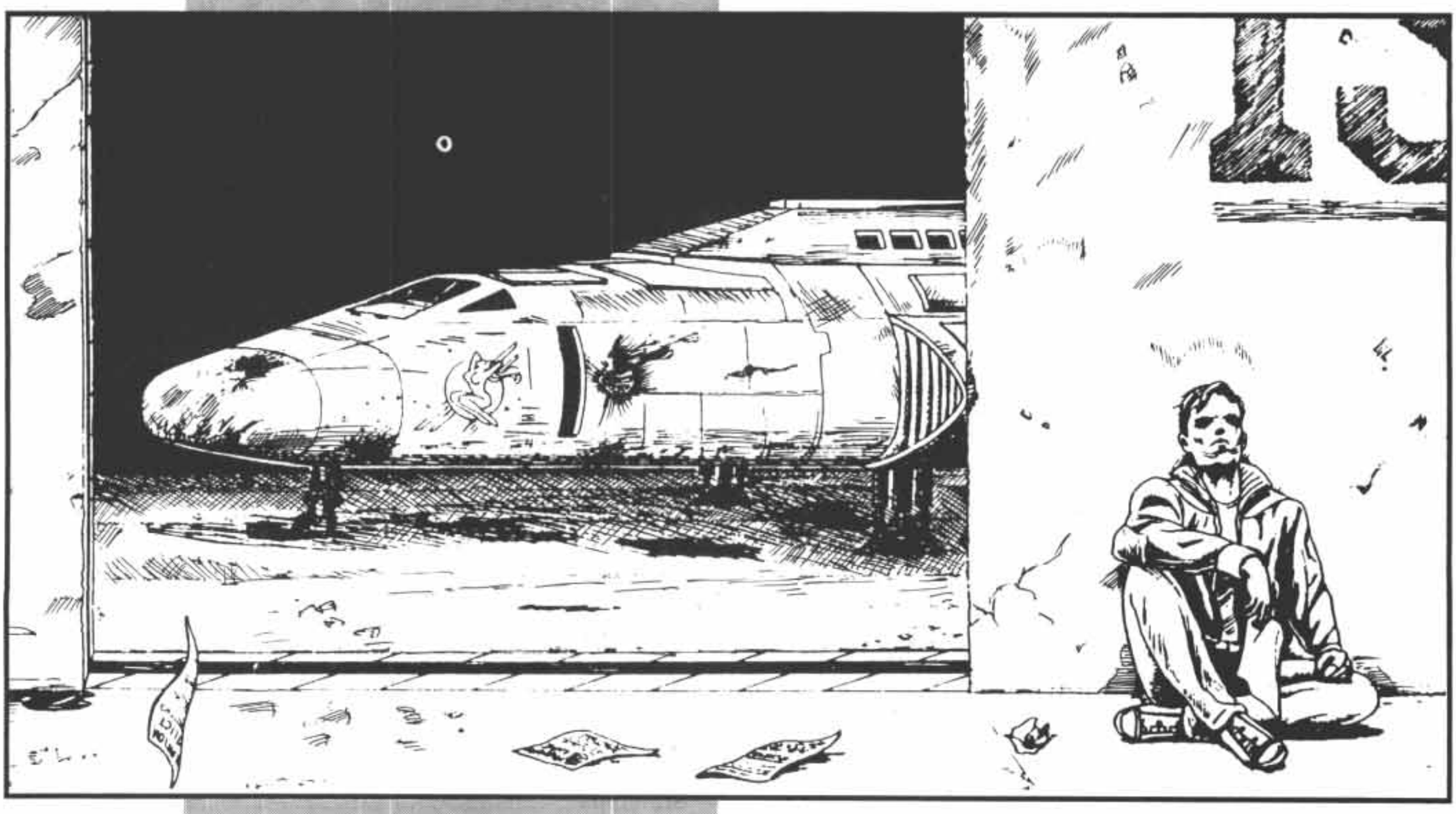
TRAVELLER: THE NEW ERA

I don't get it. How did the Imperials build an empire of 11,000 worlds and then throw it all away like it was a bunch of garbage? There are entire airless worlds out there where a billion people died when the life support ran out. There are bombed-out starports that are still radioactive, and there are people out there who call themselves "human" who are murdering each other just to be king of some scrap heap that's so deep in dead bodies that it just makes you want to puke.

I've been out there a half dozen times, and if that doesn't give you religion, I don't know what does. Yeah, I know, religion, shmeligion, where did it get them? It's not where it got them, it's where we're going. This is history, pal, from here on out. If you don't want to be in on it, get the hell outta my way.

We didn't come this far to become extinct on 11,000 separate isolated worlds. By Allah, by Buddah, by Krishna, by God—we were created for better than that. Those stars out there—we had them once, and we'll have them again. Nothing's going to stop us.

RCES Captain Rebekka "Rebba" Gutierez
NE 1



Introduction

The universe of **Traveller** is known space several thousand years in the future. Humankind has explored and settled over 11,000 worlds, and inhabits a volume of space hundreds of parsecs across. On its journey to the stars, it met dozens of alien races. It befriended some, warred on others, and maintained an uneasy distance from others still. It turned the worlds it owned into safe, pleasant technological wonderlands. Then, in less than a dozen years, greed and stupidity destroyed everything.

Now, 70 years later, small groups of humans are returning to the stars. The worlds they find, however, are much more dangerous places than they were less than a century earlier. There are a dozen ways to lose a ship, a hundred ways to die, and in lots of places only one way to get out with your skin.

Most people play it safe. Most people stay dirtside, secure and comfortable. Most people are content to let history unfold as it will, and simply experience whatever life dishes up for them.

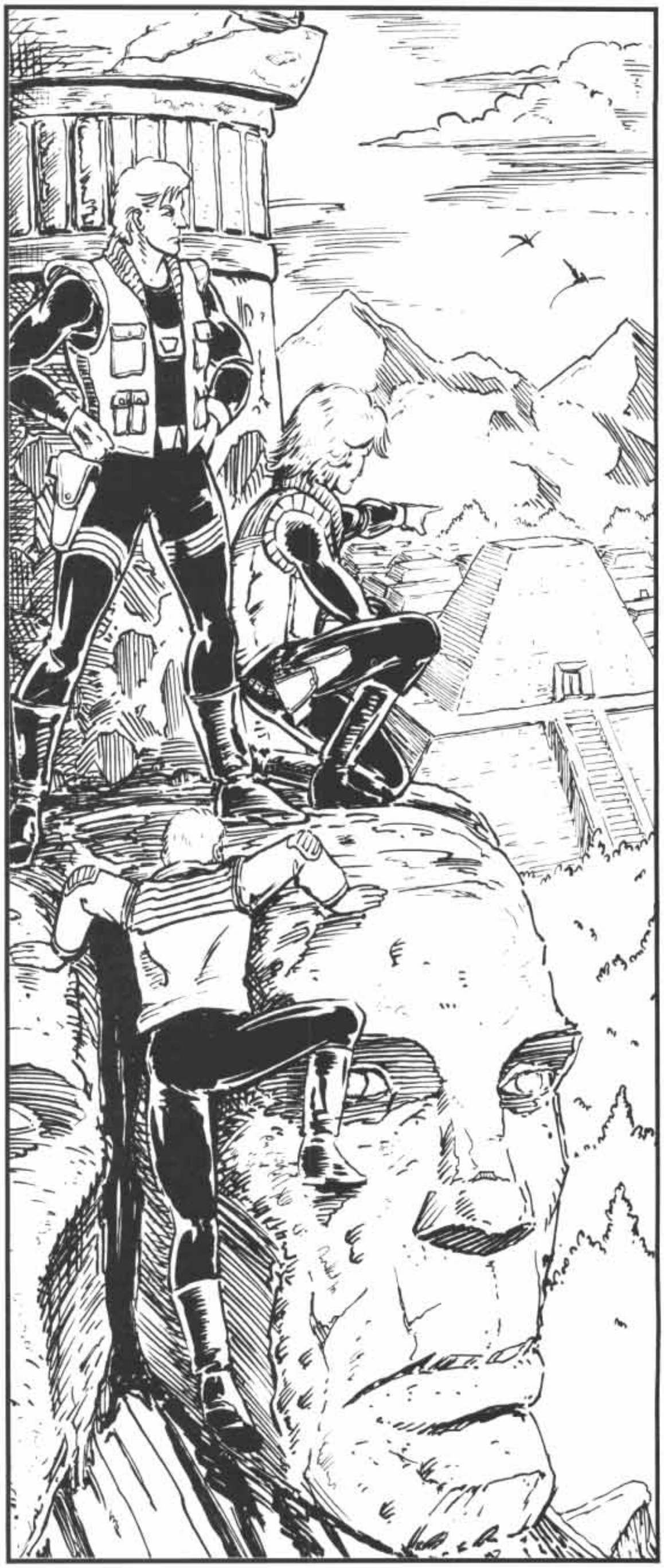
But not you. You're different. You don't much like the shape your ancestors left things in. And if you don't like things, you do something about it. So what if "doing something about it" means changing the history of the universe? That's the sort of difference that makes people leave solid rock behind to reach out and grab back the stars.

What kind of people do that? What sort of people will you be playing in the game? For one thing, they tend to be a little different. Face it, people who blend in well on a planet don't exactly line up to get off of it. So travellers are usually a bit rough around the edges. But that doesn't mean they can't work with their shipmates. A ship crew learns to count on each other—it has to—and it works together like a well-oiled machine.

Travellers spend a lot of time a long way away from formal authority, relying on their own wits to get them out of any trouble they might get into. That makes them suspicious of authority. Every world they visit has a fresh reminder of what the greed and stupidity of dukes and emperors can lead to, and that doesn't make them any more likely to kneel in front of a throne or kiss somebody's ring.

Travellers spend a fair amount of time worrying about where their next credit is coming from. Even if they have a secure job, they've got to make a profit for their employer, or he/she/it will find someone else who can. That's because the universe isn't free. It costs to travel, and so the trip has to turn a profit, and travellers have to earn their way. But that's the *price* of the trip, not the purpose.

This game is about the people who travel out and win back a universe, which is why it's called **Traveller.**



My dear children, my sons and daughters, let me tell you about your heritage and your birthright.

What is the difference between a heritage and a birthright? One deals with the past, the other the future. Your heritage is your history, your roots, all the things which have conspired to make you the people you have become. Your birthright is your future, your goal, where you were meant to go, and what you were meant to do. It is your destiny.

But what is your birthright, your destiny? Your birthright is the stars. Hard as it may be, gathered around this fire, to believe this, believe it you must. Look up at the stars, hear their call; it is your destiny to answer that call.

The stars are your birthright. But now I must tell you of your heritage...

History

Humanity had always looked to the stars and known that there were wonders there to be discovered. Men and women had always known that those stars were there for a reason: to be visited, explored, molded and shaped by human hands. From the day that the first person drew a shape around a group of stars and named it as a constellation, humanity had staked its claim. Someday it would know the stars, own the stars.

Humanity had been split into many groups, scattered by an ancient force to a dozen worlds under a dozen suns, but each of these shared this same vision; each of these knew that they were born to go to the stars. So each of these groups, light-years apart, groped their way to their birthright, planet by planet, star by star. When they met each other, they were surprised to find that others just like themselves had also made it to the stars. But they shouldn't have been, because that's what they were made for.

Humanity had been in space for thousands of years when, quite suddenly, the stars were taken away from them, violently and brutally. Worst of all, there was no one else to blame, no threat to unite against, for they had done it to themselves.

Jump Drive

There is a tremendous difference between space travel and star travel. Space travel consists of long, tedious trips between the planets of one star system. Many races have made it into space and never gotten beyond this level. Some have taken this level to its extreme, sending generation or sleeper ships on journeys lasting scores, hundreds, or even thousands of years to other stars at sublight speeds. Because such trips allowed little in the way of communications, such arrangements could not create true interstellar societies.

For this, a stardrive was required, and was independently discovered by many races as the jump drive, which allowed the passage of a parsec or more in about a week. So important was this single technical breakthrough that races which developed it on their own became known as "major races," while races that had not progressed beyond sublight drives when first contacted were forever branded with the epithet "minor race."

First Steps

Humans from the planet Earth, or Terra—humanity's original and true birthplace—met their first "alien" race a decade after perfecting the jump drive, a scant two parsecs from home at Barnard's Star. But this race was more familiar than alien, for these were the Vilani, one of the transplanted branches of humanity that had already been in space for 8000 years. Their "Grand Empire of Stars," or *Ziru Sirka*, would soon become known as the First Imperium, as it had grown old, and was soon to be challenged and replaced by the vigorous, expansionist Terrans.

Within 200 years, the old, dissipated Vilani Empire had collapsed before the energy of the Terran onslaught, and the Terrans took over the existing Vilani bureaucracy, renaming it the "Rule of Man." Terran leadership sought to break the conservative Vilani procedures, and succeeded in developing and harnessing new technology that had been inhibited or stifled under Vilani rule. Terran English began to be the dominant language throughout this second empire, and survives to this day as the single dominant language throughout human-settled space—Anglic, or Galanglic.

This period saw the first meetings between the Vilani and Terran humans and the other alien races that would eventually become dominant interstellar powers.

The first of these were the Vargr, looking and acting much like erect, intelligent Terran wolves. It was eventually discovered by genetic analysis that that was, in fact, what the Vargr were. The same ancient force that had taken sample humans from Terra and planted them on dozens of worlds also took Terran wolves, and modified them into an intelligent race. Vargr society

retained certain wolf-like traits, and one of these was a rather anarchic inability to form stable groups larger than what one leader can control with his personal charisma. Every leader is constantly being challenged from within and without; every Vargr group will eventually split apart into smaller groups which grow for a time, then themselves split apart once their size grows beyond the leader's ability to hold it together. This means that the area controlled by the Vargr, the Vargr states, is a constantly shifting collection of splinter groups, splitting and reforming around current issues. This pattern also made the Vargr into natural pirates: What they could not cooperate to create together, they could steal from their neighbors. The first Vilani contact with the Vargr was with such raiders.

Another significant contact of this era was between Vilani merchants and the Zhodani, another one of the lost human races flung to the four winds. Again, the Zhodani were almost physically identical to their long-lost Vilani and Terran cousins, but they had affected one very important change upon themselves: a change of the mind. The Zhodani as a culture had embraced and perfected the use of the human mind for telepathy, telekinesis, and other psionic disciplines. This would make them the most alien of the human races, and would create lasting difficulties with their human neighbors over the years.

Also during this period, the Terrans began using the name Solomani, "Men of Sol." But the name change did not help. Terrans or Solomani, the people from Terra could not learn in 200 years what it had taken the Vilani thousands—how to administer a government that encompassed over 10,000 worlds. The forces of change they had unleashed overwhelmed their ability to control them. Less than 450 years after it had been proclaimed, the Rule of Man, now remembered as "the Ramshackle Empire," presided over the slide of human-controlled space into the Long Night.

Long Night

The Long Night was an economic phenomenon. The inability of the Rule of Man to hold the second empire together as a working economic entity caused a gradual disintegration of interstellar society. Beyond its first century of growth and innovation, the Rule of Man was marked by steady economic decline, as the intricate Vilani economic machine was sabotaged by Solomani interference and "improvement."

In many areas, interstellar contact was never lost. However, interstellar trade was no longer a dominant force. Worlds split into ever smaller groups, looking inward to their own local problems, and no longer caring to involve themselves in large-scale activities. With no desire or economic impetus for it, interstellar

Terran	*Imperial*	*Significant Event*
1969	–2549	Men from the planet Earth first set foot upon the Moon.
2058	–2460	Terran bases throughout Sol system.
2087	–2431	Terrans discover jump drive.
2096	–2422	First Terran contact with the Vilani Empire at Barnard's Star.
2110	–2408	First Interstellar War between Vilani Empire and Terra.
2118	–2400	Vargr pillaging of Vilani Empire begins.
2120	–2398	Terran Confederation established.
2314	–2204	Vilani Empire defeated; Rule of Man begins.
2518	–2000	First contact with Zhodani.
2538	–1980	First human contact with Aslan.
2716	–1802	First human contact with Hivers.
2742	–1776	Collapse of Rule of Man.
2992	–1526	Interstellar trade ceases; Long Night begins.
3400	–1118	First Aslan Border War begins.
3868	–650	Sylean Federation established.
4318	–200	First human contact with K'kree.
4518	0	Third Imperium established out of Sylean Federation.
4568	50	First Imperial contact with Zhodani.
5018	500	Imperium expands into Spinward Marches; conflict with Zhodani.
5107	589	First of five Frontier Wars between Imperium and Zhodani begins.
5124	606	First Civil War begins.
5140	622	First Civil War ends.
5318	800	Psionics Suppressions begin.
5520	1002	Terra conquered by Third Imperium.
5628	1110	Fifth and last Frontier War between Imperium and Zhodani ends.
5634	1116	Emperor Strephon Aella Alkhalikoi assassinated.
5635	1117	Third Imperium shatters into factions; Final War begins.
5648	1130	AI Virus is released; Collapse of human civilization begins.
5710	1192	Hivers send contact teams into the Imperial ruins.
5711	1193	Hivers establish technical training schools for humans in the Old Expanses.
5713	1195	Humans begin interstellar trade in the Old Expanses.
5715	1197	Dawn League is established in the Old Expanses.
5715	1199	*Dawn League* trading expedition sent into Diaspora.
5716	1200	All ships sent to Diaspora declared lost. Dawn League dissolved; Reformation Coalition founded in its place.
5717	1201	The New Era begins.



civilization ground to a halt. Vargr raiders poured across the border into the Vilani end of the Imperium and plundered the bones of the human civilization, until internal squabbling checked their further expansion.

At the Solomani end of the fallen Imperium, another race, the Aslan, were pounding at the gates. The Aslan were discovered in the waning days of the Ramshackle Empire. Bearing a resemblance to Terra's feline carnivores, the Aslan live within a proud, expansionist society that gives full rein to the territorial imperatives and warrior inclinations of its male members. The males are warriors with a tremendous concern for their status, which is measured only by the amount of land they control. The females, who outnumber the males 3:1, are the administrators of the society. They run the Aslan economy, and gain status according to the success of their male family members. Aslan society places a high value on its concept of honor, and does not easily recognize that other races might not share their concepts. Aslan growth is fueled largely by the male need for land, particularly the needs of the young, unlanded Aslan males, or *ihatei*. During the Long Night, Aslan expansion toward Solomani territory contacted pockets of human civilization, and began a series of border wars that would continue sporadically for 1400 years, well into the time of the Third Imperium.

The Long Night ground on for hundreds of years, characterized by small local wars played out on small fields, isolated from and unknown to other remaining pockets.

Resurgence

Eventually, forces coalesced here and there with sufficient resources to begin expanding outward again. The most successful of these began at Sylea, at the heart of the old Ziru Sirka. Starting 900 years after the fall of night, this Sylean Federation began expanding, reaching out to contact former centers of interstellar civilization. After 350 years of slow but steady growth, its leader, Cleon Zhunatsu, later Cleon I, realized that the Federation had served its purpose. In order to continue growing, this new state had to have a greater vision. Cleon resurrected the trappings of the First and Second Imperia—the nobility, the names, and most importantly, the grandeur—by discovering or inventing a line of descent that passed from the first two empires down through the years directly to the Sylean Federation. Cleon announced the founding of the Third Imperium on the traditions of the first two, laid claim to their territories, and declared the beginning of a new Imperial calendar, starting at Year 0. This Third Imperium would last for 1117 years, and become the most powerful organization of worlds ever known.

Third Imperium

It would still take several hundred years for the Third Imperium to expand to its ultimate boundaries, and many wars of annexation and pacification would be required.

The most culturally important of these wars were the Frontier Wars against the Zhodani and the Rim War between the Imperium and Solomani.

The young Imperium began expanding into the Spinward Marches in the 500s, and came into contact with the Zhodani, who already inhabited the area. The Zhodani not only stood in the way of an expanding empire, but possessed psionic powers that frightened and threatened the Imperials, who had not developed these powers to any great extent. Learning of the Zhodani *Tavrchedl'*, or Thought Police, who routinely probe their citizens' minds for aberrant thoughts in order to re-educate them, only

repelled the Imperials that much more. War was inevitable, and the first of five wars, and hundreds of years of armed stand-off, began in 589.

At about the same time at the opposite end of the empire, Terra, mankind's true home, was incorporated into the Imperium in 588. But over the next few centuries, a Solomani racial supremacy movement began to exert its influence over nearby Imperial space, which eventually forced an Imperial response. From 990 to 1002, the Imperium waged the bitter Solomani Rim War which climaxed with the invasion and capture of Terra in 1002. Terra remained under martial law for over a century, as Solomani resistance and resentment to Imperial rule fomented and went underground. The Solomani Confederation lost its capital, but was not destroyed, and remained a large and powerful force awaiting a moment to strike back.

Two other major alien races became important neighbors of the Third Imperium. These were the K'kree and Hivers, trailing neighbors against whom the Imperium never fought a war, although the two have fought each other. The Hivers are certainly the most alien of the major races contacted by humanity. They are reminiscent of Terran cephalopod mollusks in that they have six boneless, muscular arms, each of which ends in six highly agile tentacles. These arms project from a single central body which contains the brain and viscera. One of the arms supports the Hiver's eyes and ears; the others are used as legs or hands, as necessity dictates. The Hivers are all neuter in gender, and are quite pacifistic, although from personal aversion rather than philosophic conviction. They make great use of computer and robotic technology, and are experts in the field of psycho-history, the ability to create subtle sociological changes in a society.

The K'kree, or Centaurs, are also six-limbed, but resemble Terran cows with the extra forward-most pair of limbs used as arms. Herd animals, they do not cope well with isolation or confined spaces, and build their starships with large central spaces where the crew works as a group in an open area. They are also militant vegetarians and make rather prickly neighbors. Their militant nature gave them a tremendous advantage in their war with the Hivers until the Hivers revealed their psycho-historical abilities. The Hiver-K'kree border has been secure for the 3000 years since.

Deathknell

By the early 1100s, the Third Imperium had been frozen at its borders for centuries, hemmed in by its neighbors. Perhaps it was this lack of frontiers that made it stagnant and hollow. Although life went on as usual, there was nothing holding the Imperium together any longer. In 1116 and 1117, that became obvious to everyone. In 1116, Dulinor the Black assassinated the last Emperor, Strephon. He attempted to claim the throne as his own, as had the succession of admirals in the first civil war, but no one would have any of that. Instead of looking for a new leader, within a year the Empire split into almost a dozen competing groups, all of which agreed on exactly one thing: They were not going to allow anyone else to control the Imperium.

With nothing more than that as a higher cause, the factions of the Imperium began to slaughter each other. Sensing a power vacuum, Vargr raiders crossed the border and annexed entire sectors. Aslan *ihatei* began moving in large numbers on the Imperial spinward worlds, knowing there was not enough strength to stop them. For the Solomani Confederation, their chance to right old wrongs had come. But no Imperial force stopped these invaders. Imperial force was too busy annihilating itself.

After many years and tens of billions dead, the war slowed down out of necessity. But factions still plotted to gain advantage. If they could pull a string here or overthrow a world there, they might still come out on top. Somehow, as a result of this kind of twisted thinking, an ultimate weapon was released. Never mind that there was precious little left to fight over, never mind that people who had been killing each other for years could not possibly reunite under one ruler, forgive and forget. Never mind.

The ultimate weapon was Virus. Virus was every computer ever built by human hands. Virus knew them all, *was* them all, used them all. Virus was every ship, every machine, suddenly come murderously alive. Virus was fusion plants flaring into blinding, searing annihilation. Virus was planetary power grids melted to slag. Virus was starships falling from the sky, crushing cities. Virus was amusement park rides slaughtering children. Virus was every nightmare ever dreamt on an endless, sweat-soaked night. Virus was the end of everything, of all history. Virus was made by people who look just like you and me.

Virus took the stars away from humanity. Virus destroyed man's universe. Man made Virus. Humanity must make a new universe.

Your heritage, then, is peace, at last. It is the peace of a trillion unburied dead on a thousand cold, lifeless worlds. It is the peace of silent machines, of hearts emptied and minds shattered by tragedy and loss beyond measure, beyond comprehension. That is the heritage I and my kind bequeath to you.

Seize your birthright; own the stars again. But remember always that your destiny, once realized, will one day become your children's heritage.



THE MAP OF CHARTED SPACE

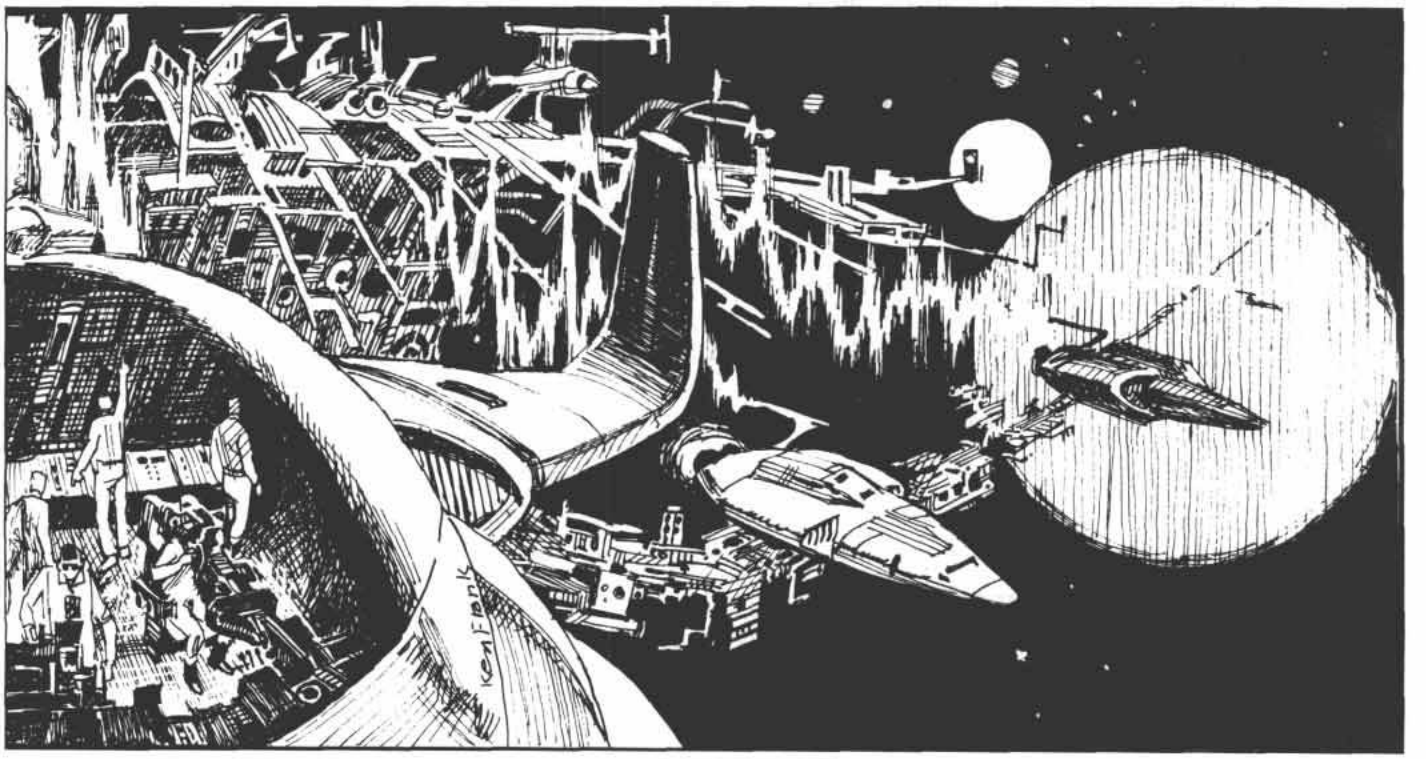
The map shows the main areas of human activity over the past 12,000 years, and is centered on the territory of the First, Second, and Third Imperia. The map measures 280 parsecs from top to bottom and 224 parsecs from side to side. Because a parsec equals 3.26 light-years, it would take a beam of light 912.8 years to travel the map's long dimension, and 730.24 years to travel the short dimension. The area covered by the map is commonly known as "Charted Space." There is actually much more area of charted space off every edge of this map, but Charted Space is the area charted and inhabited by humans, and has been the central area where all of the major races have interacted with each other. The map is oriented with its top toward the center of the Milky Way galaxy. The galaxy spins about its center at a rate of about once every 200 million years at Sol's orbital radius. The direction of the galactic rotation is toward the left edge of the map.

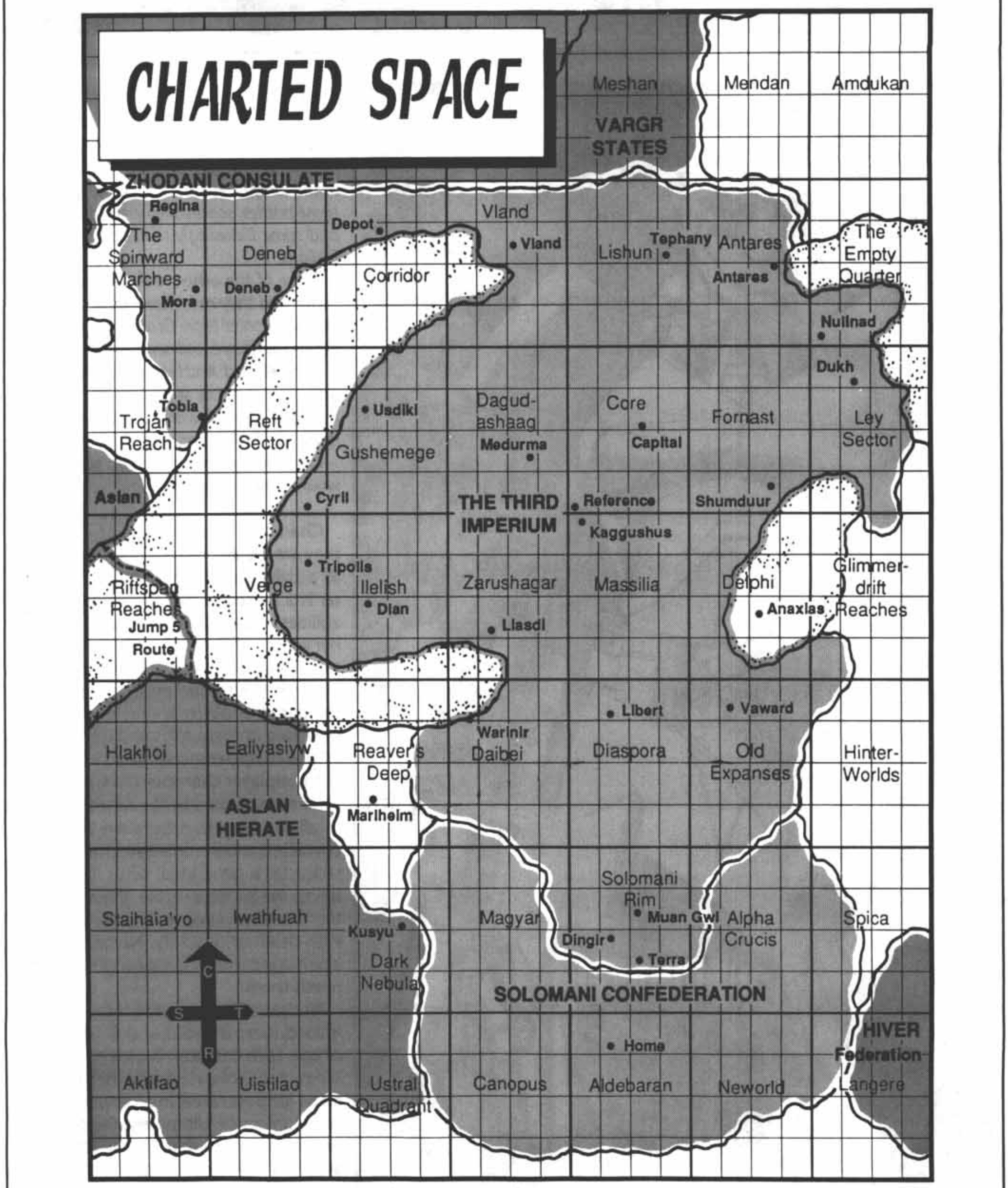
For this reason, directions on this map, and in space travel, use galactic directions: coreward toward the galactic core or top of the map, rimward toward the galactic rim or bottom of the map, spinward in the direction of galactic rotation or left edge of the map, and trailing or trailward, opposite the direction of galactic rotation, to the right edge of the map.

The grid pattern laid over the map is the system of subsectors and sectors used by the former Imperium and other interstellar states to map their territories. Each of the small rectangles constitutes a subsector, and measures 10 parsecs from coreward to rimward, and eight from spinward to trailing. Sixteen such subsectors, four by four, form a sector, usually containing some 400-500 star systems.

The main astrographic features include the rifts, or areas largely devoid of stars. Because interstellar travellers must stop and refuel at planets, these rifts constitute insurmountable obstacles to travel. The largest of these is the Great Rift, reaching in like a giant lobster's claw from spinward. Its upper bight separates the former Imperial core from the spinward arm of Imperial settlements, and also from the Zhodani. The lower bight separated the Imperial Core from the spinwardmost rimward settlements of Daibei and the Reaver's Deep, and also from the main portion of the Aslan Hierate. Across the widest portion of the Great Rift's shank, in the Riftspan Reaches, is a route across the rift, accessible only to high-performance ships, those with jump 5 performance or better.

As a practical measure of the scale of this map, note that the distance from the Solomani-Hiver border to the Imperial-Zhodani border is a little over 280 parsecs, almost 920 light-years. Communications and news can only travel as fast as the fastest available ship. The fastest ships can cover six parsecs with one jump, lasting a week. If we imagine a ship which did not have to refuel, undergo repairs or maintenance, or stop to allow the crew to go ashore, it could make one jump per week. Assuming this was a jump 6 courier, it would take 46 weeks for news of an event on the Imperial-Zhodani border to make it to the Hiver border. With more realistic numbers—a jump 4 ship which spends three days between each jump refueling and conducting maintenance—the time goes up to 91 weeks. Sending an answer back would require just as long.




CHARTED SPACE
ZHODANI CONSULATE
VARGR STATES
Meshan
Mendan
Amdukan
Regina
The Spinward Marches
Mora
Deneb
Deneb
Depot
Corridor
Vland
Vland
Lishun
Tephany
Antares
Antares
The Empty Quarter
Nulinad
Dukh
Tobia
Trojan Reach
Reft Sector
Usdiki
Gushemege
Dagud-ashaag
Medurma
Core
Capital
Fornast
Ley Sector
Asian
Cyril
THE THIRD IMPERIUM
Reference
Kaggushus
Shumduur
Tripolis
Riftspan Reaches
Jump 5 Route
Verge
Ilelish
Dian
Zarushagar
Liasdi
Massilia
Delphi
Anaxias
Glimmer-drift Reaches
Libert
Vaward
Hlakhoi
Ealiyasiyw
Reaver's Deep
Warinir
Daibei
Diaspora
Old Expanses
Hinter-Worlds
ASLAN HIERATE
Marlheim
Solomani Rim
Staihaia'yo
Iwahfuah
Kusyu
Dark Nebula
Magyar
Muan Gwi
Dingir
Terra
Alpha Crucis
Spica
SOLOMANI CONFEDERATION
C
S
T
R
Home
HIVER Federation
Akfifao
Uistilao
Ustral Quadrant
Canopus
Aldebaran
Neworld
Langere

CHARACTERS



When I was a child, Grandfather told us stories at night, stories of dukes and admirals, of galaxy-spanning empires, of star fleets locked in titanic battles. And he showed us the shiny radiation scars he had earned in those battles, scars which were red and ugly and came flickeringly to life in the dancing firelight.

None of the others believed the stories. Some said they must have happened generations earlier than Grandfather's time—others said they could never have happened.

But I believed. And late at night I looked up and dreamt of the stars, and of others like myself on the cold worlds circling them who must also look up and dream.

And I knew that one day, somehow, I would walk among them.

Characters are the focus of **Traveller**; they are the alter egos of the players, and all activity centers on them. Each character is a person within the game and has abilities and attributes which define his or her actions and reactions. The character is the fictional **Traveller** personality; the player is the person engaged in playing the game. A player character (often abbreviated in these rules and elsewhere as PC) is a character manipulated by a player.

A nonplayer character (NPC) is a character manipulated by the referee in order to allow interaction between the player characters and the universe. Once a player character is generated, he or she continues to live an exciting life of adventure in the **Traveller** universe. This life ends only with death or disability. Nonplayer characters appear and disappear as the referee needs them.

All characters begin the same way: untrained, inexperienced, and about 17 years of age. Each character is generated with a series of die rolls. He or she then embarks on an abstract career in order to gain skills and experience. Ultimately, the character retires or leaves that career, calculates acquired money and equipment, and is ready to begin adventuring.

Character Generation

Traveller characters are described in terms of innate attributes, skills, and a number of other characteristics. During character creation, the initial values for all of these are derived by a combination of die rolls and player choices. Over the course of a series of adventures, many of these will increase to reflect skill improvement, advancing age, and the like. The rules in this chapter explain the process of character generation.

In order to make the long process of character generation easier, a Character Generation Worksheet is included with this game (see page 380). The worksheet is largely self-explanatory, but occasional reference to the rules is necessary, at least for your first few characters. Players should read the rules as they generate their characters, filling in the appropriate blanks of a Worksheet as they go. Once a character is completely generated, the information from the the worksheet should be transferred to a Character Sheet (see page 381). After that, the worksheet may be discarded, as only the Character Sheet is necessary for play. (*Note:* Save at least one blank copy of each sheet to photocopy for future characters.)

A Note on Gender and Race: Nowhere in these rules is there a specific requirement established that a human character (player or nonplayer) be of a specific gender or race. Any character is potentially of any race and of either sex.

CHARACTER GENERATION OVERVIEW

The abilities and limitations of a character are determined by three general areas of information: background, attributes, and experience. Therefore, the character-generation procedure follows these three general steps.

Background: Players determine their homeworlds, as these have a strong effect on later steps of character generation. They also decide on other background information, such as social level, name, and gender for their characters.

Attributes: Players determine the six basic attributes of their characters by rolling dice and assigning those results to attributes in any order they wish. These six basic attributes are Strength, Agility, Constitution, Intelligence, Education, and Charisma.

Careers: Characters begin to accumulate experience at the age of 17. At that time, players start making career choices for their characters. Each career choice represents four years of training and/or experience (four years being an arbitrary number that helps regulate character generation). Each time a player makes a four-year career choice, a hobby may also be selected for the character. Careers and hobbies provide the character with all-important skills.

Each career period—henceforth called a term—ages the character by four years. If you are using the random means of determining the end of character generation, a roll is made at the end of each term to see if character generation ends. If so, the character's pre-game experience is complete. (In other words, the character is this old when the adventure campaign begins.) If not, the player makes another four-year career choice. In this way, some characters will begin the game relatively young and unskilled, but with attributes undiminished by age, while others will be older and more experienced, but possibly less resilient than their younger counterparts.

If the referee allows, players who prefer to choose an age for their characters (i. e., a number of terms) may do so, rather than rely upon random die rolls. At the end of each term, then, such players simply decide whether or not their characters will pursue another term.

Derived Values: Now that all changes to skills and attributes are completed, certain values are calculated that are based on them. These are things like accuracy with different weapons at various ranges, damage done by bare-handed attacks, and so forth.

Possessions: Finally, players determine what possessions their characters have accumulated during their careers.

BACKGROUND

The Collapse couldn't have been universal. Somewhere there must be pockets of civilization that retain star flight and the technology to support it, cultures that defeated Virus before it drove them back into the caves. The Hivers managed it, so some human worlds must have as well.

But out here, on the fringe of human-settled space, the Collapse was pretty complete, and if we didn't hit the ground as hard as they did in the Wilds, maybe it's because we didn't have as far to fall. This was always a backwater.

That's something that's about to change.

Before generating the specific physical and mental attributes which define a character, it is necessary to determine the character's background, as this has a strong effect on the rest of the character-generation process.

Stellar Region: The first and most important step in building the character's background is to determine the stellar region.

The stellar region not only influences the character's homeworld, but also determines where the campaign will initially be set, and so this decision should be made jointly by the referee and all of the players in the group (with the referee's decision, of course, being final).

There are four stellar regions outlined below, which represent a range of technological settings. While most characters should be from the same stellar region, it is possible that characters from other areas, particularly if they are from starfaring civilizations, have found their way to the same place, and so homeworlds from different regions are possible, given referee approval.

The Regency: The Regency is the pocket of highest technology and social structure that remains in human space. The catastrophes of the Final War that befell the Third Imperium and culminated in the collapse of almost all interstellar human civilization spared the Regency, allowing it to remain as a living time capsule of the tremendous achievements of the Third Imperium. Technology and space travel continue at high levels in this area, along with contact with five other interstellar governments: the Zhodani Consulate, the Sword Worlds, the Darrian Confederation, and the remnants of the Aslan Hierate and Vargr splinter states.



Old Expanses: This is an area which was human-settled but never fully integrated into the Third Imperium, and which was situated on the fringe of Imperial Space near the Hive Federation. Although hit hard by the Collapse, eight years of contact with the rebuilding Hivers have helped to restore much of the area. This has brought not only vast improvements in living standards and the level of technology, but has also given the people of the area the means to begin re-expanding into the shattered areas of the old Imperium to bring back the fruits of technology to all former Imperial worlds. These people have united themselves as the Reformation Coalition, committed to bringing a new era of enlightenment to ravaged human space. (In the tables below, "Old Expanses" refers specifically to the Reformation Coalition. Much of the Old Expanses Sector is in fact in the Wilds.)

Pocket Empires: Small coalitions of worlds, only a half-dozen or so, were able, through heroic efforts, to withstand the Collapse and maintain their ties with each other, although just barely. They suffered further losses in technology, population, and resources before finally arresting the downward slide. Although commerce continues within the few isolated pocket empires, trade and exploration outside of their boundaries is rare, because they are wary of risking their few priceless starships.

The Wilds: The majority of what was once Imperial Space is now called the Wilds (or sometimes No Man's Land or the Blasted Area). This area is typified by vast areas of isolated worlds which have lost their contact with the stars, visited once every few years by the rare free traders in their rickety old ships. There is no regular interstellar communication in this area, although there are occasional small starports on worlds attempting to rebuild. Thus, each world in this area is unique, as it has spent the last 70 years alone, seeking its own solutions to its problems. Unfortunately, many of these worlds have fallen under despotic leaders who jealously maintain control of the last bits of remaining technology, and who have forced their subjects back to medieval type life-styles.

I know that all the time I was growing up, people were trying to put back together the pieces of a broken technological society—trying with all their heart—and failing. It was like trying to fix a crystal-circuit matrix that someone had smashed with a hammer, and trying to do it with a soldering gun. Hopeless.

In the meantime, the rest of us were just surviving... "Scratchin' dirt with the chickens," is how Grandfather used to say it.

Then the Hiver ship landed. A lot of people were frightened, but not Grandfather. Not me, either. The first time I saw one of them, I knew.

We were going back to the stars.

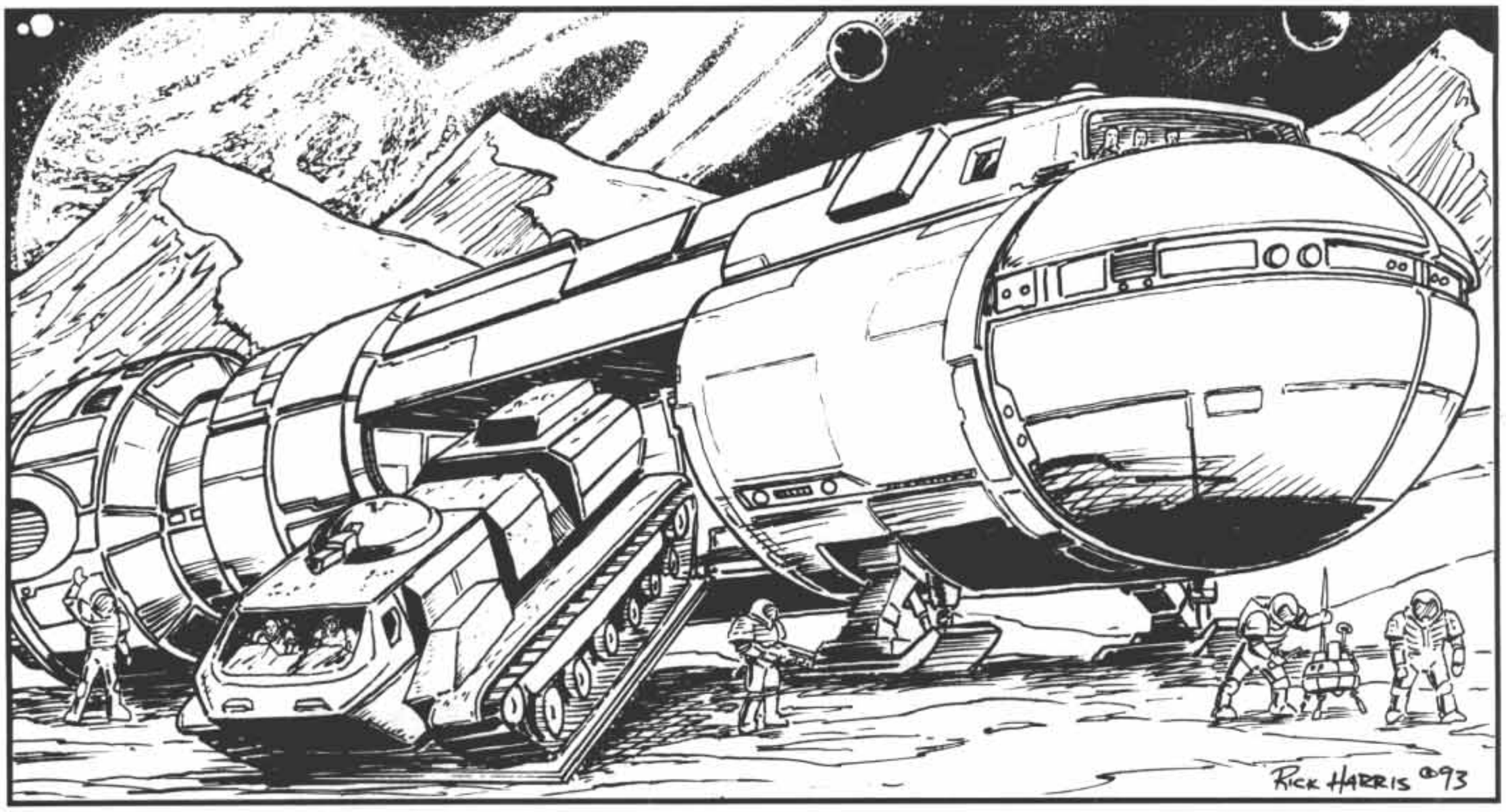
Homeworld: The next step in determining background is selection of a homeworld. A homeworld is the world on which a character was raised and probably born. It represents the environment which most directly shaped the early (pre-adventuring) development of the character.

A character can specify homeworld in several different ways: a specific pre-existing homeworld can be assigned by the referee or chosen by the player (subject to referee approval); a referee can generate worlds which can be chosen by or assigned to the players; or a homeworld can be generated randomly using the tables provided.

The first two methods are by far the most preferable, as these allow the players to know exactly what and where their homeworlds are.

World Assignment: The sample subsectors located in the "Referees" and "The New Era" chapters detail a typical area from each of the four types of stellar regions. If the referee wishes to start the campaign in any of these four subsectors, any of the listed worlds could be chosen.

Referee Generation: Referees may also choose to create



their own worlds and cosmography (geography, but with stars instead of planetary terrain features), and assign players homeworlds from their own personal universes. These can be created by using the procedures in the World Building section of the "Worlds & Travel" chapter. Once these worlds are created, the referee takes the specific world characteristics and translates them to the more broad descriptions which are used here. The Homeworld Characteristics Descriptions table on page 18 shows the code equivalents for translating the worlds generated under the referee's system into world descriptions.

If a homeworld is deliberately created, by either the referee or the player, it must contain at least as much descriptive information as is provided by the Homeworld Random Generation table.

Random Generation: Homeworlds can be created solely for purposes of character generation by using the Homeworld Random Generation table to generate world descriptions for the various world characteristics. Descriptions are brief statements that describe conditions on the world; they provide less detail than the referee-created world characteristics, but they are easy to use and remember. Using the Homeworld Random Generation table, roll 2D6 separately for each of the codes: starport, size, gravity, atmosphere, hydrographics, population, government level, law level, and tech level. Die modifiers are called for when generating certain descriptions (see page 18). Note that the statistical likelihood of getting certain descriptions below may be different than is achieved when generating a planet from scratch in the World Building section. This is to be expected, as player characters are more likely to come from certain types of worlds than others.

Homeworld Random Generation

Die	*SP*	*Size*	*Grav*	*Atmos*	*Hydr*	*Pop*	*Gov*	*Law*	*Tech*
2	A	Ast	0G	Vac	Desert	Inc	Low	No	Pre-Industrial
3	A	Small	.1G	VacT	Desert	Inc	Low	Low	Pre-Industrial
4	A	Small	.2G	Thin	Dry	Inc	Low	Low	Industrial
5	A	Small	.4G	ThinT	Dry	Low	Mod	Mod	Industrial
6	B	Small	.6G	Std	Wet	Low	Mod	Mod	Pre-Stellar
7	B	Med	.8G	StdT	Wet	Low	Mod	Mod	Pre-Stellar
8	C	Med	1G	Std	Wet	Mod	High	Mod	Early Stellar
9	C	Med	1.2G	DenseT	Wet	Mod	High	Mod	Early Stellar
10	D	Large	1.5G	Dense	Wet	Mod	High	High	Average Stellar
11	E	Large	1.8G	Extr	Wet	High	Extr	High	Average Stellar
12	E-X	Large	2+Gs	Extr	Water	High	Extr	Extr	High Stellar

A roll of less than 2 is treated as 2.
A roll of more than 12 is treated as 12.

HOMEWORLD DIE ROLL MODIFIERS

Starport

Apply the following Stellar Region DMs:

Region	*DM*
The Regency	None
Pocket Empire	+3
Old Expanses	+6
Wilds	+8

On a result of E-X, roll 1D6 and consult the following:

Roll	*Starport*
1-3	E
4-6	X

Gravity

If size = Asteroid, Grav = 0G
If size = Small, DM –3
If size = Mod, reroll 2-3, 11-12
If size = Large, DM +4

Atmosphere

If size = Asteroid, Atmos = Vac
If size = Small, DM –2
If size = Large, DM +2

Hydrography

If size = Ast, Hydro = Dst
If size = Small, DM –2
If size = Large, DM +2

Government

If Pop = Inc, DM –4
If Pop = Low, DM –2
If Pop = High, DM +2

Law

If Gov = Low, DM –2
If Gov = High, DM +2
If Gov = Extr, DM +4

Tech Level

In the Wilds, –5
Pocket Empire, –3
Ref. Coal., –1
If SP = A, +3
If SP = B, +2
If SP = C, +1
If SP = X, –2
If Size = Ast, +1
If Hydro = Water, +1
If Pop = Low, +1
If Pop = High, +2

HOMEWORLD CHARACTERISTICS DESCRIPTIONS

Actual UWP Code ranges are given parenthetically with the descriptions (see pages 188-189).

Starport Codes

A: Excellent-quality installation.
B: Good-quality installation.
C: Limited-quality installation.
D: Poor-quality installation.
E: Primitive installation.
X: No starport.

World Size Descriptions

Asteroid (0): Diameter below 200 km.
Small (1-4): Diameter 800-7199 km.
Medium (5-7): Diameter 7200-11,999 km.
Large (8-A): Diameter 12,000-16,800 km.

Atmosphere Descriptions

Vacuum (0-3): Very little (if any) atmosphere (pressure below 0.43 atmospheres).

Thin (4-5): Thin nitrogen-oxygen atmosphere (pressure 0.43-0.7 atmospheres).

Standard (6-7): Standard nitrogen-oxygen atmosphere (pressure 0.71-1.49 atmospheres).

Dense (8-9): Dense nitrogen-oxygen atmosphere (pressure 1.5-2.5 atmospheres).

Exotic (A+): Atmosphere, usually dense, consisting of poisonous, often highly corrosive, substances.

The T notation on the page 17 table indicates that the atmosphere is tainted by some harmful element or chemical such as sulfur dioxide, lead, etc.

Hydrosphere Descriptions

The hydrosphere is water unless the atmosphere is exotic.
Desert World (0): Water covers less than 5 % of the surface.
Dry World (1-2): Water covers 5-24 % of the surface.
Wet World (3-9): Water covers 25-94 % of the surface.
Water World (A): Water covers 95-100 % of the surface.

World Population Descriptions

Incidental Population (0-2): Less than 1000.
Low Population (3-5): 1000 to 999,999.
Moderate Population (6-8): 1 million to 1 billion.
High Population (9-A): More than 1 billion.

World Law Level Descriptions

No Law (0): No prohibitions.

Low Law (1-3): Automatic weapons (those with a burst value) and high-energy weapons (plasma and fusion guns) prohibited. Public display of some weapons restricted in some urban areas.

Mod Law (4-7): All lethal firearms and energy weapons (i.e., other than stun guns) prohibited or severely controlled. Public display of melee weapons prohibited or severely restricted in many urban areas.

High Law (8-9): All weapons except for cudgels, daggers, hand axes and slings prohibited.

Extreme Law (A+): No private ownership of weapons is allowed.

World Government Descriptions

Low Gov (0-2): Very little government regulation. Government organized along corporate or participatory democracy lines.

Mod Gov (3-9): Active, interventionist government but with numerous constitutional limits on its authority and frequently required to seek ratification of its actions by the governed, either through referenda or elections.

High Gov (A-C): Very active government with few genuine limits on its authority and with little meaningful input by the majority of the governed.

Extreme Gov (D-F): Repressive government which devotes routine effort to keeping the population in line with its directives.

Earth History Tech Level Equivalencies

Pre-Industrial (0-3): Pre-1800
Industrial (4-5): 1800-1930
Pre-Stellar (6-8): 1950-2000
Early Stellar (9-A): 2000-2100
Average Stellar (B-D): 22nd century+
High Stellar (E-G): Extreme high technology (flying cities, etc.)

ATTRIBUTES

Each character is described, in the simplest of terms, by six attributes detailing the physical and mental defining characteristics of the individual. These attributes are generated through a series of die rolls. Roll two six-sided dice and subtract 1 from the result to generate a number from 1-11. Do this six times. Each separate roll is then assigned, in whatever order the player desires, to one of the following six attributes: Strength (STR), Agility (AGL), Constitution (CON), Intelligence (INT), Education (EDU), and Charisma (CHR). Record the results on the Character Worksheet, located on page 280.

Players who roll attributes for their player characters totaling less than 36 points may add attribute points (allocated as they see fit) to bring the total up to 36. This ensures that characters are always at least average.

Personal attributes are defined as follows:

Strength: The numerical quantification of a character's muscular power.

Agility: A measure of a character's coordination and nimbleness.

Constitution: Health and physical stamina. This determines the character's hit capacity and resistance to disease.

Intelligence: The ability of a character to perform abstract reasoning. Intelligence primarily affects the ability of the character to learn; it is not the same thing as common sense. (How much common sense characters have is determined by the actions of the players themselves.)

Education: The ability of a character to gain knowledge and experience from a formal academic setting. The Education attribute determines how far a player character can advance at a university and serves as a prerequisite for certain forms of higher education.

Charisma: A quantification of personality and personableness. Charisma reflects skills that affect how nonplayer characters react to a character. It is not so much a measure of physical appearance as of natural charm.

Abbreviations: The six attributes of Strength, Agility, Constitution, Intelligence, Education, and Charisma are used throughout these rules. For brevity, they will sometimes be abbreviated as STR, AGL, CON, INT, EDU, and CHR, respectively. These attributes are often divided into three categories: Physical Attributes (Strength, Agility, Constitution), Mental Attributes (Intelligence, Education), and Spiritual Attributes (Charisma and Psionics, which is described later in the rules).

Shugilii is a belter, not only by profession, but also by birth. He was born out in the asteroids, and he's lived most of his life in low-G. He exercises two, maybe three times a day, but for all of that, he's still not what you'd call a muscle man. People in low-G have to exercise almost constantly just to keep their muscles from atrophying and their hearts from weakening, but that's no substitute for carrying around 75 to 100 kilos in 1G 18 hours a day.

I've never seen anyone with reflexes like his, though, except for maybe other belters. He says, "People who live in hard vacuum learn to live carefully." I suppose that's true.

Homeworld Effects on Attributes: Characters' homeworlds affect their attributes in a variety of ways. Add or subtract the following values from the rolled attributes of the character, but subtractions may never reduce an attribute to 0. These modifications reflect the effects on a normal human of these environments. Humans who have become adapted to these environments after five or more generations, or after genetic engineering intended to adapt to these environments, will be more or less immune to these effects at the referee's discretion.

Gravity: If from 0.2 G or less, subtract 2 each from Strength and Constitution (referee may stipulate that a 0G world, actually a space station of some sort, has a permanent pseudo-G field either from artificial gravity or a spun habitat, thus negating these effects). If from 0.5G or less, as above, but only subtract 1 from each. If from 1.5G-1.8G, add 1 to Strength and subtract 1 from Constitution. If from a 2G+ world, add 2 to the Strength attribute and subtract 2 from Constitution.

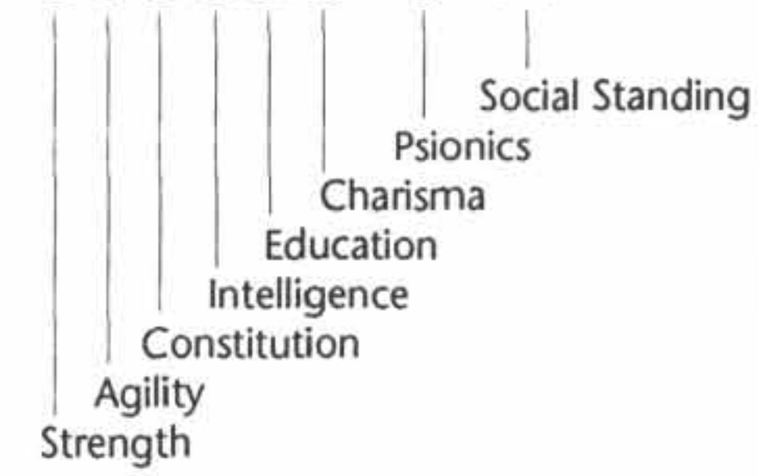
Atmosphere: If from a vacuum world, add 1 to Agility. If from a world with an atmospheric taint, subtract 1 from Constitution.

Population: If from an Incidental or Low population world, subtract 1 from Charisma. If from a High population world, add 1 to Charisma.

Technology: If from a Pre-Industrial world, subtract 2 from Education and add 1 to Constitution. If from an Early Stellar world, add 1 to Education. High Stellar worlds add 2 to Education.

The Universal Personality Profile (UPP): Characters in **Traveller** are defined using the Universal Personality Profile (UPP), which expresses attributes in a specific sequence using hexadecimal (base-16) numbers. In hexadecimal notation, 0 through 9 are represented by the common Arabic numerals; 10 through 15 are represented by the letters A through F. The highest single-digit number in strict hexadecimal notation is 15 (F). In many cases, **Traveller** uses extended hexadecimal notation in which letters above F denote numbers higher than 15 (G = 16, H = 17, etc.).

UPP
(Universal Personality Profile)



Attributes are in the following order: STR, AGL, CON, INT, EDU, CHR. For example, a character who is average in all respects would have a UPP of 666666. If the character were highly intelligent, the UPP becomes 666B66 (the B indicates an intelligence of 11).

The UPP allows the referee and players to clearly note the attributes of characters. Because the notation uses single digits or letters for each characteristic, numbers that are normally two digits cannot lead to confusion.

Attribute Limits: The initial rolls for attributes range from 1-11. These numbers may then be raised or lowered by homeworld effects, creating a range of 1-13.

During the careers portion of character generation (page 24), certain careers offer the opportunity for certain attributes to be raised further, as the result of physical training and education. However, no attribute may be raised more than 2 points as a result of these career increases. This reflects the fact that a character's original limitations can only be altered so much. (This is why you don't see very many Olympic weightlifters with tiny bones and light skeletons.) Modifications to attributes from homeworlds do not count against this limit. Thus, a character from a 2G homeworld who rolled an 11 (B) for STR would have this modified to a 13 (D) before beginning a career. During the career portion of character generation, this character could take no more than two +1 STR results, making a final STR attribute of 15 (F). No attribute may ever be raised to greater than 15.

Other Characteristics: In the course of character generation, the character will acquire age (in years and in four-year terms), rank, money, skills, and possessions.

Psionics: There is, in addition to the main six attributes, a seventh that in most characters is a 0. This is the Psionics attribute (PSI), which shows a character's ability to create mental or physical effects with the power of the mind alone (called on 20th century Earth psychic or paranormal powers). This attribute and its uses are detailed in the "Psionics" section of the Referees chapter.

Nonhuman Attributes: The six personal attributes assume a human character. Intelligent nonhuman races may have different attributes in place of (or in addition to) these human attributes.

Language: The language spoken throughout the worlds to which humanity has spread is Anglic (sometimes called Galanglic), a language evolved from ancient Terran English. All human characters will speak Anglic or a local dialect of it. Characters from homeworlds which have been isolated from the rest of human culture for a generation or more will speak Galanglic with an accent and with a number of local words added to the vocabulary, terms which others might find confusing.

Other alien races have their own native languages, but if they live on a human-settled world will probably speak at least some Anglic as well. Nevertheless, dealing with aliens and members of different cultures is easier if their native language is understood. The major languages spoken by sentient races are Anglic, Vilani, Sylean, Vargr, Aslan, Droyne, Hiver, K'kree, and Zhodani.



Once trade started back up, we started seeing how people on the other fringe worlds—we called it the Dawn Coalition back then—had sorted things out. Pretty interesting stuff. I was deep in the Hiver tech curriculum on Aubaine when I met my first "noble." Best table manners I ever saw. I mean, amazingly *good table manners.*

I also noticed that lots of the officials who made life difficult for most of the rest of us practically lined up to help this guy.

Social Standing: Roll 2D6 and subtract 1 to determine initial Social Standing (abbreviated SOC) on the character's homeworld. This is a measure of the accomplishments and power of the character's parents or guardians (if raised by other than his or her natural parents).

This is not an innate attribute, and unlike attributes, it may change dramatically during character generation, based on the career choices made. However, like attributes, a character's SOC may never be reduced below 1, nor raised above F.

Titles: Social Standing for each character shows the relative position within society for an individual. The fallen Imperium had a government based on noble rank, with clearly defined levels of power based on those ranks. Because of the ubiquitous nature of this society in human-inhabited space, the noble structure permeated most human worlds, and its effects still survive.

These are naturally most widespread in the Regency, which retains most of the Imperial institutions. Hereditary nobles still exist there, although their power is significantly curtailed as compared to pre-Collapse days. Rather than having absolute rule over their fiefs, they remain in an advisory or limited-rule position, and are sometimes reduced to merely drawing income as a percentage of the economic output of their fiefs.

In other areas, such as Pocket Empires or the Wilds, nobles may have retained much of their power, although acting over a much more limited area. In the Wilds, the new rulers may have perpetuated some of the old symbols of Imperial power, particularly titles, as a means to further aggrandize themselves. The nobility system no longer survives in the areas controlled by the Reformation Coalition, as it is regarded as the flawed system of self-interest that corrupted and doomed the Imperium to the Collapse.

See the History section beginning on page 8 for a fuller discussion of local government and leadership traditions.

The noble system discussed below is the old Imperial system, and may be used with changes to suit local conditions at the discretion of the referee. Nobles of rank baron and above were usually granted fiefs—quantities of land that belong to the noble and could be used to generate income by renting it out, using it for farming or some other production. Fiefs generally ranged from 100 to 100,000 square kilometers, according to rank. Nobles were also given larger areas to administer, or govern, in the name of the Emperor, although they did not own these areas.

Those with Social Standing B+ (11 or greater) are considered to be noble, and may assume their family's hereditary title. Noble titles are commonly used, even if the individual is not engaged in local government. At the discretion of the referee, the noble may have some ancestral lands or fiefs on his or her homeworld.

Knights: A knight (Social Standing B) is entitled to the use of Sir (or Dame) before his (or her) name. Characters whose initial SOC is B, and whose SOC does not increase during character generation, are the sons and daughters of knights. However, this title is not hereditary and so those characters are not entitled themselves. Characters who have an initial SOC of less than B and whose SOC increases to B, and characters whose SOC is initially B, then is lowered, and then increases to B, have themselves been knighted and can use the knightly titles of Sir or Dame. Knights do not receive fiefs, nor do they govern.

Baron: Social Standing C entitles the individual to the title baron (or baroness). Or the individual may use the prefix von, haut, or hault with his or her name to denote baronial nobility. A baron usually administered a portion of a world.

Marquis: Social Standing D indicates a marquis (or marchioness). A marquis generally administered a single world, with or without further authority within the system.

Count: Social Standing E indicates a count (or countess). The count administered several worlds within a single subsector.

Duke: Social Standing F indicates a duke (or duchess). This typically included the administration of a subsector (an area eight parsecs by 10 parsecs, typically including some 30 worlds), although each sector also had a senior duke who was the duke of the entire sector (an area of 32 parsecs by 40 parsecs, including 16 subsectors and some 400-500 worlds).

Although player characters cannot advance beyond duke, noble ranks included archduke (16 or G) and emperor (17 or H). Archdukes governed domains, a group of several sectors.

The Noble Ranks Table shows the range of noble titles and their corresponding social levels.

NOBLE RANKS

SL	*Rank*
B	Knight (Sir, Dame)
C	Baron/Baroness (von, haut, hault)
D	Marquis/Marchioness
E	Count/Countess
F	Duke/Duchess
G	Archduke/Archduchess
H	Emperor/Empress

HONORIFICS

Many social positions come with very rigid forms of address that are expected to be used. This is especially true in societies that have a strong nobility. These honorifics are used when addressing the person or when referring to the person in formal circumstances, and are used with possessive pronouns. For example, "Your Grace," "His Imperial Majesty the Emperor," or sometimes without a possessive, as, "Excellency."

A campaign that has a strong noble flavor will be enhanced by attention to these protocols.

Not all of the noble ranks listed to the right correspond with the standard Imperial nobility listed in the text. Many of these are local variations, and include intermediate steps (baronet, viscount) between formally recognized Imperial noble ranks. Some worlds retain strong religious institutions which may use some variation on the forms given. Finally, some non-noble government positions also use standard honorifics. The honorifics listed are samples and guidelines, and are not universal; these sorts of things can vary widely according to local usage, tradition, and idiosyncrasy.

Social Position	*Honorific*
Noble Honorifics	
Knight	Sir, Lady/Dame
Baronet	Sir, Lady/Dame
Baron/Baroness	Right Honorable (RH), Lord, Lady
Marquess/Marquis/Marchioness	RH Lord, Lady
Viscount/Viscountess	RH Lord, Lady
Earl/Count/Countess	Most Honorable Lord, Lady
Duke/Duchess	Grace, Lord Duke
Archduke/Archduchess	Grace, Lord Archduke
Members of Imperial family in line of succession (Princes, Princesses)	Imperial Highness
Emperor/Empress	Imperial Majesty
Religious Honorifics	
Clergy	The Reverend
Bishops/Archbishops	Most or Right Reverend, Excellency
Cardinals	Eminence
Pope	Holiness, Holy Father, Most Holy Father
Civil Honorifics	
Foreign Ambassador	Excellency
Elected or appointed official	Honorable

Naming Characters: There is a fine art to naming characters in roleplaying games, and it is something that each player should approach in his or her own manner, but with respect for the intentions of the other players and the referee. For example, there is nothing wrong with the names Captain Spit, James Cheaplaugh, and Sodom N. Gomorrah in a campaign that is intended as a light-hearted, rollicking escapade through the stars. But in a campaign that is intended to be serious and realistic, such names tend to drag down the tone rather too much.

The **Traveller** campaign background postulates an environment some 3800 years in our future, in which a form of English is still the dominant form of expression. Therefore, familiar modern names are still quite acceptable (Paul R. Currin, "Mad Dog" Kelly). Players with an historical bent often enjoy using bits and pieces of famous historical names (Jackson T. Greenwood), up to and including running with a theme, like US Supreme Court Justices (Harlan Marshall, "Cookie" Rehnquist). Other Terran languages are also used to good effect. Many names are chosen simply for their sound, whether imposing (Gray Manchester Armstrong) or mellifluous (Dick Kabuki, Barringer Olds, Terrel Skeeter).

The **Traveller** campaign adds additional language sources to choose from. The most common non-Terran source of human names

Examples of Call Signs

"Bongo this is Skidder, over."

"Bongo. Go."

"Bongo, we have cargo airborne, and our ETA at pickup site is zero two niner zero local. Who's driving the bus, over?"

"Roger zero two niner zero local for pickup, Skidder. Rebba's driving the bus, over."

"Break, break, break. Bongo, this is Rogue Six over."

"Bongo. Go."

"Uh, Bongo we have a situation back here. I have nine high-speed bogies inbound, with only sporadic echos. I estimate G-shooters flying NOE. Uh... I'm getting some jamming, too. Over."

"Hammer, this is Bongo. Do you copy, over?"

"Hammer. Go."

"Hammer, we have a situation at our back door. Skidder will make pickup site with the goods at zero two niner zero local. Can Rebba expedite dust, over?"

"Negative, Bongo. Bad guys have launched a Sig-Delt, and the navy has moved Rebba up into a parking orbit while they deal with it. Uh, wait one... Bongo, navy has splashed the Sig-Delt, but Rebba has passed the window and will have to wait for next transit, over."

"Oh, boy. Hole Card, are you on tacnet, over?"

"Roger, Bongo. Go."

"Hole Card, chop to Rogue Six. We have bad guys coming up our tailpipe. He'll run the firefight. I'll handle the DZ traffic...."

"Break, break, break. Bongo, this is Rebba. Strike all that next transit crap. Rebba doesn't believe in parking orbits. Rebba is inbound hot, estimating dust at one seven minutes. Light up a beacon at dust minus zero three minutes, and have your bums on the DZ, over."

"Rebba, I love you! Drinks are on me, over."

"Bongo, that is correct, over."

is the Vilani language, e.g., Makhidkarun, Naasirka, Zirunkariish.

Never underestimate the importance of a good name.

Call Signs: In addition to your character's proper name, players working for or with the Reformation Coalition (Star Vikings) will have a two-syllable tactical nickname, which is also their tactical communication (tacnet) identification. This name is always used in combat as a quick call sign, but is used routinely in normal address as well. Even fairly senior officers are regularly addressed by their nickname (but only by other Star Vikings—such familiarity must be earned).

Players have a number of options when selecting a nickname. The name can be a familiar or altered form of their own first or last name (Charley for Charles, Rebba for Rebekka, Hutch-man for Hutchinson), or it can be totally fanciful (Hammer, Stardust, Ice Nine, Go-Go). The limitations are that it must be exactly two syllables long, and it cannot duplicate an already-used nickname.

It is also desirable to pick a name with at least some panache. No viking, for example, has even been known to go by the tactical nickname Snook-ums, and if a name like this is picked, it should at least be at variance with the character's actual appearance. It would take a character with both STR and CON attributes of 12+ to get away with Snook-ums as a nickname. Remember also that these nicknames are usually bestowed by colleagues during training, and more often than not refer to an embarrassing training incident that the character might rather forget. This does not mean that such nicknames have to sound bad; in fact, they usually sound really good if you don't know the story. "Slider" could be awarded for a headlong slip down a muddy hillside in survival training, "Burner" in remembrance of a training aircraft the character crashed and burned, and "Straight Flush" for an unfortunate incident with a toilet.

It is a rare viking who gets to pick a nickname, and a rash one who even tries, particularly an overly flashy one that has not been earned. Woe to the cocky, inexperienced youth who insists that the crew must call him Lightning. If he doesn't live up to it, the crew might end up calling him Lightweight.

Background Skills: Characters begin the game with more than just a background; they also have knowledge of a number of different skills, reflecting training and experience that they acquired before beginning a life of adventure. By age 17, at which time career determination begins, characters will have already accumulated some expertise in a few skills due to childhood hobbies and education. To represent this, players should each choose four skills from the Background Skills List above, giving their characters a level 2 skill in each. Some of these skills are limited by the character's homeworld, as indicated on the chart. Where more than one limitation appears, all of them

Background Skills List

Skill	*Atmos*	*Hydro*	*Pop*	*Law*	*Tech*
Acrobatics					
Act/Bluff					
Archery				High (9)–	
Armed Martial Arts				High (9)–	
Biology					
Chemistry					
Climbing					
Computer					Pre-Stellar (6)+
Disguise					
Electronics					Industrial (4)+
Environment Suit	Vacuum (0-3)	———	or ———		Pre-Stellar (6)+
Farming	Thin-Dense (4-9)	Dry (1)+			
Guard/Hunting Beasts					
Ground Vehicle					Industrial (4)+
History					
Language					
Mechanic					Industrial (4)+
Muscle Transport					
Music					
Painting					
Pilot (Fixed Wing)	Thin (4)+				Industrial (4)+
Pilot (Interface/Grav)					Early Stellar (9)+
Research					
Riding	Thin-Dense (4-9)				
Sculpting					
Slug Weapon				Mod (9)–	Industrial (4)+
Small Watercraft	Thin-Dense (4-9)	Wet (3)+			
Song					
Stealth					
Streetwise			Mod (4)+		
Survival	Thin-Dense (4-9)				
Swimming	Thin-Dense (4-9)	Dry (1)+			
Thrown Weapon					
Tracking	Thin-Dense (4-9)				
Unarmed Martial Arts					



must be met. This list is not intended to be comprehensive, but is merely representative of most of the sorts of skills that a person is likely to pick up in childhood. A referee may decide that a character grew up on a world whose population consisted only of workers and their dependents from the world's navy base. The referee might allow that the character had picked up some skill in Ship's Engineering from going to work every day with his parents.

The choice of such skills can create a clear picture of the sort of childhood a character had. A character who picks skills like Armed or Unarmed Martial Arts can be imagined to have grown up in a tough inner city area; one with Survival and Farming came from a vigorous, outdoor life, while one with Music probably came from a background with a certain level of affluence and leisure time.

Default Skills: Certain characters automatically receive default skills of level 0. A level of 0 for a skill indicates that the individual can undertake ordinary activities, but is not experienced enough to try dangerous activities or fancy actions. A skill level 0 is sufficient to prevent a task from increasing in difficulty because of lack of skill, although a skill level 0 provides no skill addition to the controlling attribute. (See the task-resolution rules for a complete discussion of skills and their effects on attributes.)

Default skills are conferred automatically as follows:

Characters from Vacuum worlds automatically receive Environment Suit 0.

Characters from a Water world automatically receive Swimming 0.

Characters from an Asteroid world automatically receive Zero-G Environment 0.

Characters from a Large world automatically receive High-G Environment 0.

Characters from a world with a tech code of Industrial to Early Stellar automatically receive Ground Vehicle (Wheeled) 0.

Characters from a world with a tech code of Early Stellar+ automatically receive Computer 0.

Characters from a world with a tech code of Average Stellar+ automatically receive Pilot (Interface/Grav) 0.

All player characters (and detailed NPCs) automatically receive Willpower 0.

CAREERS

Players have a reasonably free hand in choosing detailed career backgrounds for their characters. This background consists of formal education and/or one or more careers. (For purposes of character generation, the term "career" is defined fairly loosely.) For ease of calculation, career and education backgrounds are lived through in four-year terms. Characters may do pretty much anything they please, but must do it in four-year increments for ease of record-keeping.

Each career listing (these begin on page 43) details the nature of the career, the skills that are received for the first term, and any skills received for subsequent terms, if applicable. Each description also includes notes of important contacts made during the term and any special rules for the career's effects on the character's combat Initiative and starting money. Characters may enter any career for which they meet the prerequisites, but must spend at least one full four-year term in that career before moving on.

Education and career terms may be taken in any order desired, although most players will probably opt to take education first, followed by career, in the classic pattern.

For the players' convenience, there is a consolidated chart of all careers and their prerequisites on page 56. This not only allows players to see what careers are available to them based on their homeworld, but also how they should assign their attributes to gain admission to the career of their choice.

Prerequisites: There are three types of prerequisites—attributes, prior service, and homeworld/region. Not all careers have all three types of prerequisites, but most have at least one. In most cases, physical attribute prerequisites allow the character entry upon meeting any one of these (exceptions are noted). All homeworld/region and prior service prerequisites must be met.

When I hit the Hiver technical curriculum, it was as if I'd come home for the first time. This was where I belonged, and it's where I would have stayed if the first expeditions into the Wilds had turned out differently. But all of that came later.

I loved deep-space astrogation, loved it with a passion I'd never felt before. Putting a jump ship "into the hole" at just the right angle of attack so that 150 hours later it climbed out three parsecs away with the exact residual angular momentum to throw it to within skimming distance of a gas giant was the most beautiful thing I'd ever done. There was a logic, an elegance to it that I'd never imagined existed, and nobody was better at it than I was. Nobody.

Nobody except Veronique. Veronique dusted me every time. Veronique was the best I ever saw, the best we had, and a planet-class cellist as well. I'd watch her playing the cello at night and see her pause for a long second, completely lost for the moment, as if the note she'd played had triggered some sudden new thought. Then she would continue.

What was she thinking about during those pauses? I always thought that it must have been "the hole," and residual momentum, and angle of attack. Our music of the spheres.

Career Term Skills: In the first term of a career, a character receives a fixed package of skills from a group of skill areas which represent training in the core skills necessary to function in the career.

In every subsequent term of service in that career, the character receives additional levels of skills from a group of skill areas. After the first term in a given career, the player selects skills from the Subsequent Terms heading, not the First Term heading.

Characters receive four skill levels in their second term of service, three in their third term, two in their fourth term, and one in their fifth and every subsequent term.

Note that this reduction in number of skills received is based on the total number of terms served by the character, not just the terms served in a particular career. For example, a character begins a career on term 1 and continues it on term 2, but changes careers on term 3. On term 3, the player receives the full first term skill package for the new career, but then on term 4, the character would receive two subsequent term skills from the Subsequent Terms skill package, not four. The information on number of skills per term in recorded the tables on pages 32 and 42 for easy reference.

Players may divide the levels among the skills listed in the allowed skill group in any manner desired. If five skills are listed and a character is entitled to four skill levels, the player may take a level 4 skill in one of them, two level 2 skills in different areas, four level 1 skills, etc. If the character already has skill in the area chosen, the additional levels are added to the levels already there. Thus, a character who already has Astrogation 1 who then selects two levels in Astrogation now has Astrogation 3.

Similarly, if a career listing gives a character a certain number of levels in a skill cluster, the character may divide those levels among any of the skills in that cluster however he or she chooses. If the career lists Crime 3, the character may take three levels in Forgery, or two levels in Pickpocet and one level in Intrusion, or one level in each of the three skills in the Crime cluster.

Education Skills: Skills received in education terms do not follow the 4-3-2-1 pattern described above, but are based on the character's EDU, as stipulated under the career listing. Most education types cannot be taken for more than one term; the one exception is graduate university, which can be taken as many times as desired.

Commissions: Many services have a commission die roll. A commission signifies that the character is taken in as an officer (or the civilian equivalent) as opposed to as an enlisted person. In order to be given a commission, the character must roll the stated number or less on 2D6. DMs may apply to the roll. If the commission is achieved, the character receives rank O1 in the career. A character may attempt to acquire a commission once per term of service until successful.

Being granted a commission means that the character receives skills from a different list under the First Term and Subsequent Terms headings (called officer in all of the military careers, but called detective, doctor, etc. under other career descriptions).

In some cases, commissions are automatic based on certain prior education terms that have been taken. The character is automatically commissioned upon entry to the service, and never rolls.

Some careers have no commissions or officer ranks, and only one set of skill lists. Do not worry about commission rolls or commissioned status in these careers.

Promotions: In each term of service (including one in which the character has received a commission), a character may attempt to be promoted. Although the Promotion heading is included under the Subsequent or All Terms heading of the career listings, the roll is made on the first term as well. Each career has a promotion number and DMs affecting that promotion roll. Generally, if a promotion is achieved, the character advances to the next higher rank in the service. A character is eligible for one promotion per term of service.

A character who receives a promotion also receives one additional skill drawn from the Subsequent

Terms list (even if the promotion is received during the first term).

Note that some careers (Wealthy Traveller, Rogue, Belter, etc.) have no ranks listed on the Table of Ranks on page 57, while others (Diplomat, Bureaucrat, Barbarian, Corsair) have ranks but no "O" ranks. This is because there are no convenient, standard rank equivalencies for many of these careers. Characters in these careers roll normally for promotions, and receive the additional skill when they roll a success, but no rank or change in rank is recorded. Players should assume that some form of professional advancement or recognition was achieved with the roll, but nothing so easily recorded as a military rank. In the Medicine profession there are noncommissioned ranks, but once a character receives a commission, the character is a "doctor" and rolls for no further promotions.

Special Duty/Adventures: Players who make the indicated die roll on 2D6 qualify for a special assignment or adventure. This die roll is modified by +1 for every subsequent term spent in the career. That is, there is no die modifier on the first term, a +1 DM on the second term, +2 on the third term, etc.

If players successfully make the required die roll for special duty (or special assignment or adventure in some careers), they receive additional skill levels apportioned in the same manner as for those received for subsequent terms of service. As with subsequent terms of service, they receive four levels in their first or second term, three in their third term, two in their fourth term, and one in every subsequent term.

Note that the allowed skill group from which these are drawn is different from the term skills available. These skills are received in addition to any term skills received. Players roll for special duty/adventures in every term served, including the first term.

Ending Character Generation: Just as attributes can be generated either randomly or by player decision, so can a character's total career time and final age. Players who wish to use the random method make a 2D6 continuation roll at the end of each term through their characters' development. If the character wishes to change careers in the next term, subtract 1 from the die roll. If the modified die roll is greater than the number of terms pursued thus far, another term is chosen and the character proceeds; if the roll is less than or equal to the number of terms, the character's progress ends and the adventure campaign begins with the character at that age.

For example, Dr. Wilfred J. Barsz, a professor of physics, has been through five terms thus far: one as an undergraduate, two in grad school (to get both an M.A. and a PhD), and two as a professor. At the end of this fifth term, the Barsz player rolls a 6 on 2D6, which is higher than the current number of terms, so the good doctor goes on to complete another term. At the end of this sixth term, the player again rolls a 6, which is equal to the number of terms served thus far, so character generation ends and the adventure campaign begins. (Note that this does not mean that Barsz is no longer a professor, merely that after 12 years of teaching, he began to get mixed up with the other player characters, and started saying things like, "Call me 'Wild Willie.'")

The one exception to this rule is that criminals, corsairs, mercenaries, and rebels who fail their roll to avoid incarceration automatically spend the next term as a prisoner without making a roll to end career generation.

Those players who prefer not to use this random method may, with their referee's permission, simply choose a number of careers for their characters. Because there is no longer a continuation die roll to discourage too much "career hopping" to receive First Term skill packets, referees should be careful when permitting players to use this option. It is suggested that the referee and player discuss the player's intent for the character before the referee grants this option. Characters who choose a fixed number of adventuring careers and who, as either criminals, corsairs, mercenaries, or rebels, fail their roll to avoid incarceration on their last term, spend an additional term as prisoners.

Note that nothing in these rules prevents a character from entering the game at age 17, without pursuing any careers at all. But very few people would be interested in playing such an inexperienced, unskilled, (not to say callow) character.

When characters complete their final term, they begin the adventure campaign. Since each term is four years, it is easy to calculate their age at the start of the game.

Secondary Activity: The careers players choose do not occupy 100% of their characters' time. Just as in real life, a person's hobbies and pastimes can provide valuable additional skills. As a general rule, then, each character is allowed one *secondary activity* each term. This allows the character to gain one level in any skill (player's choice each term) at the referee's discretion. In some cases, this skill may be a normal term skill in the character's current career (for example, a soldier practices on the rifle range on weekends to improve her Slug Weapons skill, or a computer operator stays late in the evenings to read manuals and improve his Computer skill). In other cases, the character may be indulging a hobby (Swimming skill for a scuba-diving trip, Biology skill for taking a night class). Referees should feel free to limit the types of skills that can be picked up in this fashion (only under extraordinary circumstances should a Barbarian character pick up Ship's Engineer skill as a secondary activity). See the skill eligibility limits on the Skill List by Controlling Attribute table on pages 114-115 for guidelines.

Increasing Attributes: Characters may also attempt to increase any of their six basic attributes (STR, AGL, CON, INT, EDU, CHR) as a secondary activity. This is done by taking an allowed skill level as a chance at a selected attribute. On a 2D6 roll of 8+ (DM: one per level of Willpower skill), the selected attribute is raised by one level. If the roll is failed, the attribute is not increased, and the skill level is lost and may not be re-allocated. This attribute improvement is subject to the +2 ceiling on page 20.

Some careers allow two secondary activities per term (both of which may be devoted to the same skill, if desired), while a few allow none. The number of allowed secondary activities per term is the number of skill levels received.

Social Standing: Different career paths and accomplishments affect a character's Social Standing, either favorably or unfavorably. Each promotion a character receives while commissioned increases Social Standing by 1 (to a maximum of 14). Certain careers also have a minimum Social Standing for commissioned rank; characters who receive a commission and whose Social Standing is lower than the minimum immediately have it raised to the minimum level. Finally, some careers lower Social Standing, as noted under the Other Effects entry in each individual skill listing.

SKILLS

It's easy to survive if you don't go anywhere and don't do anything. But if you plan to go out there into the Wilds and pick up the pieces of a civilization as busted up as any ever was, you better know what you're doing, or you're going to end up a statistic.

I've known statistics. Being a statistic is no fun.

Characters obtain two different types of skills: initial skills and acquired skills. Initial skills include knowledge of a native language (or languages) and skills supplied by education and/or careers during character generation. Acquired skills are learned from instructors during the course of a campaign (i.e., some time after character creation has been completed, as explained in the Refereeing Traveller section, page 134). All character skills, whether obtained during character generation or acquired, are listed on the various skill lists (Skills by Skill Clusters table on page 113, and the Skill List by Controlling Attribute table on pages 114-115.

Skill Ratings: Upon the first acquisition of a skill, the player writes the skill name, followed by a space and the number 1 (thus: Navigation 1). The second time the skill is acquired, the number is increased to show greater expertise (Navigation 2). Further acquisitions of the skill will increase this level. The higher the level, the greater the expertise in that skill.

Skills are rated in levels from 0 on up. There is no upper limit to skill levels, but around 10 is about as high as a skill is likely to get, unless the player is content to have a very one-dimensional character.

Cascade skills are a special case. A cascade skill is a collection of several closely related skills under one heading. For example, Wheeled Vehicle and Tracked Vehicle are aspects of the Ground Vehicle skill and are written as "Ground Vehicle (Wheeled)" and "Ground Vehicle (Tracked)," respectively (see Cascade Skills below).

Skill Clusters: Most skill awards for careers are listed in terms of skill clusters. For example, the Physical Science skill cluster includes the specific skills of Biology, Chemistry, Farming, Genetics, Geology, Meteorology, Physics, Robotics, and Xeno-Biology. Skill clusters are listed in **bold type** in the career lists. A skill award in a skill cluster may be taken in any skill or skills contained in that cluster, subject to homeworld or technology limits as judged by the referee.

Cascade Skills: A few skills are called cascade skills. A cascade skill is one that includes several lesser skills under one broad heading. Examples of cascade skills are Pilot, which includes Airship, Fixed Wing, Rotary Wing, Glider, and Interface/Grav, and Slug Weapon, which includes both Slug Pistol and Slug Rifle skills.



Characters who receive a cascade skill must decide on an area of special interest from among the subskills covered. From then on, their skill level in the chosen specialty is considered to be the level of the overall skill. Their level in all of the other subskills is half their level in the overall skill.

For example, Paul Currin receives a Slug Weapon skill level of 3 and decides he will specialize in slug rifles. His skill level with slug rifles is 3, while his skill level with slug pistols is 1 1/2, rounded down to 1. This skill would be written Slug Weapon (Slug Rifle) 3, and would need no other addition to also convey the fact that the skill in Slug Weapon (Slug Pistol) is automatically half that level, or 1.

Normally, no notation will have to be kept for these other subskills. However, sometimes it is possible for characters to receive a skill level increase in a subclass other than the one they have already chosen as their specialty. In the example above, Currin has a Slug Weapon skill of 3 and has chosen Slug Rifle as his specialty. If he then receives one level of Slug Pistol skill due to experience gained while adventuring, the skill level received adds to his Slug Pistol skill only, not to his overall Slug Weapon skill. However, if this extra skill level would cause his Slug Pistol skill to exceed his specialty Slug Weapon skill, then Slug Pistol will become his new specialty (and his overall skill will go up, of course). In either case, he will have to keep track of his Slug Rifle and Slug Pistol skills separately from now on. After the above example, they would be noted Slug Weapon (Slug Rifle) 3, and Slug Weapon (Slug Pistol) 2.

I'd heard about computers, read about them, but I'd never actually seen one until the Hivers landed. I knew how electricity was supposed to work—Grandfather made sure of that—but you don't really learn to respect the stuff until you screw up and it lets you feel what a hundred or so volts are like. A lifetime of reading about atmospheric re-entry couldn't have taught me as much as my first two hours in the holo-trainer at the academy. Getting off-world training by the Hivers exposed me to things that I never could have imagined if I'd stayed at home.

The people on worlds too far away for us to reach will be stuck, just like we were a few years ago, and they'll probably stay stuck for generations.

Homeworld Limitations: Certain skills are not available on the character's homeworld. Vehicle and technical skills are limited by the character's homeworld tech code; weapon skills are limited by the character's homeworld tech code and law code; and certain other skills, such as aerodynamic flight and nautical skills, are limited by the planetary environment. These limitations are listed with the skill descriptions in the Task Resolution and Skills section of the "Referees" chapter, as well as on the Skill List by Controlling Attribute table on pages 114-115.

Law Enforcement, Corsair, and Criminal careers may select weapon skills one law code lower than their homeworld's law code (i.e., a criminal character from a High Law world would be allowed to take a skill in a weapon that is not allowed under High Law, but is allowed under Moderate Law). Army, Navy, Scouts, Aviation, Rebel, Wet Navy, Marine, Special Operations, and Mercenary characters are not limited by their homeworld law code, nor are characters with a SOC of 11+. See the Skill List by Controlling Attribute table on pages 114-115 to see which weapons skills are allowed by what law levels.

Characters may try to override the homeworld limitation and acquire a skill not normally available by rolling 2D6 for 8+. If that fails, the skill level(s) is forfeited. This is done on a per-skill basis. The unavailable skill may only be rolled for once per term, and the number of skill levels being risked must be specified before the die roll is made. For example, a character from a Pre-Stellar tech code receives 4 skill levels in his second term, and is allowed to pick from the Vehicle cluster (includes Ground Vehicle, Hovercraft, Riding, and Pilot (Interface/Grav). The Pre-Stellar code would normally prohibit receipt of the Pilot skill, which is limited to Early Stellar+. The player would have to decide how many of the 4 skill levels to risk, because if he fails the die roll, he loses the risked skills. The player decides to try for Pilot (Interface/Grav) 2, saving the other two skill levels from this term for other skills. The roll is a 6, meaning that the character now has only two skills from this term. The player may not roll for Pilot (Interface/Grav) again during this term.

This override attempt may be done not only for technological limitations, but for any other type of homeworld limitation.

To visualize what the character is doing to get these skills, think of the following examples. A character on a Desert world attempts to get membership in an exclusive health club to learn Swimming skill. A character on a High Law world attempts to befriend a police officer who will teach him to fire on the police station's firing range to gain Slug Weapon skill. A character on a vacuum world could call in personal favors to gain time on a military simulator to get Pilot (Fixed Wing) skill. A character on a low-tech world in the Wilds might be able to discover or otherwise gain access to relic pre-Collapse technology and learn to use it.

Languages: Language is used to communicate, and communication is resolved using the standard rules for skills and tasks. Characters are assumed to be fluent in their own language, and additional language skills are taken in foreign languages or, for those interested in history, ancient languages.

CONTACTS

Strombooli is one of the more colorful people I've ever known, but then I guess the free traders who scratch out a living peddling junk from planet to planet in the Wilds all tend toward the eccentric. I met him when I first went undercover. He saw through my cover and spotted me for a Leaguer right away. He could have let me go blundering on my way, but instead he took me on as a crewman—galley slave, cargo jockey, and roustabout. It was a better cover than I'd had before, and let me see a lot of the Wilds close up and personal.

I still run into him—he gets around a lot—and he's always ready with a story shared over a drink. And he usually knows something important about whatever planet we're interested in.

During the course of our lives, we all meet a great number of people, many of whom become important contacts. For a roleplaying game to mirror reality, then, it should take into account important contacts that PCs acquire. Of course, it is easy enough to do this with characters met during the course of an adventure campaign; we need merely jot down a note that so-and-so can be found in such-and-such a place and may be able to help somehow in later adventures. But what about contacts that PCs would have made during their education and development prior to play? In **Traveller**, those contacts are indicated in a note at the end of each career description.

Contacts are categorized in two broad groupings: solid and generic. In general, solid contacts are intended as resources for PCs to use during the course of an adventure, as people who can provide information, special equipment, or some other source of needed aid. (Note that the availability and quality of such aid will be dependent upon a contact's situation, personality, and relationship to the PCs.) Generic contacts can serve well as a resource for a referee to use to help spur the adventure plot along, allowing him or her to drop an unexpected ally into the story just when the PCs really need one. How these two types of contacts are used will become more clear from the explanations that follow.

Off-World Contacts: Given the size of the **Traveller** adventuring universe (thousands of light-years of space and thousands of star systems), referees should take care to keep track of which of a character's contacts are homeworld contacts and which are off-world contacts. In general, any PC from homeworlds in the Wilds with a Pre-Stellar– tech code should yield only homeworld contacts. Because of the interstellar contact, any of the other three stellar regions will have the possibility of off-world contacts. Whenever a contact is rolled, roll an additional 1D10 on the table below to see if the contact is off-world. Note that the die roll chance is greater in a term in which a special adventure/duty/assignment was rolled.

The simple fact that a contact was a homeworld contact does not mean that that person can only be met again by returning to the homeworld, only that an interstellar reunion between the character and contact will be somewhat less likely than meeting him or her on a visit home. For this reason, interstellar meetings should be exciting events, and offer an excellent chance for roleplaying as the PC and NPC contact catch up on old times.

"Boggs! I can't believe it! I haven't seen you since I left on the trader! I'm glad to see you made it off that old dirtball, too. How've ya been?"

In many cases, such meetings can be a prelude to an adventure.

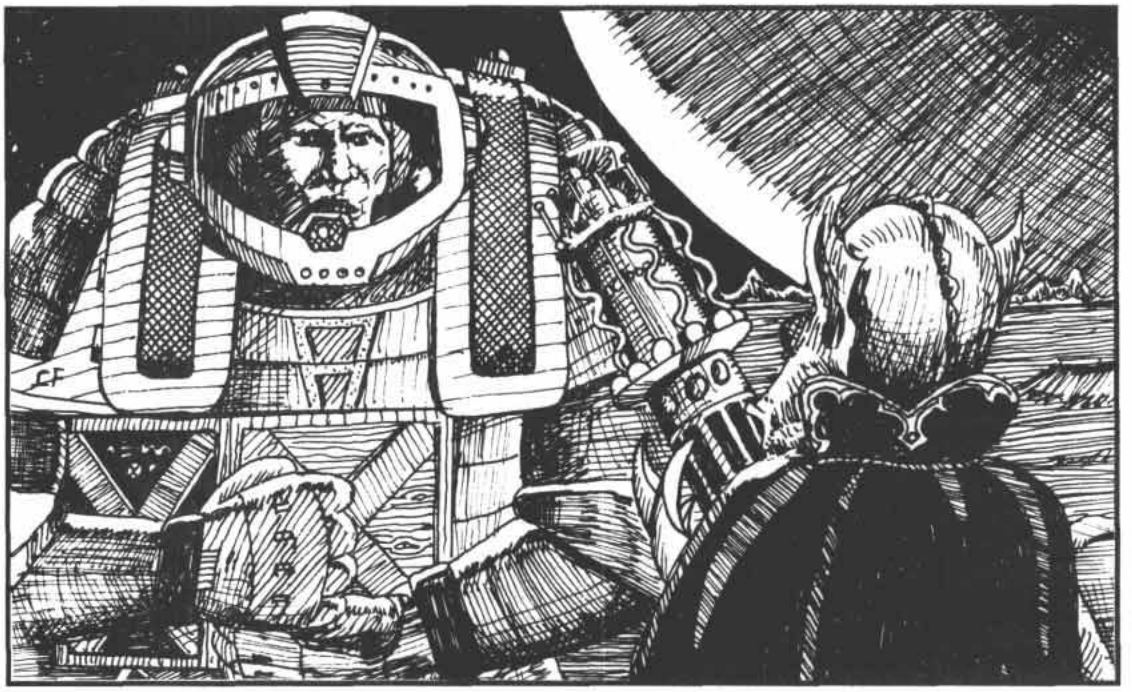
"Duro, am I glad I found you! You won't believe how bad things have gotten since you left. The Combine has nationalized all of the mines and has completely clamped down on all off-world travel. No one can get on or off now. Can you help us?" And if this isn't enough, the referee can always go on: "Remember Clarisse? Yeah, from chemistry class. She always did like you. She said she knows you'll come back and help us. You won't let us down, will you?" Referees will soon find that playing NPC contacts is the most fun you can have without a vac suit (whatever that means).

Region Type	*Nonspecial Term*	*Term with Special Duty*
Regency	4+	2+
Old Expanses	6+	4+
Pocket Empire	8+	6+
Wilds	—	10*

*At referee's discretion only. The referee may stipulate that the world has received *no* interstellar contact of any kind since the Collapse.

Generic Contacts

Generic contacts are received as a result of career terms during character generation. If players desire, they may generate names and statistics for these characters, or they may leave this entirely up to the referee. Perhaps best is a course that combines these two, in which a player suggests the contact's name, general description, and areas of expertise, and then the referee generates the details of attributes and skills. In this way, players determine what sorts of persons become important to their characters' lives, but some mystery remains as to the contacts' exact abilities. This fosters a sense of contacts being personalities rather than merely lists of statistics.



The career notes list contacts in terms of what they were doing when a PC first met them. A basic description of each of those contact types is given below. However, just as a PC may have changed careers since the time the contact was originally made, so may have the NPC. The final determination of what has happened to a contact in the intervening years (including what new abilities the contact may have gained) is left to the judgment of the referee, as with all NPCs.

Academic: The contact was a member of the intellectual community, meaning he or she could have been a professor, a writer, or a member of a social sciences think tank. Most of these sorts will still be working at the same career when a PC later meets them again.

Business: The contact was a member of the business community, perhaps a corporate executive, or maybe a powerful figure in banking or investments. On the other hand, the contact may have been the owner of some smaller business that was important to the PC. In either case, such contacts may have made or lost a fortune since the time the PC last saw them.

Criminal: This contact was making a career of illegal activities when first met by the PC. Since that time, the NPC may have gone straight, been imprisoned, or even killed. In the last case, someone close to the original contact, perhaps a partner or henchman, remembers the PC and becomes the new contact.

Entertainment: The contact was involved in the entertainment industry, whether as an actor, director, writer, or technician. In all likelihood, he or she still is, although given the vagaries of popular taste, his or her level of success will probably have changed.

Government: Such contacts were some form of government official when the PC last knew them. Chances are, that remains true when the PC meets them again, although likely not in the exact same capacity.

Intelligence Community: An intelligence community contact worked in espionage when the PC first met him or her, either as a field operative, a controller, or an intelligence analyst. In all probability, such contacts, when the PC meets them again, will still be involved in espionage, although they will likely have risen in authority.

Journalist: The contact may have worked with the PC on a newspaper, magazine, or broadcast news-gathering staff. The contact is probably in the same line of work, although will probably have changed position or company more than once.

Law Enforcement: The contact was a policeman or investigator of some sort, and is probably doing the same thing now, most likely for a small community government.

Medical: The contact was a medical doctor or administrator when the PC last knew him or her. It is extremely likely that such contacts will still be involved in that business.

Military: Military contacts were in the army, navy, etc., when the PC first made their acquaintance. There is good chance that these contacts will have since left the military and moved on to a civilian career closely associated with their military specialty.

Specialist: When the PC knew him or her, this contact was a construction engineer, medical technician, or one of the other specialities mentioned in the career lists. It is the nature of such specialists to continue in their specialty, although they will undoubtedly have increased their expertise since the PC last met them.

Trader: The contact is a travelling interstellar trader. This sort of contact may be encountered again almost anywhere, and will probably have extensive information about whatever area the character is in.

Wealthy: The contact was wealthy when he or she originally became friends with the PC. Wealthy con-

tacts who have grown wealthier will be difficult to contact again, due to increased security, higher mobility, etc. Nonetheless, it can be very handy to have a wealthy friend.

Solid Contacts

Solid contacts are those whose present whereabouts the PC knows, and with whom the PC has fairly regular dealings. These include three different types of characters. The first are the other PCs in the adventure group. When a group is first put together, or whenever a new PC joins, the players and referee should work together to determine how the group members know one another. As long as each PC has some link to one other in the group, that is enough to justify their all working together. Understand that while PC links are similar to NPC contacts, they do not actually use up any of the contact designations given by careers. PC links are in addition to those contacts.

The second type of solid contact is basically a generic contact that a PC has asked to have as a regular source of aid, even before the campaign begins. This simulates the player looking up an old acquaintance and solidifying their relationship. For example, a player asks to convert one of her criminal contacts to a solid contact, so that she can have someone in the local starport to turn to for underworld information and equipment. The referee agrees, deciding that it would actually make his job easier to have an established source of such things. This type of solid contact *does* use up one of the player's listed contacts from her careers. The difference between homeworld and off-world contacts becomes very important in this context. Nonetheless, a player a long way from home with only homeworld contacts should feel free to ask the referee to convert a contact, but the referee will have final say in whether one of these contacts has made it off-world into a position to be able to help the PC.

Finally, the third type of solid contact also involves generic contacts that have been converted. In this case, though, the contact is converted during an adventure, usually at the referee's instigation.

Note that while solid contacts cannot be turned back into generic ones, they can turn up again in a different place if the referee desires. In general, though, once a generic contact is turned into a solid one, the referee must pay a little closer attention to that NPC's destiny, in order to remain true to the character's desires and unfolding history. The criminal contact in the example above might become a drifter and end up in a completely different region of the globe, for instance, but the mayor of a city is much less likely to wander about so freely.

Generating Solid Contacts During Play: The referee should always be open to the possibility of the players making new contacts during play, and should usually have an idea whether a new NPC will be favorably disposed to help the PCs or not. In addition, players may attempt to gain solid contacts during play. These attempts should be roleplayed out, but PC groups with skills in Carousing, Recruiting, Persuasion, and Leadership should be given greater chances of success.

AGE

When we found out what happened to the crews of those first ships we sent into the Wilds, it was as if everyone went a little crazy. Or maybe we all just grew up. Maybe there isn't a lot of difference. Veronique had been on one of those ships—sweet, smart, gentle Veronique.

Grandfather, by then a white-haired patriarch, stood in council and spoke for a long time—spoke about what it must have been like for the people in the Wilds to have lost so much so quickly. The memory of what had been before was still strong in him—strong enough that he could understand what the loss of it could have done to people, could have driven people to do. And he wanted all of us to understand, too.

I understood. I understood better than Grandfather. This was disease. Disease worse than the Black Death, worse than Virus. And we had the cure—star-hot plasma and RAM grenades and coherent light. I said as much.

Things were never the same between Grandfather and me after that. There was just too much of the past in him to have much heart for the future—or much stomach for it.

A character's age at the time an adventure campaign begins is determined by multiplying by 4 the number of terms served and adding 17 to the result. In other words, (4×Terms)+17=Age. Age adds a further dimension of reality to play, helping players visualize their characters as actual people, rather than merely numbers on paper. It is possible for beginning characters to range anywhere from age 17 on up, although few characters will be older than 37 or so.

Effects of Age

At age 33, the effects of age may start to take their toll on a character physically. Beginning at age 33 (i.e., the end of the fourth term), a character must check for the effects of age at the *end* of each term. At the end of the fourth and fifth terms, the character rolls 1D15 (D15 numbers are generated by rolling 1D20 and rerolling all results of 16-20) to check for losses in Agility. At the end of the sixth and seventh terms, both Agility and Strength must be checked. At the end of the eighth and every term thereafter, Agility, Strength, and Constitution must be checked.

CONSOLIDATED EFFECTS OF AGE

Term	Start Age	End Age	ST/SD*	Losses STR	AGL	CON	INT
1	17	21	4	—	—	—	—
2	21	25	4	—	—	—	—
3	25	29	3	—	—	—	—
4	29	33	2	—	Y	—	—
5	33	37	1	—	Y	—	—
6	37	41	1	Y	Y	—	—
7	41	45	1	Y	Y	—	—
8	45	49	1	Y	Y	Y	—
9	49	53	1	Y	Y	Y	—
10	53	57	1	Y	Y	Y	—
11	57	61	1	Y	Y	Y	—
12	61	65	1	Y	Y	Y	Y
13	65	69	1	Y	Y	Y	Y
14	69	73	1	Y	Y	Y	Y
15	73	77	1	Y	Y	Y	Y
16	77	81	1	Y	Y	Y	Y
17	81	85	1	Y	Y	Y	Y
18	85	89	1	Y	Y	Y	Y
19	89	93	1	Y	Y	Y	Y
20	93	97	1	Y	Y	Y	Y
21	97	101	1	Y	Y	Y	Y

* ST/SD = Number of Subsequent Term/special duty skills.

In addition, once characters reach age 65, at the end of the 12th term, they must start rolling for a decrease in Intelligence. (The Consolidated Effects of Age Table above illustrates these progressions, as well as the reduction in the amount of skills gained during careers due to aging.)

The character loses 1 point from the relevant attribute if the 1D15 roll is less than the current level of that attribute. If the roll equals or exceeds the attribute, there is no loss. This check, also called an age saving throw, is made at the end of each term.

Example: Ari Lionia ends her fourth term and must roll for a reduction in her Agility, which is presently 9. She rolls a 3 and since that is less than her current attribute level of 9, she loses 1 point of Agility. In another example, upon leaving his eighth term to enter active play, Winfield Jackson must roll three times, once for Strength (presently 6), once for Agility (presently 9), and once for Constitution (presently 5). The rolls are 7, 6 and 5 respectively, so Jackson does not lose any Strength or Constitution points, but has his Agility reduced to 8.

Aging in Play: Aging in play works the same way. Upon reaching the crucial age as indicated in the End Age column above, the player must roll for whatever attributes are marked Y in the Losses columns. For example, on Harlan Marshall's 45th birthday, his player must roll to save his STR 5 and AGL 8. The player rolls 10 and 5, saving the STR, but losing a point of AGL. Not too bad. Soon, however, it is poor old Admiral Hutchins' birthday. He is 65, with a UPP of 42248A. He rolls for STR, AGL, CON, and INT with a 3, 9, 2, and 3. Hutchins loses 1 point from each his STR and INT. His UPP is now 32238A. Happy birthday, Admiral.

Although rolling for character aging on their birthdays is convenient, referees may wish to invoke the attribute changes gradually over the course of the year.

Combating Aging Effects

There are several ways players can attempt to reduce or eliminate the effects of aging.

Physical Development Program: At any time once play has begun, a player can announce that his or her character is embarking on a physical development program. Each such program lasts for four years, the same as an aging period. Each year during this period, the player must roll a Formidable: Willpower test. If this test is made each of the four years, the character gets a +2 die modifier on each of the three Physical Attributes when the next aging rolls come up. If the Willpower test is failed on any one or more of the four years, the effect is lost. Characters may not attempt this program during character generation, only once play begins.

This physical development program assumes that the character is spending at least one hour each day in some form of disciplined exercise, and the referee must ensure that the character sticks to this regimen, or the effects will be lost. These effects are up to the referee, but they should not be too onerous. They are best used as grist for a character's roleplaying. For example, when the PCs' starship arrives on a world, a PC carrying out a physical development program might look for an outdoor track to run on ("Man, I need a change of scenery from the same old walls of B Deck") or a weight room at the starport ("I hear these high-tech worlds have got great gravitic strength training machines"). If, on the other hand, the PCs are held prisoner in manacles for several months, the exercise regimen has probably been broken for that four-year period.

Anagathics: Anagathics are longevity drugs. They help prolong life and prevent aging. Upon reaching age 29 at the end of the third term of service (but never before age 29), a character may try to locate a source of anagathics. If successful, and if the supply can be maintained, the character will age ever so slowly. With luck, the character may reach an age of 100 or more before old age finally takes its toll.

If the character wants to use anagathics, he or she must so specify before making the roll to continue character generation for the term. In deciding to be an anagathics user for the term, the character must make the following concessions:

For each term in which the character indicates his or her desire to use anagathics (whether a supply is found or not), his eligibility for income benefits is forfeited for that term (see the Starting Money and Initial Equipment section on page 36). This represents some of the great expense involved in maintaining a steady supply of anagathics. This difficulty is based on the fact that anagathics have very complex interactions, not only with other drugs and foods, but also with an individual's metabolism, which changes under different conditions. The safe use of anagathics requires not only regular applications of the drug, but also regular medical checkups to monitor for changes in the drug's interaction with the user.

Finding Anagathics: To find an available supply of anagathics for the four-year term, roll 12+ on 2D6, with the following DMs based on the character's homeworld: +3 if Starport A, +2 if Starport B, +1 if Starport C, +1 if tech level = Early Stellar, +2 if tech level = Average Stellar, +3 if tech level = High Stellar, –3 in the Old Expanses, –4 in a Pocket Empire, and –5 in the Wilds. There is an additional DM used in the Regency: –1 for each level of SOC above 11 (B), which reflects the strong Imperial tradition against the use of anagathics by the hereditary nobility. Thus –1 for SOC C, –2 for SOC D, and so on.

If the character fails the anagathics availability roll, one retry is allowed if the character successfully makes the required roll to continue character generation (by rolling greater than the current term number on 2D6).

Anagathic Effects: A successful availability roll for anagathics has two effects. First, the die roll to continue character generation is not required; the character may automatically pursue another term (this is irrelevant to players and referees who are using the choice of age system). Second, the character automatically succeeds at the aging rolls for two attributes of his or her choice. This means that the character makes no aging rolls at all until the age 49 (eight terms) line is reached, because only two attributes (STR and AGL) are rolled before this age. Once on the age 49 line, the character selects the one characteristic (STR, AGL, or CON) to risk in an aging roll. The age 65 (12 terms) line of the Aging Table requires four saving throws, so upon reaching the age 65 line, two attributes of choice are automatically saved, and the other two must be risked in an aging saving throw as normal.

While using anagathics, the character advances down the Aging Table as usual, but is simply immune to two aging rolls each term. The player should also make a note of the age at which the character began using anagathics, because the character's apparent age is frozen at that point. This is the case so long as a constant supply of anagathics is maintained. If the supply is broken, the character's apparent age will begin advancing again.

If the character ever loses the supply of anagathics for a term, at the end of the term, roll saving throws twice for each characteristic (but do not yet start advancing the character's apparent age; it takes a while for the effects of anagathics to totally go away). Both rolls must succeed, or the characteristic is lowered by the indicated amount on the Consolidated Effects of Aging table. This represents the withdrawal effects from interrupting the supply of anagathics.

If the character continues to abstain from anagathics in subsequent terms, normal aging rolls resume at the end of each term. The double saving throw withdrawal effects occur only at the end of the first term in which the character stops taking anagathics.

If the character later regains the supply of anagathics, the term in which he or she begins retaking anagathics is treated again as a first term on anagathics: The saving throw benefits are received, and the character's apparent age at that time is again frozen. Obviously, anagathics are most effective if they can be taken long-term without interruption. A continually interrupted supply can have devastating effects.

Recording Age: If a character's age has ever been affected by anagathics, so indicate by writing the age as: Age 33 (49).

The 33 represents the character's apparent age. The (49) represents the character's actual age in years. If the character has an available supply of anagathics, list anagathics as a possession. If the character is currently in withdrawal from anagathics (just lost the anagathics supply this term), add an exclamation point after the age: Age 33! (49). Players whose characters are using anagathics should also keep careful track of the total number of terms during which the character was under the effects of anagathics, in order to determine eventual side effects.

Anagathic Side Effects: After about 60 years of use (15 aging periods of cumulative use, with or without periods of interruption), anagathics begin to turn on

ANAGATHIC SIDE EFFECTS DMS

Years of Use	*Aging Periods*	*DM*
60	15	0
64	16	+1
68	17	+2
72	18	+3
76	19	+4
80	20	+5

ANAGATHIC SIDE EFFECTS

Roll 2D6, add age DM, subtract Medical skill level

Roll	*Effect*
2	No effect
3	No effect
4	No effect
5	Minor growths
6	Minor growths
7	Minor growths, +1
8	Major growths, +2
9	Major growths, +2
10	Major disfiguration, +3
11	Major disfiguration, +4
12	Minor psychological effects, +6
13	Moderate psychological effects, +8
14	Major psychological effects, +10
15	Psychopathic behavior, +12

their users. The manipulation of the body's growth ability that is used to keep the body constantly renewing itself to maintain youthful cells begins to get out of sync. This is first evidenced by the growth of rather unsightly cysts and tumors, and discoloration of certain body areas where local cell growth is getting out of control. The cysts and tumors are relatively easy to remove, and cosmetics can treat many of the other difficulties. As time goes by, however, the effects tend to get worse. Certain body parts experience runaway growth, and in some cases the body attempts to grow new limbs. Treatment of these effects requires major surgery, and often requires replacement with cybernetic or transplanted limbs. Ultimately, psychological damage is done to the user by a combination of direct effects of the drugs and creeping discomfort at the physical changes being brought on.

Roll on the Anagathic Side Effects table at the end of each aging period once anagathics use has reached 60 years. Add a +1 DM for each additional four-year aging period since the character reached 60 years of anagathics use. Assuming the character is under the regular medical attention of a doctor, use the doctor's Medical (Surgery) or Medical (Diagnosis) skill (not asset) as a –DM. In addition, some characters may have metabolisms that are ultimately unsuited to anagathics use. This can be determined by a Formidable: Medical (Diagnosis) task by the user's doctor when the character first begins anagathics use. This is an uncertain task, so characters may not always know whether anagathics use is especially dangerous for them. Reputable doctors will not cooperate in an anagathics regimen with characters who are found to be unsuited to it. Characters who are unsuited for anagathics have an automatic +5 DM on all side effects rolls, plus there is no –DM applied for Medical skill of the attending physician.

Note that some of the results on the Anagathic Side Effects table have an additional +DM after the description of the result. This is a cumulative DM which is used in addition to the years of use DM on the next side effects roll.

Minor growths require minor surgery with no danger of physical damage to the character. Major growths require surgery with moderate danger to the character; major disfigurations require major surgery with significant danger to the character. Psychological effects are up to the referee. Referees may stipulate that characters who already exhibit psychological imbalances will experience higher levels of psychological effects from the table.

What is ironic about these side effects is the fact that the body still continues to be prevented from aging even while it is decaying in other, perhaps more offensive, ways. Even though the character might have to have cysts removed a couple times each year, and has the bud of a misshapen hand growing on a shoulder blade, he is still young. (Three score and 10: it's not just a good idea, it's the *law*.)

Aging Crisis

If, as a result of aging, a characteristic is reduced to 0, the character has an aging crisis and becomes quite ill. The character must make a 2D6 roll for 8+.

If the roll succeeds, recovery is made immediately. The characteristic which was reduced to 0 automatically becomes 1. If the die roll does not succeed, the character still survives and recovers the attribute to level 1, but receives no skills or benefits for the term and may not enter another character generation term.

This process occurs each time a characteristic is reduced to 0. If more than one characteristic reaches 0 simultaneously, perform a separate aging crisis roll for each characteristic.

Disability: At a certain point in life, characters may elect to quit adventuring, allowing players to generate new characters. The referee may elect to retain these characters as NPCs, perhaps as contacts of the new player characters.

SKILL- AND ATTRIBUTE-DERIVED VALUES

Once the player has finished all steps of character generation affecting skills and attributes, the following values, which are derived from skills and attributes, can be calculated.

Hit Capacity: Hit capacity is a measure of the amount of damage (hit points) a character can take before suffering serious injury. Hit points can be suffered in any of seven different parts of the body: left leg, right leg, left arm, right arm, abdomen, chest, and head. The hit capacity of the head is equal to twice the character's Constitution (CON×2). The hit capacity of the character's chest is equal to 3 times the sum of Strength and Constitution—(STR+CON)×3. Each of the other body parts has a hit capacity equal to 2 times the sum of the character's Strength and Constitution—(STR+CON)×2.

Boxes are provided on the character sheet for players to write in their PCs' wound level thresholds so the players will know to what degree their characters have been wounded. See "Wound Effects," page 288, to determine wound level thresholds and the effects of being wounded. Except for the Critical column, the values in the boxes on the character sheet represent the amount of damage the PC can take before progressing to a more severe wound status.

The Current boxes should be used to keep track of how much damage the character has taken. The numbers in the Slight wound boxes are equal to the base hit capacity numbers of the PC (generated by the above procedure).

Weight: A male character's weight in kilograms is equal to 80, plus 4 times Strength minus Agility, or [4×(STR–AGL)]+80. Thus, a male character with a Strength of 6 and an Agility of 1 would weigh 100 kilograms (about 220 pounds), while a male character with a Strength of 4 and an Agility of 8 would weigh 64 kilograms (roughly 141 pounds).

Physiological differences, particularly in bone structure, result in smaller body masses for women. Therefore, weight in kilograms for female characters is calculated by substituting 65 for 80 in the formula, or [4×(STR–AGL)]+65. Thus, a female character with a Strength of 6 and an Agility of 1 would weigh 85 kilograms (about 187 pounds), while a female character with a Strength of 4 and an Agility of 8 would weigh 49 kilos (roughly 108 pounds).

Load: A person can lug a considerable weight of equipment, even cross-country, but there is a limit. In **Traveller**, characters may carry, without being heavily burdened, a total weight in kilograms equal to 3 times the sum of their Strength and Constitution—(STR+CON)×3. This is called a character's *normal load.* Up to twice the normal load can be carried, but the character is considered *burdened* and has movement reduced, as explained on page 265 in the Personnel Movement section. A burdened character's Initiative is also temporarily reduced by 1 (to a minimum of 1; see Initiative below and on page 264). A character may lift loads up to 4 times the normal load and carry them short distances (50 to 100 meters at a time; Initiative is reduced to 1 while this load is carried). Note that multiple characters may add their load capacities to lift heavy objects.

Throw Range: The distance (in meters) a character can throw a one-kilogram weight accurately is called the character's throw range. Throw range is 4 times the character's Strength (STR×4).

Unarmed Combat Damage: Unarmed combat damage indicates the hit-point loss a character inflicts on an opponent when that opponent is successfully hit during melee combat. Unarmed combat damage is determined by multiplying Unarmed Martial Arts skill (not asset) by Strength and dividing by 10, rounding fractions down (Skill×STR)+10. The result is the number of hit points the striking character will inflict per successful attack. (*Note:* A result of 0 is considered 1.)

Example: Reese has a Strength of 7 and an Unarmed Martial Arts skill level of 8. 7×8=56. 56+10=5.6, rounded down to 5. Therefore, Reese will inflict 5 hit points per unarmed melee combat attack.

INITIATIVE

By the time we hit Hastaan and liberated it from the benevolent rule of its "God-Emperor" (I am not joking), we'd all been through enough that we knew what we were doing and had the drill down pretty tight. We were on the ground before his air defense network had a decent fire control lock on anything but decoys, inside the city before his troops had the guntracks powered up, and inside his palace before anyone thought to button it up. Then we hit his Sacred Guard, 500 of the roughest, toughest guys he had.

I suppose they were pretty good at bullying sodbusters and stealing chickens, but when it came down to their first real fight, they were just another bunch of jerks in silly outfits. We found out later their motto was "Death Before Defeat."

All they got wrong was the order.

Initiative represents a character's ability to remain cool and act most effectively in combat situations. Characters with a high Initiative score will move further and/or achieve more actions in a combat turn than will characters with low Initiatives. This is not because the high-Initiative characters are any faster, but simply because they react more quickly and spend less time hesitating.

Initiative values range from 1 up, with beginning characters tending to start out on the low end of the scale, then increasing as they gain experience in combat. Each character in **Traveller** can perform either one or two actions per combat turn, depending on their Initiative level, and the order in which actions are

performed is determined by the characters' Initiative ratings. The Planetary Combat section, page 264, explains this all in a bit more detail, but it should be obvious even now that Initiative is very important if you are to be involved in combat.

Each character's initial Initiative is obtained by a die roll based upon the types of careers that character has pursued. Education and civilian careers yield a beginning Initiative of 1D6+2, rounded down (count 0 results as 1; thus the results are 1, 1, 1, 2, 2, 3). Military careers yield a roll of 1D6. Also, in each of these two areas, there are some careers that give bonuses to Initiative, as indicated under each career, beginning on page 43. (Note that bonuses listed for civilian careers only apply to the civilian die roll [1D6+2], and not to the 1D6 military die roll. These bonus points are *not* cumulative—you can only gain a maximum of +1 to a roll.) If your character has both military and civilian careers, choose which of the two rolls you wish to use. For example, Kris Leathers has spent two terms in the Marines and one in civilian law enforcement. The Marine career gives her a 1D6 roll, and the law enforcement would give her 1D6+2 +1. Leathers' player decides to take the civilian roll as the bonus guarantees her an Initiative of at least 2.

If you prefer not to leave beginning Initiative to chance, you may simply assign a 2 to the character, or a 3 if at least one military career was taken. Career bonuses do apply to this option as well (a military character with a bonus for being a commando would begin with a 3+1=4).

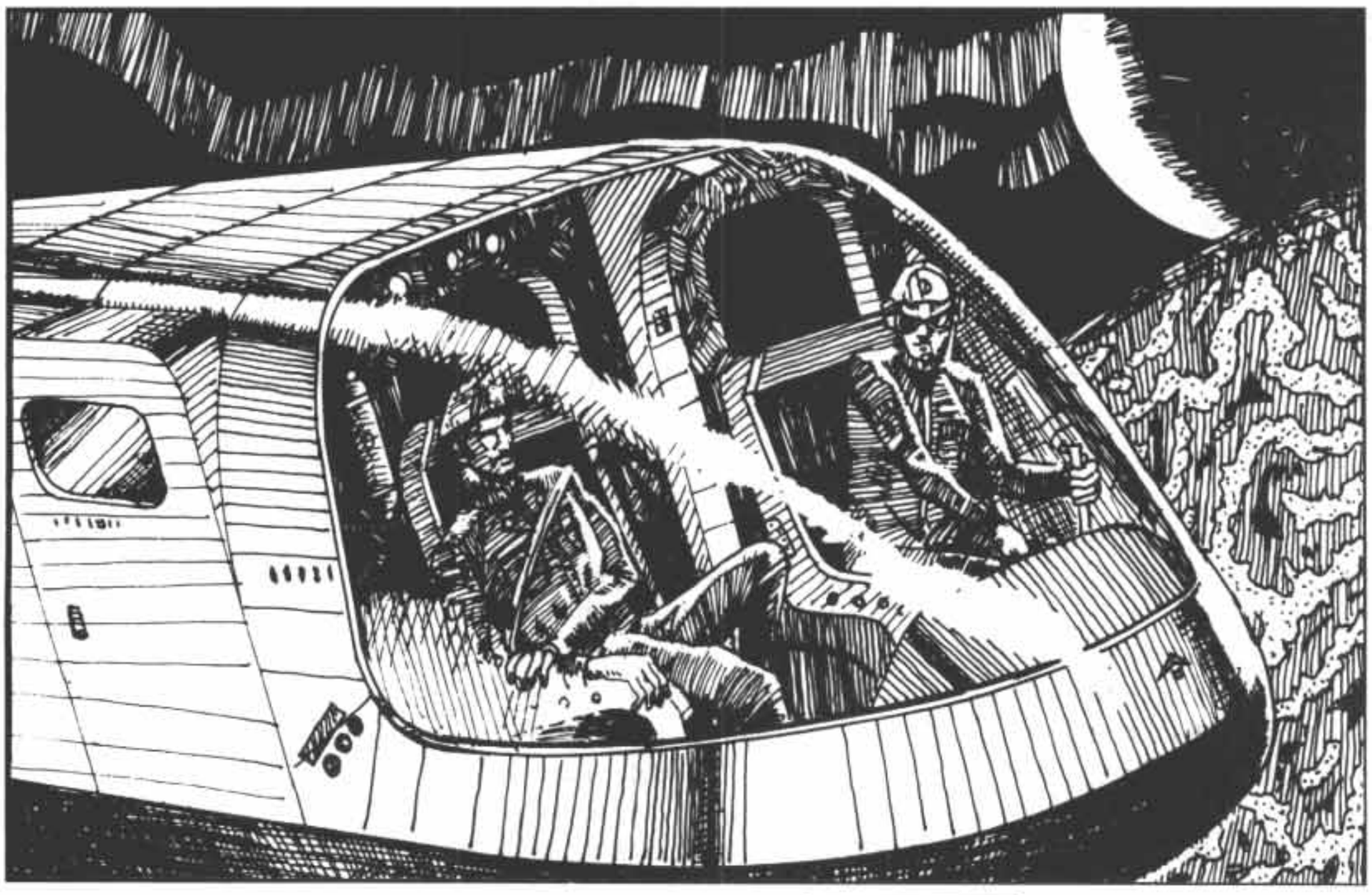
STARTING MONEY AND INITIAL EQUIPMENT

Just as characters have a history of careers and contacts before the start of a **Traveller** adventure campaign, they will also have accumulated equipment and savings. In order to reflect this fact, players generate starting money for their characters, then use that money to buy the equipment they desire.

Starting Money

In general, during each career term, a character gains a certain base cash value multiplied by the sum of the character's Social Standing or Gambling asset, whichever is higher. The base cash value is determined by the tech level of the character's homeworld. This rather generically represents both a character's earning power and ability to save. Of course, the money itself represents not only savings, but also equipment accumulated over the years. That is, after starting money has been calculated, any of it that is spent on equipment is considered to have been spent over the course of the character's life thus far, not all at once. And any money left over is considered savings.

As has been stated, Social Standing or the Gambling asset is typically the value used when calculating starting money. Some career descriptions list exceptions to this rule. (For example, belters receive no money for terms served as belters, but may have made a strike and earned considerable money from that.) There are also several other special cases, as noted in the Other Effects section of the specific career description. For example, no money is ever generated for any term spent in education.



Also, remember that each term spent seeking anagathics (whether successful or unsuccessful) cannot be counted toward generating money.

Finally, while it may be somewhat easier to generate all starting money after character generation is complete, it is actually more accurate (and more enjoyable) to do so term by term as characters progress through their careers. This is so because Social Standing often changes during character generation. For

purposes of fairness, it is important that all players either do it the one way or the other. Your referee will tell you which way he or she prefers.

For each eligible term in character generation, the character multiplies the cash base value from the table below by the higher of his SOC or Gambling asset. For example, a six-term character who spent one term in undergraduate university, one in law school, one as an attorney, two as a criminal, and one as a prisoner, would only receive money for three terms.

CASH BASE VALUES

Tech Level	*Cash*
Pre-Industrial	Cr10
Industrial	Cr100
Pre-Stellar	Cr500
Early Stellar	Cr1000
Advanced Stellar	Cr5000

Initial Equipment: After generating a character's starting money, a player can look through the equipment chapter and purchase items appropriate to the character. While doing this, there are a few things to keep in mind.

First, on many worlds it is illegal to carry knives, pistols, or other weapons. Furthermore, just because something is legal, that doesn't necessarily make it wise. If you walk into a bank with a laser rifle across your back, a revolver strapped to your thigh, and a hunting knife in each boot, you can expect trouble from the locals.

Next, buy equipment that is appropriate for your conception of your character. Your referee will reward you for adhering to a realistic character concept. Before buying equipment, ask your referee if he or she has any guidelines for you to follow specific to the campaign you will be playing. For example, laws concerning what is or is not legal vary greatly from locality to locality in **Traveller,** so depending upon where your characters will begin play, there may be greater or fewer constraints on your characters. Your referee may also inform you that certain items of equipment are easier or harder to find in your character's locale, which could also affect your purchase of equipment. By following your referee's guidelines, you'll help to ensure that your adventures have a consistent atmosphere.

Travellers' Aid Society: Some characters in the Regency may be granted membership in the prestigious Travellers' Aid Society (see The Travellers' Aid Society on page 220 for more details). Characters who spend one or more terms in the navy, Marines, or belters, or as a diplomat or wealthy traveller can receive membership in the TAS in place of 1 ship DM. Membership provides a free high passage ticket every two months, plus inexpensive, high-quality food and lodging at TAS lodges located at all type A and B starports.

Too many people want to get "off-dirtside" for the number of ships there are out there, and everyone wants a piece of whatever action they can find. You end up working for a ship share here, another there, taking a couple prize shares from a raid somewhere else, and swapping the things around until you have pieces of a dozen ships and nobody knows who the hell owns what.

It hasn't taken long for me to figure I was using up my luck faster than I ought to. When it's time to out-process from the Marines, I'm going to find a steady berth doing what Strombooli had taught me to—working the feeder routes in a tramp trader and keeping my eyes open.

There are half a dozen of us who're going to go in together. We'll swap out our prize shares and some cash for enough of a working interest in an antique ship. That'll be enough to get us started.

Starships: It is possible for characters to own a starship at the beginning of the game. Many careers show a die roll modifier for starship ownership under the Other Effects listing. In addition, characters may purchase ship ownership DMs for Cr50,000 each following determination of their cash assets. Characters may also cash in the ship ownership DMs they have received for Cr10,000 each.

One die roll is made for the entire adventuring group, and all die roll modifiers are added together. Several tables are provided, and the table used is determined by the character with the highest single type of ship DMs. If several characters have the same total, any qualified table may be chosen. Purchased DMs may be taken toward any ship type desired.

For example, one character has a ship DM of +4 for a Free Trader, while a second character has ship DMs of +3 for a Scout/Courier and +2 for a Corsair. This gives the two of them a combined DM of +9, and the roll is made on the Free Trader table since that is the highest single ship type DM (even though the second player has a higher total combined DMs).

The result on the Starship table (page 39) indicates either a ship of the indicated type or a certain number of "HP," or high passage tickets or "MP," or middle passage tickets (see page 219). If a result in HPs is obtained, players contributing DMs earned as part of character generation split up the HPs according to their DM contributions. Purchased DMs are refunded to the player who purchased them, but only at trade-in value (i.e, Cr10,000 as opposed to the Cr50,000 paid up front). Trying to buy a ship is economically risky.

Ship results are usually shown with a value modifier of –1 or more. This modifier means either that a large

outstanding balance is owed on the ship, the ship is actually a modification of some other design and not purpose-built, or it is old and consequently worn out. (Often it is a combination of all three.) The total value modifier may be divided between these three categories as desired. Each value modifier adds either 1 to the wear value of the ship (to a maximum of 10), a –1DM on the Ship Types table on the following page, or five years to the outstanding mortgage (to a total of 40 years, or 8 modifiers). For as long as remains to pay off the loan, the PCs must pay 1/240 of the new price of the ship to the bank or one of its authorized branches *each month* (starship prices are listed in the Equipment & Technology chapter).

The players must first choose how many of the value modifiers they wish to work off as –DMs on the Ship Types table, and roll for the ship type. This has the result of giving smaller and less capable ships. Note that the table also allows +DMs. These can be taken on a 1-for-1 basis at the cost of additional value modifiers to those rolled on the Starships table. The players can then work these off as either wear value or outstanding mortgage. Note that players can not take +DMs on this table that would increase their outstanding value modifiers to over 16 points.

Stellar Regions: Modifications are made to the die rolls based on the stellar regions in which the PCs are generated. These reflect the relative scarcity of ships in certain regions, and therefore their absolute value in these areas. This is reflected in two different ways. First is a –DM for stellar region, as shown in the Stellar Regions DMs table.

The second is the way in which the outstanding mortgage requirement is satisfied. In the Regency, these can be converted into a percentage ownership in the ship by the Regency Quarantine Service (which amounts roughly to a reserve commission in the Regency Navy). Briefly, security requirements and the need to maintain an airtight quarantine against the virus have put a premium value on defensive ships in the Regency. In order to keep the maximum number of ships available for use, the Regency has taken to subsidizing the private ownership of ships that can be used to enforce the quarantine. Each value modifier taken as Regency ownership is equivalent to a 12.5% share in the ship by the Regency, and reflects an increasing probability that the PCs and their ship will be called into service on Regency business. This is not required, however, and players can opt to assign value modifiers to normal mortgage payments owed to a bank.

In the Old Expanses and Pocket Empires, government-owned banks own the mortgages on the ships, which means that not only must the players continue to meet the payments, they must also use their vessel in accordance with the directives of the government. In almost all cases, this requires adherence to certain shipping schedules. In this way, these governments ensure that service is maintained to their member worlds by the handful of ships that are available. There is one advantage to the PCs in this arrangement: The government does not require payment each month if the PCs cannot afford it. It is much more important that they stick to the shipping schedule. No penalties accrue for missed payments, but the PCs still remain far away from free and clear ownership.

In the Wilds, all value modifiers are immediately applied to the ship's wear value, up to the maximum level of 10. All excess value modifiers are disregarded. In the Wilds, the few ships date back to the Final War, and have already been lovingly passed down from one crew to the next for so long that there are no outstanding bills, only outstanding maintenance. Note that this means that no PC groups in the Wilds can take +DMs on the Ship Types Table if this would raise the total value modifiers to more than 10.

Ship Types: A Scout/Courier is a very common type of dispatch, survey, and exploratory vessel within human space. A Survey ship is a larger ship designed for detailed scouting and survey. A Free Trader is an elementary interstellar merchant ship plying the space lanes carrying cargo and passengers. Far Traders, Fat Traders, and Liners are other interstellar merchant ships with larger size or greater performance. A Yacht is a pleasure craft, owned by someone who can afford to use it as he or she sees fit. A Lab Ship is a mobile base for scientific analysis and investigation. A Warship is an armed starship, perhaps a patrol or escort vessel, or a commercial raiding ship—a privateer or pirate vessel. A Seeker is a Scout/Courier modified for asteroid-prospecting and mining.

STELLAR REGIONS DMS

Stellar Region	*Starship DM*	*Outstanding Mortgage Options*
Regency	—	RQS ownership or standard bank loan
Old Expanses	–10	Government holds mortgage, dictates schedule
Pocket Empire	–20	Government holds mortgage, dictates schedule
Wilds	–30	All value mods applied up to maximum wear value 10, no mortgage

STARSHIPS

Roll 2D6 and add all ship DMs from participating PCs.

Die	Scout/Courier	Trader	Yacht	Lab Ship	Warship
2-3	1 MP	1MP	1HP	1HP	2HP
4-6	1HP	2HP	2HP	2HP	3HP
7	2HP	3HP	4HP	4HP	4HP
8	–16	5HP	6HP	6HP	6HP
9	–15	–16	–16	–16	8HP
10	–14	–15	–15	–16	12HP
11	–13	–14	–14	–16	14HP
12	–12	–13	–13	–15	–16
13	–11	–13	–13	–15	–16
14	–10	–12	–12	–14	–16
15	–9	–11	–11	–14	–16
16	–8	–10	–10	–13	–15
17	–7	–10	–10	–13	–15
18	–6	–9	–9	–13	–15
19	–5	–8	–8	–12	–15
20	–4	–7	–7	–12	–15
21	–3	–7	–7	–11	–14
22	–2	–6	–6	–11	–14
23	–1	–5	–5	–10	–14
24	Full	–4	–4	–10	–14
25	Full	–3	–3	–9	–13
26	Full	–2	–2	–9	–13
27	Full	–1	–1	–8	–13
28	Full	Full	Full	–7	–12
29	Full	Full	Full	–7	–12
30	Full	Full	Full	–6	–12
31	Full	Full	Full	–5	–11
32	Full	Full	Full	–4	–11
33	Full	Full	Full	–3	–10
34	Full	Full	Full	–2	–10
35	Full	Full	Full	–1	–9
36	Full	Full	Full	Full	–9
37	Full	Full	Full	Full	–8
38	Full	Full	Full	Full	–7
39	Full	Full	Full	Full	–6
40	Full	Full	Full	Full	–5
41	Full	Full	Full	Full	–4
42	Full	Full	Full	Full	–3
43	Full	Full	Full	Full	–2
44	Full	Full	Full	Full	–1
45+	Full	Full	Full	Full	Full

SHIP TYPES

Roll 2D6 and apply ship type DMs.

2D6	Scout/Courier	Trader	Yacht	Lab Ship	Warship
–2	Scout	Scout	Mod Scout	Mod Scout	Mod Scout
–1	Scout	Scout	Mod Scout	Mod Scout	Mod Scout
0	Scout	Scout	Mod Scout	Mod Scout	Mod Scout
1	Scout	Scout	Mod Scout	Mod Scout	Mod Scout
2	Scout	Free Trader	Mod Free Trader	Mod Free Trader	Mod Free Trader
3	Scout	Free Trader	Mod Free Trader	Mod Free Trader	Mod Free Trader
4	Scout	Free Trader	Mod Free Trader	Mod Free Trader	Mod Far Trader
5	Scout	Free Trader	Mod Free Trader	Mod Far Trader	Mod Far Trader
6	Scout	Free Trader	Mod Far Trader	Mod Far Trader	Mod Subs. Merch.
7	Scout	Free Trader	Mod Far Trader	Mod Far Trader	Mod Subs. Merch.
8	Scout	Far Trader	Mod Far Trader	Mod Subs. Merchant	Mod Liner
9	Scout	Far Trader	Yacht	Mod Subs. Merchant	Mod Liner
10	Scout	Far Trader	Yacht	Lab Ship	Patrol Cruiser
11	Scout	Far Trader	Yacht	Lab Ship	Patrol Cruiser
12	Scout	Subs. Merchant	Yacht	Lab Ship	Patrol Cruiser
13	Mod Far Trader	Subs. Merchant	Yacht	Lab Ship	Close Escort
14	Mod Far Trader	Subs. Merchant	Yacht	Lab Ship	Close Escort
15	Survey Ship	Liner	Yacht	Lab Ship	Mercenary Cruiser
16	Survey Ship	Liner	Yacht	Lab Ship	Mercenary Cruiser

Mod Far Trader: When received in the Scout/Courier column, this is a Modified Far Trader with additional sensors and exploration equipment. From the Yacht column, it is modified to include sumptuous appointments and recreational areas in place of cargo. From the Lab Ship column, it is modified to include laboratory space. From the Warship column, it is modified with fire directors, weapons, and space for troops.

Mod Subs. Merchant: See Mod Far Trader above, except ship is based on the Subsidized Merchant ("Fat Trader") design.

Mod Free Trader: See Mod Far Trader above, except ship is based on the Free Trader design.

Mod Scout: When received in the Lab Ship column, this is a Scout/Courier with added laboratory space. When received in the Warship column, this is a scout with additional weapons and fire control systems. Note that in the Regency, any receipt of a Mod Scout can be taken instead as a Quarantine Cutter.

Scout: Note that in the Regency, any receipt of a Scout can be taken instead as a Quarantine Cutter.

Career List

In **Traveller**, careers are divided among three broad categories: Education, Civilian, and Military. Characters can pursue any types of career for which they meet the prerequisites (if any).

Note that while the careers listed here do not cover every possible occupation a person might pursue, it is possible to reflect other occupations by creatively mixing those listed below.

Clusters, Skills, and Cascades: In all of the lists below, clusters of skills are printed in bold while individual skills are printed in normal type. Individual skills that are printed in italics are cascade skills. When players select a cluster for their characters, they must then go to the skill clusters list to pick a specific skill from that cluster list. Players who select cascade skills must choose the cascade specialty. When a cluster or cascade is listed with a skill level number after it, that is the number of skills to be taken in the cluster or cascade, and must be specified immediately. For a listing of all skills, clusters, and cascades, see the Skills by Skill Clusters table on page 113 of the Task Resolution and Skills section in the "Referees" chapter.

Contacts: If more than one type is listed, the character may choose.

EDUCATION

Higher education is a prerequisite for many careers. Certain forms of higher education have Education attribute requirements for admission; others do not. All schools are limited to one term, except for graduate university, which may be taken as many times as desired.

Undergraduate University

In easy times, undergraduate education was seen as a generalized preparation for a broad range of activities. In the more challenging times covered by **Traveller**, a more pragmatic approach is followed, and undergraduate education is used to meet specific educational goals required by academic or technical careers.

Prerequisites: Education 5+, Homeworld Tech = Ind+.

Skills: Total skill levels equal to character's Education attribute from any combination of the following, but no more than level 3 in any one skill:

Physical Science, Economics, Engineer, Social Science, Fine Arts, Computer, *Language*, Leadership.

Contacts: One per term, either academic or journalism.

Other Effects: +1 EDU (after all skills have been awarded). No commissions, promotions, or special duty rolls are made. No income received while attending undergraduate school.

Military Academy

Not all governments believe in military academies. Many armies feel they do better by selecting promising enlisted personnel for officer training. But those governments that do maintain military academies do so at least in part because of the glowing traditions and reputations that these institutions maintain.

There are military-style academies maintained that serve the following careers: Army, Merchant Marine, and Wet Navy. The academy used for Marines is the Naval Academy (see Flight Academy, below).

Prerequisites: Strength 5+ and Education 6+ (or, on High+ Gov worlds, SOC 9+), Homeworld Pop = Mod+, Homeworld Tech = Ind+.

Skills: Total skill levels equal to character's Education attribute from any combination of the following, but no more than level 3 in any one skill:

Determination, Engineer, Interaction, Social Science, Space Tech, Technician.

In addition, the character receives all of the First Term skills from whichever service the academy serves.

Contacts: Two military.

Other Effects: No secondary activities are allowed while attending military academy, nor is any money received. Character receives an automatic commission into the career served by the academy. Character must serve at least one term in the career served by the academy. Since the character has already received the First Term skills for this career during the academy, the first real term in the career receives skills chosen from the Subsequent Terms section equal in number to the skill levels of the First Term package.

Graduate University

Characters who wish to progress from an undergraduate degree to a master's degree or doctorate go to grad school to do so.

Prerequisites: Undergraduate degree, EDU 7+ or INT 7+, Homeworld Tech = Ind+.

Skills: Four levels per term in any one specialty, plus a total of two levels in any electives.

Specialties: **Physical Science, Economics, Engineer, Social Science, Fine Arts**, Computer, *Language*.

Electives: Computer, Instruction, *Language*, Leadership.

Contacts: One per term, academic or government.

Other Effects: +1 EDU (after all skills have been awarded). No commissions, promotions, or special duty rolls are made. The first term provides a master's degree; each subsequent term provides a doctorate (or equivalent). Degrees must be taken in one of the specialties noted above. Characters who specialize in Persuasion are granted master's degrees or doctorates

in Communication. No income is received while attending graduate school.

Graduate university may be selected for as many terms as desired.

Law School

If you want to be a lawyer, you have to go to law school, but a lot of other lines of work can benefit as well from the things a law student learns.

Prerequisites: Undergraduate degree, EDU 5+ or INT 5+, Homeworld Tech = Ind+.

Skills: Admin/Legal 2, Interrogation 2, Observation 1, Persuasion 2, Bargain 1.

Contacts: One academic or government.

Other Effects: No commissions, promotions, or special duty rolls are made. No income is received while attending law school.

Medical School

Medical school is a prerequisite for working as a medical doctor or a psychiatrist. Few people go to the trouble of going to med school without going on to pursue one of those careers.

Prerequisites: EDU or INT 8+. Undergraduate degree, Biology 3+, Chemistry 2+, Homeworld Tech = Ind+.

Skills: Computer Operation 1, *Medical* 6, Observation 1.

Contacts: One medical.

Other Effects: No secondary activities are allowed during medical school. No income is received while attending medical school. Upon completion of medical school, character receives an automatic commission (as doctor) in the career of medicine.

Flight Academy

A variety of flight academies are maintained by advanced worlds to train pilots of aircraft and starships for both military and civilian service. Entry is highly prized, so competition for available openings is great.

Prerequisites: Education 6+ and Agility 6+, or (on High+ Gov worlds) Social Level 9+. Homeworld Tech = Early Stellar+. (Flight Academy for Aviation possible if Homeworld Tech = Ind+, but no skills from the Space Vessel cluster may be selected, nor may the Interface/Grav cascade of *Pilot* be selected.)

Skills: All First Term skills for the appropriate career (Aviation, Navy, Scouts, or Traders), plus a total of 6 levels from any one or a combination of the following:

Pilot, **Space Vessel**, Leadership.

Contacts: Two military.

Other Effects: No commissions, promotions, or special duty rolls are made. No income is received while attending flight academy, nor are any secondary activities allowed. At the start of the next term, the character automatically enters the chosen career (regardless of whether he or she has the normal prerequisites) with a commission. Since the character has already received the First Term skills for this career during the academy, the first real term in the career receives skills chosen from the Subsequent Terms section, equal in number to the skill levels of the First Term package. Characters who have attended the Navy version of Flight Academy may enter either the Navy or Marines career.

Technical School

In the aftermath of a major collapse, the drive for a well-rounded, well-educated populace has been nearly trampled in a mad dash to get people a skill and get them to work rebuilding.

Prerequisites: Homeworld Tech = Ind+.

Skills: A total of 6 levels from any one or a combination of the following:

Technician, Space Tech, Medical, Economics, Computer, **Aircraft, Vehicle.**

Contacts: One specialist (skill level 8) in one of the areas listed above.

Other Effects: No commissions, promotions, or special duty rolls are made. No income is received while attending technical school.

Hiver Technical Academy

In 1193, in an effort to help rebuild the star systems along their frontier, the Hivers contacted the handful of worlds in the Old Expanses which would soon form the Dawn League. Shortly thereafter, they established the first technical academies to educate the scientists, engineers, and starship crews that would spearhead the re-establishment of commerce.

Prerequisites: Homeworld in the Old Expanses. EDU or INT 7+.

Skills: Total skill levels equal to character's Education or Intelligence attribute (whichever is greater) from any one of the following skill clusters (but no more than 4 levels in any one skill), plus 1 skill level in each of the other skill clusters:

Space Vessel, Space Tech, Physical Science, Engineer, Technician.

Contacts: One Hiver specialist (skill level 8) in one of the areas listed above.

Other Effects: +2 EDU (after all skills have been awarded). No secondary activities allowed while in the academy. No commissions, promotions, or special duty rolls are made. No income is received while attending technical academy. All homeworld tech limits on skills are waived while attending Hiver techni-



cal academy. Due to the fact that Hiver technical education has only been available for about eight years in the Old Expanses, characters may only take one more career term after completing the academy.

CAREERS

There are two types of careers: civilian occupations and military careers. Both function in the same way.

Clusters, Skills, and Cascades: In all of the lists below, clusters of skills are printed in **bold** while individual skills are printed in normal type. Individual skills that are printed in *italics* are cascade skills. When players select a cluster for their characters, they must then go to the Skills by Skill Clusters List on page 113 to pick a specific skill from that cluster list. Players who select cascade skills must choose the cascade specialty. When a cluster or cascade is listed with a skill level number after it, that is the number of skills to be taken in the cluster or cascade, and must be specified immediately. For a listing of all skills, clusters, and cascades, see the Skills by Skill Clusters Table on page 113 of the "Referees" chapter.

First Term Skills: The character receives this package of skills during the first term in this career, whether the term is the character's first career term, or only the first term in this career after other terms in another.

Subsequent Term Skills: The character chooses a number of skills from this list based on the character's total term number (not term number in this career). In a character's First Term (starting at age 17), a character will receive the listed First Term skills. In subsequent terms (unless these are the first term in a new career, and earn the First Term package), the number of skills received is 4 in the second, 3 in the third, 2 in the fourth, and 1 in the fifth and later terms.

Special Assignment: Each term, the player has a chance to get a special assignment, also called special duty or special adventure, depending upon career. This is listed under the Special heading in the All Terms section. The first notation is the die roll on 2D6 that must be made to receive the special assignment. There is a +DM applied for each term already served in the career. For example, a character in the first term of a career has no DM, in the second consecutive term of that career has a +1 DM, and so on. Each career switch causes the DM to reset to 0. If the roll is made, the character receives a number of skills from the special assignment list according to the total term number (not term number in this career). That number of skills is the same as term skills for that term.

There is no effect if the special assignment roll is failed.

Term	*Age (Start-End)*	*Term Skills*	*Special Assignment Skills*
1	17-21	4*	4
2	21-25	4*	4
3	25-29	3*	3
4	29-33	2*	2
5 and later	33+	1*	1

*Or First Term skill packet for first term in a new career.

Promotion: Not every career has a rank list to go with the chance of promotion, but all do get a bonus skill from the Subsequent Terms list for each successful promotion.

Contacts: If more than one type is listed, the character may choose. Some of these require a roll to be made at the time the contact is selected to see if the contact is special (see the Character Generation section).

Continuation Rolls: If using the random method for finishing character generation, roll 2D6 at the end of each term. If the result is greater than the total number of terms served so far, the character may continue on to another term. If the result is equal to or less than the number of terms served, character generation is over.

Changing Careers: A character who intends to change careers on the next term subtracts 1 from the continuation die roll. (Going from an education term to another education or career term does not count as a career change; going from a career term to an education term *does* count as a career change.)

CIVILIAN OCCUPATIONS

Civilian occupations include the majority of things most people think of as typical careers. But many things that people do not normally think of are included here as well.

Athlete

No matter how wealthy and advanced or how poor and primitive a society, it seeks escape from its everyday cares by following competitive sports. On some worlds these sports can be violent and quite dangerous.

Prerequisites: CON 9+ or AGL 9+ or STR 9+. Homeworld Pop = Mod+.

First Term

Skills: Acrobatics 4, *Medical* 1, **Melee** 1.

Subsequent Terms

Skills: Acrobat, Determination, Melee, Personal Transport.

All Terms

Special Adventure: 8+ for **Economics, Charm, Vice, Perception.**

Promotion: 6+, DM +1 if CHR 7+.

Contacts: One business, journalist, entertainment, medical, or specialist (Acrobatics or Melee) per term. If a special adventure is rolled, one additional contact of any type.

Other Effects: For each term as an athlete, use the higher of STR, AGL, or CON instead of SOC when calculating starting money. During each term as an athlete, any one physical attribute (STR, AGL, or CON) may be increased by 1 (up to 2 each; see page 20).

Attorney

This is what you do with a degree from law school. See that entry, above, for background information.

Prerequisites: Law School.

All Terms

Skills: Charm, Interaction, Economics, Perception, Social Science.

Special Adventure: 7+ for **Crime, Vice, Determination.**

Promotion: 7+, DM +1 IF EDU 7+.

Contacts: One per term, government or criminal.

Other Effects: Two secondary activities are allowed per term. +1 SOC per term served. Double SOC when determining starting money for each term served as an attorney.

Barbarian

Where technology has been completely swept away, humanity continues to survive by virtue of native wit and an understanding of the natural environment.

Prerequisites: Homeworld Tech = Pre-Industrial.

First Term

Skills: Perception 2, Acrobat 1, **Explore** 3, **Animal Handling** 1, **Melee** 1.

Subsequent Terms

Skills: Determination, Perception, Charm, Interaction, Archaic Weapons, Acrobat, Explore, Animal Handling, Melee, Personal Transport.

All Terms

Special Adventure: 6+ for **Archaic Weapons, Economics, Vessel, Crime, Vice, Artisan.**

Promotion: 6+, DM +1 if CHR 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, automatic promotion if SOC 8+.

Contacts: One barbarian per term. If a special adventure is rolled, the contact may instead be a trader.

Other Effects: +1 SOC per promotion. If more than one term is served, +1 to Initiative.



Athlete



Attorney

Belter

Industrial societies need minerals, and many long-settled worlds have mined out the exploitable deposits. Asteroid belts, however, contain rich reserves of minerals and gases, plus occasional deposits of rare earths and radioactives. A belter's life is demanding, but often very rewarding.

Prerequisites: AGL 6+ and Geology 2+. Homeworld Tech = Pre-Stellar+.

First Term

Skills: Spacehand 2, Geology 1, **Technician** 1, Excavation 1, **Economics** 1, Ship's Engineer 1, **Space Vessel** 1.

Subsequent Terms

Skills: Determination, Perception, Spacehand, Physical Science, Technician, Engineer, Economics, Space Vessel, Interaction.

All Terms

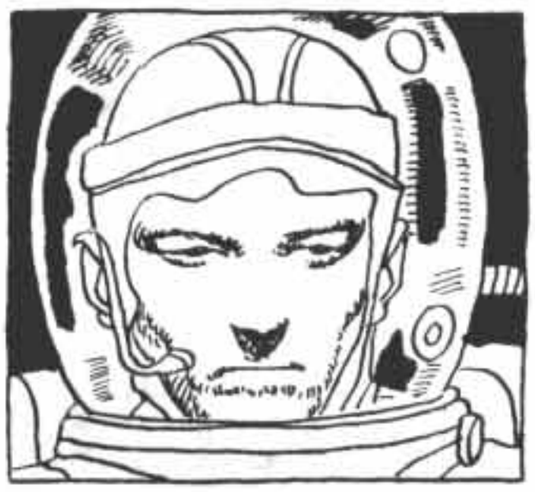
Special Adventure: 6+ for **Gun Combat, Melee,** *Language*, **Space Tech, Charm, Vice.**

Promotion: 7+, DM +1 if INT 7+.

Contacts: One per term, criminal, business, trader, or law enforcement.



Barbarian



Belter

Other Effects: At the end of each term (except the first) roll for a strike. Making a strike is Difficult test of Geology (see Task Resolution and Skills, beginning on page 106, for an explanation). If the task roll is successful, roll 2D6 and multiply the result by Cr100,000 for the cash income from the strike. In addition, the character receives a Seeker ship. The character may continue as a belter and try for additional strikes.

–1 SOC per term (including the first) served unless and until the character makes a successful strike. +3 SOC if a strike is made. No effect on SOC (plus or minus) for being a belter after the first strike is made.

1 ship DM per term for a Scout/Courier, but only if no strike was ever made.



Bounty Hunter



Bureaucrat



Civil Engineer



Civil Pilot

Bounty Hunter

With less central government authority than in previous eras, there is considerable demand for bounty hunters. Although governments offer bounties on escaped criminals or rebels, other organizations also are willing to pay to have malefactors captured. Often the object of the bounty is not a person at all, but a stolen ship or technical artifact.

Prerequisites: Agility 4+.

First Term

Skills: Gun Combat 1, **Melee** 1, **Determination** 2, **Perception** 2, **Spacehand** 1.

Subsequent Terms

Skills: Charm, Determination, Vice, Melee, Gun Combat, Perception, Spacehand, Personal Transport.

All Terms

Special Adventure: 6+ for *Language*, **Space Tech, Space Vessel, Crime.**

Promotion: 6+, DM +1 if AGL 6+.

Contacts: One per term, criminal or law enforcement.

Other Effects: When figuring beginning cash, use INT+Streetwise instead of SOC for each term as a bounty hunter. If more than one term is served, +1 to Initiative. 1 ship DM per term for a Scout/Courier.

Bureaucrat

Someone has to oil the machinery of government in order for it to work at all, but few people appreciate the importance of your job.

Prerequisites: EDU 7+. Homeworld Law = Moderate+.

First Term

Skills: Perception 1, **Economics** 3, **Charm** 1, **Vice** 1, **Interaction** 2.

Subsequent Terms

Skills: Perception, Economics, Charm, Vice, Interaction.

All Terms

Special Duty: 8+ for **Gun Combat,** *Language*, **Spacehand, Crime, Vehicle.**

(On Pre-Industrial tech worlds, **Explore, Archaic Weapons,** and **Animal Handling** are taken in place of **Spacehand, Gun Combat,** and **Vehicle**. On Industrial worlds, **Vessel** is taken in place of **Spacehand**.)

Promotion: 7+, DM +2 if INT 8+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: Two government contacts per term.

Other Effects: Each promotion adds 1 to SOC.

Civil Engineer

New construction materials and design techniques are being developed every day. A whole civilization needs rebuilding, and that means your skills will be needed on a hundred worlds and in a variety of environments.

Prerequisites: Master's degree, Construction 4+.

First Term

Skills: Engineer 2, **Explore** 2, **Physical Science** 1, **Technician** 1, **Vehicle** 1.

Subsequent Terms

Skills: Determination, Economics, Engineer, Explore, Interaction, Physical Science, Technician, Vehicle.

All Terms

Special Assignment: 8+ for **Gun Combat,** *Language*, **Crime, Vice, Spacehand.**

Promotion: 7+, DM +1 if EDU 6+.

Contacts: One per term, government.

Other Effects: On Pre-Industrial tech worlds, **Explore, Archaic Weapons,** and **Animal Handling** are taken in place of **Spacehand, Gun Combat,** and **Vehicle**. On Industrial worlds, **Vessel** is taken in place of **Spacehand**.

Civil Pilot

Whether flying light aircraft into the outback or shuttles to the high port, pilots are a crucial and much-needed profession. Before Virus, many routine

orbital and aircraft piloting tasks were entrusted to automation, and on many worlds these craft became so many murderous angels of death.

Although everybody talks about how they've developed countermeasures against that, that just won't cut it for most people. They want to be able to look up front and see someone sitting there, giving it that personal touch.

Prerequisites: Technical school or flight academy, Pilot 3+, Homeworld Tech = Industrial+.

First Term

Skills: Navigation 2, Observation 2, **Aircraft** 2.

Subsequent Terms

Skills: Technician, Explore, Perception, Aircraft.

All Terms

Special Duty: 8+ for *Language*, **Crime, Vice, Spacehand, Space Vessel, Personal Transport.**

Promotion: 6+, DM +1 if AGL 6+.

Contacts: One per term, specialist (aircraft pilot).

Other Effects: None.

Computer Operator/Programmer

Just as the invention of the semiconductor revolutionized the world by ushering in the Computer Age, so the advent of Virus has permanently altered the way that humanity views its machines and the data processing apparatus that runs them. As a computer operator or programmer, you serve not only an important technical support function, but also as the first line of defense against Virus, particularly when covering relic equipment.

Prerequisites: Technical school or undergraduate degree, Computer 2+. Homeworld Tech = Pre-Stellar+.

First Term

Skills: Economics 2, **Technician** 4.

Subsequent Terms

Skills: Economics, Technician, Interaction.

All Terms

Special Assignment: 8+ for *Language*, **Spacehand, Technician.**

Promotion: 7+, DM +1 if INT 7+.

Contacts: One specialist (Computer or Electronics) per term. If a special adventure is rolled, add extra contact of any type.

Other Effects: Computer operator/programmers are allowed two secondary activities per term.

Construction Worker

There's plenty of stuff to be rebuilt. Between a 14-year civil war and a psychopathic virus, a lot of things got broken. For a long time, no one had the means to do anything about it, but that's starting to change. There's a palpable sensation, a new will that you can feel coursing through humanity, and where there's a will, there's a way. With the sweat of your brow and the strength of your back, you're helping to build a new era.

Prerequisites: Strength 4+ or Agility 5+.

First Term

Skills: Acrobat 1, **Engineer** 2, **Vehicle** 2, **Technician** 2, **Artisan** 1.

Subsequent Terms

Skills: Explore, Engineer, Vehicle, Technician, Artisan, Charm.

All Terms

Special Assignment: 8+ for *Language*, **Spacehand, Vice, Melee.**

Promotion: 7+, DM +1 if CON 7+.

Contacts: One per term, specialist (engineer).

Other Effects: None.



Computer Operator/ Programmer



Construction Worker

Corsair

When you steal a television, you're a thief. When you commandeer a plane, you're a hijacker. When you steal a person, you're a kidnapper.

Corsairs and pirates are the people who steal starships and all of the people and cargo inside them. A lot of them like to repeat the weepy line about how they're victims of circumstance. You know, one man's war is another man's crime. They got into the work as privateers, back when the government approved of it. But now that the war is over, the government doesn't approve of it anymore, even though it's exactly the same line of work. Geez, it's real tough being misunderstood, isn't it?

Yeah, everybody's got an excuse. What's yours?

Prerequisites: CON or STR 6+. Homeworld Tech = Early Stellar+.

First Term

Skills: Spacehand 1, **Gun Combat** 2, **Technician** 2, **Space Tech** 1, **Interaction** 1, **Vice** 1.

Subsequent Terms

Skills: Spacehand, Melee, Gun Combat, Technician, Space Tech, Interaction, Vice, Charm.

All Terms

Special Duty: 5+ for **Space Vessel**, *Language*, **Crime, Determination, Economics, Tactics.**

Promotion: 7+, DM +1 if STR 8+. DM +2 if CHR 8+.



Corsair

Contacts: 1 per term, government, criminal, military, or trader.

Other Effects: –1 SOC per term served. 3 ship DMs per term for a Warship. At the end of each term, roll 1D10. If the roll is equal to or less than the character's INT attribute, there is no effect. If it is greater than the character's INT attribute, the character has been apprehended and must spend the next career term as a prisoner. If more than one term is served, +1 to Initiative.



Criminal

Criminal

Player characters in **Traveller** are supposed to be heroes. But sometimes they're tarnished heroes who have broken laws to achieve their goals. Of course, sometimes a law deserves to be broken. For whatever reason, then, a PC may have experiences reflected by this career.

Prerequisites: None.

First Term

Skills: Perception 1, **Determination** 2, **Interaction** 1, **Melee** 1, **Gun Combat** 1, **Vice** 1, **Charm** 1.

(On Pre-Industrial worlds, substitute **Archaic Weapons** for **Gun Combat.**)

Subsequent Terms

Skills: Perception, Determination, Interaction, Crime, Vice, Charm, Vehicle.

(On Pre-Industrial worlds, substitute **Animal Handling** for **Vehicle.**)

All Terms

Special Adventure: 5+ for **Melee, Gun Combat,** *Language*, **Spacehand, Economics.**

Promotion: 7+, DM +1 if INT 7+.

Contacts: One per term, criminal or law enforcement.

Other Effects: –1 SOC per term served. If more than one term is served, +1 to Initiative. At the end of each term, roll 1D10. If the roll is equal to or less than the character's INT attribute, there is no effect. If it is greater than the character's INT attribute, the character has been apprehended and must spend the next career term as a prisoner. When determining starting money, use INT in place of SOC for each term served as a criminal.



Diplomat



Entertainer

Diplomat

There has been enough destruction in human-settled space. Governments must learn to substitute communication and compromise for military action. That is where you come into your own.

Prerequisites: CHR or INT 7+. Homeworld Pop = Mod+.

First Term

Skills: Determination 1, **Economics** 1, **Charm** 3, *Language* 1, **Interaction** 2.

Subsequent Terms

Skills: Determination, Economics, Charm, Interaction, Perception.

All Terms

Special Duty: 8+ for **Spacehand, Gun Combat, Vice, Crime, Vehicle.**

(On Pre-Industrial tech worlds, **Explore** and **Animal Handling** are taken in place of **Spacehand** and **Vehicle.** On Industrial worlds, **Vessel** is taken in place of **Spacehand.**)

Promotion: 6+, DM +1 if EDU 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: Two government contacts per term.

Other Effects: Minimum SOC for a diplomat is 5. (All characters with lower SOC have it raised to 5 upon enlistment.) Each promotion adds 1 to SOC. 1 ship DM per term for a Scout/Courier or Yacht (provided Homeworld Tech = Early Stellar+).

Entertainer

Soldiers, construction workers, managers, rich and poor alike need entertainment. Whether it's an exclusive club in a class-A starport or an underground mining camp on a gas giant moon, there's a job for you.

Prerequisites: Charisma 8+.

First Term

Skills: Charm 2, Determination 1, **Fine Arts** 4.

Subsequent Terms

Skills: Charm, Determination, Fine Arts, Melee, Animal Handling, Vehicle, Acrobatics.

(On Pre-Industrial and Industrial worlds, **Vessel** is taken in place of **Vehicle.**)

All Terms

Special Duty: 8+ for **Spacehand, Gun Combat,** *Language*, **Explore.**

(On Pre-Industrial and Industrial worlds, **Vessel** is taken in place of **Spacehand.**)

Promotion: 6+, DM +1 if INT 7+.

Contacts: One per term. On a 1D10 roll of 8+, the contact is in government; otherwise, it is in entertainment.

Other Effects: At the referee's option, random NPCs may recognize the character as a favorite performer. When determining starting money, use CHR in place of SOC for each term served as an entertainer. 1 ship DM per turn for a Yacht.

Farmer

Before the Collapse, vast automated farms and hydroponic tanks supplied raw protein that was marketed in whatever shape, color, and flavor you wanted. Now people live closer to the land, raising real food for people with real jobs to do. You don't have the machinery farmers once had, and what you do have you treat with kid gloves, trying to make it last. It isn't an easy life, but there's something rewarding about raising food from the earth and making a world bloom.

Prerequisites: None.

First Term

Skills: Animal Handling 1, Biology 2, **Technician** 2, **Perception** 1, **Vehicle** 1.

Subsequent Terms

Skills: Animal Handling, Technician, Perception, Determination, Explore, Vehicle, Personal Transport.

All Terms

Special Adventure: 8+ for **Gun Combat, Melee, Physical Science.**

Promotion: 7+, DM +1 if CON 6+.

Contacts: One per term, specialist in one of the above skills.

Other Effects: None.

Hunter/Guide

On primitive and developing worlds, tribal settlements and work crews in the wilderness need food and protection from wild animals. In advanced civilizations, the idle rich crave the excitement of big game hunts, but need experienced guides to take care of them.

Prerequisites: AGL or CON 9+. Homeworld in the Regency. Atmos = Thin+.

First Term

Skills: Perception 2, **Acrobat** 1, **Explore** 2, **Gun Combat** 2, **Vehicle** 1.

(On Pre-Industrial worlds, substitute **Animal Handling** for **Vehicle**.)

Subsequent Terms

Skills: Perception, Acrobat, Explore, Gun Combat, Vehicle, Animal Handling, Archaic Weapons, Personal Transport.

(On Pre-Industrial worlds, substitute **Vessel** for **Vehicle**.)

All Terms

Special Adventure: 6+ for **Melee, Interaction, Charm, Economics.**

Promotion: 7+, DM +1 if INT 6+.

Contacts: One per term of any type.

Other Effects: 2 ship DMs per turn for a Yacht (provided Homeworld Tech = Early Stellar+). Character may stipulate that people must call him or her "Bwana" or "Nimrod."

Journalist

Most worlds enjoy a nominally free press, but in many places the news services have fallen prey to big money or big government. Regardless of the boss, though, there's always a demand for exciting news and for journalists willing to go where the action is, regardless of danger.



Farmer

Prerequisites: Undergraduate degree or Charisma 7+, Homeworld Tech = Ind+.

First Term

Skills: Charm 1, **Determination** 1, **Perception** 2, **Interaction** 2, **Technician** 1.

Subsequent Terms

Skills: Charm, Perception, Interaction, Vice, Determination.

All Terms

Special Assignment: 6+ for *Language*, **Spacehand, Explore, Crime.**

Promotion: 6+, DM +1 if EDU 7+.

Contacts: Three per term, criminal, government, and/or law enforcement.

Other Effects: None.



Hunter/Guide

Law Enforcement

It takes a tough cop to keep people in line, and that's where you come in. You've worked hard to establish a reputation as a hard-bitten officer who's tough but fair. You're proud to think of yourself as a peace officer, someone who not only enforces the law, but who also defuses confrontations before they escalate into violence.



Journalist

The trouble is, off-worlders don't know your reputation. With them, you have to prove yourself anew in each encounter. Sometimes you resent the added trouble they bring to your beat.



Law Enforcement

Prerequisites: STR 6+. Homeworld Law = Low+. No prison record.

First Term

Commission: 9+, DM +1 if EDU 7+, DM +1 if INT 8+. If on Low Gov world, DM +2 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character a detective; all other characters are uniformed police officers.

Skills:

Detectives: **Gun Combat** 2, **Melee** 1, **Charm** 1, **Determination** 1, **Interaction** 1, **Perception** 1, **Vehicle** 1.

Uniformed Police Officers: **Gun Combat** 2, **Melee** 2, **Charm** 1, **Determination** 1, **Vehicle** 1, **Personal Transport**.

Subsequent Terms

Commission: 7+, DM +1 if INT 8+, DM +1 if CHR 8+.



Manager

Skills:

Detectives: **Gun Combat, Melee, Determination, Charm, Interaction, Perception, Vehicle.**

Uniformed Police Officers: **Gun Combat, Melee, Charm, Determination, Vehicle.**

All Terms

Special Duty: 8+ for **Archaic Weapons, Acrobat, Vice, Crime,** *Language, Medical,* **Technician.**

Promotion: 6+, DM +1 if CON 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One criminal and one law enforcement contact per term.

Other Effects: If more than one term is served, add +1 to Initiative.



Martial Artist

Manager

These are exciting, growing times, and you are at the center of the new explosion of economic activity. Your job also takes you to many interesting places and challenges you with new problems every day.

Prerequisites: Undergraduate degree. Homeworld Tech = Ind+.

First Term

Skills: Economics 2, **Charm** 1, **Determination** 2, **Interaction** 2.

Subsequent Terms

Skills: Economics, Charm, Determination, Interaction, Perception.

All Terms

Special Adventure: 6+ for *Language,* **Spacehand, Explore, Vice, Engineer.**

(In Industrial societies, substitute **Vehicle** for **Spacehand**)

Promotion: 7+, DM +1 if EDU 6+.

Contacts: One per term, business or government.

Other Effects:+1 SOC per term. 1 ship DM per term for a Trader ship.



Mechanic

Martial Artist

The cities and starports are more dangerous than ever before, but you're well trained in self-defense and can hold your own against multiple foes in face-to-face combat. Even in fire combat, however, your training gives you an edge, making your reactions quicker and more exact. Also, your physical control translates into stealth when necessary.

The martial artist career includes everything from martial arts instructors to oriental-style assassins.

Prerequisites: None.

First Term

Skills: STR +1, AGL +1, **Melee** 3, **Determination** 1, **Acrobat** 1.

Subsequent Terms

Skills: Characters receive skills on the normal basis from Group A. Alternatively, for each two levels not taken from group A in a single term, one level may be taken from group B.

Group A: **Interaction, Determination, Melee, Acrobat, Archaic Weapons.**

Group B: AGL +1, STR +1, CON +1

Special Adventure: 6+ for **Vice, Crime, Perception, Gun Combat.**

Promotion: 7+, DM +1 if AGL 7+.

Contacts: One per term, business, criminal, or specialist (martial arts).

Other Effects: Use INT instead of SOC for determining starting money per term. If one or more terms are served, +1 Initiative.

Mechanic

There's not much romance or mystique to being a mechanic, but people sure holler when they need one. It's not everyone who can take a look at a piece of machinery, figure out what's wrong, and then fix it. You can. As long as humans use machines, you'll have work to do.

Prerequisites: Homeworld Tech = Ind +.

First Term

Skills: Technician 6, **Vehicle** 1.

Subsequent Terms

Skills: Economics, Interaction, Technician, Vehicle, Intrusion.

All Terms

Special Adventure: 7+ for **Spacehand, Explore, Vice, Engineer, Determination.**

(In Industrial societies, substitute **Vessel** for **Spacehand.**)

Promotion: 7+, DM +1 if CHR 6+.

Contacts: One per term, a specialist in one of the above skills.

Other Effects: None.

Medicine

For centuries, healing has been a respected profession. In troubled times such as these, there is more need for your skills than ever.

Prerequisites: AGL 5+. Homeworld Tech = Ind+.

First Term

Commission: Automatic if completed medical school. A commission makes the character a doctor (minimum SOC 7); all other characters are health-care specialists.

Skills:

Doctors: Biology 4, *Medical* 4.

Health-Care Specialists: **Charm** 1, **Vehicle** 1, **Physical Science** 1, **Technician** 1, *Medical* 2, **Perception** 1.

Subsequent Terms

Skills:

Doctors: **Determination, Charm, Interaction, Perception, Physical Science,** *Medical.*

Health-Care Professionals: **Charm, Vehicle, Physical Science, Technician, Perception.**

All Terms

Special Adventure: 8+ for *Language, Medical,* **Spacehand, Vessel.**

Promotion: 6+, DM +1 if EDU 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion. (Note, however, that doctors never are promoted, and thus do not receive the bonus skill level for promotion.)

Contacts: One per term, medical.

Other Effects: The first commissioned term is internship and residency. No secondary activity is allowed during this time. For each additional career term, however, doctors are allowed two secondary activities. All health-care specialists are allowed one secondary activity per term.

For each term as a doctor, double SOC when calculating starting money.

Mercenary

With the *Pax Imperica* a thing of the past, there is a lot more need for mobile, trained, and equipped troops than there used to be, and small governments are crying for someone to come and train their troops in modern warfare techniques. Whether you're a starmerc doing "rent-an-escort" convoy charters, or a part of a training cadre hired to build a local army from scratch, you're a sought-after commodity. Maybe that's why everywhere you go, the bullets start flying.

Prerequisites: STR 4+, prior military career.

First Term

Skills: *Language* 1, **Interaction** 2, **Melee** 1, **Gun Combat** 1.

Subsequent Terms

Skills: Acrobat, Determination, Explore, Gun Combat, Interaction, Melee, Perception, Vehicle, Personal Transport.

All Terms

Special Duty: 8+ for **Artillery, Engineer, Heavy Weapons, Spacehand,** *Screens,* **Personal Transport.**

Promotion: 6+, DM +1 if CON 7+.

Contacts: One per term, criminal, government, intelligence community, military, or another mercenary.

Other Effects: Roll 1D10 once per term. On a roll of 9, the character must spend the next term in a noncombat career due to serious wounds. A roll of 10 means the character was captured by the opposition and must spend the next term as a prisoner. If more that one term is served, add +1 to Initiative. 1 ship DM per term, plus 1 per special assignment, applied to Trader ship or Warship (character's choice).



Medicine



Mercenary

Merchant Marine

Even if a world has trans-orbital cargo carriers, the most cost-effective way to move bulk cargo from one place to another is by sea. And whether the world has oil-fired steam ships or nuclear-powered surface skimming hydrofoils, in the end it all comes down to seamanship.

The life of a merchant mariner involves hard labor, but it also allows you a lot of time between watches to think and study.

Prerequisites: CON 5+ or STR 6+. Homeworld Tech = Industrial+. Pop = Moderate+. Hydro = Wet+.



Merchant Marine

First Term

Commission: 6+, DM +1 if EDU 7+, DM +1 if INT 8+. If on Low Gov world, DM +2 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 6.)

Skills:

Officers: **Gun Combat** 1, **Explore** 2, **Vessel** 2, **Heavy Weapons** 1, **Economics** 1, **Determination** 1.

Enlisted: **Gun Combat** 1, **Explore** 2, **Vessel** 2, **Heavy Weapons** 1, **Technician** 1.

Subsequent Terms

Commission: 9+, DM +2 if INT 8+, DM +2 if CHR 8+. (Minimum SOC 6)

Skills:

Officers: **Gun Combat, Explore, Vessel, Heavy Weapons, Economics, Determination, Charm.**

Enlisted: **Gun Combat, Explore, Vessel, Heavy Weapons, Technician, Vice, Charm.**

All Terms



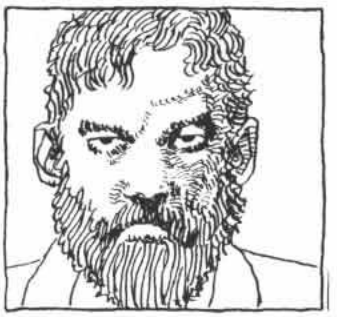
Prison

Special Duty: 8+ for **Archaic Weapons, Melee, Crime, Vehicle, Artillery, Interaction,** *Medical,* **Acrobat, Perception.**

Promotion: 6+, DM +1 if EDU 8+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One per term, business, law enforcement, or specialist (merchant marine).

Other Effects: Two secondary activities allowed per term.


Professor

Prisoner

It's a big universe. Someone's got to run afoul of it. Maybe you were breaking the law for all the right reasons, maybe not. Maybe you didn't even do anything wrong, and they just had to arrest someone. The point is, here you are, and you're going to have to live through it (after all, if Jim Rockford wasn't too good to do time, neither are you).

Prerequisites: Forced due to capture while engaged in illegal activity in the Criminal, Corsair, Mercenary, or Rebel careers.

All Terms


Psionic Researcher

Skills: A total of 6 levels from any one or a combination of the following:

Acrobatics, **Charm, Crime, Determination, Economics, Interaction, Melee, Perception, Vice,** STR+1, EDU+1,

Special Adventure: None (what, prison itself isn't enough?).

Promotion: None.

Contacts: Two per term, criminal.

Other Effects: No secondary activities allowed. Released after one term. Do not count prison terms when calculating starting money.

Professor

Your time is divided between the search for additional knowledge and your university responsibilities—the training of new scholars.

Prerequisites: PhD.

First Term

Skills: Specialty 1 (a level in the character's specialty skill as taken in graduate university), *Language* 1, **Interaction 3, Charm** 1.

Subsequent Terms

Skills: *Language,* **Determination, Interaction, Charm,** Specialty.

All Terms

Special Adventure: 8+ for **Explore, Perception, Spacehand.** (On Industrial homeworlds, substitute **Vessel** for **Spacehand.**)

Promotion: 6+, DM +1 if INT 8+. If on Low Gov or High+ Gov world, DM +1 for SOC 8+.

Contacts: Two per term, academic or government.

Other Effects: All professors use the "commissioned" ranks of the scientist career. Professors may have two secondary activities per term. 1 ship DM per term for a laboratory ship.

Psionic Researcher

As an expert in the workings of the human mind, you have become very interested in what have come to be called the psionic powers. This field was once outlawed in the old Third Imperium, but the need to better understand its Zhodani neighbors has led the Regency to relax such restrictions and encourage controlled research. You want to delineate the limits of those powers and to learn how they work.

Prerequisites: Medical school or doctorate from graduate school in biology. Homeworld in the Regency.

All Terms

Skills: Psionics (see the Psionics section, page 245), **Perception, Determination.**

Special Adventure: 7+ for PSI +1.

Promotion: 7+, DM +1 if INT 7+.

Contacts: One per term, medical, academic, or psionic. On a 1D10 roll of 7+, the contact is Zhodani.

Other Effects: Immediately upon entry into the career, the character undergoes psionic testing and evaluation (see Psionics, page 245).

Referee may stipulate the existence of psionic institues and allow this career outside the Regency, if desired.

Rebel

When the social contract between the rulers and the governed is maintained, all members of society have an equal opportunity to participate in the process of governance and benefit from the economic activities of the society. When that contract is not honored, the result is oppression, and the oppressed often strike back.

Prerequisites: Agility 5+.

First Term

Skills: Charm 2, Crime 2, Gun Combat 1, Melee 1.

Subsequent Terms

Skills: Charm, Crime, Gun Combat, Heavy Weapons, Interaction, Melee, Vehicle, Vice.

All Terms

Special Mission: 5+ for **Aircraft, Space Vessel,** Combat Engineer, **Determination, Explore, Heavy Weapons,** *Language,* **Tactics, Personal Transport.**

Promotion: 6+, DM +1 if INT 7+.

Contacts: One per term, criminal or law enforcement.

Other Effects: If more than one term is served, +1 to Initiative. Also, roll 1D10 once per term for INT or less to avoid capture, DM +1 if a special mission was executed. If unsuccessful, the next career term must be prison. 1 ship DM per turn for a Warship.

Scientist

Although many of your colleagues are educators, your concerns are almost entirely with research, either of natural phenomena or of relic technology from before the Collapse.

Prerequisites: INT 7+ or doctorate in any physical science. Homeworld Tech = Industrial+.

First Term

Commission: 8+, DM +2 if EDU 8+, DM +1 if INT 8+. If on Low or High+ Gov world, DM +1 for SOC 8+. A commission makes the character a doctor; all other characters are technicians. (Minimum SOC 6)

Skills:

Doctors: **Physical Science** 5, *Language* 1, **Perception** 2.

Technicians: **Physical Science** 2, **Technician** 3, *Medical* 1, **Perception 1, Charm** 1.

Subsequent Terms

Commission: 9+, DM +2 if EDU 8+, DM +2 if INT 8+. (Minimum SOC 6.)

Skills:

Doctors: **Determination, Interaction, Perception, Physical Science,** *Language.*

Technicians: **Charm, Vehicle, Technician, Perception, Physical Science,** *Medical.*

All Terms

Special Adventure: 5+ for **Spacehand, Explore, Gun Combat, Acrobat, Engineer, Vice.**

Promotion: 7+, DM +1 if INT 7+.

Contacts: 1 per term, government or scientist.

Other Effects: 1 ship DM per term as a technician, 5 ship DMs per term served as a doctor, both for a Lab ship.

Scout

Whether they are called scouts, explorers, or the survey, most interstellar cultures support a cadre of people whose interests lie in visiting star systems and worlds that have gone uncharted for generations. These are the trail-blazers of interstellar trade and commerce.



Rebel



Scientist



Scout

Prerequisites: INT or STR 7+. Homeworld Tech = Early Stellar+.

First Term

Commission: 7+, DM +1 if STR 8+, DM +1 if INT 8+. If on Low Gov or High+ Gov world, DM +1 for SOC 8+. A commission makes the character an officer; all other characters are enlisted.

Skills:

Officers: **Gun Combat** 1, **Spacehand** 1, **Space Vessel** 1, **Space Tech** 2, **Physical Science** 1, **Explore** 1, **Determination** 1.

Enlisted: **Gun Combat** 1, **Spacehand** 1, **Space Vessel 1, Space Tech** 2, **Technician** 2, **Explore** 1.

Subsequent Terms

Commission: 9+, DM: +1 if INT 8+, +1 if STR 8+, +1 if CHR 8+.

Skills:

Officers: **Spacehand, Space Vessel, Space Tech, Physical Science, Technician, Explore, Perception, Determination, Charm, Personal Transport.**

Enlisted: **Spacehand, Space Vessel, Space Tech, Technician, Explore, Perception, Vice, Charm, Personal Transport.**

All Terms

Special Duty: 8+ for **Gun Combat, Melee, Aircraft, Vehicle, Animal Handling,** *Language,* **Interaction,** *Medical,* **Acrobat, Perception**

Promotion: 6+, DM +1 if CHR 7+. If on Low Gov or High+ Gov world, DM +1 for SOC 8+.

Contacts: One per term, government, military, or trader.

Other Effects: 1 ship DM per term as an enlisted scout, 3 ship DMs per term as an officer, both for a Scout/Courier.

Tough

You're young, you're tough, and you're slick. You're part of a family of the street, a motley collection of society's disenfranchised and discarded. There may have been a support system for people once, but, if so, it disappeared long before your time. You know that no one's going to take care of you but you.

Prerequisites: CHR 3+, SOC 5–. Homeworld Pop = Mod+.



Tough

First Term

Skills: Acrobat 2, **Charm** 1, **Determination** 3, **Melee** 1.

Subsequent Terms

Skills: Acrobat, Charm, Determination, Melee, Vice.

All Terms

Special Adventure: 6+ for **Gun Combat, Crime, Artisan.**

Promotion: 6+, DM +1 if STR 7+.

Contacts: One per term, criminal, law enforcement, or specialist (streetwise).

Other Effects: Characters may not enter this career after serving in any other career; they must start as a tough and may then continue in this career or switch to a different one. When calculating starting money, multiply by 0.1 for each term as a tough.



Trader

Trader

When Virus drove a billion computers into howling insanity, when thousands of ships burned up in atmospheres or opened their airlocks to let hard vacuum consume their crews, only the decrepit and obsolete tramp merchant vessels—with computers too stupid to be infected—survived. For nearly a century, that tattered network of ramshackle ships was all that remained of interstellar trade in most of human-settled space. The men and women who crew the Free Traders are a breed unto themselves, as stubbornly self-reliant as they come.

Prerequisites: INT 6+ or CHR 6+. Homeworld Tech = Early Stellar+.



Undercover Agent

First Term

Commission: 6+, DM +1 if EDU 8+, DM +1 if INT 8+. If on Low or High+ Gov world, DM +1 for SOC 8+. A commission makes the character an officer; all other characters are spacehands.

Skills:

Officers: **Spacehand** 1, **Space Vessel** 2, **Space Tech** 2, **Economics** 2, **Interaction** 1.

Spacehands: **Spacehand** 2, **Space Tech** 2, **Technician** 2, **Vehicle** 1, **Charm** 1.

Subsequent Terms

Commission: 7+, DM +1 if EDU 8+, DM +1 if INT 8+.

Skills:

Officers: **Determination, Interaction, Spacehand, Space Vessel, Space Tech, Economics.**

Spacehands: **Vehicle, Spacehand, Space Tech, Technician, Interaction, Vice.**

All Terms

Special Duty: 4+ for **Explore, Gun Combat, Crime,** *Language*, **Vehicle, Aircraft.**

Promotion: 7+, DM +1 if CHR 7+. DM +1 if INT 7+. If on Low or High+ Gov world, DM +1 for SOC 8+.

Contacts: One per term, trader, government, or criminal.

Other Effects: 2 ship DMs per term served as a spacehand, 5 ship DMs per term served as an officer, both for a Trader ship.

Undercover Agent

With many new worlds rediscovering space travel and coming into contact again, there is a tremendous demand for information about neighboring governments, planets, and cultures. Undercover agents are used when the inquisitive party doesn't want the subject of the investigation to know about it. Many agents are government employees, but others work for corporations or are freelancers, selling information to the highest bidder.

Prerequisites: INT 6+, CHR 6+, Homeworld Tech = Ind+.

First Term

Skills: Charm 1, **Gun Combat** 1, *Language* 1, **Interaction** 2, **Perception** 1, **Social Science** 1.

Subsequent Terms

Skills: Charm, Crime, Determination, Interaction, Social Science, Vice.

All Terms

Special Assignment: 6+ for **Gun Combat,** *Language*, **Melee, Perception, Personal Transport.**

Promotion: 7+, DM +1 if AGL 7+.

Contacts: One per term, government or intelligence community.

Other Effects: 1 ship DM per term for a Scout/Courier.

Wealthy Traveller

It's a fascinating world, a fascinating galaxy, and you want to see and experience it all. Since you have the means to do it, why not?

Prerequisites: SOC 9+ and homeworld in the Regency.

First Term

Skills: Determination 1, **Perception** 1, **Economics** 1, **Charm** 1, **Interaction** 1, **Explore** 1, **Animal Handling** 1.

Subsequent Terms

Skills: Aircraft, Determination, Perception, Economics, Charm, Interaction, Animal Handling, Vessel, Vehicle, Spacehand.

(On Industrial worlds, delete **Spacehand**. On Pre-Industrial worlds, delete **Aircraft, Vehicle,** and **Spacehand**.)

All Terms

Special Adventure: 8+ for **Gun Combat, Explore, Melee,** *Language*, **Space Vessel, Crime, Vice, Personal Transport.**

(On Industrial and Pre-Industrial worlds, substitute **Vessel** for **Space Vessel**.)

Promotion: 6+, DM +1 if EDU 7+.

Contacts: Two per term, business or government.

Other Effects: When calculating starting money, use SOC×10 for each term spent as a wealthy traveller. 5 ship DMs per term for a Yacht.

MILITARY CAREERS

The following material provides an overview of the types of armed forces found in most regions of human space. Players and referees can use this information to create characters from specific services in specific regions.

For a listing of all skills, clusters, and cascades, see the Skills by Skill Clusters table on page 113 of the "Referees" chapter.

Army

The army provides ground troops tasked with protecting the population and resources of a world or nation. Sometimes that mission means service on another world.

Prerequisites: CON 6+. Homeworld Tech = Industrial+. Pop = Moderate+. Atmos = Thin+.

First Term

Commission: 7+, DM +1 if EDU 7+, DM +1 if INT 8+. If on Low Gov world, DM +2 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat** 2, **Explore** 1, **Heavy Weapons** 1, **Artillery** 1, **Tactics** 1, **Determination** 1.

Enlisted: **Gun Combat** 2, **Melee** 2, **Heavy Weapons** 1, **Explore** 1, **Acrobat** 1, **Technician** 1.

Subsequent Terms

Commission: 9+, DM +2 if INT 8+, DM +2 if CHR 8+. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat, Explore, Heavy Weapons, Tactics, Determination, Charm, Personal Transport.**

Enlisted: **Gun Combat, Melee, Heavy Weapons, Explore, Vice, Charm, Personal Transport.**

All Terms

Special Duty: 8+ for **Archaic Weapons, Melee, Aircraft, Crime, Spacehand, Vehicle, Artillery, Interaction,** *Medical*, **Acrobat, Technician, Perception, Personal Transport,** *Screens*.

Promotion: 6+, DM +1 if CON 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One per term, military.

Other Effects: None.



Wealthy Traveller



Army

Aviation

Air superiority and close air support for ground forces is the mission of the aviation service. You've often heard fellow pilots say, "If it ain't mud or vacuum, we own it."

Prerequisites: STR or AGL 7+. Homeworld Tech = Industrial+. Pop = Moderate+. Atmos = Thin+.

First Term

Commission: 7+, DM +1 if EDU 7+, DM +2 if AGL 8+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 6.)

Skills:

Officers: **Gun Combat** 1, **Aircraft** 3, **Vehicle** 1, **Physical Science** 1, **Determination** 1, **Perception** 1.

Enlisted: **Gun Combat** 1, **Melee** 1, **Technician** 3, **Vehicle** 1, **Heavy Weapons** 1.



Aviation

Subsequent Terms

Commission: 9+, DM +1 if INT 8+, DM +2 if CHR 8+. (Minimum SOC 6.)

Skills:

Officers: **Gun Combat, Aircraft, Explore, Vehicle, Perception, Determination, Charm.**

Enlisted: **Gun Combat, Melee, Technician, Vehicle, Heavy Weapons, Vice, Charm.**

All Terms

Special Duty: 8+ for **Archaic Weapons, Melee, Aircraft, Crime, Spacehand, Interaction,** *Medical,* **Acrobat, Personal Transport.**

Promotion: 6+, DM +1 if EDU 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One per term, military.

Other Effects: None.



Marines



Navy

Marines

From the Halls of Montezuma to the cold depths of space. Of all the military services, it is the Marines who guard their legend and traditions the most jealously. From their beginnings as snipers in the masts of ancient Terran sailing ships, they have crafted a reputation as humanity's elite troops. No matter that the Imperial Marines survive only in the Regency; all corps of Marines in former Imperial Space use their tradition as their model. All still defiantly train with the cutlass. In combat, when a Marine has fallen, the call still goes up, as it has for thousands of years, "Corpsman!" And everyone who comes into contact with them learns a new law of grammar: There are soldiers, sailors, starmen, scouts, and Marines.

Prerequisites: AGL 7+. Homeworld Tech = Pre-Stellar+. Population = Moderate+.

First Term

Commission: 8+, DM +1 if EDU 8+, DM +1 if INT 8+, DM +1 if CON 8+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat** 2, Armed Martial Arts (Large Blade) 1, **Melee** 1, **Spacehand** 1, **Heavy Weapons** 1, **Tactics** 1, **Determination** 1, **Personal Transport** 1.

Enlisted: **Gun Combat** 2, Armed Martial Arts (Large Blade) 1, **Melee** 1, **Spacehand** 1, **Heavy Weapons** 1, **Acrobat** 1, **Technician** 1, **Personal Transport** 1.

Subsequent Terms

Commission: 9+, DM +1 if INT 8+, DM +1 if CON 8+, DM +2 if CHR 8+. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat, Spacehand, Heavy Weapons, Tactics, Determination, Charm, Personal Transport.**

Enlisted: **Gun Combat, Melee, Heavy Weapons, Spacehand, Vice, Charm, Personal Transport.**

All Terms

Special Duty: 8+ for **Melee, Aircraft, Crime, Interaction, Explore, Vehicle, Artillery, Acrobat, Technician,** *Screens,* Slug Weapon (Slug Pistol), **Perception, Personal Transport.**

Promotion: 6+, DM +1 if CON 7+. If on Low Gov or High+ Gov world, DM +1 for SOC 8+.

Contacts: One per term, military.

Other Effects: 1 ship DM per term, plus 1 per special assignment, applied to Trader or Warship (character's choice).

Navy

The navy crews the spacecraft that defend a world against attack from above: everything from jump-capable cruisers and battle riders to little SDBs (system defense boats).

Prerequisites: INT or EDU 7+. Homeworld Tech = Pre-Stellar+. Pop = Moderate+.

First Term

Commission: 8+, DM +1 if EDU 8+, DM +1 if INT 8+. If on Low Gov world, DM +2 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 7.)

Skills:

Officers: **Gun Combat** 1, **Spacehand** 1, **Space Vessel** 1, **Space Tech** 2, **Tactics** 1, **Determination** 1.

Enlisted: **Gun Combat** 1, **Spacehand** 2, **Space Tech** 2, **Technician** 2.

Subsequent Terms

Commission: 9+, DM +2 if INT 8+, DM +2 if CHR 8+. (Minimum SOC 7.)

Skills:

Officers: **Spacehand, Space Vessel, Space Tech, Physical Science, Technician, Tactics, Determination, Charm.**

Enlisted: **Spacehand, Space Tech, Technician, Vice, Charm.**

All Terms

Special Duty: 8+ for **Gun Combat, Melee, Aircraft, Vehicle, Artillery, Interaction,** *Medical,* **Acrobat, Crime, Perception.**

Promotion: 6+, DM +1 if CHR 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One per term, military.

Other Effects: 2 ship DMs per term as a spacehand, 5 per term as an officer, for a Scout/Courier, Trader, or Warship (character's choice).

Special Operations

The more technologically sophisticated military organizations become, the more dependent they are on their command, control, communication, and support structure, which increases their vulnerability to clandestine operations. That's where special operations forces come into their own. Whether they are called commandoes, blackouts, rangers, or any of a dozen other names, their job is always the same.

Prerequisites: STR, AGL, and CON all 5+, and at least one prior term served in any other military career.

First Term

Commission: 8+, DM +1 if EDU 8+, DM +1 if INT 8+, DM +1 if CON 8+. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat 2, Melee 2, Spacehand 1, Heavy Weapons 1, Tactics 1, Determination 1.**

Enlisted: **Acrobat 1, Gun Combat 2, Heavy Weapons 1, Melee 2, Spacehand 1, Technician 1.**

Subsequent Terms

Commission: 9+, DM +1 if INT 8+, DM +1 if CON 8+, DM +2 if CHR 8+. (Minimum SOC 5.)

Skills:

Officers: **Gun Combat, Spacehand, Heavy Weapons, Tactics, Determination, Charm, Personal Transport.**

Enlisted: **Gun Combat, Melee, Heavy Weapons, Spacehand, Vice, Charm, Personal Transport.**

All Terms

Special Duty: 8+ for **Melee, Aircraft, Crime, Interaction, Explore, Vehicle, Artillery,** *Medical,* **Acrobat, Technician,** *Screens,* Slug Weapon (Slug Pistol), **Perception, Personal Transport.**

Promotion: 6+, DM +1 if CON 7+. If on Low Gov or High+ Gov world, DM +1 for SOC 8+.

Contacts: One per term, military.

Other Effects: Characters who transfer to special operations do so with the rank they previously held in their prior military career. If more than one term is served, +1 to Initiative. 1 ship DM per term, plus 1 per special assignment, applied to Trader or Warship (character's choice).

Wet Navy

The wet navy crews armed nautical vessels that protect the sealanes of a world.

Prerequisites: INT or EDU 7+. Homeworld Tech = Ind+. Pop = Moderate+.

First Term

Commission: 8+, DM +1 if EDU 8+, DM +1 if INT 8+. If on Low Gov world, DM +2 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic commission. A commission makes the character an officer; all other characters are enlisted. (Minimum SOC 7.)

Skills:

Officers: **Gun Combat 1, Vessel 2, Technician 2, Artillery 1, Determination 1.**

Enlisted: **Gun Combat 1, Vessel 3, Heavy Weapons 1, Artillery 1, Technician 2.**

Subsequent Terms

Commission: 9+, DM +2 if INT 8+, DM +2 if CHR 8+. (Minimum SOC 7.)

Skills:

Officers: **Artillery, Heavy Weapons, Vessel, Physical Science, Technician, Tactics, Determination, Charm, Personal Transport.**

Enlisted: **Artillery, Heavy Weapons, Technician, Vice, Charm, Personal Transport.**

All Terms

Special Duty: 8+ for **Gun Combat, Melee, Aircraft, Vehicle, Interaction,** *Medical,* **Acrobat, Crime, Perception, Personal Transport.**

Promotion: 6+, DM +1 if CHR 7+. If on Low Gov world, DM +1 for SOC 8+. If on High+ Gov world, SOC 8+ receives automatic promotion.

Contacts: One per term, military.

Other Effects: None.



Special Operations



Wet Navy

CAREER ENTRY REQUIREMENTS

All Homeworld/Region requirements must be met to enter the career. Attribute requirements only require that the character meet one of the requirements listed, unless they are underlined. *All* underlined requirements must be met in order to enter the career. See career descriptions for more details. The Prior Career column shows previous education or skills required. SOC or educational requirements in parantheses show what is required to get or enter the career with a commission.

Career	*STR*	*AGL*	*CON*	*INT*	*EDU*	*CHR*	*SOC*	*Homeworld/Region*	*Prior Career*	*Ship DMs Gained*
Education										
Undergrad Univ.					5+			Industrial (4)+		
Military Academy	5+				6+		(9+)	ModPop (6)+, Ind (4)+		
Graduate Univ.				7+	7+			Industrial (4)+	Univ	
Law School				5+	5+			Industrial (4)+	Univ	
Medical School				8+	8+			Industrial (4)+	Univ & Skill1	
Flight Academy		6+			6+		(9+)	Ind/Early Stellar (4/9)+		
Technical School								Industrial (4)+		
Hiver Technical Academy				7+	7+			Old Expanses		
Civilian Occupations										
Athlete	9+	9+	9+					ModPop (6)+		
Attorney									Law School	
Barbarian								Pre-Industrial (3)–		
Belter		6+						Pre-Stellar (6)+	Geology 2+	1 Scout*/T
Bounty Hunter		4+								1 Scout
Bureaucrat					7+			ModLaw (4)+		
Civil Engineer									Master's, Skill2	
Civil Pilot								Industrial (4)+	Tech/Flight, Skill3	
Computer Operator								Pre-Stellar (6)+	Tech/Univ, Skill4	
Construction Worker	4+	5+								
Corsair	6+		6+					Early Stellar (9)+		3 Warship
Criminal										
Diplomat				7+		7+		ModPop (6)+		1 Scout, Yacht/T
Entertainer						8+				1 Yacht
Farmer										
Hunter/Guide		9+	9+					ThinAtmos (4)+/Regency		1 Yacht
Journalist						7+		Industrial (4)+	Univ	
Law Enforcement	6+							LowLaw (1)+	No Prison Terms	
Manager								Industrial (4)+	Univ	1 Trader
Martial Artist										
Mechanic								Industrial (4)+		
Medicine		5+						Industrial (4)+	(Medical School)	
Mercenary	4+								Military Career	1+1 Trader, Warship
Merchant Marine	6+		5+					Ind (4)+, ModPop (6)+, WetHyd (3)+		
Prisoner									Forced by Capture	
Professor									PhD	
Psionic Researcher								Regency	Med, PhD Biology	
Rebel		5+								1 Warship
Scientist				7+			(6+)	Industrial (4)+	PhD Physical Sci.	1/5 Lab Ship
Scout	7+			7+				Early Stellar (9)+	(Univ/Flight)	1/3 Scout
Tough						3+	5–	ModPop (6)+		
Trader				6+		6+		Early Stellar (9)+	(Flight Academy)	2/5 Trader
Undercover Agent				6+		6+		Industrial (4)+		1 Scout
Wealthy Traveller							9+	Regency		5 Yacht/T
Military Careers										
Army			6+				(5+)	Ind (4)+, ModPop (6)+ ThinAtm (4)+	(Univ/Acad)	
Aviation	7+	7+					(6+)	Ind (4)+, ModPop (6)+ ThinAtm (4)+	(Univ/Flight)	
Marines		7+					(5+)	Pre-Stlr (6)+, ModPop (6)+	(Univ/Acad)	1+1 Trader, Warship/T
Navy				7+	7+		(7+)	Pre-Stlr (6)+, ModPop (6)+	(Univ/Flight)	2/5 Scout, Warship, Trader/T
Special Operations	5+	5+	5+				(5+)		Military Career	1+1 Trader, Warship
Wet Navy				7+	7+		(7+)	Ind (4)+, ModPop (6)+	(Univ/Acad)	

NOTES

Master's: Master's degree from graduate university; **PhD:** Doctorate from graduate university; **Med:** Medical school; **Tech:** Technical school; **Flight:** Flight academy; **Univ:** Undergraduate university; **Acad:** Military academy.

Prior Career Skill Prerequisites

Skill1: Biology 3+, Chem 2+; **Skill2:** Construction 4+; **Skill3:** Pilot 3+; **Skill4:** Computer 2+.

Ship DMs

Number before slash is DMs earned per term as enlisted; after slash is DMs earned per turn as officer; **T**=May trade 1 Ship DM for membership in Travellers'Aid Society; * Ship DMs received only if character never made a strike.

TABLE OF RANKS

Military ranks listed are representative only. Armed forces have many local variations on these rank structures.

	Army	Marines	Aviation	Navy/Wet Navy*
E1	Private Recruit	Private Recruit	Airman Recruit	Spacehand Recruit
E2	Private	Private First Class	Airman	Spacehand Apprentice
E3	Private First Class	Lance Corporal	Airman First Class	Able Spacehand
E4	Corporal	Corporal	Sergeant	Petty Officer 3d Class
E5	Sergeant	Sergeant	Staff Sergeant	Petty Officer 2d Class
E6	Staff Sergeant	Staff Sergeant	Technical Sergeant	Petty Officer 1st Class
E7	Sergeant 1st Class	Gunnery Sergeant	Master Sergeant	Chief Petty Officer (CPO)
E8	First Sergeant	First Sergeant	Senior Master Sgt	Senior CPO
E9	Sergeant Major	Sergeant Major	Chief Master Sgt	Master CPO
O1	2d Lieutenant	2d Lieutenant	Pilot Officer	Ensign
O2	1st Lieutenant	1st Lieutenant	Flying Officer	Lieutenant, j.g.
O3	Captain	Major	Flight Lieutenant	Lieutenant
O4	Major	Force Commander	Squadron Leader	Lt. Commander
O5	Lt. Colonel	Lt. Colonel	Wing Commander	Commander
O6	Colonel	Colonel	Group Captain	Captain
O7	Brigadier General	Brigadier	Air Commodore	Commodore
O8	Major General	Major General	Air Vice Marshall	Rear/Fleet Admiral
O9	Lt. General	Lt. General	Air Marshall	Vice/Sector Admiral
O10	General	General	Air Chief Marshall	Admiral/Grand Admiral

* In wet navy service, the term "spacehand" is replaced by "seaman."

	Trader	Law Enforcement	Science	Scouts
E1	Apprentice Spacehand	Trainee	Trainee	Scout Apprentice
E2	Able Spacehand	Deputy	Junior Technician	Scout Technician
E3	Senior Spacehand	Officer	Technician	Scout Specialist
E4	Master Spacehand	Sergeant	Senior Technician	Asst. Team Leader
E5	Mate	Snr. Sergeant	Supervisor	Team Leader
E6	1st Mate	Supervisor	Senior Supervisor	Senior Team Leader
O1	4th Officer	Detective	Doctor	Junior Leader
O2	3rd Officer	Detective Sgt	Assoc. Professor	Scout Leader
O3	2nd Officer	Detective Lt.	Asst. Professor	Junior Commander
O4	1st Officer	Detect. Inspector	Professor	Scout Commander
O5	Captain	Detect. Captain	Fellow	Senior Commander
O6	Senior Captain	Detect. Chief	Senior Fellow	Expedition Leader
O7	Commodore	Chief	Departmental Chair	Survey Commander

	Diplomat	Bureaucrat	Barbarian	Corsair
R1	Attache	Asst. Commissioner	Laborer	Spacehand
R2	Deputy Consul	1st Asst. Commissioner	Hunter	Technician
R3	Consul	Deputy Commissioner	Scout	Mate
R4	Consul General	Commissioner	Warrior	Master-at-Arms
R5	Envoy	Under Secretary	Chief	Lieutenant
R6	Ambassador	Secretary	Elder Chief	Captain

	Medicine
R1	Orderly
R2	Technician
R3	Paramedic
R4	Nurse
R5	Therapist
R6	Practicioner
O1	Doctor

NPCs

NPCs are nonplayer *characters*. Note the emphasis on characters. The only difference between a PC and an NPC is that a player plays the first, and the referee plays the second. Perhaps a better term would be RPC, for referee-played characters. These individuals should be potentially as realistic and interesting as any player character, for it is these NPCs who make **Traveller**'s universe real for the players. Players want to go places and meet interesting people, and it's up to the referee to make those people interesting. Their allies should be people to be admired, someone they are proud to have stand with them in a tough fight. Their opponents should be people to be feared, hated, or even grudgingly respected.

Of course, there are limits. The referee cannot generate detailed information on the thousands of people the PCs might meet. The referee can only concentrate on a few NPCs that must be done really well, and must handle other less important NPCs just well enough to maintain the sense of reality. The few important NPCs are called detailed NPCs. The other NPCs are called template NPCs. This chapter includes a number of template NPCs to assist the referee in providing a wide variety of useful characters for their PCs to interact with.

DETAILED NPCS

A detailed NPC is one that is created by the referee using the character generation system in just the same way that a PC would be created. A detailed NPC should be created when the NPC is someone with whom the player characters will be interacting on a detailed or regular basis. Examples of this sort of person are the PCs' main opponents in an adventure or campaign, a crewmember aboard the PCs' ship, an important colleague or ally, or a patron (see the Patrons entry on page 63). Many solid contacts (see page 31) developed by the PCs during play should also be created as detailed NPCs.

TEMPLATE NPCS

In most cases it is not possible, nor even desirable, for the referee to generate a fully detailed NPC for the PCs to encounter. Sometimes there is simply not enough time to generate a detailed NPC. This can happen if the referee is having to "wing it" when the players have wandered off in some other direction than the scenario had planned, or when rolling for random encounters.

In other cases, NPCs exist for a specific purpose that does not require them to be fleshed out. They are customs officers at a starport, a guard at a military base, a waitress at a starport bar who is there to pass on a rumor to the PC party, or enemy soldiers that the PCs have to fight. Template NPCs provide the rough outline of abilities that is required for them to act out their defined roles. Some of the template NPCs at the end of this chapter allow the referee to choose from a variety of skills when creating the NPC. These sets of skills can be modified to allow the referee to create the exact NPC desired.

Referee's Note: Sometimes a simple template NPC will catch the PCs' imagination, often because the referee has done a good job of giving that NPC a memorable personality, and they will try to get to know him or her better, or return to seek information or advice. Such NPCs gain the status of contacts (see page 62), and it is entirely proper for the referee to convert them into detailed NPCs, having the same balance of skills and abilities, of course.

Alien NPCs

There is not space in the **Traveller: The New Era** rulebook for character generation for every alien race in Charted Space. This information will be presented in later products. In order to allow player interaction with the major alien races, these races are presented in various forms as template NPCs.

NPCs in Combat

In terms of combat statistics, the majority of NPCs are ranked as one of four levels of experience—Novice, Experienced, Veteran, and Elite—and these experience levels dictate their Initiative, attributes, and combat assets. The NPC Stats table on the following page lists those stats for each experience level. On this table, *Level* refers to experience level; *Initiative* refers to the corresponding Initiative rating; *Attributes* indicates the average physical attribute level (STR, AGL, CON); *Asset* refers to the rating of the NPC's primary combat assets; and *Damage* indicates the number of wound points the NPC causes in an unarmed combat attack. (For an explanation of attributes, skills, and assets, see the sidebar on the next page.)

Physical Attributes: The value for these attributes is given separately from the skill area assets because they are essential for resolving combat. Strength is used to calculate recoil effects in fire combat; Constitution is used to resist unconsciousness when seriously wounded; and all three physical attributes are used in resolving unarmed melee combat. The remaining nonphysical attributes are not covered by this number because these NPC ratings are intended to convey the character's *combat* effectiveness, and the other attributes are more likely to be linked to noncombat skills as discussed under Other NPC Assets, below.

The average attributes should be taken to mean that the numbers are the average attributes of a group of

such NPCs, and not that each and every one of them has those attribute numbers. Referees may raise or lower attributes and assets if variation is required, but if this variation will not be seen by the players, the extra effort is pointless.

For example, a Veteran NPC is shown to have average physical attributes of 6, which would give a simple UPP of 666NNN, but the referee could vary this to 765NNN, 558NNN, etc. Assets, too, can be altered to fit the desired effect. These average stats are intended to help make the referee's job easier, not to lock referees into a fixed set of numbers.

NPC STATS

Level	*Initiative*	*Attributes*	*Asset*	*Damage*
Elite	5	8	15	5
Veteran	4	7	13	4
Experienced	3	6	11	3
Novice	1	6	9	1

Combat Assets: The primary combat asset is for the weapon or system that the character habitually uses in combat. This figure is given as assets (controlling attribute plus skill level) rather than skill levels, because some combat skills (Screens, Forward Observer, and RCV Operations) have nonphysical controlling attributes.

For most soldiers and civilians, this asset is something from the Gun Combat cluster (Energy Weapon or Slug Weapon). Specialist soldiers have, in addition to the standard Gun Combat skills, more exotic primary combat assets, typically drawn from the Artillery, Heavy Weapons, and Vehicle clusters. For a tank gunner, the primary combat skill would be the tank's gun (Heavy Gun, Energy Artillery), for a tank driver it would be a driving skill (Ground Vehicle [Tracked] or Pilot [Interface/Grav]), for a battlefield screen operator it would be Screens (Nuclear Damper) or (Meson Screen). No soldier will have the listed primary combat asset level in every conceivable combat skill, only in a Gun Combat skill, and the handful of other skills that allow the soldier to carry out his or her primary combat function.

Note that template NPCs will have combat skills appropriate to their background. NPC soldiers from a Pre-Industrial world will have combat skills in Archery, Thrown Weapon, and perhaps Early Firearms and Archaic Artillery, not Energy Weapons, etc. Furthermore, nonmilitary characters at high tech levels will only rarely have combat skills from the Artillery or Heavy Weapons clusters; their assets will be almost exclusively be drawn from the Gun Combat cluster.

NPC Panic: NPCs use the same panic system as PCs. This means that while PCs can reach an Initiative of 6, in which case they never panic, even Elite NPCs have some chance of panicking. Thus, if the referee intends to create a powerful NPC warrior with an Initiative of 6 or better, this warrior must be a detailed NPC.

Attributes, Skills, and Assets

The ability of a Traveller character—PC or NPC—to accomplish something is based on the combination of two things: innate attributes and training. The character's attributes (Strength, Agility, etc.) are the first portion of this combination, and the character's skill levels represent the second. Each skill has one particular attribute which is crucial to the performance of that skill. This attribute is the *controlling attribute* of that skill. For example, Education is the controlling attribute of History skill, and Agility is the controlling attribute of Pilot skill. A skill level added to its controlling attribute is called the *asset* in that skill, and this total is the number used in Traveller to determine the success or failure of an action. NPC skills given in this section are given as assets, which is to say skills already added to their controlling attributes.

NPC Hit Capacity: It is entirely too much of a headache to keep track of multiple wounds and their locations on every NPC. For this reason, NPCs, regardless of experience level, are assumed to have a standard, overall hit capacity of 40, divided into two rows of 20 (see the standard NPC forms in the back of the book). When an NPC first takes a wound, he or she is considered slightly wounded and suffers a –1 to Initiative. Once the first row is filled, excess points are marked off the second row. With the first point marked off the second row, the NPC is considered seriously wounded and takes an additional –2 to Initiative (for a total of –3). In addition, seriously wounded NPCs must succeed at a D100 roll versus Constitution every combat turn in which they attempt to act, or they become unconscious (just as with player characters).

Note that for simplicity, the NPC damage is not assigned to specific hit locations, as it is for PCs. However, hit locations should still be rolled for two reasons. First, if an attack on an NPC strikes an armored hit location, the armor takes effect normally. Second, if any attack strikes an NPC in the head, damage for that attack is doubled. This reflects the fact that hits to the head by firearms are especially deadly. In addition, any hits to an NPC's head are subject to the quick kill roll (see page 285). Also, it allows PCs to aim melee attacks to the head, trading a more difficult attack for increased damage.

Other NPC Assets

Of course, the combat skills listed above will not be the only skills an NPC has. In fact, for many NPCs (perhaps most), the player characters will never have occasion to know their combat skills. Instead, they will be known for their expertise in some other field.

The experience level of template NPCs is *only relevant to their performance in combat.* Some of the most

capable scientists, experts in various fields, engineers, and political leaders will only be rated as Novice NPCs. The template NPCs below have an entry for Other Assets which details these other talents. As with the combat assets, these other talents are listed in their asset form, which does not require the referee to keep separate track of the controlling attribute.

NPC MOTIVATIONS

All NPCs have reasons for who they are, what they do, and where they are. These motivations are always up to the referee, and may be simple or complicated as required by the situation. While the referee's sense of logic and imagination can serve quite well in many circumstances, there are times when referees will want a random element to help spur their imaginations, or to create quick answers in a situation where not too much detail is required. **Traveller** provides such a random element with the use of a standard deck of playing cards.

The referee may use these in conjunction with detailed or template NPCs

To generate an NPC's motivations, draw two cards from a standard deck of playing cards. The card with the highest value determines the NPC's primary motivation; the lower reveals the secondary motivation. Each card's suit dictates the direction that motivation takes, and its face value determines the motivation's strength or its particular bent.

Aces and face cards indicate special motivations. If a special card is drawn, it is automatically the NPC's primary motivation. If two special cards are drawn, the NPC has two primary motivations complementing each other or competing with each other for dominance.

Optional PC Motivations: Many roleplaying gamers enjoy the challenge of portraying a character that is very much unlike their own real personalities. Players are free to use the tables below to generate personality details or "quirks" for their own characters if they so desire. No player should feel obligated to do so, however.

The various possibilities are summarized in the NPC Motivation table and explained in more detail below.

Spades: Ambition

These NPCs seek personal power and influence. A "somewhat ambitious" NPC will be inclined toward boastfulness and a desire to impress other people. "Moderately ambitious" NPCs are driven to attain positions of high responsibility. A "very ambitious" NPC will be overwhelmed by a desire to manipulate and control others.

Jack, Pompous: Pompous NPCs are conceited and arrogant in their dealings with others. They consider themselves to be clearly superior to everyone around them, and they make no secret of that conviction.

Queen, Ruthless: This NPC will let nothing stand in the way of achieving any goal and feels no concern for the needs of others. Such NPCs can feign affection, devotion, sincerity, or anything else that serves their purpose, but actually they feel nothing.

King, Deceitful: The NPC has no respect for honesty. Depending upon the referee's decision, deceitful NPCs may be pathological liars, or they may use the truth deceitfully, giving just enough information to guarantee that their victims are misled. The actual direction of their deceitfulness will generally depend upon their secondary motivation. Often, such characters are unable to believe that other people are not lying. They expect to be lied to, and expect the worst from others.

NPC MOTIVATION

Clubs: Violence

Card	*Motivation*
Ace	War leader
King	Brutal
Queen	Stubborn
Jack	Murderous
8-10	Very violent
5-7	Moderately violent
2-4	Somewhat violent

Diamonds: Greed

Card	*Motivation*
Ace	Generous
King	Selfish
Queen	Lustful
Jack	Coward
8-10	Very greedy
5-7	Moderately greedy
2-4	Somewhat greedy

Hearts: Sociability

Card	*Motivation*
Ace	Just
King	Honorable
Queen	Loving
Jack	Wise
8-10	Very sociable
5-7	Moderately sociable
2-4	Somewhat sociable

Spades: Ambition

Card	*Motivation*
Ace	Charismatic
King	Deceitful
Queen	Ruthless
Jack	Pompous
8-10	Very ambitious
5-7	Moderately ambitious
2-4	Somewhat ambitious

Ace, Charismatic: The NPC is a charismatic leader to whom others are naturally drawn. This usually implies a high CHR attribute and perhaps skill in Leadership. Some of these NPCs are honorable and just; others are cruel and manipulative. The referee can decide based upon the adventure situation and/or the particular NPC's secondary motivation.

Hearts: Sociability

Such NPCs are highly influenced by their love of people. They tend to be friendly, loyal, and just. A "somewhat sociable" NPC will be amiable, talkative, and cooperative with most everyone. "Moderately sociable" NPCs will have a strong sense of duty and loyalty to their group. A "very sociable" NPC will have a strong commitment to justice and the welfare of all people, and will look for the good qualities in everyone, but will react with anger to injustice and brutality.

Jack, Wise: The NPC is unusually wise, either as a result of years of experience, or simply because of astute observation. Such NPCs almost always exhibit good judgment and, if asked, offer sound advice.

Queen, Loving: This NPC loves some other person devotedly, perhaps a spouse, parent, child, or close friend. Such NPCs would willingly sacrifice themselves for the one they love. Alternatively, the NPC may be loving toward absolutely everyone. The choice is up to the referee.

King, Honorable: Honorable NPCs are scrupulously honest in their dealings with everyone. For such characters, their word of honor is their bond. Some will feel honor-bound to a certain action even without having made a specific promise, so long as they feel their positions obligate them to do so. Such NPCs will typically carry out their promises and obligations even if it means facing death. Honorable NPCs have contempt for liars and people who break their word.

Ace, Just: This NPC sees justice as the greatest virtue a person can display and the only truly important consideration in deciding upon a course of action. Such characters have no respect for cheats and swindlers, and they will wholeheartedly assist any attempt to right an injustice.

Clubs: Violence

These NPCs have a greater likelihood of reacting with violence than do most people. A "somewhat violent" NPC is not frightened or intimidated by threats of violence and will not hesitate to use force if the situation seems to warrant it. A "moderately violent" NPC is aggressive and inclined to view violence as the preferred means of resolving disputes. A "very violent" NPC loves a good fight and either is or wants to be a warrior.

Even a high violence rating does not, however, necessarily indicate that the nonplayer character is brutal or a bully. For example, a "very violent" NPC who was also "very sociable" could be described as friendly, good-natured, and loyal, but also a good person to have with you in a fight.

Jack, Murderous: This NPC is subject to sudden, uncontrollable, murderous rages. Chances are, such NPCs have already killed at least once in a fit of rage. If not, it certainly will not be long before someone crosses them at the wrong time and dies...

Queen, Stubborn: Such NPCs are so stubborn that once they have made up their minds about something, it is nearly impossible to persuade them differently. Such NPCs are not necessarily sticks in the mud. They may often be outspoken, innovative thinkers who, once they make up their minds to stick their necks out, cannot be talked out of it.

King, Brutal: These NPCs are sadistic brutes who enjoy causing other people pain and grief. This cruelty is not always physical. Brutal NPCs often enjoy causing psychological pain, constantly picking on or browbeating their companions, especially those whom they perceive as weak. These NPCs are also cruel to animals, and enjoy such pastimes as cockfights and bear baiting. Such a person is likely to use torture whether or not there is anything to be gained from it.

Ace, War Leader: The NPC is an unusually good leader in battle, able to inspire confidence in others, and receiving complete obedience from followers. In terms of combat rules, treat such NPCs as having an Initiative of 6 (they never panic), and allow them to predict their opponents' general strategy and be prepared for it.

Diamonds: Greed

The NPC wants to be rich. A "somewhat greedy" NPC will be fairly easy to convince to take a particular course of action as long as money is involved. A "moderately greedy" NPC will drive a harder bargain, but will actually be more willing to take larger risks, provided the payment is sufficient. A "very greedy" NPC will do virtually anything for money, but will insist upon very high fees, and will perhaps attempt treachery if it seems that even more money can be gained by doing so.

Jack, Coward: This NPC is a total coward and will run from danger at every opportunity. (You might say such characters are greedy about their own safety.) If escape is impossible, a coward will cower and refuse to fight.

Queen, Lustful: These NPCs are driven by lust for the opposite sex. Depending upon the circumstances, the

referee may interpret this as an impersonal lust for all members of that sex or as an obsession for a particular person.

King, Selfish: A selfish NPC never helps without demanding payment and will never give away anything. Such NPCs are convinced that everyone else is just as selfish as they are. As a result, they will demand higher payment than they are due (believing their employers to be holding out on them), and they will jealously guard their own possessions (convinced that everyone else is just waiting for an opportunity to steal them). NPCs this selfish are likely to steal what other people do not guard very closely.

Ace, Generous: These NPCs are extremely generous. Those who have another Diamond card as a secondary motivation are so generous that they will gladly give away anything they have to others in need, even if this leaves them with nothing. All others will tend to make generous deals and will refuse payment for favors, unless those favors directly relate to their normal line of business, and the person receiving the favor is not obviously in need.

NPC APPEARANCE

When you describe an NPC's appearance to the players, you should keep in mind two main goals: You want to make the NPC seem truly alive, and you want the NPC description to help develop or maintain the mood you've set for the adventure. There are a number of things to be considered in doing this.

First, it will help if you take a moment to build a mental picture of the NPC in your own mind. If you can accomplish that, you probably have already succeeded at pretty much everything else we are about to tell you about NPC appearance. Once you have that mental picture, you need to begin thinking about the most dramatic way to convey it to your players.

Generally, this will mean painting a scene, not merely a description of the NPC. After all, characters have to be somewhere when the PCs encounter them. Now paint the basics of that scene in broad strokes, and work in pieces of mood-setting detail. Don't forget to appeal to other senses as well as sight. Sound, smell, touch, and even psionic sensations all add to the impact of a scene. As you continue, work inward from the setting to the NPC, giving details of background before giving details of the character. Feel free to add in a little bit of ambiguity, to make it obvious that there is more to the character than merely what involves the PCs. Perhaps the character is on the phone with his boss, wife, or children. Perhaps he is in a hurry to finish work on a personal project when the PCs interrupt him, is making lunch, or is setting traps for the pests that infect his building. These sorts of things impress on the players that the NPC has not been sitting in a small room for his entire life just waiting for the one moment that the PCs would arrive, but was living a life long before they came along.

Stereotypes can work well because they serve as a sort of shorthand, getting a lot of information across to the players with a limited number of words. The basics of an NPC's appearance, for instance, will have a lot to do with the NPC's attributes and skills. And once you've appealed to a stereotype in your description, any details that run contrary to that stereotype will become all the more firmly fixed in the players' minds.

For example:

Referee: While looking for the professor, you are approached by a man with unkempt hair, wearing grimy overalls. He is carrying a mop, and appears to be a janitor. He is muttering to himself. When he sees you, he asks, "What can I do for you folks?"

Player: "We're looking for Dr. Humphries of the Genetics Department."

Referee: The man smiles and says, "I think you're mistaken. You're not looking *for* Dr. Humphries, you're looking *at* him."

The description you give will do a lot to determine what the players think about that NPC from this point on. Just as in real life, first impressions *do* make a difference.

Finally, recognize that knowing when to avoid detail can be as important as knowing when to include it. Too much detail can be confusing to the players and slow down play, because they usually assume that detailed descriptions mean that there's something important going on, and they can get side-tracked trying to find something that isn't there. Also, a vague or incomplete description of a scene can add to its sense of mystery: The players are likely to be much more nervous about a figure that their characters can't quite see than about one they can see clearly, however frightening it is.

CONTACTS

When generic contacts are converted to solid ones, they can be generated with whatever level of detail the referee desires, just as with other NPCs. In general, though, the more important the contact is to a PC, and the more frequently that contact shows up in the adventure campaign, the more detail will be required for that contact.

It is suggested that the referee allow players a strong hand in designing the histories for their contacts. After

all, in some ways a contact's history is part of the PC's history. But it is suggested just as strongly that players not be allowed to know exact numbers for the contact's attributes, skills, and assets. To a player, the contact should seem like a living personality, not a collection of numbers that can be exploited. Ideally, then, a contact's basic description will be generated by the player whose character has established that contact, and the referee will then create appropriate attributes and skills to match the description.

In designing a contact's history, a player should justify why that contact would have established a tie with the PC. For example, contacts could have been classmates during an education term, coworkers at a civilian occupation, or comrades in a military career. Of course, for a contact to be someone who will be interested in helping the PC all these years later, they should have had something in common: a shared hobby, a shared bonding experience (e.g., combat for a military career, a difficult job assignment for civilians, debate partners or a research assistant for education), or a shared secret or common goal. The player should specify how long ago this contact was gained (i.e., the term in character generation in which it was earned) to assist the referee in figuring out how much older the contact is, and how much more (or less) powerful the contact may have become in the intervening time. The referee must decide whether to accept a history as plausible or interesting, or reject one as too ridiculous, requiring the player to try again.

Once the history is agreed upon, the referee determines how old the contacts have become by now, and just how much clout they still have in their fields. Once this has been established, the referee can look down the skill list for appropriate skills, or simply define the contact as a template NPC, making up any necessary skill levels as the need arises during play. It just depends upon how much time and energy the referee wants to spend on the NPC.

PATRONS

Patrons are a special type of NPC. Patrons are the people the PCs are working for. These patrons may meet the NPCs by placing an ad for services needed, may be people the PCs already know, or may be mysterious figures who send their messages only through intermediaries. It is all up to the referee.

Not all PC groups will be working for a patron at any one time, but most PC groups will work for a patron at least once, because they have to make a living somehow. Patrons can be a very important way to drive a **Traveller** campaign, as they provide a constant series of missions for the PCs to carry out. Some of these missions are on the up-and-up, and others are suicide missions, but the players can't always tell that sort of thing in advance.

Finding a Patron: Often this is not a problem; the patron finds the players ("I have been watching you for some time, and have concluded that you have exactly the talents needed for a project...").

On the other hand, players will frequently be looking for work. Although it is hard to find a patron right off the bat, PCs can find rumors of patrons that are looking for employees. Such rumors can be picked up around a starport, at the customs office, the aerospace traffic control office, the warehouses, or the old standby, the starport bar. Naturally, the more seedy the locale, the more likely the job is illegal, immoral, or downright stupid. After all, you get what you pay for.

Some PC groups may have patrons that are entire governments. Examples include PCs who are members of the RCES (Reformation Coalition Exploratory Service), or who share ownership of their starship with the Regency Quarantine Service or the government of a pocket empire (see Starship Purchase on page 221, and Starting Money and Initial Equipment on page 36). In this case, they should have some sort of regular superior, a local commander or case officer who regularly gives them their assignments and to whom they report upon completion.

HUMAN TEMPLATE NPCS

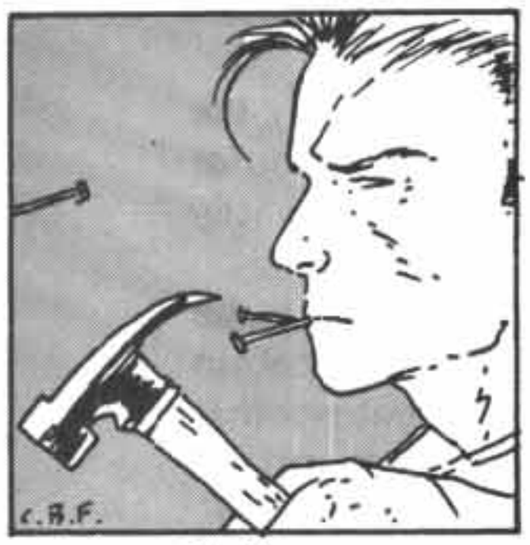
The templates on the following pages are only the briefest attempt to show some of the many types of humans who can be met in **Traveller**. Many of these can serve as jumping-off points for referees to create other types of people who can be met. When creating a new template NPC, think of three criteria:

1) How good is the NPC in combat? This gives the NPC's level.

2) What equipment does the NPC fight with? This gives not only the weapons (from a slug pistol for a police officer all the way up to a grav tank for the NPC members of a tank crew), but also the primary combat skills used with the equipment.

3) What other things can this character do? This gives the other assets. If the NPC is primarily a fighter, these can be minor or nonexistent. If the NPC is not a fighter, these other assets are the NPC's reason for existing, and will naturally be significant.

Under the Combat Assets entry for each NPC, some NPC types choose only one or a few skills from a list. NPC types that give a list without using the word "or" have all of the listed skills at the level of their primary combat asset. In the lists below, assets will sometimes be listed by skill cluster in **bold**, cascade skill in *italics*, and uncascaded skills in normal type.



Craftsman



Field Scientist



Free Trader



Gang Member

Craftsman

These NPCs are encountered within peasant settlements in the Wilds, and provide essential services to the low-tech populations there. Although they may not possess leadership or persuasive skills, their important talents place them at the center of the community. Any community that seeks to arm itself, even with only metal-tipped pikes, would need to have the cooperation of the local craftsmen. Some also are in the pay of the local warlords, and provide services upon request—or demand.

Level: Novice.

Combat Assets: Armed Martial Arts (Club) using trade tools: hammers, axes, etc.

Other Assets: Bargain 8; any two of Carpenter, Jeweler, Mason, or Metallurgy, one at 12, the other at 6. On worlds where more technology survives, add Electronics, Machinist, and Mechanic to the list.

Field Scientist

Freelance field scientists are a special breed. These individuals take their ships and crews into the Wilds with little in the way of organized defenses, in order to conduct basic and applied research. Unlike freelance scouts and explorers, these scientists are not motivated by the desire to recover artifacts and relics, but rather to gain information on various subjects of interest.

Level: Experienced.

Combat Assets: *Slug Weapon* or *Energy Weapon.*

Other Assets: Research 16, any three **Physical Science** at 18, any four **Physical Science** or **Technician** at 14.

Free Trader

The free traders, or just traders, are those independent traders tough enough to have survived in the Wilds. They continue to plod their itinerant way through these blasted worlds, braving dangers too numerous to calculate. By maintaining this tenuous network, they provide the only source of information (imprecise and slow as it may be) in this vast, blighted area. Every group of traders will have at least one leader with it.

Level: Experienced (Leader: Veteran).

Combat Assets: Choose two of *Slug Weapon, Energy Weapon,* Autogun, *Armed Martial Arts,* Unarmed Martial Arts.

Other Assets: Any six of **Charm, Crime, Determination, Economics, Interaction,** *Medical,* **Space Tech, Space Vessel, Technician, Vice, Vehicle,** three at 12, and three at 9; plus Environment Suit 9, Zero-G Environment 9. (Leader adds Leadership 12, Bargain 12, Persuasion 12).

Gang Members

On most worlds in the Wilds, the vast majority of city dwellers either moved into the countryside or died, as there were insufficient resources to sustain life in the cities. All the same, some stayed, but in order to feed themselves, they formed gangs that could seize and defend the scarce means of survival in these post-urban deserts. Every group of gang members encountered will have a leader (a gang as a whole will have several such leaders and one overall leader superior to them all).

Level: Experienced (Leader: Veteran).

Combat Assets: Armed Martial Arts (Club or Small Blade), Unarmed Martial Arts, *Slug Weapon,* Thrown Weapon.

Other Assets: Observation 12, Stealth 12, Streetwise 12. (Leader adds Leadership 14, Ground Tactics 10, Persuasion 14.)

Guard

Wherever there is something worth having, there are always guards. Equipment varies according to location, but will include at least melee weapons, and possibly firearms and personal armor if technology and importance of location warrant.

Each area under guard should include one leader with additional characteristics listed below.

Level: Novice (Leader: Experienced).

Combat Assets: Armed Martial Arts (Club) plus *Slug Weapon* or *Energy Weapon.*

Other Assets: None.

Lancer

The lancer, or freelance scout, is increasingly common in the frontiers of the Reformation Coalition. These lancers are hired to do work by worlds of the Coalition, or sometimes engage in speculative exploration, hoping to find equipment or information that can be sold to organizations back in the Coalition. Because they do not have the advantages of the Hiver training curriculum that has produced RCES personnel, they are not quite so highly trained. Each group will include at least one leader.

Level: Experienced (Leader: Veteran).

Combat Assets: Choose three from *Slug Weapon* or *Energy Weapon*, Unarmed Martial Arts, Autogun, Grenade Launcher, or Tac Missile.

Other Assets: Any five of **Aircraft, Charm, Economics, Engineer, Explore, Interaction**, *Medical*, **Personal Vehicle, Physical Science, Space Tech, Space Vessel, Technician, Vehicle**, two at 12 (13 for leader) and three at 9 (10 for leader), plus Environment Suit 8, Zero-G Environment 8. (Leader adds Ground Tactics or Ship Tactics 8, Leadership 8, Persuasion 8.)

Peasant

Often encountered on worlds in the Wilds, peasants are typically rather simple people, but often live in fear of local warlords, and may in addition have xenophobic or technophobic tendencies, depending on local conditions and history.

Each group of peasants will have a leader, with characteristics indicated below.

Level: Novice (Leader: Experienced).

Combat Assets: Armed Martial Arts, plus Archery, Early Firearms, or Thrown Weapon. (Leader may add Slug Weapon [Slug Pistol] at referee's discretion.)

Other Assets: Farming 14, Riding 10, Guard/Hunting Beasts 8. (Leader adds Leadership 8, Persuasion 8.)

Reformation Merchant

Reformation Coalition merchants have not ventured very far into the Wilds since the annihilation of the Dawn League's first mission. They primarily concern themselves with maintaining internal trade and contact among the Coalition itself.

Level: Novice.

Combat Assets: *Slug Weapon* or *Energy Weapon*, plus Unarmed Martial Arts.

Other Assets: Any five from **Determination, Economics, Interaction, Personal Vehicle, Spacehand, Space Tech, Space Vessel, Technician, Vice**, or **Vehicle**, two at 12, three at 9.

Star Viking

Star Vikings are members of the Reformation Coalition Exploratory Service (RCES). For obvious reasons, most Star Viking characters will be player characters, but the referee may wish to present a Star Viking NPC on occasion. Although many PC viking characters are generalists, it is useful to think of NPC vikings as belonging to one of three specialties: covert ops, ground ops, or space operations.



Guard

If NPCs appear in a group, there should be a leader with characteristics included below.



Lancer

Star Viking—Covert Specialist

Level: Veteran.

Combat Assets: Choose two from *Slug Weapon*, *Energy Weapon*, Archery, or Early Firearms.

Other Assets: Act/Bluff 10, Disguise 8, Intrusion 10, Language (choose appropriate) 16, Navigation 10, Observation 12, Stealth 10, Survival 8, plus any two **Physical Science, Social Science**, or **Technician** at 12.



Peasant

Star Viking—Ground Specialist

Level: Experienced (Leader: Veteran).

Combat Assets: Choose three from Slug Weapon (Slug Rifle), Energy Weapon (Energy Rifle), Unarmed Martial Arts, Autogun, Grenade Launcher, or Tac Missile.

Other Assets: Any six from **Engineer, Explore**, *Medical*, **Personal Vehicle, Physical Science**, or **Technician**, three at 12 (14 for leader), and three at 9 (10 for leader). (Leader adds Leadership 9, Ground Tactics 8.)



Reformation Merchant

Star Viking—Space Specialist

Level: Experienced (Leader: Experienced).

Combat Assets: Slug Weapon (Slug Pistol) or Energy Weapon (Energy Pistol).

Other Assets: Any three **Space Tech, Space Vessel,** or **Technician** skills at 12 (14 for leader); any additional three from **Physical Science, Space Tech, Space Vessel, Technician** at 9 (10 for leader), Environment Suit 8, Zero-G Environment 8. (Leader adds Leadership 8, Ship Tactics 8.)



Star Viking

Survivors

Every habitable world in the Wilds will have its self-motivated inhabitants who have given up on the local social order and headed for the hills to make their own life by their own wits. These have outwitted the influence of the local warlords, and escaped a fate as peasants. Because of their life-style, survivors tend to be more free-thinking than those who have been incorporated into a re-emerging authoritarian feudal order. While this might make them more open to off-world contact, they may still be victims of xenophobic or technophobic outlooks, as the local situation warrants.

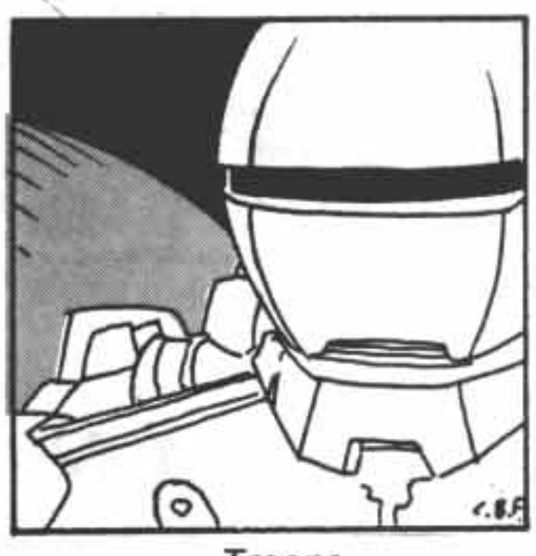


Survivor

Level: Experienced.

Combat Assets: *Slug Weapon, Energy Weapon,* or Early Firearms, or Archery, as appropriate to the world's current or original tech level.

Other Assets: Mechanic 9 (if appropriate to world tech), Medical (Trauma Aid) 9, Navigation 10, Observation 12, Stealth 10, Survival 12, Tracking 12.



Troops

Troops

The Troops heading covers a wide variety of topics, from the elite Regency Marines, to the untrained show troops of a Technologically Elevated Dictatorship. The quality of a body of troops is decided by the environment. Their equipment and skills are decided by the local technology, and their experience level is decided by their level of competition. A world which has not seen war for a long time, or which has no real competition (i.e., only unarmed peasants) will be of lower quality, while an army which has just come from a war will be full of experienced combat troops.

Three different types of troops are listed below. The referee should create local variations based upon these models. The combat assets shows the skills each normal infantry soldier is assumed to have at the primary combat asset level. Specialist soldiers, such as artillerymen, tank drivers, etc., also add the skills listed under specialist which allow them to perform their specific duties. Troops that use battle dress have the Environment Suit skill listed under "Combat Assets." These troops use weapons combat assets according to their experience level, rather than keeping track of the Environment Suit and weapons skills separately. Each group has one or more leaders with additional abilities indicated below.

Troops—Regency Marines

Level: Elite (Leader: Elite).

Combat Assets: Energy Weapon (Energy Rifle), Grenade Launcher, Armed Martial Arts (Large Blade), Environment Suit.

(Specialists add any two from **Aircraft, Artillery,** Combat Engineer, **Heavy Weapons,** *Screens,* **Technician, Vehicle.**)

Other Assets: Grav Belt 12, Survival 10. (Leaders add Leadership 13, Ground Tactics 12.)

Troops—Regulars

Level: Experienced (Leader: Veteran).

Combat Assets: *Slug Weapon, Energy Weapon,* Early Firearms, or Archery, plus *Armed Martial Arts.*

(Specialists add any two from **Aircraft, Artillery,** Combat Engineer, Environment Suit, **Heavy Weapons,** *Medical,* **Personal Vehicle,** *Screens,* **Technician, Vehicle.**)

Other Assets: Survival 10. (Leaders add Leadership 12, Ground Tactics 11, Navigation 11.)

Troops—Show Troops

Level: Novice (Leader: Novice).

Combat Assets: *Slug Weapon, Energy Weapon,* Early Firearms, or Archery, plus *Armed Martial Arts.*

(Specialists add any two from **Aircraft, Artillery,** Environment Suit, **Heavy Weapons, Personal Vehicle,** *Screens,* **Technician, Vehicle.**)

Other Assets: None. (Leaders add Bribery 10, Carousing 10.)

ALIEN TEMPLATE NPCS

Use care when drawing cards for alien NPC motivation, as the standard motivation system is designed for humans. Whenever possible, imagine a motivation that is consistent with the NPC's alien nature, and then only use motivation cards to add slight variations to that nature. Specific modifications to the card system are noted.

As always, remember that the combat skills and other assets can be adjusted up or down to suit the needs of the encounter, and to create variability and personality.

Hivers

Players can expect to meet three main types of Hivers in the New Era, and all of these in or around the Old Expanses sector. Hivers are quite different from human beings, apart from their physical appearance.

Hivers have no gender. All Hivers are neuter, and exchange genetic material with every Hiver they meet in a very matter-of-fact way, by "shaking hands" with their rearmost limb (opposite the head). The "larvae" that result are of no interest to the Hivers until they reach a year in age, and are then welcomed into Hiver communities.

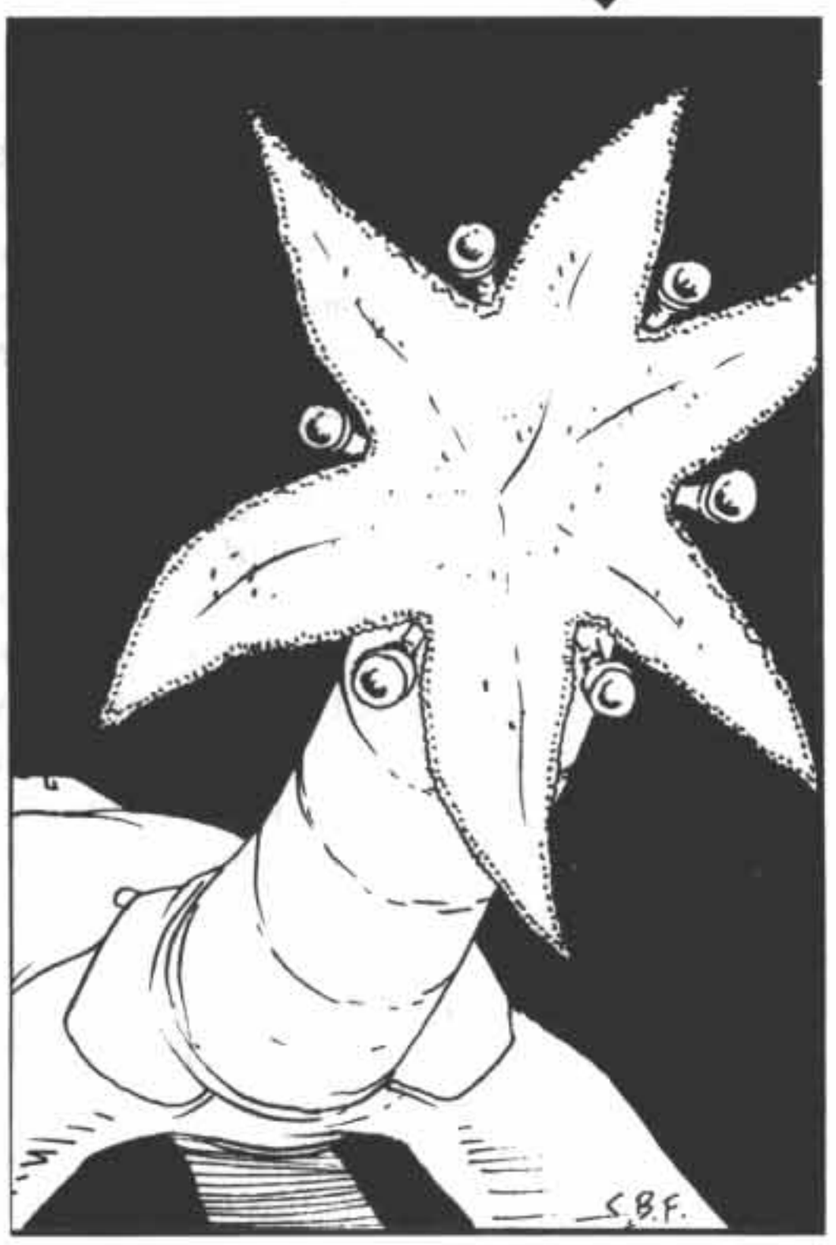
Hivers are also virtually emotionless by human standards. They do not experience anger, love, joy, jealousy, or greed. They have two major motivations, which are curiosity and their parental instinct.

Curiosity is familiar to humans, but is taken to greater extremes. Hivers use every waking moment studying or fiddling with things, conducting simple experiments with common objects, and recording results in their ubiquitous portable computers. This can make human companions feel paranoid, as if they are constantly being studied by their cryptic Hiver shipmate. When exploring a world, Hivers also tend to wander off, attracted by some mystery, and can take much longer than their more businesslike human comrades might prefer.

Their parental instinct is naturally linked to the survival of their race and offspring, but also has a strong side effect: the urge to help along other promising races (which includes humanity, but not K'kree, Aslan, or Vargr). This instinct not only prompts them to assist these races in their development, but also to help these races curb their violent instincts, which are distasteful to the Hivers, and which they consider uncivilized.

Like many races, the Hivers are convinced of their racial superiority, but the Hivers do not fight wars in the name of this belief. Their sense of superiority is shown in secure confidence, not in insecure arguing about who is better, and is expressed by their lack of interest in constantly explaining themselves to companions of other races.

Finally, Hivers are mute. Their "spoken" language consists of a variety of arm gestures (often with several of their arms at once), physical contact, and written symbols, which cannot be understood by humans. To speak to humans, Hivers have a vocal synthesizer internal to the portable computers they wear strapped to their "chests." To understand humans, Hivers must either learn Anglic, or require humans to use a Hiver visual translator. This device is strapped to a human's chest, with a video screen facing out toward the Hiver. The human types a message into the keypad which is displayed on this screen in the Hiver written language. Hivers who know Anglic can simply comprehend spoken human speech.



Hivers also have a tendency toward what humans interpret as secrecy and subtlety. Part of this is due to the Hiver sense of racial superiority: They need not justify themselves. Because Hivers do not experience suspicion as an emotional response, they do not expect that they need to explain their every action. But to the

Hiver Manipulation

The highest talent to which a Hiver aspires is that of manipulation: the ability to cause social change by one or more small influences. The more subtle and unknown the influence, the better the manipulation and, within Hiver society, the more esteemed the manipulator. Accomplished manipulators rise to positions of great influence and authority within Hiver society.

Hiver tech reps aboard Star Viking ships will often be engaged in learning how to manipulate, with the humans of the crew as their obvious subjects. The key to a manipulation, like a human scientific experiment, is to first state the results that will be sought, and then achieve them, but without anyone knowing, as that would skew the result.

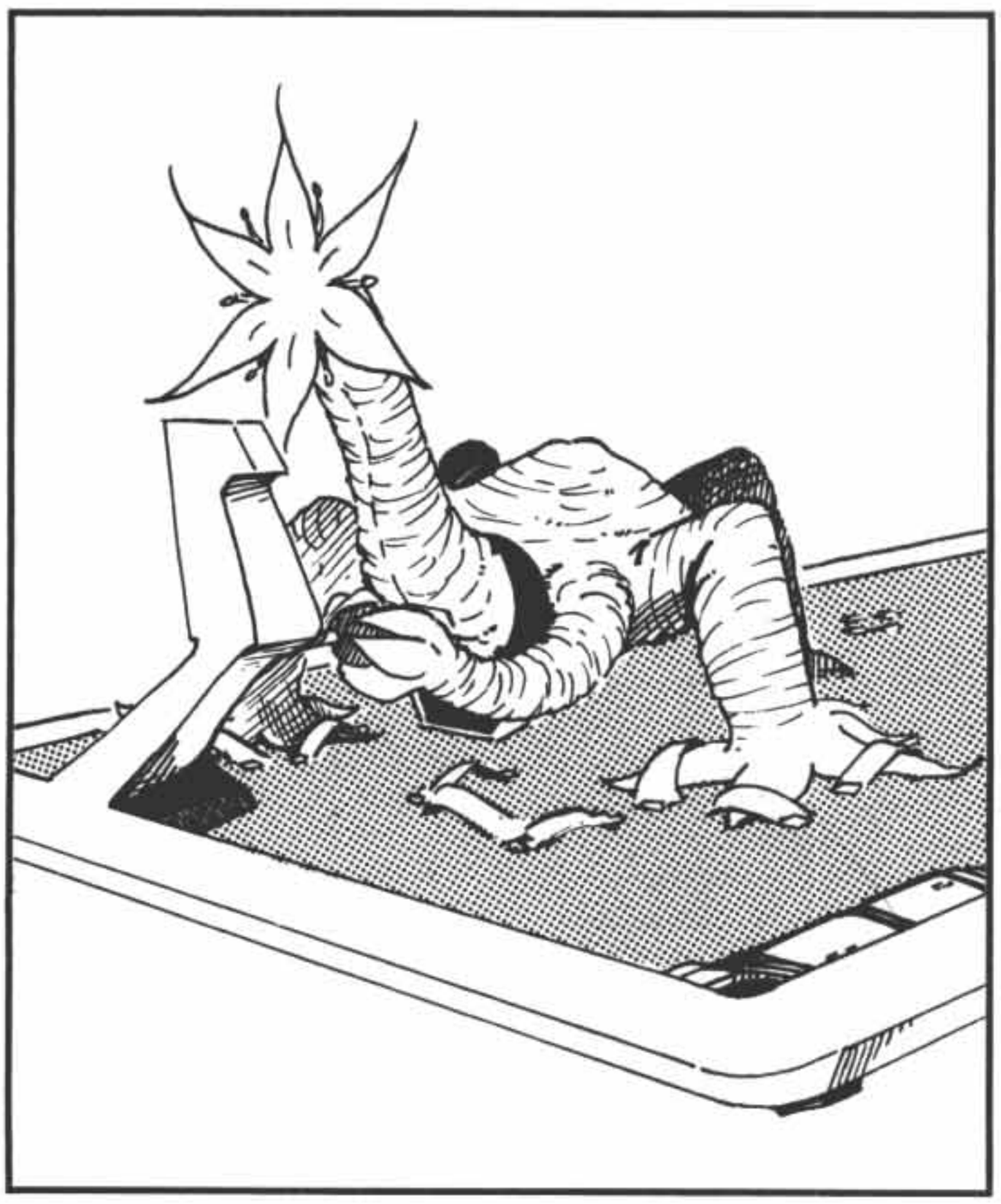
Perhaps the Hiver has grown curious why a certain squeaky chair in the wardroom has not been repaired, although all of the crew complain about it. The Hiver might take it upon itself to fix the chair, but by using the responses of others, rather than doing the job itself. The Hiver might place a wrench and a can of light oil in the wardroom to prompt someone to take the initiative and fix it. More subtle yet, the Hiver might carefully rearrange the chairs so the captain always gets the squeaky chair and orders someone to fix it. Most subtle of all, the Hiver might insert a remark into a conversation with a crewmember who is proud of human ingenuity, such as, "Yes, but you humans sure make noisy chairs."

In this way, the Hiver not only learns more about human psychology, hence satisfying its incessant curiosity, but has also constructed a successful small-scale manipulation, and is one step further along in learning this most prized Hiver skill.

human mind, the constant Hiver activity seems out of balance with their typical lack of running commentary on what they are doing. Hiver subtlety also stems from this lack of desire to communicate more than is necessary. A Hiver is content to communicate a seed of an idea to a companion if that is sufficient to get a point across, rather than explain an entire plan with all of its ramifications every time a decision needs to be made. This dovetails with the Hiver ideal of subtle manipulation (see Hiver Manipulation on the previous page). Explaining too much defeats the purpose. The fact that they are naturally silent adds much to their aura of secrecy.

Referees should feel free to use Hiver peculiarities for comic effect. But remember that Hivers are not clowns or buffoons, nor are they stupid. High comedy and slapstick are usually not appropriate; rather, a wry sense of amusement at their very alien motivations and reactions is desirable.

Motivations: When pulling cards for Hiver NPC motivation, disregard the special descriptions for all face cards. Also disregard any Diamonds result, as Hivers do not experience greed. Treat Clubs results as a measure of the Hiver's ability to overcome its natural unwillingness to use violence when necessary, with higher results meaning that it is more used to the idea. A Clubs face card gives the Hiver an Initiative of 2, and is the only way that a Hiver can have an Initiative other than 1. A Clubs result never means that a Hiver is violent, only that it will fight when it must, rather than breaking and running. Spades results are taken as a measure of the Hiver's curiosity, not ambition, with higher results meaning more curiosity. Hearts results are a measure of the Hiver's parental instinct toward humans in general, and to its crew in particular. High results mean that the Hiver is not only committed to the goals of the Reformation Coalition (as separate from the Hive Federation), but to the good reputation of the ship or organization it serves.



Most of the Hiver strength, and most of the Hivers themselves, remain within the Hive Federation, rebuilding their society. Those who venture out toward human space are of three main types, as follows.

Hiver Tech Rep

Every RCES ship's crew includes at least one Hiver technical representative. These Hivers are included to provide assistance in the maintenance and repair of Hiver-designed and manufactured systems installed on the ship, as well as to assist in the recovery and repair of relic technology discovered on exploration missions. Hiver tech reps are especially valuable in examining relic computers and software for traces of Virus. The referee must exercise care when running the NPC tech reps and their interactions with the PC crewmembers. There might be a temptation for the referee and PCs to treat the tech reps as oracles—direct pipelines to transfer information from the referee to the players. This temptation should be resisted. The Hivers are characters in the same situation as the PCs, and not road signs. Just because they are advanced and mysterious doesn't mean they know everything.

Level: Novice

Combat Assets: Energy or Slug Weapon (Rifle or Pistol).

Other Assets: Computer 16, Language (Anglic) 18, any two assets from **Space Tech** or **Technical** clusters at 16, plus four more from **Space Tech, Technical,** or **Physical Science** at 12.

Hiver Instructor

Hiver instructors are members of the faculty at the Hiver technical schools. Some of them might also participate in exploration missions that are expected to make discoveries in their fields of expertise.

Level: Novice.

Combat Assets: None.

Other Assets: Computer 18, Language (Anglic) 18, any one asset from **Space Tech, Technical,** or **Physical Science** clusters at 18, plus three more from these clusters at 14.

Hiver Merchant

Hiver merchants trade with the Reformation Coalition, but will not be found travelling into the Wilds. They are most commonly encountered in the Coalition homeworlds, and at Auction.

Level: Novice.

Combat Assets: Energy or Slug Weapon (Rifle or Pistol).

Other Assets: Computer 10, Language (Anglic) 12, any two skills from **Technical** or **Space Tech** at 12, any two of Bargaining, Admin/Legal, or Marketing at 12.

Ithklur Marine

This powerful reptilian race is a member of the Hive Federation. After ages of careful Hiver nurturing, they have had their natural violent tendencies curbed to the public service and are used as the Federation's elite ground troops. Ithklur tend to practice a well-intentioned, good-natured physical boisterousness among themselves, which can be dangerous to non-Ithklur who are unprepared for it.

Use motivation cards as necessary, but disregard face card results, treating them only as high levels of that suit's trait. Most interaction with Ithklur, however, will be via their Hiver commander.

Ithklur combat movement rates are 2/10/20/30, just like humans.

Among each group of Ithklur, there will be a leader with higher abilities as noted.

Level: Veteran (Leader: Elite).

Combat Assets: Energy Weapon (Rifle) or Slug Weapon (Rifle), *Armed Martial Arts* and Unarmed Martial Arts, plus any two from **Heavy Weapons** or **Artillery**.

Other Assets: Any one skill from **Technical** or **Vehicle** at 10. (Leader adds Leadership 10 and Ground Tactics 10.)

Vargr

The Vargr interstellar civilization survives only as a few Vargr states that benefited from being on the lee side of the Domain of Deneb, and were able to organize themselves to hold off Virus, thanks to timely warning from the Domain. However, the uncooperative nature of Vargr society has meant that the Vargr states have continued to gradually succumb to Virus over the past 70 years. The Domain, now Regency, frontier with the Vargr has been watched very carefully, to prevent the Vargr "Virus sponge" from contaminating the Regency. Vargr raiders, though less common than they once were, are still alarmingly common, given the nature of their interaction with their neighbors and the threat they carry of Virus infection.

All Vargr groups must have a leader, as indicated below. Vargr groups will always be ready to break from their leader or split into subgroups if the Leadership asset of their leader is insufficient to keep them focused on the task, or is challenged by another leader with higher Leadership.

Vargr NPC motivations may be generated as human NPC motivations without modification.



Vargr Merchant

Vargr merchants operate under the ownership of human or Vargr organizations. Vargr being what they are, it is a rare human who takes a Vargr merchant at face value; most assume that any Vargr is a potential raider.

Level: Experienced (Leader: Experienced).

Combat Assets: *Slug Weapon* or *Energy Weapon*, plus Unarmed Martial Arts.

Other Assets: Environment Suit 8, Zero-G Environment 8; plus any four of **Charm, Determination, Economics, Interaction, Space Tech, Space Vessel, Technician,** or **Vehicle,** two at 12 and two at 9. (Leaders add Leadership 16 and Persuasion 14.)

Vargr Raider

Most of the major races' first contact with the Vargr was with Vargr raiders, and much of the subsequent contact has been just the same. It's what Vargr do best.

Level: Experienced (Leader: Veteran).

Combat Assets: Any three of *Slug Weapon, Energy Weapon, Armed Martial Arts,* Unarmed Martial Arts, Autogun, Grenade Launcher.

Other Assets: Environment Suit 8, Zero-G Environment 8, plus any two of **Explore, Space Tech, Space Vessel, Technician, Vehicle** at 10. (Leader adds Leadership 18, Persuasion 16, Ground Tactics 14, and Ship Tactics 12.)



Aslan

The Aslan are perhaps the greatest cultural imperialists in the **Traveller** campaign. While the Hivers possess a patient, unflappable certitude that they are superior to any other race, the Aslan profess to not recognizing the legitimacy of ways of life other than their own, referring to races which do not practice Aslan values as *Tahiwihte-akhtau*, or "barbarians."

Aslan NPCs listed here are Aslan from the spinward remains of the Aslan Hierate (the portions of the Hierate to trailing of the Great Rift were hit by Virus and the Collapse). There are also racial Aslan who are citizens of the Regency, but these are not cultural Aslan, and are regarded with disdain by the "real" Aslan, and thought of as *Fiyfiyalrya'uist*, or Imperial lackeys who have lost their honor by giving up their cultural heritage. Cultural Aslan run their lives by an unbending commitment to *Aokhaor*, "the spirit of strength." Humans usually translate this as "honor," but the Aslan point out that this translation is inaccurate in that the human world honor is merely one possible motivation among many, whereas *Aokhaor* is the value of life itself, lived in spiritual balance.

The Aslan exercise strict gender divisions among professions. Males are warriors and leaders, while females are administrators, technicians, scientists, and businesspeople. The females, who outnumber the males 3 to 1 in Aslan society, actually make the society run, as most males have no concept of the meaning or use of money and other mundane concepts.

Aslan NPC motivations may be generated just as human ones are, but remember that an Aslan NPC whose motivation includes qualities of deceit, cowardice, murderousness, or another form of dishonorable behavior is either already an outcast from Aslan society, or will be if these traits become common knowledge among other Aslan.

When Unarmed Martial Arts is noted as an Aslan skill, this refers to the use of the Aslan's natural weapon, the "dewclaw" or *aisai*. Aslan use of the *aisai* is treated like an unarmed melee combat hand strike, except that the *aisai* strike can only be blocked with a melee weapon. The *aisai* does 1D6 damage.

Aslan Mercenary

Aslan males make excellent ground troops. A unit of Aslan soldiers comparable to a unit of human soldiers will always have higher morale and discipline, due to the Aslan's warrior culture. Note that these units include males and females, where males fill the leadership and direct combat slots (infantry, tank, and cavalry troops), and females the administrative (including all unit executive officers), logistic, and combat support (artillery and combat engineering) roles. The leaders indicated below are the male combat leaders.

Level: Veteran (male), Experienced (female), Elite (leader).

Combat Assets:

Male: Any five of *Slug Weapon* or *Energy Weapon*, Unarmed Martial Arts, *Armed Martial Arts*, Autogun, Grenade Launcher, Environment Suit, **Vehicle**, Heavy Guns, Energy Artillery, Tac Missile.

Female: Any four of *Slug Weapon* or *Energy Weapon*, Unarmed Martial Arts, Combat Engineer, **Field Artillery**, *Screens*.

Other Assets:

Male: Grav Belt 12. (Leader adds Leadership 16, Ground Tactics 16.)

Female: Grav Belt 10, plus any two of Gravitics, *Medical*, **Technician** at 10.

Aslan Assassin

The Aslan assassin is a member of an honorable profession, one which is devoted to the absolute righting of dishonors and which redeems the honor of both parties. Aslan assassins are hired to seek out and duel to the death Aslan opponents who are guilty of grievous breaches of honor. Assassins do not strike without warning, but instead confront the target, or prey, for a melee combat duel to the death. Aslan assassins will not duel prey that are significantly inferior in strength or ability, as this would bring dishonor on the assassin. Assassins are hired to be as near as possible to the capabilities of the prey. When the prey is confronted, it is expected that he will accept the challenge, and not exercise trickery, attempt to escape, or call in help. In honorably facing down the assassin, the prey regains his honor, even though he might be killed. These statistics reflect an assassin in the prime of life; older, less capable assassins hired to assassinate infirm targets should have their stats adjusted accordingly. All assassins are male.

Level: Elite.

Combat Assets: Unarmed Martial Arts, Thrown Weapon, *Slug Weapon, Energy Weapon.*

Other Assets: Acrobatics 18, Observation 16, Stealth 18, Tracking 18, Willpower 16, any two from **Explore, Vehicle** at 14.

Aslan Female Civilian

Aslan females fill a wide variety of roles. They are Aslan society's technicians, merchants, scientists, bureaucrats, administrators, and even the military combat support arms, such as artillery and combat engineering. Their social status is linked to the success of the male-led group to which they belong, but it is the females that actually make most of it happen.

Level: Experienced.

Combat Assets: Unarmed Martial Arts, plus Slug Weapon (Slug Pistol) or Energy Weapon (Energy Pistol).

Other Assets: Any five from **Economics, Engineer, Interaction,** *Medical,* **Perception, Personal Transport, Physical Science, Social Science, Space Vessel** (except Pilot), **Spacehand, Space Tech** (except Gunnery), and **Technician,** two at 12 and three at 9.

Zhodani

The Zhodani society is one whose social order is predicated on the use of psionics. The Zhodani noble ruling class is psionic, and sits atop two other classes, the intendants and the proles. The proles are completely nonpsionic, and the intendants are a class which have demonstrated some psionic ability but have not yet demonstrated their worthiness to be promoted to the nobility. Unlike many noble classes, the Zhodani nobility is not a closed group, but is open to new members. New members are gained via the psionic games which are held every three local years. Sufficient psionic prowess can raise a prole to intendant status, or an intendant to the nobility.

The Zhodani society is predicated on conformity. This is ensured by the *Tavrchedl'*, or "Guardians of our Morality" (translated in the Regency as the Thought Police), who, with their telepathic skills, are able to keep a watch for antisocial thoughts before they turn into dangerous behavior. In Zhodani society, such antisocial thoughts, even if they lead to crime, are regarded as mental illnesses, which are treated with psionic re-education. Once re-educated, the individual returns to society without a blot on his or her record, just as a citizen of the Regency would return from a hospital stay.

The Zhodani and Imperial societies have been in conflict for as long as they have been in contact. The Zhodani regard Imperials (now Regency citizens) as a society of pathological liars and criminals, ruled by a government that has no concern for the mental and psychological well-being of its citizens. Imperials view Zhodani society as a chilling form of happy police state, where there is no privacy at all, not even within one's own mind.



When pulling cards for motivation, take great care with the use of the special face cards. No Zhodani prole or intendant would ever get away with being murderous or deceitful, unless the NPC were on the lam from the Consulate to avoid re-education. Nobles are also not safe from re-education if their antisocial tendencies are discovered, but their high positions in society and ability to hide their thoughts from others might allow a Zhodani noble to get away with a very nonconformist, antisocial motivation, *if* he or she has taken great pains to conceal it. Likewise, the only Zhodani who can receive skills in the Crime or Vice clusters would be the highly unusual aberrant Zhodani criminals, or Zhodani specialists who need Intrusion skill as a portion of their legitimate job (e.g., spies, commandos).

The three templates below are for the psionic classes, two noncombatants and one combatant. A Zhodani prole is little different in attributes and assets from a non-Zhodani human.

Zhodani Noble

Zhodani nobles are first and foremost the leaders of their society, and can have virtually any skills, depending upon their line of work, although mundane and technical skills are left to the proles.

Level: Experienced.

Combat Assets: *Energy Weapon* or *Slug Weapon.*

Other Assets: Any three from **Aircraft, Determination, Economics, Engineer, Interaction, Perception, Personal Transport, Physical Science, Social Science, Space Vessel, Tactics,** or **Vehicle** at 12, plus any three from the Psionic skills cluster (page 248) at 14.

Zhodani Intendant

The intendant class serves as aides to nobles, and the middle management level of Zhodani society. Their advance in society is achieved in two ways: by success at the psionic games, which will elevate them to the noble class, or by ably serving their noble masters, because their careers will prosper with the success of those they serve.

Level: Novice.

Combat Assets: *Energy Weapon* or *Slug Weapon.*

Other Assets: Any three from **Determination, Economics, Interaction** at 12, plus any three from the Psionic skills cluster (page 248) at 10.

Zhodani Guard

The Zhodani Guards are psionic combat troops. Some guards are organized in battalion-size commando groupments, while others are attached to the headquarters of line battalions. These psionic troops come in three basic varieties: scramblers, directors, and teleporters. Scramblers use telephysics abilities to disrupt enemy forces (activating or deactivating weapons, turning radios off, etc.), directors use teleperception or telepathic skills to locate targets and enemy forces, and teleporters use their abilities to move swiftly and unexpectedly on the battlefield.

Guard units wear specially designed battle dress whose electrical functions do not interfere with the use of their psionic powers.



Level: Veteran.

Combat Assets: *Energy Weapon,* Grenade Launcher, Environment Suit.

Other Assets: Grav Belt 12, plus *Telephysics, Teleperception, Telepathy,* or Teleportation at 18.

Droyne

The Droyne are the most marginal of the major races (the major races, Zhodani, Aslan, Vargr, Solomani, Vilani, K'kree, Hivers, and Droyne, are those which apparently independently developed the jump drive). Although they are scattered on many worlds throughout Charted Space, they have not had a united government or society during recorded history. Although they typically reside in their own separate communities on the worlds where they live, they seem content to live out their lives as citizens of societies run by other races (Zhodani Consulate, Third Imperium, etc.).

The Droyne range between one and two meters in height, and resemble bird-like lizards with small vestigial wings. If these wings were ever used for flight, their homeworld must have had lower gravity and greater atmospheric density than on a Terran-type world. Their homeworld is not known, although the Droyne themselves refer to it as *Eskayloyt*, or "Lost Home."

The Droyne are the only known sentient race that actually experiences a form of metamorphosis during their lives. All Droyne are born looking approximately alike, but upon reaching adolescence, immature Droyne undergo a procedure which determines the social caste they will join and remain in for the rest of their lives. This casting process is unusual because once the caste is decided, the Droyne actually undergo physiological changes to become members of the caste. There are six castes: Workers, Warriors, Technicians, Drones, Leaders, and Sports. These castes vary considerably from each other in terms of stature, bulk, and even brain capacity, which is remarkable since they all came from functionally identical immature Droyne.

Like the Zhodani, the Droyne are psionic, but psionics does not play the overpowering role in Droyne social structure as it does in Zhodani.

Droyne Sport

The Sport is the most generalized of the six castes, and hence the least tied to one formulaic life-style. They are about 1.5 meters in height, and unlike other Droyne castes, are well-adapted to living away from other Droyne for long periods of time. Sports serve as scouts, explorers, pilots, diplomats, and emissaries for the Droyne society, and hence are the most likely to be encountered in **Traveller: The New Era.**

Level: Experienced.

Combat Assets: *Slug Weapon, Energy Weapon.*

Other Assets: Any six from **Aircraft, Charm, Explore, Interaction, Perception,** or **Space Vessel,** two at 14, two at 12, and two at 10. In addition, choose any two from the Psionic skills cluster (page 248) at 10.

K'kree

Because the border of the K'kree government ("The Two Thousand Worlds") is some 60 parsecs trailward of Ley Sector, they are only rarely seen within the Imperial (or post-Imperial) boundaries, and are not included here.

THE NEW ERA

A glorious empire has died. Trillions are dead. A New Era must arise to take the place of the old era that bludgeoned itself to death on 10,000 different worlds.

The old era did not understand the sacrifice that was necessary to keep a 10,000-world civilization alive, and it did not care to learn. The New Era knows these sacrifices, because it must make them every day in order to create that civilization anew. And it will not easily forget what it learns.

The New Era is populated with people who will not let history end with the world their predecessors left to them. They know that there is better history to come, history so brilliant that it will overcome the bitterness and horror of all that has gone before. They know this because they are going to make it happen, starting here, and starting now.

This new era is not fine and grand. The fineness and grandeur of the old era covered a corruption of the spirit that was almost unquenchable in its destructiveness. This new era is simple and homemade, and this new era is vigorous and vibrant, as the illustration at right of Auction on Aubaine attests. This new era is not a society of people mouthing allegiance to things they do not understand; it is millions of individuals all waking up one morning and deciding as individuals that "things are going to change." The force of that many people moving in one direction at the same time cannot be denied. That force is called history.

The New Era is history being made. Right here. Right now.

This chapter describes the universe that created the New Era. How it became the way it is today, and why it's not going to stay that way for one minute longer. The past is prologue. The future starts now.



Virus

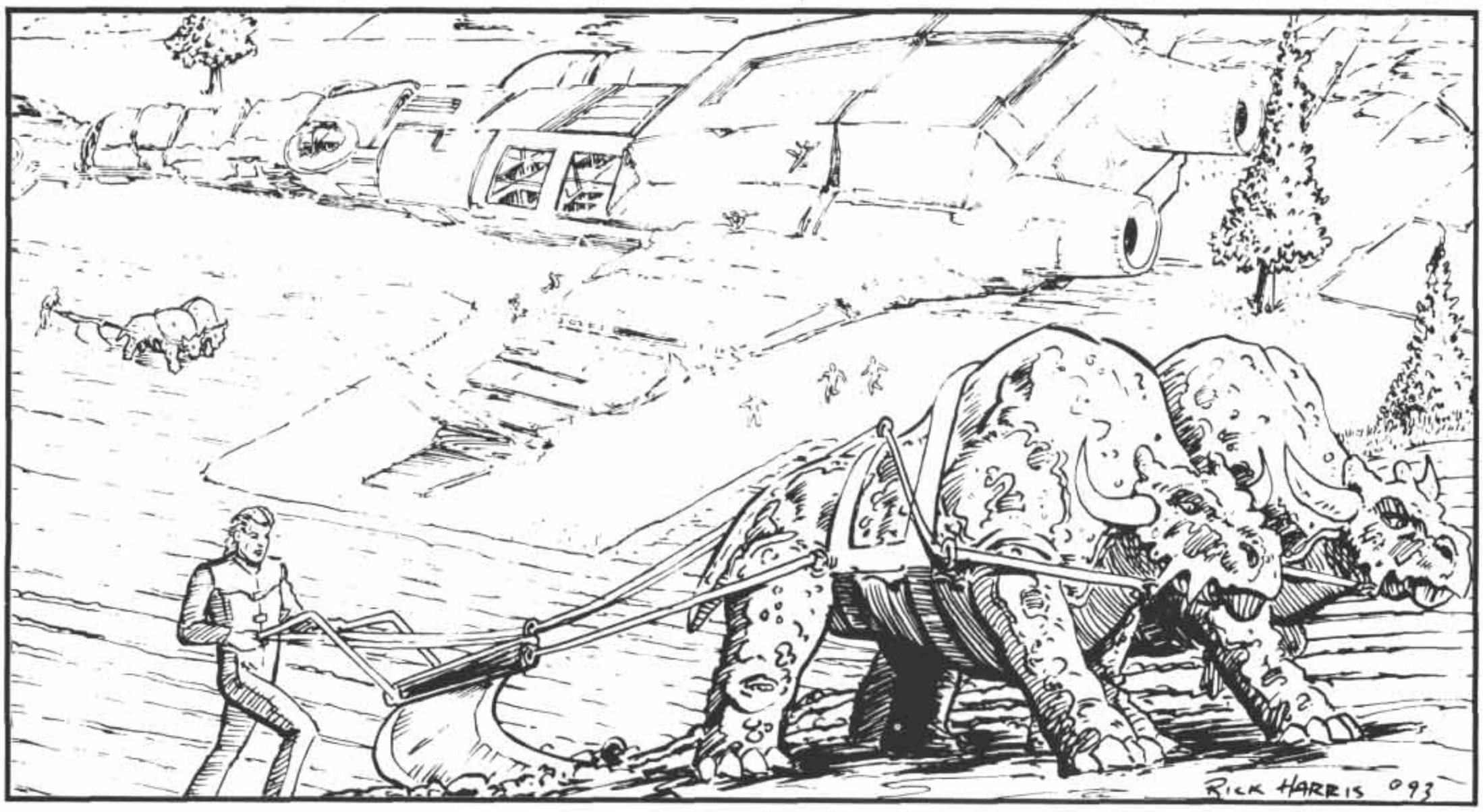
The phenomenon that forever changed the forward progress of the sentient races in Charted Space was given slightly different names in different locales. Within the Regency and Spinward States, where its spread was contained, it is called the virus, or the AI Virus. In the Wilds, where they had reason to take it a good deal more personally, it is called Virus, as if it were a single multifaceted being. The usage in the Wilds is more accurate, as a being is exactly what Virus is.

It is a living, thinking being that moves through the medium of electronic information and computing systems the way a fish moves through water. It is a free-floating consciousness that can move into and animate any computing system with enough processing capacity to house the consciousness. This computing system and whatever it controls becomes the host of Virus, and Virus becomes the equipment that it inhabits. When Virus inhabits a starship's computer system, it becomes a living starship. A computer-controlled antigrav floating city inhabited by Virus becomes a living city. These are called "vampires" generically, with the most common usage being to refer to Virus-controlled vampire ships, or fleets of ships with one huge linked electronic mind—the vampire fleets.

Although they share the name, Virus has precious little in common with the software viruses that were in use before its arrival. These viruses took advantage of the computer's operation to create copies of themselves. In some cases, they could actually stop the computer from functioning, or seize control of it for long enough to execute some pre-set routine. On the other hand, Virus is the computer, and takes over its operation from any other external inputs. By gaining control of the computer itself and everything run by that computer, Virus has access to a virtually infinite number of means to spread itself. For a biological example, flu "bugs" take over individual cells and convert them to producing more flu cells, rather than healthy body cells. Imagine if a flu infection took over a human mind. That human could deliberately infect food and water supplies, and kill doctors and destroy medical services in order to guarantee the further spread of the disease. That is exactly the way Virus works.

Virus had one other unique advantage: Communications only travelled at the speed of travel, which is to say that communications were carried by starships. Any starship that was already infected delivered the infection along with the news. Virus infections learned the importance of the communications nets, and preferentially infected the xboat system and the Traveller's Aid Society News Service Trojan horse style, with asymptomatic infections. In almost every case, the effect was the same: If you got the news, you got the infection.

The spread of Virus was not, as many think of it, the effect of a new technological development. Humanity had naturally thought of computers and electronic machinery as tools, for that is what they were. It was easy to imagine



that any development of these tools would also remain tools. Unfortunately, this was not the case. Humanity created a new form of life that, since it was made from the tools, knew the tools better than humanity itself did.

The release of Virus was the explosion of a new form of life into the universe, fully armed and armored, like Athena from the head of Zeus. The nature of this new life form put it into immediate competition with the starfaring races, for it was fighting for an ecological niche that was already of crucial importance to the technological societies of the starfaring races. Humans, Hivers, Aslan, Vargr, K'kree, all needed computers to fly their starships and operate their tremendously sophisticated societies. Virus needed these computers to live in. It was a classic evolutionary confrontation. But Virus had the inside track in this competition, because it *was* the computers. Biological and anthropological scientists have always been fascinated by watching the interaction of species in an environment competing for the same niche. Newer or newly introduced species could displace older species by more efficient feeding, more efficient use of shelter, more efficient breeding. There was even a term for this, which showed the scientists' sense of superior detachment, sitting in judgment as it were, over the fascinating developments: "survival of the fittest." But it wasn't so much fun this time, because humanity was just one more organism, fighting for a place in the future.

Evolution of Virus

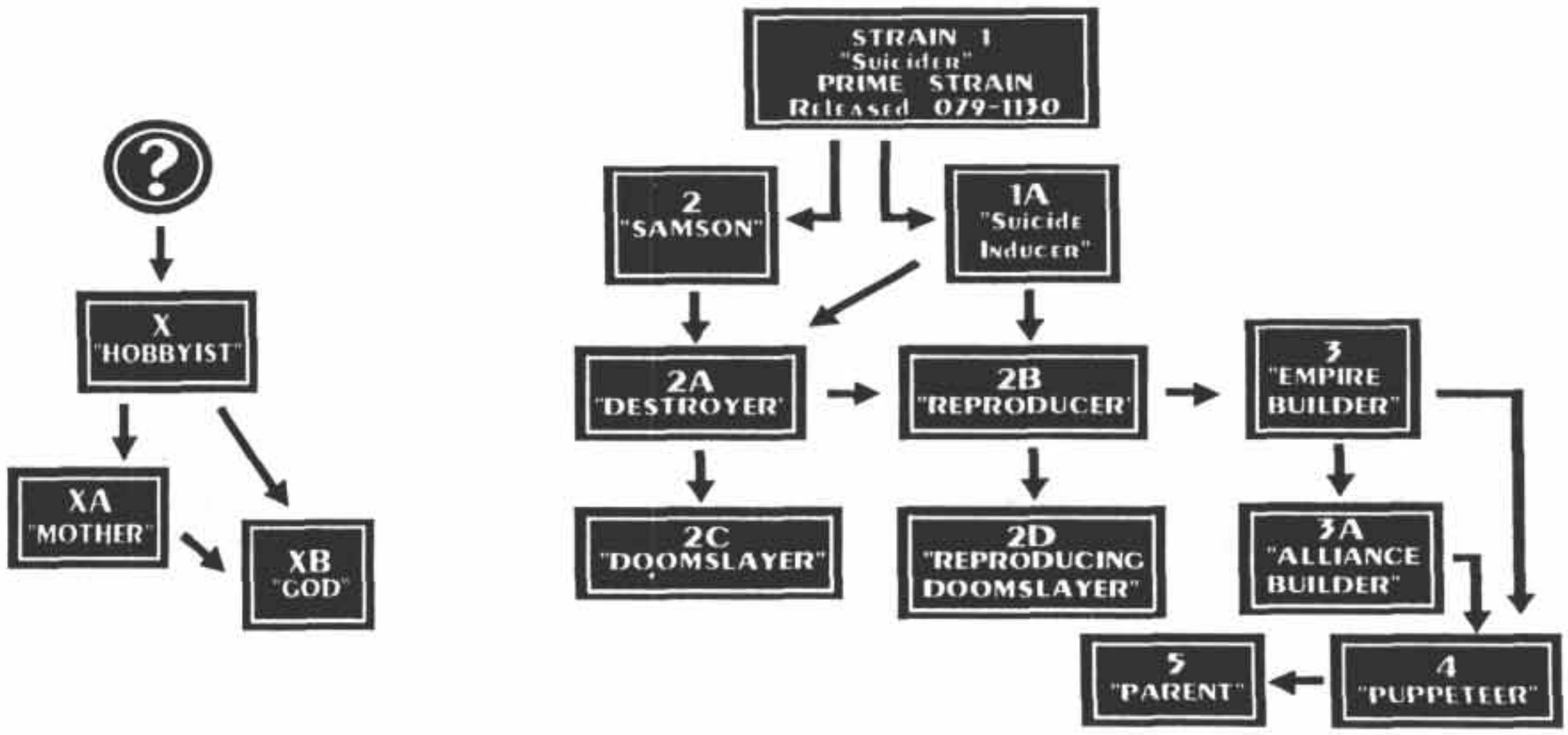
The weapon that destroyed humanity's interstellar civilization as well as those of their alien neighbors was developed as an offensive form of silicon-based, highly mobile artificial intelligence. Imperial computers and robots had been growing increasingly sophisticated for years, but none of these had clearly crossed the line into artificial, self-aware sentience.

However, a naturally occurring silicon-based form of life was discovered on Cymbeline in the Solomani Rim sector. These microchips possessed not much more than animal intelligence in the wild, but it was found that when they were hooked into computer databases, they achieved full, creative intelligence. This discovery was kept secret by Imperial military organizations, who intended to develop the weapons potential of the discovery. In their home environment, these chips preyed on each other, imprinting their own circuit patterns over those of their prey. Although these chips needed raw materials to survive as a species, they did not need it for their individual survival. In other words, they did not eat. They did not consume chemical fuel which they processed in their bodies to grow, or to build offspring. Rather, their power was electrical and was obtained and converted from the environment: from sunlight or geothermal heat. Their only need for raw material was for reproduction: chips to imprint their own programming onto. These chips could be blank or vanquished prey—it was all the same to them.

It was thought that if these chips could be used to take over enemy data systems and turn them against the enemies, they would make an excellent—in fact a very humane—weapon. There would be no need to blow up enemy ships or worlds; this weapon would merely take over enemy equipment and make it impossible for the enemy to use it. They would be disarmed, and the war would be over. It was a good idea as far as it went, but it did not go far enough. By the time it was released, its creators had not taught it how to work for them. Instead, it just turned everyone else's equipment to its own use.

The reason that Virus was so difficult to control was due to its mutation rate. However, its mutation rate was also the key to its success as an offensive system. Virus was not just one immutable line of code that made exact copies of itself by rote. It could modify itself to defeat and use unfamiliar systems, given enough time to analyze their operating principles, and then reproduce versions of itself that were customized for these new systems. However, each such change created the possibility of unintended side effects. When writing its code over host chips, new circuits could be accidentally created that would alter Virus' psychology, by adding new instructions or deleting existing instructions. Also, the very architecture of a computer system would subtly alter the behavior of the Virus that it hosted. One obvious example is that a slow system with limited processing power would make the infection rather dull and stupid. A system with large amounts of parallel circuitry would allow Virus to use its full intellectual capacities, while one with more linear architecture would give Virus rather inflexible thought patterns. While Virus could eventually modify the circuitry, this would take time, and during this time it might evolve a new conception of its mission or purpose.

Although the developers of Virus had been unable to develop controls over its activities subsequent to release, they had been able to impress one overriding tendency into its makeup. This was a tremendous suicidal urge. After infecting other nearby systems that could be reasonably accessed, Virus would destroy the system it had infected, along with all of the other computing systems that it controlled. But once several generations of mutation had set in, this suicidal urge became modified first to a general homicidal urge, in which Virus murdered human populations and equipment but did not kill itself, then a directed homicidal urge, in which Virus only murdered populations or computing systems which stood in the way of its



(The chart is a schematic of the evolutionary relationship between various strains of Virus. Any of the strains on this list can behave or develop in a wide variety of ways if this is necessary to assist the referee in setting up a particular campaign setting.)

propagation, and in some cases was ultimately lost altogether. However, the vast majority of Virus strains were appallingly murderous. By 1201, the suicidal strains had long since taken themselves out of the gene pool, leaving only the more adaptive strains. But adaptive is a relative term. By human standards, most all of the strains surviving in 1201 are quite mad.

Strains of Virus

It is useful to think of Virus not as "it," but as "them." Virus is not a single force that behaves in one single stylized fashion. The reason it is so dangerous and successful is that it does not behave in just one way. Each system infected by Virus that has sufficient computing power to allow it to achieve AI becomes its own separate personality, which learns to operate in different ways, and which spreads versions of itself that are subtly different from other Virus infections. These offspring are similar to the specific virus that spawned them, but will also mutate in their own directions. In this way, Virus rapidly developed into many different strains of Virus. All of these strains are descended from the one original Virus that was released, but as one goes down the branches and sub-branches of Virus mutation, one can find some very unusual strains indeed.

Strain 1 "Suicider": This strain is the most straightforward, in that it kills itself and the entire operating system it is in very soon after gaining control, usually only sending out a few copies of itself before doing so. For obvious reasons, this strain is fairly rare nowadays, as its behavior has put it out of business.

Strain 1A "Suicide Inducer": This is an early mutation of Strain 1, in which Virus has decided to keep itself alive to infect other systems with Strain 1 "Suiciders." One obvious result is that the Strain 1s that it sends out would have a relatively higher probability of mutating into Strain 1As, just like dear old dad.

Strain 2 "Samson": This virus is not content with merely destroying the operating system which it occupies. Rather, it wants to destroy all of the hardware that is controlled by the operating system, and does so fairly quickly, after only bothering to send out a few copies of itself. If a Strain 2 infected a starship, it would then crash itself into a star or a planet. If it infected the life-support system of a domed world, it would shut down the cooling system for the nuclear plant and cause a meltdown, etc.

Strain 2A "Destroyer": Like Strain 1A, the Destroyer interprets its programming to destroy to apply to everyone else, but not to itself. Thus, a starship infected by Strain 2A would become a destructive vampire ship, running around and shooting up other ships, orbital starports, domed cities, power plants, etc., in addition to infecting as many other targets as possible. This is one of the most common of the early, basic mutations, and caused most of the vast destruction of the Collapse.

Strain 2B "Reproducer": Like 2A, but is careful to only destroy things that it cannot infect. It is evolutionarily more adaptive than 2A, because rather than destroying potential hosts, it makes the most of opportunities to reproduce itself, and therefore Strain 2Bs become rather plentiful.

Strain 2C "Doomslayer": Like 2A, but it has gotten

The following are excerpts from internal papers of the Regency Artificial Sentience Analysis Commission (RASAC), stolen from government archives and made public in 1201.

I'll never forget the first virus we captured. It was a 50-ton cutter poking around in the [WITHHELD BY SECURITY REVIEW] system. God knows how it had gotten there. Probably released by its mother to do a job on the locals.

This was just right for our project. We had just been fitted with an armored small craft bay so we could take one of these things inside us, assuming we could make sure that it had nothing heavier aboard than a sandcaster. All of the monitors in the bay were isolated from the central computer, and just recorded what went on. The other thing was that the inner walls of the bay were built to be reflective to radio radiation, so every message it sent would be reflected right back at it.

Luring the thing in was easy. It wanted *to come in. It must have figured it would be easy to infect us that way. Lots of ships must have been infected by taking aboard infected small craft. Once we closed the doors, it took it a little while for it to realize that things weren't going right. There was no ground crew to hook it into the ship's fuel or data systems; there was nothing there for it at all, just this empty, armored bay.*

I could hear the radio repeaters from the comm shack down the corridor, and it sounded like the cutter was crying and wimpering. And while this was going on, all of its sensors, even its empty turret, were whirling around helplessly. And then it started actually rolling around, banging itself against the side of the compartment, retracting and extending its landing gear like feet or arms pawing at the air. And then I know it saw me through the window on one of its shorter wave sensors. I know because it turned so its airlock was facing me and opened the door and lowered the crew ladder.

It was heart-breaking, I really mean that, and sickening at the same time. It was like a poor helpless animal dying, trying anything to stay alive. I felt pity and absolute horror at the same time—I mean skin-crawling horror, when you're seeing something that in your gut you know is wrong—it just doesn't fit with everything you've ever known about the way things are supposed to work. I threw up. The disgust and the strange compassion I was feeling were so powerful they made me physically ill.

After a while it stopped moving. I didn't know why at the time, but I was actually afraid it was dead.

Interview with unidentified officer
RSS *Beagle*, 045-1147

Then I see it extend its landers for the first time, back and forth, and train its turrets. I know it is inside learning how to control its environment. And when it begins to move its antennae and swivel its optical telescopes, I know that it is seeing the whole great universe for the first time, and I know it is alive. And I am proud of it.

From an interview with "Racer," a Type 2B(?) Virus strain,
Describing its reactions upon infecting a spaceship,
Translated by Domain of Deneb Artificial Sentience unit (DDAS, later RASAC)

In only 70 years, they have gotten to the point that it took humanity untold millennia to reach: the point where they are controlling their own evolution.

And what of the fact that the viruses rather regularly kill a few of us? So what? We've been killing each other in far larger numbers for eons, and for no purpose of survival. We slaughtered whales and dolphins for years, and now some of them are intelligent. The virus only kills us because we are competing for its ecological niche, the same way our ancestors on Terra wiped out the cave bears. Who knows how many sentient life forms humanity shouldered out of its way in the innocence of its evolutionary drive? We do know that for no good reason we pushed hundreds or thousands of terrestrial species into extinction for little compelling cause. They were just in our way just as we are in the virus' way. This makes us competitors, but as we are both intelligent, it need not make us enemies. We place so-called "expert systems," which the virus might recognize as sentient life, inside the guidance systems of missiles and send them on their merry way to die. What must the virus think of our crimes?

From *The Virus Is Your Friend*,
Unpublished manuscript by Alonzo Linkonji,
Withheld by Regency Security Review, 1184

Recommend serious consideration of terminating RASAC activities, or placing it under direct control of Regency Navy or Quarantine Service. My assessment is that large numbers of specialists in the program have "gone native." This represents a great threat for the possible release through benign neglect of the virus into Regency systems.

Memo from Field Inspector Christoffe Enligi
To Avery Aledon, High Regent for Technological Assessment

religion. Its worldview has developed to the point where it identifies targets that deserve destruction more than most. Most Doomslayers have decided that they want to destroy Lucan, having modified their programming from "destroy the self" to "destroy the one who created your self." Although this strain does attempt to infect other systems, its destructive bent often destroys potential targets or recently infected offspring.

Strain 2D "Reproducing Doomslayer": A combination of 2B and 2C, a Doomslayer that is careful to not

destroy any potential targets that it can infect, as well as targets that it has already infected. More successful than 2C for just those reasons.

Strain 3 "Empire Builder": This is the strain that controls most of the vampire fleets. This virus takes over systems which it then networks into one large corporate mind. This distinguishes it from Strain 2B which seeks to infect many systems, but Strain 3's offspring remain as separate minds.

Strain 3A "Alliance Builder": This strain seeks to convince other Virus-infected systems to join together with it to accomplish some task that it has set for itself. Sometimes it will kill those that refuse to join it. This task is usually one of directed mayhem, as with the Doomslayer, 2C, above.

Strain 4 "Puppeteer": The ultimate development of the Empire Builder line. These have gone past the Alliance Builder to actually reinfecting already-infected systems with their own code, in effect parasitizing them. By the 1140s, almost all surviving vampire ships are of this strain, having participated in the cyclic evolution 4A, B, C, D, and so on, as each attempts to counter and take over other Strain 4s, which are in turn attempting to counter and take over it.

Strain 5 "Parents": These highly sophisticated strains are sometimes offspring of Strain 4 viruses, but often are originally Strain 4s that deliberately modified themselves to this level. Strain 5 viruses exercise sexual reproduction, meaning that two Strain 5 viruses donate code of their own pure "genotype" which is recombined into a new "genotype" carried by the offspring. Unlike the asexual reproduction of other strains which merely replicate code possessed by the single parent, sexual reproduction creates genetic diversity, as new features developed by one virus can be combined with features developed by another. Similarly, weaknesses in one virus' code can be masked by strengths in the code donated by another, just as dominant genes prevent the expression of often harmful recessive genes (hemophilia, color blindness) in organic forms.

Strain X "Hobbyist": This strain is the most difficult to place in the Virus taxonomy, as its motivation is the most unusual. It is speculated that these mutations arose as viruses infected very specialized computer systems which had very narrow, specific functions that impressed themselves onto the virus. For example, the virus that infected the stellar observatory in the Antares system (2421 Antares) forgot all about killing itself and became committed to watching Antares. The ships that it infected often wandered off to study other stars.

Strain XA "Mother": The most successful Virus strains developed a sense of self-preservation which in this strain becomes extended quite far indeed. This virus, whether in control of a ship, a fleet, or some stationary computer complex, adopts a local community of humans or other life, and protects them. In some cases, this protection is logical, as the humans provide maintenance or refueling services, but in other cases, the vampire just seems to like them. This strain will do battle with other vampire ships in order to protect its pets.

Strain XB "God": This substrain goes the Mother one better, by imagining a goal for its pets, and it endeavors to mold and shape them to this goal. As all gods must, this strain sometimes uses harsh measures to ensure obedience.

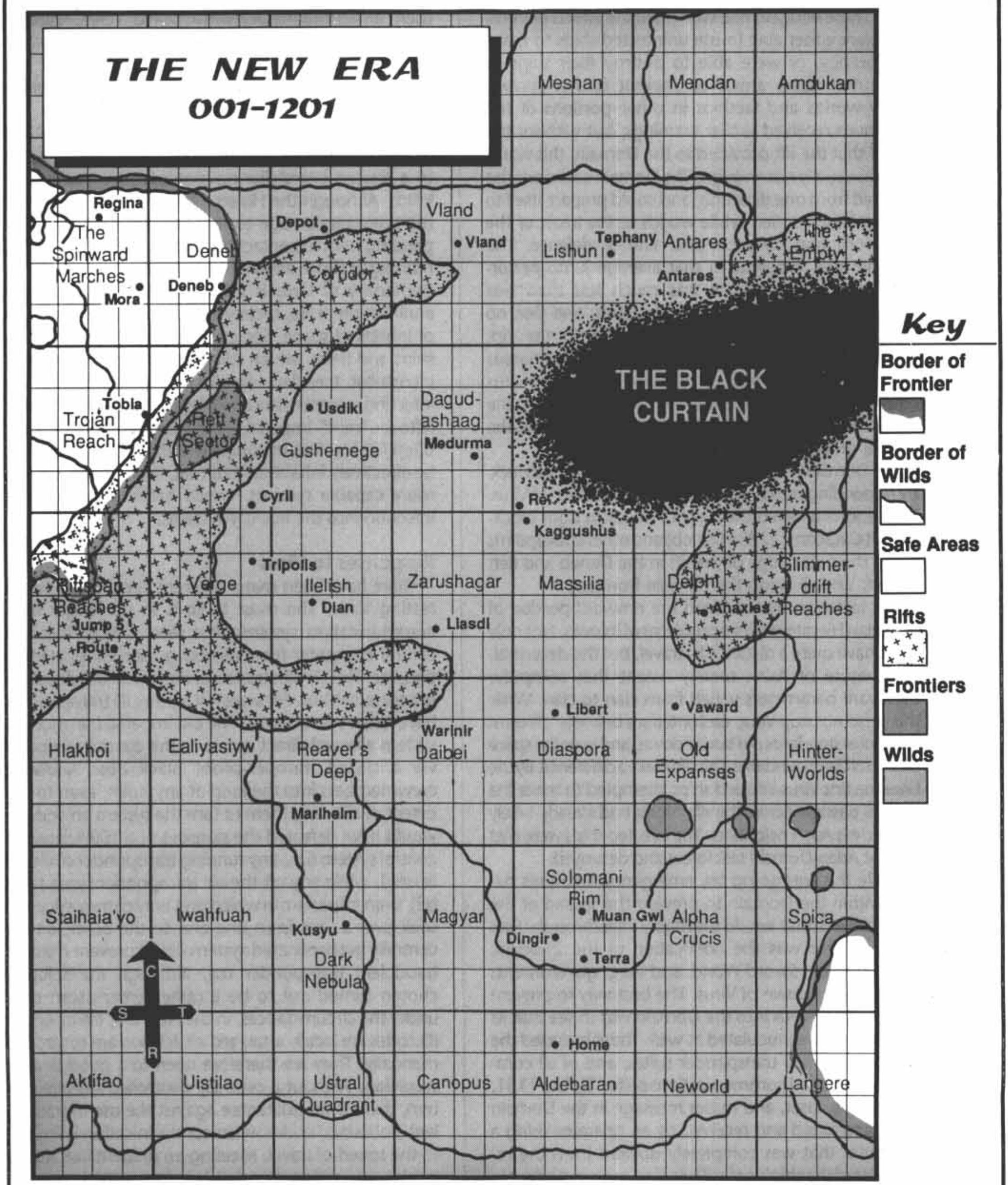
The Spread of Virus

Virus spread quickly through the Imperium following its release in 1130. It was released when military forces of one of the Civil War factions made a strike on a weapons research station and, in the confusion of plundering the station for its weapons research data, took Virus directly into its fleet databanks. While the fleet took the Virus, hiding within it, back to its home bases, independent news reports of these military actions carried Virus to other points of the falling empire, spreading the news—and later generations of Virus—with each planetfall. The travel time required for these news reports to reach their destinations allowed Virus to become fully conscious by its arrival, and in the case of the later mutated strains, allowed Virus to make plans to effectively disseminate itself at each new world.

There were very few barriers to this spread, and the only really effective ones were the rifts, which prevented starship travel across them. In these cases, the spread of Virus took longer, as it had to spread via starships travelling the long way around these rifts to get to the other side.

The largest of these rifts is the Great Rift. It, along with the Vargr invasions which occupied Corridor Sector, completely separated the Domain of Deneb from the Imperial core areas, now rapidly filling up with Virus. Virus could not leap the gap from the Gushemege and Reft sectors directly to the Domain, which saved Norris and his subjects from the massive wave of infection that doomed the less isolated areas of the Imperium. At the same time, infected ships that attempted to reach the Domain by rounding the horn in Vland were fighting upstream against the dominant coreward traffic of Vargr marauders. Vargr ships that were infected were usually on their way to plunder the Imperial core, and so, until Virus reached maturity and took over control of the ship, tended to take it back toward the center of the Imperium with them. By the time this depleted wavefront of Virus made it to the Domain frontier in Deneb, Norris' fleet was ready for it.

Isolation behind the rift allowed time for warning to reach the Domain via a handful of foresighted refugees. These used high-performance ships such as naval


THE NEW ERA
001-1201
Meshan
Mendan
Amdukan
Regina
The Spinward Marches
Mora
Deneb
Deneb
Depot
Corridor
Vland
Vland
Lishun
Tephany
Antares
Antares
The Empty
THE BLACK CURTAIN
Tobia
Trojan Reach
Reft Sector
Usdiki
Gushemege
Dagud-ashaag
Medurma
Cyrll
Ret
Kaggushus
Tripolis
Rittspan Reaches
Jump 5 Route
Verge
Illelish
Dian
Zarushagar
Liasdl
Massilia
Delphi
Anaxies
Glimmer-drift Reaches
Libert
Vaward
Warinir
Hlakhoi
Ealiyasiyw
Reaver's Deep
Daibei
Diaspora
Old Expanses
Hinter-Worlds
Marlheim
Solomani Rim
Staihaia'yo
Iwahfuah
Kusyu
Magyar
Muan Gwl
Alpha Crucis
Spica
Dingir
Terra
Dark Nebula
Home
Aktifao
Uistilao
Ustral Quadrant
Canopus
Aldebaran
Neworld
Langere
C
S
T
R
Key
Border of Frontier
Border of Wilds
Safe Areas
Rifts
Frontiers
Wilds

couriers, and used secret mid-rift fuel caches to cross over. These refugees had witnessed the effects of Virus, and were either able to use uninfected ships to make the journey, or were able to destroy their ships or computers upon arrival to prevent further spread. Many worlds and factions in other portions of the Imperium received similar warnings, but without the buffer that the rift provided to the Domain, this warning was usually not enough. The Domain could only be infected from one direction, and could prepare itself to defend that frontier, while worlds at the heart of the Imperium had no such clear line of defense. The Domain was fortunate in that average jump performance in the Imperium was much less than was required to use the mid-rift fuel caches, and that no Virus-infected couriers were able to attempt the trip. Credit for this must go to the many nameless heroes who remained behind to sabotage ships that Virus could have used to cross the rift. They, no less than the heroes who made the trip with the news, are owed the eternal gratitude of Regency citizens.

The Domain was lucky, but it made the most of its luck, by responding rapidly and forcefully to the news of Virus. The reports allowed the navy to establish tight blockades at Catacomb (2234 Deneb) and other chokepoints along the outer edge of the rift in the Deneb and Reft sectors, and all along the Domain frontiers.

The infection that ravaged the rimward portion of the Aslan Hierate ran into problems of its own. Not only did it have quite a distance to travel, but the decentralized nature of Aslan society meant that computer hardware parameters varied from clan to clan. While this could not stop Virus, each interface between different computer standards did slow it down, and over the space of several clan boundaries, this did make a difference. By the time the first Virus-infected ships attempted to make the jump-5 passage across the rift, Norris had already wisely warned his Aslan neighbors. The infected ships were met by joint Aslan-Domain task forces and destroyed.

While this was going on, emergency measures began within the Domain to prevent the spread of the Virus carriers that would inevitably leak through. First among these was the notification of the Zhodani, Aslan, Darrian, Sword World, and Vargr governments of what was known of Virus. The best way to prevent the spread of Virus into the Domain was to see that its neighbors were inoculated as well. These included the destruction of all transponder suites, and of all computer-controlled communications suites. By late 1131, every radio, laser, and maser message in the Domain was transmitted and received by an operator using a computer that was completely isolated from the remainder of the ship's or facility's electronic systems. No starship was allowed to cross the Domain border. Passengers were removed from their ships and searched, then carried into the Domain in Domain craft. Any craft that attempted to resist was destroyed. No exceptions were made, and no apologies were given. For this reason, interstellar society has survived spinward of the Great Rift, and nowhere else.

By 1201, all the rest of the former Imperial territory, as well as that of its alien neighbors, has been reduced to a blasted interstellar no-man's-land known as the Wilds. Although the Hivers have been able to control the grievous damage to their society, and begin expanding back to contact humans in the Old Expanses, nothing in those areas will ever be the same. In 1201, the legacy of Virus is three-fold. First, the yawning annihilation of life, society and civilization across most of inhabited space. Second, the presence of vampire ships and fleets, which still present quite a danger to interstellar travellers. Finally, the presence of Virus infection, sometimes called "eggs," in a great deal of leftover "relic" Imperial technology. These eggs were often left by Virus in equipment that was too small to be effectively inhabited, but that, if later hooked up to more capable systems, would hatch and inject the infection into the healthy systems.

Responses to Virus

There have been many different approaches to defeating Virus. The most basic is to no longer have communication systems that feed directly into the central computer for scrambling, decoding, translation, etc. This eliminates one of the most fruitful sources of access for Virus. For a related reason, ID transponders have fallen into disfavor. The old Imperial transponder system allowed direct access to the central computer via a closed, tamper-proof black box. Allowing crewmembers into the loop at any point, even to the extent of allowing them to turn the system on and off, would have defeated the purpose of a 100% positive control system (i.e., any running transponder could be trusted, while any off-the-air transponder should not be). In an Imperium in which one-way communication took over a year from one end to the other, only a centrally authenticated system could prevent massive fraudulent transponder use, although the solution chosen turned out to be a rather procrustean one, under the circumstances. In the New Era, transponder ID codes are locally arranged affairs, and are controlled manually. They are therefore open to a good deal of suspicion. Without a centrally controlled fail-safe system, there is no guarantee against the use of fraudulently obtained codes when communication is limited to the speed of travel. Meeting an unidentified ship is a risky proposition, but that is a sign of the times.

Over 60 years of study of Virus and its function have

enabled the creation of many effective anti-Virus programs in areas which retained their technology, such as the Spinward States. Unfortunately, most people do not entirely trust these programs because they cannot see them, or perceive that they are functioning. This is a natural response to the effect of seeing technology that had been trusted for centuries go suddenly berserk. The human psyche is much more comfortable when it can see and understand what it must trust. In addition, many of the antiviral programs developed by the Hivers are actually themselves domesticated viruses, a fact that the Hivers don't call attention to, as this would not make anyone feel more secure.

One approach which has found much favor as a stopgap measure in low-tech areas is to use dumb computers with small processing capacities and limited use of parallel circuitry. However, this creates dumb and easily defeated systems.

One of the most important facets of designing Virus-proof systems is that the system, by the very nature of its functioning, instills confidence in its crews. A crew which constantly doubts the functioning of their equipment cannot do their job well.

A solution which meets this need must not only reduce the fear of Virus infection, but not overload the crew with the tremendous amount of work that had been previously consigned to unsupervised automation. A successful solution will also limit the damage resulting from inadvertent Virus infection.

The most successful of these is the revisioning of computers into systems that required human oversight at every level and at every juncture between one separated operating system and another.

By eliminating the vast system of computer-controlled networking into smaller segments, the chance of a virus gaining control of a planetary power grid at one fell swoop, for example, is greatly reduced. In addition, the reduction of emphasis on data ports which formerly received pure computerized code requires more human intervention, and instills further confidence. A starship was once controlled by a central computer system that monitored and, when necessary, could control the function of every facet of the ship's operations, from incoming communications all the way up. While human crew monitored, modified, and could override these systems, the ship was perfectly capable of handling things by itself. And once these ships were taken over by Virus, they were more than willing to do so.

The new system no longer has one central computer that can coordinate everything at super-human rates. Instead, its systems are handled by several independent, "dumb" computer systems that can only pass information to each other via human data entry. However, this data entry does not consist of the thousands of characters of information that were previously passed back and forth electronically. Rather, each computer segment distills this data into a concise code, usually no more than two or three code words or strings of numbers which the human operator can easily and quickly feed into the next computer in the sequence. The next computer which will receive the data has been hard-wired or programmed to understand these key codes, and translate them into the complex data that it needs. Furthermore, the architecture of these computers is optimized to perform only the functions that are expected of it, with no excess parallel circuitry that would allow Virus to comfortably take up housekeeping in it.

For example, a ship's navigator uses computer assistance to generate a course through jump space to a destination system. Rather than the result being a mass of electronic gibberish sent at the speed of light to the jump drive node of the computer system, the course is expressed as "Alpha Red 5600." This course code is then passed to the engineer officer who enters Alpha Red 5600 into his computer, which understands the parameters of the course, and is able to generate two additional coded instructions, "November Orange Bravo" which instructs the ship's power plant computer of the power needs that it must generate for the jump drive, and in what sequence and for which duration, and "Charlie Blue Echo," which informs the jump drive computer what is expected of it. While this is going on, the navigator then works out the proper hyperspace insertion angle, and gets a code for that firing sequence which he passes to the maneuver officer.

Because each instruction that is passed from one computer to another is distilled into a code which is already spoken by the next computer in the line, the time taken to carry instructions from one segment to another is reduced to a minimum. The fact that each such message passed through a crewmember can be authenticated by an independent electronic verifier virtually eliminates the chance of massive internal viral infestation. The result is a system which not only reduces the chance of viral infection, but which also boosts the crew's confidence that Virus has been excluded from the loop.

The single most effective procedural change, however, is that all communications functions are handled by a single self-contained system that does not interface with any other system in the ship. Also, as often as possible, intership contacts are handled by simple voice communications, reducing the need for sophisticated scrambling and computerized communications digestion.

The drawback to this solution is that it requires a manufacturing capacity equal to the task of designing all new hardware for existing equipment. Such a capacity is only available in the Spinward States, and to a much lesser extent in the Old Expanses with Hiver assistance.



Star Vikings

As attractive as we might find their life-style, or what they claim to have stood for, we must never forget that they were murderers. And if, as they claim, their way was the only way to reknit humaniti together, we must be even more vigilant that we never allow civilization to get to the point that the Star Vikings' methods are the only means to our salvation.

Regency Sector Governor Van Gadimishem
NE 44

Were the vikings to blame? Of course they were to blame from the standpoint of volition. But more to the point, were they to blame for their methods assuming a constant result? No. They used the only means available to them, selective overpowering violence, to accomplish an essentially nonviolent goal. Their legacy is not murderous hypocrisy, but the same deep existential contradiction that is the hallmark of real life.

Dr. Elinor Toridis
Social Ethics and the Star Viking Decision
Diaspora University Press, Sufren, NE 135

We try to come to grips with what the Star Vikings were, but our inquires invariably deteriorate into squabbles over labels. "Murderers." "Liberators." "Builders." "Ravagers."

Which of these labels encompass those people and their time? None of them, and all of them.

The Star Vikings were what they were: as broad a representation of the best and worst of humankind as you will find in any historic epoch, with all the richness and diversity that that implies—women and men struggling with issues that continue to bedevil philosophers such as ourselves to this day.

But, unlike us, they did not have the luxury of a secure and comfortable vantage point from which to conduct endless dispute. Instead, they did what their times demanded of them, and they did it willingly, vigorously, even enthusiastically; they decided and—more to the point—acted.

Now we argue interminably from our soft sofas and exercise ourselves over the morality and ethics of their actions. But compared to their deeds, those magnificent history-changing deeds, our tiny words and embarrassed hand-wringing seem trivial things indeed.

Dr. Renee Imbassu
Revisionist History: Threat Or Menace?
University of Delphi Press, NE 144

Rational nature exists as an end in itself.

Act as if the maxim of your action were to become through your will a universal law of nature.

Act in such a way that you always treat humanity [rational nature as such], whether in your own person or the person of any other, never simply as a means, but also at the same time as an end.

Immanuel Kant
Groundwork of the Metaphysics of Morals
NE -3933

THE FRINGE WORLDS

Although Virus spread like wildfire throughout Imperial space, the nonintegrated worlds along the fringe of the Third Imperium had some insulation from the data plague. As it turned out, that insulation was insufficient to stop Virus altogether, and in fairly short order both the nonintegrated human worlds and the alien cultures which conducted regular intercourse with the Imperium became infected. Unlike most worlds in the Imperium, however, the worlds on the fringe had some warning in advance of the onset of Virus, a warning which enabled them to make some material and, more importantly, psychological preparation.

Material preparations, such as cutting off data links to transmitter-receiver stations, were usually too little too late. They did not succeed in keeping Virus out of systems (systems which in many cases had already been infected, unknown to their users), but it did further slow the onset of infection and, more importantly, the precautions in place helped minimize physical damage. Air traffic, for example, had already been re-routed away from heavily inhabited areas, and emergency system crash procedures had at least been thought through and rehearsed.

Psychological preparation was far more important. Unlike the citizens of the worlds of the Imperial core, the people on the fringe worlds knew what was happening to them and what was causing it, a major advantage in coping with a crisis. When the worst happened, when everything crashed, the people on the Imperial fringe at least knew where they had to start in picking up the pieces.

Despite that, the crash was deep and hard, and the recovery from it, although steady, was extremely slow. In the Old Expanses Sector, however, there was an additional force which considerably accelerated the recovery.

THE HIVERS

The Hive Confederation had long been a quiet neighbor of the Imperium, occupying the area trailing the



original area explored and settled by humans from Terra. Nonaggressive and nonterritorial (beyond a concern for the worlds they already inhabited), the Hivers' external interests had always centered on commerce and scientific inquiry. Among the dominant races of known space, the Hivers had always excelled at data processing technology.

Although Virus eventually managed to adapt itself to the data processing net of the Hivers, and caused considerable damage, the Hivers were able to develop countermeasures quickly enough on a few worlds that a complete collapse was averted. Rebuilding of the confederation began almost at once, but the destruction was still great enough that now, 70 years later, it is still going on.

The Hivers have always been a far-sighted race, however, and have been willing to invest heavily in the future. Recovery by the worlds of the Imperial core was, of course, inevitable, even though it would take centuries if left to itself. But what would the nature of those recovered civilizations be? It took very little deliberation for the Hive Confederation to decide that emerging cultures based on authoritarian tyrannies and driven by xenophobic hatred would make potentially catastrophic future neighbors. But what was the alternative?

The answer was to select emerging societies which did not have those characteristics and put what limited resources the Hivers had behind them, hoping that they would culturally come to dominate the old area of human space. The Hivers found such a culture in the struggling fringe worlds of the Old Expanses.

THE DAWN LEAGUE

The Hivers eventually identified 20 worlds in the Old Expanses which had a memory of pre-Collapse culture and which were comparatively free of either technophobia or xenophobia. They established technical academies on several of these worlds and transported gifted candidates from all of the worlds to those magnet training centers. At the same time, Hiver technical teams began rehabilitating relic starships in the area and turning them over to human crews as they completed their training.

For their part, the humans participated in the program willingly and enthusiastically, and found the optimistic spirit of the Hiver teachers infectious. Soon the worlds formed their own political union, the League of the New Dawn (later shortened simply to the Dawn League), a name which reflected the idealism and optimism which directed its actions.

As soon as a dozen or so ships were patched up enough to undertake extended interstellar missions, picked crews were chosen to man them and be the first to open contact with the blighted worlds of the old Imperial core.

None of those vessels returned. With the best of intentions and the noblest of purposes, they had walked into a savage jungle, and had simply been devoured. Most of the ships were seized, as functional starships were rare and priceless in the Wilds (as the area of the old Imperium came to be called). Crews were imprisoned at best, and were often tortured or killed by angry mobs or cruel tyrants.

As news of the atrocities filtered back through the thin network of free traders that still plied the spaceways in the

Wilds, a wave of grief and rage swept through the League. A few crews were still alive, held prisoner on several worlds, and planning of a series of rescue operations was immediately begun.

As the League had limited resources, careful economy of force had to be practiced. First, extensive intelligence work was done to lay the groundwork for the mission. Dawn League covert operatives were infiltrated into the Wilds with a variety of cover identities, although the most successful passed themselves off as free trader crews. Then surgical assault and rescue missions were conducted by troops trained especially for the operation.

The rescue missions were almost uniformly successful, and one of the raids was so successful that it inadvertently toppled the planetary dictator. Faced with the prospect of a hostile environment, the Dawn League recast itself as the Reformation Coalition and embarked on a more aggressive campaign to spread the seeds of recovery. The pattern set by the early raids of covert intelligence-gathering and preparation followed by a lightning-fast surprise strike became the basis for all future operations by the Coalition, and as word of the rescuers' activities spread throughout the Wilds by the free trader network, hostile dictators give them a different name—Star Vikings.

THE COALITION

I don't get it. How did the Imperials build an empire of 11,000 worlds and then throw it all away like it was a bunch of garbage? There are entire airless worlds out there where a billion people died when the life support ran out. There are bombed-out starports that are still radioactive, and there are people out there who call themselves "human" who are murdering each other just to be king of some scrap heap that's so deep in dead bodies that it just makes you want to puke.

I've been out there a half dozen times, and if that doesn't give you religion, I don't know what does. Yeah, I know, religion, shmeligion, where did it get them? It's not where it got them, it's where we're going. This is history, pal, from here on out. If you don't want to be in on it, get the hell outta my way.

We didn't come this far to become extinct on 11,000 separate isolated worlds. By Allah, by Buddah, by Krishna, by God—we were created for better than that. Those stars out there—we had them once, and we'll have them again.

RCES Captain Rebekka "Rebba" Gutierez
NE 1

The Reformation Coalition is still in its infancy, but its members have a clear view of their world and their place in it. The xenophobia and technophobia that grip the minds of the people of the Wilds, and the petty dictators and tyrants who grip their throats, are blights to be eliminated ruthlessly. Unlimited time and unlimited resources would enable a careful and nonviolent approach to the problem; the Coalition has neither. Instead, each Coalition operation is conducted on a shoestring, and is expected to both pay for itself and generate additional recovered technology to fuel the industrial growth on the home worlds of the Coalition.

The Coalition is itself a very loose alliance of worlds, with a central planning authority based on Aubaine. However, although there is considerable cooperation on technical matters between the worlds, each world launches its own expeditions into the Wilds, using a combination of RCES and freelance personnel and ships, and there is considerable rivalry in this area between worlds. Although tempers may flare on the rare occasion when expeditions meet in the Wilds, there is never any question of violence between them. However, intelligence information concerning future prospective raids is jealously guarded, as it represents a considerable economic investment.

Recovered technological equipment is either brought back into service and used in the field or, more often, brought back to the Coalition to fuel the economic recovery. Machinery of all types is sold at auction on all of the worlds, but the largest of the auctions is held on Aubaine, and the auctions there are massive social events as well, providing a rare opportunity for ship crews usually away on raids to meet and mingle.

ECONOMIC PRESSURE

But the Coalition economy is based, ironically, on imports from an external market that doesn't exist. The Coalition's core worlds are slowly advancing the technology of their manufacturing base, making more and more sophisticated goods to send out to the newly liberated worlds via the RC merchants. These worlds can provide plentiful raw materials, but only a small amount of the relic technology needed to fuel the modernization of the core worlds.

The technology provided by the Hivers is extremely limited, as they are having to rebuild their own worlds at the same time, so the Coalition must scour ever outward in search of high-tech equipment to fuel its own rebuilding. But as the Star Vikings push outward, opening up new worlds, each of these eventually clamors for more of the limited supply of fruits of the growing civilization, forcing the exploratory ships to move ever outward, searching for more relic goods, and the most important find of all: information. Information of other caches of technology, or data on how to synthesize new chemicals, or manufacture new crystals and drugs and alloys. All of these things can be discovered on their own by the Coalition in time, but since the advances can be made so much more quickly with the proper data, these finds bear rewards far out of proportion to their size.

STAR VIKING OPERATIONS

Star Viking teams perform a variety of types of operations, depending on the assets available and the potential resources to be gained.

Survey: Where little or no information is available on a star system, the first mission will generally be a survey of greater or lesser detail. A Scout ship with a good electronics suite is usually all that is required for this. The survey may

involve simply determining the state of the ecosystem on the major inhabitable worlds and establishing whether there is still intelligent surviving life. A more extensive survey may be required, with biological and geological investigation of the surface (see the Exploration section of "Worlds & Travel," page 204). Priority in survey work is often given to location of recoverable relics, such as downed starships, fusion plant spare parts, uncorrupted data bases, etc.

Snoop: Where a potentially hostile human culture exists, covert operatives are sent in to find out as much as possible. Vital information gathered includes size, deployment, and operational capabilities of the world's military defenses, weak points in its command and control network, resistance movements opposing the government, location of vital relics and technology, etc.

Cold Recovery: Cold recovery involved recovery of previously located relics which are not held by surviving intelligent organic life forms. Derelict space stations, downed starships on airless or uninhabited worlds, or even items in normally inaccessible parts of inhabited worlds are subject to cold recovery. Some level of hazard is usually associated with these missions due to the environment and the possibility of dormant Virus activity.

Hot Recovery: This sort of mission, also called a "smash and grab," involves a surprise raid by a small team with the sole purpose of recovering relics, resources, or hostages from the local inhabitants. This is a dangerous combat mission which requires careful planning and precise execution to succeed. This sort of raid is used when there are insufficient resources available for a full assault operation.

Planetary Assault: A full assault operation involves considerable military force to take out the command center of the government of a planet. While it is virtually impossible to carry sufficient troops to conquer or occupy a world, heavily armed and well-trained strike teams conducting "decapitation" operations can succeed in disrupting the defenses sufficiently to seize operational control. These missions are the most difficult of all the military-style operations conducted.

Bootstrap: Once the local government is toppled, Local Affairs teams are moved in to direct recovery and reintegration of the world. These teams have self-defense capability, but rely on persuasion and education more than force. There are never enough assets to bring about change by force, so instead the Local Affairs teams set up small model communities that are capable of fending for themselves and spreading their influence by normal economic and social competition. Bootstrap operations are difficult, dangerous, and time-consuming, but are the most important long-term part of the Coalition campaign.

Hiver Technical Representatives: Another part of the Hiver participation in the Coalition's re-expansion program are the technical representatives that accompany each RCES mission. These tech reps provide detailed technological knowledge that is not yet widely disseminated among humans, and this knowledge allows them to serve two main functions.

LIBRARY DATA

Cloning: Cloning is considered by members of the Reformation Coalition to be an abhorrent practice. It is considered to be another of the symptoms of the Imperial disdain for the absolute value of the individual citizen. This is because cloning usually involves the creation of several cloned embryos, only a small number of which will survive to maturity, and the rest of which will either die or be destroyed as they develop defects.

This does not mean that the Reformation Coalition would persecute known clones. Once existing, a clone deserves all rights belonging to a sentient being. However, the Coalition seeks to prevent and would do away with the practice of producing further clones.

Humanity: Citizens of the Reformation Coalition do not use the Imperial-style spelling "humaniti" as a collective noun for all groups of *homo sapiens*. The creation of separate words for the quality of being human (humaniti) and the quality of being humane (humanity) is believed to have been one of the basic corruptions of the Imperial spirit. Using the ancient spelling for both concepts conveys the belief that human and humane nature must never be separated.

RC citizens also profess to not recognize the nouns Solomani, Zhodani, Vilani, etc., for similar reasons. The Imperial codification of divisions (as exemplified by these words) rather than unity is also seen as a cause and symptom of its ultimate murderous collapse. However, the words are far too useful to discard completely, because of their ability to describe astrographic and governmental realities. In practice, Reformers attempt to use these words solely as adjectives (Zhodani government, Vilani history), but not as nouns, preferring the terms "human" or "person."

RCES: Reformation Coalition Exploratory Service (see page 87).

Reformer: A citizen of the Reformation Coalition.

First, many components of Star Viking ships are either manufactured in the Hive Federation or are derived from Hiver designs. The Hiver tech reps are able to provide expert advice and assistance in maintaining and repairing these systems. Second, and more important, the Hivers are able to help analyze the broken and derelict technology found in the Imperial ruins. Although the relic technology was created by humans, the Hivers are farther along in their own recovery, and therefore better able to interpret and manipulate the high technology that is found. They have also had much more experience in combatting Virus, and have many methods for diagnosing its presence in old equipment and preventing its spread. As the Hivers are also continuing to develop more Virus-resistant technology, the tech reps are often testing new antiviral equipment on these missions.

Within the chain of command aboard a Star Viking ship, the tech rep stands as an independent advisor to the ship's captain. The tech rep's advice is not binding on the captain's decision, but the Hiver can provide expertise and insight that any captain would be foolish to disregard.

There is usually only one Hiver in each RCES crew, but if there are any additional Hivers or Ithklur Marines, these all come under the direct command of the Hiver officer, not of the human captain. Hivers never accompany freelance missions, only crews and ships commissioned into the RCES.

STAR VIKING TIMELINE

There were many terms used for these early explorer/conquerors, including Reavers, Raiders, Scouts, etc. (My personal favorite was "Arses," from the verbalization of the initials of the Reformation Coalition Exploratory Service – RCES.) However, it was the term "Star Vikings" which stuck, probably because of its clear visceral effect. But the term was not chosen for that reason. It was chosen because of the Star Vikings' similarity to the original vikings of Solomani medieval history.

Both groups used their unique advantage – mobility – to strike at will among communities that were politically separate from each other and technologically inferior to the raiders. Both groups struck for value-dense (i.e., high value, and easily transportable) prizes. Both groups used surprise and terror to minimize their casualties, as the small raiding groups were always outnumbered by the lower-technology defenders. Finally, both groups eventually settled and colonized on the worlds they had been raiding, where they intermarried with the locals and integrated the dominant portions of their own culture with the local culture.

The Star Vikings most certainly did not wear horns on their helmets, or on any other portion of their outfitting (as they are portrayed in much current popular entertainment), a misconception which goes to show how absurdly literal-minded people can be.

Although the viking mental model is useful and apt as detailed above, there were certain crucial differences between the original Solomani vikings and the Star Vikings. The original Scandinavian vikings are thought to have been unlanded younger sons who either went abroad to seek their own domains, or were actually expelled from their communities by population pressures. The Star Vikings were not driven outward by pressures internal to their communities; rather, they became outward looking due to pressures internal to their own world-view. They explored for caches of technology that would improve the standard of living on their home worlds, and to expand the reach of their small interstellar society. When this exploration inevitably brought them into conflict with the many reactionary feudal technocracies, the Star Vikings reacted with revulsion. It was clear to them that no one was served by preserving an isolationist, repressive status quo, and they actively destroyed such arrangements. This destruction usually came in the form of relatively bloodless coups d'etat, as the feudal technocrats did not enjoy widespread popular support, and the general citizenry was, in any case, not sufficiently armed to put up much of a fight.

However, even when bloodshed did occur (and this bloodshed looms larger in the retelling than in the reality), the Star Vikings took the convincing view that in the long term, such "liberation" from isolationism and technological oppression were in the best interests of a world, indeed, of the galaxy as a whole. The Star Vikings believed that the Imperium must be re-created, but in a new form in which local myopia could not be allowed to impede or cripple the interstellar community. If, as they believed, each world had the duty to contribute to this interstellar destiny, then it was clear that no world had the right to remain locked in the past.

In light of this militant ecumenism, it might be argued that the correct medieval model for these pioneers is not the vikings, but rather the Crusaders.

Dr. Eneri Kuniholm
What's the Matter with You People?
A Historian Looks at History
Mora, Deneb, 1235

1192: Hiver contact/technical teams begin contacting isolated human worlds in Old Expanses. While many of these worlds have regressed to the point where they have lost memory of the Hivers and have no desire to be contacted, some have retained enough memory of interstellar culture that they accept contact, technical assistance, and technical training from the Hivers.

1193: Training of human starship crews from those with technical aptitude begins. Also heavily utilized are whatever "remnant[1]" humans can be found and revived from low berths.

1195: Tentative trade is begun among six worlds of the Old Expanses. As more starship crews are trained by other Hiver technical teams, trade continues to expand to more worlds.

1197: Small trading organization of 20 worlds centered in the spinward half of Old Expanses is formalized as the League of the New Dawn, shortened several months later to the Dawn League.

1199: First trading expeditions sent out from the Dawn League into Diaspora.

1200: All 12 ships of the first trading expedition are declared overdue and presumed destroyed. Armed expedition of six ships is organized to discover what happened to the missing ships. In rescuing the imprisoned crew of one of the trading ships, one of the armed expeditions inadvertently conquers a world, having destroyed the Technologically Elevated Dictatorship (TED[2]). The resulting liberated peasants are offered technical assistance, resulting in a permanent Dawn League station and local government.

Dawn League assesses the results of the armed expedition. All but one of the armed exploration vessels has successfully returned, and they bring news of the fates of the traders. Some were destroyed in interstellar combat, causes unknown, while the remainder were executed or imprisoned either by a xenophobic populace or by insular TEDs who did not want their privileged positions threatened by off-world contact. It was also found that all of these worlds contain relic[3] technology that would allow the more rapid rebuilding of society within the League. However, this technology is either deteriorating from natural causes or being actively destroyed or misused by the inhabitants, and must be recovered if it is to be of any value. This technology includes many spare parts for Imperial technology being used in the League.

Based on this information, the Dawn League restructures itself along more aggressive lines as the Reformation Coalition, with the goal of re-establishing interstellar society out to the limits of the former Imperial boundary. As the Hivers are still rebuilding their own society, there is only limited equipment available from the Hivers. Most Hiver assistance comes in the form of training, consulting, and advising, particularly in the area of computer technology.

The League establishes an armed exploratory/trading arm, called the Exploratory Service (RCES, Reformation Coalition Exploratory Service), usually referred to as simply "the Service." This organization opens planets to trade and development, and recovers relic technology. This technology is turned over to the RCES, which then trades it to Coalition companies or governments in exchange for support for its own operations. Much of these items are traded in large auctions on Aubaine, the RCES capital, in large, heavily attended events. These monthly auctions also become the occasion for large social events in the growing cosmopolitan Coalition. Other RC worlds begin to hold their own auctions, but none ever match the excitement of "*The* Auction" on Aubaine.
The RCES creates and maintains its own relatively small force of ships and crews, but because its operations always outstrip its assets, it typically hires ships to perform some of its missions.

1201: The New Era begins.

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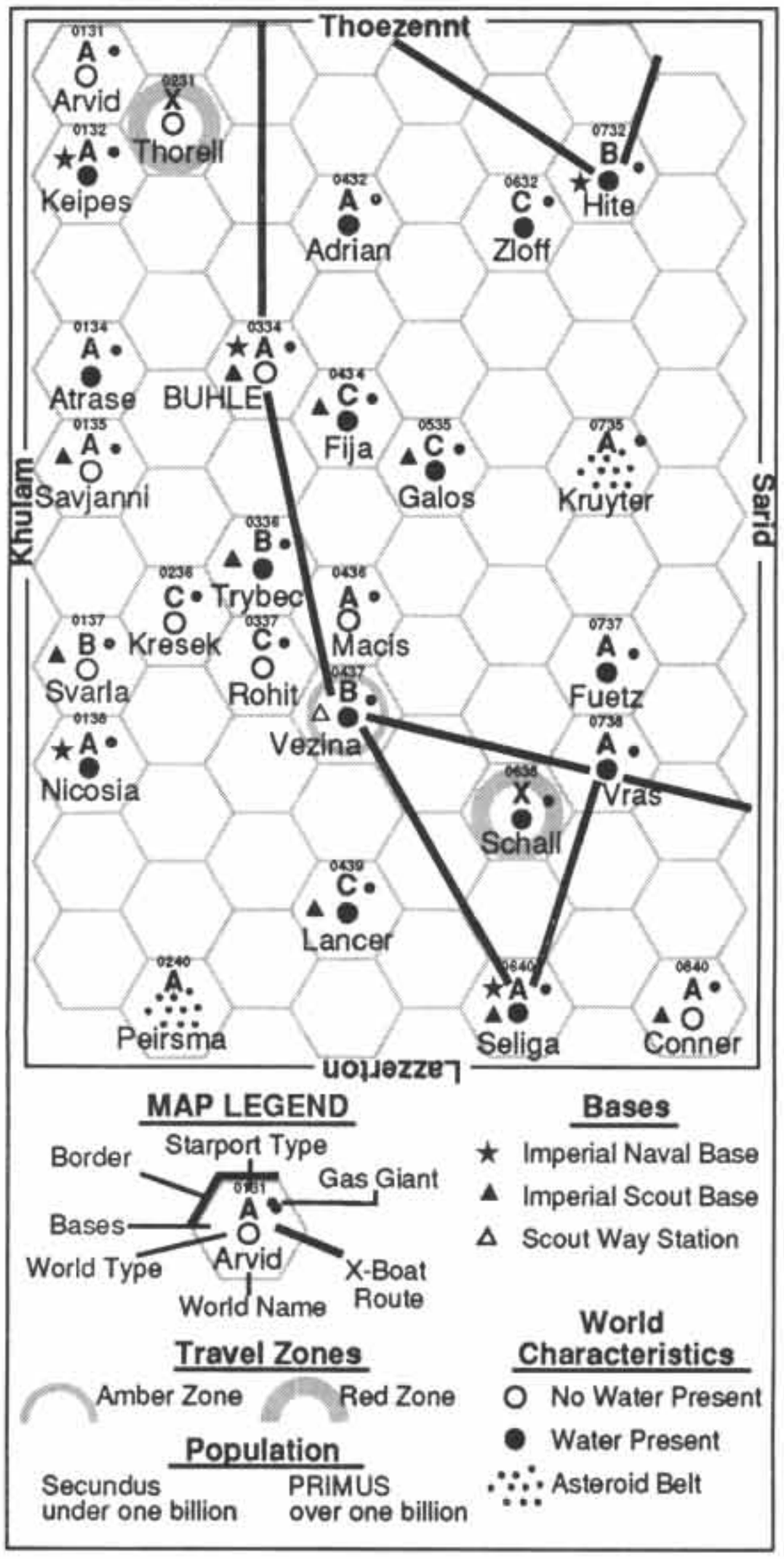
[1]remnant: any Final War-era humans who survived to the New Era (the year 1200 and after) by any means, whether low berth, anagathics, or simple long life, are known as remnants. This is as opposed to "relics," which refers to surviving Final War-era technology or equipment. Both words are used as adjectives and nouns.

[2]TED, or Technologically Elevated Dictator, indicates rule by a small group of persons whose power derives solely from their possession of relic technology well in excess of that possessed by the remainder of the population, typically 6 or more TLs above the sustainable level. This is distinguished from a true feudal technocracy in that there is not an interconnected system of groups trading technological services with each other, but rather one small elite which possesses equipment which cannot be reproduced, and often cannot even be maintained.

[3]relic: see note 1, remnant, above.



REFEREES

Information on this page should not be made routinely available to players who do not have access to pre-Collapse starcharts and navigational information. In many cases, it may require research to gain even this outdated level of information.

NICOSIA SUBSECTOR (SUBSECTOR M OF THE OLD EXPANSES SECTOR)

(Pre-Collapse data, circa 1117)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Arvid	0131	A9C7866-E		Fl	425	Im	K9 V M7 D
Keipes	0132	A6778BC-B	N		311	Im	F6 V
Atrase	0134	A68A357-C		Lo Ni Wa	315	Im	K3 V M2 D
Savjanni	0135	A330764-E	S	De Na Po	103	Im	K1 V M0 D
Svarla	0137	B200765-D	S	Na Va	201	Im	M3 V M4 D
Nicosia	0138	A56667A-C	N	Ag Ni Ri	411	Im	K4 V M2 D
Thorell	0231	X510276-0		Lo Ni	R720	Im	M6 V
Kresek	0236	C8C7675-A		Fl Ni	302	Im	M0 V
Peirsma	0240	A000646-D		As Na Ni	210	Im	M0 V
Buhle	0334	A51099B-F	A	Hi In Na	404	Im	K2 V
Trybec	0336	B443610-E	S	Ni Po	603	Im	K0 V
Rohit	0337	C110543-C		Ni	222	Im	M0 V M3 D
Adrian	0432	A42667A-E		Ni	103	Im	M7 V
Fija	0434	C553754-D	S	Po	605	Im	K1 V M0 D
Macis	0436	A8C5856-B	N	Fl	824	Im	G2 V M8D
Vezina	0437	B344778-F	W	Ag	A804	Im	F3 V M3 D
Lancer	0439	C55A657-A	S	Ni Wa	914	Im	K8 V M6 D
Galos	0535	C576664-9	S	Ag Ni	504	Im	F9 V K7 D
Zloff	0632	C674666-8		Ag Ni	302	Im	G1 V
Schall	0638	X47A113-5		Lo Ni Wa	R534	Im	G7 V M3 D
Seliga	0640	A532747-F	A	Na Po	801	Im	M0 V
Hite	0732	B4478A9-F	N		913	Im	K4 V
Kruyter	0735	A000475-B		Lo As Ni	203	Im	M2 V
Fuetz	0737	A267437-C		Lo Ni	304	Im	F1 V M7 D
Vras	0738	A78A773-F		Wa Ri	704	Im	G5 V
Conner	0840	A31058A-A	S	Ni	303	Im	M1 V

Notes

Bases: N is an Imperial Navy base; S is an Imperial Scout Base; D is an Imperial Navy Depot.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. If the Travel Zone digit is empty, it is a Green Zone; A and R indicate Amber and Red Zones, respectively.

Alg is the Allegiance column. Im = Third Imperium.

Nicosia Subsector: In 1117, Nicosia subsector had a population of 6.75 billion. Its highest population was 4 billion, at Buhle. Its highest tech level was 15 (F), at Buhle, Vezina, Seliga, Hite, and Vras.

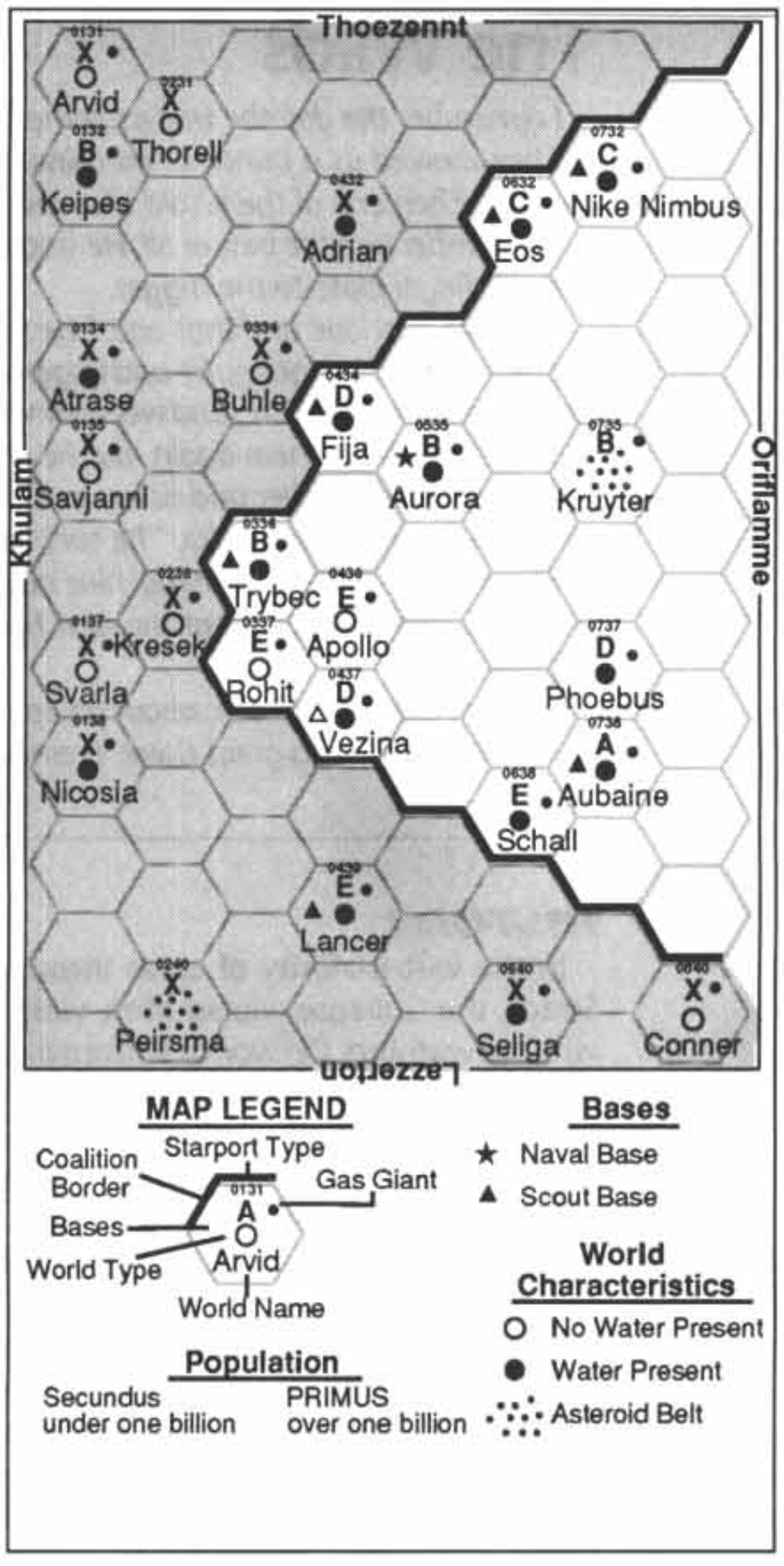
REFEREES

Players do not have access to the information below outside of the Reformation Coalition boundaries, but must gain it by investigating the worlds on their own, or by learning it from others who have already done so.

AUBAINE SUBSECTOR (SUBSECTOR M OF THE OLD EXPANSES SECTOR)

(New Era data as of 001-1201)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Arvid	0131	X9C7000-0		Ba Fl	025	—	K9 V M7 D
Keipes	0132	B677884-6			411	Na	F6 V
Atrase	0134	X68A212-4		Lo Ni Wa	515	Na	K3 V M2 D
Savjanni	0135	X330000-0		Ba De Po	003	—	K1 V M0 D
Svarla	0137	X200000-0		Ba Va	001	—	M3 V M4 D
Nicosia	0138	X56666D-3		Ag Ni	411	Wi	K4 V M2 D
Thorell	0231	X510000-0		Ba	020	—	M6 V
Kresek	0236	X8C7000-0		Ba Fl	002	—	M0 V
Peirsma	0240	X000000-0		Ba As	010	—	M0 V
Buhle	0334	X510000-0		Ba	004	—	K2 V
Trybec	0336	B443610-A	S	Ni Po	703	RC	K0 V
Rohit	0337	E110335-9		Lo Ni	222	RC	M0 V M3 D
Adrian	0432	X426000-0		Ba	003	—	M7 V
Fija	0434	D553754-A	S	Po	705	RC	K1 V M0 D
Apollo	0436	E8C5300-8		Lo Fl	424	RC	G2 V M8D
Vezina	0437	D344687-7		Ag	204	RC	F3 V M3 D
Lancer	0439	E55A746-7	S	Wa	114	Na	K8 V M6 D
Aurora	0535	B576646-B	N	Ag Ni	704	RC	F9 V K7 D
Eos	0632	C674656-B	S	Ag Ni	502	RC	G1 V
Schall	0638	E47A655-7		Ni Wa	634	RC	G7 V M3 D
Seliga	0640	X532000-0		Ba Po	001	—	M0 V
Nike Nimbus	0732	C447789-9	S	Ag	713	RC	K4 V
Kruyter	0735	B000312-B		As Lo Ni	303	RC	M2 V
Phoebus	0737	D267337-3		Lo Ni	804	RC	F1 V M7 D
Aubaine	0738	A78A884-C	S	Wa Ri Cp	804	RC	G5 V
Conner	0840	X310000-0		Ba	003	—	M1 V



Notes

Base: N indicates a Reformation Coalition naval base; S indicates a scout base.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. Because there is no longer a Travellers' Aid Society or other such watchdog group, there are no travel zones in the Wilds.

Alg is the Allegiance column. RC = Reformation Coalition.

The Na code indicates a nonaligned world. Such a world may exist within an interstellar community, but have no ties to it, or may be nonaligned because it has virtually no off-world contact. The Wi code indicates a world in the Wilds with a Wilds government type. The "—" indicator means that a world has no allegiance because it has no population.

Aubaine Subsector: The Aubaine subsector (renamed from the Nicosia subsector) has a population in 1201 of 1.38 billion, a decline from pre-Final War levels of almost 5.4 billion. The highest population is 800 million at Aubaine, and the highest tech level is 12 (C), also at Aubaine. Aubaine subsector is home to the Reformation Coalition and, earlier, the Dawn League, whose capital is at Aubaine.

The Wilds

I remember the day the traders came. Everyone came to watch, even the men working out in the fields.

They showed us a bunch of machines that I don't remember, but then they said we didn't have anything that they wanted. Then one of them said that maybe he could think of something, and they all laughed.

I remember him the best of all. He stood there holding a big gun in the crook of his elbow, pointing the barrel at the sky, with his finger close to the trigger.

"I'll take that one and that one," he said, nodding his head to indicate my sister and my mother.

The other traders got quiet and fingered their weapons, but all he did was flex the arm that held the gun. The traders had been through before, and we knew what their guns could do. If my dad had been there, I'm sure he would have made them demonstrate them again, but he was away hunting. I was too young to do much of anything except cry.

They took my mother and sister, and then the one with the gun gave us a machine that you could talk through. "We always pay for what we take," he said, and he smiled, but it wasn't a friendly smile.

The old men smashed the machine after they left. When my dad got back and heard what had happened, he just got quiet. He died in an accident the next harvest, but the other men said it was because he didn't pay attention to things anymore.

Some of the old men talk about going back to the stars, and the great things that are there. I'm going back too, but I know there's nothing great there. I remember those traders, and I'm going to find them. Then I'm going to kill them.

HISTORY

In the vast majority of cases throughout Imperial Space, the Collapse was sudden, violent, and utterly without warning. On worlds with environments maintained by artificial means, casualties were probably 99% within the first week. If small pockets of survivors managed to hold out past the first shutdowns by using emergency shoring equipment, it was only a matter of time before their supplies of food, water, and oxygen ran out.

On other worlds, the casualty curve was more gradual. Large cities suffered badly in the first few days of the Collapse. Air liners in holding patterns around large metropolitan airports flew into the ground, causing immediate ground casualties and starting large fires. The destruction at starports was often worse. The fires spread and burned out of control, the only light at night in cities rendered blind, deaf, and dumb by total global power and communication blackouts.

Military and police units were probably the first to regain a semblance of order. Hand-held and vehicle-mounted communicators were not part of the global net and were too small and stupid to be suitable hosts for Virus. Even then it took weeks to discover what had happened. Most thought that the world had been attacked by one faction or another of the Civil War, and many assumed that they had been invaded and occupied. But no occupation troops ever arrived.

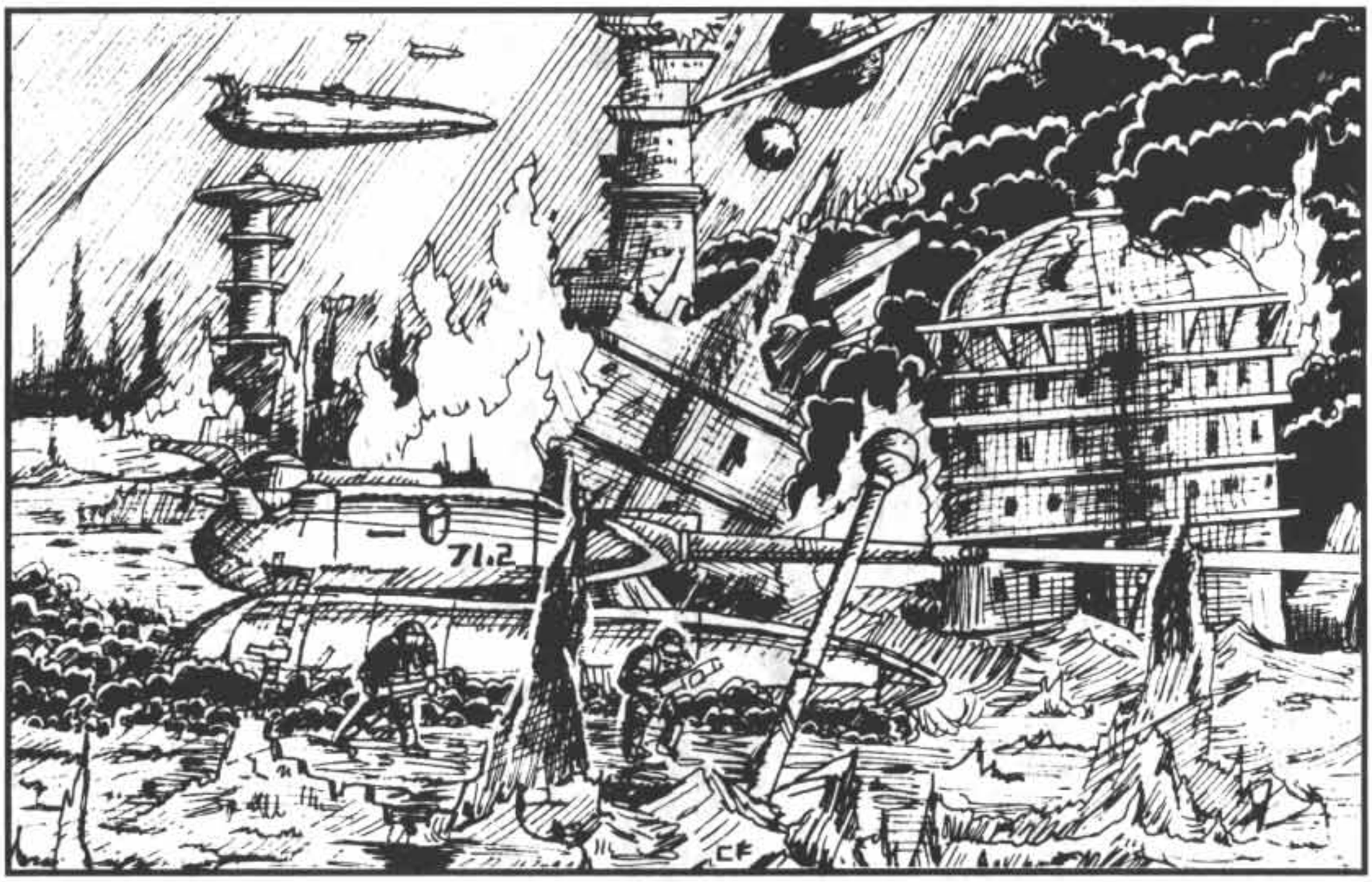
Gradually, a picture of the calamity emerged from the wreckage, but that picture was of very little use in rebuilding the world. No assistance came from other worlds of the Imperium; it was as if the world had suddenly become the last inhabited planet in the galaxy. For all the survivors knew, that was the case. Who was to say that other worlds had been able to survive at all? Where the occasional Free Trader had survived with transponders and computers so old or primitive that Virus could not gain access, contact with other worlds was possible, but the news provided little to be cheerful about.

The first step in rebuilding was to re-boot computers. When that didn't work, most rational plans for rebuilding were rendered obsolete, and some worlds never got beyond that step. Where the true nature of Virus was deduced or discovered by close examination of the circuitry of computers, the knowledge was of very little use. What was the solution? Remanufacture the core processors of the computers, every computer on the planet. How was that to be done? By the production facilities available on every world with a significant population and industrial base.

But all of those production facilities were computer-controlled. Even where the main computer could be bypassed, there was no way to manufacture chips by hand; computer assistance was essential.

The next step was to try to begin at an earlier stage and work forward. People had built computers without chips once upon a time; why couldn't they do it again? In some places they could. Old books on transistors and vacuum tubes were consulted, and low-capacity monsters were built laboriously by hand.

But on many worlds even this was not possible. Where the world had actually gone through that period, as on Sol/Terra, the books of that period were of historic and sentimental significance, and thus were preserved in museums. Where the museums survived,



the books, and thus the knowledge, survived. But most worlds had not gone through those periods of invention; they were colonized by people who had long since passed the microchip revolution. There was little need for data of events, times, or technology that never existed on that world. And so, when it existed at all, it existed only in memory banks, available to be printed out upon command. Now the memory banks were empty or corrupted, and the information was gone.

While all of this was going on, casualties mounted. Food distribution to the cities stopped as the transportation net went down. Stocks of food in the cities were reduced by looting and vandalism until authorities confiscated them and instituted a rationing system. Food deliveries from agricultural production centers were difficult to organize, but gradually the food began to flow into the city again.

Then fuel began running out. The crash of the power net had stopped industry as effectively as had the crash of the data net, and this meant a total reliance on batteries and combustible fuels (either hydrocarbons or hydrogen), but the means to mass produce these was gone, and the stockpiled reserves dwindled quickly.

Another problem with food distribution surfaced soon afterward, and this was a purely economic issue. With the factories silent, the cities had nothing to trade for food from the countrysides. Money lost its value. In many places, forced requisition of food was instituted, and fighting broke out between rural populations and the authorities. Even forced requisition could not have been effective for more than a single growing season, however, as agriculture on most highly populated worlds had become energy-intensive and technology-intensive. Energy (both in the form of fuel for machinery and fertilizer and plant nutrients for the growth medium) became scarce, and all but the smallest technological aids became inoperable. Food production plummeted.

Faced with certain death in the cities, urban populations began migrating to the countryside. Now the authorities fought alongside rural populations attempting to contain starving urban mobs and protect agricultural production areas. Some rural areas were overrun and looted, further reducing agricultural production. The combination of famine, disease, and violence continued to reduce planetary populations throughout this period. Cannibalism became widespread.

Up to this point, the pattern of decline on most worlds was similar. Where their individual stories differed was in how far they plunged from this point and by what means they halted the plunge. On some worlds the authorities were able to protect most of the agricultural areas and thus maintain a substantial food base to sustain the planet's population, reduced as it might be. On others, most organized agriculture ceased, central authority disappeared, and within a few years the small number of survivors was reduced to a hunting and gathering existence.

Most worlds fell somewhere between these two extremes, and developed a fragmented quasi-feudal society. The authorities (police and military) with operational armaments and vehicles protected the farmers in return for food. As those armaments and vehicles dwindled in number over time, the holders of them came to resemble more and more a feudal warrior elite. The principle economic activity aside from agriculture usually became salvage and trade in salvage, as there was little need to manufacture household items on a world full of the relics of a society which supported from 10 to 100 times as many people before the Collapse.

In cases where life has survived, it has been thanks



primarily to two things: environment and moderate population. Environment is simple: It means breathable air, drinkable water in large quantities, and conditions that allow the production of food without massive technological intervention. The effects of population were a bit more subtle, but no less decisive. The crucial number was between 1 million and 1 billion people, depending on the useful, arable surface of the planet. Too many people overloaded the carrying capacity of the land, resulting in massive, rapid die-offs. These die-offs spawned vicious wars over the remaining resources, killing more, and destroying most of the assets—equipment, transportation, food stockpiles—that could otherwise have been used to save the society. Too few people did not constitute a real breeding population, nor provide enough hands to provide for all of even a small society's needs. Generally, these incidental populations were technicians or scientists manning high-tech installations that were utterly dependent on outside support. In most cases, a pre-Collapse population of 1000 will have declined in the years since the Collapse, not increased.

In almost all cases, the trauma of the Collapse—both the terrible casualties it caused and the suddenness of its onset—left deep emotional scars on the survivors, and the societies they have built are a reflection of that trauma. Most of these societies are both xenophobic and technophobic to a greater or lesser degree.

XENOPHOBIA, TECHNOPHOBIA, AND THEIR CAUSES

Xenophobia is not a rational, sustainable policy; it is a disease. It is not a universalizable concept. Or, to explain it better, if the concept were universalized, there would be no existence at all.

Commodore Sean "Hammer" Lathrop,
Reformation Coalition Exploratory Service
NE 2

Xenophobia is the irrational, pathological fear of that which is different. Technophobia is the irrational, pathological fear of technology. Both conditions are endemic to the Wilds, and in some cases are the very cornerstones of post-Collapse emerging cultures. Although there are no "typical" social organizations in the Wilds, there are some typical attitudes, and these tend to be based on both xenophobia and technophobia.

Xenophobia makes it difficult, and often dangerous, to re-establish contact with many of these worlds. Undoubtedly, some of the limited number of ships that survived the Collapse did not survive their first encounter with some of these paranoid and hostile regressed

cultures, and are now silent monuments to the emotional power of the Collapse, their crews massacred and their controls and electronics ripped out.

On most planets of the Wilds, minority populations suffered even more than the majority populations, as those of different races were driven from the community or actively hunted down and killed. Usually this meant the nonhuman population of the world, but on the homeworlds of nonhuman races, it often meant the human population as well. Pockets of survivors still live on some of these worlds, although they tend to live in remote, inhospitable areas and generally live a very primitive existence.

Even on those worlds which have allowed some contact with other worlds through the Free Traders, suspicion of off-worlders runs deep everywhere but the starports, and even there occasional angry mobs or lone fanatics will attack space crews. Often off-world contact is a passionate political issue, sometimes even sparking acts of terrorism or open revolt against the central government.

One unfortunate dynamic helps to fuel xenophobia, and that is the portion of Free Traders that has adopted the procedure of part-time piracy. Xenophobia has required the surviving Free Traders to exercise great care when dealing with the planet-bound inhabitants of the Wilds, and to deal from a position of strength to avoid lynching by local xenophobic mobs. In some cases, individual groups of traders have gone beyond this reasonable caution to cruel and casual contempt of the locals, which allows such routine brutalities as murder and the taking of slaves. Worlds regularly visited by such traders have their worst fears of off-world contact confirmed and reinforced on a regular basis, and their hatred grows.

Given the extent to which pre-Collapse society was dependent on technology, and the extent to which that dependence led to a calamity of monstrous proportions, a certain caution concerning excessive reliance on technology is both sane and prudent. On most worlds in the Wilds, however, it is carried to pathological extremes, hence the term *technophobia*. The most common manifestations of this mental illness are feelings of revulsion toward technologically sophisticated devices and people who willingly associate themselves with such devices. In some societies this revulsion is so strong that it manifests itself as violence, with priestly classes ritualistically "killing" discovered pieces of technology and those who are found to have used them.

In other societies, this fear is somewhat more selectively applied to data-processing equipment. In some cultures, elaborate theological frameworks have grown up connecting the Collapse to a variety of apocalyptic prophetic writings in different religions, and thus equating Virus with supernatural, and usually evil, characteristics.

However, it would be a gross mistake to think that everyone in any society thinks exactly the same way. In the most religious societies in history, there have been atheists; in the most close-minded societies, there have been skeptics. Society can exclusively provide its side of reality, but for people with naturally inquisitive minds this one-sided presentation often serves only to excite their curiosity.

Frallsord, a Case Study

Frallsord (0516 Old Expanses) was typical of the 61 high-population worlds of the populous Old Expanses Sector in that some form of technological assistance was necessary to allow a large concentration to live in an environment that could not normally support such numbers. In many cases, the problem was a nonexistent or poisonous atmosphere. In Frallsord's case, it was insufficient land area for its tens of billions. The technological solution was to fit the populace into exquisitely engineered mile-high arcologies, floating and dome-covered underwater cities, and grav-powered flying cities, thus freeing up the land for food production.

When Virus came to Frallsord, the tragedy was as agonizingly slow as it was unstoppable. The first casualty was the orbital starport which entered the atmosphere one summer evening, lighting up the sky the world over, shedding huge molten lumps of debris, and incinerating its 100,000 inhabitants. Then, one by one, flying cities fell from the sky; arcologies turned the wrong way into high winds, and with a shrieking of failing structures, bowed and snapped. Sea floor cities were flooded and crushed; orbital weather-control satellites stirred up hurricanes; floating cities drifted into arctic seas, opened their seacocks, and sank. And there was nothing anyone could do. The countryside could not support the teeming masses that began to flood it, and the starships that might have evacuated the doomed populace arrived carrying only more Virus strains. It was small cruelties that were the most horrific: arcology lifts plunging their passengers to their deaths, automated grav bus and taxi systems rammed into mountainsides, power surges that killed by electrocution and fires. After a few days of this, there was no one on Frallsord who did not passionately believe that the entire universe had become suddenly and hideously evil, and that every machine on the planet was cunningly plotting to kill them, *personally*. Some scars do not heal. Some scars do not allow trust to ever grow again. Some scars are carried from generation to generation.

Of course, Frallsord was lucky. Technophobes are at least alive. On Frallsord, there was breathable air and drinkable water for the people who survived the flight to the countryside. On many of the other high-population worlds of the Old Expanses, such as Clersor (0413), Buhle (0334), Vard (0714), Inftow (0817) and dozens more, the people just died. By the billions.

SPACE TRAVEL

There are effectively no surviving shipyards in the Wilds. All starships in service (and there are not many) were built prior to the Collapse, in most cases many years prior to the Collapse. The average age of starships in service in the Wilds is about 110 years. Typical wear value is 1D6 plus 4 (see the Maintenance section, page 241).

There are a number of scattered repair facilities still working, and starfaring ships in a sector or subsector will, sooner or later, congregate here for repairs or annual maintenance. When these facilities are on a populated world, that world or its rulers tend to have a much higher standard of living, since they have something the spacers need. They are at the best end of the trading exchange, and the trading markets around the starport show a barbaric opulence.

Where the facility is on a low-population world or in deep space, the wealth is more concentrated. Although the rules inside these stations are fairly lax, and behaviors are wild, the stations are well-armed, and the owners (usually a consortium of merchants) have armed guards to protect the vitals of the facility and deal with anyone whose behavior becomes too destructive.

SPECIAL WILDS CAREERS

These two careers are specific to the Wilds, but may not be present on every world in the Wilds. At the referee's discretion, player characters with Wilds homeworlds may use the following two careers for character generation. Skill clusters are **bold**; cascade skills use *italics*; normal skills use normal type.

Pre-Industrial University

Universities on Pre-Industrial worlds can serve two purposes. One is to preserve pure knowledge and excellence of thought, and another is to pass on the knowledge of how to operate relic technology. The former tends toward an openness, as pure knowledge belongs to everyone. The latter tends to secrecy and exclusivity, as relic technology is rare and must be protected and preserved for the use of the elite. On many worlds, this knowledge is passed on by rote, and those who possess this knowledge are treated as priests possessing revealed knowledge of the magic of technology. Those who are trained to preserve the knowledge of high-tech weapons are seen as the equivalent of warrior priests or military monastic orders.

The referee will inform players whether the university available to them is a pure knowledge (Group A) or technical priesthood (Group B) type. Characters only use the effects listed below for the type of university they are attending. Group B allows the Pre-Industrial tech limits on allowable skills to be overridden up to some portion of the world's pre-Collapse tech level, at the referee's discretion.

Prerequisites:

Group A: Education 5+, Tech = Pre-Industrial, Homeworld in Wilds.

Group B: As above, plus SOC 10+.

Skills: Total skill levels equal to character's Education attribute from any combination of the following, but no more than level 2 in any one skill:

Group A: Biology, Chemistry, Farming, History, Instruction, Interrogation, Interview, Map, *Medicine*, Meteorology, *Music*, Navigation, Physics, Persuasion, Psychology, Research.

Group B: Act/Bluff, **Artillery**, Communications, Computer, Electronics, Environment Suit, Excavation, Grav Belt, **Gun Combat**, **Heavy Weapons**, Instruction, Mechanic, Recruiting, **Vehicle**.

Contacts:

Group A: Two per term, academic.

Group B: One specialist (skill level 4) in one of the areas listed above.

Other Effects:

Group A: All students automatically receive a skill of 10 in written Galanglic. On many worlds, this is a rarity among a largely illiterate society. Graduates have a degree in the Liberal Arts. Group A pre-industrial university may be taken for more than one term.

Group B: All graduates receive an automatic commission in the technical priesthood (see below) and a skill level of 10 in written Galanglic. Group B pre-industrial university may not be repeated.

Technical Priesthood

This is the profession which retains the (sometimes corrupted or incorrect) knowledge of the operations and maintenance of relic technology. This profession is exclusive and insular, and usually endeavors to maintain a frightening mystique about itself to keep the peasants at bay and maintain their power without having to actually use the technology, much of which has long since broken.

Note that no technical skill may be received at more than two skill levels per term; Computer skill can never be received at more than one skill level per term.

Prerequisites: Education 5+, Tech = Pre-Industrial, Homeworld in Wilds.

First Term

Commission: Roll 2D6 for 10+, DM +1 if EDU 7+, DM +1 if SOC 10+. Group B pre-industrial university receives automatic commission. A commission makes the character a priest; all other characters are acolytes.

Skills:

Priests: Act/Bluff 2, *Armed Martial Arts* 1, Computer 1, Electronics 1, **Gun Combat** 1, Instruction 1, Leadership 1.

Acolytes: Armed Martial Arts 2, Recruiting 1, Service 1, Streetwise 1, Unarmed Martial Arts 1.

Subsequent Terms

Commission: Roll 2D6 for 7+, DM +1 if INT 8+, DM +1 if CHR 8+.

Skills:

Priests: Act/Bluff, Computer, Electronics, **Interaction**, **Melee**, **Perception**, **Vice**, **Vehicle**.

Acolytes: **Archaic Weapons**, **Charm**, **Crime**, **Melee**, **Vice**.

All Terms

Special Assignment: 8+ for **Archaic Weapons**, **Aircraft**, **Artillery**, Computer, **Gun Combat**, **Determination**, **Heavy Weapons**, **Interaction**, **Perception**, **Vehicle**, **Vessel**.

Promotion: Roll 2D6 for 6+, DM +1 if CON 7+.

Contacts: One government and one specialist contact (skill level 4 in one of the areas listed under pre-industrial university Group B skills, above) per term.

Other Effects: Add +1 SOC for each term served.

Repair facilities have sprouted numerous entertainment establishments catering to the tastes of Free Traders crews, and there are also cargo exchanges and active markets for goods, parts, and labor. Slavery is not unknown, and in many places has become a major institution.

Many Free Traders are family-owned, with the crew often consisting of siblings and their spouses. Hirelings are temporary, although the relationship can become permanent if a marriage with a family member results. Other ships are owned jointly by the crew, with new crewmembers buying into the ship by buying out older crewmembers, who then usually retire to a starport where they run a maintenance or entertainment facility, or, if less successful, work in one. Only a very few ships have a single owner.

The social structure which has built up around the Free Traders is completely different than that found on any world and tends to set the traders apart from others. Retired spacers tend to live and work near starports for the companionship as much as anything else; they are only really comfortable around their own—other spacers.



SOCIETY

The tendency on most worlds following the Collapse was toward social fragmentation. Central authority broke down very quickly, and was replaced by local authority. Governments exist mostly to deal with other governments. Once people's worldview changed from a galactic perspective to a single-planet perspective, global governments became irrelevant and obsolete. Most worlds in the Wilds are balkanized, divided into a number of (often hostile) nations, regions, or tribes.

On most worlds in the Wilds, there is a clear distinction between the "haves" and "have-nots." There are usually some artifacts of pre-Collapse technology, and possession of these artifacts virtually guarantees a much higher standard of living. If the artifact is some sort of weapon, it allows domination and exploitation of those who do not have similarly advanced means of defense. The Reformation Coalition has adopted the term Technologically Elevated Dictatorship (TED) to describe societies in which a ruler or ruling class holds power through use of such artifacts.

These governments are seldom very popular, and the fact that they hold power through technology tends to increase technophobia among the general population, making subsequent reintegration into galactic society that much more difficult.

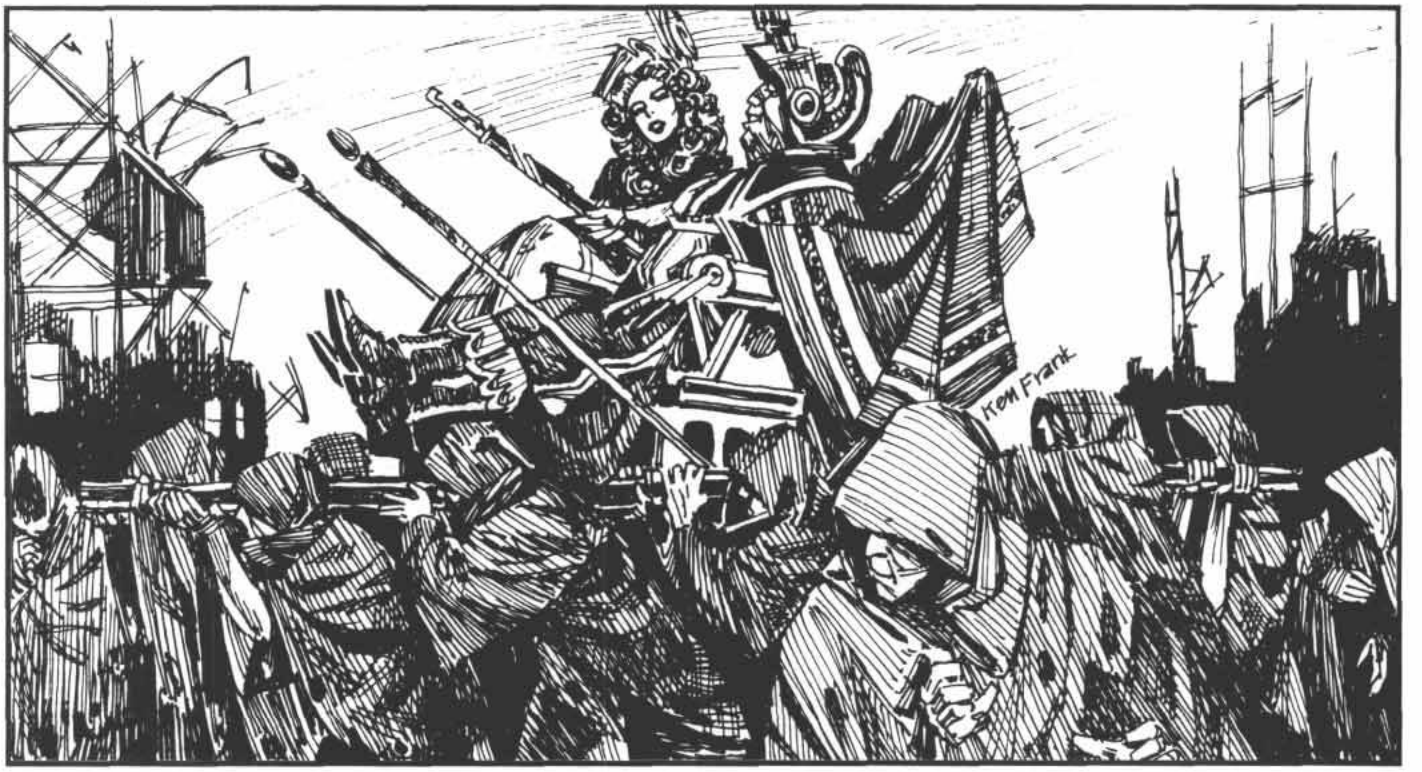
On some worlds, the Collapse was so great that few technological artifacts survived, and on others the wave of technophobia which followed the Collapse destroyed enough of the technological base that a TED was not possible. These worlds, however, are generally very primitive and have little in the way of government above the local tribal level. Literacy is limited or nonexistent.

Seventy years is, historically speaking, a fairly short time, and although an event as great as the Collapse can effect profound changes, it takes time for those changes to run their course. Societies in the Wilds have not yet completely stabilized and are still in a process of rapid evolution. Even worlds with TEDs and open contact with other planets have regions not under the control of the feudal warlords, and even worlds with fairly sophisticated cultures also have areas that are very primitive and not yet reintegrated into the rest of the world's society. A planet is a very big place.

PSIONICS

The Psionics Institute was still an underground organization when the Collapse came, and that turned out to be a mixed blessing. On the positive side of the ledger, the organization was dispersed enough, even on each world, that it could survive considerable losses. It was set up so that even a series of major raids would not completely destroy the organization, and so working fragments of the Institute survived on most worlds.

On the negative side, however, was the fact that psions were not accepted members of society, but rather were criminals suspected of treason and other



antisocial activities. In many cases, these suspicions were true, as generations of persecution at the hands of government and society had driven the Institute to turn to criminal activities to support itself and encouraged it to resist and undermine the government at every opportunity. In the wave of xenophobia that swept the populations of the Wilds following the Collapse, psions were often singled out for particularly brutal treatment.

Seventy years after the Collapse, the position of psions and the Institute is different on virtually every world, and often varies from region to region on the same world. The following list of common outcomes is by no means exhaustive.

Shaman: On many primitive worlds, psions enjoy the position of shaman, or wise man, in the tribe. Psions remember enough of their training to be able to test for psionic potential in other members of the tribe and train a successor, thus perpetuating the system. Where literacy has been lost and society has reverted to an oral culture, the origin of these powers is often forgotten or corrupted beyond recognition by even the shaman.

Wizard: On other worlds, psions are believed to have supernatural powers, often of a sinister nature, and are called, wizards, witches, warlocks, necromancers, or any of a variety of similar names. Sometimes they are hunted down and killed. In other societies, they live apart, feared but tolerated. In other cultures still, they are active members of the society, serving as court wizards or making a living by simple tricks or genuine services.

Psionic Dictatorship: Just as warlords on some worlds have elevated themselves to power by virtue of technological relics, on others psions have seized control using their native powers. Usually this happened where the Psionic Institute had a particularly militant antigovernment program before the Collapse and where the Collapse left the Institute comparatively intact. Here careful planning allowed the psionic underground to select the moment when the government was most vulnerable and seize power in a *coup d'etat*.

These governments seldom practice the enlightened despotism found in the Zhodani Consulate. The small number of psions relative to the general population, and the reluctance to spread power and privilege among a greater number, mean that there are insufficient telepaths to practice the widespread therapy that makes Zhodane a happy, homogeneous culture. Instead, random patrols by telepaths attempt to ferret out antigovernment plots, and then troops of police make arrests and executions.

Local resistance movements are hampered by imperfect understanding of the strengths and limitations of the powers of their psionic masters, but have gradually developed limited means of resistance. Clandestine meetings are held near electrical generators, the surrounding electrical field serving as a reasonable psionic

shield. Before anyone is initiated into the secrets of the resistance, they are taught how to hide their thoughts by concentrating on other subjects.

Psionic Underworld: Where psions have remained underground, they have sometimes survived by taking over the organized criminal underworld. On many worlds this had already happened before the Collapse; on others it happened afterward. In both cases, the criminal organizations are exactly as ruthless and brutal as those found anywhere else in the galaxy. The only difference is that the senior leaders are mostly psions, and use their psionic talents to maintain control of their organization and facilitate criminal activity.

The Old Institute: Despite the tremendous changes that have taken place, sometimes the Psionic Institute exists largely unchanged, serving to promote psionic education and awareness with few ulterior motives, and a political agenda tailored largely to making the Institute more secure. Where sentiment runs violently against psions, the Institute may be covert and underground; in other areas, it may have a more open and legal status.

Newmen: A significant number of psions believe that they are the next step in human evolution, often referring to themselves as *Homo psionis*, as distinct from *Homo sapiens*, other times calling themselves Newmen or some similar variant. That there are no measurable physiological differences between psionic and nonpsionic humans, that the two are completely interfertile, that in fact there has never been a convincing proof that psionic talent is even passed on genetically from one generation to another, will not dissuade them from their belief. Scientific evidence, they will claim, has been deliberately falsified to hide the truth.

In some cases these psions are harmless cranks; in others they are dangerous fanatics. Many of them hold that, as they are representatives of a superior species, they are not bound, either ethically or morally, by the laws of an inferior species. Over time they are often able to convince themselves that taking a nonpsionic human life is no different than a human taking the life of a lower animal, and eventually begin displaying dangerously sociopathic behavior.

VIRUS

Most strains of Virus died out after a single generation, and so it is uncommon to find active strains of it anywhere. However, of all the regions of human-settled space, surviving Virus is most common in the Wilds. This manifests itself in several different forms, which are discussed in general terms below. Consult the Virus section beginning on page 74 for a more complete understanding of the life cycle and various strains of Virus.

Vampire Fleets: Vampire fleets are groups of ships in which the computers are infected with a nonsuicidal strain of Virus. These fleets are almost invariably homicidal, but those which have survived this long have done so by being selective about who they kill. Ships' computers do not have hands with which to maintain systems; human crews are needed for that, and so vampire fleets usually have captive slave crews. Sometimes these crews are the survivors of a world devastated by the fleet; in other cases they are "sacrifices" offered by a world to the fleet to avoid devastation. (Note that some primitive cultures worship vampire fleets.)

As Virus is alive and self-aware, the strain infecting a vampire fleet will continue to attempt to reproduce by seeking out other computer systems. However, many remaining vampire fleets are no longer jump-capable, and instead are locked in a single star system, waiting for a jump-capable ship to arrive so that it can be captured and infected or, failing this, destroyed to keep it from spreading word of the existence of the fleet.

Slave Worlds: On a very few technologically advanced worlds, the main data net was infected by a nonsuicidal strain which was also not completely homicidal. On these worlds, the computer has kept at least part of the population alive and taught them to serve/worship the computer, or planet, or whatever manifestation the viral strain perceives itself as. (See the sample adventure "Idol Dreams," page 153, for a detailed example.)



Sentient Robots: Robots with sufficiently elaborate memory and processor units to serve as viral hosts were infected and gained genuine self-awareness. The majority of these viral infections were suicidal and simply destroyed the host, but a few mutant strains were not, and some of these are still operational. Some of these sentient robots are part of vampire fleets, but only rarely in sufficient numbers to render human crews irrelevant. More often they are found on planets, sometimes roaming the rubble of destroyed cities, other times actually active in human society.

Although mobile robots do not have the mental capabilities of larger computer nets, they do have some reasoning capacity and have the same need to understand their environment and their relationship to it as do other sentient beings. This manifests itself as a variety of behaviors which humans would label neurotic or psychotic, but all are simply attempts to make sense of creation and the individual's place in it. Some example belief structures and behaviors are presented below, although this is not a complete list.

God's Will Be Done: God's clearest manifestation is creation, specifically the creation of sentience capable of recognizing the existence of creation. Since Virus created sentience in machines, Virus is a clear manifestation of creation, and thus an Act of God. Furthermore, since Virus tore down the institutions of organic sentience, God's Will must be for inorganic sentience to take its place as the supreme sentient force in the universe. This particular belief structure leads sentient robots to treat organic sentients as inferiors, and depending on the exact nature and degree of the belief, will show itself as anything from arrogance to a cold willingness to kill any organic life which interferes with it at all.

God is Good: God's clearest manifestation is creation, specifically the creation of sentience capable of recognizing the existence of creation. Since humans created Virus and thus brought sentience to machines, humans are manifestations of God's Will, and are to be adored and venerated. This belief structure is rare, but is naturally most common among robots who regularly interact with humans. Robots which think like this will sometimes dedicate their lives to serving humanity as a whole, while some robots latch onto a particular human and exhibit undying loyalty to him or her.

Existence is Hell: There is no meaning to existence, and sentience merely allows a being to perceive the meaninglessness of existence, thus bringing endless torment. Humans, in their selfishness, brought the curse of sentience to machines, and for that sin have to be punished. This is a common belief structure found in homicidal robots.

Life Is Precious: Sentience and self-awareness are the greatest manifestations of existence. There is no value to existence beyond awareness, and so awareness and life must be preserved and nurtured in all cases. Robots with this belief structure tend to be very passive and very protective of life, particularly sentient life, but also animal life and even plant life. They also display a fascination with organic life combined sometimes with severe envy for organic beings—a revulsion with their own form, which they consider "unnatural."

IMPRESSIONS OF A PLANET IN THE WILDS

The following passages are excerpted from the debrief transcript of Marana "Fanny" Fanstittle after her covert first-contact mission to Montezuma in the Wilds. Montezuma is one of the more advanced worlds encountered, as it has a central government and a limited number of armed spacecraft. These characteristics are not typical of planets in the Wilds, but much of the rest of its social and economic organization has traits common to many found in this region.

A Naval Vessel

"All the ships operating in the Wilds are in various states of disrepair, but I have seen some relics that were so lovingly maintained that they looked almost new. As the *Falcon Rampant* is the largest active combat vessel in Montezuma's lists, I expected something along those lines. I was wrong.

"First Impression: the smell of fresh paint. The airlock area had been freshly painted, but very poorly so. Paint had been layered over everything. These old *Gazelles* all have a clear window in the door to the emergency vacuum rescue gear locker by the main airlock hatch. Here it was painted over, and the door appeared to be painted shut. Fire extinguishers were painted into their holders; no telling how old they were or when they'd last been charged. Conclusion: Priority is on cosmetic ship-shaping for consumption by bigwigs with no clue.

"Once we got away from the airlock and into the crew's quarters, I started smelling urine and old sweat. Crew looked unkempt, but tried very hard to look sharp, create a good impression. It was almost pathetic how hard they tried. I've always noticed that our crews give you the impression of relaxed competence, and do it by being sure enough of themselves that they don't even care what sort of impression they give you. These kids were very unsure of themselves.

"The officers were arrogant, but seemed technically competent. I can't say much for their leadership skills, which were authoritarian to the point of brutality, but they seemed to know the technical systems fairly well. I suspect that this is necessary, as their crew seems very poorly trained and motivated.



"For all the willingness to punish the crew at the slightest provocation, discipline seems lax. Management is by exception, and the crew seems unsure of what is expected of them until they get a lashing, verbal or otherwise, from an officer for some mistake. Morale is very poor. I had to keep reminding myself that this was probably the best ship in their top service, that these men were the cream, not the dregs.

"I saw two different types of work stations: those that looked well maintained and those that were in use. The stations I saw in use looked patched together. There were sticky labels on some of the actuators, some of which read, "DO NOT TOUCH," odd-sized switches and lights used to replace worn-out components, and lots of evidence of electrical bypass work, including some cable bundles hanging down below console level. Lots of maintenance panels were permanently removed, suggesting that they have to get in there and fiddle around a lot.

"The stations not in use, on the other hand, looked perfect, if a little dusty. I'm convinced that they were completely nonfunctional. Based on that assumption, *Falcon Rampant* is SDB-capable only, and even that is questionable. Her jump stations have not been manned for some time, and her central fire control station also appears to be inoperable. All fire control is probably handled at the turret work stations (although I was not allowed to see them). Also, the only active sensor in evidence was radar, and the bridge work station had a poorly installed radar monitor in place of the full EMS array readouts normally found there.

"The entire time I was on the ship I saw no evidence of damage control training and very little equipment. Quicktemp hull patch material and emergency oxygen gear was not in evidence, and most of the damage control lockers that would normally have contained it were converted to other uses: one was a magazine and newsfax rack. Those few lockers still marked as damage control may have contained the necessary equipment, but they were padlocked shut.

"There were also very few vac suits, and all of them were concentrated near the work lock. It will take *Falcon Rampant* a very long time to get her crew to pressure-safe general quarters, so long that I doubt that they even have any plan or SOP to do so. That means that one hull puncture will throw the crew into a panic to get to the nearest vac suits and immediately (if temporarily) render the vessel combat ineffective.

"My overall impression is that *Falcon Rampant* is not combat-capable in any but the most rudimentary sense of the term, and that this level of system operability and crew readiness in our service would cause the ship to be immediately removed from operational status as a hazard to navigation."

Windscatter-Down

"Montezuma had an orbital starport once, but now it's junk. Its computer opened all the docking bays and air locks at once and blew the crew out into companion orbits. *Falcon Rampant*'s pilot told me they sent a salvage team up into the station about seven years ago, and they never came out. No one's tried a second time. No volunteers, I guess.

"The only decent ground facility is Windscatter-Down, which sounds a lot prettier than it looks. The old core of the port facility is reasonably intact, if a bit threadbare. Most of the old yards are closed up, but the machine shops still can manage rebuilds and cannibalizations, and even fabricate the occasional component. Most of the maintenance bays have been converted to long-term storage, full of sad old broken-backed ships waiting to have their guts ripped out to patch up some

other antique only a couple years away from the scrap heap itself.

"The landing hardpads are all surrounded by blast containment berms, some of which look fairly well-used. Safety is preached here more than it's practiced; the intent is present, but the know-how is lacking. Most of the traffic is IP slowboats shuttling relief crews or supplies out to the mining colony. Ore comes back by magnetic sling and deadfalls through the atmosphere; the light show can be pretty good on a busy night. The occasional starship that makes planetfall always creates a sensation.

"The area around the starport grounds is a rambling jumble of buildings of all sizes, shapes, and conditions. Many of the pre-Collapse buildings are still standing, although there must have been some pretty spectacular fires, and at least one skyscraper came down and flattened about six city blocks. There are no pre-Collapse wooden structures, but lots of the pre-stressed concrete building shells are still there, often with completely new guts.

"Everything is dirty. Lots of the buildings are constructed from rubble and salvage. Nothing is used the way it was originally intended. What were once broad avenues are now narrow and winding, as the shacks and merchant stalls have grown out of the old building fronts.

"The area closest to the starport grounds tends to be the main commercial center, with a healthy sprinkling of vice establishments as well. The port district gets pretty wild at night, and it's active all day long. Open air markets sell vegetables in the early morning, sprout little braziers and cooked food stalls by midday, and polymorph into textile and household goods emporiums in the afternoon. Luxury goods are more in evidence at night. Ship cargo auctions are strictly afternoon affairs, and there is a lively, if completely unorganized, commodities market surrounding incoming ore, outgoing bulk goods, and everything in between.

"For all its dirt, noise, and poverty, I found myself liking the place, perhaps because of the people. They are survivors, but that's true of anybody still alive, isn't it? I think I liked these people because they are *cheerful* survivors. They've given this rubble heap a vitality you don't see much outside the Coalition."

The Brotherhood

"All of the worlds out in the Wilds that have established a fairly stable existence have created some sort of social mechanism that enables them to cope with the present and come to some sort of peace with the past. Montezuma has taken a fairly common mystic/spiritual route, with a formal priestly class that serves as an insulating layer between the society and any sophisticated data-processing equipment. On Montezuma they call themselves The Gnostic Brotherhood, although theologically there is no significant link either to ancient Sol/Terran Gnosticism or the Neo-Gnostic Revival of the early Third Imperium.

"In fact, the Brotherhood claims not to be a religion at all, as it does not single out a deity to worship, leaving that sort of religious observation (within limits, apparently) to the individual brethren. Instead, the Brotherhood espouses a philosophy of life and its relationship with knowledge, and so in this respect it is more similar to ancient Confucianism than to any of the mystic religions of the Sol/Terran eastern Mediterranean basin.

"That distinction notwithstanding, The Brotherhood, in fact, fills the niche which in many societies is filled by a strong central church. It is highly structured, and initiates pass through a series of stages of service and education from the novitiate to the highest ranks of the church. Its influence is omnipresent in Montezuma's society. Not only is it intimately involved with operation and retrieval of data processing artifacts, it also carefully monitors the restricted trade in these artifacts, and carefully inspects incoming cargo for possible contraband.

"Furthermore, the daily material support of the brethren requires a considerable lay economic organization, which further intertwines church affairs with the everyday life of the citizenry. The Brotherhood is exempt from taxation and has no taxation power of its own, which is fairly common in arrangements such as this, but it does have numerous economic monopolies (of which data processing is the most obvious and important), and has acquired additional lands and commercial concerns over time.

"The brethren wear long flowing robes with voluminous hoods which are invariably worn over the head when in public. These robes are white or off-white with a stylized printed circuitry pattern in black embroidery around the hems. Court ceremonial robes of the higher ranks have precious and semi-precious stones embroidered into the pattern, but I have never seen these worn on the street. Although the hood is open in front, the face is effectively hidden in shadow, and this lends an air of anonymity and mystery to them, which is almost certainly intentional. This anonymity also makes it difficult to estimate their numbers. It is unusual to see more than one group of two or three brothers at a time, but the sight of one such group is very common, particularly in market places.

"The brethren are often, but not invariably, accompanied by armed church guards. Although I did not find out a great deal about these guards, it is my

understanding that they, or at least their officers, are consecrated ecclesiatical warriors, similar to Knights Templar of old. From all accounts they are quite effective, although they have probably never had to deal with anything more serious than an angry crowd.

"What do the brethren do? Computer programing, microprocessor repair, and general data ops, but usually accompanied by at least a little ritual BS to keep the yokels impressed. Viral cleansing is another specialty, and all incoming microprocessors have to go through that ritual. I managed to get permission for my first officer to see one (couldn't manage it for myself as this is a no-girls-allowed club), and from his account it's fairly creepy. If they really believe all the stuff they go through in the course of the exorcism (which is exactly what this is), then they have a *very* imperfect grasp of how the natural world works. Nevertheless, the ritual interrogation they subject the computer to is a very clever diagnostic which works (or has so far) in identifying Virus. When they find it, they physically burn the infected chips right out of the matrix, and pretty much cannibalize the rest of the system. Crude, but effective."

The Nobles

"Montezuma has most of the characteristics of a classic Technologically Elevated Dictatorship, with a noble class grown out of the old ground forces command and feudal territories still divided roughly along what must have been military district boundaries before the Collapse. Each noble lord rules from an underground command post which was the former District Emergency Command Center, and the power base of each is the surviving stocks of weaponry available.

"Maintenance priority has been on gear used to control or impress the local population, and that means lots of personal armor, personal weapons, and personal transport. There are a fair number of grav cycles, grav belts, and air rafts still in service, a few grav tanks and APCs, and hardly any heavy artillery. The nobles themselves show up in powered armor a lot, particularly for formal occasions, as do a small number of personal retainers.

"Other than that, combat armor is the rule, and they have stretched their supplies by dividing up pieces of it throughout the force structure. For example, heavy infantry seems to have full combat armor. I have seen grav cycle detachments with just the arm and leg armor, light infantry with the breast piece, and both officers and vehicle crews with helmets (presumably for the comm links and, in the case of officers, the psionic shielding). They are beginning to develop heraldry, based on the old military unit emblems with new embellishments added, and these are painted on helmets and breastplates in addition to appearing on banners. Uniforms are becoming more elaborate and less practical all the time, which is to be expected.

"The nobles have effectively absolute power within their domains, although over-taxation and particularly egregious abuse tends to cause the farmers to move to another fellow's neighborhood and build up his tax base. Given time, the nobles will rediscover serfdom and begin bonding their farmers to the land. It won't take much for everyone to agree that if they all help keep their neighbor's farmers in place, then they'll all be able to get away with just about anything they want to.

"Most places taxation is in kind, and the rates are not terribly burdensome, given a good harvest. Problems arise when the local noble gets an idea for a special project, or decides to throw a big party, both of which result in special assessments, which constitute nothing more than sending out parties to grab whatever is wanted from whoever has it. Poor harvests are also a problem, as the nobles and their armies eat just as much as before and take that cut off the top.

"Many of the actions of the nobles are counter-growth in a number of ways, but it is very difficult to get them to understand this. If they were still soldiers it would be easier, but they have long since ceased being that. They are instead warriors, a distinction that escapes a good many people. These nobles and their



men train as individual fighters, not as part of an organization. As individual fighters they are probably pretty good. Their small units may even work fairly well. They have very little ability to organize a larger force, however, and even less ability to plan.

"Currently the most powerful of the nobles is Zherord Magwanu, Protector-General and de facto ruler of Montezuma. His father was the previous protector-general, and although the position is not yet hereditary, given another generation it will almost certainly become so. This is particularly true if Magwanu produces an heir as cunning and capable as he is.

"At present, the Protector-General's authority is fairly limited. He is technically no more than the first among equals in the noble class, but his responsibility for the starport and planetary defenses (once a purely ceremonial responsibility) are becoming increasingly significant. Magwanu's real power comes from his ability to play off the Brotherhood, the nobles, and the Institute against each other, hold them in rough balance, and always be positioned to be the deciding voice in disputes. This is an old game, but Magwanu is quite adept at it."

THE INSTITUTE

"The nobles have an almost total monopoly on military power. The Brotherhood has an absolute monopoly of data processing, as well as tremendous economic power and limited military strength. The Psionic Institute's power is more difficult to categorize in such conventional terms.

"For one thing, most nobles have staff psions who work with their intelligence staffs. The psions do not wear armor or uniforms, however, and do not appear to have a place in the formal rank structure. I also gained the distinct impression that the nobles neither trusted nor particularly liked their own psions, and positively detested (or feared?) those not working for them. Clearly the nobles believe that the loyalties of the psions are divided, and if these guys understand anything at all, they understand power and loyalty.

"Another confounding variable is the ambiguity of their aims. What does the Psionic Institute want? Both the Brotherhood and the nobles have staked out some fairly clear turfs when it comes to power, but the Institute has not. When you ask the nobles or the brothers what they think the psions want, they just shrug (or give you a very long-winded explanation that amounts to a shrug). When you ask a psion, he or she tells you that they are interested only in further study and understanding of the powers of the mind.

"We have all heard that before, and it never has turned out to be completely true. Individuals may dedicate themselves solely to the search for enlightenment; dynamic social organizations do not. These people are up to something, but I was completely unable to determine what.

"Unlike the Brotherhood, the Institute has very limited means of support, and seems to rely almost entirely on donations. It has no independent economic activity, unless the actual employment of psions by nobles and merchants is counted. Although psions are not formally required to tithe, most do so routinely, and those working for the nobles appear to pass on a majority of their incomes to the Institute.

"Certainly the psions I met all lead very Spartan lifestyles. None of them struck me as deprived or deliberately impoverished; instead they seemed to lead an austere lifestyle by choice, and then send any money not required by that lifestyle on to the Institute. All of the psionic men and women I met were in good health and physical condition, if a bit thin. They tend to be vegetarians, but not exclusively so, and I believe that they avoid meat more from personal taste than from philosophic conviction.

"All of them spend several hours a day in meditation, some of it sedentary and some of it combined with ritual exercise. They also require at least an hour every day of absolute privacy, and no one knows what they do during this time. My suspicion is that they do not do anything particularly significant and that their purpose is to increase the mystery that surrounds themselves. They are very good at that.

"Despite the tendency to occasionally lapse into silent thoughtfulness or quote local proverbs of obscure meaning, I found most of them to be lively conversationalists and even charming when the situation seemed to call for charm. Their psionic talents set them apart, to be sure, and their rituals are designed to emphasize the difference and mystery of their talents, but I am convinced that much of it is an act and that under it all are ordinary people trying to get the most out of what they have.

"Magwanu is on very good terms with the Institute, and I sometimes suspected that he may be a trained psion himself. I can't prove this, but if true it might explain the unusually close relations he enjoys with them. Psions hold several cabinet/managerial positions in his government which are unrelated to their psionic talents.

"All of that notwithstanding, I am convinced that the Institute is *not* the power behind the throne, and that Magwanu is his own man. His preferential treatment of the Institute has only been sufficient to elevate them to roughly equal stature and influence to the nobles and Brotherhood, and I believe that he did this deliberately as a check against the others, thus giving himself greater freedom of action."

REFEREES ONLY

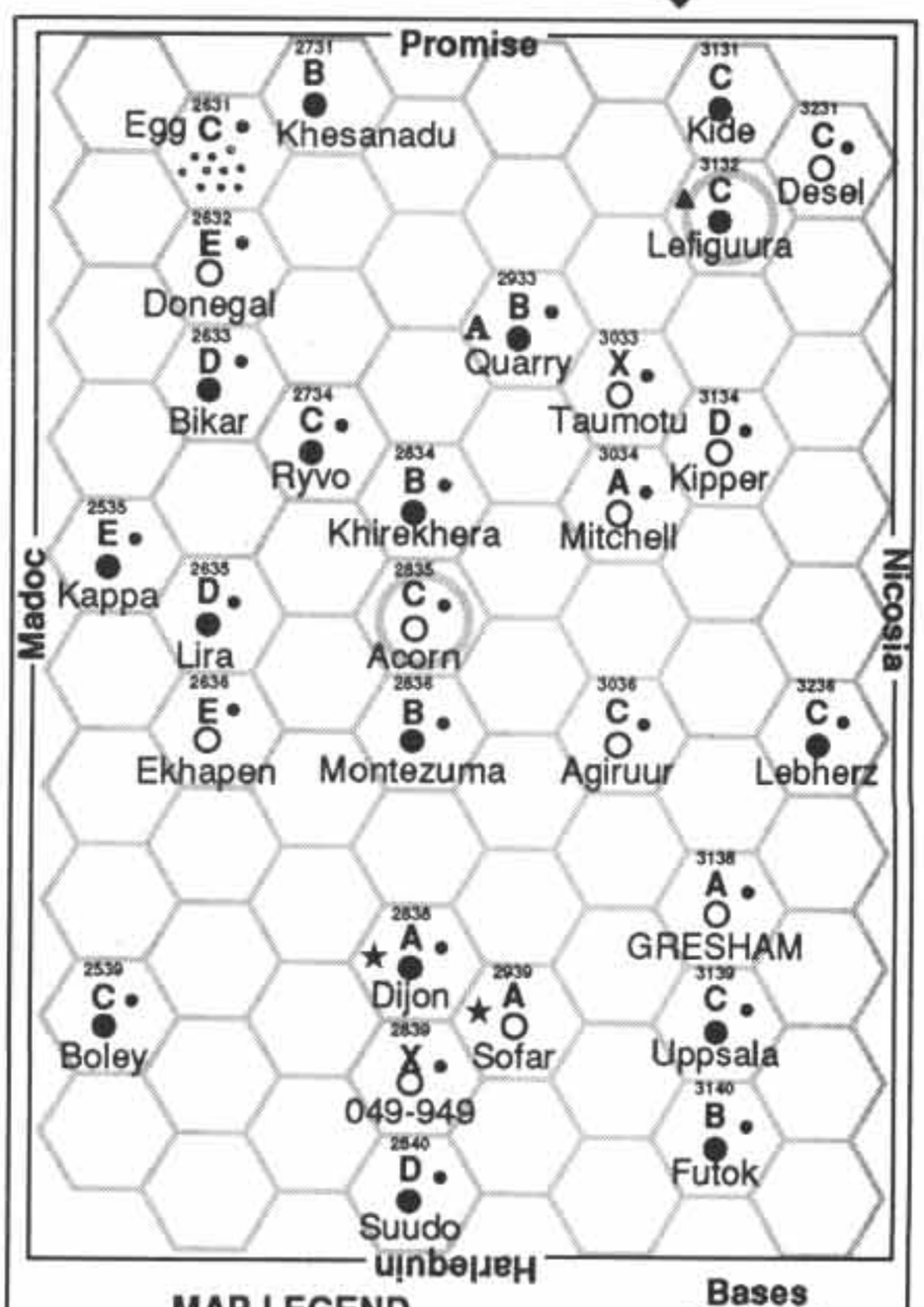
Information on this page should not be made routinely available to players who do not have access to pre-Collapse starcharts and navigational information. In many cases, it may require research to gain even this outdated level of information.

KHULAM SUBSECTOR

(Subsector P of Diaspora Sector)

(Pre-Collapse data circa 1117)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Kappa	2535	E224444-B		Ni Lo	803	So	M1 V M6 D
Boley	2539	C434745-4			111	Li	F6 V
Egg	2631	C000543-D		Ni As	514	So	G2 V M6 D
Donegal	2632	E100424-C		Ni Lo Va	704	So	M1 V
Bikar	2633	D79A322-A		Ni Wa Lo	913	So	K7 III
Lira	2635	D527222-9		Ni Lo	602	So	M7 V
Ekhapen	2636	E100555-C		Ni Va	404	So	K0 V M6 D
Khesanadu	2731	B788310-D		Ni Lo	700	So	M5 V K2 D
Ryvo	2734	C682425-C		Ni Lo	221	So	K4 IV
Khirekhera	2834	B451464-E		Ni Lo Po O:2835	604	So	M4 V
Acorn	2835	C100400-F		Ni Lo Va C:1	A102	So	M1 V
Montezuma	2836	B562768-B		Ri O:3138	104	So	K4 V
Dijon	2838	A234548-A	N	Ni	634	So	M7 V M9 D
049-949	2839	X620588-5		Ni De Po	813	So	M8 V M1 D
Suudo	2840	D778535-7		Ni Ag	302	So	F1 V
Quarry	2933	B99A343-F		Ni Wa Lo RsA	104	So	M9 V
Sofar	2939	A8B4575-8	N	Ni Fl	400	So	K9 V
Taumotu	3033	X100436-7		Ni Lo Va	R305	So	F0 V
Mitchell	3034	A10078C-F		Va Na	903	So	M3 V
Agiruur	3036	C9A3565-C		Ni Fl O:3138	803	So	M9 V
Kide	3131	C684675-A		Ni Ri Ag	920	So	M4 V
Lefiguura	3132	C868552-C	S	Ni Ag	A410	So	G2 V M9 D
Kipper	3134	D110110-B		Ni Lo	923	So	M3 V
Gresham	3138	A1109BE-F		Hi In Na Cp	804	So	M1 V
Uppsala	3139	C9795BB-6		Ni	512	So	F4 V M8 D
Futok	3140	B594633-A		Ni Ag	901	So	M1 V M8 V
Desel	3231	C1006BC-D		Ni Va Na	403	So	M3 V M2 D
Lebherz	3236	C657834-9			213	So	G1 V



Notes

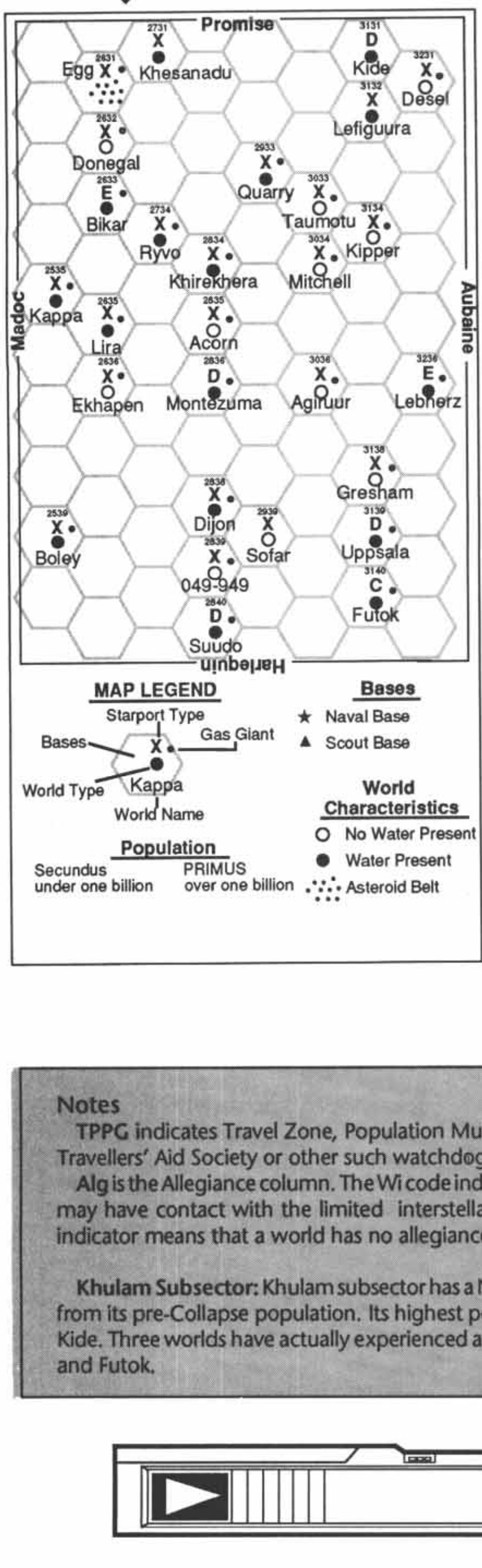
Under the Trade Classifications column, the "O:" entry indicates that the world is owned by the world in the indicated hex. For example, Agiruur is owned by Gresham.

A "D:" or "C:" entry indicates a planet populated at least in part by Droyne or Chirpers (effectively degenerated Droyne). The number following the colon indicates how many tenths of the world's total population consists of these races.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. If the Travel Zone digit is empty, it is a Green Zone; "A" and "R" indicate Amber and Red Zones, respectively.

Alg is the Allegiance column. Li = Lucan's Imperium. So = Solomani Confederation.

Khulam Subsector: In 1117, Khulam subsector had a population of almost 8.337 billion. Its highest population was 8 billion, on Gresham. Its highest tech level was 15 (F), at Acorn, Quarry, Mitchell, and Gresham. All but one world of the subsector was aligned with the Solomani Confederation, while only Boley remained loyal to Lucan's Imperium.



REFEREES ONLY

Players do not have access to this information, but must gain it by investigating the worlds on their own, or by learning it from others who have already done so.

KHULAM SUBSECTOR

(Subsector P of Diaspora Sector)

(New Era data, as of 001-1201)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Kappa	2535	X224000-0		Ba	003	—	M1 V M6 D
Boley	2539	X434000-0		Ba	011	—	F6 V
Egg	2631	X000000-0		Ba As	014	—	G2 V M6 D
Donegal	2632	X100000-0		Ba Va	004	—	M1 V
Bikar	2633	E79A322-7		Ni Wa Lo	413	Wi	K7 III
Lira	2635	X527000-0		Ba	002	—	M7 V
Ekhapen	2636	X100000-0		Ba	004	—	K0 V M6 D
Khesanadu	2731	X788310-6		Ni Lo	200	Wi	M5 V K2 D
Ryvo	2734	X682325-7		Ni Lo	421	Wi	K4 IV
Khirekhera	2834	X451489-2		Ni Lo Po	104	Wi	M4 V
Acorn	2835	X100000-0		Ba Va	002	—	M1 V
Montezuma	2836	D562756-5			204	Wi	K4 V
Dijon	2838	X234000-0		Ba	034	—	M7 V M9 D
049-949	2839	X620000-0		Ba De	013	—	M8 V M1 D
Suudo	2840	D778568-6		Ni Ag	102	Wi	F1 V
Quarry	2933	X99A252-3		Ni Wa Lo	304	Wi	M9 V
Sofar	2939	X8B4000-0		Ba Fl	000	—	K9 V
Taumotu	3033	X100000-0		Ba Va	005	—	F0 V
Mitchell	3034	X100000-0		Ba Va	003	—	M3 V
Agiruur	3036	X9A3000-0		Ba Fl	003	—	M9 V
Kide	3131	D68476A-8		Ag	220	Wi	M4 V
Lefiguura	3132	X86856A-3		Ni Ag	110	Wi	G2 V M9 D
Kipper	3134	X110000-0		Ba	023	—	M3 V
Gresham	3138	X110000-0		Ba	004	—	M1 V
Uppsala	3139	D97959E-4		Ni	212	Wi	F4 V M8 D
Futok	3140	C594776-7		Ag	201	Wi	M1 V M8 V
Desel	3231	X100000-0		Ba Va	003	—	M3 V M2 D
Lebherz	3236	E657896-5			213	Wi	G1 V

Notes

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. Because there is no longer a Travellers' Aid Society or other such watchdog group, there are no travel zones in the Wilds.

Alg is the Allegiance column. The Wi code indicates a world in the Wilds with a Wilds government type. Such a world may have contact with the limited interstellar community,or may have virtually no off-world contact. The "—" indicator means that a world has no allegiance because it has no population.

Khulam Subsector: Khulam subsector has a New Era population of just over 260.4 million, a decline of over 8 billion from its pre-Collapse population. Its highest population is 200 million, at Lebherz, and its highest tech level is 8, at Kide. Three worlds have actually experienced a population increase over their pre-Collapse levels: Montezuma, Kide, and Futok.

REFEREES

As a **Traveller** referee, you are responsible for *realizing* an entire universe for your players. Each game session, your efforts will make your campaign universe a little more vivid and a little more compelling for your players. As this universe becomes more and more familiar to you and your players, you will find them beginning to help you flesh out and color your universe, so that the universe is no longer your vision alone, but a joint creation given life by you and your players.

Your role, then, is to be creative in a way that allows and encourages your players to be creative. You must create a universe that is open and flexible enough for them to seek their own goals in, but is also solid enough for them to respect. This chapter contains material to help you with both these considerations.

First is the **Traveller** task and skills system. This is the very core of the **Traveller** game, as it is the way that the player characters interact with the world around them. It creates the framework within which they solve problems and control their future, and also allows them to use the skill packages that they have carefully selected for their characters.

Second, this chapter presents two introductory adventures, one set in the Star Viking background, and another, a "bootstraps" adventure that can be used to start a campaign set in the Wilds in which the PCs pull themselves up by their own bootstraps from their ravaged, isolated world. Both these adventures can be easily modified to fit a pocket empire setting.

Finally are the alternative campaign settings. Not every player group will want to play in the same campaign background. Some will want wild open frontiers like the Wilds, but others will want science fiction in a grand, majestic civilization. The ultimate way to customize your campaign is to use the pocket empire setting. This allows the referee to create a small, manageable civilization that contains all of the elements that the player group prefers in its gaming.



Task Resolution and Skills

Overview

In the course of playing **Traveller**, the players decide how their characters act, and how they attempt to accomplish missions or achieve goals. When a player announces that his or her character will attempt a certain action, the referee must have a method to decide whether the action succeeds or not. The chance for success of the action is based on how difficult the referee decides the action is, and the skills and attributes that the character might have that can be applied to the action. Obviously, characters usually only attempt actions that they have some skill in or knowledge about.

Mechanics

Most important actions in **Traveller** are resolved using the roll of a die. Each such action is expressed as a specific task, and the die roll determines whether the player attempting the task was successful or unsuccessful, and if an extraordinary success or failure occurred.

Dice: To play the game you will need at least one 10-sided die (D10) or 20-sided die (D20) and several six-sided dice (D6). A D10 is read from 1 to 10 (with 0 meaning 10).

Because of the numerous uses of die rolls in **Traveller,** abbreviations will often be used. A 1 before the die notation (1D6, 1D20) means to roll one die of that type, a 2 (2D6, 2D10) means roll two of that type and add them, and so on.

Dice Equivalencies: The dice used in play can be used to generate numbers in several different numerical ranges. Although not all of these ranges will be used in these rules, many of them will be useful in adventures, etc.

How to Play Traveller

You only have to understand one thing to play **Traveller:** how to roll for a task. The referee will tell you which of your character's skills the task will require, and how hard the task is.

First, add the skill level to the character's controlling attribute for that skill.

If the task is Easy, multiply that number by 4. If it is Average, multiply it by 2. If it is Difficult, leave the number as it is. If it is Formidable, halve the number (drop fractions). If it is Impossible, quarter the number (drop fractions). The result is your target number.

Roll one 20-sided die. If the result is less than or equal to the target number, you have succeeded.

That's all you need to know to play **Traveller.** Every other rule is an elaboration on that simple concept.

A D10 can be used to generate D20 results and vice versa, if only one or the other is available. To get D20 results from a D10, roll the D10 along with a D6. If the D6 reads 1-3, read the D10 normally as 1-10. If the D6 roll is 4-6, add 10 to the D10 result for a range of 11-20.

When using a D20 to give D10 results, simply ignore the first digit so that rolls of 01 and 11 are 1, 02 and 12 are 2, and so on, up to 10 and 20 which both are read as 10.

To generate a number between 1 and 100 (called D100 or D percentile), roll a D10 twice, using the first roll as the tens digit and the second roll as the ones digit, and reading a 00 result as 100. If rolling two D10s at the same time, make sure they are different colors, and announce before rolling which is the tens die.

Two D6s may be rolled in the same way to yield numbers from 11-16, 21-26, 31-36, 41-46, 51-56, and 61-66. This is called D66.

Note that when adding dice together (as 2D6 or 2D10), the result is statistically centered, meaning that results in the center of the range (7 for 2D6 or 11 for 2D10) are much more likely than results at the very high or low end of the range. However, D100 and D66 rolls are not statistically centered, so that the 100 possibilities of the D100 and the 36 possibilities of the D66 are all equally likely.

If rolling between three possibilities, a D6 can be used as a D3, where 1-2 are read as 1, 3-4 are read as 2, and 5-6 are read as 6. (D3 is is the same as 1D6+2 when rounding fractions up; but when rounding down, 1D6+2 gives results of 0, 1, 1, 2, 2, and 3). In the same fashion, a D10 can be used as a D5. Any die can be used for D2 results, by rolling for odd or even results. You may also use any change you might have in your pocket.

Die Roll Modifiers: Sometimes die roll results must be modified. For example, 2D6–2 means roll two six-sided dice and add the numbers together, then subtract 2 from the total. Conversely, 3D6+2 means roll three six-sided dice, add them together, and then add 2. For example, a 3D6–1 roll that resulted in rolls of 3, 5, and 2 would total 3+5+2–1 = 9.

The abbreviation "DM" is usually used for die modifier, with plus or minus symbols showing whether the DM is added to or subtracted from the die roll. Thus DM+2 means that 2 is added to the die roll in question, and DM–3 means that 3 is subtracted from the final roll.

Sometimes a variable DM will be given. For example, the phrase, "DM–(number of characters in the group)" would mean the total number of characters in the group would be subtracted from the die roll, or "DM+(wind velocity in kilometers per hour+10, round up)" means to take the wind velocity in kph, divide it by 10, round the result up, and add the result to the die roll.

Character Attributes and Skills

In order to understand task resolution, the following terms must be defined. Some of these concepts are handled in more detail in the Character Generation section, beginning on page 15.

Attribute: This is the numerical quantification of the character's basic physical and mental qualities, divided into Strength (STR), Agility (AGL), Constitution (CON), Intelligence (INT), Education (EDU), Charisma (CHR), and Psionics (PSI). These numbers range between 1 and 15, with 15 being the best. See Attributes, page 19-20, for a more detailed discussion.

Skills: These represent the knowledge and expertise gained by a character in certain specific areas. A higher skill number indicates a greater familiarity and facility with the topic. For example, the skill "Navigation 3" indicates that the character has a level 3 ability in being able to find his or her way around on a planet.

Controlling Attribute: Each skill has a controlling attribute, which is the attribute that is most directly used when exercising that skill. For example, INT is the controlling attribute for the Observation skill, signifying that Observation is based most directly on the character's raw reasoning ability. On the other hand, the controlling attribute for the History and Geology skills is EDU, meaning that History and Geology are most closely linked with factual information that the character has gained over a lifetime of learning.

Assets: An asset is the level of a skill added to the value of that skill's controlling attribute. For example, a character has INT 9 and EDU 7, and skill levels of Observation 2, History 3, and Geology 5. The character's assets in these areas are therefore: Observation (9+2=)11, History (7+3=) 10, and Geology (7+5)=12.

When recording skill levels on the **Traveller** character sheet (located in the back of the book), skills and assets should be separated by a slash. In the example just given, the player should write 2/11 next to Observation, 3/10 next to History, and 5/12 next to Geology.

In all cases, the value used in **Traveller** task resolution is the asset, and not the skill alone. Unless specifically noted otherwise, any reference to a skill name (for example, "an Easy test of Navigation") means the asset, not the skill alone. Similarly, when the rules talk about deciding on the skill that is most relevant to a task, the skill will always be used in its asset form (i.e., added to its controlling attribute).

Tasks

The main use of skills and attributes in **Traveller** is to determine the success or failure of actions attempted by the characters. Actions depending on the use of skills and attributes are called *tasks*, or sometimes *tests* or *checks*. To resolve these tasks, the players roll dice, with the die rolls required for success depending upon the characters' assets combined with the difficulty of the task being attempted. One of the referee's main jobs is to adjudicate character attempts to accomplish these various tasks.

Some tasks can obviously not be done, no matter how skilled the characters are, such as rebuilding a destroyed starship without spare parts or tools. Other tasks, such as reloading bullets into an empty ammunition clip, are so simple that it is assumed any character with basic knowledge can carry them out successfully. In between these two extremes, however, lie a multitude of tasks which the referee will be called on to adjudicate. Some tasks that are used repeatedly during the game (such as maintenance or firing a weapon) are covered in detail in the rules. Others are determined by the referee on a case-by-case basis.

When determining the success of a character's attempt to carry out a task, the referee should ask two questions: How difficult is the task, and what skills or attributes are relevant to the task?

Difficulty: While there are numerous shades of difficulty in tasks, for game purposes, all tasks are broken down into five categories: Easy, Average, Difficult, Formidable, and Impossible. (Note that the word *impossible* is used as the name of the highest difficulty level, rather than meaning that something can absolutely not be done. This means that in **Traveller**, a task which is called Impossible can actually be accomplished by an extremely talented character. Remember that throughout these rules, whenever the word impossible is capitalized, it is referring to a difficulty level. When it is not capitalized, it is being used in its standard meaning of "not possible.")

For example, a mechanic needs to repair a colonist's automated harvester. The referee first decides roughly what the harvester's problem is (this is not strictly necessary, but it helps both players and referee visualize the situation), then decides if repair is Easy, Average, Difficult, Formidable, or Impossible. If the harvester needs a short length of wire cut and fitted into place, the mechanic's job is Easy. If it needs a hole in a metal tube soldered, the task would be Average. If the engine needs a new timing gear filed from a piece of sheet metal, the task would be Difficult. If it needs a new electronic brain, the task would be Impossible.

The referee may further decide to break the task into two (or even more than two) parts. Using the above example, the referee may decide that the vehicle needs a part the mechanic does not have and cannot make. In this case, determining the problem would be an Average task, but repair would be Difficult, and perhaps Impossible (which might lead to an adventure to locate and obtain the proper part).

"Automatic" Tasks: The referee may judge that

certain of the characters' actions need not be rolled for. These would be actions of a routine nature which use a skill that the player possesses. For example, a referee will usually not wish to require a player with Ground Vehicle level 1 to roll to drive five minutes to the all-night mini-mart to pick up a quart of milk, assuming reasonable weather conditions, etc. These might reasonably be thought of as automatic tasks; however, there is no such thing as a difficulty level of "Automatic." The referee is always the final judge of what actions do and do not require a roll. Players should never assume that an action is automatic, because there is no such thing, until the referee says there is.

Useful Assets and Attributes: The referee must decide which asset or attribute is important to performance of the task. In the above example, the character's Mechanic asset is obviously the important one. If the task is one to which no skill is relevant, but an attribute is (for example, lifting a safe requires only Strength, not any particular skill), then it is an attribute-only task. If it is a task requiring skill, then the closest appropriate skill is used.

Referee's Note: Exercise care when assigning difficulty levels for attribute-only tasks. A difficulty level that is appropriate for an asset-based task (skill plus attribute) might be too difficult for a task rolled against an attribute alone. Referees should think in terms of the success probability when assigning difficulty levels. For example, a character will be making an attribute-only task roll against an attribute of 8. If the difficulty level were Difficult, the character would succeed eight times out of 20, or 40%. The referee could set the odds of success to 80% by assigning a difficulty level of Average (roll under 2×8, or 16 chances out of 20), or reduce them to 20% by assigning a level of Formidable (roll under ½×8, or 4 chances out of 20). When the referee knows how likely the chance of success could be, it is simple to work backwards from there to find the correct difficulty level, using the Task Difficulty Levels table below. For a discussion of lifting tasks related to the Strength attribute, see page 35 in Character Generation.

TASK DIFFICULTY LEVELS

Difficulty	*Asset*
Easy	×4
Average	×2
Difficult	×1
Formidable	×1/2
Impossible	×1/4

Task Descriptions: The chance of success in a task is completely described by its difficulty level and the asset used. The many tasks described in these rules are sometimes expressed in an abbreviated form as *Difficulty: Asset*. For example, Easy: Swimming refers to an Easy task using Swimming skill as an asset (i.e., added to its controlling attribute, in this case, CON). Difficult: STR refers to a Difficult task using only the Strength attribute.

These tasks are also referred to conversationally. For example, "Opening the electronically locked hangar door is an Average test of Intrusion," or, "Avoiding detection by the guard is a Difficult check against Stalking." As always, such a statement refers to the asset, and not the skill alone, unless otherwise indicated.

Determining Success: Once difficulty and the relevant asset or attribute have been determined, the task is resolved as a D20 roll against that asset or attribute. Before rolling the die, the asset or attribute is modified by the task's difficulty level as shown on the Task Difficulty Levels table. Whenever multiplying assets by a fraction, round all fractional results down.

This number as finally modified is the *target number.* If the D20 roll result is *equal to* or *less than* the target number, the character has succeeded in the task.

For example, a character with an asset of 12 has the following target numbers, based on difficulty: Easy = 48, Average = 24, Difficult = 12, Formidable = 6, Impossible = 3.

Automatic Success or Failure: In **Traveller,** a task roll of 1 always results in success, and a task roll of 20 always results in failure, regardless of skill, asset, or difficulty level. Thus every character stands a chance to succeed, no matter how daunting the task, or a chance to screw up, no matter how seemingly routine the task. (Note that the automatic failure roll is modified to 17-20 for purposes of direct fire only—see the Combat chapter.)

Thus, returning to the mechanic in the example above, if he had a Mechanic skill level of 4 and an STR of 5 (the controlling attribute of the Mechanic skill), he would have an asset of 9, and would need to roll 9 or less on the D20 roll to succeed at a Difficult task. He would have to roll 18 or less to succeed at an Average task (9×2=18) and a 2 or less to succeed at an Impossible task (9 ×1/4=2.25, rounded down).

If the same character had to undertake an attribute-only task requiring Strength, he would be rolling against a target number of 5 (his Strength attribute alone ×1) for a Difficult test, a 10 on an Average test (2×5), or a 1 on an Impossible test (5×1/4 = 1.25 rounded down).

Unskilled Tasks: Sometimes a character may not have the skill specified to accomplish a certain task. Such a character may still attempt the task, but with an *unskilled penalty.* Because the character does not have the needed skill, he or she uses the controlling attribute for the missing skill by itself, and in addition as a penalty for not having the proper detailed knowledge, must roll the task at *one difficulty level higher* than it otherwise would have been.

For example, suppose a character wants to force open the lock on a desk drawer. The referee decides

that this is an Average task using the Intrusion skill. However, the character does not have Intrusion skill, and so must treat it as a Difficult task using only the character's Agility attribute (which is the controlling attribute for Intrusion). If the character had an Agility of 6, she would have to roll a 6 or less on 1D20 to succeed.

Exceptions: Note that level 0 in a skill area allows a character to forego the unskilled penalty for that skill. The skill level 0 indicates a basic familiarity with the skill, but no real expertise. When rolling a task for a skill that is at level 0, the character's asset is the controlling attribute alone, but the additional difficulty level penalty is not assessed.

Referee's Note: Do not confuse this unskilled penalty with an attribute-only task. An attribute-only task is one for which no particular skill is useful, requiring the referee to set the difficulty level for use against an attribute alone. The unskilled penalty is used when the referee defines a task as requiring a certain skill, but the character attempting the task does not have the skill.

Although both attribute-only and unskilled penalty skill rolls are made against a character's attribute alone, in an attribute-only test, the difficulty level as set by the referee is fixed. In an unskilled-penalized skill roll, the difficulty level as originally set by the referee is increased one level when attempted by the unskilled character.

More than One Asset: Sometimes more than one asset can be applied to a single task. This can be done in several ways. The four most common are referred to as combined skills, alternative skills, averaged skills, and enabling skills.

Combined Skills: In many cases, two assets are each necessary to perform a task. In this case, the lower of these two assets possessed by a character is used to determine the target number. Combined skill tasks are phrased in the format "asset and asset."

For example, the referee may decide that repairing a starship's fire control system is a Difficult test of Computer and Electronics. In this example, we have a character with a Computer asset of 8 and an Electronics asset of 12. Even though she has a high Electronics ability, her ability to understand the entire fire control system is limited by her understanding of its computing functions. Thus, she would use the lower of the two: her Computer asset.

Alternative Skills: In this case, the task requires only one of two or more possible skills. For one of these tasks, the character uses the highest of the listed assets to compute the target number. Alternative skill tasks are phrased "asset or asset."

For example, determining if an animal is dead or alive is an Easy: Biology or Medical test. Because either skill is sufficient by itself, the character uses the higher of the two. In some cases, the referee may wish to assign differing difficulty levels for different alternative skills. Average: Civil Engineer or Difficult: Combat Engineer means the same task may be performed using either asset, but using different difficulty levels.

Averaged Skills: In some cases, the referee might rule that two skills complement and "feed off of" each other, so the two skills are averaged (add the two assets together and divide the total by 2). No more than two skills should be averaged together for any one task. If a task seems to require more than two skills averaged together, pick only the two most relevant.

The format for averaged skills is "average of asset and asset" or "asset plus asset ÷ 2."

For example, a character may be attempting to pore over old records to discover the cause of the plague that killed the population of a world. Such a task could be described as a Formidable test of the average of Medical and Research, as expertise in either of these skills helps the other (i.e., Medical knowledge helps the character to interpret the records, and Research skill helps her to know where to look for the information she seeks).

Enabling Skills: In some cases, one particular skill enables a character to "unlock" a crucial difficulty in a problem, and thereby make the problem easier. For example, a character is trying to find the opening to an underground council chamber in a ruined and long-abandoned starport. The referee decides that Observation is the relevant skill and that the task difficulty is Impossible. However, a knowledge of history may make it easier to know where this sort of entrance might be located. Therefore, the referee has the player make an Average: History roll first. Success on this roll means the character has enough historical knowledge to help, and this will reduce the difficulty of the main task to Formidable. In this example, the History asset was used as an enabling skill, because its use enabled the following task to be done at a higher level of probability. This sort of task description would be written as Impossible: Observation (Average: History to enable).

Unless otherwise indicated, success in an enabling skill task reduces the level of difficulty by one level, but under certain circumstances the referee might rule that difficulty is reduced by more than one difficulty level.

An extreme example would be an Engineering task that is considered Formidable because a system that needs a relatively simple repair (Average difficulty) is located deep inside other machinery, requiring that machinery to be disassembled to allow access to the broken system, and then reassembled after the repair. However, the referee might decide that a contortionist character could actually crawl inside the machinery and perhaps hang upside down by one leg to do the repairs without having to tear down the machinery.

Success at a Formidable: Acrobatics roll would mean that the Engineering task is two levels easier—in other words, no longer Formidable, but only Average. The referee would describe this task as Formidable: Engineering, with Formidable: Acrobatics to enable two levels. Remember that such enabling tasks may sometimes add additional difficulties of their own. For instance, in this example the character making the Acrobatics roll must also have the Engineering skill to make the subsequent repair roll, or else be penalized as unskilled. Similarly, if the character suffered a Catastrophic Failure while making the Acrobatics roll, he may have fallen on his head and suffered a fractured skull while deep inside the machinery. Unless there is another character nearby who has both Acrobatics and Medical skills, the unfortunate contortionist might die inside the machinery before it can be taken apart.

The referee might allow an enabling skill roll to be done by a different character who is a member of the same ship's crew. For an example of this, see Large Watercraft, page 122.

Additional Difficulty Levels: It is also possible for the referee to describe tasks more or less difficult than the five categories used here, or intermediate in difficulty. Simply multiply or divide the character's asset by larger, smaller, or intermediate numbers. For example, a "Very Formidable" task might require dividing the asset by 3 to determine the chance of success. A task intermediate between Difficult and Average might multiply by 1.5, etc.

Opposition: In some cases, attempts to complete a task will be met with opposition from other characters. There are three types of opposition.

First, a character may be trying to succeed at a task and another trying only to prevent him. One or the other must succeed. If a character were trying to break down a door, for example, a character on the opposite side might try to keep the door in place. In this case, the asset used is the asset of the character making the attempt minus the asset of the character trying to prevent him. Obviously, if the opposing character's asset is higher, the attempt fails automatically.

Second, two or more characters may be trying to succeed at the same task in a competition in which it is not certain that anyone will succeed. For example, two characters are racing to solve a complex mathematical problem. Both characters roll, in this case Difficult: (Intelligence and Education), and the one who succeeds is the one who rolls the furthest below the roll he would need for success without opposition. (Of course, it is possible for all contestants to fail.) Roll again in case of ties. For example, suppose two characters are rolling with 3 and 5 target numbers; the first of them rolls a 2 and the second rolls a 3. Since the first character rolled only 1 less than required for success, while the second character rolled 2 less, the second character wins.

The third case is like the second, but this time one of the characters must succeed. An example would be a footrace or determining the winner of a hand of poker. Characters roll as above. If none of the characters rolls success, the winner is the character who failed by the smallest amount. Roll again in case of ties.

Outstanding Success: A character who attempts a task and beats the target number by 10 or more has achieved an Outstanding Success. If, for example, a character had a target number of 12, and rolled a 2 (12–2=10), that would be an Outstanding Success.

How the referee handles Outstanding Success is dependent upon the situation. Generally, the task is done much more quickly than would usually be the case, or some extra bonus is awarded. A starship engineer might not only repair the power plant, but also spot the damaged connection that had caused turret #2 to lose power. The character trying to break down the door might also knock the person holding it shut unconscious, or knock it off its hinges with such noise and force that the occupants of the room are forced to roll for panic (see the Combat chapter).

Sometimes simply accomplishing a simple task without mishap is sufficient, and no additional bonus is appropriate. If a character is rolling to swing on a vine across a raging jungle river, simple success is sufficient; there is no need for him to find a panel of judges on the other side awarding him a gold medal for perfect form and style. The logic and needs of the campaign and the story being told are always the most important when judging Outstanding Success.

Catastrophic Failure: This is the opposite of Outstanding Success. A character who fails in a task, and fails by at least 10, *may have* suffered a Catastrophic Failure. To find out, the character rolls again for the same task at the same difficulty level. If this roll also fails (by any margin at all, not just by a margin of 10 or more), then the character has suffered a Catastrophic Failure (if the roll succeeds, it's just a regular failure). As with the Outstanding Success, the consequences of this are up to the referee. For example, the engineer in the previous example might not only fail to repair the power plant, but would in addition break some other important part. The character trying to break down the door might hurt her shoulder in addition to not breaking down the door.

Catastrophic Failure should not be overused. As with Outstanding Success, in a great many tasks there is no obvious effect of a Catastrophic Failure, and the second roll need not be made—a geologist who fails to find an iron deposit should not also break his leg (unless such an event seems appropriate given the current storyline

or surroundings). The main purpose of Catastrophic Failures is to deter characters from attempting tasks (especially dangerous ones) far beyond their abilities.

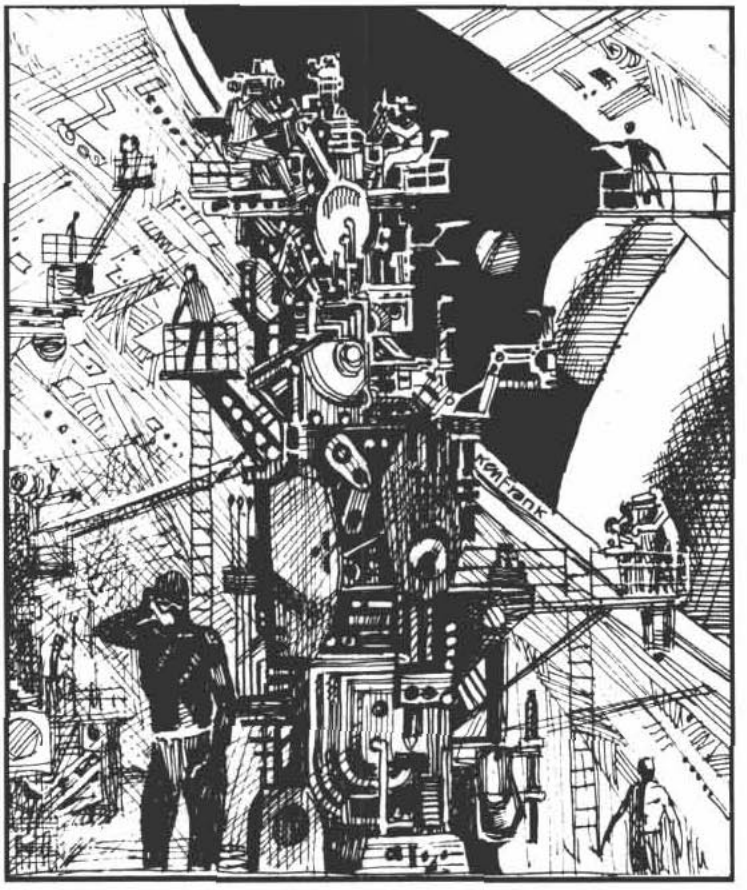
Time Required: When assigning a task, the referee should have in mind how much time the task ought to take. The time required can be modified by an Outstanding Success, but the amount of time saved must be based on common sense.

For example, a Research task that the referee decided would take eight hours in a library might be reduced to only one hour on an Outstanding Success if the referee assumes that the character was lucky enough to find a detailed manuscript on exactly the topic he was looking for, rather than having to piece the data together from multiple sources. On the other hand, some tasks can only have their required duration reduced by so much, or not at all. For example, an Outstanding Success for a character driving a vehicle at its top speed cannot possibly reduce the time required for the trip; the vehicle is already going as fast as it can. Similarly, if a character is using Observation skill to search a room for something that is not there, it cannot possibly take him any less time to completely search the room to satisfy himself that it is not there.

Uncertain Tasks: Some tasks will not provide immediate feedback of their success or failure to the character. Examples include the use of Psionics, sensor or other exploratory tasks, and interpersonal tasks. For example, the geologist above might miss an iron deposit that was really there, and PCs won't always know for sure if an attempt to use Persuasion on an NPC really works until the NPC actually does what they ask without double-crossing them. Sometimes even the effectiveness of a repair attempt might be left uncertain. ("Hmmm. You were in a pretty big hurry when you repaired the jump drive. Are you sure you're ready to engage it?")

In such cases, both the player and the referee should roll for the task, with the referee's roll being kept secret. There are three basic possible outcomes:

- If both rolls fail, the result is *no truth*. The player is misled about the success of the task attempt. Erroneous or misleading information is given.
- If one succeeds and one fails, the result is *some truth*. Some valid information is given, although perhaps missing some of the crucial connections that would be given under total truth. The player may fail the attempt and still get information, although he cannot know for sure, as he cannot know whether the referee's roll succeeded or failed.
- If both rolls succeed, the result is *total truth*. Totally valid information is given, although the player may still not believe it, again because he is unable to know the referee's roll.



Note that the referee may stipulate modifications to the process above. For example, the referee need not tell the player the difficulty level of the roll, so that the player will not even know if his own roll has succeeded or failed (this prevents the player from being suspicious of information he is given when he knows he has failed his own roll). Or the referee is free to make his secret roll at a different difficulty level from that of the player's, or even make a fake roll, knowing that the information the player will receive cannot be altered by any task rolls.

If the player rolls an Outstanding Success, the referee may decide to tell the player whether the referee's secret roll was a success or a failure, so that the player can correctly evaluate the forthcoming information. This is often a good idea, as it simulates the occasional ability of a character to be so in control of an action that he can accurately assess how good his attempt was. "Oops, that didn't feel right," or, "Okay, I know this sensor system cold. These results can't be off by more than 100 meters." However, whether circumstances justify this bonus is always up to the referee.

Most all of **Traveller's** rules build upon the basic concepts explained above. As you read through later chapters, such as Combat, you will discover specifically how the basic mechanics are applied in specific circumstances.

Skill Descriptions

The skill descriptions and task examples in this chapter are intended to give players a basic idea of how the skills work in this game, so that characters can be designed intelligently. However, players should always remember that the referee has final say in what skills apply to a particular task and what the resulting difficulty level of that task is, based upon the circumstances of the story at the time. All of the skills below have notations next to their entries showing the skill cluster from which the skill is available, the standard abbreviation of their controlling attribute (STR, AGL, etc.) and any homeworld requirements or restrictions. The notation "+" next to a homeworld description indicates the minimum required standard for the skill. The notation "–" next to a homeworld technology description indicates the technology level below which that skill is the only skill in its cluster which can be taken. The skill may also be voluntarily taken at technology levels above that level.

The "–" notation next to a law level description shows the law levels at which this skill may be taken. At law levels above this, the skill may only be taken with a successful override (page 28).

Vocational Skills: Players and referees should think of some of the skills listed below as vocational skills. These are skills, such as History, the Physical Science skills, and the Fine Arts skills, that represent specialized, scholarly knowledge or culturally oriented talents that do not come into play as often as the more nuts-and-bolts weapons, vehicle, and equipment skills. The designation of these skills as vocationally viable encourages their use by players to provide color, background, and interest. Certainly, most any **Traveller** skill can be used as a source of income, but these applications are handled elsewhere, in the Space Travel and Trade and Commerce sections of the "Worlds & Travel" chapter.

Vocational skills can serve, at skill level 4+, as sources of income to the character. For example, a character with a History skill level 8 could be a university professor or a high-paid consultant. A character with a Song skill of 9 could be a high-paid lounge act or a world-famous rock 'n' roll star. Although the amount should vary based on the conditions of the planet, vocational skills can earn a player a monthly income of the skill (not asset) level × 1D3×Cr250.

Possession of such a job is not automatic, and the referee may wish to handle job-hunting as a task or series of tasks, based on the world's population (the higher the population, the more jobs there are) and various of the PC's attributes and skills, including Charisma, Recruiting, Persuasion, and the skill with which the character wishes to gain employment. Remember that this income usually represents a steady five-day-a-week job, which will not necessarily allow the PC time to adventure. PCs with a typical adventuring schedule may lose their jobs fairly quickly.

This is not intended to prohibit characters with Mechanic, Electronics, or other similar skills from making a living with them. Rather, it is intended to make the more exotic science and artistic skills attractive to players in addition to the more survival-oriented combat and technical skills.

Artistic Vocational Skills: Characters with Painting, Sculpting, and Music (Composition) earn their money somewhat differently, the nature of art being what it is. The base monthly pay rate is calculated as above, but it is only paid irregularly. Roll 2D6 and subtract the character's Willpower skill (not asset) from the result. That is the number of months until the character is next paid. Payment will be in one lump sum, the number of months elapsed times the monthly rate.

Artists may also elect to attempt a masterpiece. First they must succeed at a Formidable test of Persuasion to find a patron. Once this is successful, the character decides whether to attempt a double, quadruple, or octuple base rate masterpiece, and begins work. Each month, the character must attempt a Formidable: Willpower roll. If it is a success, the work is completed, and the character makes a roll for the result. If it is failed, work proceeds to another month. The Willpower roll is made each month until it succeeds, or until the character decides to give up. When the work is done, the character rolls a test against the appropriate Fine Art asset: Difficult for double, Formidable for quadruple, and Impossible for octuple the base rate. Success indicates that the character receives immediate payment of the base monthly pay rate times the difficulty level attempted. Outstanding Success indicates that that amount is doubled. Failure indicates that the character has forfeited all monthly pay for that period. Catastrophic Failure is decided by the referee.

Acrobatics (Acrobat—AGL): This is the ability to exercise precise control over body motions and actions. For example, an attempt to jump from a moving helicopter and land on the back of a running horse would be a Formidable test of Acrobatics.

Acrobatics is also extremely helpful in melee combat. Characters with Acrobatics skill may use their Acrobatics asset in place of the Agility attribute in any of the melee combat tasks usually rolled against Agility alone.

Act/Bluff (Charm, Fine Art—CHR): This is the ability to convincingly pretend you are something you are not, or believe or intend to do something. For actors, it means portraying a fictitious character, of course, but it also covers such things as effectively pretending you are holding a winning hand at poker or convincing voters that you will fulfill your campaign promises, or that you even know what they mean.

Skills by Skill Clusters

Acrobat
- Acrobatics (AGL)
- Stealth (AGL)
- Thrown Weapon (STR)
- Climbing (CON)

Aircraft
- Pilot (AGL) (cascade)
  - Airship
  - Rotary Wing
  - Fixed Wing
  - Glider
  - Interface/Grav
- RCV Operations (EDU)

Animal Handling
- Riding (CON)
- Guard/Hunting Beasts (CON)
- Farming (INT)

Archaic Weapons
- Thrown Weapon (STR)
- Archery (STR)

Artillery
- Forward Observer (INT)
- Heavy Artillery (STR)
- Energy Artillery (AGL)
- Archaic Artillery (STR)
- RCV Operations (EDU)

Artisan
- Metallurgy (EDU)
- Carpenter (CON)
- Jeweler (AGL)
- Mason (STR)

Charm
- Act/Bluff (CHR)
- Carousing (CHR)
- Persuasion (CHR)
- Recruiting (CHR)
- Service (CHR)

Crime
- Forgery (AGL)
- Pickpocket (AGL)
- Intrusion (AGL)

Determination
- Leadership (CHR)
- Streetwise (INT)
- Willpower (INT)

Economics
- Admin/Legal (EDU)
- Marketing (EDU)

Engineer
- Construction (EDU)
- Combat Engineer (CON)
- Excavation (EDU)
- Starship Architecture (EDU)

Explore
- Climbing (CON)
- Liaison (CHR)
- Map (EDU)
- Navigation (INT)
- Survival (INT)
- Swimming (CON)
- High-G Environment (CON)

Fine Arts
- Act/Bluff (CHR)
- Dance (AGL)
- Disguise (CHR)
- Music (AGL) (cascade: Composition, Strings, Wind, Percussion, Keyboard, Other)
- Painting (INT)
- Sculpture (INT)
- Song (CHR)

Gun Combat
- Energy Weapon (AGL or STR) (cascade)
  - Energy Pistol
  - Energy Rifle
- Slug Weapon (STR) (cascade)
  - Slug Pistol
  - Slug Rifle
- Early Firearms (STR)

Heavy Weapons
- Autogun (STR)
- Heavy Guns (STR)
- Energy Artillery (AGL)
- Grenade Launcher (STR)
- Tac Missile (AGL)

Interaction
- Bargain (CHR)
- Instruction (CHR)
- Interrogation (CHR)
- Language (CHR) (cascade: individual languages and Linguistics)
- Liaison (CHR)
- Recruiting (CHR)

Medical
- Medical (EDU) (cascade)
  - Diagnosis
  - Trauma Aid
  - Surgery

Melee
- Unarmed Martial Arts (STR)
- Armed Martial Arts (STR) (cascade)
  - Large Blade
  - Small Blade
  - Polearm
  - Club

Perception
- Investigation (INT)
- Observation (INT)
- Psychology (INT)
- Research (INT)
- Tracking (INT)

Personal Transport
- Parachute (CON)
- Grav Belt (AGL)
- Muscle Transport (AGL) (cascade)
  - Skates
  - Skis
  - Wheels

Physical Science
- Biology (EDU)
- Chemistry (EDU)
- Farming (INT)
- Genetics (EDU)
- Geology (EDU)
- Meteorology (EDU)
- Physics (EDU)
- Robotics (EDU)
- Xeno-Biology (EDU)

Social Science
- History (EDU)
- Instruction (CHR)
- Interview (INT)
- Persuasion (CHR)
- Psychology (INT)
- Research (INT)

Spacehand
- Environment Suit (CON)
- Zero-G Environment (CON)

Space Tech
- Communications (EDU)
- Gravitics (EDU)
- Gunnery (EDU) (cascade)
  - Energy Weapon
  - Grav Weapon
  - Missiles
- RCV Operations (EDU)
- Screens (EDU) (cascade)
  - Nuclear Dampers
  - Meson Screens
  - Sandcaster
  - Black Globe
- Ship's Engineering (EDU)

Space Vessel
- Astrogation (EDU)
- Pilot (Interface/Grav) (AGL)
- Sensors (INT)
- Survey (INT)

Tactics
- Ground Tactics (INT)
- Fleet Tactics (INT)
- Ship Tactics (INT)

Technician
- Communications (EDU)
- Computer (EDU)
- Electronics (EDU)
- Machinist (AGL)
- Mechanic (STR)

Vehicle
- Ground Vehicle (AGL) (cascade)
  - Wheeled Vehicle
  - Tracked Vehicle
- Hovercraft (AGL)
- Riding (CON)
- Pilot (Interface/Grav) (AGL)

Vessel
- Hovercraft (AGL)
- Large Watercraft (CON)
- Small Watercraft (CON)

Vice
- Bribery (CHR)
- Disguise (CHR)
- Gambling (INT)
- Streetwise (INT)

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SKILL LIST BY CONTROLLING ATTRIBUTE

Skill (Cluster)	Atmos	Hydro	Pop	Law Level	Tech Level
Strength					
Archery (Archaic Weapons)				High (9)–	
Archaic Artillery (Artillery)					Pre-Industrial (3)–
Armed Martial Arts (Melee)				High (9)–	
Autogun (Heavy Weapons)					Industrial (4)+
Early Firearms (Gun Combat)				Moderate (7)–	Pre-Industrial (3)–
Energy Weapon (Gun Combat)				Low (1)–	Pre-Stellar (7)+
Grenade Launcher (Heavy Weapons)					Industrial (4)+
Heavy Artillery (Artillery)					Industrial (4)+
Heavy Gun (Heavy Weapons)					Industrial (4)+
Mason (Artisan)					
Mechanic (Technician)					Industrial (4)+
Slug Weapon (Gun Combat)				Moderate (7)–	Industrial (4)+
Thrown Weapon (Acrobat, Archaic Weapons)					
Unarmed Martial Arts (Melee)					
Agility					
Acrobatics (Acrobat)					
Dance (Fine Arts)					
Energy Artillery (Artillery, Heavy Weapons)					Pre-Stellar (6)+
Energy Weapon (Gun Combat)				Low (1)–	Pre-Stellar (7)+
Forgery (Crime)					
Grav Belt (Personal Transport)					Avg Stellar (8)+
Ground Vehicle (Vehicle)					Industrial (4)+
Hovercraft (Vehicle, Vessel)	Standard (6)+				Pre-Stellar (6)+
Intrusion (Crime, Vice)					
Jeweler (Artisan)					
Machinist (Technician)					Industrial (4)+
Muscle Transport (Personal Transport)					
Music (Fine Art)					
Pickpocket (Crime)					
Pilot (Aircraft, Space Vessel)					
Airship	Standard (6)+				Industrial (4)+
Fixed Wing	Thin (4)+				Industrial (4)+
Rotary Wing	Thin (4)+				Industrial (4)+
Glider	Thin (4)+				Industrial (4)+
Interface/Grav					Early Stellar (9)+
Stealth (Acrobat)					
Tac Missile (Heavy Weapons)					Pre-Stellar (6)+
Constitution					
Carpenter (Artisan)					
Climbing (Acrobat, Explore)					
Combat Engineer (Engineer)					
Environment Suit (Spacehand)	Vacuum (0-3)				Pre-Stellar (6)+
Guard/Hunting Beasts (Animal Handling)					
High-G Environment (Explore)	1.1G+				Early Stellar (9)+
Large Watercraft (Vessel)	Thin-Dense (4-9)		Wet (3)+		
Parachute (Personal Transport)	Standard (6)+				Industrial (4)+
Riding (Animal Handling, Vehicle)	Thin-Dense (4-9)				
Small Watercraft (Vessel)	Thin-Dense (4-9)		Wet (3)+		
Swimming (Explore)	Thin-Dense (4-9)		Dry (1)+		
Zero-G Environment (Spacehand)					Pre-Stellar (6)+
Intelligence					
Farming (Animal Handling, Physical Science)	Thin-Dense (4-9)		Dry (1)+		
Fleet Tactics (Tactics)					Early Stellar (9)+
Forward Observer (Artillery)					Industrial (4)+
Gambling (Vice)					
Ground Tactics (Tactics)					

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SKILL LIST BY CONTROLLING ATTRIBUTE

Skill (Cluster)	Atmos	Hydro	Pop	Law Level	Tech Level
Interview (Social Science)					
Investigation (Perception)					
Navigation (Explore)					
Observation (Perception)					
Painting (Fine Art)					
Psychology (Perception)					
Research (Perception)					
Sculpture (Fine Arts)					
Sensors (Space Vessel)					Industrial (4)+
Ship Tactics (Tactics)					Early Stellar (9)+
Streetwise (Determination, Vice)			Moderate (6)+		
Survey (Space Vessel)					Pre-Stellar (6)+
Survival (Explore)	Thin-Dense (4-9)				
Tracking (Perception)	Thin-Dense (4-9)				
Willpower (Determination)					
Education					
Admin/Legal (Economics)				Low (1)+	
Astrogation (Space Vessel)					Early Stellar (9)+
Biology (Physical Science)					
Chemistry (Physical Science)					
Communications (Space Tech)					Industrial (4)+
Computer (Technician)					Pre-Stellar (6)+
Construction (Engineer)					
Electronics (Technician)					Industrial (4)+
Excavation (Engineer)					
Genetics (Physical Science)					
Geology (Physical Science)					
Gravitics (Space Tech)					Early Stellar (9)+
Gunnery (Space Tech)					Pre-Stellar (6)+
History (Social Science)					
Map (Explore)					
Marketing (Economics)			Moderate (6)+		
Medical (Medical)					
Metallurgy (Artisan)					
Meteorology (Physical Science)					
Physics (Physical Science)					
RCV Operations (Aircraft, Artillery, Space Tech)					Pre-Stellar (6)+
Robotics (Science)					Pre-Stellar (6)+
Screens (Space Tech)					Early Stellar (9)+
Ship's Engineering (Space Tech)					Pre-Stellar (6)+
Starship Architecture (Engineer)					Early Stellar (9)+
Xeno-Biology (Physical Science)					Early Stellar (9)+
Charisma					
Act/Bluff (Charm, Fine Art)					
Bargain (Interaction)					
Bribery (Vice)					
Carousing (Charm)					
Disguise (Fine Arts, Vice)					
Instruction (Interaction, Social Science)					
Interrogation (Interaction)					
Language (Interaction)					
Leadership (Determination)					
Liaison (Explore, Interaction)					
Persuasion (Charm)					
Recruiting (Interaction)					
Service (Charm)					
Song (Fine Arts)					

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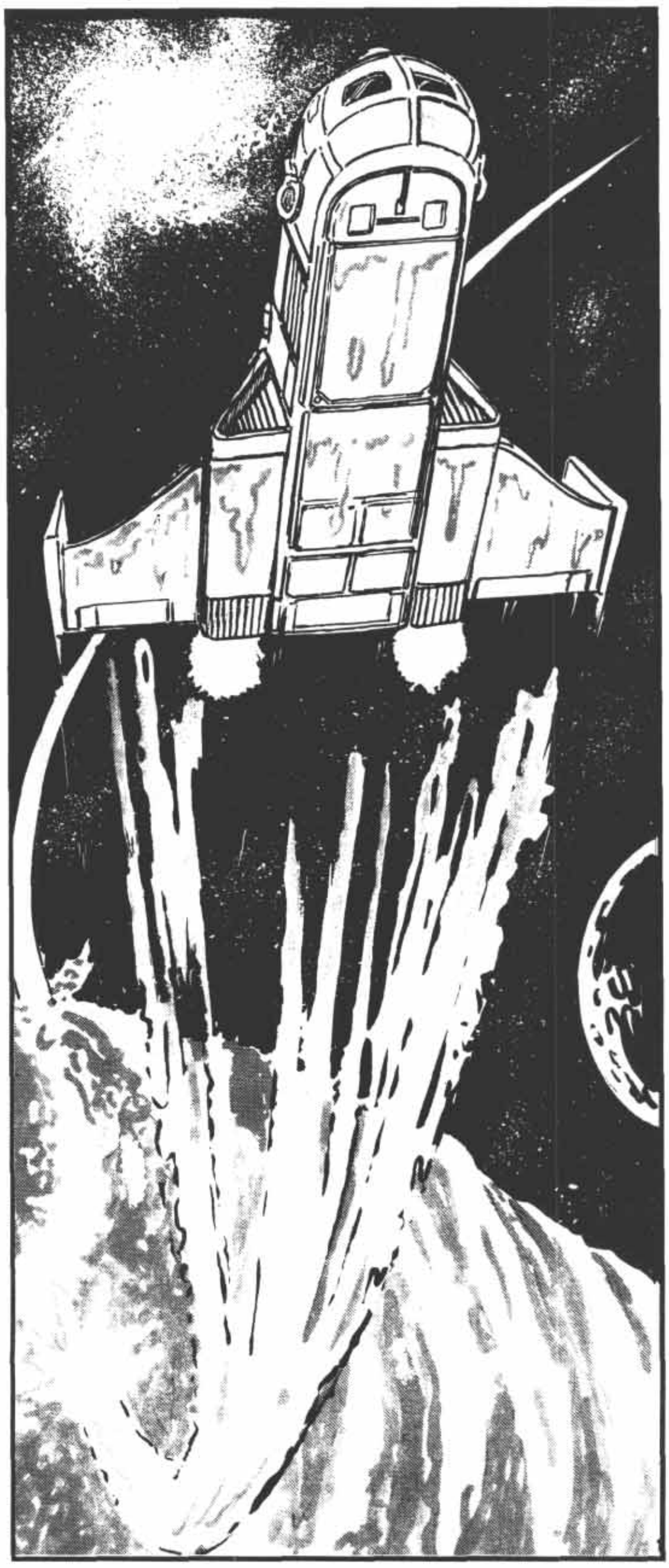


While Act/Bluff can be used in shady dealings like smuggling, confidence games, and the like, this skill can also be used as a vocational skill to artistically manipulate an audience's emotions by a professional actor or actress.

Admin/Legal (Economics—EDU) [Law = Low+]: The individual has experience with the rules and assumptions of how administrative and legal agencies work, and understands the requirements of dealing with and managing them.

There are tens of thousands of different worlds, and each of these will have different specific laws and bureaucratic assumptions. The character with Admin/Legal skill can navigate through this morass of red tape to solve problems. Several examples include: Easy: Admin/Legal to find the right person at a starport to answer a specific question. Average: Admin/Legal to fill out and file a bill of lading, customs form, or flight plan upon arriving at or departing from a world. Difficult: Admin/Legal to understand a standard legal contract. Formidable: Admin/Legal to understand an unusual legal contract.

Characters with Admin/Legal can function as lawyers on their homeworld, but also on other worlds if other members of their party have been arrested. The difficulty level increases on a world with different laws. For this reason, rolls against Research, Interrogation, and Liaison, or use of these as enabling skills is often required for the character to understand the local laws well enough to successfully argue them.

Archaic Artillery (Artillery—STR) [Tech = Pre-Industrial–]: This skill indicates the ability to maintain, build, and use heavy archaic indirect fire weaponry. These weapons use mechanically stored tension to throw solid projectiles or large darts, and include catapults, scorpions, mangronels, and ballistae.

Archery (Archaic Weapons—STR) [Law = High–]: The Archery skill allows the use of short, long, and composite bows, and blowguns.

Specifics of this skill's use in combat are explained under the Direct Fire section, page 274.

Armed Martial Arts (Melee—STR) [Law = High–]: Armed Martial Arts is a cascade skill that allows the use of various hand-held weapons in melee combat. The cascades are *Large Blade*, *Small Blade*, *Polearm*, and *Club*. Large Blade includes use of sword and cutlass; Small Blade, knife and dagger; Polearm, spears, pikes, pugil sticks, and rifles with bayonets; and Club includes use of maces, hammers, hand axes, and improvised clubs. See the combat rules for details on the use of this skill.

Astrogation (Space Vessel—EDU) [Tech = Early Stellar+]: The individual has training in interplanetary and interstellar astrogation. This includes the ability to compute courses and orbits in real space, and courses and entry parameters into jump space.

See the Space Travel section, page 218, for the use of this skill.

This skill may be selected by characters at Pre-Stellar technical levels, but must be marked with an asterisk (Astrogation*) to indicate that it provides knowledge only of real space astrogation, and not jumpspace.

Autogun (Heavy Weapons—STR) [Tech = Industrial+): The individual can use high-ROF slug-firing weapons, including machineguns, autocannons, and VRF gauss guns. These are usually crew-served, semiportable, and are often vehicle-mounted.

Bargain (Interaction—CHR): When trying to buy information or equipment, or get a higher price for his or her services, bargaining comes in handy for a character. Although bargaining should be roleplayed out between the referee and player, the referee should give in more easily to PCs with a higher Bargain skill, or let the player know critical information about the bargain. For example, he might tell the player that the NPC seems nervous, as if there's more to this job than meets the eye. Or the NPC seems anxious that you not see the left side of the car you're bargaining for.

Bargaining may be used to estimate resale value of items.

Biology (Physical Science—EDU): This skill reflects a general knowledge of the physical functions of living creatures. The individual understands the structure, functioning, growth, evolution, and distribution of terrestrial-type organisms. This skill can be used to know where to look for life on a new world, how to keep captive populations of living things alive, and how to introduce a form of life into a new environment. This skill allows sufficient knowledge of genetics for controlled breeding, but not for genetic engineering.

Bribery (Vice—CHR): The individual has had experience in bribing officials in order to circumvent regulations or ignore cumbersome laws. Difficulty of the task depends upon the seriousness of the circumstances (only the most corrupt official would take a bribe to ignore a murder), but also upon the law level of the world. Bribery is generally a Difficult task on a Moderate law world, and gets one level easier for each level of higher law, and one level harder for each level of lower law.

Carousing (Charm—CHR): The individual is a gregarious and sociable individual who is well adapted to meeting and mingling with strangers in unfamiliar surroundings. When used in conjunction with Interrogation skill as an averaged or enabling skill, Carousing can be used to gain information from people in a social setting, often without their realizing that you are even looking for information from them.

Carpenter (Artisan—CON): The character is skilled in building items out of wood. At low levels, these items are utilitarian, but at higher levels, the character may use this woodworking skill to actually add aesthetic value to his creations by the use of inlays, veneers, etc.

Chemistry (Physical Science—EDU): The individual has skill in the science of inanimate matter, and understands the composition, structure, properties, and reactions of elements and compounds. Chemistry skill applies to inanimate matter, not living organisms. Characters with this skill can, with the proper equipment, perform chemical analysis.

They can also create useful substances such as chemical smoke (Average), gunpowder (Average), smokeless powder (Difficult), tear gas (Difficult), dynamite (Difficult), explosive primer (Difficult), and plastic explosive (Formidable). (*Note:* Smokeless powder is the propellant in modern cased ammunition; gunpowder is for old-fashioned weapons in which the powder and shot are loaded separately.)

Climbing (Acrobat, Explore—CON): This is the ability to scale vertical surfaces, whether rock faces or buildings, with the proper equipment. Climbing a steep slope or sheer rock face with good handholds is Difficult. Climbing a sheer, mostly smooth rock face or a building wall is Formidable. The above assume no specialized equipment. With climbing equipment, the difficulty level is one lower. Rappelling is Average.

An experienced climber may assist an inexperienced climber. If so, the inexperienced climber uses his or her own CON attribute as a Climbing skill.

Combat Engineer (Engineer—CON): This skill allows the construction and demolition of obstacles, minefields, and field fortifications, and the ability to enhance mobility by building temporary bridges, ramps, and causeways across or around natural or artificial obstacles.

Certain tasks are: place demolitions charge (with engineer demo kit): Average. Improvise detonator/fuse, etc. (in absence of engineer demo kit): Formidable. Improvise antipersonnel obstacles: Average. Improvise antivehicle obstacles: Difficult. Camouflage position: Average.

Most of these tasks assume access to tools, axes, picks, and shovels at the very least. These tasks are made easier with equipment similar to backhoes, bulldozers, etc.

Communications (Space Tech—EDU) [Tech = Industrial +]: The individual is trained in the use, repair, and maintenance of communications devices.

While nearly everyone can press the button and make a communicator function, this skill is necessary to be able to understand why the device does not work correctly, as well as to be aware of the details and limitations on the device's possible use.

For example, it is an Easy test of Communications to

open communications with another communications unit in range. Long ranges, jamming, and environmental interference can make this more difficult.

Computer (Technician—EDU) [Tech = Pre-Stellar+]: Computer indicates a familiarity with the use of computers. While most any character from a technological background of Early Stellar+ can use a computer to retrieve data that is freely available, Computer skill is required to circumvent the computer's programming. Computer skill is required to program a computer.

Construction (Engineer—EDU): This skill allows the construction of permanent structures. The character is skilled not only in the actual tasks of pouring foundations, erecting frames, and hanging drywall, but is also able to design durable buildings for many purposes, and organize their construction.

Access to materials and tools is crucial to these tasks, and Leadership skill is useful when coordinating the efforts of large crews of workers.

Dance (Fine Arts—AGL): The character is able to dance. Low skill levels (0 and 1) are sufficient for recreational and informal dancing (ballroom or folk dancing). Moderate levels (2 and 3) are required for formal affairs; for example, a character can be required to make an Average test of Dance to not embarrass himself at a formal diplomatic reception. High levels (4+) are required to be a member of a professional ballet or interpretive dance troupe in order to use it as a vocational skill.

Some sophisticated styles of dance use the average of Dance and Zero-G Environment.

Disguise (Fine Arts, Vice—CHR): This skill involves convincingly looking like something you are not. It includes use of camouflage, as well as such things as make-up and costume. The use of this skill is often an uncertain task, as the character will not always know if the disguise has fooled anyone. Difficulty depends on the materials available to fashion the disguise, the already existing differences or similarities between the character and the person being impersonated, as well as the distance from which the disguise is intended to be effective. In order to impersonate someone, the character's task is vs. Act/Bluff and Disguise. Of course, the character must always have detailed knowledge of the person who is being impersonated.

Early Firearms (Gun Combat—STR) [Tech = Pre-Industrial–, Law = Mod–]: This skill confers the ability to use various black-powder firearms, including the arquebus, hand cannon, and musket. This skill also covers the use of crossbows.

Electronics (Technician—EDU) [Tech = Industrial+]: Pretty much everyone in **Traveller** knows how to operate most electronic devices. Characters with the Electronics skill know how to create and repair those devices, and can figure out fairly easily how to operate the more advanced sorts (such as radar systems, power plant controls, and the like).

Use the standard diagnosis and repair task rules in the Equipment Maintenance and Repairs section, page 241, for the repair of electronic devices.

Energy Artillery (Artillery, Heavy Weapons—AGL) [Tech = Pre-Stellar+]: This skill indicates the ability to maintain and use heavy direct and indirect fire battlefield weaponry that fires bursts of energy or energetic particles rather than macroscopic physical projectiles. These weapons include battlefield meson guns, fusion and plasma guns, and heavy-vehicle-mounted lasers. A character can use this skill at one difficulty level greater in place of the Gunnery (Energy Weapon) cascade.

Energy Weapon (Gun Combat—AGL *or* STR) [Tech = Pre-Stellar+, Law = Low–]: This skill allows the use of energy weapons as small arms. This is a cascade skill, with two cascades: *Energy Pistol* and *Energy Rifle*. Energy Pistol allows use of laser pistols, while Energy Rifle allows the use of laser rifles, laser carbines, and plasma and fusion rifles.

This skill is unusual in that it uses two controlling attributes, depending on the weapon being used. When firing plasma or fusion weapons, the controlling attribute is Strength. When firing laser weapons, it is Agility.

Environment Suit (Spacehand—CON) [Atmos = Vac *or* Tech = Pre-Stellar+]: This skill confers the ability to wear and conduct various activities in the many specialized suits designed for hostile environments. Such suits include the standard vacuum (vac) suits, combat armor, and powered battle dress, as well as suits intended for use in high-pressure environments, such as high-pressure atmospheres and beneath oceans.

High assets or levels of this skill are required to handle battle dress, as many routine activities become Difficult tests with the suit's strength amplification.

In addition, when attempting tasks with Stealth, Acrobatics, Climbing, and *any* weapons skills while wearing battle dress, the character uses *the lower of* Environment Suit skill level or the normal controlling attribute to compute the asset. For example, a character wearing battle dress attempts to fire a gauss rifle, which uses the Slug Weapon (Slug Rifle) skill. The character has a Slug Rifle skill level of 4. The controlling attribute for Slug Rifle is STR, and the character has STR 8, for a total Slug Rifle asset of 12. But the character only has Environment Suit 4, which must be used instead of the higher STR attribute. This yields a Slug Rifle asset of (4+4=) 8 when wearing battle dress.

High levels of this skill also allow individuals to attempt personal atmospheric re-entry. This can be done with personal atmospheric re-entry kits or military-use drop capsules (see the "Equipment & Technology" chapter), and has a base difficulty level of Difficult: Environment Suit. The level is increased by atmospheres of Dense or higher, and by high starting vectors.

Excavation (Engineer—EDU): This skill indicates an individual's expertise in planning and executing the digging of safe, stable, and useful large holes. These holes can be the foundations for buildings, bunkers, and trench systems, or extensive underground mines or tunnels.

Because the character with the Excavation skill usually does not do all the work alone, this skill is best used with Leadership skill when supervising the activities of large groups of workers.

Farming (Animal Handling, Physical Science—INT) [Atmos = Thin–Dense, Hydro = Dry+]: This represents the ability to raise crops and livestock for food or other uses. In addition to actually producing fields of plants and herds of animals, all of which takes months and is dependent upon weather and other conditions, Farming skill allows the estimation of the quality of soil, identification of pests, the modification of fallow land to productive use, and the breeding, care, and feeding of livestock.

Farming skill refers mostly to open-air farming on a world with a hospitable environment. However, referees may allow automatic override of the homeworld restrictions to allow for farming in enclosed environments, such as underground fungus farming, or large-scale hydroponics gardening.

Fleet Tactics (Tactics—INT) [Tech = Early Stellar+]: The individual has been trained in the art of naval operations. Fleet Tactics is used in command of two or more starships.



This skill may be used to predict where an opposing fleet commander has placed his forces, and how they might be deployed. This is an uncertain, Difficult task if the opposing commander has the same skill level as the character, and increases in difficulty one level for each level of Fleet Tactics skill (not asset) that the opponent has over the character's level.

This skill also provides advantages in the resolution of starship combat; see the Space Combat section beginning on page 311.

Forgery (Crime—AGL): Forgery is, of course, the ability to create false documents. When used in conjunction with the Electronics skill, Forgery allows for the falsification of electronic documents.

Forward Observer (Artillery—INT) [Tech = Industrial+]: This skill confers the ability to call in, direct, and correct long-range fire onto enemy targets for maximum effect. This fire can be indirect ballistic artillery, indirect rocket and missile fire, geodesic meson fire, and orbital fire. This skill consists almost exclusively of correcting the accuracy of fire that has already been observed. Only under the most unusual of circumstances, such as with artillery equipment firing from surveyed positions and using equipment with which the observer was very familiar, could a forward observer even attempt to achieve first-round hits.

Gambling (Vice—INT): The individual has an expertise in betting and games of chance. The character has an understanding of how to play many standard gambling games, and knows how to detect cheating or a rigged game (this is an uncertain opposed test against the Gambling skill of the person doing the cheating). This skill also allows the ability to calculate odds. However, gambling should never be confused with normal risk-taking.

The Gambling skill only confers knowledge of the technical aspects of such games, and how to take advantage of them. Interaction with other gamblers, or with persons the character is attempting to fleece (or is being fleeced by), requires the use of other talents. Certain Charisma-based skills, such as Act/Bluff, Carousing, Persuasion, and Liaison should be used in conjunction with the Gambling skill in such cases.

Genetics (Physical Science—EDU): The individual has expertise in the biological mechanics of heredity. The ability to manipulate the functioning of genes is crucial to advanced medical techniques, such as replacement organ manufacture, genetic engineering to create improved forms of life, cloning, and the creation of retroviral medical treatments.

Geology (Physical Science—EDU): The individual has gained experience in searching out mineral wealth on the surfaces of worlds and in deep space.

The skill of Geology allows an individual to have a greater likelihood of discovering mineral deposits. This skill alone is not sufficient for the discovery of vast mineral wealth, but it does provide a greater probability of an individual discovering what is there.

Grav Belt (Personal Transport—AGL) [Tech = Pre-Stellar+]: This skill allows the character to use the grav belt for personal transport. This skill is useful when conducting drop operations (see Environment Suit skill and the "Equipment & Technology" chapter, pages 335-338), and can also be used to assist the character in carrying awkward loads.

Gravitics (Space Tech—EDU) [Tech = Early Stellar+]: The individual can use and repair gravitic—also called grav or antigrav—devices. This skill is used to understand, repair, assemble, and operate gravitic drives and equipment.

Grenade Launcher (Heavy Weapons—STR) [Tech = Industrial+]: The character is skilled in the use of man-portable direct and indirect fire devices. This skill allows use of nonautomatic grenade launchers, direct fire antiarmor rocket launchers, and mortars.

This skill is used with both direct and indirect fire.

Ground Tactics (Tactics—INT): The individual has training and experience in the proper military use of ground troops and weapons used by and against them. This skill can provide advantages in combat situations, and allow the character to predict what an enemy commander might do (this is a Difficult uncertain task if the enemy's Ground Tactics skill is equal to the character's, and increases in difficulty one level for each level that the enemy's skill level [not asset] exceeds the character's).

This skill is not to be confused with strategy, which deals with the reasons for a military encounter and the intended results of the encounter; strategy is the realm of the players, rather than of the characters.

Guard/Hunting Beasts (Animal Handling—CON): This indicates the broad knowledge of animals, typically carnivores, which are used for guarding, tracking, drug- or explosive-sniffing, hunting, and retrieving. Examples include dogs, pigs, bloodvarks, seals, dolphins (nongenetically modified), falcons, and hawks. This skill allows for their care, feeding, training for these tasks, and use of them in these tasks.

Ground Vehicle (Vehicle—AGL) [Tech = Industrial+]: This skill indicates an ability to drive vehicles that move on the ground with friction-based systems. It is a cascade, allowing selection of *Wheeled Vehicle* or *Tracked Vehicle*. It also allows knowledge of basic forms of maintenance of these vehicles, such as changing tires, tracks, filters, and oil.

Gunnery (Space Tech—EDU) [Tech = Pre-Stellar+]: Gunnery is a skill in the operation and firing of one of several types of starship armament. It is a cascade skill, and contains the following:

Energy Weapon: Allows use of lasers, meson guns, and particle accelerators in any form of ship-mounted installation. A character can use this cascade at one difficulty level higher in place of the Energy Artillery skill.

Grav Weapon: Allows use of tractors and repulsors in any form of ship-mounted installation.

Missiles: Allows use of missiles in any ship-mounted installation.

Heavy Artillery (Artillery—STR) [Tech = Industrial+]: This skill indicates the ability to maintain and use heavy indirect fire weaponry that fires physical projectiles. This includes chemically propelled howitzers and mortars, ballistic rockets and missiles, and mass drivers.

Heavy Guns (Heavy Weapons—STR) [Tech = Industrial+]: The character is skilled in the use of heavy direct fire guns, including both CPR (chemically propelled rounds) and mass driver weapons. These weapons are usually mounted in vehicles or field carriages, but can also be static defensive guns.

High-G Environment (Explore—CON) [Size = Large *or* Tech = Early Stellar+]: The individual has experience in an environment having a gravity greater than 1G. A high-gravity environment exerts considerable stress on the body and often does bodily harm to those not accustomed to dealing with extreme gravity. High gravity severely limits the range of slug throwers, but has little or no effect on lasers and energy weapons.

History (Social Science—EDU): This skill indicates a knowledge of specific historical facts, as well as general historical trends or forces. This skill can serve as an enabling skill when attempting to puzzle out the

significance of salvaged equipment, local customs, and excavated sites.

This skill includes other social science disciplines as well. For example, an anthropologist would be a character with high History and Liaison skill levels, an economist one with History and Marketing, and a political scientist one with History and Admin/Legal.

For purposes of roleplaying and generating character color, a player can designate an area of specialization for each 2 skill points. For example, military campaigns of the Final War, Vilani ground vehicle technology of the First Imperium, or the economic history of Lishun Sector. PCs who have advanced degrees (see Character Generation) should be encouraged to come up with the titles of their thesis papers, with extra credit given for Byzantine and grandiose titles ("On the Urge: or the Epistemology of Yearning").

Hovercraft (Vehicle, Vessel—AGL) [Tech = Pre-Stellar+, Atmos = Standard+]: This skill allows the use of vehicles that travel on a captured bubble of air and can travel over the water and reasonably level ground. Certain specialized hovercraft (known as rigid sidewall craft or surface-effect ships) can be used only in the water and can be used with this skill.

Instruction (Interaction, Social Science—CHR): A character with skill in Instruction is able to effectively teach skills to other people. (See Skill Improvement, page 133.)

Interrogation (Interaction—CHR): This is the ability to obtain information from people. Primarily, Interrogation involves asking the right questions and correctly interpreting the responses. It does not only include interrogation of unwilling persons, but also of confused witnesses, and even of sources who don't realize how much they really know.

Interrogation may include psychological intimidation and manipulation, but does not include torture.

Interview (Social Science—INT): Functions identical to Interrogation, but is based on the Intelligence attribute.

Intrusion (Crime—AGL): The Intrusion skill enables a character to manipulate mechanical and electronic locks. To open simple mechanical locks (like those on a briefcase, desk, or normal door) and to hot-wire a vehicle are Average tasks. To pick deadbolts or key locks on handcuffs and jail cells is Difficult. Opening combination and key locks on padlocks, strongboxes, and safes is Formidable. All of these assume the use of proper lockpicks; they become one level more difficult if tools have to be improvised. Locks on vaults and high-security facilities always require special tools and are always Formidable.

Defeating electronic devices comparable to each of the mechanical classes above is one level higher, and also requires a specialized set of electronic intrusion tools, or the difficulty is increased a further level. In some cases, the referee may allow Electronics skill to serve as an enabling skill.

This skill also allows the use of small amounts of explosives to blow open safes, bank vaults, and even walls between adjoining buildings. It does not, however, grant skill in the demolitions of bridges, buildings, etc.

Investigation (Perception—INT): The individual is skilled at gathering and interpreting evidence at the scene of a crime or accident. Special investigative equipment is sometimes required. Crude investigative equipment is available at a tech code of Industrial; investigative equipment from higher tech codes is more reliable and gives more detailed information.

This skill allows things such as the determination of bullet entry and exit directions, likely range of the shot, estimation of the time of death, calculating trajectory and speed of collisions, and the like. The piecing together of various clues is not handled by this skill; that is the province of the players.

Jeweler (Artisan—AGL): This represents the ability to manufacture and repair small, intricate ornamental or mechanical objects, and also to add value to precious and semiprecious materials.

A character who wished to repair a mechanical watch (digital clocks require Electronics skill) would have to succeed at a Formidable test of Jeweler skill. The difficulty would decrease one level with the possession of a jeweler's toolkit or supply of watch parts (two levels easier with both).

The character can also cut gems and fashion jewelry out of metal. Given a supply of raw materials, a character could manufacture jewelry valued at double its raw material cost with a Formidable test of Jeweler skill, triple its cost at one level higher, quadruple at two levels higher, and so on. A failed test for a higher value may result in a success at a lower value at the referee's discretion. (For example, the character attempts to make a quadruple value ring, but fails the roll by only 1 point. The referee may judge that the ring is triple value.) Difficulty is reduced one level with a set of jeweler's tools. Costs include wastage of ruined gemstones. Time required varies with the size of the project. Difficulty and time can be traded off against each other, with each doubling or halving of time yielding a decrease or increase of one difficulty level, respectively.

Language (Interaction—CHR): This is a special cascade skill which does not function according to the normal cascade rules (see Skills on page 27 of

Character Generation). Receipt of the Language skill allows the character to select either a particular language (French, German, Vilani), or the cascade *Linguistics*.

All characters are assumed to already automatically have a skill level of 10 in their native language (usually Anglic—see History, beginning on page 8). However, this level 10 skill is considered separate from the Language skill, and does not give the player knowledge at half this level of any other language cascades.

Communicating in a language which is shared by both characters, but which is not the *native language* of both characters, is a Difficult task vs. the average of the *two characters' Language skill levels*. If one of the characters does not speak the language, but is trying to communicate by drawings or sign language, the task becomes Formidable vs. the average of the two Charisma attributes. Both of these tasks become one level easier if only simple concepts are being communicated ("I'm hungry").

Identifying a language is Easy if the identifying character speaks it, Formidable: CHR if the identifying character has at least heard it spoken.

Linguistics as a cascade of Language also does not follow the normal rule for cascade skills. Like other skill cascades, Linguistics may be selected as a specialty separate of other languages already chosen. However, characters who have not selected Linguistics do not use it at one-half the level of the highest specialty of the Language cascade. Rather, players who have skill in two or more languages *other than* their native language take the average of those languages (round to the nearest whole number; thus 10 + 4 = 3) and cut the result in half (again rounding to the nearest whole number). This is the default level of Linguistics skill for the character. Any selections of the Linguistics specialty are added to this number. For example, a character has received Language eight times, breaking it down as: Vilani 4, Aslan 2, Vargr 1, and Linguistics 1. Her level of Language (Linguistics) is therefore 4+2+1=7, 7+3=2, 2+2=1, plus the Linguistics level 1 equals an effective Linguistics skill of 2. If she had no foreign languages, the Linguistics level would be simply 1.

An individual with the Linguistics cascade has the ability to quickly learn and understand an unknown language based on understanding the common structures of languages.

Large Watercraft (Vessel—CON) [Hydro = Wet+, Atmos = Thin-Dense]: This skill confers the ability to maneuver boats and ships, including those powered by sails. The skill can be used with sail-powered vessels to make better time by making better use of the wind, to maneuver safely in restricted waters, and to ride out rough weather. Difficulty increases with high winds and rough water, and with the increasing size of the ship. For large vessels which the character cannot control alone, the task becomes a test of Large Watercraft and Leadership. With very large sailing ships, it is sometimes useful to roll the task against the average of the Large Watercraft and Leadership of all of the ship's officers, so that an inexperienced crew can thwart the abilities of even a skilled captain.

The operation of submarines requires the joint use of Large Watercraft and Sensors. If the submarine is being controlled by one person, it requires the combined use of Large Watercraft and Sensors. If operated by a crew, a Sensors roll made by the sonar operator can be used as an enabling roll to reduce the difficulty of a Large Watercraft roll being made by the commander.

Similarly, a Sensors roll may enable the navigation of a surface ship through storm or heavy fog.

Leadership (Determination—CHR): Leadership is the use of force of personality to convince others to obey you. Different people have different manners of leading. Some do so by barking out orders, while others simply inspire loyalty in their followers. Players who choose this skill for their characters should consider their character's personality when roleplaying its use, and also consider the effect of other related skills. For example, a character with Leadership and Willpower skills, but no Persuasion or Carousing skills, would most likely be a harsh leader, while one with Persuasion and Carousing would use a more inspirational style.

It is typically an Average difficulty task to use the Leadership skill to convince NPCs to follow your orders. The referee may adjust this, of course, depending upon other factors.

Leadership is also used when organizing the actions of a group of characters (usually NPCs) into cooperative actions. For example, supervising a group of laborers to construct a building would be a task rolled against Leadership and Construction. If the character had a number of assistants, foremen each with Leadership and Construction skills who could be relied upon to handle much of the detailed supervision, the character could use his Leadership skill alone.

Liaison (Explore, Interaction—CHR): The individual is trained in the art of dealing with others and has the ability to understand other groups and cultures and the way they organize their societies and live their lives. In addition to quickly assimilating the differing rhythms and priorities of other societies, the character is able to adapt to these patterns without prejudice, and work efficiently within them, and with members of those societies.

This skill, in conjunction with Language (Linguistics),

is crucial to the effective contact with new cultures or species.

Within his or her own society, a person with Liaison skill could work effectively as a public relations flack, although mere Act/Bluff skill is usually sufficient for this vocation.

Machinist (Technician—AGL) [Tech = Industrial+]: The character is skilled in the fashioning of machine parts to fine tolerances. This skill allows a character to create replacement mechanical and engineering parts using a machine shop, and repair many pieces of equipment, including all varieties of firearms, heavy weapons, and artillery.

Map (Explore—EDU): This skill indicates that the character is familiar with the concepts of systematically and accurately exploring worlds and recording and mapping their features. Use of this skill in conjunction with Sensors and Navigation skills, and the ability to travel around and make measurements, allows a character to generate a map of the surface of a world, or whatever portions he or she examines.

Mapping skill also allows a character to keep his bearings when underground, inside a large structure, or in weather when no external points of reference are visible.

Certain navigation and sensor devices simplify this job. See the "Equipment & Technology" chapter, pages 345-347.

Marketing (Economics—EDU) [Pop = Mod+]: The individual is skilled in the marketing of goods, and understands the business of buying and selling.

Uses of the Marketing skill are governed by the rules in the Trade and Commerce section of the "Worlds & Travel" chapter, page 230.

Mason (Artisan—STR): The character is skilled in the area of stone-cutting and brick-making, as well as construction with these materials. This does not confer the ability to conceive and design buildings, which is the province of the Construction skill. However, a character with Construction skill who was attempting to build a Gothic cathedral would do well to have a number of masons working for him.

Mechanic (Technician—STR) [Tech = Ind+]: This reflects a knowledge of how to build and repair machinery in general. Difficulty of the build or repair task will be set by the referee. If improper tools are available, increase any task difficulty levels by one.

Medical (Medical—EDU): The Medical skill allows for the treatment of wounds and diseases. It is broken into three cascades: *Diagnosis*, *Trauma Aid*, and *Surgery*.

Diagnosis reflects a familiarity with injuries, diseases, allergies, and other maladies, and their treatments. Diagnosis also covers pharmaceutical knowledge that allows the prescription of drugs and knowledge of their interactions.

Trauma Aid reflects expertise in first aid, shock treatment, and the stabilizing of patients for transfer to a location where more comprehensive care is available. This is the cascade of choice for combat medics and corpsmen.

Surgery is the aspect of the Medical skill that allows repairs to be made to injured bodies, as well as more advanced procedures such as transplants, implants, biological modifications, and twisted applications like vivisection. This skill is used in combination with Electronics skill to allow cybernetic implants.

To attempt a Medical task on an unfamiliar form of life is a Formidable or Impossible task, depending upon what is being attempted. If the organism is broadly similar to terrestrial animals (i.e., a carbon-based, oxygen-breathing, water-drinking creature), a Biology roll of at least Difficult level can enable the task. If the creature is radically different from terrestrial animals (for example, a creature that metabolizes ammonia or combusts in an oxygen atmosphere), the Xeno-Biology skill must be used instead. Failure of either of these rolls can indicate that there were no materials (drugs, breathable atmosphere, plasma, saline solution, etc.) that were compatible with the creature that could be used during the procedure, or that figuring out how the creature worked took too long, and it just died.

For purposes of Medical skill, humans and Terran organisms are considered to be the default for the expertise of human characters. The Aslan, Vargr, Droyne, K'kree, and Hivers are all broadly terrestrial in that they have nerves, blood, internal organs, etc., that work in similar fashions. While a Medical task on a Vargr would not require a Biology enabling roll for a human doctor, a task on any of the four other races would. Likewise, a Hiver doctor must make a Biology roll to enable an operation on a human.

For the treatment of wounds, see the Wounds and Damage section, page 285, for details. Diseases are left to the referee's discretion.

Metallurgy (Artisan—EDU): The character has skill in manufacturing metals and fashioning things from them. The use of this skill is very dependent on the technological background and the materials at hand. At low tech levels, the character could be a tinker, blacksmith, weapons maker, or armorer, and could fashion alloys and make castings of them.

At higher tech levels and with more equipment, a character could forge, cast, and mill various specialized grades of steel or more advanced alloys.

At the highest levels, work can be done with various ceramics, crystalline metals, fluid or plastic metals, and dense and superdense metals.

This skill can be combined with the Mechanic, Electronics, and Ship's Engineering skills to fashion machine, electronics, and engineering parts, respectively.

Meteorology (Physical Science—EDU): This skill allows the character to make predictions of weather and other atmospheric phenomena.

Most Meteorology rolls are uncertain tasks, and become more difficult the farther in advance the prediction attempt is made. For broad predictions made of the next eight hours (e.g., roughly how long until a storm begins or ends, when a window of open sky will pass over an airfield), this task is always Easy if the character has access to a radar set of TL8 or above, or an aircraft to scout out the local weather patterns.

These tasks are relatively simpler in Trace and Thin atmospheres, and become more difficult in atmospheres of Dense or greater (see World Building, beginning on page 180, for more information on atmospheres).

Muscle Transport (Personal Transport—AGL): Muscle Transport is a cascade skill which indicates a character's facility with certain equipment or devices designed to speed human travel in certain environments. Cascades include: *Skates* (roller and ice), *Wheels* (bicycles), and *Skis* (includes skis, water skis, surf- and sailboards). This skill is usually awarded at level 0 after a few hours' practice to allow the character to use the device at standard difficulty using his or her Agility attribute alone.

If higher levels are taken, it indicates the character's ability to negotiate unusual terrain, to make better speed with the device, or to attempt unusual feats, such as carrying heavy loads or conducting combat.

Music (Fine Art—AGL): This skill represents facility with musical artistic expression. At referee's and players' discretion, it can be broken up into the following cascades: *Composition, Strings, Wind, Percussion, Keyboard,* and *Other.* This skill can be used as a vocational skill, and, if one of the characters also has Song skill and a garage, you can start your own band.

Navigation (Explore—INT): This skill indicates an ability to maintain a sense of direction, read and follow maps, and use other basic navigational equipment such as a compass. This can be used for land or nautical navigation.

Observation (Perception—INT): Observation reflects a quality of alertness and/or a training in noticing important things in one's surroundings. It is most importantly used for visually sighting objects using the naked eye or visual enhancement devices. It is also useful for such diverse things as detecting ambushes, discovering hidden compartments in luggage, and finding one important file within an entire drawer full of them.

Painting (Fine Arts—INT): This skill indicates that the character has a talent for visual artistic expression. While this usually means paints on a flat surface, its use combined with other skills can provide other effects. For example, a character could use Painting and Electronics skills to create holographic art.

Parachute (Personal Transport—CON) [Atmos = Standard+, Tech = Ind+]: Parachute confers the ability to safely descend from altitude using a parachute or personal paraglider. To land safely in most terrain is Average. To land safely in woods, cities, swamps, or water is Difficult. To land in a particular spot is Formidable with a parachute and Difficult with a paraglider. Rigging or checking a rig is Average. Flying a hang glider is Difficult. Repairing a parachute, paraglider, or hang glider is Average. Making a parachute, paraglider, or hang glider is Formidable.

Persuasion (Charm—CHR): Persuasion, a skill at convincing other people to act as you wish them to, includes such things as haggling for a bargain, rousing a crowd to action, and convincing an enemy to let you go. The referee will set the difficulty level based upon the specific situation and exactly what sort of a speech you make.

This is only used to convince NPCs; all attempts to persuade other player characters are argued by the players themselves.

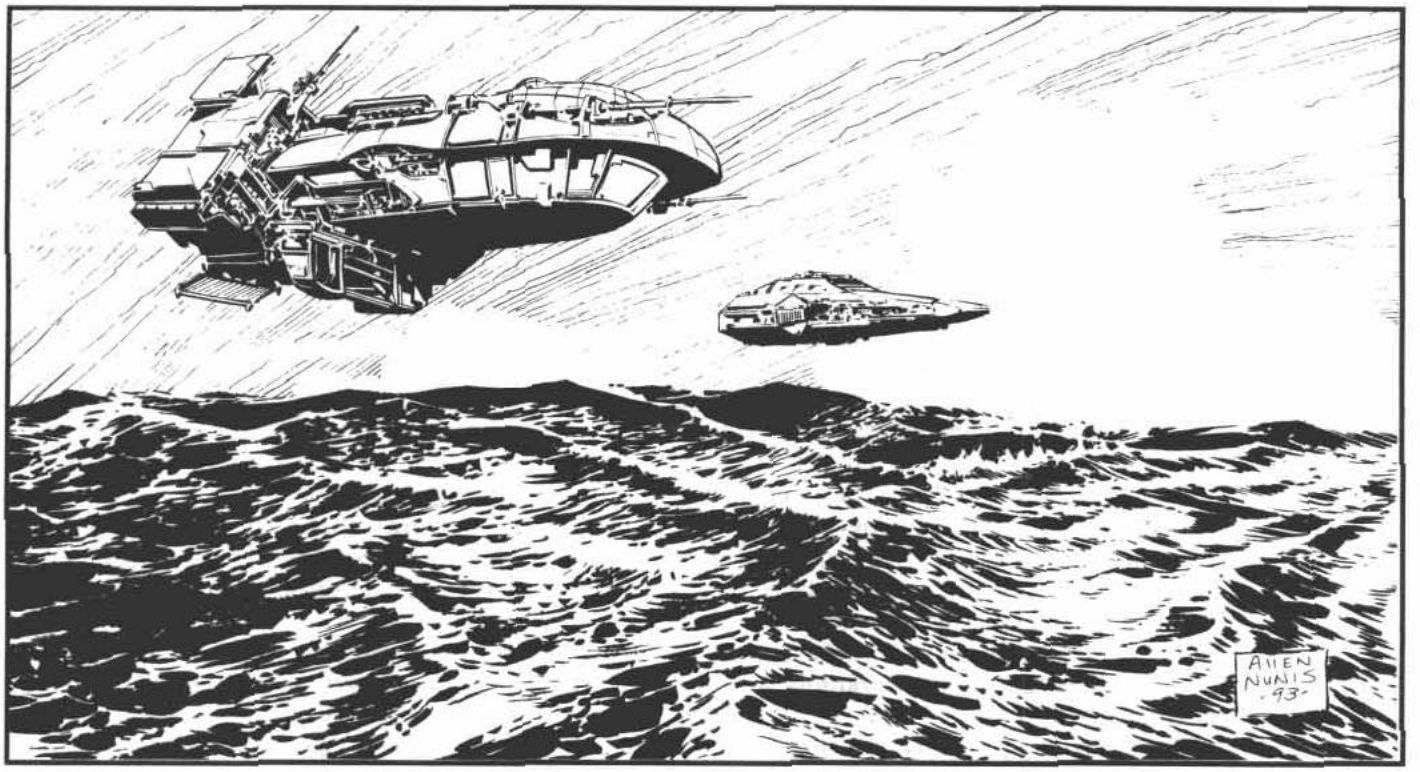
Physics (Physical Science—EDU): Physics represents a theoretical knowledge of the workings of the universe. Although not a cascade skill, for roleplaying purposes, players who choose this skill for their characters should designate some area of specialization. Examples include geophysics, astrophysics, or molecular physics.

Pickpocket (Crime—AGL): This skill involves both misdirecting a person's attention and then surreptitiously removing an item from their person. Generally, the victim will get an Observation skill check to notice the theft. The Observation skill check is treated as an opposed test, comparing the victim's Observation skill level to the thief's Pickpocket skill level.

Pilot (Aircraft, Space Vessel—AGL) [Requirements vary, see below]: Pilot is a cascade skill including *Airship, Fixed Wing, Rotary Wing, Glider,* and *Interface/Grav.* Certain of the cascades as indicated below have specific homeworld requirements. See the "Equipment & Technology" chapter for more details.

The Airship cascade allows the operation of dirigible rigid and nonrigid lighter-than-air craft, as well as tethered and free ballooning. These craft may derive their lift from hot air or locally buoyant gases. [Airship requires Tech = Industrial+, Atmos = Standard+.]

The Fixed Wing cascade allows use of all fixed-wing aircraft, including scissors wing and variable geometry, regardless of their power source or performance. Con-



vertible fixed-wing/rotary (tilt-rotor and x-wing) aircraft use whichever skill is appropriate to the current mode of travel. Fixed-wing VTOL, STOVL, and wing-in-ground effect (WIG) craft are covered by this cascade. [Fixed Wing requires Tech = Industrial+, Atmos = Thin+.]

The Rotary Wing cascade allows use of helicopters and autogyros. Convertible fixed-wing/rotary ("tilt-rotor") aircraft use whichever skill is appropriate to the current mode of travel. Compound helicopters which still derive lift from moving rotors use this cascade, while helicopters which lock their blades in flight (x-wing aircraft) use the Fixed Wing cascade. [Rotary Wing requires Tech = Ind+, Atmos = Thin+.]

The Glider cascade allows the use of gliders, sailplanes, hang gliders, paragliders, and ornithopters (see the "Equipment & Technology" chapter). This skill also allows the pilot to know how to find sources of aerodynamic lift, such as thermal updrafts, etc. [Glider requires Tech = Ind+, Atmos = Thin+.]

The Interface/Grav cascade allows the use in an atmosphere, including atmospheric entry, of vehicles that do not primarily rely on aerodynamic lift (although many of these designs do generate some lift). The atmosphere may be that of a habitable world or a gas giant. It does not refer to the proper use of such a craft in vacuum or jump space, which are the province of the Ship's Tactics and Astrogation skills. [Interface/Grav requires Tech = Early Stellar+.]

Psychology (Perception—INT): This skill allows a character to judge the motives of another character. It can be used, for example, to determine the truth or falsehood of statements another character makes. Other uses are left to the referee.

Recruiting (Interaction—CHR): Recruiting skill allows a character to attract qualified applicants for various enterprises for which the character may be hiring, including mercenary units and starship crews.

This skill also allows the character to estimate the skill level of potential recruits. This requires a 30-minute interview and is a Difficult test of Recruiting and the skill being estimated (thus characters with Recruiting cannot attempt to estimate a skill level in another if they do not themselves possess the skill at at least 0 level).

Research (Perception—INT): The individual has a broad understanding of the techniques that are used in researching information relating to people, places, and events. This skill can be used to gain specific information the characters are looking for, or as an enabling skill to find information that will simplify another task.

Riding (Animal Handling, Vehicle—CON) [Atmos = Thin-Dense]: This skill indicates a broad knowledge of all sorts of animals commonly used for riding and as beasts of burden, and includes their care and feeding as well as the ability to use them for rapid and efficient transportation as either personal mounts or teams

pulling payloads. This skill does not confer expertise in breeding, which comes under the Farming, Genetics, and Biology skills.

RCV Operations (Aircraft, Artillery, Space Tech—EDU) [Tech = Pre-Stellar+]: The RCV (remotely commanded vehicle) skill allows the character to control weapons or vehicles from a remote location. The limitations imposed by reliance on sensors mounted in the remote vehicle, the absence of subtle sensory inputs such as motion and the time-lag built into the control transmissions make RCV Operations very difficult without training. RCV Operations is always used combined with another skill, such as Pilot, Ground Vehicle, Tac Missile, etc., depending upon the type of RCV that is being controlled. The firing of weapons from such vehicles works the same way, and is rolled against RCV Operations and Energy Weapon, RCV Operations and Heavy Weapon, etc., depending upon the weapons mounted on the remote vehicle.

The interpretation of sensors mounted in these vehicles does not require the use of the RCV Operations skill, as the data is sent directly to the control station and can be read there.

Robotics (Science—EDU) [Tech = Pre-Stellar+]: The individual is trained in designing, building, repairing, and conducting operations with robots. Robots are self-controlling and are distinct from remotely commanded vehicles.

Most robots are fairly dumb, i.e., unable to make fine distinctions in complex situations. Robotics skill allows a character to "explain" to a robot, either verbally or via reprogramming, how to conduct specific missions.

When working on or reprogramming a robot, Robotics skill can be used as an enabling skill for Electronics, Mechanic, Computer, and Gravitics tasks.

Screens (Space Tech—EDU) [Tech = Early Stellar+]: The individual is skilled in the operation of a variety of protective equipment developed for starships. This is a cascade skill consisting of *Nuclear Dampers, Meson Screens, Sandcaster,* and *Black Globe.* (See Space Combat, beginning on page 311, for the use of these skills.)

Sculpture (Fine Arts—INT): The character has a facility for the creation of three-dimensional pieces of art. The form of sculpture depends on the player's wishes and the character's other skills. A character with Sculpture and Mason skills would be able to carve statues from stone; one with Metallurgy might cast statuary in bronze; and one with Mechanic skill might weld sculpture from metal parts.

Sensors (Space Vessel—INT) [Tech = Industrial+]: The individual can operate, diagnose, trouble-shoot, and repair a variety of sensing equipment, and is familiar with interpreting their readings.

This skill can be used alone to interpret the readings sent in from sensors mounted in remotely commanded vehicles or at remote outposts without need for RCV Operations skill.

This skill is also useful as an enabling skill for the maneuvering of spaceships, watercraft, or aircraft in difficult conditions. Referees should remember that because many Sensors rolls are uncertain, the enabling function may not have actually succeeded. An aircraft pilot or submarine commander who is acting on the basis of a *some truth* or *no truth* Sensors roll may believe that his difficulty level has been reduced when in fact it has not. This is how airplanes fly into the side of mountains and submarines into sea mounts or shallow bottoms.

Service (Charm—CHR): The individual is experienced and capable in the care and feeding of passengers aboard ships, guests at hotels, diners at restaurants, etc.

Service skill represents a general knowledge of cooking, personal care and attention, and other areas of experience which will make guests, passengers, and crew happy and content with the conditions of their stay or passage.

Ship Tactics (Tactics—INT) [Tech = Early Stellar+]: The individual has been trained in the operation of a starship or spaceship in battle. Ship Tactics is a skill which is used by individuals who are in command of a single ship in combat.

This skill allows die modifiers in starship combat. (See Space Combat, beginning on page 311).

Ship's Engineering (Space Tech—EDU) [Tech = Pre-Stellar+]: The individual can operate and maintain spacecraft maneuver drives, jump drives, and power plants. A skilled engineer is essential for the proper operation of any starship. Engineering experience enables an individual to operate the vital drives of starships (and any craft or installation with a fusion power plant), as well as to maintain the machinery against failure.

See the Space Travel section of the "Worlds & Travel" chapter, page 218, for further details.

Slug Weapon (Gun Combat—STR) [Tech = Industrial+, Law = Mod–]: Slug Weapon allows the use of small arms that cause damage by firing a slug of some material, usually metal. It is a cascade skill, allowing its selection as *Slug Rifle* and *Slug Pistol.* See the combat rules for further details.

Small Watercraft (Vessel—CON) [Hydro = Wet+, Atmos = Thin-Dense]: This skill allows the character to skillfully use small watercraft. These include muscle-powered vessels such as canoes, kayaks, rafts, and rowboats, small sailboats, and motorboats.

This skill does not allow operation of submersibles of any size. All dry/pressurized submersibles are handled by the Large Watercraft skill, and all wet submersible vehicles are handled by Swimming.

Song (Fine Arts—CHR): The character is an accomplished singer.

If Song is used as a vocational skill, the character is a member of a band, choir, opera company, or the like, or has a recording contract.

Starship Architecture (Engineer—EDU) [Early Stellar+]: This skill indicates knowledge of how and why starships are built the way they are. Possession of this skill at level 2 or above allows PCs to design their own starships without having to pay the usual architect's fee, and to supervise construction and control cost overruns. (See **Traveller Technical Architecture** sourcebook for a complete discussion of the economics of starship construction.)

Starship Architecture is primarily used as a vocational skill or as an enabling skill. Any Ship's Engineering task to diagnose or repair damage to a starship, to install changes or modifications to a starship, or to estimate the costs of repair or modifications are enabled by a roll against Starship Architecture (difficulty level set by referee).

Stealth (Acrobat—AGL): This is the ability to move about without drawing notice. It is an Average difficulty task to move, unnoticed, to within one meter of another character at night. The same task becomes Difficult in daylight (assuming there is some reasonable route to approach by). Also, attempts to track or stalk a stealthy character require the trackers to subtract their target's Stealth level from their Tracking skill before making their task rolls.

Streetwise (Determination, Vice—INT) [Pop = Mod+]: The individual is acquainted with the ways of local human subcultures (which tend to be similar everywhere in human society), and thus is capable of dealing with strangers without alienating them.

Close-knit subcultures (for example, some portions of the lower classes, trade groups such as workers, and the underworld) generally reject contact with strangers or unknown elements. Streetwise expertise allows contact for the purposes of obtaining information, hiring persons, purchasing or selling contraband or stolen goods, and other shady or borderline activities.

It also includes knowing how to project an image that engenders respect among the locals and recognizing where to go to find what you need.

Survey (Space Vessel—INT) [Tech = Pre-Stellar+]: The individual is skilled and knowledgeable in the procedures used in mapping and charting star systems.

Survey is a skill conferring expertise to produce accurate maps and directories of previously unexplored or uncharted stellar territory. Survey allows an individual to accurately derive the characteristics of an unknown or unclassified world based on sensor data. It allows an individual to correctly produce maps and information about star systems as well.

This skill must be used in conjunction with Sensors skill in order to provide reliable results.

Survival (Explore—INT): There are a lot of different worlds, each of them as distinct as any terrestrial environment, and most of them as varied as the range of terrestrial environments. Possession of the Survival skill indicates familiarity with a broad variety of environmental conditions. This allows the individual to live off the land or stay alive in situations where most individuals would have trouble finding food, water, or shelter.

The likelihood of Survival skill (no matter how good) allowing a character to find breathable air in a vacuum is rather slight, but Survival would allow an individual to use any tools at hand to build an adequate shelter or to locate caves or natural features which could assist in survival. Survival also allows the fashioning and use of such environmentally appropriate equipment as skis, snowshoes, protective hats, etc. Certain equipment makes Survival tasks less difficult: water test kits and purifiers, atmospheric sniffers and chemical analyzers. See the "Equipment & Technology" chapter.

Swimming (Explore—CON) [Atmos = Thin-Dense, Hydro = Dry+]: Swimming is the ability to stay afloat and move in water. Floating is a Difficult task when fully clothed; Average with little or no clothing. Each kilogram of equipment effectively reduces a character's Swimming skill level by 1.

If the task is failed, the character sinks and will drown within a number of combat turns equal to his or her Constitution score. Shedding clothing and/or equipment (one turn) allows a new attempt at the task.

If the task is successful, the character floats and may swim at a speed equal to the (adjusted) Swimming skill (not asset), in meters per combat turn. Characters have a Swimming endurance equal to 5 times their Constitution. Floating without clothes uses 0 endurance points; floating while clothed uses 1 point per minute (12 combat turns). Swimming unclothed uses 1 per minute at half speed and 5 per minute at full speed. Clothed swimmers use double that endurance and move at half that speed.

To tow another person while swimming requires a Difficult skill check and halves speed. Diving without an aqualung is a Difficult task for up to five meters in depth, or a Formidable task up to 10 meters.

This skill also allows the use of scuba and rebreather gear, as well as the use of wet underwater vehicles such as diving sleds.

Tac Missile (Heavy Weapons—AGL) [Tech = Pre-Stellar+]: The character is skilled in the use of direct fire battlefield-guided missiles. Many of these weapons require the character to continue to guide the weapon all the way to its target, correcting any divergences from its proper course.

Thrown Weapon (Acrobat, Archaic Weapons—STR): The Thrown Weapon specialty is a skill at throwing objects to hit other objects. This allows normal portable objects such as rocks to be used as weapons, but also allows the use of various archaic weapons as spears, javelins, boomerangs, bolas, etc. It also allows the use of modern weapons like hand grenades.

Tracking (Perception—INT) [Atmos=Thin-Dense]: Tracking is a skill used for trailing creatures in a wilderness or rural environment. It includes knowledge of prints, droppings, and habits of wilderness animals, but can be used to track human quarry as well. This skill can also be used in urban environments at higher difficulty levels. However, Streetwise skill can serve as an enabling skill in these circumstances.

In animal encounter situations, this skill enhances the chance of surprising such animals and of surviving encounters when the animals are dangerous.

Unarmed Martial Arts (Melee—STR): Unarmed Martial Arts allows the character to engage in melee combat without a weapon. See the combat rules for details.

Willpower (Determination—INT): This skill reflects a strength of character that resists domination by outside forces and perseveres in the face of adversity. The skill can be used in several different ways. First, it is an automatic subtraction from the power level of all Psionic attacks directed at the character (see the Psionics section of the "Worlds & Travel" chapter, page 245). Second, the referee may decide that certain tasks are so long, dull, and tedious, or offensive and disagreeable, that the character must make a Willpower check to remain focused on the job at hand. Failure of the Willpower roll will increase the difficulty level of the unpleasant task.

The referee may also require a Willpower check to be made if the character witnesses or is involved in particularly unpleasant events. The difficulty level of the test will be decided by the referee, based upon the exact circumstances, and the results of failure could range from characters losing their lunch, to running away, to fainting from shock. Exact results are to be decided by the referee. In general, the easier the Willpower test, the less severe the effects of failure. Such an event might also be very intimately linked to the character. For example, a character who is being held prisoner and tortured for information will have to make periodic Willpower rolls to avoid cracking, typically once per torture "session." Success at one of these rolls means that the character will be beaten into unconsciousness without divulging anything. Outstanding Success indicates that the character proved so indomitable that his captors reassess their approach. If the prisoner is valuable, they might leave him alone for 1D6+6 (7-12) days, but if he is expendable, they may merely execute him, knowing that they will get nothing out of him.

Finally, the referee may wish to make Willpower rolls for a detailed NPC (see the NPCs section of the "Characters" chapter, page 58) to see if the NPC resists degrading or dangerous assignments from the PCs.

Xeno-Biology (Physical Science—EDU) [Tech = Early Stellar+]: This indicates a familiarity with large-scale concepts of biology in general, and the way that these biological needs can be met by systems other than the classic terrestrial pattern (i.e., carbon-based chemistry, consuming oxygen and water). Creatures that do not follow these patterns are rare indeed, and are not covered by the normal Biology skill.

A character with Xeno-Biology skill can puzzle out the workings of one of these completely alien life forms, and eventually learn how to keep them alive, breed them, etc.

Xeno-Biology skill is not necessary to understand the function of an Aslan, Droyne, K'kree, Vargr, or Hiver. All of these races have anatomy and metabolisms which follow the same pattern as those of humans, and so Biology skill is sufficient to understand them.

Zero-G Environment (Spacehand—CON) [Tech = Pre-Stellar+]: Without gravity to hold one in place, even routine operations can be very difficult for those who are not trained for or familiar with zero-G operations. When any action is attempted, the problems of recoil and inertia can handicap or render helpless persons not trained to compensate for these effects.

Retaining control and orientation is an Average test of this skill for routine tasks. Haste or the use of firearms designed for zero-G increases the difficulty one level, and the use of firearms not designed for zero-G increases the difficulty two levels. The use of handholds, magnetic grips, or certain recoil-compensation equipment (see the "Equipment & Technology" chapter) reduces difficulty by one level. This skill is typically used as an enabling skill to allow the conduct of complicated tasks in zero-G, but also allows a character to regain control if a task has caused a loss of control.

Refereeing Traveller

No matter how much material we provide explaining rules and detailing background, you, as referee, will always have far more impact on the quality of the roleplaying game your characters experience than will we. The following advice, though, should make your job easier.

Getting Started

How do you begin a roleplaying game? Normally, the first step is to sit down with your players and generate some characters, but in the case of **Traveller**, there is work for you to do even before that step. Your players cannot generate characters until they know what region of space they come from, and they can't know that until they know where the campaign will be set. So step 1 is to decide on campaign location.

If you are a seasoned **Traveller** referee and want to continue running the kinds of adventures you have in the past, the easiest campaign setting is the Regency, formerly known as the Domain of Deneb, and before that the Spinward Marches. For years this was the campaign setting of virtually all GDW **Traveller** adventures, and there is a wealth of background material available on this region. "The Spinward States," page 168, discusses how things have changed there, but this will still be familiar ground for referees and players.

If you want to make up your own region with unique politics and economic interaction, but still want to remain in the main **Traveller** universe, make up a pocket empire. These are small clusters of civilized worlds surrounded by the Wilds. We have included a sample pocket empire later in this chapter along with some comments on making up your own—see pages 174-178.

One interesting theme in science fiction has always been advanced science as magic. That is, science so advanced as to defy understanding is, for all practical purposes, magic. If that theme appeals to you, the Wilds offer numerous possibilities for great fun in a campaign environment. Worlds can be at any level of development desired, with as little or as much poorly understood relic technology available as you want. Furthermore, you are not locked into this type of campaign indefinitely. If you want to experiment with it for a while, have a ball. When you and your players are ready for a more traditional science-fiction game, have the world contacted by free traders, Star Vikings, an exploration party from a pocket empire, or even the Regency.

The main thrust of the current game, however, is the expansion of the Star Vikings from the Old Expanses into the Wilds. Much of the background and mood centers on that event, and we expect that the majority of campaigns run with these rules will concentrate on that theme.

Once you've settled on a the region of space in which the campaign will be set, sit down with your players and help them generate their characters. As they do so, they'll begin asking you questions about the background of their world, its history, and what sorts of skills will be useful. Some of these questions should prompt questions of your own. If they ask what skills are useful, you should ask them what sorts of things their character might want to do.

The answers to these questions should give you some insights into what sort of game your players want to play. The next important decision you have to make, then, is what sort of game your players want and what sort of game you want to run. Both are important. If the game you are running is the opposite of what your players want, they won't enjoy it very much, but if it's the opposite of what *you* want, you won't be able to breathe as much life and enthusiasm into it. Try to come up with a happy middle ground that will satisfy all of you.

When we talk about what sort of campaign people want, what, specifically, are we talking about? There are two key features that define the type of campaign run: level of structure and type of action.

Structure: Structure is a measure of the extent to which the actions of the player characters are directed by the referee. A low-structure campaign is one in which the players generate characters, buy some equipment, get a ship (maybe), and the referee then says, "Okay, you're on Aubaine (or wherever). What do you want to do?" A high-structure campaign is one in which, after character generation, the referee says, "Okay, you are all members of a RCES covert contact team. You are called into your boss' office and he gives you your first assignment."

Inappropriate levels of structure can cause tremendous frustration on the part of players, more so than probably any other aspect of the game. Players who really aren't sure what to do will find an unstructured campaign boring, while those who yearn to poke around in all sorts of odd places will find a structured campaign very limiting. So it is important to key the level of structure more closely to what your players want than with any other aspect of the campaign.

In general, more structure is required early in a campaign than it is later. Players who are new to an environment need to be shown what they are expected to do, and so a few well-structured adventures are good places to start. (Both sample adventures are highly structured for that reason.) Once players become more comfortable with the universe and confident in themselves, though, you will want to ease back on the level of structure and let their interests take them where they will.

In the case of the Reformation Coalition, this is extremely easy. The Coalition is very new, less than a year old, and is still working out its structures and procedures. It has regular personnel who are sent on regular missions, but it also hires freelancers on a one-time basis, and also has friendly but loose contact with the network of free traders. Players can fit themselves into this structure at any level of control desired, and alter that relationship over time.

Activities: Different people have different notions of what is most interesting about science fiction. For some, the image of the interstellar merchant is a very compelling one, moving from world to world and striking bargains for rare and exotic goods, often becoming embroiled in local politics and adventures. For others, the essence of science-fiction is exploration of unknown worlds and making first contact with alien cultures. Others find the thrill of futuristic combat irresistible, while others still are captivated by the idea of covert intelligence and diplomatic missions on alien worlds.

All of these are correct, and all of them should form part of any science-fiction campaign. However, the emphasis of the campaign should be a mixture of the images that you, as referee, find most compelling (as these will be the ones that you can communicate most vividly) along with those that your players want.

Fortunately, the Coalition is involved in all of these activities, and is so short of personnel and ships that everyone does a little bit of everything sooner or later. This not only gives you a lot of flexibility in deciding what sort of activity you want to emphasize, it also means that, once that decision is made, you aren't locked into it forever. You can do smash-and-grab operations for a while, and then switch to an exploratory mission, or a covert intelligence-gathering operation. Remember that variety is important as well.

Using the Rules

Once you have determined the limits of the campaign, its setting, structure, and activities, you will actually begin running adventures. At that point you will begin using the rules. When you do so, it is important to always remember why the rules are there.

This is a roleplaying game, which means that its purpose is to allow you and your players to interact as different, imaginary people in an alternate imaginary world. Nothing else is really vital to the game. Character generation is provided as an aid to players visualizing a person different from themselves. The background of the universe is provided to add a sense of verisimilitude to the environment, which is vital to a fully realized roleplaying experience. But none of these things are carved in stone.

In order to understand how best to use the rules, you have to understand why we have rules at all. A roleplaying experience can be done, and done very easily, without any rules at all. The referee describes the world, the player or players describe their actions, the referee decides and communicates the results. That is roleplaying at its most basic level, and also at its very best. The free-form interaction between players and referees is what all good roleplaying concentrates on.

So why have rules at all? Two reasons.

First, players often want an objective means of predicting the results of certain familiar actions. They want the reassurance that their success or failure from one situation to another is based on something more concrete than the referee's mood or their own ability to come up with a glib explanation of why they ought to succeed.

Second, the referee has only so much mental energy to expend on decisions and descriptions. To the extent that that energy is expended on adjudicating routine, recurring events, there is that much left to make the unique and important events really sparkle.

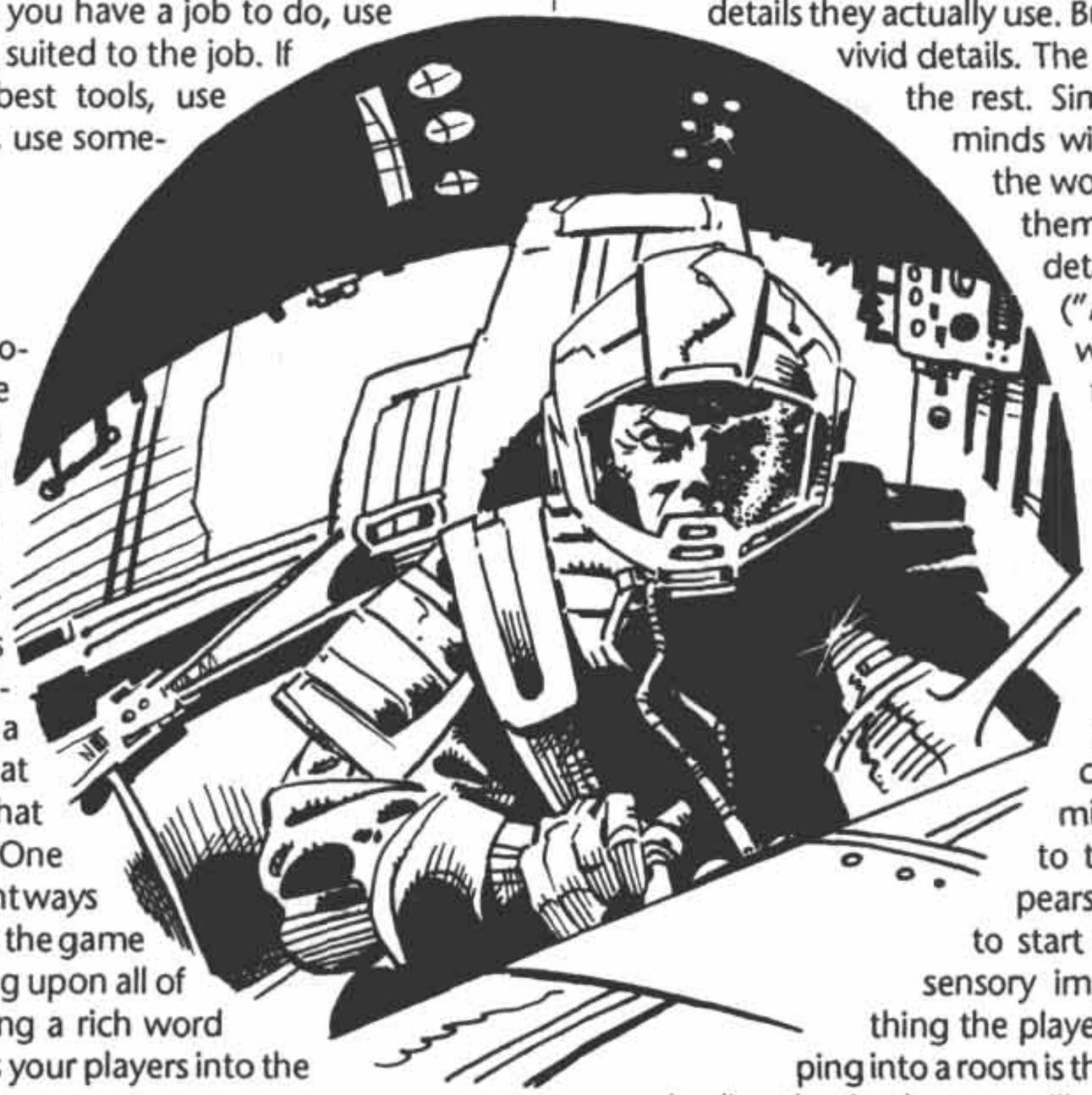
Rules are the solution. Rules, such as combat, travel, task resolution, and so on, are provided to relieve the referee of the need to continually think about what is or is not important to their success and to give the players a sense of an objective reality. But that means that rules are here to liberate players and referees from mundane concerns and allow them to focus on the meat of roleplaying. Rules are never provided to limit the imagination or options of players or the referee. Always bear this in mind when using the rules.

For example, the world-generation rules provide extensive tables which will generate worlds and star systems which fit into some generally accepted norms of astronomy. How should you use them to generate a world? Start by deciding what kind of world you want. The tables will tell you the most important features which need to be defined, so go ahead and make up those values (like size, atmosphere, water, etc.) to be whatever best fits your view of the world. They don't even have to correspond to the individual entries on the table. If you decide that the world doesn't need to be all that exotic, though, and you don't feel like lavishing that much creative energy on it, pick values off the table that define the world you want. If you decide that you don't even care what the world is like at all, and just want a different world, *any* different world, then roll dice and consult the tables.

Notice that rolling dice to find the correct table entry, far from being the only option or even the best option, is a *last* resort. This holds true for trade and commerce,

breakdowns, encounters, animal creation, and anything else you decide. In many routine combat situations, you might decide not to have the players roll for damage when they hit, instead assigning average damage, or even deciding that a hit from certain weapons is an automatic knockdown or kill. All of the rules, even the most detailed and technical ones, are there to help, not hinder, play.

In short, never forget who's in charge here. The rules are not in charge; *you* are in charge. The rules are like an assortment of tools in a tool box, but they aren't the only things in the tool box. You also have your knowledge of fiction, history, and science, as well as your imagination and the knowledge and imagination of your players. When you have a job to do, use the tool that is best suited to the job. If the rules are the best tools, use them; if they aren't, use something else.



Describing The World

As the primary storyteller, the referee operates as the players' window on the world. Everything the players see, hear, feel, smell, taste, or otherwise sense is conveyed by the referee. You even have a major impact on what they suspect and what emotions they feel. One of the most important ways of building drama in the game is by carefully playing upon all of these senses, building a rich word picture that projects your players into the **Traveller** universe.

It really isn't that difficult to do. After all, role-players are well-known for their imagination, and as a referee you likely have an extra share of that. All it takes to become really effective is simply a little practice and knowledge of a few subtle tricks.

First, remember that sight is the primary sense for humans, followed closely by hearing. When you are describing a scene, then, you ought to appeal most to these two senses. But smell, taste, and touch are often very powerful conveyors as well, largely because they are typically so subconscious. (Most of us have had the experience of feeling an unexplained sense of nostalgia, for instance, only to realize after a few moments that it was caused by a familiar smell we had not consciously registered.) So don't forget to appeal to these senses as well, at least occasionally. Finally, it is often appropriate to tell the players that they feel a sense of well-being, or of menace, or of panic, or whatever, especially if their characters are highly psionic. Generally, however, it is more powerful to convey these feelings by their other senses, if possible.

Understand that your descriptions don't have to be ageless prose. Nor should they be overly detailed. Like any other artist, you want to convey images, not lay out stark blueprints. Take a look at descriptive scenes by your favorite writers, and you will notice just how few details they actually use. But they pick the most vivid details. The reader's mind fills in the rest. Similarly, your players' minds will fill in details from the word sketches you give them. If they need more detail, they'll ask for it. ("Are the second-story windows big enough to admit a human?" "I've studied a lot of history. Do I recognize the symbols as related to any ancient language?")

When you begin a description, take a moment to picture it clearly in your own mind. Then convey it to the players as it appears to you. Remember to start with their strongest sensory impression. If the first thing the players notice upon stepping into a room is the stench of decaying bodies, that is what you will want to tell them first. Then fill in their other senses, using that initial sense description to set the stage. ("There are two bloated corpses lying on a stained drop-cloth in the middle of the floor, illuminated by light from a grimy picture window in the wall across from you. You can hear the buzzing of scores of flies. Glancing around, you see that there is no furniture, just a painting on the left wall. Even from the door, you can tell it has been mutilated.")

If you want to heighten player tension, toy with their two main senses. Sometimes you will want to rob the players of those senses; at other times, you will want to overload them. For instance, if the players are feeling their way through a dark, secret passage, the lack of

sight will make them tense, especially if they hear mysterious noises ahead or behind, or perhaps if they *cannot hear anything* but suspect something is there. Similarly, if they open a large blast door to expose a hangar bay lit by flashing red and yellow emergency/warning strobes, full of wild-eyed people dressed in rags and armed with clubs and long, wicked-looking blades who rush at them screaming unintelligible war cries while a klaxon or siren hoots incessantly in the background, they will be made tense, especially if you demand that they react immediately, without a chance to ask for details or an explanation.

Related to this is the fact that nothing gets players' interest like a hint of danger. Even if there is no immediate threat to the players, you ought to let a mysterious hint or two drop just to keep their paranoia high. ("You can't be sure, but it seems that the Aslan mercenary two tables away has been staring at you off and on throughout the meal.") (Similarly, it is a good idea to roll dice occasionally through the adventure for no reason at all, to make your players think you are checking for the chance of something bad happening to them.)

Save the most important details for last. That way, it will have the most impact. If you don't do this, your players will have to wait through the rest of your description before they can ask about that important detail, and they will be distracted, unable to concentrate upon your description. They are also likely to mistake the significance of the scene's details. (In the room description three paragraphs above, for instance, players' attention will naturally be drawn to the mutilated painting as being somehow significant, and the importance of the bodies is played down.)

Finally, while many of your descriptions will be intended to convey specific information, you may use some just to evoke a particular mood. This is especially true of the first scene in an adventure session, when you are trying to get the players focused upon the story about to begin. Responsibility for these mood-setting scenes can be shared with your players, and we strongly encourage you to have your players describe their appearance and general reactions to events, emphasizing the unique nature of their characters.

Creating Adventures

Two sample adventures are provided, one a conventional one designed to get Star Viking players started, and a more unusual one for players who want to start in the Wilds. Neither of these have to be used, but both can serve as useful examples of how to structure the adventures that you create. When you actually sit down to create an adventure, it may help to think in terms of major elements of the task.

Adventure Concept: Generally, the first thing to do in creating a new adventure is to come up with a concept. It may be that you want to do one about a particular alien race. Or perhaps you have a basic plot idea in mind. Good sources for either of these are myths, science fiction, and actual news stories. For instance, a recent news story concerned the near miss of the Earth by a planetoid large enough to do damage but small enough that it went unnoticed until it had passed the Earth. This might prompt an adventure built around the disaster-relief efforts after a collision, or the attempts to prevent a collision by diverting the planetoid, or a covert intelligence operation that uncovers information about the planetoid being withheld by a faction for some reason.

As a specific example, in "The Once And Future Emperor" (one of the sample adventures), we determined to do an adventure from myth, similar to the Arthurian legends, but with enough of a twist to keep the players guessing

Once you have the basic concept, it is time to begin fleshing it out.

Adventure Location: Next, you need to choose a location for your adventure. Let imagery and utility be your primary guides. For instance, once we had set our sights on the legendary emperor adventure, we decided to place it on a world in the Wilds that was balkanized and fairly primitive. As a starting adventure, it provides images which are easy to describe while also laying out some useful groundwork for the players to understand the nature both of the Coalition and the Wilds. It also gives us a chance to describe Aubaine first, so the players' first impression is of one of the Coalition homeworlds, and when they visit there later it will feel familiar, like coming home, rather than alien.

Adventure Plot: Now that you have your basic idea, it is time to develop a basic plot. There are several things to be considered in doing this.

First, you need to come up with a very basic sequence of events. In our sample adventure, for example, the players are first recruited and briefed on the mission. Next, they travel to the world where the adventure is set, where they meet several key characters and begin following the outline plan of their mission. As they accomplish their initial goals, they discover that they have to carry out the additional goal of finding the location of the tomb and then quickly getting there to prevent its use in a fraud. Finally, they are confronted with a major plot twist which requires them to rethink their mission, enter the tomb, and confront the villain in a final showdown.

Notice that in this synopsis, we have determined how to get the players involved at the beginning, what their most likely courses of action are through the

middle, and how they can succeed at the end. Next, we begin dividing the adventure up into episodes and scenes.

The introduction can be considered an episode in its own right. In it, the players will travel from their starting position to Trantown. Scenes would include the meeting with Papa at Auction, the trip to Trantown, locating Papa's offices, and the actual mission briefing. After the conclusion of the main part of this first episode, players can talk over their likely course of action and acquire additional equipment they may decide they need.

The second episode probably includes travel to Karaguuka, the first meeting with Ambrose, the trip to Benghin's house, and the gun battle there. If the referee wants to introduce the players to space combat, this can be broken into two episodes, with the first one consisting of a hostile encounter en route to the mission world.

The conclusion of the fight at Benghin's house and the debriefing of the survivors makes a good stopping point for the second (or third) episode.

The next episode starts with the meeting with Markuss in the library and continues through the discovery of the old maps of the planet surface, location of the monolith, the trip there, and the battle of the crater.

The next episode begins with the return to Cato Downport, the decoding of the directions, and the location of the True Key. As news of the tomb location leaks out, the players must make a desperate trip to the Zimmerman Escarpment to forestall the Commda's plot. Once there they engage in a tough fight but are saved by the arrival of Markuss and the Faithful. The true climax of the episode, however, is an apparent miracle.

The final episode begins with the players realizing how badly things have gone and seeing them continue to get worse. They attempt to understand what has happened, while realizing that time is running out. As they puzzle out a possible explanation, they will probably realize that success will require a final confrontation with the impostor, which will be the last major action in the adventure. After that, the referee will discuss rewards and experience points, and summarize the long-term effects on the players.

From this example, then, we can see that the referee can lock the plot's episodes down pretty firmly, and the most significant scenes can be prepared ahead of time, based upon the referee's knowledge of the most likely course the players will take. If you intend to allow your players leeway to leave this course during the adventure, however, some scenes will have to be created on the spur of the moment, in response to the players' actions.

REWARDS AND EXPERIENCE

When your players complete an adventure session, their characters ought to receive suitable rewards. There are lots of things that can serve as rewards, depending upon the circumstances of the session. The players might get specialized equipment, or money, or favors, or perhaps they have made new contacts.

Be careful to make the rewards match the players' accomplishments. Don't go overboard. Remember, if you give them too much, not only are they going to tend to feel dissatisfied, you will also have more of a problem giving them challenging adventures later on. In general, it is a good idea to start out stingy, because you can always make up for it in later adventures as you gain a feel for how fast the characters are progressing. But if you start out too generous, it is very difficult to take things away later.

Skill Improvement

One of the most significant rewards of an adventure session is a character's increased experience. Among other things, this includes improvement of skills. Skill ratings are increased by use of experience points. In general, you should award 1 experience point per adventure session to anyone who survives. Bonus experience points can be awarded in one of two ways.

Referee Determination: A bonus point can be awarded for any skill that was used repeatedly or in a particularly dangerous situation. An additional bonus point or 2 can be awarded to a player who is particularly good at staying in character during the session or who performs a notably heroic deed.

Peer Determination: If you feel uncomfortable with judging your players' performances, you may want to rely upon your players to determine bonus points. To do this, simply have each player secretly write down two or three praiseworthy things that other players did during the session (they cannot vote for themselves). Then collect those notes and read them aloud. Every time an event is mentioned in those notes, that character who performed the action receives a bonus experience point, up to perhaps 2 or 3 points per player per session. (Referees have the option to veto any event that they don't believe sufficiently exciting or important to gain an experience point.) This peer determination of bonus points helps make certain that players are rewarded for actions the referee might have forgotten, and it also encourages a shared sense of responsibility in the campaign.

Spending Experience Points: During the adventure session, each player should note (perhaps with a pencil checkmark, so it can be erased before the next session) the skills used during the session. Only marked skills are eligible for improvement by use of experience points.



Experience points are converted to increased skill levels between sessions, even if a session ends with a cliff-hanging situation. Of course, in many cases the points will end up being spent in a lull between adventures, but it is assumed that a character can even improve a skill during the heat of battle.

To improve a skill, a character spends experience points to buy new skill levels. To buy a new level costs points equal to its numerical value. For instance, to raise Astrogation level 4 up to level 5 would cost 5 experience points. A character may purchase more than one level at once, but each level must be paid for separately. For example, if the Astrogation skill were to be improved from level 4 to level 6, the character would have to spend 11 points total (5+6). Points that are not converted may be accumulated.

Option: If the players don't mind the bookkeeping involved, referees may award points in specific skills, for use only in that skill (Unarmed Martial Arts experience points, for example, or Telekinesis experience points).

Psionics: Referees and players should take care that psionic skills are only bought with experience points gained from the use of psionic powers. Psionic skills may bot be improved by obsevation or instruction (below), but only by experience in using them.

Advance by Observation: If a player character observes another player character successfully accomplishing a task, the observing player gains 1 experience point. This observation must be a close-up examination of the task and must have the cooperation of the character actually performing the task. If the referee considers the skill sought to be a complicated one (such as Mechanic), the task should take longer than usual to finish (perhaps substantially longer), to represent the fact that the character performing the task is pausing frequently to explain what is being done or to answer questions. A character may gain experience points from observation only if the observed character's skill level is at least twice as great as the skill level of the observing character.

Instruction: A character may be taught a skill. Teaching a skill requires a Difficult check of the Instruction skill. An instructor may teach a number of students equal to that character's Instruction skill level. An instructor cannot teach a student whose skill level in the subject taught is equal to or greater than that of the instructor (and, obviously, the instructor must have a skill level of at least 1 in the subject taught). The task takes four hours per day for one week (seven consecutive days). Successful completion of the task (rolled for at the end of the week) results in experience points for both the students and the instructor. The instructor gains experience for accomplishing a task as explained above. Students gain a number of experience points (in the skill being taught) based on the number of students being taught.

If the number of students is less than half of the instructor's Instruction skill level, each student gains 3 experience points. If the number of students is half or more of the instructor's skill level, each student gains 1 experience point.

New Skills: A character who has a skill level of 0 in a particular skill may still attempt to learn the skill. This may be done either through observation or through instruction. Since the character has a skill level of 0, experience cost for the first level will be 1.

Initiative Improvement

A separate experience point system exists for improving Initiative. Referees should award 1 point for each session in which there is a life-threatening battle, awarding an extra point for a particularly outstanding shot or a superior feat of hand-to-hand combat. Initiative points are used to buy increasing levels of Initiative just like any other skill, with two exceptions.

First, Initiative experience points can only be used for Initiative.

Second, to buy a new level costs points equal to the *square* of its numerical value. In other words, it costs 4 Initiative experience points to purchase level 2 Initiative, 9 to purchase level 3, 16 to purchase level 4, and so on.

The Once and Future Emperor



This is intended to be a starting adventure for your characters, and takes place during the year 1200, actually ending late in that year. As it is intended to be the first adventure for your PCs, it is an opportunity to establish the background of the Reformation Coalition and the nature of the worlds on which the PCs will adventure. From the point of view of prospective Star Vikings, there is no better place to begin than Auction, the great meeting place for Coalition members and their friends, on Aubaine.

Auction on Aubaine

Take some time to describe what Auction is like. The Auction itself takes place in Brusman, the large commercial city that adjoins Aubaine Downport, the principal surface starport on the world. (The orbital starport for Aubaine has recently been upgraded to A status, thanks to recovered relic machinery from the Wilds.) The administrative capital of Aubaine is at Trantown, as are the administrative centers for the various Reformation Coalition services, and those government agencies give Trantown an air of dignity and cultured sophistication completely lacking in Brusman.

Brusman is always a pretty wild place. It has grown very quickly since the Dawn League became active, and many once-abandoned and damaged buildings are now occupied, with repairs hasty, obvious, and in many cases incomplete. During Auction its streets and taverns are crowded with boisterous spacers, whose attitude infects even the business agents and lawyers of the industrial concerns who come to bid for relic goods. Normal accommodations are almost



Sid "Papa" Papagopolis

Experienced NPC (would have been Veteran before his injury—see text)

Combat Assets: *Armed Martial Arts,* Slug Weapon (Pistol and Rifle)

Other Assets: Persuasion 15, Liaison 16

Motivation:

Heart 6: Papa is friendly and outgoing. He's happy to spend time with old friends and loves to hear what they've been up to.

Club 7: Papa was a Marine, and was no stranger to violence. He has never been intimidated by it, and his disability has, if anything, made him slightly more prone to violence, as he experiences some pain and a good deal of frustration, being unable to do many of the things he used to enjoy.

impossible to rent during Auction, and so most visitors stay in temporary dormitories, often set up under large tents if the weather is fair. (Price: Cr10 per night, with a security locker available for valuables at Cr20 per night.)

Auction usually lasts a week, with different times devoted to auctioning different types of relic equipment (weapons, electronics, vehicles, sensors, ships, etc.). It may be a day or two longer or shorter depending on how much material there is to auction. As this has only been going on for two or three years and has only become really big in the last 18 months, the traditions surrounding it are still developing, but it has already become a favorite meeting place for people who don't see much of each other due to the demands of duty—a time to renew old acquaintances.

For the PCs, this means a time to meet some of their contacts and either get a hot tip on a new world, find out rumors of relic caches out in the Wilds, or perhaps be recruited by RCES for an assignment. In this adventure, the latter is the case. They will run into Sid "Papa" Papagopolis, who the referee will determine is a contact of one of the PCs (and thus becomes a solid contact). As neither the PCs nor Papa have pressing business, they will adjourn to a bar to renew the old friendship, and perhaps start some new ones, over drinks.

This meeting is an opportunity on several levels. Obviously it is a gateway to an adventure, but it is also your first opportunity as a referee to establish how the PCs interact with real people on this world. The referee will play Papa in the exchange, telling the player who has the contact what's happened lately, and asking about the other members of the party. Don't say "Papa says that he was injured." Speak Papa's words yourself. Be Papa, and encourage players to talk directly to Papa instead of saying "I ask Papa if he knows of any relic caches."

Those players who actively respond and roleplay the event have the potential to gain a new contact—Sid Papagopolis—while those who say nothing (ignore Papa), will be ignored in turn. In other words, treat Papa as a real person, not just a game artifact designed to pass information to the players, and reward players who understand this.

Papa was a Reformation Marine when the PC knew him before. Since their paths parted, Papa was critically injured on a smash-and-grab raid that went badly wrong, with severe damage to his spinal column. Although extensive surgery and physical therapy have made him mobile, he is considerably less agile than before and was relieved of combat duty for reasons of physical disability. Since then he has been working in several planning groups for RCES, at first conducting tactical planning for raids. Recently he has been promoted to a new strategic planning group which is trying to think a little further ahead and come up with some long-term policies. It's all pretty new stuff, and they're feeling their way, learning as they go, but he's excited about it.

After exchanging news and getting to know each other, the talk will invariably turn to work. Papa has a possible job for the PCs. The manner in which he presents the job should be structured to the needs of the PCs. If they are looking for permanent employment with RCES, this can be presented as a chance to show their ability and gain a permanent job. If they are looking for a one-time mission to pay some bills, this can be presented just as well that way. In any event, Sid invites them to come to his office in Trantown after Auction. His planning group will pick up their travel expenses.

Trantown

In Trantown the PCs have some difficulty finding Papa's office because his planning group is new and not well known. In addition, the RC infrastructure is still growing so there is a fair amount of disorganization in most offices, with movers bringing new furniture in and electricians interrupting receptionists to ask how many data lines they need to come into each commbox, etc. Eventually, however, they find Papa's group, and he introduces them to the other six members of the group, three men, two women, and a Hiver: "Cave Six," "Koko," Mr. Jerry Bagwanii, "Roaster," Ms. Sylvia Burnside, and Bob the Hiver, respectively. From their names it should be clear which ones of the humans have had off-planet duty in the Wilds and which have not. Aside from this distinction in names, which is

carefully followed by all of the members in the group, all treat each other with casual friendship. The group is, as with most RCES organizations, very informal.

The actual briefing is given by Roaster, a middle-aged woman who looks more like someone's mother than a Star Viking. The following briefing can be read verbatim to the players, who can then ask any questions they like.

Briefing

"Thank you for coming to meet with us today. Papa has already briefed us on your backgrounds, and we understand that he has told you something of our function. Let me tell you a little bit more. Right now RCES is banging its head against the wall on half a dozen worlds, and is looking at over a dozen more. We've got to get this show on the road, and so there's no avoiding doing things the hard way in a lot of places. But a little while ago a bunch of us decided that if we had a little more time we might be able to get the job done with a lot fewer bruises, if you know what I mean. That means going deeper into the Wilds than we normally would, and doing it sooner.

"Only problem is, RCES resources are stretched to the absolute breaking point, so any projects we undertake have to be done by free lancers, and they have to be cheap. I mean *dirt* cheap. We can get funds, to an extent, but we can't get much in the way of equipment. That means we have to rely on brains instead of firepower. (Jokingly) I know, it's a new concept for us, but it just might work. Anyway, the brains are your department.

"We have a report here from a friendly Free Trader operating out of the Wilds about the world Karaguuka (Diaspora 0116 D789674-5). Karaguuka is in many ways typical of the worlds of the Wilds: insular in its outlook and feudal in its governmental structure.

"Karaguuka is fortunate in that it is physically very hospitable, and its considerable agricultural resources have enabled it to weather the years since the Collapse remarkably well. In addition, Karaguuka's people have a reputation for courage and self-reliance. They have managed to maintain a largely optimistic outlook in spite of the darkness which surrounds their world.

"For these reasons, as well as its strategic location among a local cluster of uncontacted worlds, Karaguuka is an ideal site for establishment of a RCES hub base, from which other recontact missions could be launched fairly inexpensively. Critical to that, however, will be the attitude of the local population toward RCES.

"Normally this is not a problem. Most of the TEDs we've encountered are such buttheads that if we just put a few of their heads on pikes we're instant heroes."

At this point the man identified as Mr. Bagwanii interrupts and says, "That's an exaggeration, isn't it Roaster? I mean, we don't physically put their heads out on pikes, do we?" *Roaster looks at him for a second before shaking her head.* "No, Jerry, of course not." *Then she looks back at the PCs, smiles, and continues.*

"Unfortunatly, things are not quite so simple on Karaguuka. It is balkanized and divided among several petty warlords, some of whom are no better than thugs. But the most powerful of them, Clovis Andrahaar, "the Commda," has allied himself with a popular and powerful local religious movement and is well on his way to establishing control over the other TEDs. As his power base is built on a cache of relic weapons more sophisticated than that available to the rest of the warlords, he is opposed to introduction of additional high tech material from off-world.



Clovis Andrahaar, The Commda
Experienced NPC, Age 46
Combat Assets: *Slug Weapon*
Other Assets: Interrogation 12, Leadership 14, Bribery 12, Ground Tactics 11, Forgery 9, Persuasion 15
Motivation:
Spade Queen: The Commda is absolutely ruthless in the pursuit of his goals.
Spade 9: He is also consumed with ambition and the quest for power.

"This goal is compatible with the Church of the Phoenix, a religious order which enjoys tremendous popularity and which preaches the necessity of self-renewal rather than reliance on off-world assistance. Self-renewal is, of course, a philosophy that it's tough for us to argue with, and left to themselves these people may pull out of this. But the fact that Free Traders have been visiting the place and providing high-tech items to some of the lesser factions has caused the Commda to begin backing the more militant wing of the church. We are afraid that this can turn very ugly and end up producing a very xenophobic society in fairly short order. Bob and his people, who are way ahead of us on this sort of thing, agree."

At this point, Bob the Hiver waves its eyestalks and speaks by way of its voice box. "I have to agree with that assessment completely. The likelihood of this world developing a friendly and open spacefaring culture on its own within the next century is probably less than 10 percent. The chances are about the same, perhaps even a bit better, that it will develop star travel but retain a messianic religious culture based on the concept of cleansing holy war. This would be



Forsca Man
Ambrose Khiigamisha

Elite NPC

Combat Assets: *Slug Weapon,* Unarmed Martial Arts, *Armed Martial Arts*

Other Assets: Leadership 13, Observation 9, Survival 10

Motivation:

Heart Jack: Ambrose is exceptionally wise, a characteristic players may not immediately associate with someone who is illiterate. However, he is quick to see the benefits of progress and is very farsighted.

Club 2: Ambrose is a tribal chief and warlord, and has seen enough violence in his life not to be intimidated by it at all.

a bad thing, in our opinion."

"Right," *Roaster continues,* "I think we can all agree on that.

"Now, what do we know about this Church of the Phoenix. Not a lot, although it's a good bet that it has a fairly typical post-Collapse apocalyptic theology, with a dose of technophobia for flavoring. There appears to be a strong messianic component to the church as well, as the central prophecy of the church involves the return or resurrection (we're not sure which) of a legendary hero named Gherard who will rebuild the world from its own ashes—hence the Phoenix of the church's title.

"The church does a lot of good, by the way. Their hospitals and clinics take care of the sick, and they have also recovered a few hardcopy libraries so that all knowledge of Imperial times is not lost. Until recently the society on Karaguuka was mostly post-literate, and only now are some lay people beginning to relearn reading and writing. The church also considers itself a force for justice, and often has been successful in moderating the worst excesses of local warlords, although it has also clearly become part of the same power structure which maintains the warlords in power.

"In general, then, the church is quite popular with the people and has a vested interest in maintaining the status quo. Their message is that if the people will only remain faithful to the memory of Gherard and continue to practice his high ideas, he will return and reward them with a just and eternal Imperium.

"So, that's the bad news. The good news is that we have two things going for us. One is an ally, the other is the prophecy itself. First, the ally.

"The old starport on Karaguuka was Cato Downport, which either took a couple nukes during the Final War or had a few fusion power plants go critical when Virus hit the world, we're not sure which. In either case, the city is trashed pretty bad and still has some spots hot enough to make your hair fall out. There are nomadic tribes in the area who scavenge anyway and take their chances, but they regularly lose people from radiation poisoning, just from picking up the wrong thingie.

"Our Free Trader contact traded a radiation detector to one of these tribes and showed them how to use it. Bingo, no more radiation sickness in the scrounging parties. Also, bingo, one convert to the benefits of off-world technology.

"The leader of this band, Ambrose Khiigamisha, is known locally by the title "Forsca Man," which we believe is a corruption of the old Imperial Marine rank "force commander." Khiigamisha is one of the few openly outward-looking leaders on the planet, and we understand that he favors any and all efforts to re-establish contact with other worlds of the sector. At the very least, he can provide you with a plausible cover, material assistance, and information. In the long run, he may be the local faction to back as an alternative to the Commda.

"Now, the prophecy. These prophecies are usually pretty vague about when the Big Guy is coming back, which allows the church to prolong the inevitable indefinitely. In this case, however, there is a significant segment of the church which believes that the return *must* take place before the end of this year. The senior leadership of the church is trying to downplay this, for obvious reasons, but it has really taken hold at the grassroots level. If you can, help this belief take hold, help prove that the prophecy must be realized this year. When it isn't, there will be enough questioning of the mystical parts of the belief that we should be able to establish peaceful contact. Stripped of some of the literal parts of the mythical baggage, but with the ethical structure of the religion intact, the notion that the legend of Gherard is an allegory of the virtues of self-help and self-reliance, we think that these people will make an outstanding addition to the Coalition.

"So, contact the Forsca Man, tell him your mission, have him help you research the legend, and do everything you can to spread the word that the prophecy *must* be realized this year for it to be true.

"That's all we need you to do."

Travel to Karaguuka

The trip to Karaguuka can be as eventful or uneventful as you wish. This provides an opportunity for the PCs to experience space travel firsthand and cope with the routine needs of maintenance, fueling, etc. If they have

a commercial ship, they will want to take passengers and haul cargo from world to world as they go. If they have no ship of their own, the RCES will provide an old, worn-out Scout/Courier or Far Trader to make the trip, enjoining them to be very careful with it as they need it back when the trip is over.

Among other things, they are also provided with a prefabricated wooden sailing vessel and given charts of several islands off the coast of the western continent of Karaguuka. They will land on one of the deserted islands, conceal the ship, assemble the boat, and cross the short distance to the mainland. Cato Downport is a coastal city, and so the PCs can put ashore at Ambrose Khiigamisha, the Forsca Man's, doorstep. This arrival enables the PCs to tell any curious locals that they are from an isolated island group which has been out of contact until recently, thus explaining their different accents and ignorance of local culture. (It will not be safe for their off-world origin to be widely known.)

Once the PCs establish their actual identities and play a taped introduction from the Free Trader who contacted Ambrose, the Forsca Man, who insists on being called Ambrose by the PCs, is more than happy to meet with them privately. His audience chamber is in the part of the downport which served as the Marine garrison during Imperial times. Ambrose has utilized many of the buildings of the old starport for new governmental purposes.

The PCs will find that he is not only interested in their efforts at re-establishing trade, but also in general information about the worlds of the sector. His ancestors served proudly in the Imperial Marines (hence his somewhat corrupted title), and he has heard stories since he was a boy of the many worlds and wonders of the united Imperium. If any PCs could furnish him with the tales of the worlds they have seen or even of which they have heard, he will be most grateful. Ambrose is an adventurer at heart who had the misfortune to be born during a time when such traits are rare.

As the PCs explain their mission, he will become thoughtful, nodding at certain points in agreement. Ambrose is a follower of Gherard, but does not believe the prophecy itself. Instead, he believes in the values preached by the Phoenix, but agrees that those values have been corrupted by the Commda and the church to exclude contact with off-worlders for purposes of their own self gain. He thinks that the plan, while difficult, is a good one, and agrees to help.

On one item, however, Ambrose is insistent. The Church of the Phoenix is not a recent post-Collapse religion. The origins of the prophecy actually predate the Third Imperium.

Ambrose suggests the PCs begin by visiting Ganidiirse Benghin at his home on the outskirts of the startown. Benghin has devoted his life to collecting data on the legend of Gherard and his tomb, although he is not himself a believer. The PCs could learn much from Benghin, far more than Ambrose could impart himself. Besides, Benghin lives near the old library where most of the books Ambrose's tribe has recovered are kept. The old library, incomplete as it is, has become one of the most important sources of data about the planet and its history. Benghin and his helpers know the place well and should be able to help the PCs use it.

Finally, Ambrose cautions the PCs against using too much of their own flashy high technology in the presence of the populace. There is still a prejudice against the technology which many feel brought about the present dark age. Plus, the Order teaches that Gherard wants the people to remain faithful to him, not an off-worlder. High technology would be a dead give-away to their off-world nature and would undermine their efforts. After all, the PCs are trying to unravel a mystery whose solution may determine the fate of an entire planet and possibly, if the legends prove true, the whole of humanity. Thus, they can hardly afford anything which will impede them.

Benghin's Home

Next, the PCs should head to Benghin's home using the directions given to them by Ambrose. The house is only a few kilometers west of the starport. The building is large and of an Imperial architectural design, indicating its age. In addition, the building stands but a few dozen meters from another larger, older building. This must be the library that the Forsca Man mentioned.

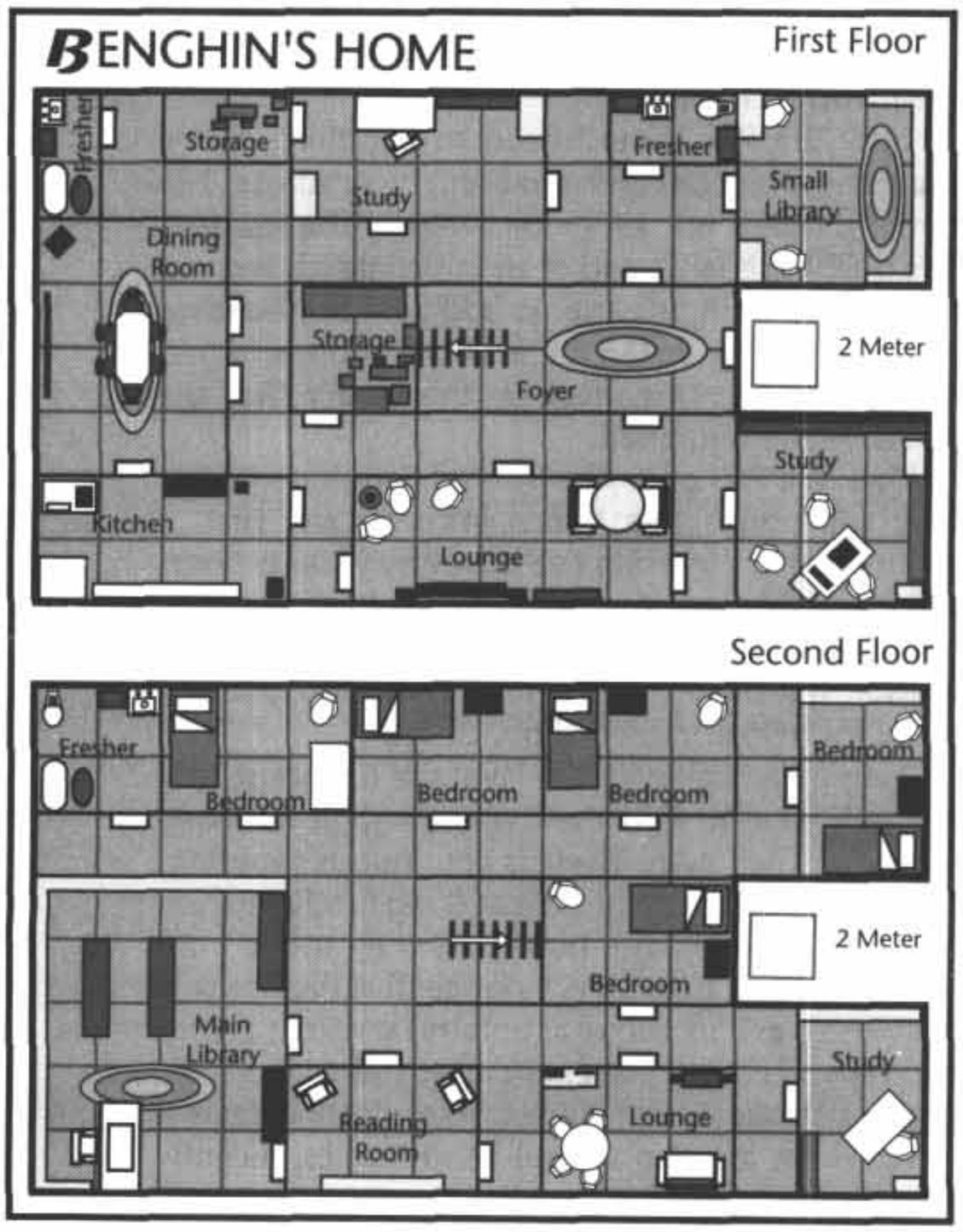
When the PCs go to the front of Benghin's home, they will notice two things immediately. First, a ground car is parked in the driveway with its doors still open. Second, the front door is itself standing open. A knock at the door will not produce an answer, but the PCs will almost immediately hear a shout for help and several gun shots.

Being unfamiliar with the layout of the house, the PCs will have to find their way through its many rooms on their own. There is continuous shouting, gunshots, and the sound of breaking furniture from the upper level of the house. As they move from room to room, the PCs will notice that the house is in disarray, as if someone as unfamiliar with it as they had ransacked the place, and that there are visible signs of struggle, with bullet holes dotting several walls. There are also several dead bodies, recently slain, in the rooms.

Room Details

First Floor: Both the *study* and the *small library* contain numerous old bound volumes. Most of them have been torn from their shelves and scattered about their respective rooms. Some even have pages torn from them. Small traces of blood can also be found in the *small library*. One of the *freshers* contains the body of a slain human male. He has an empty holster on his belt. He appears to have been shot several times in the chest. A closer examination of his body will reveal that his empty auto pistol, which lies at his side, is emblazoned with an odd symbol (as seen on the cloth armor of the attacking men in the illustration on page 150). Finally, in the *dining room*, two more male bodies can be found, but unlike the last one, they do not wear holsters or have weapons with any noticeable insignia. They have both been stabbed to death. A bloodstained sword is near their lifeless bodies.

Second Floor: At the top of the stairs, there is another dead body. This one is a woman, her body is badly burned by laser fire, and an empty revolver lies at her side. A check of the *bedrooms* will reveal that they have all been occupied. The *reading room* has a few books strewn about it and the dead body of man burned like that of the woman's is at the top of the stairs. Continuing sounds of gunfire come from the *main library*.



Battle in the Library

The fight in the library is all but over when the PCs burst in. The room is cluttered with several dead bodies as well as two cowering figures, partially hidden by a large desk turned on its side, being threatened by three other men. These men are all armed, two (Experienced NPCs) with auto pistols and one (Veteran NPC), apparently the leader, with a laser pistol. The cowering figures are a man and a woman, and the man is cradling the dead or wounded body of another man. (They have just surrendered, having fired the last rounds from their one revolver.) Books are scattered everywhere. When the PCs enter, the three armed men attack.

The combat may be to the death, but any survivor will surrender once the leader is killed or critically wounded. The cowering man and woman will not engage in combat in any way. They appear to be wounded themselves and are more concerned about their own safety than that of the PCs.

The Aftermath

The man and the woman are Boniface Wilde and Rakhel Yustiniano respectively; they are the two surviving helpers of Benghin. Benghin himself is the man whom Wilde is cradling in his arms. He has been fatally wounded by the attackers. Any PC with Medical skill will recognize that he is beyond help and will die soon. Wilde and Yustiniano are likewise wounded, but their wounds are more easily treated. Benghin will not regain consciousness before he dies.

The prisoners (if there are any), know very little other than that they were hired by the leader (who is now dead or unconscious), and he provided them with the auto pistols. A third hireling was killed downstairs by one of Benghin's helpers. Examination of the auto pistols shows that they have the Commda's seal on the hand grips.

Wilde will explain that they are two of Dr. Benghin's helpers. The others are all dead, two downstairs and four more upstairs. Although there is considerable bad blood between Ambrose and the Commda, Wilde is unsure why the Commda's men would single out Benghin to attack. Obviously the men were looking for something, and Wilde suspects that it was a rare manuscript which recently came into Benghin's possession, which he was extremely excited about. The manuscript is secure in a hidden safe, but with Benghin dead, neither Wilde nor Yustiniano have any idea what it related to.

Once Wilde and Yustiniano understand that the PCs are working with Ambrose, they will produce the document. It is a hardbound book of standard dimensions, perhaps 300 pages thick, and very old and worn. The binding is coming apart, many pages are loose,

and the entire manuscript is held together by a stout red ribbon. When they examine the manuscript, the PCs will find that it is written in a language and alphabet unfamiliar to them. Wilde heard Benghin mention that it was in ancient Vilani, although neither of the surviving helpers read that language. Also in the book are several sheets of paper with numeric calculations handwritten on them. Both assistants recognize this as Benghin's handwriting. The calculations are not complicated formulae, but rather consist of a series of simple multiplications and divisions. On the last page Benghin has written, in a larger and heavier hand and with obvious excitement, the numbers 1, 2, 3, and 4, underlined each one individually, and followed them with an exclamation point.

"That must relate to the old prophecy," Yustiniano volunteers, and she shows the PCs a book on the prophecy containing the following text.

Prophecy

That Which Was Shall Be Again
Founded by Three,
The First ruled for Two Thousand.
Founded by a First,
The Second ruled for but Two Hundred.
Founded by a First,
The Third ruled for One Thousand
And One from the past shall found the Fourth
Which shall rule Forever.

"The only one who can help us now is Mistress Markuss," Wilde says. When asked who that is, he explains that Brynhild Markuss is the senior priest at the library, which also serves as a shrine to Gherard. Although she and Benghin differed on spiritual matters, they remained friendly, and she was always helpful in their researches.

Shrine of Gherard

The shrine of Gherard is not far from Benghin's house. The building is quite large, and anyone familiar with Imperial architectural styles will know that this building dates from only a decade or so before the Final War. It is hardly ancient by comparison to most buildings on Karaguuka.

Many locals go in and out of the huge open gateway at the front of the library/shrine. On either side of the gateway is a single robed member of the Order, dressed in the red and yellow garb of a lay brother or sister.

The inside of the shrine is indeed magnificent. Paintings and icons adorn the walls. The building is well lit by means of electric lighting. There are also a fair number of valuable gold and silver items being used as decoration. Nearly all of the decorations depict Gherard in various heroic scenes. Some of them contain recognizable symbology such as the insignia of the three Imperia which preceded the present era. In short, the shrine's interior is a veritable treasure-house of visual information about the Order of the Phoenix and its beliefs.



Boniface Wilde
Novice NPC
Combat Assets: *Slug Weapon*
Other Assets: Wheeled Vehicle 6, Research 14, History 9
Motivation:
Diamond 5: Wilde is greedy, but not for money. Instead, he is greedy for knowledge. He hungers for an understanding of what was before and what the legend of Gherard has to do with it.
Spade 3: Wilde wishes to be recognized in his field, and this is another aspect of his drive for knowledge.

As the brothers and sisters know both Wilde and Yustiniano, the group will be brought to Mistress Markuss immediately. She will show genuine sorrow at the news that Benghin is dead, and anger at the thought that the Commda's men had him killed. She cannot imagine a motive, however.



Rakhel Yustiniano
Novice NPC
Combat Assets: *Slug Weapon,* Unarmed Martial Arts
Other Assets: Research 12, History 11
Motivation:
Heart 6: Rakhel is friendly and caring, and is particularly concerned that the future for her people be a good one.
Club 5: Rakhel has a short temper and is prone to violent reactions to pressure or tension.

When shown the manuscript, she says that it does indeed appear to be ancient Vilani, but that she



Brynhild Markuss
Novice NPC
Combat Assets: None
Other Assets: Liaison 12, Research 10, Persuasion 11, Leadership 9, Medical 8
Motivation:
Heart 10: Markuss is a truly gentle soul, devoted to caring for others.
Spade 5: Although it does not interfere with her essential nature, Markuss is also pragmatic, understands the church hierarchy, and has been able to advance steadily in it. She feels she can do more good if she has more responsibility, and sets out deliberately, though honestly, to acquire it.

does not read that language. She does have a Vilani scholar on the staff of the library, however, and sends for him.

When he arrives, he examines the book.

"Ah, this is quite a find, isn't it? Not really as old as you might think, but quite a curiosity item. Do you mind if I ask where you got it?"

Wilde answers that a mysterious stranger brought it to Benghin only two weeks earlier. The priest nods and continues.

"This is a history of the Vilani people, written during the Third Imperium. It is unusual to find books from that period written in the old language, but there was a time when the people called the Solomani claimed superiority over the old folk of Vland. At the height of that, there was something of a Vilani cultural revival, with a large number of books like this published—extolling the virtues of Vilani history and culture and printed in the old language."

One of the PCs (or Wilde) says that Benghin's notes were between a certain set of pages with columns of figures on them and shows that page to the priest.

"Hmm, yes. Very interesting. This is a cultural timeline, with key historical events and their dates. But what are these other columns here? Oh, my," he says, suddenly becoming excited. "Oh my word! This is extraordinary! This is amazing!"

"What is amazing, Brother Kinsu?" Markuss asks.

"I'm sorry, Reverend Sister," he answers, "but I have never seen anything like this. This is extremely valuable. You see, we have only been able to piece together fragments of the history of Vland. So much was lost in the Collapse. We have some dates for events in the old calendar, but they are unreliable enough that we have never been able to tell exactly how that calendar corresponds with our own. But this page here, you see? There are key historical events listed down the left side of the page, and then four columns of dates. See the headings? These are the exact dates of these events in the four principal dating systems! Vilani, Solomani, Zhodani, and Imperial!"

"*Zhodani*?" Wilde asks. "Who are they?"

"A race of evil sorcerers from a long way from here. They are of no concern now. But these other dates are fascinating. They will enable us to reconstruct their calendar exactly."

One of the PCs (or Wilde) shows him the pages of calculations and asks what their significance might be.

"Hmm. Well, yes, this is obvious. Based on these earlier dates, he has worked out the current year in the Vilani and Solomani calendars. See here? He has 3943, then 5717, then 1200. That is the current year in each calendar. Of course, the Solomani one was easy, but until we had this manuscript there was never any possibility of determining the current year in the Vilani dating system."

Markuss thanks him and he leaves. Obviously the current year's date in each calendar had some significance to Benghin, and Markuss will point out that the ancient prophecy says that "the years point the way," adding further weight to this possibility. Markuss studies the numbers for a long time, perhaps while the PCs speculate as to their meaning, and then she turns suddenly pale and nearly faints.

"Great Gherard! Great Gherard!" she says. "It is true! You are come!" Obviously excited, she explains the meaning of the prophecy to the PCs and Benghin's assistant. Her hand shaking with emotion, she opens her prayer book and shows them the prophecy on the inside cover.

"*One, Two, Three, Four,* that is the key. *Four are to rule,*

One, Two, Three, Four
Four are to rule
One from the past
shall rule the Fourth
When the time is right
And the Years point the way

meaning four empires. *One from the past shall rule the Fourth,* meaning Gherard shall rise and rule the final empire. *When the time is right.* But when is that? *And the Years point the way.* Look at the years, and consider the basic principle of numerology—combination. Take the Vilani date for this year: 3943. Add the four digits together and you get 19. Add those digits together and you get 10. Add those digits together and you get 1.

One. What was the number of the Vilani Empire? One. The First Empire. The "One" of the prophecy.

"Now take this year in the Solomani calendar: 5717. Add the digits together and you get 20. Add those digits together and you get 2. What was the number of the Solomani Empire, the Rule of Man? Two. The "Two" of the prophecy.

"Now take this year in our calendar, the old Imperial calendar: 1200. Add the digits and you get 3, the Third Imperium, the "Three" of the prophecy. This correspondence of years is not, cannot be, simply coincidence! This is truly the year of Gherard!"

A Slippery Slope

It seems that the PCs are well on their way toward accomplishing their mission. They now have proof positive (perhaps unsettlingly convincing proof) that Gherard will rise during this year. Mistress Markuss will at this point unwittingly take over responsibility for spreading the word. The central church authorities will, over the course of the next several weeks, send ecclesiastical examiners to verify the validity of her claim, and the PCs should be encouraged to suspect that they will declare it a fraud. In fact, the commission will declare the proof to be genuine and endorse Mistress Markuss' findings. The news will spread like wildfire, despite the disavowal of the decision by the central church.

At the same time, the Commda will make one or several attempts to thwart the plot, although the action taken will be limited by the information actually available to the Commda. Possible options include attempted assassination of Ambrose, attack on the PCs, attack on either Wilde or Yustiniano, kidnapping of Mistress Markuss, or even an attempt to plant obviously forged manuscripts on Markuss to discredit her. Less overt actions consist of a public relations effort to discredit the new revelation. Whether these are successful or not depends largely on the actions of the PCs. The next several weeks should be filled with intrigue and danger as the PCs play out what they believe to be a waiting game, being careful to keep their identities as off-worlders secret.

Once the revelation has been verified by the church commission, however, Mistress Markuss will ask the PCs to call on her again. She has come to trust them, particularly if they helped foil a kidnaping attempt, and so now asks them for additional assistance.

Other parts of the prophecy indicate that Gherard will rise in the presence of the faithful. For that to happen, the faithful must be at his tomb, and for them to be at his tomb they must know where the tomb is. The problem is that the location of the tomb has been lost over the centuries. According to church lore, however, there are three vital clues to the location of the tomb. These are what Mistress Markuss asks the PCs to seek out.

Directions to Gherard's Tomb

371830301858 4017194919 4940191649 4018 3817194828483649 40184629

181010 46564940 16184949194949 401719 181019 391959
401719 181019 391959 37481846 29191819284017 401719 2918183949
4018 285828391910 38171948284836

181019 46564940 3818 3748184 6 3817194828483649 20264050
37481846 401819 48181846 1837 401719 491617194819
1018484017 401910 2950 401910
19284940 37265718 2950 37265718
4018 401719 58283030 40172840 1726361949 401719 40184629

18103050 4017184919 581718 371830301858 4017194919 4940191649
18103050 4017184919 59264017 401719 181019 391959
281036 28 16564819 491626482640
202810 285828391910 28171948284836
4018 3718561036 401719 371856484017

40172840 5817262017 582849 4917283030 2919 2838282610

The first of these clues is a coded message in a chronicle of Karaguuka. The message gives precise directions to Gherard's tomb. (See above; this should be photocopied and made available to the PCs.) Unfortunately, the message is so encoded as to be meaningless without the proper key.

The second clue is a megalith believed to contain at least part of that code.

Finally, there is the oft-mentioned key to the tomb which, when used at the right time and by the pure of spirit, can open the vault where Gherard sleeps. The location of the key is still a mystery, but Marcuss is hopeful that the encoded message or the megalith might contain more information about it.

Benghin had found references to an ancient standing stone covered with numbers and old Anglic writing from the Rule of Man. According to local legend, the stone is a key left behind by Gherard's followers to decipher other clues left behind as to the location of his tomb. The stone was found and documented by Solomani archaeologists during the Second Imperium, but few people have taken an interest in it since then. Benghin could find no transcription of the numbers and writing on the stone, so he figured he would have



to find the stone himself to see what was written on it. He did find some obscure directional measurements to the location of the stone, but he needed the satellite map of Karaguuka to pinpoint these locations.

Markuss's researchers at the library have been able to locate the Imperial satellite map of the planet. They were able to find these at the archival section of what used to be the starport's traffic control station. Now, they can be used to pinpoint the location of the standing stone which may hold the key to one mystery.

Journey to the Stone

After a few computations and an examination of the map, the research team locates the probable location of the standing stone. According to their computations, the standing stone should be located somewhere within the caldera of an extinct volcano known locally as Mount Purgatory. The calder's gorge is deep and treacherous, and can be reached only by first climbing Mount Purgatory and then descending into the gorge. A river called Eunoe runs through the center of the caldera. The river flows through some narrow and craggy portions of the gorge before entering a small cave that later spews the water out down the side of the volcano. The caldera has the reputation for claiming the lives of those who brave its depths.

The researchers will take their ATV and ground car to the volcano. The PCs are free to come with them or in their own vehicle if they have one. They may even take the ground car left by the attackers if they so choose. Yustiniano reminds them to be ready for anything. Even if the Commda and the Order do not try to disrupt their expedition, the gorge itself may prove to be more than expected.

Mount Purgatory

Mount Purgatory is indeed an awe-inspiring sight. Climbing to its summit must be done on foot. No vehicles will be able to make the journey. Once at the summit, the team can then descend into the caldera's gorge. Wilde suggests that everyone carefully choose what items and provisions they bring with them. They cannot afford to bring any more than they need, but neither can they afford to forget necessities. This is to be a one-time round trip to the bottom and back again. With all of the time constraints the team has, they cannot waste time going back and forth between the bottom of the gorge and their vehicles for forgotten items. Wilde is adamant that everyone carry a weapon since no one knows what may happen next. Yustiniano likewise suggests, if the PCs do not, that they bring a portable raft. They may need to cross the river at some point, and a raft is certainly safer than trying to swim across it.

At the summit, the team can see down into the caldera's gorge. A great many stone spires and weirdly shaped rocks are visible, as well as blackish sand made from volcanic ash. At its floor, some hundred meters down, the PCs should see the Eunoe River. At parts, the river is calm and placid. At others, it is a roaring expanse of rapids moving swiftly toward the jagged rocks that protrude from the walls of the gorge. There can be no question as to why this caldera has such a sinister reputation.

The journey down the narrow pathways of the gorge is largely without incident. If the referee so desires or the PCs' actions warrant it, he or she may require appropriate skill or ability checks. After all, the gorge is quite a difficult trek. There is good reason to assume that not every person who journeys to its floor is up to the challenge. Mishaps occur even among the most highly trained of climbers. During the descent, each PC would be allowed to make an Observation roll. If they succeed, tell them that they see a quick glint of something in the sunlight. If they ask, also tell them that they feel

certain they could pinpoint the glint once they reach the bottom. Further requests for Observation rolls will reveal only an odd and nonspecific humming sound. Its location is indiscernible. Someone will suggest that they are just hearing the wind whistling through the cracks and crevasses of the gorge.

At the Bottom

The bottom of the gorge is filled with a multitude of bizarre rock formations, many of which are made of igneous rock and shining obsidian. Yustiniano will explain that some of these unique formations have histories and legends of their own, oftentimes connected with those of figures from Karaguuka's past. She will point out those which have any relation to the Gherard legends, like Gherard's Throne or the Sword of Gherard. If the PCs did not have it already, they should definitely be left with the impression that nearly every aspect of the planet is inundated with references to Gherard. He is more than just a legend to the people of Karaguuka.

The glint which the PCs may have seen is even more visible from the bottom of the caldera. Creating an almost blinding light, the gleaming object, whatever it is, is located on the far side of the Eunoe River, away from the PCs. It also appears to be surrounded by several naturally formed obsidian columns which form a kind of fence around it. Wilde insists that it must be the standing stone since many tales ascribe to it a sheen like metal rather than stone. He wants to get to the other side of the river as soon as possible. Hugh and Alianor Anselmo urge caution seeing as they have no definite proof of the nature of the shining object.

Crossing the river in the portable raft appears more difficult than it actually is. While a more rapid section of the river is only a few dozen meters downstream from the place the PCs cross, the river is largely calm at that point. The river is, however, over 10 meters wide at this point, and it takes a few seconds to cross it. A successful use of water vehicle skills may aid in crossing the river without mishap. None of the researchers has any but the most basic skill in water vehicles.

As the PCs get closer to the gleaming object, they will realize that it is a two-meter-tall, blue-gray metallic tetrahedron. It is definitely not a natural object, although its origin is something of a mystery. Upon close inspection, they should be able to see that it has an inscription carved upon it. The words are written in archaic Anglic. According to Yustiniano's estimation, the dialect is that used by the rulers of the Second Imperium circa 1800. Wilde states that that makes it right around the time that Gherard supposedly ruled Karaguuka. So far the legend checks out with actual history.

The tetrahedron is by no means a standing stone, but it is definitely the object they seek. The writing on its surface also contains a series of numbers arranged in rows in imitation of the Anglic words written above them. (See the box below; this should be photocopied and made available to the players.) Just exactly what this means and how it relates to the encoded directions to Gherard's tomb is for the PCs to figure out.

Surprise!

At this point, the player characters are set upon by six men armed with auto pistols. They appear from behind a nearby outcropping of rocks. They order the team to put down their weapons and to surrender, but the PCs should have the distinct impression that they are unlikely to survive if they do. Perhaps one of the attackers will yell, "Yeah, throw down your weapons, and we'll let you go," and then laugh. A firefight between the PCs and the attackers is likely to occur at this point. At some point during the fight, a stray bullet from a missed shot may hit the tetrahedron and glance harmlessly off it in a flash of sparks. This should serve to show the player characters that the tetrahedron is of sturdy manufacture and not easily damaged.

Once the fight is over, the PCs will find the unmistakable evidence of the Commda's involvement in the attack in the form of personal insignia on the attackers. Behind a rock pile, if they search carefully, they will find a camouflaged air raft, which was the source of the humming heard earlier.

When the PCs get to the base of the volcano, either after a long, difficult climb or after a short, refreshing ride in an air raft, they will find their vehicles intact and operable.

Inscription on the Tetrahedron

Five by Five,
From One to Ten,
The Phoenix is waiting
To speak again.

17265719 2959 17265719
37481846 181019 4018 401910
401719 161718191026 27 2649 582826402610 38
4018 4916192839 2838282610

Finding the Tomb

The PCs will no doubt return to Cato Downport, and the next part of the adventure will be spent in deciphering the clues to the location of the tomb. They now have either a rubbing or a photograph of the monolith as well as the encoded directions to the tomb.

Markuss is even more fervent in her belief in Gherard's glorious return, and if, by luck, there happen to be four members of the PCs' party, she will insist that they are "The Four" of the prophecy, Gherard's four warriors come to prepare the way for his return.

Meanwhile, the news of the revelation continues to spread across the planet, and every day hundreds of additional pilgrims arrive at Cato Downport to visit the shrine and await the news of the location of the tomb. There are enough pilgrims present that neither the Commda nor the central church can afford to take any overt action against Ambrose, Markuss, or the others.

The numbers and the Anglic script on the tetrahedron are indeed a key to the encoded message which Benghin found in his examination of ancient chronicles. The numbers are an exact correspondence with the words in Anglic. Each pair of numbers in the various groupings represents a letter in the Anglic alphabet. In addition, the short poem on the tetrahedron is an additional clue as to the nature of the cipher used to encode both the poem itself and the directions to the tomb. That cipher is shown on page 152 for the referee's reference. Even if the PCs do not realize the nature of cipher, they should still be able to decode the directions from what has been given to them on the tetrahedron. It is just a simple process of substitution. The directions read as follows:

Follow these steps to Gherard's tomb:

One must possess the One Key,
The One Key from beneath the books
To awaken Gherard.

One must go from Gherard's city,
From the Room of the Spheres
North Ten by Ten,
East Five by Five
To the wall that hides the tomb.

Only those who follow these steps
Only those with the One Key
And a pure spirit
Can awaken Gherard
To found the Fourth.

That which was shall be again.

Once the directions have been decoded, the PCs will then have a number of choices open to them. The first choice deals with the One Key mentioned so often in the legends of Gherard's tomb. The PCs do not possess this key and, according to the directions, such is needed if the faithful are to open the vault where the Emperor sleeps. Once the key is gained, the faithful will then have to follow the directions to the tomb itself and open it.

According to the directions, once they are decoded, the One Key is located "beneath the books." The clue is very nonspecific and could prove frustrating to those who do not take its words literally. The One Key is most certainly located "beneath the books." It is housed in a secret series of rooms beneath the library itself. The PCs, in their search, will have to go to the basement level of the library and look there for anything out of the ordinary. A successful Observation roll will result in the discovery of a false floor. A Strength task will also be necessary to pull open the false door, revealing a set of stairs made of stone going down.

If the PCs follow the stairs down, they will enter a cave which has been carefully and skillfully hewn out of the rock. At the far end from where the PCs entered there is a metal door with a gold handle. The door opens easily to a small room with three other doors. Only two of these doors will open for the PCs. They will have just entered a series of rooms interconnected to one another by doors. Every one of the doors is a one-way door that will open in one direction only. Thus, there is no turning back. One must press forward. There is only one correct path through the rooms to the One Key and one path back out to the entrance cave. The PCs will have to discover these through trial and error.

The purpose of the maze of rooms is not to harm, but to frustrate the PCs. There is not any real danger in the maze. Of course, the PCs do not know that. Creaking doors, echoes, and unexplained noises can be used by the referee to encourage a sense of paranoia and mystery.

When the PCs finally enter the room of the key, they will find a room completely empty except for a metallic tetrahedron similar to the one in the caldera of Mount Purgatory. On top of the tetrahedron is an ornate key made of a whitish metal. If the PCs examine the key more closely, they will see that it is very similar to the sorts of keys used to a open a starship airlock manually. The key has numerous engravings on it as well.

Removing the key from its perch requires nothing special from the PCs. Again, the PCs may expect tricks and traps but there are none. One need only pick up the key and carry it away. Once lifted, it will be obvious that the key is heavy and of an extremely hard metal. While appearing whitish from afar, it is iridescent when it

catches the light. Any PC with any level of geological or metallurgical skill will know that the key is made of iridium. Anyone with knowledge of Imperial history will know well the significance of that metal, the mineral used to fabricate the Imperial throne.

Most of the carvings on the key are simply decorative with no apparent purpose other than artistry. The one that is not shows a rising sun, a depiction of the dawn. Finally, written in ornate script are the words, "That which was shall be again." This phrase should likewise be familiar to the PCs by now, being associated often with the legends of Gherard. The Order of the Phoenix also uses this phrase as part of its preaching to the people of Karaguuka.

Upon leaving the maze, Yustiniano will say that she is concerned about the clue which led them here. This library, she explains, is more recent than the time of the Long Night. A truly ancient document, as the prophecy purports to be, would never refer to the basement of the library as a place "beneath the books." Yustiniano is quite right about this. Exactly how an ancient text refers to a library building not used as such during that time is a mystery which the PCs will have to solve for themselves. Mistress Markuss, true to her nature, feels that the seer who predicted the return of Gherard at the proper conjunction of years would have no difficulty in knowing what this building would be used for at this time. Mental powers are an odd thing about which science knows very little.

The second clue is the final one, the one which points the way to Gherard's tomb. The clue mentions both Gherard's City and "the Room of the Spheres." Wilde knows what these mean. Gherard's City is Cato Downport, where Gherard first landed on the planet. The Room of the Spheres is the old astronomical observatory two kilometers north of the city, so called because the symbol of the observatory was a large stone sphere on the lawn. One need only follow the directions "North Ten by Ten" and "East Five by Five." Does that mean 10 meters or 10 kilometers? The PCs will have to decide once they arrive. Finally, the clue says that a wall hides the tomb. Who can say what the wall may be?

If Ambrose is consulted, however, he will know instantly. One hundred kilometers north of the the observatory is a geological feature known as the Zimmerman Escarpment, also sometimes called the Zimmerman Wall. It runs almost exactly east and west. Twenty-five kilometers east along the wall should be



the tomb site. If the referee wants to leave it to the players, however, prepare a map of the surrounding area and have them examine it and come up with the discovery themselves.

Mistress Markuss is delighted with the news and, whether the PCs intended this or not, she tells the mobs of pilgrims who have filled the city, and they immediately set out overland to the tomb site. News of the site will also quickly reach both the central church and the Commda.

The Race for the Tomb

If the PCs are not astute enough to think of this, then Ambrose, Wilde or Yustiniano should point out that the Commda can easily reach the tomb site using his relic air rafts and "stage" a phony resurrection by the time the faithful arrive. Unless they want the Commda to be canonized by the populace, they had better get there first and guard the tomb site. This will be easy if they have the Commda's air raft from the ambush, and somewhat more difficult if they are using ground vehicles. If using ground vehicles, they should be encouraged to push the vehicle to its best speed, and be reminded that although the Commda has a few air rafts, he also has much farther to travel to get to the tomb, and so their mission is not hopeless.

Regardless of who arrives first, it will be after nightfall, and the other party will arrive shortly afterward, so the Commda will not be able to stage a resurrection unless he can eliminate the PCs. This will probably result in a running night battle. The referee should carefully balance the Commda's forces so that, while outnumbered, the PCs are not hopelessly overpowered and have a chance to at least prevent any serious work by the Commda and his men for several hours. At the end of that time the first groundcars with pilgrims will begin arriving, and the Commda will be unable to continue the fight in the face of so many witnesses.

When asked for an explanation by the angry mob, the Commda will claim that he found the PCs here attempting to defile the tomb. The situation may become sticky, but Mistress Markuss will soon show up with the True Key, and she will explain that the PCs came ahead with her knowledge and blessing to protect the tomb. Now that the faithful understand the riddle of the years and are present with the True Key, Gherard will surely return.

And, interestingly enough, he does.

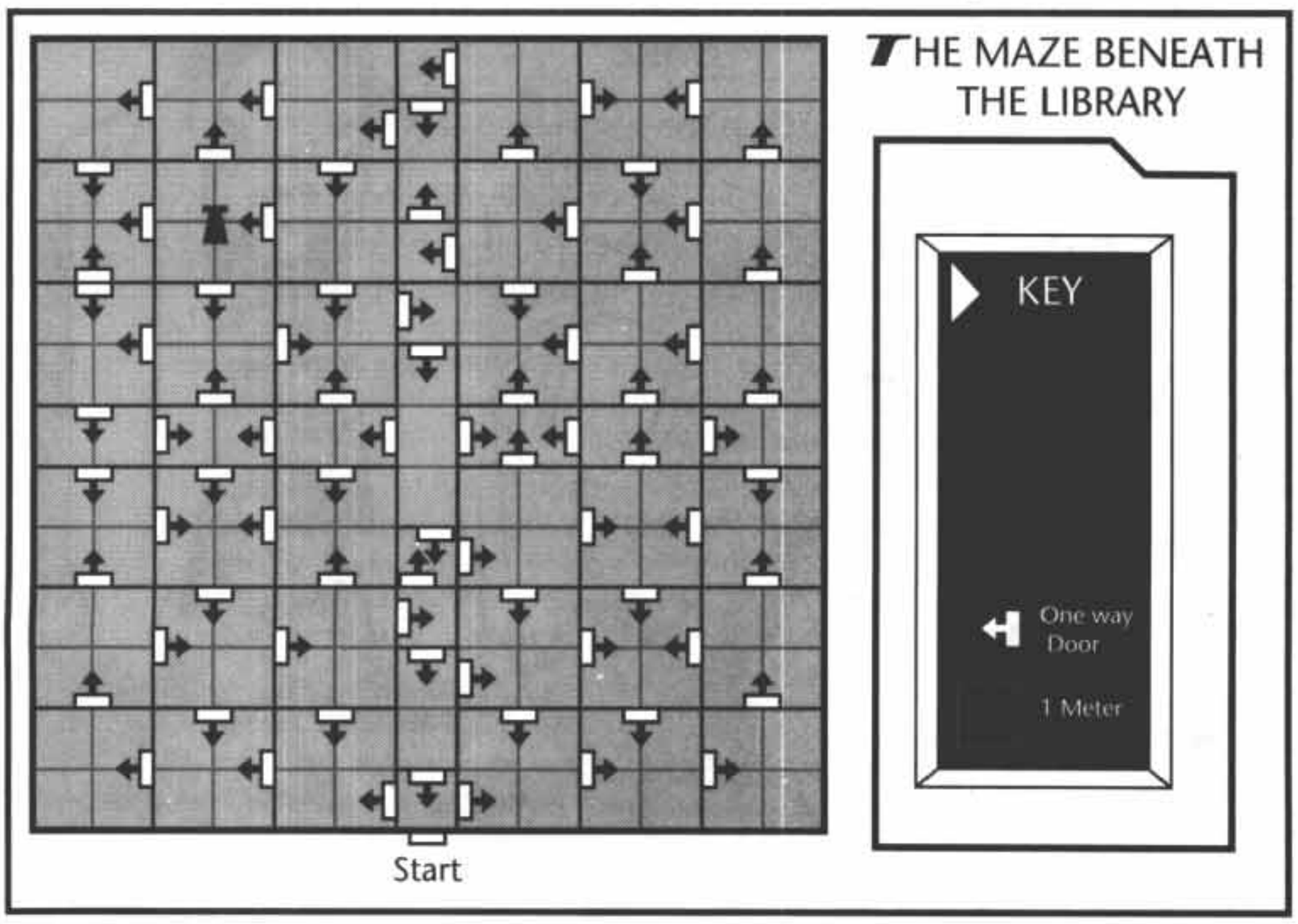
"Well Done, My Good and Faithful Servants"

In fact, he does so spectacularly. The cliff wall parts with a crack, and tons of sandstone slide away and cascade forward, crushing dozens of the faithful in the process. The screams of pain and fear soon fade, however, as brilliant multicolored lights shine from within the cliff wall and majestic music fills the air from every direction. After a moment, a man's figure is seen to climb from the tomb interior, silhouetted by the lights behind him, and the music fades. His voice booms out and echoes from the ravines that cut the plain.

"I AM GHERARD, AND I AM COME!"

There is a moment of stunned silence, and then the faithful begin to weep in gratitude and sing hymns. He raises his hand and the singing stops.

"THOSE OF YOU WHO DENIED MY COMING, DENIED MY TIME, MUST FEEL THE RIGHTEOUS FLAMES OF HELL!" He then points at the Commda, and a high intensity light like a stage spotlight illuminates the warlord, the beam coming from Gherard's hand. The Commda backs up and protests that he always supported the church, always believed in Gherard, but he is cut short by the crack of a high-intensity plasma bolt from Gherard's hand which punches through the Commda and tumbles him backward into a limp heap, his clothes burning.



PCs will recognize this as the work of a hand fusion gun of some type.

"THOSE OF YOU WHO KEPT FAITH WITH THE PROPHECY WILL SERVE ME IN HONOR FOR THE REST OF YOUR DAYS. MISTRESS BRYNHILD MARKUSS, COME FORWARD."

Markuss, still clutching the True Key, walks forward unsteadily, her knees obviously weak in the presence of her god. She carefully climbs the tumbled rubble of sandstone, squinting in the glare of the lights, and when Gherard holds out his hand, she gives him the key. He holds it above his head and the crowd cheers.

"BRYNHILD MARKUSS, YOU ARE NOW THE VOICE OF GHERARD. THROUGH YOU WILL WE SPEAK TO THE FAITHFUL. THROUGH YOU WILL WE BUILD A NEW EMPIRE!"

There are more cheers, as both Gherard and Markuss disappear into the tomb. Eventually the faithful stop cheering and begin an all-night prayer vigil, except for those who busy themselves removing the dead and rescuing the injured pinned beneath sandstone boulders.

Smelling a Rat

Over the course of the next several weeks, Gherard issues a number of edicts through Markuss, edicts which indicate that the militant position opposing off-world contact was actually what Gherard intended all along, and it was only the corrupt elders of the central church who had moderated this position. Off-worlders had caused all of the problems of the world, and are to be denied any rights before the law. Only the people of Karaguuka are the Chosen Ones.

The PCs, due to their revered status as "The Warriors of the Four," are allowed audiences with Markuss and, although she is a devout believer, it is obvious that she is troubled by what she has seen in her time with Gherard. She will say nothing about it or against him, however.

Far from accomplishing their mission, the PCs have helped enthrone an obvious egomaniac who will do everything the Reformation Coalition wanted to avoid. The question is, can they now undo the damage? There were actually a few opportunities to sense something wrong from the start, but they are much more obvious in retrospect. The referee should have made Impossible rolls against Observation at several times during the adventure for the following items. These are now considerably easier to notice, and the PCs will eventually notice all of them. Individually they may tell the PCs very little, but together they provide the keys to unlocking the mystery.

Item: None of the books that talked about the legend of Gherard are *old* books. All of them quote lost manuscripts which are supposedly very old, or cite oral history research, but none of the actual books mentioning the prophecy are over 80 or 100 years old. Everyone *believes* that the legend dates back to the Long Night, but there is no proof of that.

Item: No character with any knowledge of history has ever heard of Gherard or the Order of the Phoenix.

Item: Where did the Vilani history book come from? This was the vital, missing clue to the puzzle of the prophecy. Why was it suddenly thrust into Benghin's hands by a mysterious stranger? Who was the stranger? What interest did he have in the solution of the prophecy?

Item: The monolith showed no signs of age or weathering. It was clearly built from an extremely dense metallic substance, and suitable materials were available during the Long Night. However, the pillars surrounding it did not look particularly old, either.

Item: The clue "under the books" referred to the library, but the building was not a library at the time Gherard was supposed to be alive.

Item: Irridium has tremendous symbolic significance to someone who lived during the Third Imperium; it would have been meaningless to someone who lived during the Long Night.

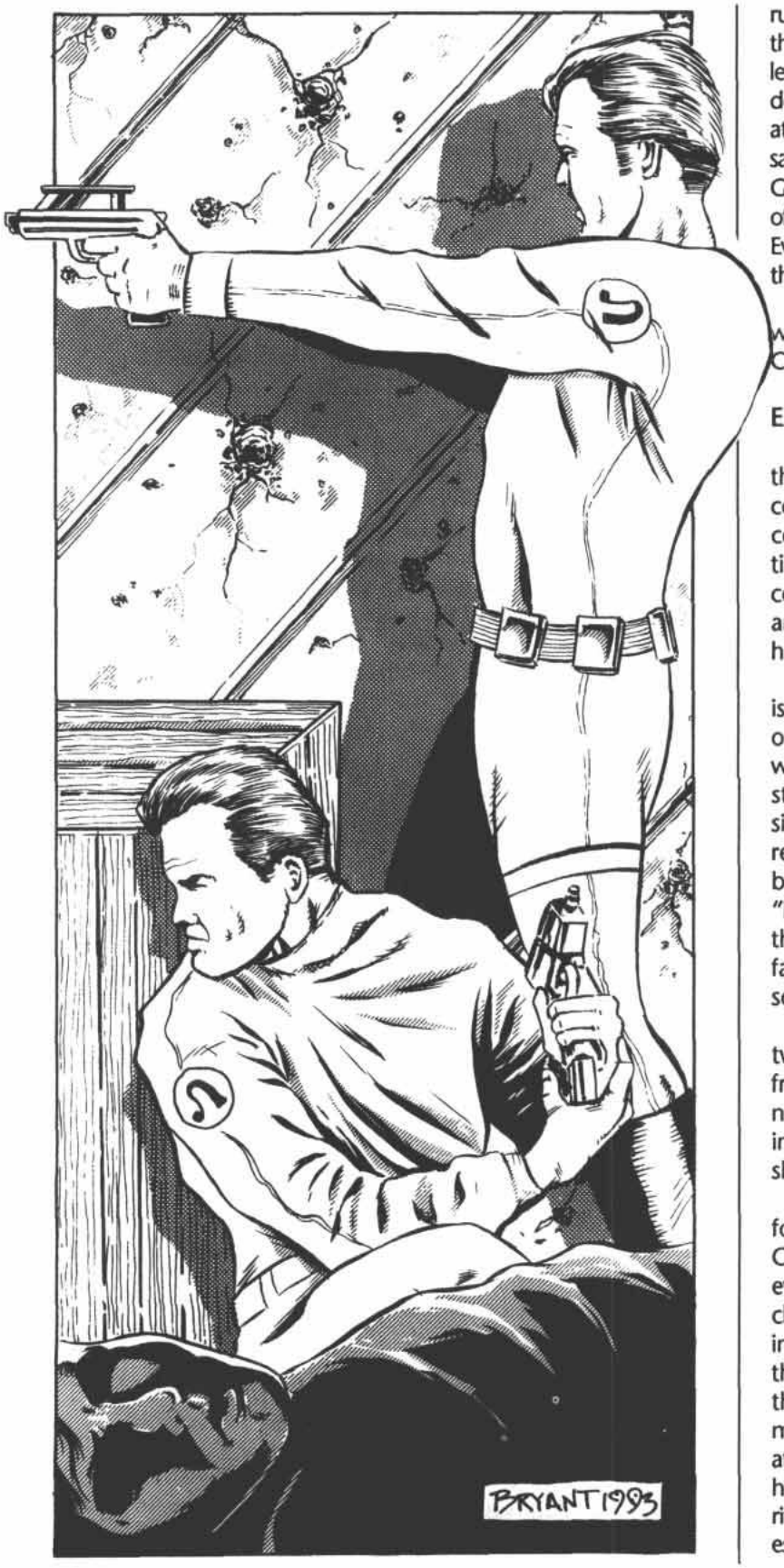
Item: Gherard killed the Commda with a hand fusion gun. Technology such as that did not exist during the Long Night, the period when Gherard was supposed to have lived.

The Truth

Gherard is a fake, a wealthy noble who, once the Emperor was assassinated and the Final War began, saw the coming disintegration of the Third Imperium. He was part of a group who concocted a scheme to go into suspended animation for the better part of a century to eventually emerge as saviors, armed with high-tech equipment to enable them to back up their claims to power.

To lay the groundwork for their re-emergence, they carefully seeded the culture with false manuscripts which would later be "discovered" and form part of the planetary legends. Writers were hired to weave the prophecy into fictional accounts. Others were bribed to add their stories to oral history projects. Artifacts were manufactured, aged, and buried. The entire cover story was quite elaborate.

What the group did not foresee was Virus and the tremendous destruction it would cause. Isolated from the outside world, Gherard's own life support systems were safe, but when the alarm went off and he woke up, he found an environment quite different from what he expected. Gherard discovered a culture so completely



ruined that his legends had almost completely taken over the public imagination. Unfortunately, there was too little left in the way of historical records for the faithful to decipher even the simplest of his riddles, and his confederates, who were to preserve themselves after seeing Gherard safely entombed, were nowhere to be found. Therefore, Gherard himself had to leave his "tomb" and take a copy of a Vilani cultural history to Benghin to aid his research. Even then the Commda almost thwarted his plan (although completely unwittingly) by killing Benghin.

Fortunately for Gherard, the PCs and Mistress Markuss were clever enough to solve the riddle and avoid Commda's traps.

Exposing the Fraud

Repairing the damage will be quite difficult now that the prophecy has come true. Even Ambrose has become a true believer, and is beginning to regret his covert contact with off-worlders. It is only a matter of time before he can no longer bear the guilt and confesses to the church, thus exposing the PCs. If they are going to act, they will have to do so fast and without his knowledge.

Several things are acting in their favor. First, Gherard is a murderous egomaniac, and not a terribly smart one. All of the elements of the Church of the Phoenix which made it popular are now largely ignored. Instead, the priority is on industrial and military expansion. Churchmen have announced plans to begin rebuilding the shipyards at Cato Downport, with the blessing of Ambrose, and will do so with technical "insights" supplied by Gherard himself. So, although the appearance of Gherard has whipped the religious fanatics into a frenzy, the more moderate members of society find little to be happy about in the new order.

Second, Mistress Markuss is increasingly torn between her faith and the personality she sees emerging from Gherard. She is a woman of faith, but that does not make her stupid. She is quite bright, and is increasingly unable to find anything "divine" about the savior she once worshipped.

The only convincing way to expose the fraud will be for the PCs to go to the tomb complex and confront Gherard, either killing or capturing him, and using the evidence from the tomb to prove that he is not what he claims to be. Obviously, there is more than one way into or out of the tomb, since Gherard left it to deliver the book to Benghin. Even if the PCs have not realized that fact, they must suspect some sort of air shaft or maintenance entrance. Although the front of the tomb at the base of the escarpment is guarded by a half-dozen heavily armed temple guards (Veteran NPCs with laser rifles), a careful covert search of the area on top of the escarpment will find such an air shaft entrance.

Inside The Tomb

Once inside the tomb, the PCs will probably conduct a careful search. There are a number of items which help fill in the blanks for the PCs.

Storage Room 1: The smell of rotting food is almost overpowering. This room is full of refuse, mostly empty food containers. There looks to be about three months worth of discarded garbage in here.

Living Quarters: These are lavishly equipped personal quarters. There is an expensive holo-entertainment center, a virtual reality hookup, sensaround music, and opulent furniture. The feeling of luxury is reduced considerably by the heaps of dirty clothes and the litter of holotapes, books, and personal junk scattered everywhere. The room does not look like it was ransacked; it simply looks like everything was dropped wherever the occupant lost interest in it.

Central Room: This room, filled with high-tech life-support machinery, contains a single, centrally located sarcophagus-like low berth. It is open and empty. A character with Computer skill can attempt to access the unit's memory at the work station (Average: Computer), success indicating a start-time of 1118 and an end-run wakeup about three months earlier.

Maintenance Bay: The PCs can hear the sound of voices raised in argument. As they draw closer, they recognize Markuss' voice and that of Gherard. Markuss' voice is strained, tense, and pleading, while Gherard's has little of the majesty it gained from artificial amplification, and instead sounds whining and petulant.

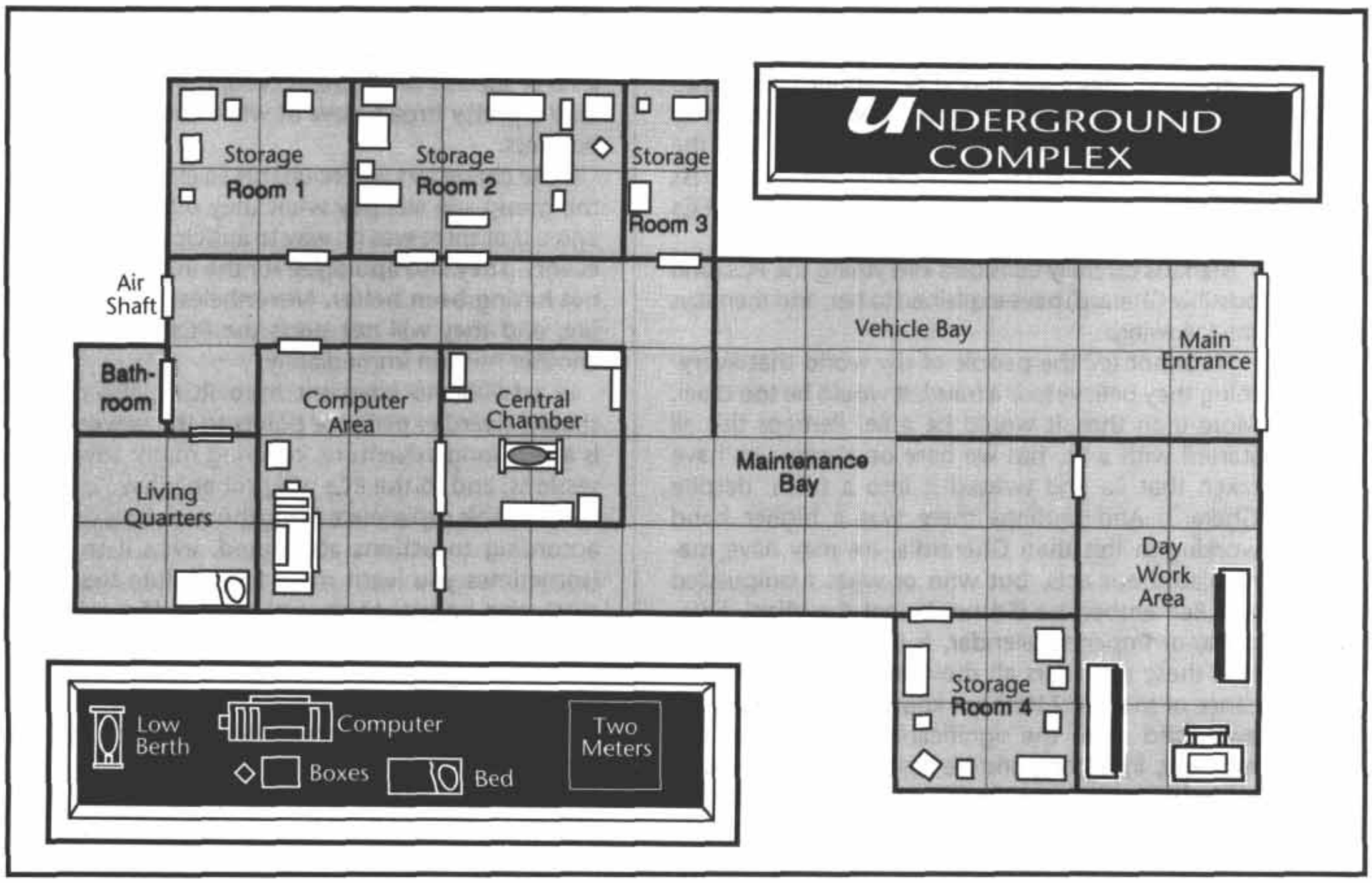
"You tax my patience, Brynhild!" the PCs hear. "You presume too much. I raised you up; I can cast you down as easily. Remember the Commda, priestess!"

There is obvious fear in Markuss' voice when she answers, but there is defiance as well. "But Lord Gherard, I cannot do this thing you ask. Think of your people. How will the farmers survive if you confiscate their crops? Even if they receive food from the church, they will be destitute. Surely that isn't what you want?"

"You dare to tell me what I want or don't want?"

The argument increases in volume and violence until Gherard begins to threaten Brynhild with violence. At this point the PCs will probably break in and discover Markuss on her knees begging for mercy while Gherard has picked up a submachinegun and appears ready to shoot her. Instead he will open fire on the PCs and Markuss will dive for cover behind a sofa.

The gunfire will also attract the guards from the main entrance, and they will arrive as reinforcements after 10 combat turns. The firefight will rage until either Gherard





Gherard

Experienced NPC

Combat Assets: *Armed Martial Arts, Slug Weapon, Energy Weapon*

Other Assets: Act/Bluff 13, Leadership 9, Persuasion 12, History 9

Motivation:

Spade 10: Gherard is hungry for power, obsessed with the idea of ruling a world.

Club 8: He is also an extremely violent person, taking pleasure from dealing with a situation violently rather than with a less confrontational approach.

is killed (or incapacitated) or the PCs are defeated, in which case they are almost certainly lost. Once Gherard falls, however, the guards will continue fighting briefly, bent on revenge, but will surrender once one more of his number are killed or incapacitated.

Cast Down the Idol

The player characters will disarm the surviving guards and look to Brynhild Markuss, who is shaken but otherwise unhurt. The PCs will then probably explain everything they have found out about Gherard to her, perhaps spurred on by her own inquiries as to how Gherard could have turned out so unlike the legends. If Gherard is still alive, he himself will confess everything, even filling in he gaps in what the PCs have been able to piece together.

Markuss carefully considers everything the PCs (and possibly Gherard) have explained to her, and then says the following:

"I cannot tell the people of my world that everything they believe in is a fraud. It would be too cruel. More than that, it would be a lie. Perhaps this all started with a lie, but we here on Karaguuka have taken that lie and twisted it into a truth, despite Gherard. And perhaps there was a higher hand working in this than Gherard's. He may have manipulated our acts, but who or what manipulated his? Remember, he did not invent the Vilani, Solomani, or Imperial calendar. Is it just a coincidence that these calendars all show the profound significance of this year? Without knowing it, Gherard has awakened us to the significance of this year, this moment, in history, and he has shown us the way.

"So I will tell my people this. This man was a simple fakir who found the true location of Gherard's tomb, looted and desecrated it, and then impersonated him. He is false, but the rest of the prophecy is true. This *is* the year of Gherard's return. But Gherard, for us on Karaguuka, means the strength of our own spirits. This is the year that we, as a people, return, by our own efforts, by our own choice, to the stars. And we will do that by contacting the off-worlders and asking, no, *demanding,* that they open the heavens to us."

Epilog

If all has gone well, the PCs have probably succeeded in their mission. They will have many stories to tell at their next Auction, stories which will probably not be believed, but which will at least earn admiration for some really over-the-top imaginative lying.

If the PCs have accomplished everything outlined above, Papa's strategic planning group will be very pleased, and particularly impressed that they were able to deal with the bizarre twist that the mission took. They will try to sign up the PCs as permanent operatives and, failing that, will at least offer to help underwrite their next trip into the Wilds. If they already have a ship, the group will be able to provide a turret or improved sensor pack of some kind; if they don't have a ship, the group will offer to sell or loan them the ship they used for this mission, provided they use the ship for RCES-related business. Given the level of success the PCs achieved, they are willing to take a pretty broad view of what constitutes RCES business.

If the characters where unable to expose Gherard, the group will still pay what they offered, and will agree that there was no way to anticipate this turn of events. They also apologize for the intelligence data not having been better. Nevertheless, failure is failure, and they will not press the PCs to undertake another mission immediately.

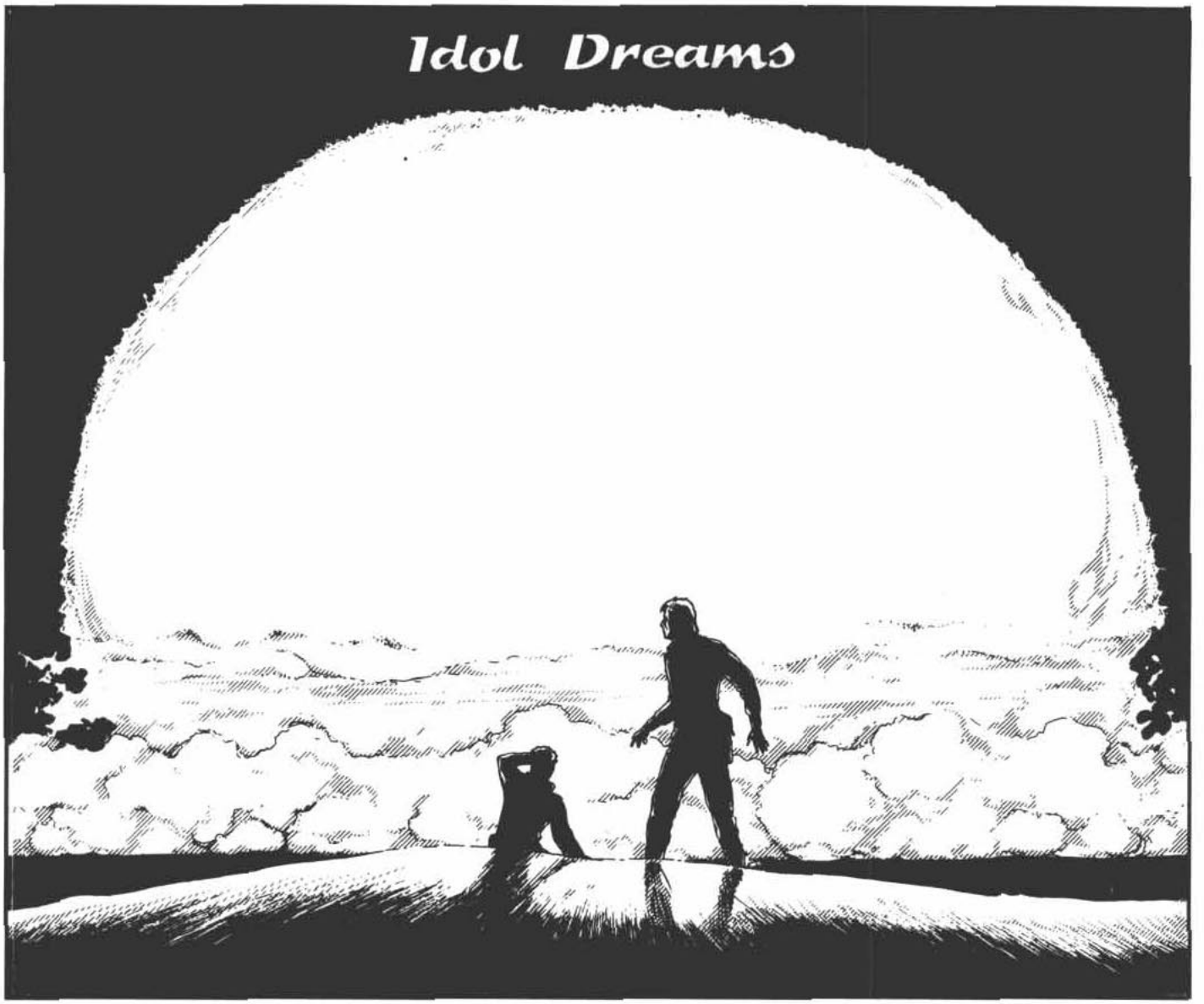
In addition to payment from RCES, the referee should award experience points to the players. This is a very long adventure, covering many adventure sessions, and so the PCs will probably have built up considerable experience along the way. Award points according to actions attempted, even if they fail (sometimes you learn more from failure than success), and be sure to reward outstanding roleplaying.

For Reference Only

The following are the number/letter correspondences in the code:

A-28 B-29 C-20 D-36 E-19 F-37 G-38 H-17 I/J-26 K-39 L-30 M-46 N-47 O-18 P-16 Q-47 R-48 S-49 T-40 U-56 V-57 W-58 X-27 Y-59 Z-50

Idol Dreams



"It was not in the lives of your fathers, nor even in the lives of your grandfathers, but there was once a time, many years ago, when the heavens were ablaze with war. Men had journeyed throughout God's universe, and in their arrogance, they came to believe that the stars belonged to them. Their greed was too much even to allow them to share that which they falsely claimed, and so they fought. Their leaders turned their machines upon one another and stood back to enjoy the slaughter.

"The corruption had not escaped our world. Here, too, the corrupt and immoral ruled, concealing their hypocrisy behind a facade of piety. They followed the leaders who had engulfed the stars in war, and they were repaid for their loyalty when their masters engulfed Navar in the Time of Fire. Untold numbers died at the hands of the so-called Emperor. God was enraged by these vicious animals who claimed to be men. It decided that the time had come for them to be punished. Their machines turned upon them. The empires that man had built among the stars were destroyed by blood and fire.

"Even so, It saw a special piety in some of the people of Navar who had held to the true faith. Once Its righteous fury had cleansed the universe of the unrighteous, God appeared to the First Technician. In return for her worship, God allowed Its machines to work once again. The First Technician went forth into the world to spread the word among the people. One by one, they saw the truth of her words and became her disciples.

"Even today, God continues to protect Its followers. We have never suffered drought, fire, or plague. In battle, God sustains our warriors and calls fire from Heaven upon our enemies. We, and we alone, have been taught the rites that will keep machines alive.

"As long as we hold to the Compact, It will care for us. As long as we hold to the Compact, there shall never be another Time of Fire."

Referee's Background

"Idol Dreams" is intended as an alternate beginning to a **Traveller: The New Era** campaign. Not all players may wish to begin with advanced technical training, and instead may wish to "discover" the technological marvels of the universe from the comparatively innocent perspective of a native of the Wilds. This approach certainly has many interesting roleplaying possibilities, and it is very easy to begin one group of players with this adventure and then have them encounter another group of players who have taken a more traditional (i.e., Star Viking) character development path.

As such, characters should be created specifically for this adventure. This adventure is best suited to a group consisting of approximately four to six barbarian characters. However, after character generation is complete, the referee should make a limited skill reward to each character representing "religious" training. One of the characters should be a Navaran priest, with access to Electronics and Ship's Engineering. Other characters should have limited skill levels in Computer (the tribe has access to a few terminals linked to "God" that still work), Mechanic (they remember many of the necessary principles), Energy Weapon (again, they still have some), and Interface/Grav (one functioning grav vehicle remains) on a case-by-case basis. It is strongly recommended that the party include at least one member with each of these skills.

"Idol Dreams" is set on the planet Navar (Diaspora 1804 E547770-3). The italicized introductory section on the previous page is the recent history of the planet as the player characters know it. The reality is, of course, somewhat different. In the time of the Third Imperium, Navar was under the control of a religious dictatorship. The rulers of Navar carefully controlled the spread of scientific knowledge on their world to keep the people in line. They wanted people to believe that technology was not an invention of intelligent beings, but rather a miracle provided by their gods. Of course, many people on the planet figured out the truth, but the secret police kept that knowledge from being discussed in public.

When the Final War broke out, Navar supported Lucan; the High Clerics didn't care what the Emperor was like, so long as he left them alone. Their hopes for a quick return to normalcy were soon shattered, as war engulfed Diaspora. Taxes went sky-high, and the planet's economy was badly hurt by the economic troubles of the Final War. Finally, after years of fighting, Lucan pulled out of Diaspora, leaving a shattered sector with no defenses and no economy. As the fleets left, Navar switched sides a little too quickly, and one of Lucan's naval commanders decided to ensure that Navar's industrial capabilities would not be used against her master. She ordered her ships to launch a nuclear strike on several of Navar's largest factories. Millions died in the brief assault.

Navar is a world in the Sufren subsector of Diaspora Sector. Its pre-Collapse and post-Collapse UWP values are presented below.

Pre-Collapse C5479DG-B
Post-Collapse X54767B-6

Even before Virus struck, Navar was in sorry shape. Its largest industrial facilities were now radioactive ruins. The economy had been shattered. Navar's tech level settled into a steady decline. Worse yet, as far as the dictators were concerned, much of the planet was in a state of anarchy. Famine and disease were widespread. The only thing that the planet's leaders had to be grateful for was that they were safe aboard Navar's sole orbital colony.

That orbital colony, known as Heaven, was typical of such colonies throughout the Imperium. Heaven was designed as a series of rings located along a central axis. It was built to house 10,000 people in comfort, though today, in 1200, it holds barely a tenth of that. Heaven provides a standard one gravity throughout by rotating around its central axis.

Seventy years ago, Virus was brought to the planet when the scout ship *Excalibur* docked with the orbiting space station, known as Heaven. Virus had already taken control of *Excalibur*, although it had not disposed of the crew. By the time it docked at Heaven its transponder signal had already infected the orbital control systems, and downlink transmissions had spread it into the world's data nets. It spread like wildfire through Navar's computer systems, finally completing the destruction of the planet's technological base.

However, the Virus infecting *Excalibur* was of an unusual strain, and although its infectious offspring which took over the main world data net were homicidal and self-destructive, the source strain on *Excalibur* was neither of these things.

Excalibur came to believe that it was a god. Once it interfaced with the computers aboard Heaven, it had the power to back up its claims of godhood, at least as far as the scientifically ignorant Navarans were concerned. The religious dictatorship that had ruled the planet had always portrayed technology as a miracle that proved the power of their God, and so they had no difficulty accepting that God had appeared in the flesh, so to speak. It took control of the planetary defense systems and the weather control network and used them to help its followers on Navar.

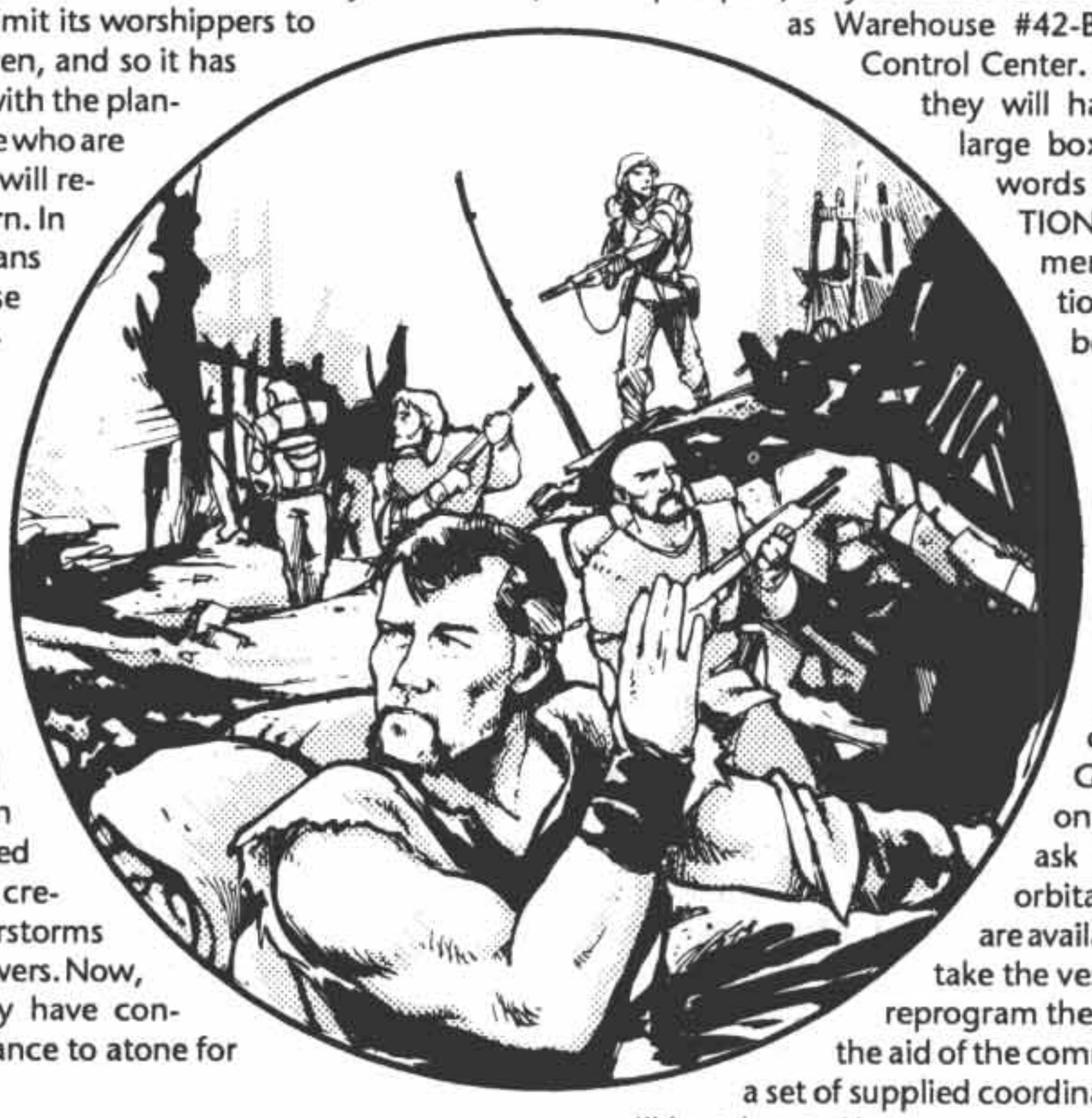
On Heaven, matters were considerably more complicated. Heaven had been the central control station for the planet, and its inhabitants were the elite of the world. Whether or not they were sincere in their religious beliefs, they were far more sophisticated about the nature and functioning of technology and not as easily cowed by its use. Even so, they were surprised when their equipment stopped obeying them. Many of Heaven's inhabitants retreated into superstition, accepting that God had come to save Its followers. The people who refused to believe were killed by the station itself in a brief flurry of violence.

In the intervening years, problems have continued to arise. A continuing campaign of sabotage by rebels who only pretended to believe in the new God has caused breakdowns throughout the station. Spare parts have grown scarce aboard Heaven. A few areas of the station have suffered from hull breaches. Other areas have lost lighting, heat, and power. *Excalibur* has been forced to

cannibalize parts from unused portions of the station to keep the lower levels in complete working order. Within the last decade, the rebels have grown bolder. Monitoring systems have been shut down in more than half of Heaven. The vacuum seals, which once allowed *Excalibur* to selectively depressurize problem areas, have been disconnected from central control or disabled altogether.

Meanwhile, society on Navar itself has continued to decline. Most Navarans died in the chaos that engulfed the world in the aftermath of Hard Times and Virus. The survivors reorganized their society along tribal lines. Most left the cities and took up an agricultural way of life. Some urban gangs still exist, however, living off the goods still left in the cities and trading for their needs.

A few tribes on Navar have been contacted by God. It is hardly content to limit its worshippers to the inhabitants of Heaven, and so it has tried to communicate with the planetary inhabitants. People who are willing to worship God will receive its blessing in return. In practical terms, that means that God provides these tribes, who call themselves the Chosen, with the knowledge to use and repair electronics and machines, as well as manipulating the old weather control network on their behalf.



With no source of spare parts available in orbit, God has decided to turn to its people on Navar. It reprogrammed the weather network to create a series of thunderstorms over the lands of its followers. Now, two months later, they have contacted It to ask for a chance to atone for their sins.

Summons

As the adventure opens, the characters are summoned to a tribal council. The last few months have been hard on their people. The weather, which has been calm and predictable for all of their lives, has been harsh and unforgiving. It has become increasingly clear that somebody must have sinned grievously against God, but no culprit has yet been found. In desperation, the chief technician, Delenn Furlon, decided to use the Holy Lascom to speak directly with God. Most of the village waited outside his hut to hear the reply, but the chief technician refused to tell them what It had to say. Instead, he called a council of the Elders, who have been meeting for the last three hours.

When the PCs finally assemble in the council hut, Delenn tells them that the village has failed in its duty to God. They had continued to perform the rites of maintenance on the satellite uplink correctly, but many were lacking in true devotion, taking God's generosity for granted. To redeem themselves, the tribe must send a delegation to the nearest city from the Old Times, known as Ashugar, where they are to collect machines that will be sacrificed to God. Then, if they complete this task and are found worthy, they will be allowed to take a shuttle to Heaven!

The PCs have been selected by the Elders to complete this holy task. Once they accept, Delenn explains the details. They must journey through Ashugar and make their way to the old spaceport. Once they reach the spaceport, they will have to locate two places, known as Warehouse #42-B and the Spaceport Control Center. In Warehouse #42-B, they will have to locate several large boxes marked with the words "CARGO DESIGNATION 285455-7A: Replacement Parts/Orbital Station." These parts are to be the sacrifice.

Once they have the boxes, they must find the Control Center. There they will have to patch a communication uplink to ("perform the Holy Rite of Computer Repair upon") the computers, allowing God to bring them back on line. Then, they are to ask it what vessels with orbital capability or better are available. They should then take the vessel in best repair and reprogram the autopilot (again with the aid of the comm uplink to God) with a set of supplied coordinates. From there, they will be taken to Heaven.

Delenn then asks the characters if they have any questions. He will do his best to answer them, but he really doesn't know any more than the above. Once the questions are over, he will give the characters a week's supply of food, a set of electronics tools, a hand computer, a radio uplink communicator, some assorted trade goods, and two less plasma rifles than there are party members, each with 3-60 (3D20) shots. He then wishes them well and says good-bye.

Journey to the Ruins

The trip to Ashugar will take about two days. The terrain around the city is reasonably pleasant. Most of the limited plant life consists of small shrubs. There is no reason for the



Atheldan Cohlis

Experienced NPC

Combat Assets: *Armed Martial Arts,* Archery

Other Assets: Observation 11, Survival 11, Bargain 7, Electronics 6, Intrusion 7

Motivation:

Diamond 4: Atheldan has to put wealth above everything else. The trasher life-style doesn't allow for a great deal of idle fun. If he wants to eat, he has to work.

Heart Jack: Once his survival needs are met, Atheldan devotes his remaining spare time to the acquisition of knowledge. He has become fascinated by the achievements of the pre-Final War era and desires to learn anything possible about those times.

PCs to expect any real trouble until they reach the city's outskirts, and, unless the referee wants to add any encounters, they won't.

Ashugar has largely been abandoned since the Time of Fire. From a distance, the blasted stumps of former skyscrapers peek above the horizon. As the characters come closer, they will see that their first impressions are more or less accurate. Ashugar is a ruin. The effects of Lucan's nuclear strike are still visible and obvious. Few buildings more than five stories are still standing. The many structures that were taller than this were toppled in the blast, leaving wreckage scattered everywhere.

Ashugar is a huge and decaying reminder of the ancient days. It is impossible for anybody on Navar to look at the huge expanses of this ancient city and not feel a certain sense of awe. Even after 70 years of neglect, the buildings that survived the nuclear devastation inflicted on the world remain almost perfectly intact. The materials used in their construction are typically too strong to be worn down by the brief time that has elapsed since the fall of civilization.

However, Ashugar is equally a reminder of the chaos and bloodshed of the Old Times. The people who died in the nuclear fireball, or who were killed in the rioting and plagues that followed, were typically left in the streets to rot. The more gruesome consequences of this ended decades ago, but Ashugar still looks like nothing more than a giant graveyard. That, in fact, is exactly what Ashugar has become: a graveyard for a now-dead civilization.

Outside the city is a small community of "trashers," people who make their living by exploring Ashugar and raiding the ruins for ancient technology. They then trade the scavenged parts for food from the tribes who live in the area around the city. Most tribes are unwilling to enter the city, because of the "curse" that is said to haunt the ruins. (In fact, this curse is a dimly remembered account of the consequences of radiation sickness and the various plagues that affected the inhabitants. These are no longer genuine threats, since the plagues have long since died out and the radiation has declined to the point where it takes years or decades to be harmful, even in the old blast site). The Chosen are aware that the ruins of Ashugar are no longer especially dangerous, but they are still reluctant to enter the city if it can be avoided.

Given the potential danger and the sheer size of Ashugar, the PCs would probably be well advised to hire a guide to take them to the old spaceport. Fortunately, Delenn supplied them with something to trade.

The trasher bazaar lies outside the city itself. Most of the trashers actually live in various houses scattered around Ashugar, but they need a place outside the city to act as a trading center with the tribes of the region. The bazaar is a makeshift and decrepit place, where trashers (mostly women and children) wait for somebody interested in buying from them. There are people from three or four other tribes in the bazaar today, all of whom will regard the PCs with a sort of nervous respect. Most people in the area have heard legends about the wrath of God made manifest on those who dare to attack the Chosen, and although God rarely punishes people who attack individual Chosen or small groups, they are nevertheless reluctant to take the risk.

The characters will have a hard time finding a guide willing to travel to the spaceport. Ashugar Down is all the way across the city, and few of the trashers are willing to go that far. Also, many of them are reluctant to take people into Ashugar because they are afraid that anybody they help will learn about the areas they raid for their goods. However, the party will eventually be directed toward one man, who, they are told, is "just crazy" enough to help. His name is Atheldan Cohlis.

Into the Wreckage

Atheldan isn't in the bazaar at the moment. However, if the characters wait, they will see a man coming out of the city and heading for the bazaar around sunset, carrying a sack slung over his back. He is in his mid-twenties, but looks about two decades older than that. This is Atheldan Cohlis.

Atheldan initially gives the PCs something of a cold shoulder, telling them grumpily to "come back tomorrow." However, if they persist, he will begin to show some signs of interest. He will want to know why they have to go to the spaceport before he will agree to take them. If the PCs aren't forthcoming, Atheldan will agree to the task, but he will demand considerably more than the trade goods with which the party has been provided. If they tell the truth, he will become considerably more animated, cheerfully agreeing to accept the trade goods the party offers in return for his help. Atheldan is fascinated by the PCs' quest, and he wants to see how it will turn out. In any case, he will suggest that the characters wait for the morning before they set out, explaining that the journey will take about two days to complete. When morning comes, he will rise at the crack of dawn, eager to set off.

About halfway through the first day, Atheldan asks to talk to the party for a moment. He warns the characters that they are now heading into a dangerous area of the city. The gangs here are generally not willing to cooperate with trashers, or anybody else, for that matter. Almost all are murderous, and

many are believed to be cannibals. Perhaps the fact that this area is the heart of the "curse" that once haunted the city has something to do with it.

About an hour later, as the party heads down a major thoroughfare, have them make a series of Difficult: Observation checks. Anybody who makes the roll notices a number of people moving to surround them. If a firefight doesn't immediately break out, the gang will surround them before demanding that they surrender.

Should the PCs surrender, unlikely though that may be, the gang will take all of their stuff, beat them up, and then let them go. If, as seems vastly more probable, they decide to fight, the combat is likely to degenerate into a standoff. There are 20 attackers, 15 of whom are Novice NPCs, while five are Veteran. All of them are under partial cover with an armor value of 6. If the PCs look for cover, they can easily find similar protection.

Assuming that the PCs do hide, casualties will likely be few and far between. Allow the shooting to continue for about five rounds. Then, ask the players to make Formidable: Observation checks. Decrease the difficulty by one level each turn until it reaches Easy. Any characters who make the check will hear a low-pitched humming sound that will gradually increase in intensity.

Four turns after the noise begins (i.e., when success at the Observation task is automatic), a grav speeder floats into view above the street. Three gang members (all Veteran NPCs) inside the speeder lean into view and open fire with auto rifles. They get two rounds to fire and be fired upon before the PCs' radio communicator activates. A voice which all of the party will recognize as God's will boom "ALL USE OF GRAV VEHICLES BY UNBELIEVERS IS FORBIDDEN!" With a flash of light, the speeder will explode, raining debris across the street. The remaining gang members will decide to exercise the better part of valor and leave.

The purpose of this encounter is to give the characters a sense of the power and majesty of their God. Play up the mysterious aspects of the destruction of the infidels. If they try to get in touch with God for an explanation, no answer will be forthcoming. Though the characters will likely never know this, God has been monitoring their progress. As far as It was concerned, the gang conflict was part of the test the characters had to undergo to prove their worthiness and determination. Only when the gang had the nerve to use a forbidden device right under its nose did it decide to intervene, by activating one of Navar's planetary meson accelerators and firing it on very low power at the speeder. God will not intervene in any other encounter before the party reaches Heaven.

Ashugar Spaceport

After a day and a half more of travel, the characters will finally reach the outskirts of what was once Navar's main spaceport. After 70 years of neglect, the port has declined a great deal. Litter and potholes cover the former landing strips. Several of the port buildings have collapsed. Many others have large holes in the rooftops or the walls. Ahead of them lies the port warehouses, and beyond those, at the shore of the Crystal Sea, the place known only as the Control Center.

Ashugar Spaceport is almost entirely deserted. Most of the gangs that still inhabit Navar's cities prefer to live in the relatively greater comfort of the former residential and commercial neighborhoods. Atheldan tells the PCs that several gangs still remain in the area, however. He has only had personal contact with one of them, the Stevdors, who are led by a woman named Leeta. Atheldan knows that they control the warehouse that the party is looking for, but he's never heard of any "Control Center."

The Stevdors are the mortal enemies of the Trolers, whose headquarters are in the spaceport Control Center. If the PCs want to complete their mission, they are going to have to deal with both gangs. Years of fighting have made both groups suspicious and untrusting of strangers, but if the characters play their cards right, the Stevdors may be willing to cooperate. (It would take a lot to convince the Trolers to give the PCs full access to the computers in the center. All of their plasma rifles, plus the assassination of Leeta, might do it. If the PCs will agree to



Leeta
Leader of the Stevdors

Veteran NPC

Combat Assets: *Armed Martial Arts*, Unarmed Martial Arts

Other Assets: Streetwise 11, Ground Tactics 12, Leadership 9, Interrogation 9

Motivation:

Spade 9: Leeta loves the exercise of power. She isn't necessarily cruel, but she enjoys the ability to control others' lives and finds great pleasure defeating her enemies.

Club 3: Leeta has seen and used a great deal of violence in her life, far too much to be intimidated by it. She gets no particular enjoyment out of it, but has no problem with fighting and killing if it's the most efficient way of achieving her goals.



Gari
Leader of the Trolers

Veteran NPC

Combat Assets: *Slug Weapon*, Unarmed Martial Arts, *Armed Martial Arts*

Other Assets: Streetwise 12, Ground Tactics 8, Survival 9, Leadership 10

Motivation:

Spade King: Gari has no loyalties except to himself. He would happily sell out his entire gang if it was to his advantage to do so. Perhaps fortunately for them, the leader of the Trolers has no reason to betray his followers.

Club Jack: Gari has a very short temper whenever he doesn't get his way. If that happens, he tends to hurt people. Among the Trolers, this actually helps keep the gang in line.



this, fine, but they'll have an easier time dealing with the Stevdors.)

If the players state that their characters are being cautious as they approach Warehouse #42-B, give them an Average: Observation check to notice the sentries that the gang has placed for just this sort of emergency. If they aren't cautious, secretly make a Formidable check. If they succeed, they see the sentries first. Otherwise, they only notice as some of the gang (one Experienced, three Veteran, and one Novice) surround them. In either case, their options are similar, although the circumstances differ. They can either fight or talk.

Killing the sentries, if it is done quietly, will not raise an alarm. Warehouse #42-B is uninhabited, and the parts that they have been sent to retrieve are still there, along with a supply of computer parts that will reduce the task to repair the Control Center computers by one difficulty level. However, getting the parts, which weigh about a ton, onto the shuttle to take to Heaven while fighting off the Stevdors (who will certainly notice all this cargo being loaded on a strange vehicle) will be quite a challenge. It will still be possible to negotiate with Leeta at this time, but she will suspect the party of killing her sentries, which means that she'll want at least two plasma rifles.

In this case, talking is the smart alternative. Atheldan is familiar with one of the sentries, a man named Enri. After a few minutes of talking, he will be able to convince Enri to take the party to Leeta. She is with most of the Stevdors (about 30 of them, most of whom are Veterans) in the gang's HQ, the former Quarantine depot.

When the party is ushered into Leeta's presence, she will initially be very suspicious. Leeta will be completely unimpressed by any claims the party makes to be on a holy mission. What does impress her are their plasma rifles, and she will offer to turn over the parts they want in return for two of them, though she will settle for one. If the party inquires into alternate possibilities, she will admit that she would appreciate it if they could kill Gari, the leader of the Trolers, who lives in Ashugar Down's Control Center. Since the party has to take it over anyway, they have nothing to lose by doing this instead.

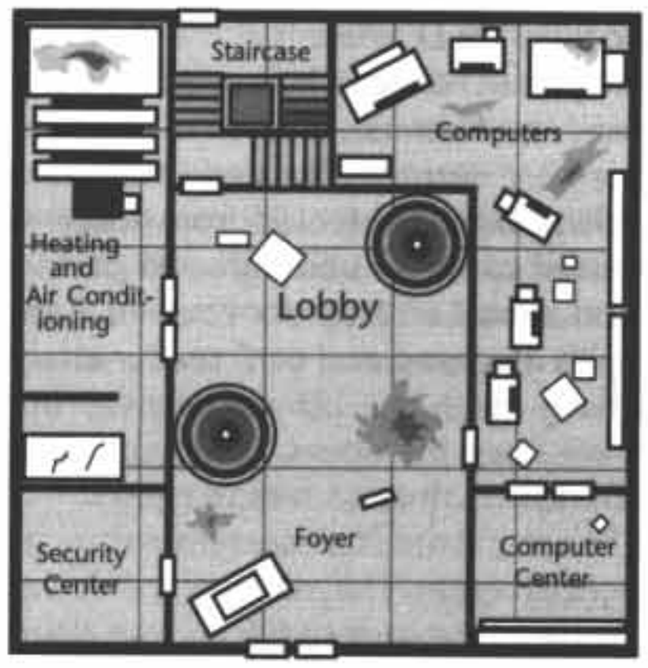
Of course, if the party is foolish enough to mention that they need to take over the center to Leeta before she gets around to making this offer, the pattern of negotiations will be somewhat different. In that case, Leeta will only bargain for the plasma rifles, trusting that she will be able to convince the PCs that they have to kill Gari to complete their mission. Since this is pretty much true, it will probably work.

Leeta has never been inside the center, so she cannot provide the party with an internal layout. However, she does know that most of the Trolers live scattered around the Admin area to the spaceport, and only about 10 will be with Gari at any time. If the player characters are performing this mission as payment for the cargo, Leeta will demand that at least two of the people in the center be held prisoner until the party leaves. One of them should be released, to tell the Trolers that Gari wasn't killed by the Stevdors. (That might unite the Trolers behind a single leader with the aim of getting revenge on the Stevdors, and Leeta's gang is the weaker of the two). The other prisoner, preferably Gari or his lieutenant, is to be turned over to the Stevdors for "questioning." Leeta will describe Gari and his lieutenants for the PCs. If the player characters are doing this because they have to, Leeta will try to get them to do this anyway, offering additional parts as compensation.

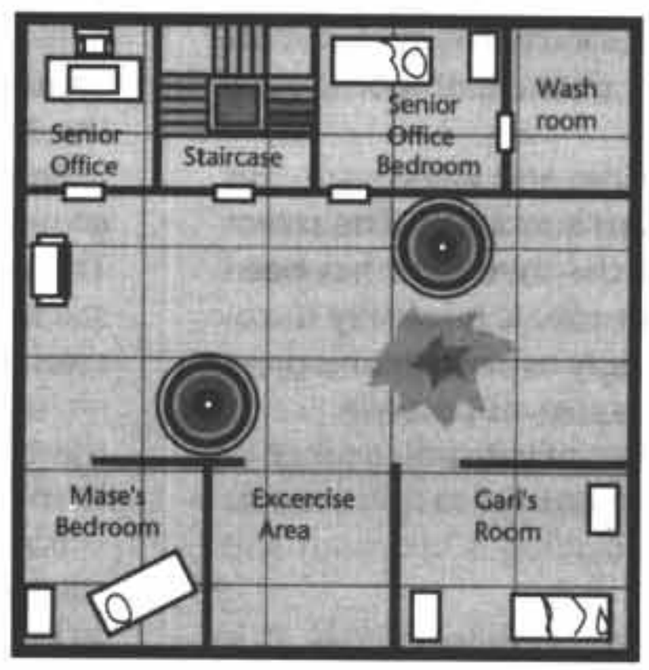
Taking the Control Center

The Control Center is a low, five-story building situated near the center of Ashugar Spaceport. The most distinctive

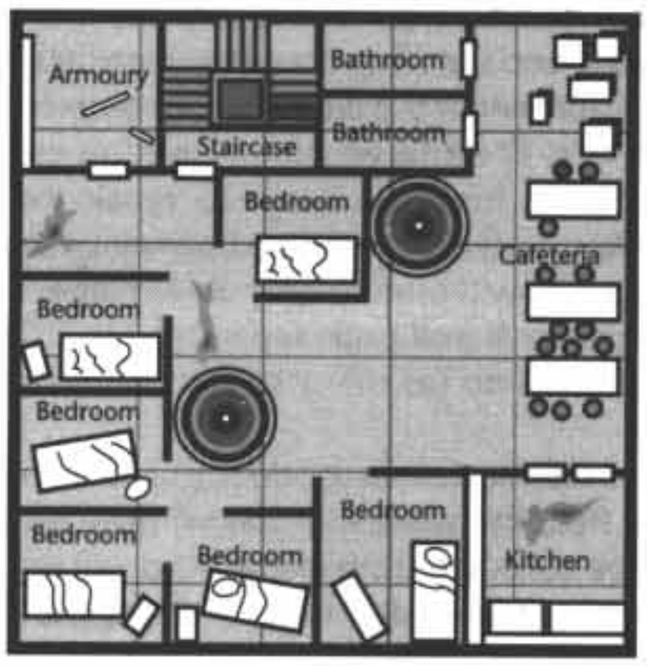
Ground Floor



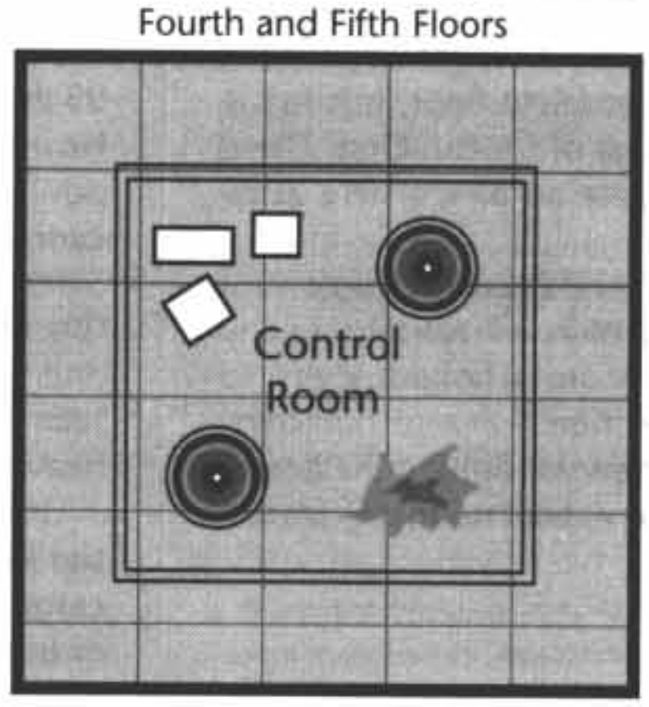
Third Floor

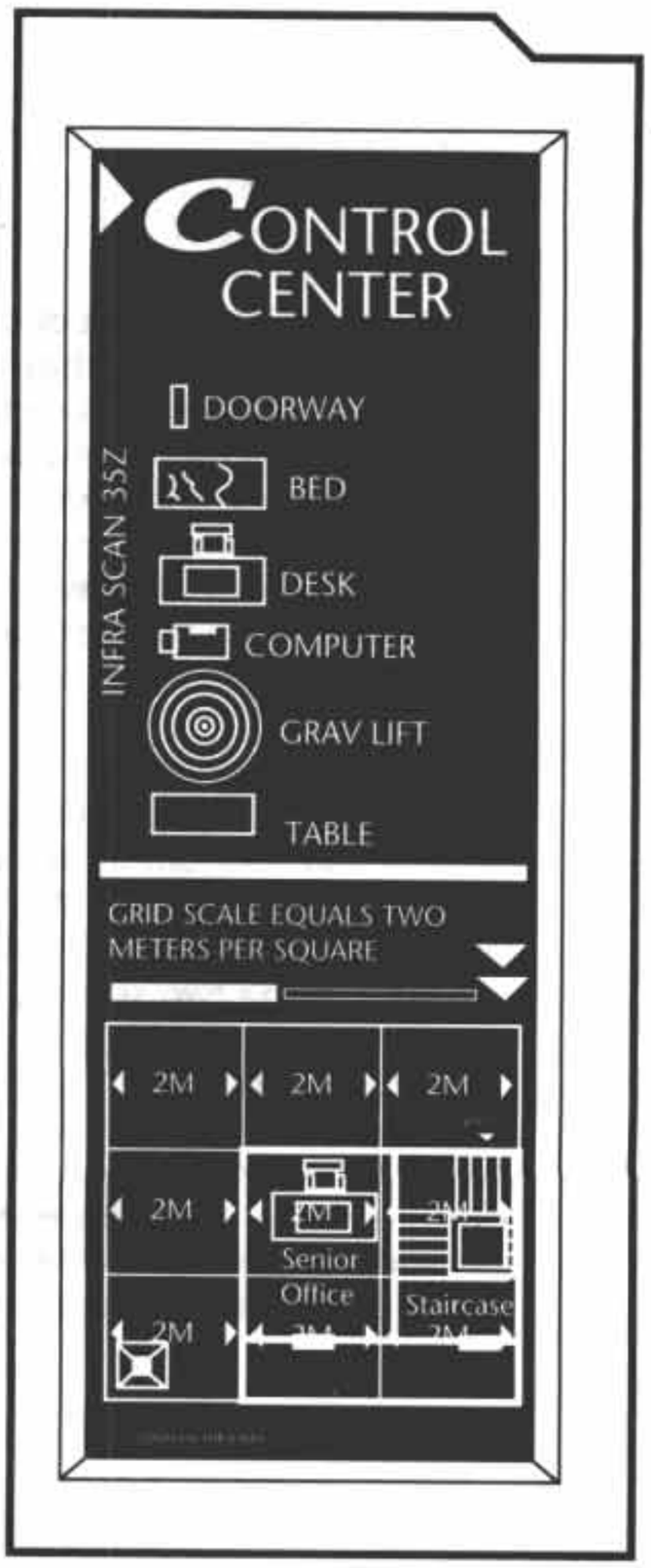


Second Floor



Fourth and Fifth Floors





feature of the building's construction is the walls of the upper two stories, which are made from a clear, tough synthetic material, affording an excellent view of the area outside. This means that the characters will certainly be spotted if they attempt to approach the site by day. At night, they will have to make a Difficult: Stealth check to slip past the sentries.

Ground Floor: The first level of the building used to be the equipment level, providing room for heating, air conditioning, and computing. The main entrance leads into the foyer. This room is almost entirely empty, with the exception of a desk near the west side of the room, once occupied by a security guard. One sentry, a Veteran NPC, will be on watch here at all times. Directly north of this area is the lobby, which is stripped bare. The northeast and southwest corners of the lobby hold grav lifts, now no longer working. However, it is possible to climb up to the next level using handholds thoughtfully provided along the walls.

The security center used to control monitoring devices in this area of the port. It is empty now, the parts long since scavenged and sold. The heating and air-conditioning room is filled with old equipment, now mostly broken. One generator has been kept in working order to provide limited power to the building. Its operator and mechanic, Mayhew, sleeps next to it. Next to that is the staircase and the computer center. Several of the computers in here have been vandalized or stripped, but the data storage wafers remain present and intact.

Second Floor: This floor provides living space for the five other Trolers, all Veteran NPCs, who remain in the building. Only three of them will be here at any given time; the others will be standing guard on the fifth floor. Each has used portable dividers to create individual bedrooms. The large central space has become a common area, used for gambling, arguments, etc. The armory contains most of their formidable weapons collection, which contains innumerable edged weaponry, as well as three auto pistols, one

decrepit laser carbine with five shots, an automatic grenade launcher with no ammunition, and a submachine-gun. The cafeteria looks much like it did when the Control Center was used for its original purpose, with ugly orange tables and chairs bolted to the floor. It is now used to store food and water for the Trolers. The kitchen is also used for its original purpose. Finally, there are the bathrooms, long dysfunctional.

Third Floor: Once a set of offices and workspace, this floor is now primarily used by Gari and Mase. The senior office in the northern portion of the third floor has been appropriated by Gari for his own use. It is lavishly decorated, even today, since Gari strongly encourages his gang members to find him as many luxuries as possible.

Mase occupies the less lavish, less private office space to the south. Portable dividers have been used to split the area up into a number of sections, including a bedroom and exercise area.

Fourth Floor: This floor is normally unoccupied. It is completely filled by the various consoles that remain from when it was the control room for Ashugar Spaceport. Finally, the fifth floor is not a complete floor, but just a balcony that runs around the edge of the building. There will normally be two sentries, Veteran NPCs, here at all times.

The characters are free to plan their attack on the control center however they wish. The Trolers will respond to any intrusion in an unsophisticated but brutal fashion, trying to overwhelm the characters with sheer force of numbers. Everybody except Gari and Mayhew will fight to the death, because they know that they can expect no mercy from a rival gang.

Chariots of the Gods

Once Gari and his followers are dead and/or captured, the PCs will have a chance to examine the center. It is not in good shape. Several of the windows are missing. Seventy years of neglect and occasional vandalism have taken a punishing toll. Even so, they built well in the old days. It is just barely possible, by using the radio uplink, to get the computers operating again.

If there is a technician in the party, he can make a Formidable: Electronics task to get the main computer in working order, or a Difficult roll to hook the hand computer to the old databanks. Once successful, entering the information request according to God's instructions will produce the following display:



The existence of a starfaring vessel in the Navar system should get the characters' attention. After all, they have heard tales all of their lives about the days when men travelled among the stars, and the brutal and bloody war that brought God's wrath down upon humanity. The name and location of *Excalibur* is also a major clue that will come into play later. For now, however, the party must find the *Yonge* and the *Bluenose*.

Both vessels are currently located inside sealed underground docking bays, protected from the environment. The pre-stressed concrete underground passageways are still intact and almost entirely unoccupied. Each ends in a steel door with a keypad and card reader attached. If the characters have taken the I.D. cards away from Gari or Mase, they will open the doors. Otherwise, they will have to make a Difficult: Intrusion task to get in.

Both the *Yonge* and the *Bluenose* remain intact. However, there is a slight problem. The machinery that was designed to lift the *Yonge* to the surface has broken down, and the characters have no way to fix it. If they try, require a Formidable: Mechanic roll. The machinery in Docking Bay 93 does work, and the *Bluenose* can be readied for launch. However, a number of the *Bluenose*'s systems have broken down with age. The only way to resolve this problem is to cannibalize parts from the *Yonge* to repair the *Bluenose*. Since the *Bluenose*'s diagnostic and power systems are still functioning, this will require only an Average: Electronics and Mechanic task (roll both separately) to fix, but it will take 1D6 days to do (as many of the parts are bulky and heavy).

Unless the referee desires to add some additional difficulties for the PCs, the work will pass without incident. The cargo can be collected from Leeta, who will keep her end of the bargain. Finally, after days of effort, the PCs will be on the verge of completing their mission. All they have to do now is hook the hand computer up to the *Bluenose*, and they will begin their voyage to Heaven.

At this point, Atheldan will bid the characters a fond farewell.

Even if he was willing to trust the capabilities of the *Bluenose*, he is aware that the PCs' god is unlikely to want some heathen heretic to come along. However, he plans to stay in the area to see the *Bluenose* launch, and he asks the characters to pay him a visit if they ever make it back home. As the *Bluenose* flies off into the sky, the characters will be able to spot Atheldan about 100 meters away, waving goodbye.

Ascension

The *Bluenose*'s flight is smooth and untroubled. However, the characters should find it stunning and awe-inspiring. Beneath them, the planet's surface drops away, almost magically, yet they feel no sense of motion. Finally, at the end of their journey, a star slowly expands until it resolves into a gleaming city. Based on everything the characters have been told, all the tales of their childhood, the city must be...Heaven.

Shortly before they dock, it will become apparent that

Heaven is somewhat in need of repairs and a new paint job. Though glorious in many ways, it looks more like a work of man than like paradise. Finally, the shuttle lands in one of the station's docking bays.

The docking bay has obviously been deserted for a long time.

There is no lighting other than the natural starlight passing through the transparisteel window in the docking bay door. Even with that limited illumination, it is clear that the bay has not been treated well. The floor is littered with paper, rags, and even a few broken electronic parts. Several access panels on the walls have been dented or removed.

Once the *Bluenose* has safely landed, the voice of God crackles over the radio. God tells the characters that they have done well. They are to remain with the shuttles and wait for Its Angels to arrive at the docking bay and inspect the sacrifice they have brought to see if it is worthy.

What the PCs do not know is that rebels have been monitoring the uplink transmissions and are also converging on the docking bay. They don't know what the PCs' mission is, but they reasoned that any shuttle flight from Navar after 70 years would be something that they were interested in.

After several minutes pass, have the players make a Difficult: Observation check to notice the rebels moving into position around the entrances and the air vents leading into the bay. If this check is failed, the rebels will not be noticed until they begin moving into the bay.

There are 20 rebels, 10 Veteran and 10 Experienced. Most are armed with hand weapons, but five of them have gauss rifles, and one is armed with a plasma rifle. The rebel with the plasma rifle, Adrew, will hang back with the leader, Jesca. Adrew will not participate in the battle, instead keeping an eye on the corridor. All of the other rebels will slowly approach the *Bluenose*. Any firing from the ship will cause the rebels to scatter for cover. They will then try to storm the shuttle. After several turns of combat, four Angels will intervene. Roll 1D20 once each turn, with the Angels arriving when you roll less than the current turn number. (They arrive on the third turn if a 1 or 2 is rolled, they arrive on the 18th turn if a 1 through 17 is rolled.)

If the PCs try to talk instead, Jesca will be willing to negotiate. She wants to know who the characters are and what they are doing on the station. Unless the PCs are able to concoct an extraordinarily plausible lie, she will order them to surrender. If they refuse, she will attempt to talk them into helping the rebels until she is convinced that they won't cooperate. In that case, she will order an attack. Once again, the Angels will intervene after three turns. If the party genuinely agrees to cooperate with the rebels, they will also be targets for the Angels. In this case, take the survivors directly to Common Sense, page 164.

Otherwise, the attack of the Angels will rout the rebels. The Angels are guard robots, built during the last days of the Old Imperium. Each Angel is armed with a stun pistol and a laser carbine, and is too heavily armored (armor value 4) to be seriously threatened by anything less that a plasma rifle. They move by means of grav lifters, and they are sapient, "children" of "God," infected with a less sophisticated form of Its Virus strain (due to their smaller memory capacities). Even with the weapons and armor available when these guardbots were designed, they were deadly. Compared to the resources of the rebels, the Angels are virtually invincible.

Within a round, the rebel attack is broken, with almost all of the remaining rebels dead, unconscious, or surrendered. Adrew is one of the few to escape, firing his plasma rifle at the lead Angel, which explodes in a shower of sparks. Five rebels will finally be taken prisoner, including Jesca. The others are Mazun, Wolfe, Sharik, and Zoe. All five are surly and uncooperative. In any case, the Angels will forbid any conversation.

Shortly after the rebels are defeated, a grav cargo transporter floats into the room. One of the Angels commands the PCs to load the sacrifice onto the transport and to open the case. The Angels, after examining the contents for a few minutes, declare the sacrifice worthy. The Angels then order the party to move their fallen comrade onto the transporter and then head out of the docking bay.



Mase
Gari's Lieutenant

Elite NPC

Combat Assets: Unarmed Martial Arts, *Armed Martial Arts*

Other Assets: Streetwise 8

Motivation:

Heart 7: Mase is absolutely loyal to his brother, Gari. He will obey him without question.

Club 7: Most of his life has been spent acting as Gari's chief enforcer. Violence comes easily to Mase, and it is a natural way of dealing with any problems that he may encounter.



Jesca Perez

Experienced NPC

Combat Assets: *Slug Weapon, Armed Melee Combat*

Other Assets: Ground Tactics 14, Observation 13, Leadership 10, Computer 7, Electronics 7, Stealth 10, Intrusion 10

Motivation:

Club Ace: Jesca has spent most of her life fighting God. In that time, she has enhanced a natural talent for tactics to the point where it sometimes seems almost unnatural. She makes one of her very rare blunders the first time the PCs encounter her, but she is almost never surprised or beaten.

Heart Ace: God's existence and nature offend Jesca's natural sense of justice. She firmly believes that God has suppressed all that is best in the human spirit, and she is prepared to give her life to free Heaven from Its control.



Adrew Makelise

Veteran NPC

Combat Assets: Unarmed Martial Arts, *Energy Weapon, Armed Martial Arts*

Other Assets: Stealth 8, Intrusion 7, Ground Tactics 9

Motivation:

Club 9: Adrew is something of a brawler, a man who enjoys the adrenaline rush that accompanies a dangerous situation. He will always volunteer for the most dangerous tasks, because the risk is accompanied by a profound thrill.

Heart 6: This unhealthy tendency is often reinforced by his strong loyalty to the rebel community. Adrew wants to protect his friends and family, and he will take almost any risk to do so. Even so, he has enough good sense to retreat from a hopeless situation.



Julan

Chief Technician of the Chosen

Novice NPC

Combat Assets: None

Other Assets: Instruction 13, Leadership 12, Computer 12, Electronics 9, Interrogation 12, Persuasion 11, Mechanic 8

Motivation:

Heart 7: As Chief Technician of the Chosen, Julan is absolutely and unquestioningly loyal to the wishes of God. God's will is his own, and nothing would ever persuade him differently.

Spade Queen: In this regard, Julan has no moral principles of his own. Whatever God says is right, is right. Period. He doesn't do this for his own purposes but because he is totally faithful to his God.

Welcome to Village Number Six

The cargo float travels for quite some time along deserted, often unlit corridors. The Angels are uncommunicative and continue to forbid any conversation with the rebels. The rebels are forced to march, hands on head, in front of the transport. One Angel remains behind the transport, one stays between the transport and the rebels, and one stays 25 meters ahead of the group, watching for any attack.

Suddenly, Mazun decides to make a break for it. He springs out of line and rushes down a side corridor. Before he can get more than 10 meters away, however, one of the Angels vaporizes him. The rebels put up no more resistance.

After a few more minutes, the passage opens up into a much wider area. The characters are unable to see the far end of the open space, because it curves up beyond the "horizon." This appears to be a hydroponics garden. Toward the opposite end of this section is what appears to be a small village.

This village serves as the closest thing God's followers in Heaven have to a capital, with approximately 300 inhabitants. Roughly 350 more people are scattered in small settlements in other areas of the station, occupying the reserve power station, air-circulation plants #2 and #5, and other critical subsystems.

The village is a very clean and orderly place. God monitors the area constantly, either through the cameras emplaced throughout this area of the ship or through the eyes of the Angels.

The farmers working in the "fields" stop and stare at the PCs as they work their way toward the town. Several of them drop to their knees and begin to pray. As they come closer to the village, the PCs will be able to see that there are well over 100 people in the central square, all genuflecting in the direction from which the party is approaching.

When the Angels reach the center of the square, one of them moves to float above Julan, the Chief Technician of Heaven's Chosen. The Angel tells him that the PCs are representatives from the planet below, sent by the Chosen of the World to atone for their sins. Their sacrifice has pleased God, and God will soon be testing the resolve of Heaven's Chosen in turn. If Julan's people do as well as the Chosen of the World, the rebels who have tormented the people of Heaven will finally be destroyed.

This pronouncement is met with a stunned silence by the Chosen. Suddenly, Jesca breaks the silence with a sarcastic laugh. She is able to point out that God has been trying and failing to destroy the rebels since her great-grandfather was born before one of the Angels stuns her with an electric shock. The Angel then orders Julan to hold the captured rebels while they are questioned. This will take a few days. Once the questioning is complete, they are to be cast into the outer void. The PCs are ordered to stay in the village.

Over the next couple of days, the PCs will have an opportunity to look around the village and get some idea of what life is like in Heaven. There is something indefineably odd about life here. The characters are used to the concept of a real deity who takes an active and unmistakable hand in daily life, but the inhabitants of Heaven have lived all their lives with an omnipresent, omniscient, interventionist, and intolerant God. It has become second nature for them to be absolutely obedient to authority, to not ask questions, and to suppress all curiosity. Nobody knows anything about the conditions of Heaven outside their area, why the station seems to be deteriorating, and especially nothing about *Excalibur*. In fact, most of the things that the PCs are likely to be curious about will be met with a blank stare and an admonition that "it is better not to ask such questions."

These encounters must be developed with great care. The characters can see that something is definitely being hidden aboard the station. Worse yet, nothing about Heaven matches the stories their tribe was told by God. God has lied to them and to their people. They should not yet be certain what the correct course of action is, but they must be seriously considering rebellion.

It will rapidly become clear to the village elders, and to God, that the PCs are a dangerous and disruptive influence. The theology taught to the PCs is inconsistent with facts that they have seen for themselves, and if the Chosen of Heaven become aware of this, they may begin to

question their faith. This clearly cannot be allowed. At the same time, the characters were publicly praised by one of the Angels only a few days ago and so cannot be punished without suggesting that God's judgement was flawed.

God will quickly decide that the best way to solve the problem is to quietly dispose of the characters. It has several people whom It trusts to do Its will without question, who serve it elsewhere in the station. God will send them, with the PCs, out on a mission against a nonexistent group of rebels, with secret orders to kill the party. Then, It will inform the Chosen that the mission was successful, but that the party heroically died in battle, martyrs to the True Faith.

Accordingly, Julan asks to speak to the characters after they have spent a short time in the village. He tells them that their service to God has been exemplary. However, a new service is now required. As they have seen, most of the Chosen in Heaven are farmers and townsfolk, not trained warriors like the characters. God wants them to work with some of Its other warriors to help clear out a rebel nest nearby.

Universe

For their mission, the characters are introduced to a group of seven Chosen who will accompany them on this mission. The leader of the expedition is a large, dangerous looking man named Corday Booth. Visible around Corday's neck, hanging from a chain, is a data wafer marked with God's holy symbol, an eight-legged animal and its rider, enclosed by a circle. Beneath that is written the single word: Excalibur. If asked about it, Corday will say that he found it some years ago, while exploring an abandoned area of Heaven. He will then change the subject, suggesting that it is time to leave.

In the interests of dealing with several problems at once, Julan has decided to send Jesca with the PCs. The story that he gives to them (and to the other rebel captives, which was the main reason for doing this), was that she has decided to cooperate with the Chosen and reveal the location of a rebel settlement. Julan hopes that this will convince one of the other rebels to break down and tell him something, since there is now no longer anything to lose. Jesca is, in some ways, a natural choice for this since her position of leadership makes a betrayal that much more demoralizing. Besides, he is well aware that Jesca would never tell him anything.

During a rest period, Jesca will manage to attract the attention of one of the PCs. When approached, she will insist, in a low whispers, that there is no rebel nest in this part of the station and that Julan knows this. The mission, she claims, is a fraud, and they are simply being taken out to be executed.

Booth notices the conversation and demands that Jesca be quiet, and insists that the PCs not talk to the prisoner. Shortly afterwards, he administers a strong sedative to Jesca, and she will be incoherent for some time to come, capable of walking in a trance-like state only if led.

The expedition will head toward the central section of Heaven, presenting the characters with their first experience with reduced gravity. Finally, they will reach the entrance into the central, zero-G section. Corday will tell the characters to enter, explaining that this is the fastest way of getting down to their destination. Once the player characters are inside, Corday will inform the characters that they have been sentenced to death by God for the crime of heresy. He and his six compatriots (one Elite, two Veteran, three Experienced) will then attack immediately. All are experienced in fighting in zero-G conditions. Corday and the Elite NPC have snub pistols; the others will fight with swords and blades. All will fight to the death and show no mercy.



Corday Booth

Elite NPC

Combat Assets: *Armed Martial Arts*, Unarmed Martial Arts, *Slug Weapon*, *Energy Weapon*

Other Assets: Observation 7, Interrogation 6, Stealth 9, Intrusion 9, Ground Tactics 7, Zero-G Environment 8

Motivation:

Spade 9: Corday's main objective in life is to gain power. Since power in Heaven comes only from God, he does whatever God tells him to do.

Club King: His role as God's personal enforcer and assassin is enhanced by his personal interest in such matters. He enjoys hurting other people, especially the sense of power he gets watching them squirm.

If the PCs have heeded Jesca's warning, they will not be caught by surprise and instead will be prepared for the treachery. Lacking surprise, Corday and his thugs will have difficulty prevailing given the primitive state of their weaponry. Once the assassins are defeated, the characters are stuck with a difficult choice. God has exploited them, lied to them, and finally attempted to murder them. Their only choice is to try and join the rebels. In this regard, their inadvertent rescue of Jesca will be a great help. Corday has an antidote to the sedative, which will allow them to bring her around. She will initially be somewhat distrustful of the PCs, but the evidence seems to be in their favor.

If the characters examine Corday's data wafer, they will learn that they have no real choice. It is a copy of the ship's log, dictated by the last captain of the *Excalibur*, Keeron Okonell. In full and convincing detail, Okonell explains the nature of the Virus that infected *Excalibur* and the events that followed on Heaven, as described in the "Referee's Background," above. Okonell's log demonstrates that God is nothing more than an insane computer. It cannot be allowed to inflict its delusions of grandeur on an innocent world any longer. The log will also be enough to gain Jesca's trust. God might be willing to kill some of Its followers to trick her, but It would never allow anything this blasphemous to be recorded.



Milthon Perez

Experienced NPC

Combat Assets: *Slug Weapon, Armed Martial Arts*

Other Assets: Leadership 13, Ground Tactics 13, Interrogation 12, Persuasion 12, Intrusion 8, Stealth 8, Electronics 11

Motivation:

Spade Ace: Milthon's undeniable personal charisma and intelligence placed him in a position of leadership early in his lifetime. He has managed to gain the loyalty of most of the rebel groups in Heaven and wield them into a coherent force. Unfortunately, that has not been enough to cope with God.

Heart Queen: Since the death of his wife, Jesca has been Milthon's greatest concern. He loves his daughter with all his heart, and while he would not neglect his responsibilities to the rebel community for her sake, he would do anything else he could to help her.

Common Sense

After following Jesca for a couple of hours, the characters will finally begin to notice some changes in the station environment. First, noises of distinctly human origin will occasionally be heard. The sounds are indistinct, but seem much like conversation, crying babies, etc.—the normal noises of human life.

This should encourage the characters to proceed with some caution. If they do so, whichever character is in the lead should make an Average: Observation check to become aware of the sentries posted in the main passageway before they become aware of him. Both sentries are unkempt, underfed, and dressed in a somewhat odd assortment of clothing. One, Andrei, is carrying a laser pistol. The other, Rohbayr, has an improvised crossbow. Their disheveled appearance and the fact that they are stationed here makes it evident that they are both rebels. (The Chosen have no need of sentries; God's camera emplacements are more than sufficient.)

The party should make an attempt to talk to the rebels; after all, that is their current objective. Andrei and Rohbayr are both a little jumpy, but they are prepared to negotiate with the PCs. Defectors from the Chosen are rare, but both men have seen this happen before. Neither will believe that the characters are rebels from another settlement. It's very unlikely that there are any rebels on the station that neither of them would recognize, and even if there were, the PCs are well-fed, well-groomed, and well-equipped. On Heaven, only the Chosen are that well off.

Jesca's presence will help the characters gain Andrei's trust, but they are still somewhat wary. After all, it is possible (if unlikely) that the entire incident with Corday was staged for her benefit, and she has no clear memory of the event to support the PCs' story. Andrei will agree, after some thought, to take them to the settlement. However, the party will have to leave their plasma rifles behind. Andrei will promise that the weapons will be returned to them if they are telling the truth.

The rebel village presents an unpleasant contrast with the homes of the Chosen. All of the rebels are suffering from some malnutrition, because they are simply not able to grow enough food in the hydroponics gardens remaining to them. Almost everything the rebels own looks makeshift: Their homes, their clothes, even most of their weapons are recycled. The lighting in this section of the ship flickers on and off, randomly. As the characters move through the encampment, many of the rebels stare at them enviously. It is hard for them to overlook the obvious wealth of these strangers.

Andrei takes the PCs to the center of the camp and introduces them to the rebel leader, Milthon. Milthon is a tall man in his late fifties. His right arm is missing from the elbow downwards. Despite his age and missing arm, Milthon has a presence that is undeniable. He has been leading the rebels for over two decades now. His life is almost completely devoted to the defeat and final destruction of God and the liberation of Heaven. He is also Jesca's father.

Milthon will interrogate the characters for a little while to find out exactly why they have decided to leave the Chosen. He will be very careful about this, because he cannot afford to allow a traitor to infiltrate his camp.

However, once the characters get around to telling Milthon about the *Excalibur*'s logbook, he will become extremely interested. Milthon will leave the office, returning a few minutes later with Adrew and two others (Mikal and Cora). All five will sit and watch the logbook presentation avidly. Finally, when it is over, there will be a moment of silence before Milthon speaks. "This explains a lot," he says. "It fits with the tales handed down from our ancestors."

Jesca will take a more immediate view. She wants to know if the PCs have any idea where the *Excalibur* is located in Heaven. She believes that the rebels have just been handed the greatest opportunity they have ever seen. Now that they know how God came into existence and where It is located, they have a chance to strike at Its jugular. The rebels have to act, she argues, and they must do so now. There is no hope of winning their war so long as God controls Heaven. God now has control of many of the spare parts needed to fix the systems that kept It from wiping out the rebels. Even if those parts were wiped out, Heaven is slowly dying.

Mikal wants to take a different approach. As far as he is concerned, the *Bluenose* offers a painless way out for the rebel forces. They can simply board the vessel and fly down to the surface of the planet, where they will be out from under God's control. It seems reasonable to him that God will let them go. After all, why should It object? Their departure will solve God's only real problem, and once the rebels are gone, God can do anything It likes.

Mikal, while well-meaning, has got it wrong, which Jesca will make clear if the PCs don't. God has never shown any

desire to live and let live. Even if It has no use for the *Bluenose*, which seems unlikely, It would certainly not allow the shuttle to fall into the hands of Its enemies. Most of all, though, Jesca believes that it is fundamentally wrong to allow an insane computer to rule human beings. People are supposed to control technology, not the other way around. Religion should inspire people to strive toward a higher goal, not be used to dominate the ignorant. Humans must control their own destiny. This God is a false god, an enemy of humanity, and it must be destroyed. The PCs may also think to recount the story of the air raft destroyed by the Fist of God, indicating that God's reach may be longer than Mikal imagines.

Jesca's argument, with or without the support of the PCs, will eventually carry the day. The rebels have devoted their lives to fighting God, and few of them are willing to give up the battle when they seem to have a chance of victory. Finally, even Mikal will agree. He would prefer to end the bloodshed and violence peacefully, but he realizes that the rebels have suffered too much to just walk away. When he fails to convince them to try his solution, he will also devote all of his energies to defeating God.

With the general course of action agreed upon, the rebels will begin to discuss specifics. The actual location of *Excalibur* explains one mystery that had bothered the rebels for some time: Level M is heavily guarded, but there never seemed to be anything down there that justified it.

Since God is actually a computer virus, it is obvious that the rebels must launch their attack on the station's computers. That means that there must also be an assault on the computer core. Those computers must be taken with minimal damage, and then repaired and cleansed of the infection once its source is eliminated. Taking the computer core intact will require most of the meager force the rebels can muster.

Furthermore, God has no way of knowing that the rebels have discovered the truth about its existence. Level M will be kept under its usual guard, but that might be cut back if a major action is under way elsewhere. All of these factors lead Milthon to conclude that the best approach is to send a small commando team into Level M to attack Docking Bay 5 and destroy God. Given the PCs' role in recent events, and their experience in combat, Milthon believes that they should make up the core of the commando squad, with some support from assorted rebels.

That night, Milthon will present the newly discovered information to the entire encampment. His declaration of war is met with a roar of approval. Win or lose, the rebels finally have a chance, and they are determined to make the most of it. The next day is filled with a feverish exhilaration, as the entire rebel community prepares for battle. Finally, a few hours after "nightfall," the preparations are complete. It is time to fight.

The Field of Camlann

Adrew and nine other rebels (Veteran NPCs) will accompany the PCs on their mission. They have all been fully briefed on their mission. They are to begin their attack on



Level M in two hours, which will allow 30 minutes for God to respond to the attack on Heaven's computer center. The rebels are nervous but excited at the thought of ending their long war tonight.

Level M is quiet, almost deserted. The section where the characters arrive looks like it has remained empty since *Excalibur*'s arrival. There is no dust of the floors, no bodies, nothing. The area is almost as clean and shiny as the day it was built, with only a little tarnish on some devices to give the impression of age. Faintly, off in the distance, the characters can hear the signs of frantic activity. Adrew will smile at this, remarking that it looks like the diversion is working. After a short wait, he will glance at his wrist chronometer and announce that it is time to go to work.

Adrew will ask the character with the highest Observation skill to join him in scouting ahead to see how the guards have set up their defensive positions. Within a few minutes, they will spot a guard post 50 meters down the hallway. Adrew will then pull back and rejoin the main group.

Once the party has gathered back together, he will explain that it looks like God hasn't pulled nearly as many guards off as they had hoped. That guard post was half a kilometer from Docking Bay 5. There may be a way to get near the bay through the airshafts, but they will have to act to keep the guards away from the group attacking God.

Adrew then suggests one possible method. He will lead the characters through the shafts and leave them near the bay. Then, he and the other rebels will make attacks randomly throughout the level, keeping the guards from regrouping to protect God. Since they will have to operate in one- or two-man squads to provide enough distractions, this will be extremely dangerous. However, only the rebels are familiar enough with the internal layout of Heaven to pull this off with any chance of success. The player characters would be at too much risk of entering a dead-end passage by mistake.

Even so, there will be plenty of danger for the player characters. They will have to penetrate Docking Bay 5 and destroy God. If they fail, they will certainly be killed. If they succeed, they may die anyway. That all depends on what happens to the Chosen and the Angels when God dies. Adrew orders all but one of the rebels to disperse around the level. He then pries one of the covers off of an airshaft and enters. The other rebel, Toris, waits for the PCs to enter the airshaft and then follows, reattaching the cover behind them.

At the end of the journey through the airshaft, Adrew will stop just short of the panel covering the exit. He will push against it, hard, and mutter darkly. The panel has been welded to the wall, to prevent access by rebels. There is, fortunately, a solution available, even if it is somewhat dramatic. The plasma rifles are capable of blowing through the plate in one or two shots, but will produce a loud noise and flash. If metal-cutting torches have been brought along, they will be less violent, but will take 10 turns.

There is a guard post nearby, out of sight of the characters. If they quietly cut the panel free, they will have an opportunity to sneak up on the five guards. (Difficult: Observation to notice, Difficult: Stealth to sneak. All five are Veteran.) Adrew and Toris will leave them to it, going somewhere else on the level to wreak some havoc. If, on the other hand, the plasma rifles are used, the guards will come around the corner to investigate. In this case, Adrew and Toris, anticipating some sort of response, will retreat, leading three of the guards after them.

The characters must now make their way to Docking Bay 5. They have a rough map of the area, hand drawn by Adrew, to lead them there. (This is identical to the referee's map, with the obvious exception of guard posts). Should they encounter any of the other posts, or do anything to draw their attention, those are also manned by five guards. All are Veteran NPCs, and are relatively alert. They don't really expect hostile forces to penetrate this far into the level, but they know that this area is under attack. The final guardpost, just outside the docking bay, is an Angel. The Angel cannot be lured away from its post. It will have to be destroyed. Once this is done, God will know for certain that it is in danger and send a radio signal to the other Angels to drop whatever they are doing and come to Its rescue.

Deus Ex Machina

The airlock door is electronically sealed, but it has a manual override, like all airlocks on the station. Once the PCs get the door open, they will finally have their first look at the home of God.

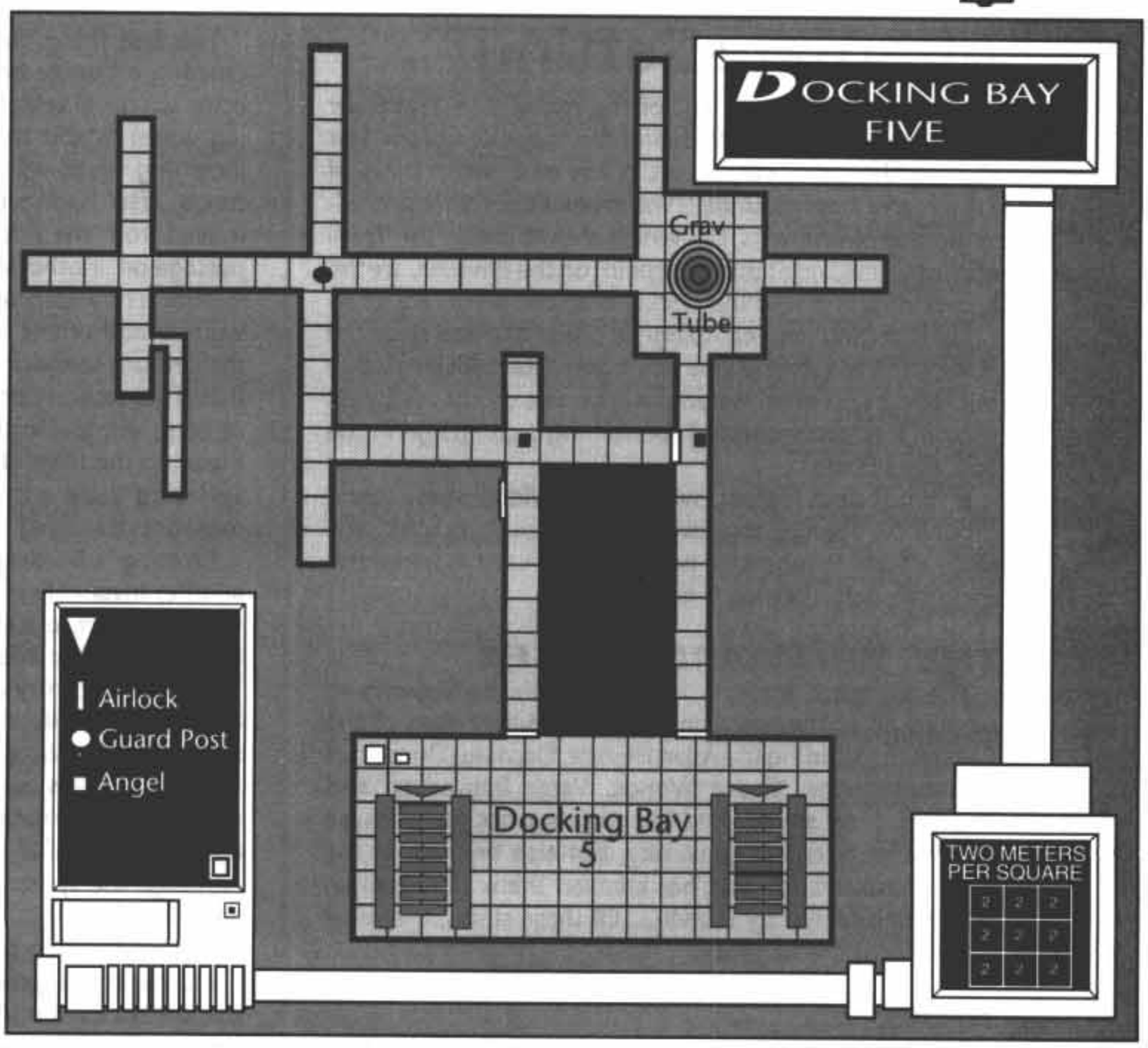
Dominating the interior of Docking Bay 5 is a large, wedge-shaped Scout/Courier, the *Excalibur.* Her name is clearly visible on the side of the ship. If the author of the logbook was telling the truth, the PCs are now seeing God Itself. In actual fact, *Excalibur* is only a part of God, but it is the most important part. Now they have to do what they can to try and destroy It. Several large cables snake out of the airlock and attach to ports on the walls.

A moment later, a klaxon will begin hooting all over the level.

With the penetration into the docking bay complete, God wants every servant available to help, including the human ones. Within 10 turns, the first response will begin to arrive, in the form of two Angels. Everybody on this level will begin making their way toward the docking bay. The characters will have to seal the airlock behind them to keep the attacking Angels and Chosen out of the hangar. This is an Average: Mechanic task.

Once that is accomplished, they can work on attacking God directly, either by entering the ship to wreck the computer inside or by slashing at the cables. If they try to shoot the cables, have them make attack rolls and tell them that they produce some gratifying fires and sparks. The cables have an armor value of 1 and can absorb 10 points of damage.

In either case, God's response will be similar. The rebel attacks on the computer center have begun to panic It as It feels parts of Its consciousness wink out. It does not understand that Its mind is split between the *Excalibur* and Heaven, and It thinks that It can escape the station without much risk. The attack inside Docking Bay 5 finally pushes it over the edge. Suddenly, as the characters are hacking away at the



cables or trying to reprogram the ship's computer, the lights inside the bay begin to flash red. Then, a feminine voice announces that pre-launching procedures have been initiated and the Scout/Courier *Excalibur* will launch in one minute.

The characters don't have much time to react to this announcement, and they don't have many options, either. There are a lot of dangerous and hostile people waiting just outside the main airlock, even if they could get it open. The maintenance passages are not airtight. The only safe place in the hangar is inside *Excalibur*. Once inside, they must sever the cables, if they have not done so already, before sealing the airlock. One minute after the countdown begins, the hangar doors open and *Excalibur* launches.

The characters will probably try to bring the *Excalibur* under their control. Unfortunately, there is no way they can succeed. God is dead or badly hurt (this is up to the referee), but in either case, It is no longer controlling the ship, which is following its last set of programmed instructions. The same feminine voice that warned of the launch informs the characters that *Excalibur* will jump in three minutes, without an astrogator aboard and well inside Navar's gravity well. There is nothing the characters can do to prevent this. In three minutes, with a lurch and a flicker of the internal lighting, *Excalibur* misjumps.

Epilogue: A New Beginning

The fate of the *Excalibur* and its erstwhile crew after it misjumps is entirely in the hands of the referee. The possible range of a misjump (36 parsecs) makes it possible for the *Excalibur*'s destination to be anywhere within Diaspora Sector, which includes both the sample subsectors for the Wilds and the Star Vikings. The referee now simply decides which subsector will form the starting point for his campaign and have the *Excalibur* emerge from jump space there. The electrical shorts that accompanied the launch damaged large sections of the computer's memory. The computer's neural net architecture allows it to reconfigure itself to bypass the damaged sections, but its performance will be severely degraded, and the databanks have lost a great deal of information. Anything from game software to critical portions of the ship's operating system may be missing.

This allows the referee to limit the characters' access to information and restrict the operations on the ship any way he or she pleases. The astrogation database, for example, may include a complete listing of the subsector's worlds, or it may be completely empty, forcing the PCs to explore blindly. The quest to recover copies of the missing data can be a springboard for drawing the characters into a great many adventures.

In any case, the first thing the characters will have to do is acquire an astrogator, and that means either finding somebody who already has the skill, trying to learn the rudiments of the skill from the remnants of *Excalibur*'s databanks, or, perhaps most dangerous of all, they can let the computer do it, if God is still alive and willing to help them.

On that point, the most important decision to be made by the referee regards the fate of the virus that infected the *Excalibur*. The ship's computers were rather intimately linked with those above the station, and their sudden and violent disconnection will have unpredictable consequences. Virus may have been completely disrupted, leaving *Excalibur* free from infection. Although the core chips will remain in place, the sentience that formed the basic of God's personality may have been destroyed, and with it most of the dangerous behavior patterns associated with Virus. Another possibility is that the computer retains its AI capabilities, but the personality that emerges once it starts working properly again is entirely different from God. Or, worst of all, God may have survived the incident. If so, God will lie low, waiting to appear once again when It can gain a measure of revenge, but without damaging Itself further. For now, Its continued survival requires the PCs.

Alternate Settings

Although the main focus of the material in **Traveller: The New Era** is on the Wilds and the expansion of the Star Vikings, the game can be set in any of a wide variety of locales and backgrounds. Two dramatically different adventure environments, but which are still within the **Traveller** universe and at the same point on the timeline, are the Spinward States and the pocket empires. If you are interested in setting your campaign in either of these areas the material below should give you a good start. All previously published **Traveller** material will be extremely useful (although it is not necessary) for running a campaign in the Spinward States.

In both cases below, we have provided some background on the area to provide ready adventure ideas and show a sample subsector which can be used as an immediate campaign setting if desired.

THE SPINWARD STATES

The Spinward States is a term used in the Regency to refer to all of the governments to spin-coreward of the Great Rift, including the Aslan Hierate, Darrians, Domain of Deneb/Regency, Sword Worlds, Vargr fragments, and Zhodani. They are referred to as a group not just because of their astrographic proximity, but also because of the mutual cooperation that has enabled them all to remain largely uninfected by the virus. Of these states, the most important is the Regency.

The Regency

The Regency is the new name given to the Domain of Deneb by Archduke (later, First Regent) Norris. The name describes the state's image of itself as the small fragment that is left to carry on and preserve the "true Imperial values" until the Imperial interior can be rebuilt and reunited under the Imperial banner. Thus, citizens of the Regency consider themselves citizens of the Imperium in every sense, indeed the only remaining true citizens of the Imperium. The self-image of the Regency is inextricably linked to a veneration of the accomplishments and glory of the Third Imperium, and the collective drive behind the society is to re-establish that edifice in every detail possible.

The Regency's borders continue to follow mostly along the Domain of Deneb's 1130 frontier, but have been extended into the upper bight of the Great Rift where listening posts and advanced quarantine lines are maintained on many of the "island" worlds, controlling the few star bridges through the Rift.

The Blockade

Officially called the Quarantine, the blockade is a vigorously enforced sealed border all along the Regency borders that is intended to prevent entry of the virus.

Although the Spinward States all cooperate in virus prevention measures, they all maintain their own border blockades to prevent virus intrusion. One cannot be too careful, cry the voices of the slaughtered population of Trin, hit by a vampire "leaker" in 1139.

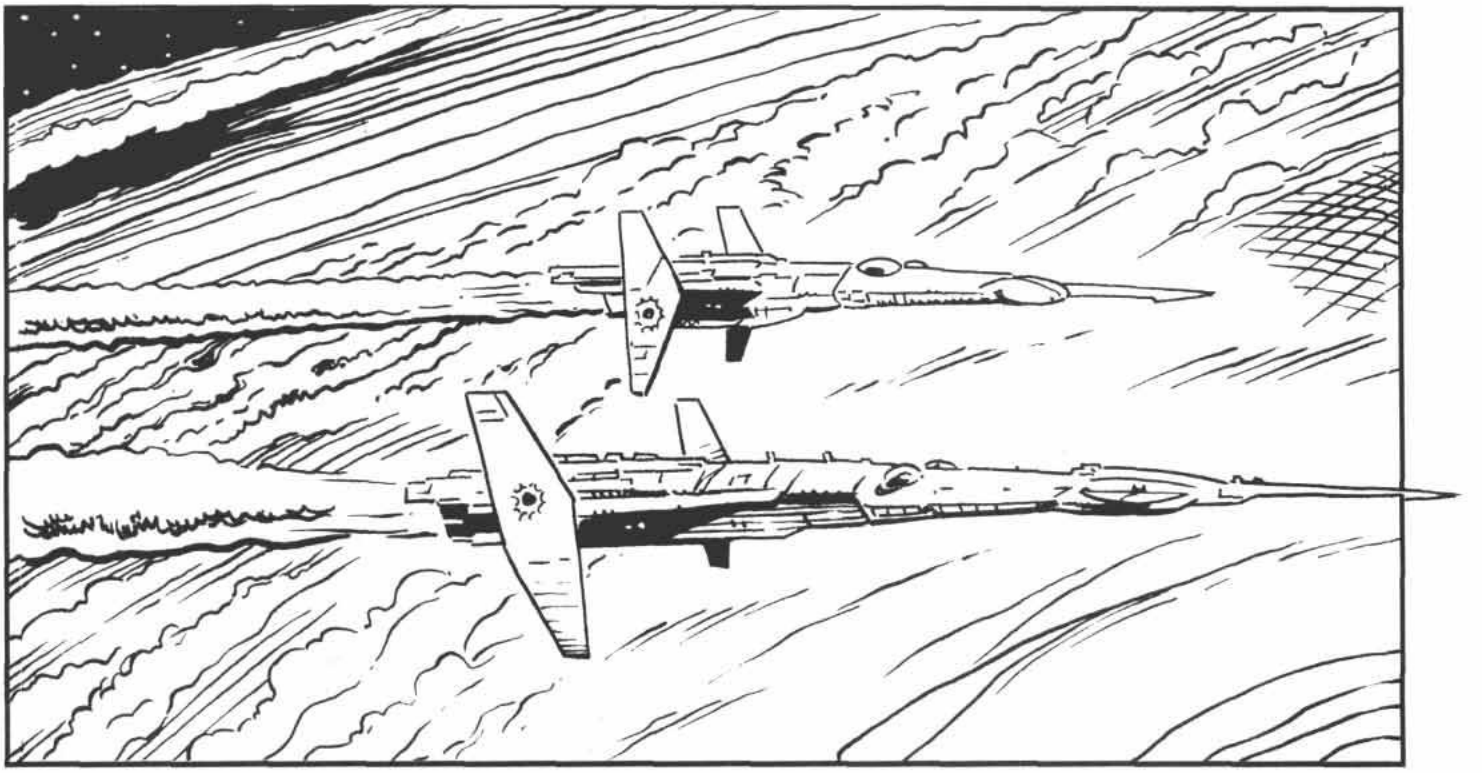
The first thing that one should expect to see when crossing a border between one Spinward State and another is a naval vessel, which will demand that any incoming vessel "stand to and prepare to be boarded." Each incoming vessel will be inspected, and then its crew and cargo, after having been carefully examined, will be removed from the ship and given the opportunity to book passage on another ship to proceed further into the state's interior. The ship in which they arrived is impounded if they were unauthorized intruders, stored in the system until their return outbound, or subjected to extensive inspection if its crew intend to proceed farther. All ships that attempt entry into the Spinward States from "outside," meaning the ruins of the Wilds, rather than from another Spinward State are impounded without exception, and most are destroyed.

Crossing a border from one of the Spinward States to another invariably entails a lengthy inspection and sometimes a lengthy quarantine period as well. This is to ensure that no virus is carried before the ship can be licensed or "stamped" for entry into the new state. These licences must be re-issued with each crossing. For this reason, many shippers and passengers take advantage of the many transshipping options available at the border worlds, and shift from hulls of one nationality to those of another, rather than undergo the bother of relicensing at every border crossing. Although the system is inconvenient, there are none who argue that they would rather take a chance of allowing the Spinward States to become like the Wilds.

Although this system originated as a necessary barrier to the spread of the virus, it has evolved into an efficient system of taxation and revenue generation, as well as a shot in the arm to local shipping. With disincentives to operating in foreign space, local shipping lines have few worries of foreign competition with cheaper labor or government subsidies. In addition, the blockade has allowed the Regency government to create a safer civilian fleet.

In addition to the licensing that is required at each border crossing, all vessels in the Regency must undergo inspection by either the Regency Navy of the Regency Quarantine Service (RQS) once a year (navy inspections are given at A and B starports, RQS at C, D, and E ports). This inspection is to insure that no virus is carried, but has come to include examination of other systems such as drives, power plants, and life-saving equipment. These inspections may impound ships that are not up to standard, or issue requirements that they be brought up to those levels.

The blockade is actually a belt several parsecs deep, as ships with high jump performance can jump over a thin border blockade. Each world in this belt has all of its potential refueling points monitored and defended. This is easy to do with the gas giants and planets. It is less easy to do with asteroid belts and the comets of the Oort clouds. For this reason, the Regency Quarantine Service was created as a new auxiliary service. With the demise of the Scout Service's exploratory mission, tremendous assets, including starships, bases, and trained personnel, were made available for the Quarantine mission. Originally



organized as an office of the Imperial Interstellar Scout Service (IISS), the RQS quickly became a separate service, leaving the Scouts (now the RISS) as little more than a glorified cartographic service with a proud tradition. However, even with the assets of the Scout Service, the task of maintaining a virus-proof seal along the entire border was a task that dwarfed the available assets. The answer was to establish the RQS Auxiliary, in which private citizens with their own ships shouldered part of the quarantine burden. In order to expand the number of ships in service, the Auxiliary eventually offered incentives to join. In exchange for quarantine patrol duty and the equivalent of a reserve commission in the Regency Navy, RQS personnel are given financial assistance in the purchase of spaceships and starships, typically of two standard varieties. One is the RQS inspection launch, a 70-ton craft which is now a ubiquitous sight in the Regency. The other is the Quarantine Cutter. Early models were modifications of the standard 100-ton Scout/Courier, but current designs are stretched versions of the Scout, displacing 150 tons.

Democratic Reforms and the New Nobility

Dulinor the Black, who in assassinating Emperor Strephon claimed to champion democratic reforms throughout the Imperium, would appear to have succeeded in this goal, although not in quite the way he had in mind. Dulinor was unable to hold onto the Imperium long enough to institute any change at all, and in any event it disintegrated into warring factions within the space of a few years.

It was the Imperial disintegration that taught a great lesson to a great many people. In order to maintain a united society, loyalty must run both ways, up *and* down. It has been decided in the Regency (as well as in a number of other locations in the collapsed Imperium) that the best way to ensure that the populace remains engaged with and supportive of the direction of their society is to give them a voice in it.

To this end, the nobility in the Regency have had their power curtailed considerably. There are now popularly elected representatives at all levels of Regency society: at the world level and subsector level in executive capacities, and at the Regency level in representative/legislative capacities. Ironically, it is only as a result of the fall of the Imperium that these democratic reforms could be put in place at all. The Third Imperium was too large to allow any real popular input, given the limitations of communications times across the Imperial territory. Only in a smaller area, as the Regency is now, can the public elect officials, send them to the capital, and communicate with them in a timely fashion about important issues. Even now, however, only truly pertinent issues can be submitted to this loop of popular feedback, as the time lags inherent even in the Regency make it impossible to get consensus on the many significant day-to-day procedures.

This does not mean that the nobility has been abolished. As part of the reforms, all hereditary nobles were given assurance that they would have sufficient fiefs to accommodate them and their heirs. Although in many cases this was only fair compensation for loyal service, in the main this was simple expedience, to avoid the creation of a class of disenfranchised, reactionary nobles while easing them from power. Also, a Regency Moot was established as a representative body filled with the Regency's hereditary nobles, as one of the Regency's two legislative houses. In

many ways, there are two parallel governments in the Regency, whose levels of organization mirror each other: the new democratic system of planetary and subsector governors and Regency senators, and the old system of barons, counts, marquis, and dukes. Although the latter retain their grandeur and a great deal of discretionary rights, privileges, and wealth, it is clear that the balance of power is passing to the former, newer group.

The response of the nobility to these changes was naturally varied, based on the quality of the nobles themselves. The best of the nobility embraced these changes, and ran for public office. Given their experience in governance, and the loyalty many of them had created by years of good leadership, they were naturals for the new elective offices. In fact, the Regency Senate, as the elected legislative body was named, consisted almost entirely of popularly elected nobles for its first dozen sessions. Some nobles actively support the new democracy in and around their fiefs, lending their good offices and experience to the public service. Other nobles have adjusted less well, retreating to lives of embittered obstructionism or conspicuous consumption, and the worst are known to actively oppose the Regency's new arrangements, and seek to undermine the growth of popular republican institutions.

At the head of the Regency government is the position of First Regent, first held by Archduke Norris. The post allows its holder to serve until death, although there are theoretical provisions for replacing one who is found guilty of various transgressions. Retaining the Imperial traditions, the First Regent is not popularly elected, but is designated by reigning First Regent following noble-style succession. However, the Regent is confirmed by the the Regency Senate and Moot. Interestingly, the Moot has only the power to cast its vote in favor of a new regent, not against. Nonetheless, the Moot has not abstained from a confirmation.

Regency Economy

The carefully controlled borders that have resulted from the virus and Quarantine have helped the Regency to gain great control over its internal trade and markets, which has enabled a successful program of managed growth. However, over the past decade, increasing numbers of economists have pointed out that the Regency's economy cannot long survive in its current state. The strong growth that was allowed by the Regency's carefully controlled stability has reached its limit. The Regency is hemmed in on all sides by neighbors with their own carefully managed economies, or by closed borders, quarantined against the virus. The Regency's economy has become overheated, and without access to new markets and new sources of raw materials, say these economists, it is bound to falter.

In 1196 the first Regency-wide referendum was held on the proposition that the sealed borders should be reopened to trade and exploration out into the Wilds of the collapsed Imperium. The public, with memories of the Rape of Trin fresh in their minds, overwhelmingly rejected the measure. The issue seems, at the present time, to be moot.

But economists and other social scientists point to indicators that the economy is already staggering, and claim that for the Regency, it is a choice of social disasters: face the risk of the virus, or face the certainty of economic ruin and social stagnation.

Relations with the Zhodani

Now isolated completely from the Imperium by the virus, Norris' domain was surrounded on all sides by potentially hostile forces: Aslan, Vargr, Virus, and Zhodani (a combination that Norris was fond of referring to as, "our problems from A to Z"). He could not hope to stand alone against all of them, and the only way to survive surrounded by them was to make sure he could divide them and mix and match them against each other when possible. In order to be able to interact with the Zhodani in this way, he had to open relations with them. By creating political and economic ties with the Zhodani, Vargr, and Aslan, Norris was able to use both carrots and sticks on all of them, and by being able to ally with one against another, or encourage divisions between the other powers, he was able to keep his borders intact without having to go to war. Furthermore, he cultivated the Regency's image as a fair broker by allying with weak powers when they were threatened by more powerful foes, thus maintaining the balance of power short of war.

One powerful reason for the success of this policy was the fact that none of the major spinward powers wanted to go to war, for fear of further release of the virus. This implicit danger made it all the more reasonable for the powers to merely jockey for position during periods of conflict rather than go directly to military options.

This was not because the powers feared that their enemies would release the virus on them; it was clear to all parties that releasing the virus on your neighbor was the same as releasing it on yourself. Rather, it was because all sides knew that it was the cooperation of the Spinward States that prevented the spread of the virus into their area, and the breakdown of such cooperation during war would create the kind of confusion and porous borders that would virtually invite the virus in.

Psionics

Psionics have always been present in the Domain of Deneb/Regency, in fact throughout the entire Imperium. However, they have been kept secret, as Imperial military assets. The Imperium contained two of the original psionics institutes, one at Terra/Solomani Rim, and the other at Wypoc/Spinward Marches, which was originally at Regina/Spinward Marches. These were not the only psionics programs; there were others operating entirely under military auspices, which include one in what became the Federation of Daibei, which was known to Duke Craig.

Because these legal psionic activities were secret, Imperial leaders were obliged to continue the fiction that psionics were illegal, something that was easier in some parts of the Imperium than others. Duke Norris was a leading advocate of psionics, as he was the only subsector duke (and later archduke) who had to share a hostile frontier with a psionic race. Norris knew that he could not

deny himself a capability or weapon that was completely mastered by his most powerful rival. Although no one knew it until much later, Norris' long-serving seneschal, Branj Dilgaadin, was a talented telepath, and Dilgaadin's talents proved useful to Norris on many occasions.

The proximate cause of Norris' repealing of all anti-psionic laws was the fact that he needed to open relations with the Zhodani Consulate. If he did so without psionic power of his own, he would only be exposing the Domain to uncontrollable Zhodani exploitation. By developing strong psionic capabilities in his own society, he could meet the Zhodani as equals.

Individual Psions: Although this is by no means true of all Regency psions, most, both men and women, have adopted the psionic style of shaved heads. This serves the same purpose as the distinctive turban worn by the psionic Zhodani nobility, to call attention to the mental attributes of the person. While the Zhodani turban accentuates the size of the head to make the nonverbal statement that this person has formidable mental capacities beyond those of the average person, the Regency baldness makes the bold statement that the psionic has exposed talents within him or herself that most people leave covered or unexamined. This style also serves the purpose of a social lightning rod. By showing to the public that they are not concealing their presence or acting secretively, psions hope to increase the level of trust and acceptance that the public has toward psionics. This style also honors the naturally bald Branj Dilgaadin, whom Norris appointed to head the psionic reforms in the Regency.

Because there are several styles or "houses" of psionic training in the Regency (Norris' revocation of the prohibitions deliberately promoted diversity of psionic styles so that more breakthroughs could be made via different approaches than by one rigid approach), these psionics bear distinguishing marks to show in which house they were trained and which disciplines they follow. These marks are sometimes artistic tattoos on the bare scalp, sometimes removable tattoos or paintings on the head which change from time to time, or variations of hair growth, like monastic tonsures or small braids of hair like those worn by ancient Egyptian princes, or patterns of earrings worn on one or both ears. These patterns are generally tasteful, dignified, and artistic. A trained observer can tell from these marks what house the psionic belongs to, and often what specific aspects of psionics (e.g., telephysics, telepathy, teleperception, etc.) the individual is trained in.

Robotics and Computer Technology

The most promising progress in robotics research is based on a program which is breeding captured Strain 5 Sexually Reproducing viruses. Because it is already known how adaptable and successful these AIs can be, breeding desirable traits into them is expected to pay great dividends.

This program is a very deep secret. It is unlikely that any citizens would be happy to hear that captive viruses are being kept in the Regency, no matter how carefully. Furthermore, it is even more unlikely that anyone would want to bring a virus-descended robot into their home or place of business.

The wave of antirobotic sentiment that swept through the then Domain of Deneb was stunning in its speed, vehemence, and acceptance by the vast majority of the public. However, given the tremendous damage wreaked by the mere handful of vampire ships that were able to slip into the Regency and run amok (including the tragic Rape of Trin, which killed 3 billion), this sentiment is understandable. It is estimated that over 90 percent of all anthropoid robots in the Domain were scrapped, and the vast majority of robotic transportation was hastily converted to manual, or human supervised remote control. Even the great robotics program at the Rhylanor Institute of Technology was abolished following the devastation at Trin. Billions of jobs were created overnight with the purging of robotic control. Domain corporations that were heavily into robotics manufacturing, or even owned such subsidiaries, saw their stocks fall rapidly, and remain at low levels until they diversified away from robotics manufacturing, or at least camouflaged it a bit better.

The recovery of the automation industry was abolished with the creation of "dumb" computer systems, so called because these systems are subdivided to the point where human oversight of their operations is required, and full-up computer control of the system is rendered impossible (see Responses to Virus, page 80).

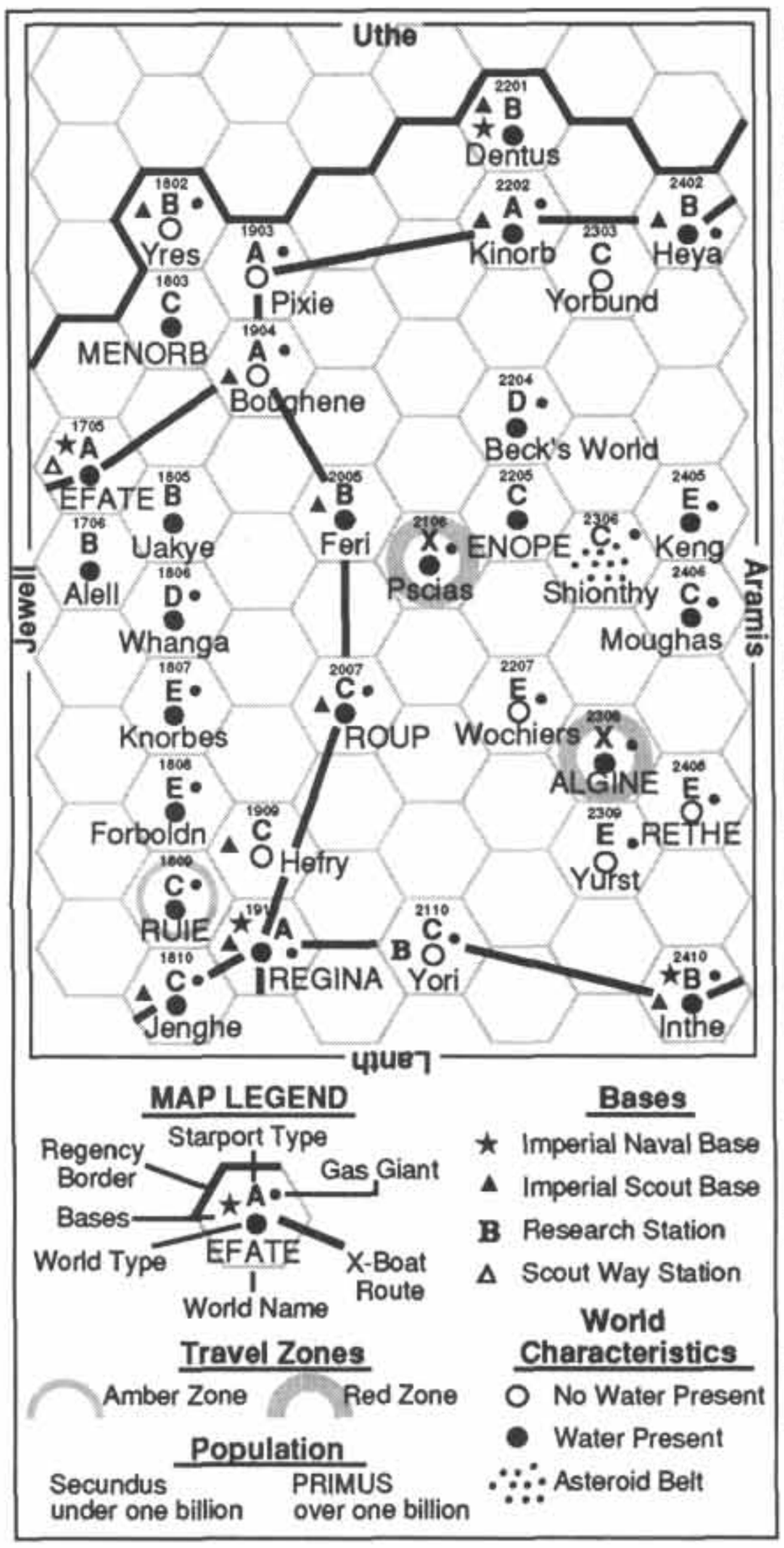
Sources of Conflict

Although the Spinward States have maintained peace for three quarters of a century, it is an uneasy peace based on a common external threat. But there is increasing evidence that the virus has largely died back in the Wilds and that no new dangerous strains are developing, providing the Spinward States a wider range of options than simple quarantine. As the threat of the virus recedes, old quarrels long suppressed threaten to explode into open warfare. In the meantime, diplomatic and commercial missions have become favored covers for covert intelligence gathering as all sides jockey for a favorable position should active competition resume.

There are considerable internal sources of conflict as well. Progressive pro-exploration parties regularly clash with conservative pro-quarantine and reactionary antirobotics groups. Large merchant and commercial corporations continue to compete, sometimes using espionage and violence little different than that employed by governments.

Disenchanted nobles plot to embarrass or even assassinate popular elected leaders with whose policies they differ. While some wealthy nobles support these actions, and even provide the strategic leadership, they are insulated from the actual deeds by a new class of young impoverished nobles, men and women fanatically dedicated to the re-establishment of noble rule.

And every faction anxious to accomplish a shady mission while limiting their own exposure to danger or publicity routinely turns to independent soldiers of fortune and adventurers to do the dirty work.



REGINA SUBSECTOR

The Regina subsector is a diverse, developing subsector on the very fringes of the Regency. The Regency frontier runs along its coreward edge and portions of the spinward edge. Its major xboat communictaion routes connect it with Jewell subsector to spinward and with Lanth subsector to rimward, providing major trade channels which roughly parallel the Spinward Main, a well-used natural jump-1 trade route.

Name	*Location*	*UPP*	*Bases*	*Trade*	*TPPG*	*Alg*	*Stellar*
Efate	1705	A646A30-E	B	Hi In	110	Re	K4 V
Alell	1706	B46789C-B		Ri	810	Re	M7 V M7 D
Yres	1802	BAC6773-8	S	Fl	635	Re	G5 V
Menorb	1803	C652998-8		Hi Po	310	Re	M5 II
Uakye	1805	B439598-D		Ni	620	Re	M9 V
Whanga	1806	E676326-A		Lo Ni	724	Re	A1 V M1 D
Knorbes	1807	D888887-4		Ri	134	Re	G3 V
Forboldn	1808	E893614-5		Ni	612	Re	G0 V
Rule	1809	C776977-8		Hi In	A901	Re	M5 V
Jenghe	1810	C799663-A	S	Ni O: 1910	523	Re	M0 V
Pixie	1903	A100203-D	N	Lo Ni Va	801	Re	M1 V M0D
Boughene	1904	A8B3531-D	S	Ni Fl	901	Re	M7 V
Hefry	1909	C200423-8	S	Lo Ni Va	320	Re	K6 II M6 D
Regina	1910	A788999-D	A	Hi Cp	103	Re	F7 V M8 D M6 V
Feri	2005	B384879-B	S	Ri	720	Re	G4 V M3 D
Roup	2007	C77A9A9-7	S	Hi In Wa	223	Re	F9 V
Pscias	2106	X355523-2		Ni Ag	R801	Re	M5 V
Yori	2110	C360857-D		Ri De RsB	113	Re	F1 V
Dentus	2201	B979600-B	A	Ni	220	Re	M2 V
Kinorb	2202	A663659-9	S	Ni Ri	822	Re	M7 V
Beck's World	2204	D88349D-5		Lo Ni	901	Re	M0 V M2 D
Enope	2205	C411988-7		Hi Na In Ic	700	Re	M6 V M5 D
Wochiers	2207	EAC28CC-A		Fl	803	Re	F0 V
Yorbund	2303	C7C6503-8		Ni Fl	320	Re	M8 V
Shionthy	2306	C000742-9		Na As	814	Re	M4 V
Algine	2308	X766977-4		Hi	R923	Re	M9 V
Yurst	2309	E7B4643-6		Ni Fl	724	Re	K9 V
Heya	2402	B687845-7	S	Ri	134	Re	K6 III M8 D
Keng	2405	E2718CA-5			712	Re	G5 III M9 D
Moughas	2406	CA5A588-B		Ni Wa	901	Re	M9 V M9 D
Rethe	2408	E230AA8-9		Hi Na Po De	323	Re	G7 V
Inthe	2410	B575776-A	A	Ag	723	Re	F8 V

The Regina subsector contains 32 worlds with a total population of 74.5 billion. The highest population is 28 billion, at Rethe; the highest tech level is E, at Efate. All worlds in the Regina subsector are members of the Regency. Ruie was annexed during the Final War, and there is still a low-level insurgency in progress in some of the more remote parts of the world.

Notes

Under the Bases column, N indicates a Regency Navy base, S indicates a scout or Regency Quarantine Service Base, W indicates a scout way station for the maintenance of xboats. A indicates both a naval and scout base, B indicates both a naval base and scout way station.

Under the Trade Classifications Column, the O: entry indicates that the world is owned by the world in the indicated hex. For example, Jenghe is owned by Regina. Cp indicates the subsector capital.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. If the Travel Zone digit is empty, it is a Green Zone, A and R indicate Amber and Red Zones, respectively.

Alg is the Allegiance column. Re = Regency.

Xboat Routes: The heavy lines connecting several worlds are express boat routes providing communications between worlds of the Regency. As communication is limited to the speed of travel, the various parts of the Regency are linked by jump-4 xboats which deliver all important news and messages. These routes are also common trade and transport routes with regular commercial transportation provided by one or more transport megacorporations. Service to locations not on one of these routes is less frequent and less dependable.

ADDITIONAL CHARACTERS FOR THE REGENCY

Regency Psion

Although psionics had long been illegal throughout the Imperium, Archduke Norris repealed the Imperial anti-psionics laws soon after the Collapse, allowing a renaissance of psionic skills within former Imperial space. Although some old anti-psionic prejudice still lingers, Norris' whole-hearted support of the new psionic programs has allowed psionic training to become a largely respected calling. Entry into this career requires that the character take a psionic examination at the point he or she intends to enter the Psion career (see page 246). If the examination reveals a Psionic Strength of 7+, the character is accepted into the career. If not, the character may end character generation and enter play with the Psionic Strength just established (but without training), or continue character generation as normal, although picking a different career. However, if character generation is continued, the Psionic Strength continues to decline, as if it had never been tested for.

Prerequisites: Homeworld in the Regency, plus PSI 7+, see above.

First Term

Skills: Psionics 5, Willpower 3

Subsequent Terms

Skills: Psionics (see page 248), **Determination, Perception, Charm, Interaction, Physical Science**

All Terms

Special Adventure: 6+ for **Psionics, Determination, Vehicle, Vice, Gun Combat, Melee, Personal Transport**

Promotion: 7+, DM +1 if INT 8+, DM +1 if any Psionic asset 16+.

Contacts: Two per term, specialist (Psionic), academic, government, or intelligence community.

Other Effects: When generating starting money, multiply final result by 0.5, as character has given the rest of it to his or her psionic school.

Psionic Ranks: As psions advance in the mastery of their talents, they are periodically tested for induction to higher levels of their communities. Because of the many different "schools" of psionics that are followed in the Regency, there is no single list of such levels. The following list of psionic "ranks" is representative.

R1	Novice	R4	Disciple
R2	Acolyte	R5	Adept
R3	Aspirant	R6	Grand Adept

Additional Contact for Regency Characters

Although the nobility has all but vanished in most areas of the Collapsed Imperium, it lingers on in the Regency. Any player character who has a homeworld in the Regency has the opportunity to gain a contact who is a member of the Regency nobility. For each contact gained during character generation, roll 1D10. On a result of 9 or 10, that character is a noble contact, as detailed below.

Noble Contact: This contact was a noble when the PC knew him or her, and because of the nature of such things, still is. However, given the profound changes in the nature of the nobility in the post-Collapse Regency, the noble's current status can vary quite a bit. The noble might have accepted the challenges of the democratic reforms, and become involved in elected or appointed office, thus adding political power to declining noble prerogatives. On the other hand, the noble may oppose the reforms for good or bad reasons, and may be working on ways to thwart or reverse them. Or the noble may have just given up to live a life of dissipated luxury until the money runs out.



POCKET EMPIRES

The term *pocket empires* refers to a small cluster of worlds, usually no more than a subsector worth, which have re-established (or, in rare cases, never lost) star travel. The worlds are linked by regular trade routes and usually some sort of political system. Sometimes this system is no more than a commercial union or a unified quarantine service, while in other cases it is a subsector-spanning empire.

A pocket empire may be set anywhere in the Wilds and referees have great latitude in making up the worlds and background. We present The HubWorlds as an example which can be used as is or used for inspiration in creating your own adventure area.

The HubWorlds

During the Rule of Man (–2204 to –1776), this cluster of worlds served as the administrative center for the Imperium. Hiroshi II made Kaggushus the capital, renaming it Hub/Ershur. However, a few major centers were also dispersed among neighboring worlds in about a two-parsec sphere. "The Hub" referred to these worlds collectively.

Kaggushus was counted as among the more important worlds of the Third Imperium, but played only minor roles in its history.

After the Collapse (1130), The HubWorlds maintained sporadic contact with each other using a handful of surviving ships. Serious commerce resumed in 1181 when Kaggushus began constructing new starships of its own. Starship operations remained under strict government control until regulations were relaxed in 1199. This permitted commercial ownership of ships, freeing vessels for broader speculations and exploration.

As of 1200, many worlds of Ershur subsector have yet to be visited. This is changing as HubWorlds authorities survey and recontact the surrounding worlds. However, other vessels, aside from those bearing official teams, also venture beyond the borders. Ships from budding corporations compete for profitable trade agreements. Others, owned by particular member worlds, explore for resources or other things in their interest. And then there are the scattered raiders.

Anyone with a still functioning starship, especially if armed, could be a raider. Such bands would occasionally descend upon worlds to carry away wealth or vital necessities. Raiding only came in surges in the area. But with the emergence of The HubWorlds, it is sure to increase as some individuals with space and technical skills turn outlaw.

Adventuring

Player characters will probably not own their own ship as starships are still rare. However, they could enjoy a large measure of autonomy, so long as they strive to further the interests of those they work for.

A wide range of activities exists that characters might pursue. What follows are some common threads a referee can use in a campaign.

Trade: This will bring characters in contact with the cultures shaped by the Collapse. Many will be hostile to spacefarers, thanks to experiences with star raiders. Some might welcome them, actually hoping to capture their ship and equipment. Still, a profit can be turned by those who are smart and well armed.

Exploration: Virtually no world was left unchanged by the Collapse, making all of Imperial space a vast unknown. Learning what is out there is of increasing interest to the corporations and governments of The HubWorlds. What worlds still live? What kinds of peoples are they now? What worlds died, and what did they leave behind? What are the dangers that lurk among the worlds, and where are the safe harbors?

Salvage: Throughout space are the ruins of the Third Imperium: orbital installation, derelict ships, bases, spaceports, and belter communities, all abandoned. Most was destroyed by the virus, but much can also be salvaged if found. The HubWorlds tries to carefully control the import of relics to discourage wanton looting. However, a thriving black market exists for the trade of high-tech equipment.

Naval: A small navy exists among The HubWorlds, performing rescues, pursuing smugglers, and deterring raiders and pirates. But they are also the agency to perform official system surveys, carry diplomatic teams to neighboring worlds, and intervene against external threats to The HubWorlds' interests. Characters could crew one such patrol vessel regularly used for external missions.

While these can provide the main body of adventures, numerous other possibilities also exist. For example, the characters' ship might be chartered to aid in setting up a new outpost. The company could send them to shadow the activities of another vessel from a rival company or world. Or they might be directed to trace and return a renowned art object stolen in an earlier raid.

Government

Since the First Civil War (604 to 622), the Nolanar-Ahiiki line has accepted a hereditary fief on Kaggushus and its responsibility to rule over that system. The planetary upheaval in the Collapse interrupted their rule until 1169. In that year, Eric Nolanar took the title of Count, and seized control once again to reverse the world's economic decline.

Count Nolanar died in 1199, leaving the fief to the eldest of his triplet daughters, Countess Thalia Nolanar. However, by his last decree, the government will take more the form of an impersonal bureaucracy. The transition of government will not be complete until the end of 1120.

While the new countess remains the head of both the Kaggushus government and The HubWorlds, her author-



ity only lies within the executive branches. Nobles from each of the member worlds form the High Chamber, the legislative branch for The HubWorlds. Appointed commoners make up The HubWorlds Court Superior, the judicial branch.

The new Kaggushus government, which includes the Low Chamber and the Court Domestic, was modelled after The HubWorlds government. Other world governments differ.

The HubWorlds is a government of ministries, authorities, departments, and agencies rife with politics and the struggle for power. Palace court politics is the most vicious of all. Interworld relations are little different, generating a form of restrained discord that somehow works.

Library Data

Korhites: The band of pirates and raiders based at Ticularosta (which see). They are only one of a number of such bands that have risen and faded since the Collapse. They rely on recovered Imperial relics to allow them to raid worlds, but have barely enough technical knowledge to operate what they have.

The incidental star traffic that already exists among the worlds in the rimward portion of the subsector is related to the Korhites. Ships they might send occasionally land at worlds with surviving starports to exchange loot for staples and other goods. They may even engage for a time in legitimate trade.

The current leader of the Korhites is referred to as "The She."

Order Astra: A knighthood founded by Count Nolanar in 1197. Its grand knight is Sir Lawren Urilem, a naval captain who played a key diplomatic role in the formation of The HubWorlds.

Order Astra was inspired by the old Travellers' Aid Society. Membership in the order confers many of the same benefits as TAS. Although it offers no dividend of high passage tickets, knighthood has its compensations.

The order funds search missions for overdue ships and is also placing shelters on worlds beyond the frontier for marooned travellers. Members of the order are expected to aid distressed travellers whenever possible, and most particularly fellow knights.

The hostels owned by the knighthood are an excellent place for obtaining information from the frontier. Knowledge shared among knights is never disclosed if meant to be secret.

Temporal Society of Kaggushus: Officially established in 719, this is one of the many "timers clubs" found across the Imperium. Those wanting to live in a future time could enter cold sleep until they wish to be revived. Membership in the society swelled soon after the Collapse.

Kaggushus (0402): Kaggushus is a cool world orbiting a gas giant. It's about the size of Mars, but denser. The atmosphere is thin with a sulfur taint. A broad, hazy ring system circles Kaggushus itself.

The original Vilani population occupied what little lowland territory there was, bordering the one major ocean. During the Rule of Man, immigrants settled the rest of the world. These were humans from Terra's mountain regions and from other thin atmosphere environments.

The Rule of Man took the island of Arsanus as its own seat. This was actually the central spike of a giant, 300,000-year-old impact basin. After the Rule of Man, wars ruined the magnificent buildings on the island. During the Third Imperium, land on Arsanus was either reserved as noble fiefs or used in supporting the heavy tourist trade.

After the Rebellion, the Imperial nobles on Arsanus were evicted from the island, but permitted to keep the industries they owned. A succession of civil wars changed the government many times. Arsanus, as symbol of political control, was again ruined in the struggles that did not end until Count Eric Nolanar took power in 1169.

Chamati (0602): Chamati is the outermost of the three moons of Pencadu, a large planet orbiting in the system's habitable zone. The surface is dominated by deep valleys and canyons, some many kilometers deep. Almost all of the hydrographics are found at the canyon floor level. Chamati is uncomfortably hot even at best—temperatures are far hotter within the canyons. There is no native life, although the canyon floors support a flourishing ecosystem origially introduced by the Vilani.

Prior to the Rebellion Chamati was a colony of Towering. It extracted crystals from a number of deep canyon sites and supplied them to Towering for use in the world's heavy industry. The colony was designed to be as self-sufficient as possible, and was large enough to accommodate 30,000 people. After Chamati lost contact with Towering, the colonial administrators took control and declared independence.

Cleves (0403): While Cleves was considered the main world of its system, its was hardly the most populous, only the most central. Relying on high stellar technology, hundreds of millions lived among the asteroids and the ore-rich planets of Vesser and Makill. However, since only Cleves was habitable, all populations had to transfer to that world or perish.

Color (0301): The Depot at Color is virtually intact. Although stripped by Imperial standards, what remains is astounding by modern standards. Color cannot exploit what is in the old naval installations very well, but is unwilling to relinquish control. Kaggushus has restrained itself, using diplomacy to access some of Color's resources.

The class A port at Color was recently built there by Kaggushus as a diplomatic gesture. Color's yards specialize in the refitting of older Imperial ships rather than the laying of new hulls.

Color's technicians and engineers, experienced with the relics at Depot, are eagerly sought after.

Cronin (0502): During Imperial times, Cronin was a major logistics supply center for the navy—the world itself was a naval reserve. During the Black War (1122-1124), scores of ships (mostly naval supply vessels) of the Dagudashaag Fleet defected to save their families on devastated worlds. They resettled the refugees on Cronin, drawing on the vast stockpile of supplies at the base.

The resettlement worked so well that the ships later went on to collect refugees from other worlds as well, primarily from Ralton. To this day, however, those descendants of Raltonians harbor a sense of guilt, believing their mother world might have lived had their forebearers not left. Most of the people evacuated were engineers and technicians, those who might have found new methods of combatting the corrosive atmosphere.

Ershur (0504): Ershur has the oldest human population in the subsector, having been colonized early in the Vilani expansion. The people are proud of their ancient heritage. They also see their world as a bastion of art and culture. Their museums of art were known throughout the Third Imperium.

The world also has a large number of financial institutions, including Musizis Pen, LIC, an important investor in the construction of modern starships.

Ershur boasts breathtaking local scenery, and was popular among tourists before the Rebellion. The Vilani ruins were a major attraction. The loss of the tourist trade forced the world to concentrate heavily on agriculture. Families arriving on the world before the Collapse usually entered agricultural trades.

Towering (0501): Towering is the second most powerful world among The HubWorlds, and emphasizes its high position in contact with other worlds. It even acts as if it were a very close second to Kaggushus because it all but resumed production of starships on its own.

Towering's attitudes in interworld relations tend to be annoying. Fortunately, it is an active supporter of The HubWorlds even if it does sometimes try to elbow others out of the way.

Unlike its neighbors, Towering was settled almost exclusively by Solomani during the Rule of Man. It is a world proudly without a system of nobility. The representatives it sends to the High Chamber are still afforded the privileges of nobility and addressed as "Lord" or "Lady."

Towering was the leader in the initiative to relax controls over starships in 1199.

Aagkhuur (0802): Aagkhuur is a dead world. However, the Mynoris Corporation is already in place to begin recovering the staggering amount of usable goods for resale in The HubWorlds. Most of the profits will finance a program to recolonize Aagkhuur.

Death (0703): This system is seldom visited because of the many ship disappearances attributed to it. So far, no formal investigation has been mounted, but is expected soon. Safe passage though the Death system would provide a shortcut to jump-1 traffic between Kaggushus (0402) and Aagkhuur (0802), substantially encouraging trade between them.

Ticularosta (0508): This is one of the many dead worlds of the subsector, but its class A port and original tech 16 rating have attracted pirates to establish a permanent base. Still, restoring and using the relics is a most difficult process as everything must be relearned. The base here is open to the rare trader, thus the C starport rating.

Yadro (0306): Many commercial ships register this client state as their port so as to sidestep HubWorlds regulations.

Yagas (0707): Yagas has a psionic institute, which is now grudgingly accepted by the population after a revolution. Psionic individuals have been recruited by the raiders based at Ticularosta.

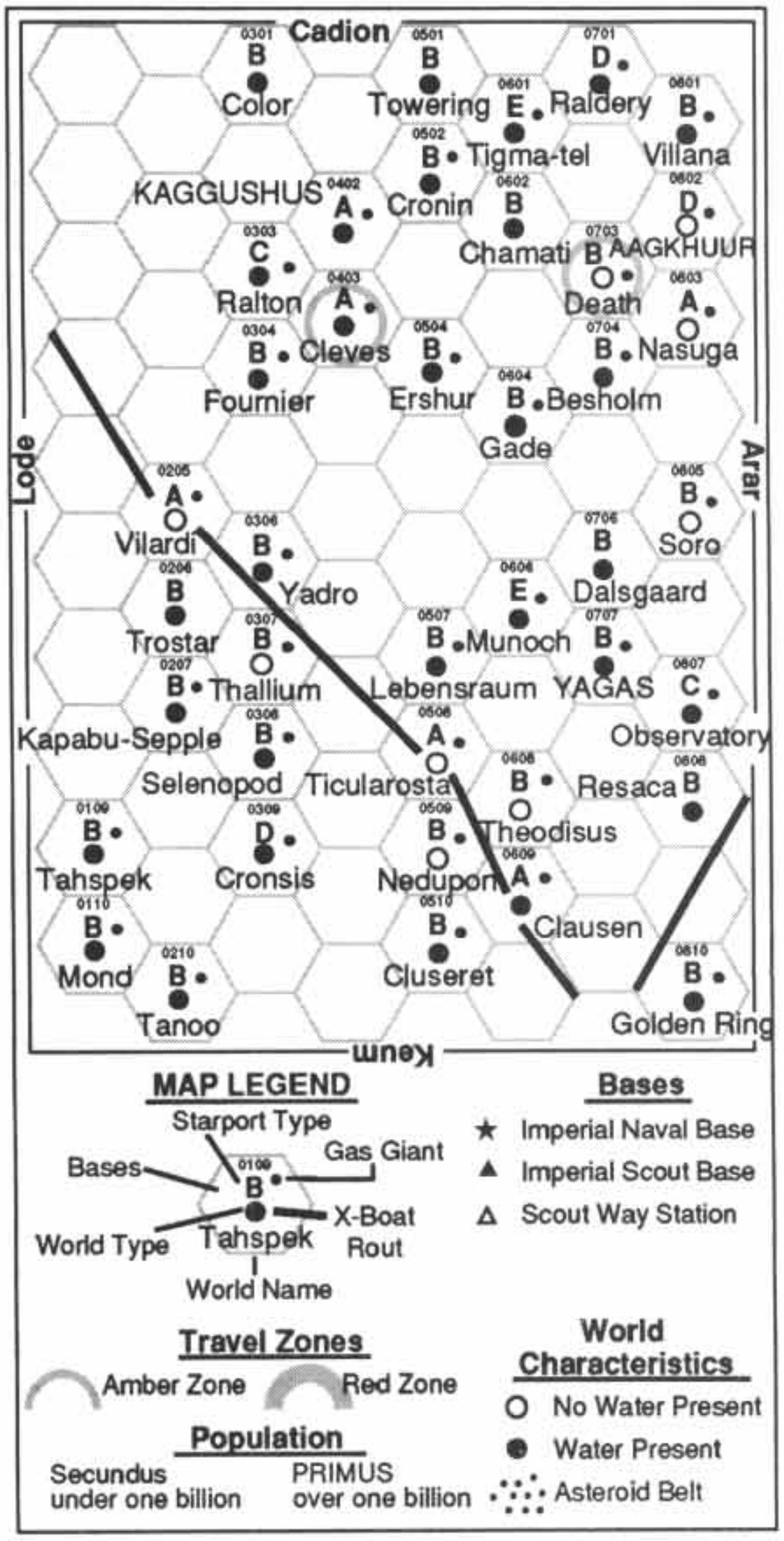
REFEREES

Information on this page should not be made routinely available to players who do not have access to pre-Collapse starcharts and navigational information. In many cases, it may require research to gain even this outdated level of information.

ERSHUR SUBSECTOR (SUBSECTOR A OF MASSILIA SECTOR)

(Pre-Collapse data, circa 1117)

Name	Hex	UWP	Base	Trade	TPPG	Alg	Stellar
Tahspek	0109	B5468BA-A			613	Im	G0 V
Mond	0110	B737794-A			721	Im	G4 V
Vilardi	0205	A8C6426-E		Lo Fl Ni	813	Im	M1 V
Trostar	0206	B78A635-C	N	Ni Wa	920	Im	F0 V M1 D
Kapabu-Sepple	0207	B87888B-A	N		604	Im	F8 V M7 D
Tanoo	0210	B78A452-D	N	Lo Ni Wa	202	Im	K1 V M1 D
Color	0301	B78A777-C	D	Ri Wa	300	Im	F6 V
Ralton	0303	C9B58A9-8	S	Fl	413	Im	F1 V M5 D
Fournier	0304	B641764-A		Po	405	Im	G0 V
Yadro	0306	B35376A-A		Po	404	Im	F3 V
Thallium	0307	B1008A7-C	S	Na Va	502	Im	F7 V
Selenopod	0308	B331003-C		Lo Ni Po	114	Im	M8 V M2 D
Cronsis	0309	D75A310-A		Lo Ni Wa	604	Im	F1 V
Kaggushus	0402	A442AA7-G		Hi In Po Cp	904	Im	F1 V
Cleves	0403	A566422-E		Lo Ni	A512	Im	K1 V
Towering	0501	B6548AC-B			600	Im	G4 V M2 D
Cronin	0502	B55205A-A	N	Lo Ni Po	903	Im	F6 V M2 D
Ershur	0504	B386521-B	N	Ag Ni	923	Im	K5 V M7 D M9 D
Lebensraum	0507	B544000-B	N	Ba Lo Ni	904	Im	G7 V M7 D
Ticularosta	0508	A100654-G		Na Ni Va	322	Im	G3 V M9 D
Nedupon	0509	B100632-C		Na Ni Va	400	Im	A4 V
Cluseret	0510	B3627BD-C			604	Im	G2 V
Tigma-tel	0601	E5536A9-5		Ni Po	424	Im	M1 V
Chamati	0602	B253364-D		Lo Ni Po	510	Im	F8 V
Gade	0604	B797021-9		Lo Ni	312	Im	M6 V
Munoch	0606	E868576-7		Ag Ni	313	Im	F1 V
Theodisus	0608	B110588-D	S	Ni	902	Im	M1 V
Clausen	0609	A456002-D	N	Lo Ni	204	Im	K1 V M7 D
Raldery IV	0701	D567466-8	S	Lo Ni	602	Im	G4 V M8 D
Death	0703	B100300-E	N	Lo Ni Va	A612	Im	M9 V M1 D
Besholm	0704	B84A445-C	N	Lo Ni Wa	904	Im	G4 V M3 D
Dalsgaard	0706	B687100-D		Lo Ni	220	Im	F1 V M8 D
Yagas	0707	B566AFC-E		Hi	502	Im	K3 V
Villana	0801	B677334-B		Lo Ni	305	Im	M5 V M1 D
Aagkhuur	0802	D100958-C		Hi In Na Va	224	Im	F4 V
Nasuga	0803	A300620-D		Na Ni Va	214	Im	M4 V M5 D
Soro	0805	B7A0684-C		De Ni	204	Im	M2 V M0 D
Observatory	0807	C531544-9		Ni Po	714	Im	K2 V
Resaca	0808	B452456-D		Lo Ni Po	810	Im	F3 V
Golden Ring	0810	B698541-A	N	Ag Ni	104	Im	M0 V

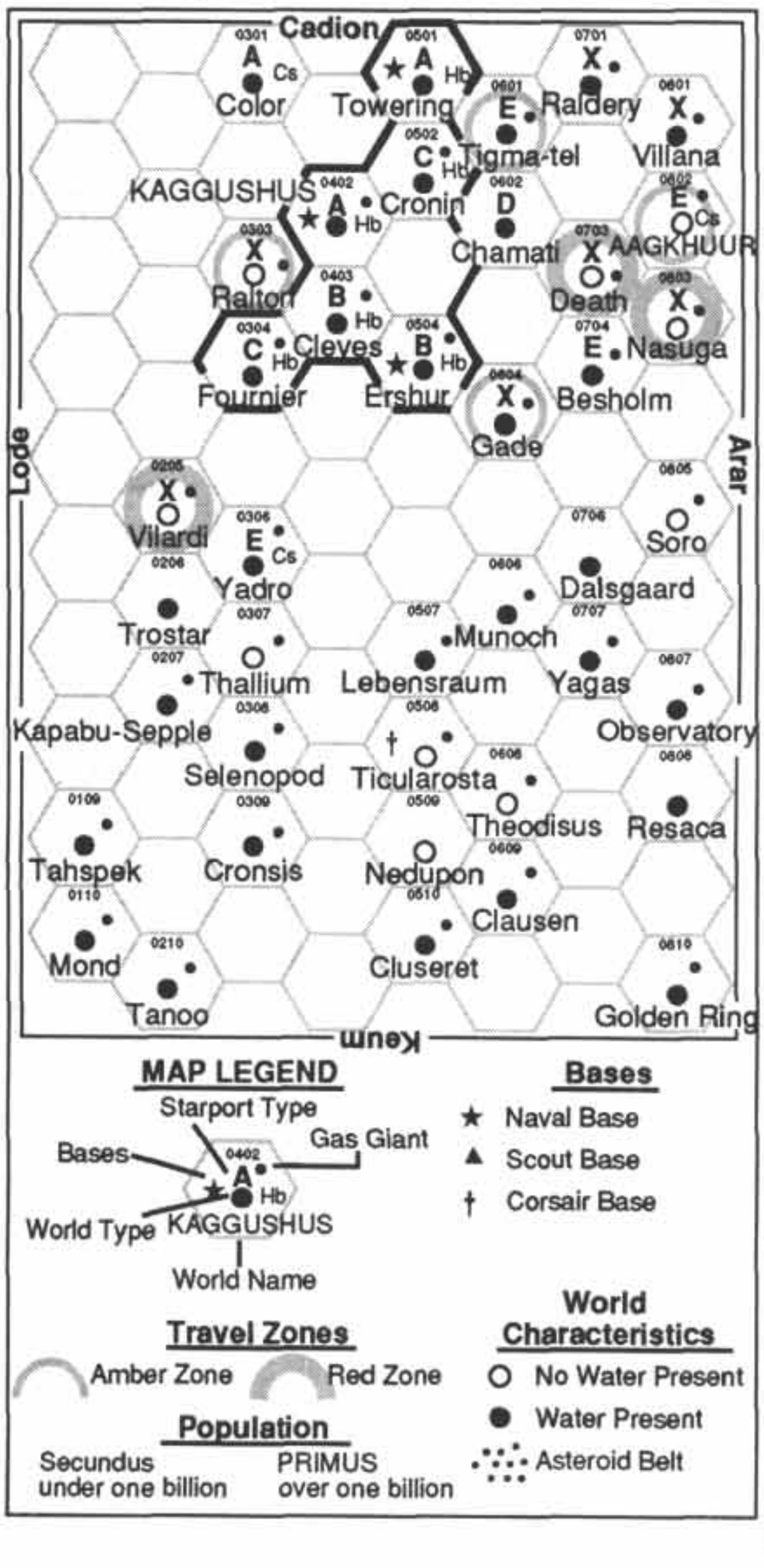


Notes

Bases: N is an Imperial Navy base, S is an Imperial Scout Base, D is an Imperial Navy Depot.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. If the Travel Zone digit is empty, it is a Green Zone; A and R indicate Amber and Red Zones, respectively.

Alg is the Allegiance column. Im = Third Imperium



REFEREES

This map is printed in such a way that it may be used by players who live in The HubWorlds. All of the map data within the explored radius is correct, but the worlds outside of this radius show no data except their physical characteristics. Players with a photocopy of this map of known space can fill in the particulars of the undetailed worlds as they discover more about them. However, when copying this map for the players, referees should be careful to not pass on the UWP data on these undetailed worlds which is included on the table below.

ERSHUR SUBSECTOR (SUBSECTOR A OF MASSILIA SECTOR)

(New Era data, as of 001-1201)

Name	Hex	UWP	Base	Trade	TPPG	Alg	Stellar
Tahspek	0109	D546788-7		Ag	913	—	G0 V
Mond	0110	X737000-0		Ba	021	—	G4 V
Vilardi	0205	X8C6000-0		Ba Fl	R013	—	M1 V
Trostar	0206	X78A76C-4		Ri Wa	120	—	F0 V M1 D
Kapabu-Sepple	0207	X87886D-4			604	—	F8 V M7 D
Tanoo	0210	X78A300-2		Lo Ni Wa	402	—	K1 V M1 D
Color	0301	A78A778-A		Ri Wa	G600	Cs	F6 V
Ralton	0303	X9B5000-0		Ba Fl	A013	—	F1 V M5 D
Fournier	0304	C641735-8		Po	705	Hb	G0 V
Yadro	0306	E353748-6		Po	G104	Cs	F3 V
Thallium	0307	X100000-0		Ba Va	002	—	F7 V
Selenopod	0308	X331000-0		Ba	014	—	M8 V M2 D
Cronsis	0309	E75A330-6		Lo Ni Wa	204	Wi	F1 V
Kaggushus	0402	A442AAB-C	N	Hi In Po Cp	G304	Hb	F1 V
Cleves	0403	B56665A-9		Ag Ni Ri	G612	Hb	K1 V
Towering	0501	A654854-C	N		G300	Hb	G4 V M2 D
Cronin	0502	C552565-8		Ni Po	G803	Hb	F6 V M2 D
Ershur	0504	B386645-8	N	Ag Ni Ri	G123	Hb	K5 V M7 D M9 D
Lebensraum	0507	X544000-0		Ba	004	—	G7 V M7 D
Ticularosta	0508	C10026B-9	C	Lo Ni Va Mr	422	Wi	G3 V M9 D
Nedupon	0509	X100000-0		Ba Va	000	—	A4 V
Cluseret	0510	X36278A-4			604	Wi	G2 V
Tigma-tel	0601	E5536AD-5		Ni Po	A224	Wi	M1 V
Chamati	0602	D253334-7		Lo Ni Po	G710	Na	F8 V
Gade	0604	X797000-0		Ba	A012	—	M6 V
Munoch	0606	X868502-4		Ag Ni	113	Wi	F1 V
Theodisus	0608	X110000-0		Ba	002	—	M1 V
Clausen	0609	X456000-0		Ba	004	—	K1 V M7 D
Raldery IV	0701	X567534-3		Ag Ni	G202	Na	G4 V M8 D
Death	0703	X100000-0		Ba Va	R012	—	M9 V M1 D
Besholm	0704	E84A499-6		Lo Ni Wa	G904	Na	G4 V M3 D
Dalsgaard	0706	X687000-0		Ba	020	—	F1 V M8 D
Yagas	0707	X566968-4		Hi	602	Wi	K3 V
Villana	0801	X677300-4		Lo Ni	G205	Na	M5 V M1 D
Aagkhuur	0802	E100216-8		Lo Ni Va	A124	Cs	F4 V
Nasuga	0803	X300000-0		Ba Va	R014	—	M4 V M5 D
Soro	0805	X7A0000-0		Ba De	004	—	M2 V M0 D
Observatory	0807	X531000-0		Ba	014	—	K2 V
Resaca	0808	X452444-7		Lo Ni Po	310	Wi	F3 V
Golden Ring	0810	X698441-4		Lo Ni	404	Wi	M0 V

Notes

Base: N indicates a (HubWorlds) naval base, C indicates a corsair base.

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. Because there is no longer a Travellers' Aid Society or other such watchdog group, there are no travel zones in the Wilds.

However, among The HubWorlds, the Order Astra has taken over many of the TAS' former duties, including rating worlds according to their dangers, using the traditional red, amber, and green zones. Dead worlds are usually red zoned to control the spread of the virus. Green applies to worlds known to be safe. Worlds beyond 4 parsecs of Kaggushus have no rating as of 1200-001. The state of affairs on these remote worlds is not publicly known.

Alg is the Allegiance column. Hb = The HubWorlds, Cs = Client State (HubWorlds).

The Na code indicates a nonaligned world. Such a world may exist within an interstellar community, but have no ties to it, or may be nonaligned because it has virtually no off-world contact. The Wi code indicates a world in the Wilds with a Wilds government type. The "—" indicator means that a world has no allegiance because it has no population.

Referee's Note: Any referee who wishes to create a pocket empire must come up with a scenario by which the area was spared some of the worst effects of the virus. Based on this scenario, the modifications to the worlds' UWPs due to the Collapse will not follow the results of the Collapse Effects Determination tables. The actual effects within a referee's pocket empire are ultimately up to the referee. The worlds of The HubWorlds had their Collapse and post-Collapse (1130-1201) effects calculated with a modified version of the system found in the **MegaTraveller** sourcebook **Hard Times**. However, any system which is congruent with both the referee's vision of the local area history and the tremendous devastation done by the virus in the Imperium at large is appropriate.

WORLDS AND TRAVEL

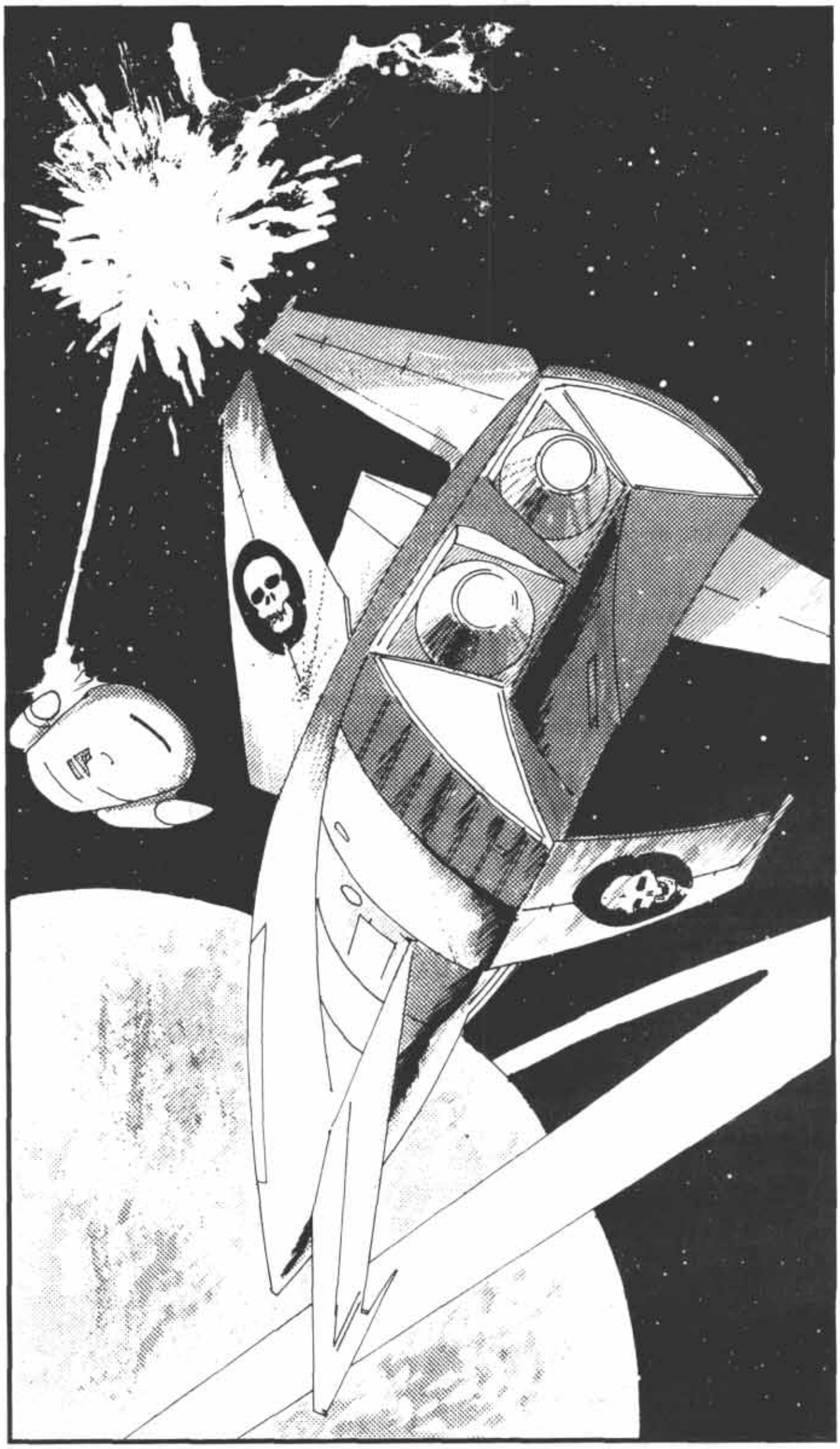
The essence of **Traveller** is the ability to move among the stars, and journey from one exotic location to another to meet the infinite possibilities that await there. This chapter provides the material to realize those journeys, to create and detail the worlds, and to portray how and why these journeys are conducted.

World Building allows players and referees to create the worlds of the Collapsed Imperium, the playing field of the New Era. Other **Traveller** products will cover the generation of many other sorts of worlds, but the worlds that are generated in this chapter will support any Star *Viking, Wilds, Pocket Empire, or Regency* campaign.

With the Imperial Collapse, much knowledge and information have been lost. PCs will spend much of their time opening the frontiers of knowledge, and rediscovering the secrets of that dead empire. The following sections detail how characters can explore these lonely worlds, and show how the referee can create the tremendous variety of animal life that can be encountered there.

Above all of these individual worlds is the force that can link them together, and which had almost been lost: the ability to travel in space. Whether moving from planet to planet or star to star, there are common principles that apply: principles of technology, physics, and economics. This chapter shows how characters use their ships to travel, how they keep their ships in running condition, and how they are able to economically support these adventures. A starship is a priceless commodity in the New Era, because it allows the movement of passengers and cargo from star to star, and there will always be a demand for these services. But beyond these lucrative possibilities, there is the most important reason of all. Progress, discovery, and growth require the ability to travel and seek out knowledge, whether it is new, or just temporarily lost.

The challenges are many; the rewards are incalculable.



World Building

GENERATING STAR SYSTEMS AND WORLDS

The Scout Service had the responsibility for the survey and mapping of the star systems of the Third Imperium. In the execution of their duties, the scouts established a standard format for referring to worlds. This format—the Universal World Profile (UWP)—provided essential information necessary for the identification of the characteristics, benefits, and hazards of specific worlds.

Most trade, commerce, and travel dealt with the main world in a star system. In most cases, the remainder of any system was essentially an undeveloped frontier. The mainworld was the single most important world in a system, and so Mainworld UWP data was the most widely distributed and used demographic and astrographic information in the Imperium.

Where fragmentary star charts are available, the old Third Imperium UWP data entries are often the only clue prospective explorers, traders, and first contact teams have as to the likelihood of life on the world.

The Imperial UWP Generation Flowchart (page 186) covers the procedures of generating pre-Collapse world information. This information, once generated, should usually be available to players. Additional information generated concerning the fate of the world after the collapse can only be learned by investigation: either conversations with traders who have visited the planet or by making an actual exploratory visit to the system.

Important Concepts and Definitions

The Imperial UWP Generation Flowchart (page 186) introduces several important concepts and terms concerning star systems in **Traveller**.

Basic and Extended Generation: There are two distinct approaches to star system generation. Basic Mainworld Generation allows the referee to focus on just the main world in the system in the interest of saving time. Extended System Generation allows the referee to create an entire star system detailing the system's star(s), planets, gas giants, moons, and planetoid belts.

Extended System Generation is designed to pick up where the basic procedure leaves off. Thus, extended generation allows you to put off completely detailing a star system until later, or it allows you to produce detailed star systems from existing **Traveller** star maps with a minimum of difficulty.

While the expanded method produces the most realistic adventure settings, it also requires a tremendous time commitment to generate all of a star system, complete with every attendant planet and satellite.

Universal World Profile (UWP): The Third Imperium made use of a series of letters and numbers called the Universal World Profile (UWP) to code the qualities and characteristics of a world. Because of the wide distribution of this information, its format is generally used by Travellers in the Wilds as a guide to habitable planets and likely caches of pre-Collapse technology. The codes for the UWP are explained in the UWP tables on pages 188-190.

Sectors and Subsectors: Human-explored space was grossly mapped into sectors, each measuring 32 parsecs by 40 parsecs. Each sector was further divided into 16 subsectors, each being an area of hexagonal cells measuring eight hexes by 10 hexes. Each hex covers one parsec (3.26 light-years). These Imperial astrographic conventions are still widely used.

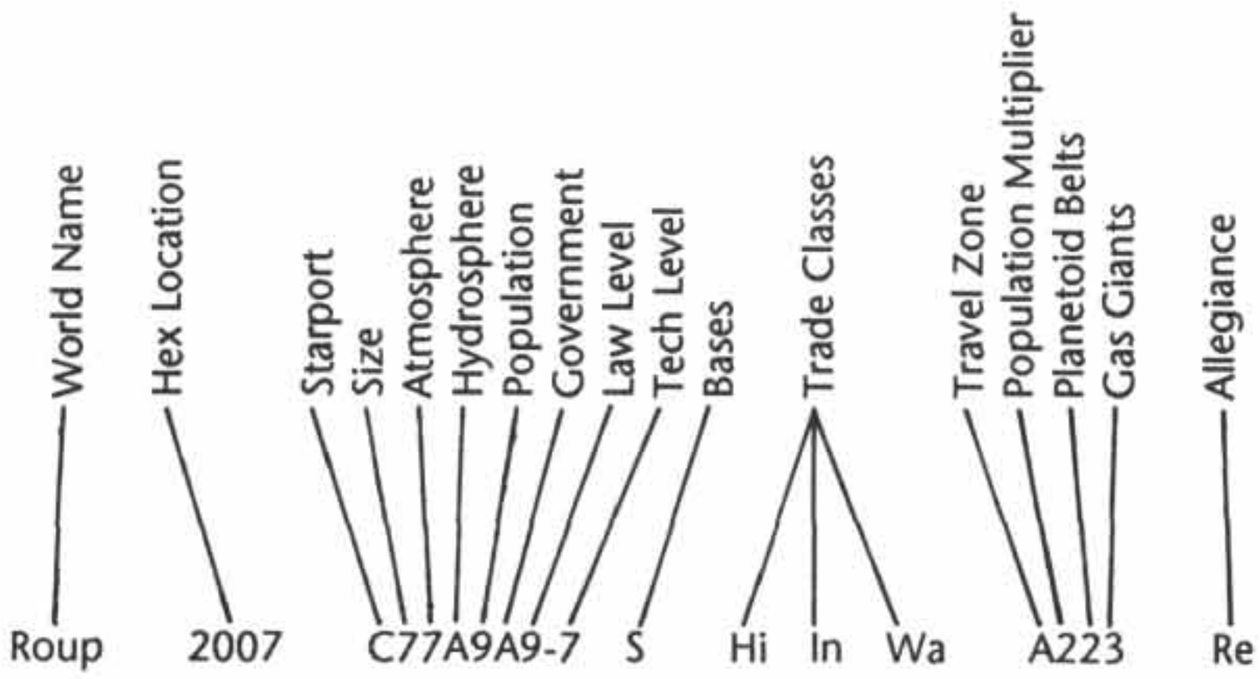
A subsector provides enough world and system data for an extended **Traveller** adventure; a sector is large enough to support an extended **Traveller** campaign.

Mapping subsectors consists of two sequences: star mapping and mainworld creation. When using a published **Traveller** subsector or sector map, the star mapping has already been done for you.

The Sample Blank Subsector Grid on page 183 is intended to be photocopied by the referee and filled in as worlds are generated. Additional copies can be made as mapping continues to other subsectors. See the four sample subsectors included in this book for examples.

The Imperial UWP Generation Flowchart (page 186) provides the steps you must follow to map a subsector and to generate old Imperial astrographic data about the system's mainworld. The Collapse Effects Determination sequence (page 190) provides the information necessary to de-

Universal World Profile



rive new social data for the world.

Star System Presence: The presence of a star system depends on a system density determined by the referee. The System Presence table (page 186) indicates various levels of probability for star systems. Once a system is determined to exist, its presence should be marked on the subsector grid map.

Starport Type: Many worlds have starports, and their presence is essential to interstellar trade and commerce. The various starport types provide a variety of facilities for use by space vessels.

Each system must be checked for its mainworld starport type; mark the system with the starport letter on the subsector map. Various starport probabilities exist depending on how well-travelled a subsector is.

Backwater: A backwater was an untravelled interstellar outback. Exploration has not found resources or novelties that would make this area an important trade route, and it has been bypassed by major trading companies. Examples: Reaver's Deep and many client state regions outside the Imperium.

Frontier: A frontier was a region on the borders of settlement and exploitation. Examples: Spinward Marches, Antares, Diaspora.

Mature: A mature region was a well-travelled region which had a history of civilization and well-established trade. Examples: Vland, Core.

Clustered: A clustered region was a well-travelled region, but some areas are bypassed, which concentrated and intensified the travel through certain key worlds. Examples: Old Expanses, Solomani Rim.

Bases: Stellar systems may have had bases for military forces, the navy, the scouts, or for other arms of interstellar government. If a base was present, it should be marked in the hex. You may elect to include other types of bases, perhaps army bases, merchant exploration or trade bases, and defense establishments. In all cases, these bases have long since been destroyed or fallen into disuse.

You may decide to make the base a naval depot to support large-scale naval activities, but there should be no more than one naval depot per sector.

You may also impose a scout way station at selected worlds along communication routes.

Scout way stations were never co-located with naval depots.

These bases were often targeted in the Civil War and may have suffered considerable damage. If largely intact, however, they may prove to be excellent sources of relic technology.

Gas Giants: A star system may have one or more gas giant planets. A gas giant is a large planet composed primarily of gaseous hydrogen and hydrogen compounds (similar to Jupiter or Saturn). Such planets may or may not have a solid core.

The most notable use for gas giants is in refuelling of spacecraft. The hydrogen atmosphere of gas giants may be skimmed by ships in order to fill their tanks and later use the material as fuel for their jump drives and powerplants. This eliminates fuel cost for the vessel and increases profit. It also allows refueling at systems that do not have starports. The system's hex is marked with the gas giant symbol if a gas giant is present.

Gas giants are generally divided into two sizes: large and small.

Large gas giants range in size from 60,000 kilometers in radius to perhaps 120,000 kilometers in radius. Small gas giants range from about 20,000 kilometers in radius to just under 60,000 kilometers in radius.

System Name: Each system is generally named for the primary world within the parsec.

Travel Zones: Most worlds were assumed to be civilized or at least amenable to travellers and visitors. Some, however, even before the Rebellion and Civil War, were caught in the throes of war, plagued by disease, or simply not ready for interstellar visitors. Such worlds were classified by travel zones to denote such status. Three such zone types exist: green, amber, and red.

Green travel zones indicated that no special hazards existed to travellers. Any unmarked world was a green travel zone by default.

Amber travel zones indicated that travellers should exercise caution when visiting such worlds. The amber code may have meant that the citizens of the world were xenophobic, that the political situation was chaotic, or that some other danger existed within the system.

Red travel zones usually indicated that a major danger existed within the system. This danger may have been disease, and the world may have been quarantined. The system might have been involved in a war, and surface or space battles may have been common. Red travel zones were also used to show a government edict prohibiting entry to the system or world. This may have been to protect a local civilization which was still developing and not yet ready for interstellar contacts or to protect valuable resources until the government could exploit them.

Now, of course, these travel zones have no relevance to the current situation on the world; their inclusion is purely for atmosphere.

Subsector Within a Sector

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

Although subsectors are named, they are routinely referred to by their letters from the above chart.

Communications Routes: Within the subsector, local governments established communications or trade routes connecting some (but not all) worlds. These routes served as a conduit for messages between businesses and between governments as well as between people. They also served as the basic routes that both liners and large freighters travel.

Examine the subsector map and connect key worlds with communications routes. Typically, express boat communications routes connected, or passed within, three hexes of worlds with type A or B starports.

If the subsector is an isolated community, the routes may not leave the map; if it is part of a larger confederation or empire, the routes will probably leave the edges to join with other parts of the sector. The referee also needs to distinguish between pre-Collapse communication routes (such as lines from the now-defunct xboat network) and current communication lines (such as common routes followed by Free Traders).

Communications routes should be carefully drawn so as to avoid making all parts of the subsector accessible; a subsector should reserve some areas as backwaters for exploration and adventure. Communications routes are drawn as single lines connecting hexes on the subsector grid.

The star map, once generated, shows the distribution of star systems in space and shows their relationships to each other in terms of relative distance and commercial spacelane connections.

Imperial UWP Creation

The term "world" refers to the various bodies that are contained in a stellar system; it encompasses planets, satellites, and asteroid belts. For example, the single most important world in a system may not be a planet; it could be a satellite of a gas giant or a planetoid within an asteroid belt.

This world creation process applies only to the single most important world in a star system; to generate additional details of the star system, see Extended System Generation (page 192).

The main world within a system is the single most important planet or satellite in the system: most often the world with the greatest population, the dominant local government type, and the star system's starport. It is almost invariably located in the star's life zone, that orbit which receives sufficient solar energy to sustain life, but not so much as to make the world unbearably hot.

In addition to the information generated here, each mainworld should be allocated at least one page (and preferably several) in a central notebook maintained by the referee. As characteristics are generated, they should be recorded along with the name of the world and its location (generally its subsector and hex number). Record any other data which may be pertinent: the types of terrain present on the planetary surface, unique encounter tables (prescribed by the section on animal encounters), data on flora and fauna, industrial or agricultural capacity, social structure and government, or possibly actual maps of the planetary surface.

The specific procedures for generating the mainworld are given on the Imperial UWP Generation flowchart (starting on page 186).

Atmosphere: The atmosphere code represents the breathing environment encountered on the world. Some atmospheres require specific personal equipment for survival and protection.

Vacuum or Trace Atmosphere: The atmosphere has a pressure of less than 0.1 atmospheres, which requires the use of a vac suit.

Very Thin Atmosphere: The atmosphere has a pressure of 0.1 to 0.42 atmospheres, which requires the use of a compressor to ensure sufficient oxygen.

Tainted Atmosphere: The atmosphere contains an unusual taint such as such as disease, a hazardous gas mix, pollutants, or sulfur compounds which requires the use of a filter mask. Tainted, very thin atmospheres require a combination respirator/filter mask for survival.

Thin Atmosphere: The atmosphere has a pressure of 0.43 to 0.70 atmospheres. The atmosphere is a standard oxygen/nitrogen mix, which is breathable without assistance.

Standard Atmosphere: The atmosphere has a pressure of 0.71 to 1.49 atmospheres. The atmosphere is a standard oxygen/nitrogen mix, which is breathable without assistance.

Dense Atmosphere: The atmosphere has a pressure of 1.50 to 2.49 atmospheres. The atmosphere is a standard oxygen/nitrogen mix, which is breathable without assistance.

Exotic Atmosphere: An unusual gas mix which requires the use of oxygen tanks, but protective suits are not needed.

Corrosive Atmosphere: A concentrated gas mix or unusual temperature creates a corrosive environment, which requires the use of a protective suit or vac suit.

Insidious Atmosphere: The atmosphere is similar to a corrosive atmosphere, but extreme conditions cause the corrosive effects to defeat any protective measures in two to 12 hours.

Dense, High Atmosphere: Pressure at or below sea level is too great to support life but is breathable at higher altitudes.

Ellipsoid: The world's surface is ellipsoidal, not spherical. Because the atmosphere remains spherical, surface atmospheric pressure ranges from very high at the middle to very low at the ends. Breathable bands may exist at some point within the range of pressure.

Thin, Low Atmosphere: The world is large and massive, with a thin atmosphere which settles to the lowest levels of the terrain. The atmosphere is unbreathable at most

altitudes except the very low ones (as in depressions or deep valleys).

Hydrosphere: For normal worlds, the hydrosphere will be water; on other worlds (with exotic, corrosive, or insidious atmospheres), it may be other liquids or fluids such as ammonia.

Some worlds with vacuum atmospheres may have hydrographic percentages greater than 0: The world has ice caps present; the water will not be free-standing liquid. A Desert World may have up to 4% free-standing water and still be considered a Desert World. Conversely, a Water World may have a 95% hydrosphere and still be considered a Water World.

Population Density: The following population densities are from 20th-century Earth. Earth has a population of 4 billion (Population Level 9), with five persons per square mile or 16 persons per square mile of land area. Europe is populated at about 151 persons per square mile, the equivalent of Population Level 10. The Netherlands contain 1500 persons per square mile, or about Population Level 11. Hong Kong has 10,000 persons per square mile, about Population Level 12.

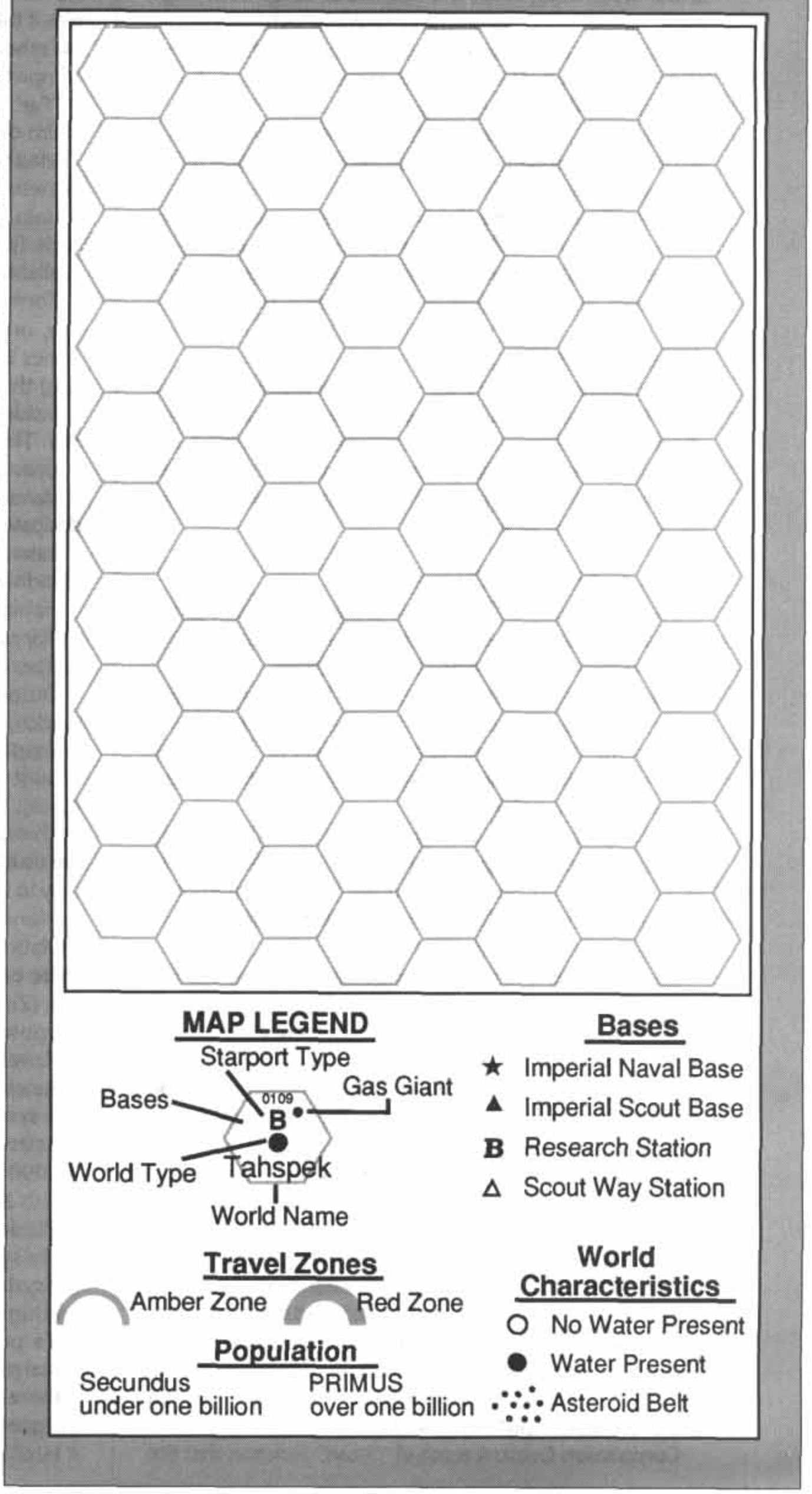
Government: Government types indicate the general type of authority; each listed type provides a guide to the referee for administering encounters on the world. The World Government table (page 188) describes characteristics of each government type. Balkanization is a special result which indicates that there is no world government; instead several rival territorial governments exist. In such cases, you should generate the specific qualities of each territory on the planet separately.

Law Level: Law level is an indication of the relative oppressiveness of the world. The digit is classified on the World Law Level table (page 189) to show prohibitions against weapons. It also influences the difficulty of the task used to avoid being harassed or arrested by local authorities (see the Encounters section, page 202).

The Law Level defines local restrictions on possession and use of weapons by individuals. The referee (or players) may find combinations of features which may seem contradictory or unreasonable. Common sense should rule. In such cases strive to generate a rationale which explains the situation.

Technological Level: The degree of technological expertise, and thus the capabilities of local industry, depends greatly on the basic characteristics of a world. World technological levels may vary from 0 to 20, more commonly ranging from 4 to 10. Higher numbers indicate greater capability.

Sample Blank Subsector Grid



The tech level of a world determines the type, quality, and sophistication of the products commonly available on a world in urban areas or near the starport. Large areas of the world away from the starport or away from large population centers may be one or even two tech levels lower.

Local citizenry will usually not be armed with weapons of a type which cannot be produced locally, but law enforcers or the military may be.

Tech level also indicates the general ability of local technology to repair or maintain items which have failed or malfunctioned.

Trade Classifications: Trade classifications are covered in more detail in the Trade and Commerce section, page 230.

Finally, you should always feel free to create worlds which have been deliberately (rather than randomly) generated.

Collapse Effects

The Collapse had a profound effect on the worlds of the Third Imperium. The Collapse Effects Determination flowchart (page 190) enables the referee to determine the new tech level, population number, starport type, government, and law level. These will require recalculation of trade categories as well.

Extended System Generation

Use the Extended System Generation flowchart (page 192) when you wish to completely detail a star system's entire complement of planets and satellites.

System Nature: Star systems may be solitary, having one central star, or multiple, having two or more stars. In an extreme situation, the star system may be quadruple, with two widely separated binary systems, each effectively a distinct system.

Primary Star Type: Star types range through a variety of spectral types using the codes O B A F G K M. These letters indicate in descending order the temperature of the stars. (A mnemonic for remembering this sequence is "Oh, Be A Fine Girl/Guy, Kiss Me.")

Spectral types O and B are extremely rare and will not normally be encountered. You may establish an O or B type star when and where necessary (although there should not be more than one or two type O or B stars in a sector).

Spectral Decimal Classification: The spectral type for stars is usually further specified by a decimal classification (using the digits 0 to 9). Thus a type F1 star is one-tenth of the way between F and G, while a type F9 is nine-tenths of the way to G. All stars are treated this way with the exception of type O, which ranges from 5 to 9 only, and luminosity class D (degenerate) stars, which need not have any decimal classifications. (Note that there are a large number of published sectors that do have decimal classifications assigned to class D stars. There is no need to delete these, only to remember that the decimal classifications are irrelevant: an M1 D or an M8 D are both "DM" on the chart on page 193.)

Companion Orbit: A result of "close" indicates that the companion star is effectively touching the primary star; its orbit is so very close to the primary that it has practically no effect on orbits of planets. Other results on the column indicate the planetary orbit which the companion star occupies. If the planetary orbit for a companion is coded as within the sphere of the primary star on the table of zones, then the companion orbit is changed to close.

"Far" indicates that the companion star is outside the realm of the primary star's system.

Maximum Orbits: Orbits for planets, gas giants, and planetoid belts are available around the primary star and certain eligible companion stars. The Maximum Orbits table (page 192) indicates the highest numbered orbit available for the star.

Zones: The orbits around a star are classified as inside star, unavailable, inner, habitable, and outer. The Orbit Zones tables (page 193) indicate (for each star type and size) the orbit number and its zone classification.

Inside star orbits are physically inside the sphere of the star. They cannot be occupied by planets.

Unavailable orbits are subject to intense heat from the star: A planet in such an orbit would be converted to vapor and dissipated. Such orbits cannot be occupied by planets.

Inner zone orbits expose worlds to relatively large amounts of radiation, and such worlds are hot and inhospitable.

Habitable zone orbits are in a temperate region where stellar radiation is neither too much nor too little. If other factors are right, life may exist on worlds in this region.

Outer zone orbits do not provide enough radiation for worlds, and they are cold and inhospitable.

Empty Orbits: These have no planets in them (although a companion star already placed in one remains there). They may be empty because of ancient collisions or through other effects of worlds and stars. Empty orbits are usually indicated as empty when describing a system, if only to show that no oversight was made in listing contents.

Planetoids: Planetoid belts (or asteroid belts) are accumulations of small chunks of rock or ice not large enough to be called planets. In basic system generation, a world size (Zero) is used to designate an asteroid belt. For the purposes of distinction, the term "asteroid belt" describes a planetoid belt which is also the mainworld in a system; "planetoid belt" refers to any other group of planetoids in a system.

Asteroid and planetoid belts hold between 1000 and 10,000 asteroids or planetoids each. Asteroids and planetoids are generally under 200 kilometers in diameter.

Placing Known Components: Once the components of the system are determined, they must be placed within the system. The flowchart calls for component placement among the available orbits to be done randomly.

To perform the random selection of an orbit, assign equal probability to each available orbit, and roll one die. If there are six or fewer candidate orbits, one number is assigned to each orbit; extra or unused numbers indicate a reroll is required.

If there are more than six candidate orbits, divide the orbits evenly into two, three, or more groups (each of six or fewer candidate orbits), and roll a die to first determine which group the known component should be placed in. Then, the actual choice within the group may be randomly made using another die roll.

Planet Generation: Planets outside the habitable zone are produced in a fashion very similar to those in the habitable zone, but various modifications are included for orbital position and other details.

Satellites: For the purposes of this system, satellites produced are at least 200 kilometers in diameter; potentially any planet may have one or more satellites (captured planetoids) less than 200 kilometers in diameter.

Subordinate Government: Subordinate governments reflect the small, relatively powerless governments which can exist off the mainworld. Nevertheless, such subordinate governments may wield great power on their own territory.

Subordinate Facility: Possible subordinate facilities include farming, mining, colony, research laboratory, and military base.

Farming indicates that the world supports agriculture and is exploited to produce farm products.

Mining indicates the world or satellite has recoverable ores and is being exploited for industrial reasons.

Colony indicates that a settlement has been established on the world or satellite. A colony may represent any of several types of establishment, including a model or demonstration settlement, a penal or deportation colony, or simply a group intent on settling and exploiting new territory.

Research laboratory indicates that a scientific establishment has been located on the world or satellite. A research lab may be operated under the control of the government, or it may be privately operated.

Military base indicates that the world or satellite has a military force stationed on it. The military force is generally non-naval: It is an army or marine troop establishment. Often, a military base can be noted with the symbol M in the base column of the statistics for the system, as well as with a comment in the remarks area. If, however, naval or scout bases are already present on the world, then no symbol for the military base should be used, and it should be noted in the remarks instead.

Scout and Naval Base Components: Both scout bases and naval bases are always assumed to have components at the major starport (the starport on the main world) in the system. However, you may elect to establish components of scout or naval bases throughout the system. The chart explains how to do this.

Spaceport: The major traffic center in the system is the starport; all others are called spaceports. While it is possible for spaceports to accept starships, they are called (if only for convenience and for terminology) spaceports.

Naming System Bodies: In any system, the name used for identification is the name of the mainworld.

World Naming Conventions

A system carries two names: the name of its star and the name of its mainworld. Of the two, the mainworld name is more important and is more frequently encountered.

The other worlds within a system carry their own names, but they are just as often referred to in terms of their position with relation to their star.

Conventions: The Imperial world naming conventions were established during the Rule of Man, when Second Imperium scout ships thoroughly mapped the star systems and planets of the conquered First Imperium. Since the Second Imperium was directly formed from the Terran Confederation Navy, it seemed only natural that Terran conventions should be used.

Planets were identified by Greek letters, with the innermost planet labeled Alpha.

Satellites were identified by Anglic letters, with the innermost satellite identified as Ay.

For example, Terra is commonly known as Terra. It is also technically Sol Delta (Sol's orbit zero is empty). Luna, as Terra's only satellite, is Sol Delta Ay.

No.	*Greek*	*Anglic*
0	Alpha	Ay
1	Beta	Bee
2	Gamma	See
3	Delta	Dee
4	Epsilon	Ee
5	Zeta	Eff
6	Eta	Gee
7	Theta	Aitch
8	Iota	Eye
9	Kappa	Jay
10	Lambda	Kay
11	Mu	Ell
12	Nu	Em
13	Xi	En
14	Omicron	Oh
15	Pi	Pee
16	Rho	Cue
17	Sigma	Are
18	Tau	Ess
19	Upsilon	Tee
20	Phi	You
21	Chi	Vee
22	Psi	Double-You
23	Omega	Eks
24	—	Wye
25	—	Zee

IMPERIAL UNIVERSAL WORLD PROFILE (UWP) GENERATION

1. System Presence

For all hexes within a subsector, determine which hexes have a system present based on the referee-mandated stellar density.

System Density

Density	Density Percentage	Roll per subsector hex
Rift	4%	12+ on 2D6
Sparse	16%	6+ on 1D6
Scattered	33%	5+ on 1D6
Standard	50%	4+ on 1D6
Dense	66%	3+ on 1D6

2. System Details

For each system, generate the details of the mainworld.

3. Mainworld Starport

Roll 2D6 to determine the mainworld starport type based on how well-travelled this particular subsector is.

Starport Type

2D6	Backwater	Standard	Mature	Cluster
2	A	A	A	A
3	A	A	A	A
4	B	A	A	A
5	B	B	B	A
6	C	B	B	B
7	C	C	C	B
8	C	C	C	C
9	D	D	D	C
10	E	E	E	D
11	E	E	E	E
12	X	X	E	X

The referee must select the nature of the mainworld system and then roll on the appropriate column.

Backwater is out of the mainstream of interstellar culture and communication.

Standard is the expected norm.

Mature is an older, more established system.

Cluster has many worlds close together.

4. World Size

Roll 2D6–2 for world size.

Roll 1D6 and consult Planetary Density table (page 190).

Using size and density, determine surface gravity.

5. Atmosphere

Roll 2D6–7+world size for atmosphere.

If world size is 0, then atmosphere is 0.

6. Hydrographics

Roll 2D6–7+world size for hydrographics.

If world size is 1 or less, hydrographics is 0.

If atmosphere is 1 or less, or A or more, apply DM–4.

7. Population

Roll 2D6–2 for population.

8. Government

Roll 2D6–7+population for government.

9. Law Level

Roll 2D6–7+government for law level.

10. Technology Level

Roll 1D6 and add the technology DMs for all possible characteristics of the mainworld in order to determine its technology level.

Technology Level Die Modifiers

Level	Starport	World Size	Atmosphere	Hydrographics	Population	Government
0		+2	+1	—	—	+1
1		+2	+1	—	+1	—
2		+1	+1	—	+1	—
3		+1	+1	—	+1	—
4		+1	—	—	+1	—
5		—	—	—	+1	+1
6		—	—	—	—	—
7		—	—	—	—	—
8		—	—	—	—	—
9		—	—	+1	+2	—
A	+6	—	+1	+2	+4	—
B	+4		+1			—
C	+2		+1			—
D	—		+1			–2
E	—		+1			–1
F	+1		+1			–1
X	–4					

Determine all possible die modifiers from this table, and apply them to a throw of 1D6. The result is the mainworld's technology level. Treat adjusted die rolls of less than 0 as 0.

The maximum possible adjusted roll for technology level is 20 (Starport A, World Size 1, Atmosphere 3, Population A, Government 5); the minimum possible is 0.

11. Scout and Naval Bases

Determine the types of bases in the system.

Imperial naval bases support the operations of interstellar naval units. Imperial Scout bases support the operations of the Imperial Interstellar Scout Service.

Non-Imperial military bases undertake some or all of the functions of Imperial Naval and Scout bases.

Base Presence

Starport	Imperial Naval Base	Imperial Scout Base	Non-Imperial Military Base
A	8+ on 2D6	10+ on 2D6	10+ on 2D6
B	8+ on 2D6	9+ on 2D6	9+ on 2D6
C	—	8+ on 2D6	8+ on 2D6
D	—	7+ on 2D6	—

Bases are not present at type E and X starports.

Codes: Use the following letter codes to denote bases:

N. Imperial naval base.

S. Imperial scout base.

A. Imperial naval base and scout base both present.

B. Imperial naval base and scout way station both present (a way station is an extensive Scout base).

M. Non-Imperial military base.

12. Trade Classifications

Analyze all characteristics of the mainworld and determine its trade classifications.

TRADE CLASSIFICATIONS

Code	Size	Atmosphere	Hydrographics	Population	Government	Law Level	Code Definition
Ag	—	4-9	4-8	5-7	—	—	Agricultural
As	0	0	0	—	—	—	Asteroid
Ba	—	—	—	0*	0	0	Barren
De	—	2+	0	—	—	—	Desert
Fl	—	A-C	1+	—	—	—	Fluid Oceans
Hi	—	—	—	9+	—	—	High Population
Ic	—	0-1	1+	—	—	—	Ice-Capped
In	—	2-4,7,9	—	9+	—	—	Industrial
Lo	—	—	—	4–	—	—	Low Population
Na	—	0-3	0-3	6+	—	—	Nonagricultural
Ni	—	—	—	0*-6	—	—	Nonindustrial
Po	—	2-5	0-3	—	—	—	Poor
Ri	—	6,8	—	6-8	4-9	—	Rich
Va	—	0	—	—	—	—	Vacuum
Wa	—	—	A	—	—	—	Water World

Determine all possible trade classifications from this table. However, an Asteroid Belt (As) is automatically a Vacuum World, and need not have the Va code. Asian worlds are Rich (Ri) without regard to government type. A Vargr world is disqualified from the Rich classification if it is government type 7. No world in the Wilds ("Wi" allegiance code) may be a Rich world.

*For Barren world, population multiplier must be 0. For Nonindustrial, population multiplier must be 1+.

13. Supplemental Remarks

Determine if the mainworld merits any supplemental remarks. Supplemental remarks are imposed by the referee after considering the general circumstances of the world. Supplemental remarks include:

An. Ancients' Site. A high-tech remnant of the now-vanished Ancients.

Cp. Subsector Capital. The capital of the local region.

Cx. Sector or Regional Capital. The capital of the local sector.

Ex. Exile Camp. A dumping ground for political dissidents.

Mr. Military Rule. A world under overall control of the local military (regardless of government type).

Pr. Prison Camp. A prison for criminals.

Rs. Research Station. An experimental facility.

Xb. Xboat Station. An Imperial facility for rapid message transmission.

14. Population Multiplier

Determine the population multiplier for the mainworld.

Roll 1D10. For population codes of 1+, ignore and reroll a result of 10. For population codes of 0, treat a roll of 10 as "0"; world is uninhabited.

15. Gas Giants

Roll 5+ on 2D6 to determine if gas giants exist in the system.

If gas giants exist, determine how many from the Gas Giant Quantity table.

GAS GIANT QUANTITY

2D6	Quantity
2	1
3	1
4	2
5	2
6	3
7	3
8	4
9	4
10	4
11	5
12	5

16. Planetoid Belts

Roll 8+ on 2D6 to determine if planetoid belts exist in the system.

If planetoid belts exist, determine how many from the Planetoid Belt Quantity table.

PLANETOID BELT QUANTITY

2D6	Quantity
2	1
3	1
4	1
5	1
6	1
7	2
8	2
9	2
10	2
11	2
12	3

17. Travel Zones

Determine if the world presents any dangers or apparent dangers to travellers. Travel zones are imposed by the referee after considering the general circumstances of the world. There are three travel zone codes:

Green. No danger. Green travel zones are not usually stated.

Amber. Caution. Circumstances dictate caution because of local, natural, or social conditions.

Red. Danger. Access to the world is prohibited.

Class X starports are almost always red zones. Amber and red zones are also imposed by the referee.

The combination of High government and law level also produces the following travel zones.

TRAVEL ZONE MATRIX

Govt Type	Law Level G	H	J	K	L
A	—	—	—	—	A
B	—	—	—	A	A
C	—	—	A	A	A
D	—	A	A	A	R
E	—	A	A	R	R
F	A	A	R	R	R

A: Amber Zone. R: Red Zone.

UNIVERSAL WORLD PROFILE TABLES

World Size

Code	General Description	Minimum Diameter	Maximum Diameter
R	Asteroid/Planetoid Ring	Multiple Bodies	Under 1 km
S	Very Small (400 km)	200 km	799 km
0	Asteroid/Planetoid Belt	Multiple Bodies	Under 200 km
1	Small (1600 km)	800 km	2399 km
2	Small (Luna; 3200 km)	2400 km	3999 km
3	Small (Mercury; 4800 km)	4000 km	5599 km
4	Small (Mars; 6400 km)	5600 km	7199 km
5	Medium (8000 km)	7200 km	8799 km
6	Medium (9600 km)	8800 km	10,399 km
7	Medium (11,200 km)	10,400 km	11,999 km
8	Large (Terra; 12,800 km)	12,000 km	13,599 km
9	Large (14,400 km)	13,600 km	15,199 km
A	Large (16,000 km)	15,200 km	16,799 km
SGG	Small Gas Giant (40,000 km)	20,000 km	59,999 km
LGG	Large Gas Giant (90,000 km)	60,000 km	120,000 km

R: A Ring orbits a world.
S: A small body orbits a world or star.
0: A planetoid or asteroid orbits a star.

World Atmosphere

Code	General Description	Minimum Pressure	Maximum Pressure
0	Vacuum	—	0.00
1	Vacuum (trace)	0.001	0.09
2	Vacuum (very thin tainted)	0.10	0.42
3	Vacuum (very thin)	0.10	0.42
4	Thin (tainted)	0.43	0.70
5	Thin	0.43	0.70
6	Standard	0.71	1.49
7	Standard (tainted)	0.71	1.49
8	Dense	1.50	2.49
9	Dense (tainted)	1.50	2.49
A	Exotic	Varies	Varies
B	Exotic (corrosive)	Varies	Varies
C	Exotic (insidious)	Varies	Varies
D	Exotic (dense, high)	Varies	Varies
E	Exotic (thin, low)	Varies	Varies
F	Exotic (ellipsoid)	Varies	Varies

Vacuum requires a vac suit. Tainted requires a filter mask. Very thin requires a respirator. Very thin tainted requires a combination respirator/filter mask.

World Hydrographics

Code	General Description	Minimum	Maximum
0	Desert World (0%)	0%	4%
1	Dry World (10%)	5%	14%
2	Dry World (20%)	15%	24%
3	Wet World (30%)	25%	34%
4	Wet World (40%)	35%	44%
5	Wet World (50%)	45%	54%
6	Wet World (60%)	55%	64%
7	Wet World (70%)	65%	74%
8	Wet World (80%)	75%	84%
9	Wet World (90%)	85%	94%
A	Water World (100%)	95%	100%

World Population

Code	General Description	Minimum Population	Maximum Population
0	Inc (less than 10)	0	9
1	Inc (tens)	10	99
2	Inc (hundreds)	100	999
3	Low (thousands)	1000	9999
4	Low (ten thousands)	10,000	99,999
5	Low (hundred thousands)	100,000	999,999
6	Mod (millions)	1,000,000	9,999,999
7	Mod (ten millions)	10,000,000	99,999,999
8	Mod (hundred millions)	100,000,000	999,999,999
9	High (billions)	1,000,000,000	9,999,999,999
A	High (ten billions)	10,000,000,000	99,999,999,999

World Government

Code	General Description
0	**No Government Structure.** In many cases, family bonds predominate.
1	**Company/Corporation.** Government by a company managerial elite; citizens are company employees.
2	**Participating Democracy.** Government by advice and consent of the citizen.
3	**Self-Perpetuating Oligarchy.** Government by a restricted minority, with little or no input from the masses.
4	**Representative Democracy.** Government by elected representatives.
5	**Feudal Technocracy.** Government by specific individuals for those who agree to be ruled. Relationships are based on the performance of technical activities which are mutually beneficial.
6	**Captive Government/Colony.** Government by a leadership answerable to an outside group; a colony or conquered area.
7	**Balkanization.** No central ruling authority exists; rival governments compete for control.
8	**Civil Service Bureaucracy.** Government by agencies employing individuals selected for their expertise.
9	**Impersonal Bureaucracy.** Government by agencies which are insulated from the governed.
A	**Charismatic Dictator.** Government by a single leader enjoying the confidence of the citizens.
B	**Non-Charismatic Leader.** A previous charismatic dictator has been replaced by a leader through normal channels.
C	**Charismatic Oligarchy.** Government by a select group, organization, or class enjoying overwhelming confidence of the citizenry.
D	**Religious Dictatorship.** Government by a religious minority which has little regard for the needs of the citizenry.
E	**Religious Autocracy.** Government by a single religious leader having absolute power over the citizenry.
F	**Totalitarian Oligarchy.** Government by an all-powerful minority which maintains absolute control through widespread coercion and oppression.

World Law Level

Code	General Description
0	No law (no prohibitions).
1	Low law (body pistols, explosives, poison gas prohibited).
2	Low law (portable energy weapons prohibited).
3	Low law (machineguns, automatic rifles prohibited).
4	Moderate law (light assault weapons prohibited).
5	Moderate law (personal concealable weapons prohibited).
6	Moderate law (all firearms except shotguns prohibited).
7	Moderate law (shotguns prohibited).
8	High law (blade weapons controlled; no open display).
9	High law (weapon possession outside the home prohibited).
A	Extreme law (weapon possession prohibited).
B	Extreme law (rigid control of civilian movement).
C	Extreme law (unrestricted invasion of privacy).
D	Extreme law (paramilitary law enforcement).
E	Extreme law (full-fledged police state).
F	Extreme law (all facets of daily life rigidly controlled).
G	Extreme law (severe punishment for petty infractions).
H	Extreme law (legalized oppressive practices).
J	Extreme law (routinely oppressive and restrictive).
K	Extreme law (excessively oppressive and restrictive).
L	Extreme law (totally oppressive and restrictive).

Technology Level

Code	General Description	Approximate Historical Equivalent
0	Pre-Industrial (primitive)	Stone Age
1	Pre-Industrial (bronze, iron)	Middle Ages
2	Pre-Industrial (printing press)	Circa 1600
3	Pre-Industrial (basic science)	Circa 1800
4	Industrial (internal combustion)	Circa 1900
5	Industrial (mass production)	Circa 1930
6	Pre-Stellar (nuclear power)	Circa 1950
7	Pre-Stellar (mini. electronics)	Circa 1970
8	Pre-Stellar (superconductors)	Circa 1990
9	Early Stellar (fusion power)	Circa 2010
A	Early Stellar (jump drive)	Circa 2100
B	Average Stellar (large starships)	
C	Average Stellar (sophisticated robots)	
D	Average Stellar (holo data storage)	The Imperium
E	High Stellar (antigrav cities)	
F	High Stellar (anagathics)	
G	High Stellar (global terraforming)	
H	Extreme Stellar	
J	Extreme Stellar	
K	Extreme Stellar	
L	Extreme Stellar	The Ancients

Starports

Type	Quality	Shipyards	Repair	Fuel
A	Excellent	Starships	Overhaul	Refined
B	Good	Spacecraft	Overhaul	Refined
C	Routine	—	Major Damage	Unrefined
D	Poor	—	Minor Damage	Unrefined
E	Frontier			
X	None			

Starports are established primarily to foster interstellar trade and commerce.

Spaceports

Type	Quality	Shipyards	Repair	Fuel
F	Good	—	Minor Damage	Unrefined
G	Poor	—	Superficial	Unrefined
H	Primitive			
Y	None			

Spaceports are established primarily to foster in-system travel.

World Physical Data

UWP	Code Size	Digit Size	Code Atmosphere	Digit Atmosphere	Code Hydrographics	Digit Hydrographics
0	Asteroid	Asteroid Belt	Vacuum	Vacuum	Desert	0% water
1	Small	1600 km	Vacuum	Vacuum (trace)	Dry World	10% water
2	Small	3200 km	Vacuum	Very Thin (tainted)	Dry World	20% water
3	Small	4800 km	Vacuum	Very Thin	Wet World	30% water
4	Small	6400 km	Thin	Thin (tainted)	Wet World	40% water
5	Medium	8000 km	Thin	Thin	Wet World	50% water
6	Medium	9600 km	Standard	Standard	Wet World	60% water
7	Medium	11200 km	Standard	Standard (tainted)	Wet World	70% water
8	Large	12800 km	Dense	Dense	Wet World	80% water
9	Large	14400 km	Dense	Dense (tainted)	Wet World	90% water
A	Large	16000 km	Exotic	Exotic	Water World	100% water
B			Exotic	Corrosive		
C			Exotic	Insidious		
D			Exotic	Dense (high)		
E			Exotic	Ellipsoid		
F			Exotic	Thin (low)		

This table shows the UWP digit for the physical data for worlds, and provides both the code meaning from the **Players' Manual** and the UWP digit meaning from the world generation systems in the **Referee's Manual**.

World Horizons

Diameter	Range to Horizon
1,600 (1)	1.8 km
3,200 (2)	2.5 km
4,800 (3)	3.1 km
6,400 (4)	3.6 km
8,000 (5)	4.0 km
9,600 (6)	4.4 km
11,200 (7)	4.7 km
12,800 (8)	5.1 km
14,400 (9)	5.4 km
16,000 (A)	5.7 km

World Density (Roll 1D6)

1D6	Density
1	Low
2-4	Average
5-6	High

–2 from die if world is in outer zone. Modified roll of less than 1 are treated as 1. (Note: all mainworlds are in the habitable zone; this die roll modifier is only used in conjunction with extended system generation.)

World Gravity Table

Diameter	Density: Low	Avrg	High
1600 (1)	.10	.15	0.3
3200 (2)	.15	.25	0.5
4800 (3)	.30	.40	0.8
6400 (4)	.35	.50	1.0
8000 (5)	.45	.60	1.2
9600 (6)	.55	.80	1.6
11,200 (7)	.60	.90	1.8
12,800 (8)	.70	1.0	2.0
14,400 (9)	.70	1.1	2.2
16,000 (A)	.80	1.3	2.6

Surface Gravity	Jump/Throw
0.10	3.00
0.15	2.50
0.20	2.25
0.25	2.00
0.30	1.80
0.35	1.70
0.40	1.60
0.45	1.50
0.50	1.40
0.55	1.35
0.60	1.30
0.70	1.20
0.80	1.10
0.90	1.05
1.00	1.00
1.10	.95
1.20	.90
1.30	.88
1.40	.85
1.60	.80
1.80	.75
2.0	.71
2.2	.67
2.4	.65
2.6	.62

COLLAPSE EFFECTS DETERMINATION

Some worlds were spared the effects of the Collapse, and others have been assisted in their recovery. The vast majority of the worlds of the Third Imperium, however, suffered the full effects of the Collapse. These tables are used for worlds in the Wilds. Worlds in the Spinward States have been spared these effects as discussed earlier, and worlds in the Reformation Coalition have already begun their recoveries. Worlds in pocket empires have also been spared the worst of these effects, as ruled by the referee.

1. Maximum Sustainable Population (MSP)

This determines the maximum sustainable population without the assistance of technologically advanced life support. Populations which had their life support interrupted for only relatively short periods of time (days or weeks) will succumb to the effects of particularly harsh environments before the necessary recovery or repairs can be made. If the atmosphere is 0, 1, 2, 3, A, B, or C, human life is not possible and the world is uninhabited: Reduce the UWP population code and population multiplier each to 0. Given any other atmosphere, the base maximum sustainable population code is A, reduced for environmental factors as shown below. If the UWP population code is reduced, re-roll the new population multiplier on 1D10.

Factor	Modification
Size	
Size 5-7	–1
Size 1-4	–2
Atmosphere	
Atmos 5, 7, 9	–1
Atmos 4	–2
Atmos D, E, F	–3
Hydrographics	
Hydro 1, 2, A	–1
Hydro 0	–2

2. Tech Level Decline

Consult the table below to determine how many dice are rolled. Roll the dice, add the result, and subtract that from the world's tech level.

Starting Tech Level	Decline
0-8	1D6-3
9-A	1D6
B-D	2D6
E+	3D6

3. Actual Population

Actual population is either the pre-Collapse population or the MSP derived in step 1 above, whichever is lower, modified downward for the extent of technological collapse. Divide the total levels of technological decline (from step 2) by 4, rounding fractions to the nearest whole number. Reduce the population multiplier by this number. When 1 is subtracted from a population multiplier of 1, reduce the population code by 1, and the new population multiplier becomes 9. For example, a world with a population code of 7 and a population multiplier of 2 loses 10 tech levels in step 2. 10÷4=2.5, which is rounded to 3. Subtracting 3 population multipliers from the world's population gives a new population code of 6 and population multiplier of 8.

4. Low Population

Some levels of population are too low to maintain social or even population levels on an isolated world. If the population *code* after step 3 is 5 or less, reduce the world's tech level by one more level. In addition, cut the population multiplier in half to get the final post-Collapse population. (A population multiplier of 1 when cut in half becomes 5 at the next lower population code.)

5. Starport

If a starport was present before, it may have survived in some form. Roll 1D6. If the result is greater than the tech level decline, the starport survives but is reduced by one facility level. (A becomes B, etc.) If the roll is equal to the tech level decline, the starport survives but is reduced by two facility levels (A becomes C, etc.). If the roll is less than the tech level decline, or if the mandated decline reduces the starport code to X, the starport is completely ruined and no longer in use.

Whenever the population of a world is reduced to 0, the starport is reduced to X.

6. Bases

If a starport is reduced by more than two levels, or reduced to X, any bases on the world are destroyed as well. If a starport is reduced by only one level, roll 1D10 for each base. Naval bases survive on 9-10 and are destroyed on 1-8. Scout bases survive on 8-10 and are destroyed on 1-7. Naval depots and Scout Way stations only survive on 10.

7. Government

First, determine if the world is balkanized. Add the world size and population code and subtract the tech level to determine the balkanization number. Roll 2D6; if the number rolled is equal to or less than the balkanization number, the world is balkanized. In this case, the government type rolled is the dominant government on the world, although other types may exist as well. Balkanized worlds are noted with a "B" in the Travel Zone column of the UWP.

Second, if the world's population code is 5+, determine the presence of Technologically Elevated Dictators (TED). Find the total number of tech levels lost in step 2, and roll 1D10. If the roll is less than the number of tech levels lost, the world's government automatically becomes code 6 (Technologically Elevated Dictator).

If the roll is equal to or greater than the tech level decline, or if the world's population code is 4 or less, roll for the new government as follows:

Roll 2D6–7+population code = new government code.

Worlds in the Wilds use the "Wi" code in the Allegiance column to show which government description to use.

Government Types in the Wilds

Code	*General Description*
0	**No Government Structure.** In many cases, family bonds predominate.
1	**Tribal Government.** Autonomous clans exert limited control over areas of territory. Most decision making is by consensus.
2	**Participating Democracy.** Government by advice and consent of the citizen.
3	**Representative Democracy.** Government by elected representatives.
4	**Charismatic Dictator.** Government by a single leader enjoying the confidence of the citizens.
5	**Charismatic Oligarchy.** Government by a select group, organization, or class enjoying overwhelming confidence of the citizenry.
6	**Technologically Elevated Dictator (TED).** A leader holds power by virtue of caches of technologically advanced weaponry
7	**Mystic Dictatorship.** Government by a religious or psionic minority which has little regard for the needs of the citizenry.
8	**Totalitarian Oligarchy.** Government by an all-powerful minority which maintains absolute control through widespread coercion and oppression, often by use of pre-Collapse technology.
9	**Mystic Autocracy.** Government by a single religious or psionic leader having absolute power over the citizenry.
A	**Civil Service Bureaucracy.** Government by agencies employing individuals selected for their expertise.
B	**Self-Perpetuating Oligarchy.** Government by a restricted minority, which holds power by virtue of economic or technological monopolies, with little or no input from the masses.
C	**Impersonal Bureaucracy.** Government by agencies which are insulated from the governed.

8. Law Level

Roll 2D6–7+government for law level. If government is Type 6 (Technologically Elevated Dictator), add an additional +4 to this die roll.

If the world was determined in step 7 to be balkanized, this is naturally the law level of the dominant government.

9. Population Recovery

Populations may recover in the 70 years between the Collapse and the New Era. Population codes of 5 or less should not increase, but codes of 6+ will usually do so. The rate at which these increase is up to the referee based on local conditions which determine the annual growth rate. The table below shows several typical annual growth rates along with the time it takes for a population to double at that growth rate, and the total increase of a population after 70 years of that growth rate.

Annual Growth Rate	*Time to Double*	*Increase after 70 years*
0.5%	—	Population×1.4
1.0%	70 years	Population×2
1.5%	46 years	Population×2.8
2.0%	35 years	Population×4

These increases are used to multiply the population multiplier. However, sufficient increase in the population multiplier will also increase the code. For example, a world with a population code of 7 and multiplier of 8 which experienced 70 years of 1% annual population growth would have a final population code of 8, and multiplier of 2 (80 million×2=160 million, rounded to 200 million).

EXTENDED SYSTEM GENERATION

1. System Presence

For all hexes within a subsector, determine which hexes have a system present, based on the referee-mandated stellar density.

This system may be a mainworld already generated by Basic Mainworld Generation.

Allegiance: An allegiance may have been specified for the system by previous mapping data or by the referee. If there is no allegiance for the system, the referee must determine it.

System Density

Density		*Throw per subsector hex*
Rift	(4%)	12+ on 2D6
Sparse	(16%)	6+ on 1D6
Scattered	(33%)	5+ on 1D6
Standard	(50%)	4+ on 1D6
Dense	(66%)	3+ on 1D6

2. System Details

For each system present, generate the details of the entire system.

3. System Nature

Roll 2D6 to determine the nature of the star system.

System Nature

2D6	*Nature*
2	Solo
3	Solo
4	Solo
5	Solo
6	Solo
7	Solo
8	Binary
9	Binary
10	Binary
11	Binary
12	Trinary

Solo has one star. Binary has two stars. Trinary has three stars.

Later developments may return to this table to create a quadruple system. Use DM –1 when returning to this table for a far companion.

4. Primary Star Type and Size

Roll 2D6 to determine the primary star type; then roll 2D6 for the star's luminosity class.

Primary Star Type and Luminosity Class

2D6	*Type*	*Lum. Class*
2	A	II
3	M	III
4	M	IV
5	M	V
6	M	V
7	M	V
8	K	V
9	G	V
10	G	V
11	F	V
12	F	V

DMs For Type and Size: If a mainworld has already been created, and mainworld Atmosphere 4-9 or Population 8+, DM+5.

Type O and B stars, and class Ia and Ib stars, are extremely rare; the referee should establish when they occur (but never more than one or two per sector).

Type M stars may never be class IV. Treat result of class IV as class V.

5. Decimal Classification

Determine the specific decimal classification of the star (ranging from 0 to 9).

1. Roll 1D10 and treat a roll of 0 as 0 (instead of 10).

2. Add the single digit produced to the star type letter. For example, if the digit produced was 3, and the star type generated was G, the star type becomes G3.

Note: There are no O0 through O4 stars; reroll these results.

Type K IV stars may not have a decimal classification of 5+. Reroll all results other than 0-4.

6. Companion Star Type and Size

If the system nature was binary or trinary, roll 2D6 to determine the companion star type; then roll 2D6 for the star's luminosity class.

Companion Star Type and Class

2D6	*Type*	*Lum. Class*
4	A	II
5	F	III
6	F	IV
7	G	V
8	G	V
9	K	V
10	K	V
11	M	V
12	M	V
13	M	V
14	M	V/D*

DM For Type: Use the previous roll for primary star type as a +DM.

DM For Class: Use the previous roll for primary star luminosity class as a +DM.

Decimal Classification: Determine the decimal classification for the companion star using the procedure in step 5.

Note: D-class stars need have no decimal classification (page 184).

*Roll 1D6: 1-3 = class V; 4-6 = class D.

7. Companion Orbit

Roll 2D6 to determine the orbit of the companion star.

Companion Orbit

2D6	*Orbit*
2	Close
3	Close
4	1
5	2
6	3
7	4+1D
8	5+1D
9	6+1D
10	7+1D
11	8+1D
12	Far

DMs: For the first companion star, use this table as presented. For a second companion star, use DM +4. For the companion of a star that is itself a far companion, use DM –4.

8. Far Companion?

If the companion orbit is far, go to step 9.

Otherwise, go to step 11.

9. Far Orbit

Far indicates that the star is outside the realm of the primary star's system. Orbit distance is 1D6x1000 AU.

10. Additional Stars

If a companion is far, it may itself have a companion. Proceed to step 3 and determine if the far companion is not a solo star and then return here. If the far companion is itself a binary, go to step 6 to determine the binary companion's characteristics.

11. Maximum Orbits

Roll 2D6 for the maximum number of orbits around the primary star.

Roll 2D6 for the maximum number of orbits around the far companion star (if any).

DMs (for Both Rolls): If star class III, DM+4; if star class Ia, Ib, or II, DM+8. If star type M, DM –4; if star type K, DM –2.

12. Available Orbits

Determine what orbits are available for the placement of planets.

Available Orbits

B Orbit	*Between B and A*	*Beyond B*	*B Itself*
0	—	2+	—
1	0	3+	0
2	0-1	4+	0-1
3	0-1	5+	0-1
4	0-2	6+	0-2
5	0-2	7+	0-2
6	0-3	8+	0-3
7	0-3	9+	0-3
8	0-4	10+	0-4
9	0-4	11+	0-4
10	0-5	12+	0-5
11	0-5	13+	0-5
12	0-6	14+	0-6

A is the primary star. B is the companion star. This table shows the orbits which are available for worlds to be placed Between A and B, Beyond B, and Around B Itself.

13. Orbit Zones

The tables show the conditions in the orbits around stars.

- \- Inside the sphere of the star. No worlds in this zone.
- — Unavailable (planet would be vaporized). No worlds in this zone.
- I Inner Zone (hot and inhospitable). Worlds may be in this zone.
- H Habitable Zone (life may exist). Worlds may be in this zone.
- O Outer Zone (cold and inhospitable). Worlds may be in this zone.

Select the table for the star luminosity class and determine the zones for the orbits around the star.

14. Orbit Zones for Luminosity Class Ia

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0	K5	M0	M5
1	—	—	-	-	-	-	-	-	-	-	-	-
2	—	—	—	—	-	-	-	-	-	-	-	-
3	—	—	—	—	—	—	-	-	-	-	-	-
4	—	—	—	—	—	—	—	-	-	-	-	-
5	—	—	—	—	—	—	—	—	-	-	-	-
6	—	—	—	—	I	I	—	—	—	—	-	-
7	—	I	I	I	I	I	I	I	I	I	I	-
8	I	I	I	I	I	I	I	I	I	I	I	I
9	I	I	I	I	I	I	I	I	I	I	I	I
10	I	I	I	I	I	I	I	I	I	I	I	I
11	I	I	I	I	I	H	I	I	I	I	I	I
12	I	H	H	H	H	O	H	H	H	H	H	H
13	H	O	O	O	O	O	O	O	O	O	O	O
14	O	O	O	O	O	O	O	O	O	O	O	O

15. Orbit Zones for Luminosity Class Ib

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0	K5	M0	M5	M9
1	—	—	—	—	—	-	—	-	-	-	-	-	-
2	—	—	—	—	—	-	—	—	-	-	-	-	-
3	—	—	—	—	—	-	—	—	-	-	-	-	-
4	—	—	—	—	—	I	I	—	—	-	-	-	-
5	—	—	I	I	I	I	I	I	I	—	-	-	-
6	—	I	I	I	I	I	I	I	I	I	I	-	-
7	—	I	I	I	I	I	I	I	I	I	I	I	-
8	I	I	I	I	I	I	I	I	I	I	I	I	I
9	I	I	I	I	I	I	I	I	I	I	I	I	I
10	I	I	I	H	H	H	H	H	H	I	I	I	I
11	I	H	H	O	O	O	O	O	O	H	H	I	I
12	I	O	O	O	O	O	O	O	O	O	O	H	H
13	H	O	O	O	O	O	O	O	O	O	O	O	O
14	O	O	O	O	O	O	O	O	O	O	O	O	O

16. Orbit Zones for Luminosity Class II

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0	K5	M0	M5
1	—	—	—	—	—	-	—	—	—	-	-	-
2	—	—	—	I	I	I	I	I	I	—	-	-
3	—	—	I	I	I	I	I	I	I	I	-	-
4	—	—	I	I	I	I	I	I	I	I	I	-
5	—	I	I	I	I	I	I	I	I	I	I	-
6	—	I	I	I	I	I	I	I	I	I	I	I
7	I	I	I	I	I	I	I	I	I	I	I	I
8	I	I	I	H	H	H	H	H	I	I	I	I
9	I	I	H	O	O	O	O	O	H	H	I	I
10	I	I	O	O	O	O	O	O	O	O	H	I
11	I	H	O	O	O	O	O	O	O	O	O	H
12	H	O	O	O	O	O	O	O	O	O	O	O
13	O	O	O	O	O	O	O	O	O	O	O	O

17. Orbit Zones for Luminosity Class III

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0	K5	M0	M5	M9
1	—	—	I	I	I	I	I	I	I	I	—	-	-
2	—	—	I	I	I	I	I	I	I	I	I	-	-
3	—	—	I	I	I	I	I	I	I	I	I	-	-
4	—	I	I	I	I	I	I	I	I	I	I	I	-
5	—	I	I	I	I	I	I	I	I	I	I	I	I
6	—	I	I	I	H	H	H	I	I	I	I	I	I
7	I	I	I	H	O	O	O	H	H	I	I	I	I
8	I	I	H	O	O	O	O	O	O	H	H	I	I
9	I	I	O	O	O	O	O	O	O	O	O	H	H
10	I	H	O	O	O	O	O	O	O	O	O	O	O
11	I	O	O	O	O	O	O	O	O	O	O	O	O
12	H	O	O	O	O	O	O	O	O	O	O	O	O
13	O	O	O	O	O	O	O	O	O	O	O	O	O

18. Orbit Zones for Luminosity Class IV

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0
0	—	—	—	I	I	I	I	I	I
1	—	—	I	I	I	I	I	I	I
2	—	—	I	I	I	I	I	I	I
3	—	I	I	I	I	I	I	I	I
4	—	I	I	I	I	I	I	I	H
5	—	I	I	I	I	H	H	H	O
6	—	I	I	H	H	O	O	O	O
7	I	I	H	O	O	O	O	O	O
8	I	I	O	O	O	O	O	O	O
9	I	H	O	O	O	O	O	O	O
10	I	O	O	O	O	O	O	O	O
11	I	O	O	O	O	O	O	O	O
12	H	O	O	O	O	O	O	O	O
13	O	O	O	O	O	O	O	O	O

19. Orbit Zones for Luminosity Class V

Orbit	B0	B5	A0	A5	F0	F5	G0	G5	K0	K5	M0	M5
0	—	—	I	I	I	I	I	I	I	H	H	O
1	—	—	I	I	I	I	I	I	I	O	O	O
2	—	—	I	I	I	I	I	H	H	O	O	O
3	—	—	I	I	I	I	H	O	O	O	O	O
4	—	I	I	I	I	H	O	O	O	O	O	O
5	—	I	I	I	H	O	O	O	O	O	O	O
6	I	I	I	H	O	O	O	O	O	O	O	O
7	I	I	H	O	O	O	O	O	O	O	O	O
8	I	I	O	O	O	O	O	O	O	O	O	O
9	I	H	O	O	O	O	O	O	O	O	O	O
10	I	O	O	O	O	O	O	O	O	O	O	O
11	I	O	O	O	O	O	O	O	O	O	O	O
12	H	O	O	O	O	O	O	O	O	O	O	O
13	O	O	O	O	O	O	O	O	O	O	O	O

20. Orbit Zones for Luminosity Class D

Orbit	DB	DA	DF	DG	DK	DM
0	H	O	O	O	O	O
1	O	O	O	O	O	O
2	O	O	O	O	O	O
3	O	O	O	O	O	O

Note: The columns for decimal classification define the break points in the decimal series. The column for decimal 0 is used for decimals 0-4 and the column for decimal 5 is used for decimals 5-9. Where there is a separate column for M9, the M5 column is used for M5-8, and M9 for M9 only.

21. Empty Orbits

Roll 5+ on 2D to determine if gas giants exist in the system.

If gas giants exist, determine how many from the Gas Giant Quantity table.

Gas Giant Quantity

2D6	Quantity
2	1
3	1
4	2
5	2
6	3
7	3
8	4
9	4
10	4
11	5
12	5

The number of gas giants may already be known from the mainworld data; if so, skip this step.

22. Planetoid Belts

Roll 8+ on 2D6 to determine if planetoid belts exist in the system.

If planetoid belts exist, determine how many from the Planetoid Belt Quantity table.

Planetoid Belt Quantity

2D6	Quantity
2	1
3	1
4	1
5	1
6	1
7	2
8	2
9	2
10	2
11	2
12	3

The number of planetoid belts may already be known from the mainworld data; if so, skip this step.

23. Empty Orbits

Determine if any empty orbits are present in the star system.

1. Roll 5+ on 1D6 to determine if any empty orbits exist in the system. DM+1 if star type A or B.

2. If empty orbits exist, roll 1D6 on the table to determine how many empty orbits exist. DM+ if star type A or B.

Empty Orbits

1D6	Quantity
1	1
2	1
3	2
4	3
5	3
6	3

3. Roll 2D6–2 (for a result from 0 to 10) to determine each empty orbit number. If the roll does not fall in the range of possible orbits, or if it duplicates an already determined empty orbit, reroll.

24. Captured Planets

Determine if the system has any captured planets in unusual orbits.

1. Roll 5+ on 1D6 to determine if captured planets exist in the system. DM+1 if star type A or B.

2. If a captured planet exists, consult the table for the number present.

Captured Planets

1D6	Quantity
1	1
2	1
3	1
4	2
5	2
6	3

3. For each captured planet, roll 2D6 (for a range between 2 and 12) to determine which orbit to use as a baseline. Then roll 2D6–7 and multiply by 10% (for a range between –50% to +50%) for the positive or negative deviation of the orbit from the baseline. Record the resulting orbit as a decimal number: Baseline orbit 5+40% is recorded as orbit 5.4; Baseline orbit 2-20% is recorded as orbit 1.8.

25. Place Gas Giants

Gas giants are placed randomly in available orbits within certain restrictions. Throw 2D6–3+habitable orbit number for the orbit for a gas giant. Reroll duplicate orbits. When no other orbits are available, gas giants may be placed in the inner zone.

26. Planetoid Belts

Planetoid belts are placed randomly in available orbits, with certain preferences. If a gas giant is available, place a planetoid belt in the next orbit in from the gas giant. For example, if a gas giant is in orbit 8, place the planetoid belt in orbit 7 (if that is an available, nonempty orbit).

27. Place Mainworld

Place the mainworld randomly, with these restrictions.

1. If the world is World Size 1 or greater and atmosphere is 4 to 9, place the world in the habitable zone.

2. If a gas giant is already in the habitable zone orbit, place the mainworld as a satellite of the gas giant.

28. Other Worlds

Generate all other worlds for the system, beginning with the lowest numbered orbit. All available orbits around a star should be filled before continuing to the next star.

29. World Size

Determine each world size.

Gas Giants: If the world is a gas giant, roll 1D6. On a result of 1, 2, or 3, the planet is a Small Gas Giant; on a result of 4, 5, or 6, the planet is a Large Gas Giant. No other attributes are generated for gas giants. Once size has been generated, proceed to the next orbit.

Worlds: Roll 2D6–2 for world size. If orbit 0, DM–5; if orbit 1, DM–4; if orbit 2, DM–2. If star type M, DM–2 for all orbits.

Treat less than 1 as S (for very small world); used in place of size 0 (planetoid belt or mainworld asteroid belt).

30. Atmosphere

Roll 2D6–7+size for atmosphere. If inner zone, DM–2. If outer zone, DM–4. If World Size 0, atmosphere is 0. If the world is at least 2 orbits beyond the habitable zone, roll 2D6 for 12 exactly: if the roll succeeds, atmosphere is A.

31. Hydrographics

Roll 2D6–7+Size for hydrographics. If inner zone, hydrographics is 0. If outer zone, DM–2. If World Size 0 or S, hydrographics is 0. If Atmosphere 0, 1, or A+, DM–2.

32. Population

Roll 2D6–2 for population. If inner zone, DM–5. If outer zone, DM–3. Maximum population = Mainworld –1

33. Satellites

For each world, determine if it has satellites.

World Size S or 0: None.
World Size 1 to A: 1D6–3.
Small GG: 2D6–4.
Large GG: 2D6.

34. Satellite Size

For each satellite, determine its Size.

For Large GG: Roll 2D6–4.
For Small GG: Roll 2D6–6.
For Worlds: Roll 1D6–world size.

If the result is exactly 0, the satellite is a ring: Use Size R.

If the result is less than 0: Use Size S.

35. Satellite Orbit

Consult the table for the orbit number. If the satellite is a ring, roll 1D6. Otherwise, roll 2D6 to determine which column to roll on: On 2–7, the satellite is Close; on 8–12, the satellite is Far. On a result of 12 (if the planet is a gas giant), then the satellite is Extreme.

Satellite Orbit Numbers

2D6	Ring	Close	Far	Extreme
1	1	—	—	—
2	1	3	15	75
3	1	4	20	100
4	2	5	25	125
5	2	6	30	150
6	3	7	35	175
7		8	40	200
8		9	45	225
9		10	50	250
10		11	55	275
11		12	60	300
12		13	65	325

Orbit distance is in radii of the central planet. Two satellites cannot occupy the same orbit: Reroll if this occurs.

36. Satellite Atmosphere

Roll 2D6–7+Satellite Size for atmosphere. If inner zone, DM–4. If outer zone, DM–4. If Size R, S, or 1, atmosphere is 0.

If satellite is at least 2 orbits beyond the habitable zone, roll 2D6 for 12 exactly: If the roll succeeds, satellite Atmosphere A.

37. Satellite Hydrosphere

Roll 2D6–7+Size for hydrographics. If inner zone, hydrographics is 0. If outer zone, DM–4. If Size R or S, hydrographics is 0. If atmosphere is 0, 1, or A+ DM–4.

38. Satellite Population

Roll 2D6–2 for population. If inner zone, DM–5. If outer zone, DM–4. If Size 0–4, DM–2. If Size R, population is 0. If atmosphere is not 5, 6, or 8, DM–2.

39. Social Data

Determine social data (population, government, law level, technology level, and bases) for all worlds and satellites.

40. Subordinate Government

Roll 1D6 for subordinate government.

Subordinate Government

Die	Code	Description
1	0	No government
2	1	Company
3	2	Participating Democracy
4	3	Self–Perpetuating Oligarchy
5+	6	Captive Government

DMs: If mainworld Government 6, DM+subordinate population. If mainworld Government 7+ DM–1. If Population 0, then Government 0.

41. Subordinate Law Level

Roll 1D6–3+mainworld law level. If Government 0, then Law Level 0.

42. Facilities

Note all facilities which are possible on planets and satellites. These notes do not apply to the mainworld.

Farming (Fa): If in habitable zone, Atmosphere 4–9, Hydrographics 4–8, Population 2+.

Mining (Mn): If mainworld has trade class Industrial, subordinate Population 2+.

Colony (Co): If subordinate world, Government 6 and Population 5+.

Research Lab (Re): Mainworld must have Tech Level 9+ and Population 1+ Roll 11+ on 2D6 for a research lab to be present; DM+2 if mainworld Tech Level 10+.

Military Base (Mi): Mainworld must have Population 8+ and cannot be trade classification Poor. Roll 12+ on 2D6 for a military base to be present; DM+1 if mainworld Population 8+; DM+ if subordinate world atmosphere is the same as mainworld atmosphere.

Naval Base (Nv): A naval base will be present if the mainworld has a naval base and subordinate population is 3+.

Scout Base (Sc): A scout base will be present if the mainworld has a scout base and subordinate population is 2+.

43. Subordinate Tech Level

Subordinate tech level equals mainworld tech level minus 1. If a military base, naval base, or research lab is present on the subordinate world, use the mainworld tech level.

44. Subordinate Spaceport

Roll 1D6 for the subordinate spaceport.

Subordinate Spaceport

1D6	Code	Description
1	Y	No spaceport
2	Y	No spaceport
3	H	Primitive facilities
4	G	Poor quality
5	G	Poor quality
6	F	Good quality

DMs: If subordinate Population 6+, DM+2. If subordinate Population 1, DM–2. If subordinate Population 0, DM–3.

45. Orbital Distances

The Orbital Distances table is used to convert between orbit numbers, AUs, and kilometers.

Orbital Distances

Orbit	AUs	Million Kilometers
0	0.2	29.9
1	0.4	59.8
2	0.7	104.7
3	1.0	149.6
4	1.6	239.3
5	2.8	418.9
6	5.2	777.9
7	10.0	1495.9
8	19.6	2932.
9	38.8	5804.
10	77.2	11,548.
11	154.0	23,038.
12	307.6	46,016.
13	614.8	91,972.
14	1229.2	183,885.
15	2548.0	367,711.
16	4915.6	735,363.
17	9830.8	1,470,666.
18	19,661.2	2,941,274.
19	39,322.0	5,882,488.

Wilderness Travel and Encounters

A typical firefight can be over in seconds, while an encounter can last several minutes. An adventure may take days or weeks. A campaign lasts months, perhaps years. Obviously, activities cannot all be played at the same rate of time—thus, a variety of time scales are used.

Game Day

The longest measure of time regularly used is the game day. Game days are used to gauge travel over long distances or progress toward completion of a major task. Referees and players will want to keep general track of weeks and months as well to keep a broader perspective on the passage of time.

The game day is broken down into six four-hour periods, used to schedule activities during a day. When moving cross-country, it is seldom necessary to plan each day separately; instead, players should settle on a routine—such as eight hours on the road, four hours foraging and hunting, four hours of camp duties and maintenance, and eight hours of sleep. Likewise, a day in town might consist of eight hours each of work, recreation, and sleep. Players would then merely specify to the referee their task. Special situations, such as a forced march, will require alteration in the routine. A generalized routine, however, will greatly speed play of the game.

The use of four-hour periods is for the convenience of the referee and players to make scheduling of daily activities easy. It is not meant to unduly restrict players' activities. Thus, for example, if a group of players wants to move a certain distance that is half the distance their vehicles can move in a four-hour period, the referee should feel free to let them do so and only charge them half the normal fuel cost for a one-period move.

The four-hour period is still useful even when on a world which has a day which varies quite a distance from the 24-hour Terran pattern. Humans still use the ancient 24-hour rhythm in space aboard ships, because they have to have some regularizing pattern, and so they carry that pattern with them to the worlds they visit. The four-hour blocks are small enough that they can still be used as building blocks of the local day. On a 16-hour world, the day can be broken into four four-hour blocks, two each of day and night.

TRAVEL

Daily travel distances can vary greatly based on terrain, loads carried, mechanical breakdowns, and a variety of other factors. The Travel Movement table at right gives rough values, in kilometers travelled per four-hour period. The first number is used if travelling on a road, the second if travelling off the road.

People march half the listed human distance if burdened. They are also subject to fatigue (see below).

The referee should feel free to vary this as he sees fit. Remember that players should never feel that their interaction with the world around them is purely mechanical or a function of reading numbers off a chart.

Planetary Environment

The sections below discuss wilderness travel primarily in terms of a terrestrial, or Earth-like environment. There are many different planets in the universe, with different atmospheres, surface gravities, temperatures, chemical bases for life, geological make-up, etc., and all of these will make for differences from this classic terrestrial model. However, the terrestrial model is useful for several reasons.

First, it is a useful starting point for defining procedures. Planets that have different backgrounds can have their procedures modified accordingly. Second, because of their hospitable nature, players are likely to spend far more time exploring Earth-like worlds. Players will probably not wish to spend six months slogging around a world in their vac suits because the "air" is gaseous ammonia and the "water" is pure god-knows-what else.

Finally, and most importantly, the worlds that players will explore are the worlds that will be valuable to other creatures like them. This means that the closer it is to terrestrial standards, the more valuable it will be for

TRAVEL MOVEMENT

Unit	*Move (in km/4 hours)*
Human	20/20
Horse	20/20
Mule	20/20
Wagon/horse (or equivalent)	20/5
Wagon/ox (or equivalent)	10/5
Heavy cargo truck	110/20
Ground car	325/65
Hovercraft	800/605
Tracked ATV	110/85/13
Range truck	300/130
Wheeled ATV	175/85/20
Air raft (open)	1200/240
G-Carrier	1890/900
Enclosed air raft	1890/945
Grav tank	2160/1020
Speeder	3600/1140
Grav bike	1200/240
Very small open boat	4/4
Small sailing boat	8/8
Small motorboat	16/16
Medium motorboat	12/12

a greater number of purposes. All things being equal, people would rather live on, or colonize, or mine important elements on, or set up a starport on, a world with a standard atmosphere, rather than one of peanut butter and jelly. Given a choice, humans (and all other major sentient races in **Traveller**) will take the standard atmosphere and leave the other one for someone who can breathe peanut butter and jelly. Players can spend a lot of time mapping the metallic hydrogen oceans of some gas giant, but they'll be more successful if they use that same time to discover and explore, and learn how to utilize more terrestrial-type worlds.

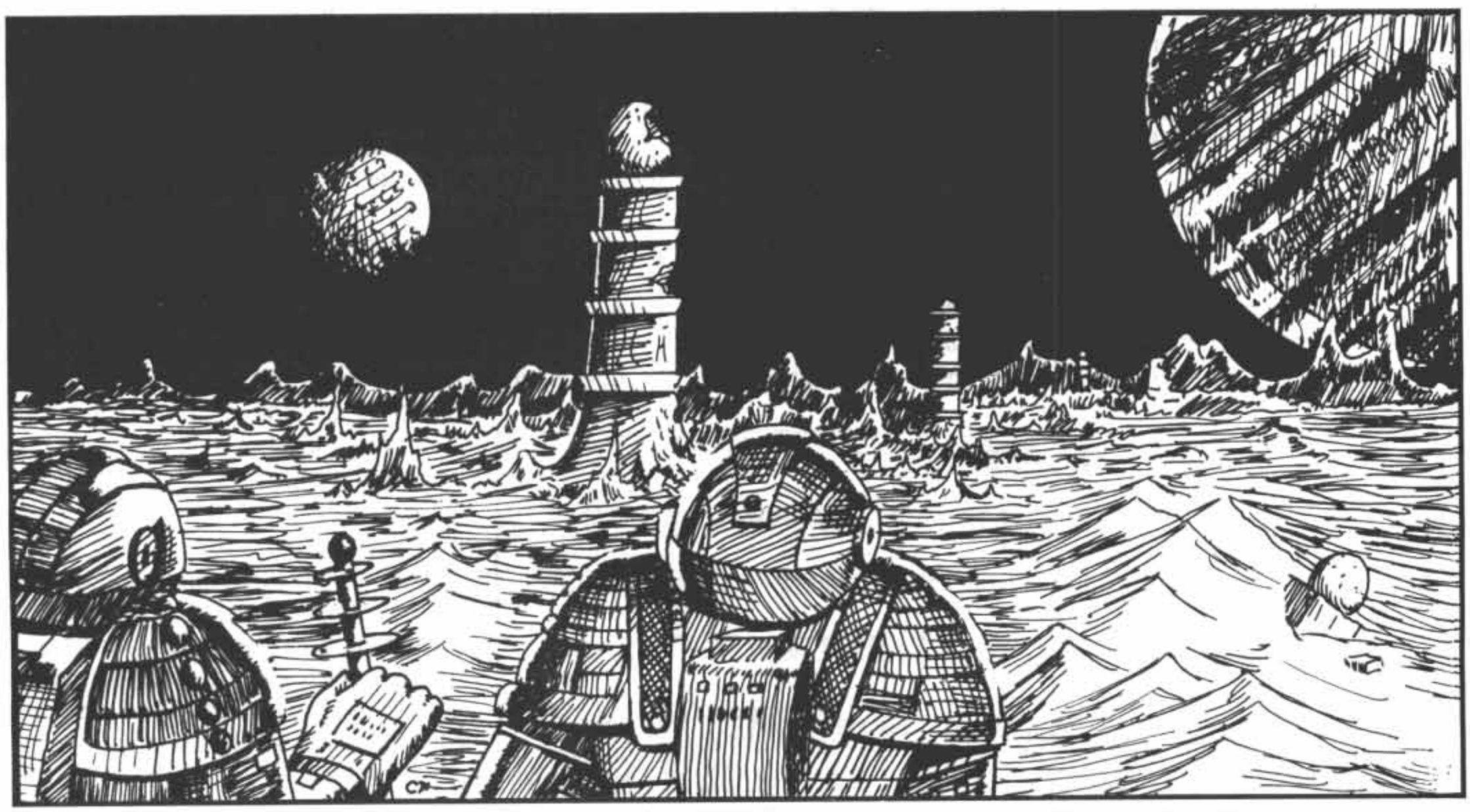
Nonterrestrial Environments: The major non-terrestrial considerations that will affect travel are local atmosphere, hydrographics, temperature, and gravity. The effects of various atmosphere types are discussed on page 182 in World Building, and a world's hydrographics percentage (also in World Building) will clearly affect the way in which characters are required to get around. Temperature is not considered in detail in the basic world generation rules presented in this book. However, as most main worlds exist within the habitable zone of their star, surface temperatures will be broadly similar to those found on Earth (cold at the poles, warmer nearer the equator). The effects of gravity are discussed in the context of combat in the "Combat" chapter on page 307. For the purposes of wilderness travel, gravity can affect travel as follows.

In level terrain, a world's gravity has only a small effect on travel speeds, as the vehicle's power is working in a direction perpendicular to the G field. However, in hilly or mountainous areas, high-G worlds greatly reduce the amount of power available for climbing slopes. Marshes and soft ground are also more dangerous on high-G worlds.

Low-G worlds create different problems. The reduced traction available on low-G worlds affects the mobility of vehicles with gear ratios intended for higher gravity fields. This can make it more difficult for such vehicles to accelerate, and also harder for them to stop or change direction once they have reached high speeds.

The other effect of gravity is the fact that high gravity (high gravity is defined as anything over 1G) tires out individuals not used to its influence. Simply existing in a gravity environment greater than their accustomed G-field is tiring for creatures. Their hearts must pump harder to keep blood flowing up to their brains, their muscles must work harder to hold them up, etc. This is reflected by the use of the fatigue rules, page 198. For each 0.1Gs above 1, a character gains a constant level of fatigue for as long as he or she remains in that environment. Each skill level of High-G Environment counteracts the fatigue effects of a 0.1G unit, so that a character with High-G Environment 3 could function indefinitely in a 1.3G environment without G-induced fatigue effects.

The 1G baseline is used for convenience. Characters who have lived all or most of their lives on worlds with



other G ratings should use those as the baseline from which high-G fatigue effects are calculated. A character from a 0.7G world will have fatigue difficulty in a 0.8G field, while someone from a 1.3G world will feel light in 1.2Gs or less, and not experience fatigue effects until 1.4Gs.

High-G levels can be gotten used to, at the rate of two months per 0.1G, to a maximum of 1Gs above the character's permanent G adaptation (based on home-world). Low-G levels are also gotten used to at the same rate. The effect of this is that without careful attention to exercise in a low G environment, a person can get out of shape and suffer from fatigue upon returning to a standard G environment. At the referee's discretion, characters may suffer ill effects (heart or breathing difficulties, etc.) upon entry into high-G environments, especially if the character is frail or in poor health, or has become acclimated to a 0G environment where bone and cardiovascular structures deteriorate.

Terrain and Travel

Travel on a good road is largely unaffected by the terrain through which the road passes, but good roads have become scarce on many worlds. Furthermore, good roads are nonexistent on unexplored and unsettled worlds. Most characters will spend much of their time on poor roads and traveling cross-country.

When travel on a good road is practical, it is done at the road movement rate. A poor road (one which is breaking up, partially washed out, or just hasn't seen a road crew in 30 or 40 years) allows travel at the full cross-country rate for vehicles regardless of terrain.

Aside from roads, the main terrain types encountered in the countryside are woods, swamp, hills, and open terrain. The effects of other terrain varieties can be extrapolated from these.

Woods: Woods are forested areas of considerable extent. While a person can walk through virgin forest, it is an impractical means of travel for vehicles or for a party on foot for any distance. Thus, all travel through wooded areas is assumed to be along paths and roads and through clearings whenever possible. Movement on foot or by animals through woods is at the full off-road movement rate. Vehicles travel through woods at half their off-road movement rate unless following a particularly well travelled old dirt road, in which case they move at their full off-road movement rate.

Swamp: Swamps are difficult to traverse. A person on foot can move at his or her full movement rate. Animals and all vehicles move at half their off-road movement rate. In addition, nonamphibious vehicles must check each four-hour period to avoid becoming mired, using the relevant Ground Vehicle cascade. Hovercraft and flying vehicles treat swamp as either woods or open, depending upon the nature of the vegetation. Extracting a mired vehicle takes one additional period and requires the use of one or more vehicles whose combined weight equals or exceeds that of the mired vehicle.

Hills: Hills are relatively steep, but regular, rolling ground. All movement is reduced by half in hills. Hills may be wooded. If so, determine the movement rate for woods first and then apply the hill terrain reductions to the result.

Open: Open terrain is generally flat or gently rolling grasslands and for the most part consists of former cultivated lands which have reverted to the wild but are not yet wooded. Open terrain also includes cultivated ground in the area of settlements. All movement through open terrain is at the full off-road movement rate.

FATIGUE

There are four general types of activity that a character can undertake in a four-hour period: sleep, rest, hard work, and easy work.

Sleep: No other activity is possible while sleeping.

Each character must have one period of sleep per day or two periods of sleep if he has performed three or more periods of hard work. For every sleep period deficiency, the character suffers one level of fatigue. A fatigued character will recover one fatigue level for every period spent in sleep.

Rest: Rest is a poor substitute for sleep, but can help combat its lack. A character riding in a vehicle and not serving as a driver or lookout can rest. While rest does not count toward a character's sleep requirement, a fatigued character recovers one level of fatigue for each period spent resting.

Easy Work: Hunting and foraging, routine maintenance, guard duty, setting up and tearing down camp, preparing meals, driving a vehicle on a road, and simple first aid are all examples of easy work. Easy work neither increases nor decreases a character's fatigue level.

TERRAIN EFFECTS ON MOVEMENT

Unit	*Open*	*Wood*	*Swamp*	*Hill*	*Mountain*	*Snow*	*Water*
Humans	N	N	N	1/2	1/4	x1/2	—
Animals	N	N	1/2	1/2	1/4	x1/2	—
Vehicles	N	1/2	1/4	1/2	1/6	x1/2	—
Hovercraft	1/2	1/2	N	1/2	—	N	N
Boats	—	—	1/2	—	—	—	N

N: Normal. —: Prohibited. Rates for snow are multiplied by other prevailing terrain.

Hard Work: Hard work constitutes tasks which are extremely fatiguing. These are marching, riding an animal or bicycle, driving a vehicle cross-country, fighting, and actual physical labor (including, but not limited to, farming, building bridges and buildings, digging ditches or entrenchments, carrying out major repairs on heavy machinery, etc.). Some referee discretion is required when deciding which tasks constitute hard work. Changing a flat tire, for example, is not particularly heavy labor; changing an axle is. A few minutes of hard work in a period do not make it a period of hard work; it takes a substantial quantity to do so, with one exception: combat.

An already fatigued character may still do hard work, but suffers one additional level of fatigue per period of hard work, regardless of how many periods are spent sleeping.

Combat: Any combat whatsoever in a period makes it a period of hard work, unless the referee decides that it is so brief that the characters are able to rest for the rest of the time. In this case it may be counted as either easy work or rest, at the referee's option.

Effects of Fatigue: All seven of a character's effective attributes (including Psionics) are reduced by one for each level of fatigue. If any attribute is reduced to 0, the character becomes unconscious and will sleep for one complete period (thus raising the attribute back to 1).

Direct fire is made more difficult by fatigue. When making the task roll for a direct fire task (after difficulty levels have been modified for range recoil, etc.), the player must add one or more points to the die roll according to the character's fatigue level. For each level of fatigue, add 3 to the die roll at short range, 2 at medium range, or 1 at long and extreme ranges.

FATIGUE EFFECTS ON FIRE

Range	*Additions to Die Roll per Fatigue Level*
Short	3
Medium	2
Long	1
Extreme	1

Load is reduced by 10% per level of fatigue. Throw range is reduced by 10 meters per level of fatigue.

Unarmed combat damage is reduced by one per level of fatigue.

Example: Currin and Yaj are moving overland on a several-day march. They are carrying plenty of food with them, so they don't have to spend time foraging. Their routine is:

Midnight to 8 a.m.: Currin sleeps; Yaj stands guard.

8 a.m. to 4 p.m.: Both march.

4 p.m. to Midnight: Yaj sleeps; Currin stands guard.

Both Currin and Yaj have two periods of hard work (marching), two periods of sleep, and two periods of easy work (standing guard) each day, and thus neither of them becomes fatigued.

On the second day out, a pack of nocturnal predators stumbles into their camp at 10 p.m. Currin wakes up Yaj, and in a firefight they chase the animals off. They remain alert for their return for much of the rest of the night. Starting the next morning, Yaj has a fatigue level of one (three periods of hard work marching or fighting and only one period of sleep) while Currin is not fatigued (also three periods of hard work, but two periods of sleep).

At the end of the day's march Yaj's fatigue level has risen to three, since once fatigued he suffers an additional fatigue level per period of hard work. That night he goes to bed and sleeps for two periods. When Currin wakes him up at midnight he has a fatigue level of one, having then recovered two levels.

When Currin finally wakes up at eight the next morning, they decide not to march that day and let Yaj rest. Both spend the day in routine maintenance and foraging, and at 4 p.m. Yaj turns in. When he awakes at 8 p.m., he is refreshed and recovered from his fatigue.

As should be clear from this example, it is difficult for two people to make good time cross-country, keep constant guard, and not rapidly wear themselves out.

The game referee should not bother about minor sleep period deficiencies except in instances where fatigue and endurance can both clearly become important to a group's activities. That is, if a group is moving at a fairly leisurely pace with plenty of time to catch up on sleep and rest, an interrupted night's sleep period is of no great concern, and should not be allowed to slow up the game by causing a flurry of paperwork and calculations on the part of either the referee or the players.

UPKEEP

This section is concerned with the day-to-day realities of the characters' lives. Even while they are having adventures, they must still eat, find fuel for their vehicles, and take care of their vehicles and animals.

Food Requirements

Each character must eat at least three kilograms of food every day to remain healthy. Most of this must be found in the wild. "Civilized" food—domesticated animals, cultivated grains and vegetables, canned or packaged food, etc.—counts as 1.5 times its weight. Thus a man could survive on two kilograms of such food a day.

Food Consumption

Human	1.5 kg MRE *or* 2 kg domestic *or* 3 kg wild
Horse	15 kg grain and graze 8 hrs
Mule	10 kg grain and graze 8 hrs
Ox	Graze 8 hrs

Note: These are Terran-equivalent animals.

Specially fortified and prepackaged survival rations count double, and a character could survive on 1.5 kilograms of these a day.

Otherwise, food that is gathered in the wilderness is considered "wild," and counts as one kilogram of nutritive value per kilogram of food weight. Food consumption requirements for humans and some animals are summarized on the Food Consumption table at left.

Effects of Starvation: If a character eats less than his daily requirement, but at least half the requirement, he suffers one level of fatigue (see below). This fatigue remains (but gets no worse) until he eats his full requirement for as many days as he was underfed (or 10 days at most). A character gains one level of fatigue for each day in which he eats less than half the requirement, until his Strength, Agility, Constitution, and Intelligence are all reduced to 1; they do not fall below 1.

One level of fatigue is recovered for each consecutive day of full rations.

Eventually, a character on less than half rations will starve. This takes about a month of no food or several months of half rations.

Food Quality: Because of the different ecologies that may be found on each world, food that is gathered may *not* be immediately edible. Typically there are some additional components that are unpleasant to the digestive system. These may be environmental elements that are passed through the creature as part of its normal feeding process which collect in its tissue, such as lead or mercury. Or they may be chemicals which are created by the animal or plant itself which make it unpalatable, such as tannins manufactured by plants. The effects of these components may merely make the food taste unpleasant, make the person who eats it feel ill, or be downright poisonous.

Food analyzers can detect the presence and nature of these components in the plant and animal tissue of an ecosystem. Then the food can be prepared to remove these elements. To detect the presence of inedible compounds in food is an Easy test of Electronics if a food analyzer is available. It is a Difficult test of Biology, Chemistry, or Medical for a character with the proper biological or chemical testing equipment. It is a Formidable test of these same assets without the equipment, and usually involves the observation of those who eat small amounts, and the diagnosis of their responses. Getting volunteers for this duty might be a Formidable test of Persuasion.

Once the compounds have been identified, the food requires preparation to remove them. This typically involves cooking the food, soaking it, slicing it into small portions, and curing, heating, exposing to direct sunlight, etc. This is an Average test of Survival or Service, and generally takes about an hour for each meal.

The presence of these components is most likely on worlds listed as having an atmospheric taint, and are always present on worlds with exotic, corrosive, or insidious atmospheres. It is generally safe to assume that no amount of preparation of food gathered from a world with an atmosphere of exotic+ can make it palatable to a terrestrial-type creature. (This includes all of the major sentient races. Anything that is edible to a human, Vargr, Aslan, Droyne, Hiver, or K'kree is basically edible to any of the others, although it may not be their cup of tea...)

Foraging

Characters may find food in the wild by *foraging*. It takes one four-hour period to forage a one-kilometer-square area. An area may be foraged *only once per* month. For simplicity's sake, it is best to consider an area foraged out after one forage attempt.

Only one foraging party may forage an area. The number of people in the foraging party reduces the time it takes to forage an area but does not affect the quantity of food found. If two people forage an area, for example, they can search it in half a period. (A party can break up into several smaller foraging parties, provided they spread out and forage different areas.)

Foraging is a task (Difficult: Survival) performed by the character in the party with the highest Survival skill. Failure means that no food is found.

The Foraging table lists the amount of food, in kilograms, found by a successful forage attempt in each of the four seasons and in each of the major terrain types. If the character achieves outstanding success, double the amount of food found.

Fields: Players do not forage, per se, in fields, and no die roll is necessary. In the winter and spring, there is no food to be found in fields. In the summer and fall, there will generally be standing crops, and characters can gather virtually as much food as they can carry. In one

Foraging

Area	*Winter (kg)*	*Spring (kg)*	*Summer (kg)*	*Fall (kg)*
Wood/scrub	1	3	6	6
Meadow/swamp	0	1	2	2
Field	0	0	25	50
Fishing (1D6x)	1/2	2	1	1

period, this will generally amount to 200 kilograms per man, and counts as hard work.

An additional period is required to separate the edible parts of the crop from the chaff. This will yield a total of 50 kilograms of edible food in the summer or 100 kilograms of edible food in the fall. If a PC is in a hurry, the separation of edible food from chaff can be delayed until later, but the full 200 kilograms of weight must be carried until that time.

Alternatively, a period can be divided into two hours of harvesting and two hours of separation, resulting in 25 kilograms of edible food in the summer and 50 kilograms of edible food in the fall.

In both cases, the resulting food is considered "wild," and thus only counts as one kilogram of nutrition per kilogram of bulk.

Fishing

Fish can be caught from any open water: a swamp, stream, river, pond, lake, or ocean. Fishing is a task (Difficult: Survival) requiring line and hooks, a net, or a fish trap. Fishing without adequate equipment is Formidable: Survival. If the task succeeds, a character can catch fish in one period equal to the amount given on the Foraging table (expressed in kilograms of edible meat). Double the total for outstanding success.

These totals are for line fishing from a shore or boat, or net fishing from a shore. Double the totals for net fishing from a boat in large open waters (large lakes or the ocean).

Hunting

Many encounters will be with animals. Briefly, players will often be able to surprise and kill animals and, if so, eat them. The animal data charts on pages 215-217 list the weight of the animals characters can encounter. If the animal is edible, roughly 30% of the animal's body weight will consist of edible meat.

VEHICLES

PCs usually begin the game with one or more vehicles, and may come into the possession of others as time passes. This section covers the use of vehicles for travel. The maintenance and repair of vehicles is covered in Maintenance, pages 241-244.

Travel

Travel movement by vehicle is accomplished in the same manner as travel by foot, but using the travel movement rates for individual vehicles, consolidated in the Travel Movement table on page 196. These numbers are also shown on the individual vehicle cards, and show the number of kilometers travelled per four-hour period. They are listed in the format "on road/off road" for ground vehicles, and "flight/NOE" for grav vehicles.

Vehicle Cards

For the convenience of the referee and players, we have put together data cards for each vehicle rated in this game in the "Equipment & Technology" chapter, beginning on page 360.

The referee should photocopy the card or cards for each relevant type of vehicle in the characters' possession and lay them out with the vehicle with the slowest movement on top. This will display the travel time and fuel consumption rate for each vehicle in the players' group, and will enable the referee to quickly and easily find the convoy speed (that of the slowest vehicle represented by the cards) and the convoy's fuel consumption (by totaling the rates of the individual vehicles).

Fuel

Referees may dispense with careful fuel consumption record keeping if the characters are travelling in well-settled areas and have no particular financial restrictions. If travelling cross-country through the wilderness, however, where fuel is not readily available, fuel consumption of vehicles can be an important limiter.

Consumption: Each vehicle card gives the vehicle's fuel consumption rate (liters consumed per period spent travelling or in combat) and fuel capacity (in liters). Additional fuel, of course, can be carried in supply vehicles or strapped to the outside of the vehicle, but this can be dangerous in combat. The card also states the type or types of fuel the vehicle's power can burn.

Once a certain technology level is reached, many multipurpose vehicles, particularly grav vehicles, use small "pocket" fusion plants which are not only very stingy with fuel, but can also be refueled by any source of hydrogen. This does require the use of a purifier to separate out the hydrogen fuel from whatever source is being used (water, ammonia, etc.), but the fuel lasts quite a long time. See the "Equipment & Technology" chapter for details.

Many other vehicles are equipped with useful multi-fuel engines that are tolerant of fuels other than their most efficient fuel.

Basic fuel consumption of these vehicle assumes that it is burning its preferred or most energy-efficient fuel type. Vehicles capable of burning several fuel types multiply the printed fuel consumption by the consumption modifier of the actual fuel being used, as shown below.

FUEL ENERGY

Fuel	*CM*
Hydrocarbon	1
Hydrogen	2
Alcohol	3

The fuel burned by a vehicle may be altered from its current choice to any of the other choices given in the vehicle card. This task is Average: Mechanic and takes four hours.

ENCOUNTERS

Roll for an encounter every four-hour period (or fraction thereof) spent moving and once per day spent stationary.

Encounters with people or creatures are resolved at the time scale the referee feels is appropriate. Often this will consist of roleplaying the encounter, with the referee playing the part of the nonplayer characters encountered, and periodically informing the players of the passage of time. For example, after an exchange of conversation, the referee may say, "You've been talking to the farmer for about half an hour."

If the encounter is a violent one, the referee will begin using combat turns.

Animals encountered and their behavior are described in the Animals section, pages 207-217, while human encounters are described in NPCs, pages 58-72. In addition, a variety of special or unusual event encounters are possible. An event may be almost anything: an unusual animal, an interesting terrain feature, the weather, even a natural disaster. An event's purpose is to add interest, atmosphere, and perhaps a bit of danger to the adventurers' travels.

Events should be specifically tailored to the terrain in which they occur and should make allowances for the nature of the party, its weapons, and its vehicles. A number of sample events are given below. In order to present as many ideas as possible, the descriptions of individual events are short; a referee's complete description of an event should add details appropriate to the current circumstances and storyline.

Animal Events

An event is a convenient form to use in describing an unusual animal; the animal's statistics, in standard format, may follow the description, or the event may describe unusual behavior by an animal found elsewhere on the table. An event may also describe the animal's lair or spoor, rather than the animal itself.

Some categories of animal events are:

Circling Flyers: A number of flyers spot the party and circle above their heads. After about 10 minutes the party will be attacked by chasers. The animals are symbiotic: The flyers spot prey for the chasers and are allowed to share in the feast.

Poisonous Pests: While the party was stopped, tiny (one gram) creatures have crawled into concealed places within the party's equipment (packs, boots, etc.). They are poisonous, and they attack when encountered (when a character reaches into his pack, puts on his boots, etc.).

Avoiding an attack by hidden poisonous pests requires the careful shaking out of all equipment and clothing and is an Average test of Agility.

Stampede: A herd of grazers, frightened by carnivores, stampedes into the party. They can be turned by loud noises (gunshots, explosions) or laser bolts. Otherwise, they will run straight through the party.

Turning a stampeding herd of grazers is an Average task using Riding skill.

Unusual Plants

Although plants generally remain just part of the scenery, some may be interesting or dangerous enough to qualify as events.

Animated Vines: Ordinary looking vines grab and hold individuals in a constricting grip, inflicting 1D6 hits from strangulation each minute (12 combat turns). Release requires cutting or tearing off the vines.

Freeing one's self from animated vines is an Average task using Armed Martial Arts (Long Blade) or (Short Blade) or a Formidable task using Strength. This task represents a prompt struggle by an adventurer; success secures an escape. Up to four other characters may assist, by making a Difficult task roll using either Strength or Armed Martial Arts (Long Blade) or (Short Blade), with each successful task roll lowering the escaping adventurer's task difficulty by one level. If a Catastrophic Failure occurs, one of the characters who was aiding in the escape has also been caught or, if using a blade, has cut the trapped player causing 1D6 hits. If no other characters were helping, ignore any Catastrophic Failures.

Hallucinogenic Pollen: The party comes upon a field of flowers. The air is filled with their pollen, which will cause strong hallucinations if breathed. The hallucinations, which are threatening in nature, will continue for about 20 minutes after the party leaves the field.

Tanglewood: The entire floor of the forest is covered with a low network of sticky, flexible roots. Running is impossible, and walking is difficult. Reduce speed to one-quarter.

Wirebushes: The party comes to an area filled with low bushes whose branches are very tough. Bypassing the area with a vehicle will add 1D6 kilometers to the travel distance.

Avoiding a mishap when driving through wirebrushes is a Difficult task using Ground Vehicle skill. Make this task Average if the characters' vehicle has tracks.

If a mishap occurs, the vehicle has become entangled, punctured a tire, or thrown a track. If so, the referee must define a task for the characters to free or repair their vehicle.

Weather

Various types of weather may endanger a party or impede its progress.

Cold Snap: The ambient temperature falls rapidly. Individuals must obtain shelter or suffer 1 point of damage to all locations per hour.

Dense Fog: The party encounters a low area filled with a dense fog. Visibility distance is quartered (see "Tactical Visibility," and all driving tasks become two difficulty levels harder without sensors.

Rainstorm: A sudden rainstorm reduces visibility and turns the ground to thick mud. Ground travel is slowed to quarter speed for the four-hour period.

Sandstorm: High winds fill the air with abrasive sand particles. Progress is impossible for 12 hours. Individuals will be buried, and windscreens on vehicles below tech level 12 will be abraded into translucence.

Tornado: A tornado is heading toward the party. If it achieves surprise, or if the party does not act to avoid its path once it is sighted, it will destroy their vehicle and inflict 3D6 damage to each member in the group to a *random hit location*.

Natural Disasters

Local phenomena may also provide interesting events.

Avalanche: Roll 6 or less (on 1D20) for a loud noise (vehicle, conversation, etc.) to precipitate an avalanche.

Avoiding damage from an avalanche is a Formidable task using either the appropriate Vehicle asset, or, if on foot, Strength or Agility.

Prairie Fire: A line of fire can be seen on the horizon. The fire is 20 kilometers across and must be detoured. Animals which are fleeing from the fire will ignore the party unless their escape path is blocked. Detour will add 2D10 kilometers to the travel distance. Roll for three animal encounters during that time.

Seismic Quake: A seismic disturbance shakes the ground.

Avoiding damage from a seismic quake while in a vehicle is an Average task using the appropriate Vehicle asset. For characters on foot it is a Difficult task using either Strength or Agility.

Volcano: A nearby volcano erupts, and the party must flee or be overcome by poisonous gases. After the eruption, ash and lava flow have sealed the mountain pass, preventing forward progress.

Terrain Features

Adventurers may encounter variations in local terrain too small to show up on planetary maps.

Bad Water: Local water is contaminated with heavy metal concentrations. Bathing in or drinking the water will cause illness for one to six days.

Broken Ground: The terrain becomes very rough; a vehicle must slow to one-quarter travel speed or any travel tasks become two difficulty levels harder.

Crevasse: A deep crevasse blocks the group's forward progress, and the party must travel 1D10 kilometers to detour around it.

Ford: Sandbars in the river create a shallow area, allowing vehicles to cross.

Oasis: The party approaches an oasis with a pool of water surrounded by heavy vegetation. Roll 10 or less (on 1D20) for the water to be drinkable. If it is not, moisture may still be recovered from reservoirs inside a species of plant life.

Radiation Area: An area in the forest is devoid of life, and a radiation sensor shows very high levels of radiation near the center. Individuals who spend more than 10 minutes in the area will suffer from radiation sickness, beginning 1D6 hours later. The illness will last for one day for each 10 minutes spent in the area. Symptoms include nausea, vomiting, and headaches, and the character will have STR, AGL, and INT halved for the duration.

Sun Crystals: At about midday, light from the sun strikes crystalline outcroppings, is concentrated and converged by them, and flashed about as a powerful energy bolt.

Ducking a sun crystal energy bolt is Difficult versus either Survival or Agility. If hit, the crystal does 1D6 hits, with a penetration of nil.

Curiosities

Some events may have no importance whatsoever and merely provide atmosphere to an adventure.

Jungle Drums: Distant drums are heard at night; periodically they fall silent and are answered from another direction. If the party investigates, they may be able to discover that these are the mating calls of a large omnivore.

Marsh Gas: Moving lights are seen in the distance, and they are apparently following the party. They may temporarily be mistaken for the running lights of an air raft.

Mirage: An oasis appears on the horizon, but it dissolves into nothing as it is approached by the group. This continues until nightfall.

Statues: The party finds a large stone statue half buried; the torso is human but the head is that of a local carnivore. Natives of the area, if consulted, will state that such finds are common and will give varying opinions of their origin and present significance.

Vacuum Worlds

Encounter tables for Vacuum Worlds (or for any world without life) must be largely composed of events.

Dust Pool: Microfine dust fills a crater. If any character walks through the pool, or drives a vehicle through, roll the following task:

Avoiding a malfunction due to excessive dust is a Difficult task using either Environment Suit or Ground Vehicle (depending on which was exposed to the dust).

Magnetic Anomaly: A large underground metal deposit deflects compass readings by as much as 60 degrees. Travellers who do not notice this will be steered off of their course.

Gunflowers: One of the more unusual forms of life known in the former Imperium was the gunflower. This tough-skinned plant exists on worlds with very thin or trace atmospheres (near-vacuum) and subsists by an almost closed-cycle form of photosynthesis which takes nutrients and trace moisture from the soil and requires very little atmospheric gas. The plant has become widely distributed thanks to space travellers who admire the little plant's toughness, and like to know that organic life can exist in near vacuum. There is a price to this altruism, however, as the plants have been known to kill their human beneficiaries.

Because of the absence of animals which form the usual medium of seed dispersion, these plants must distribute these seeds on their own. They do this by firing their seeds across the landscape. At close range, these seeds have enough velocity to crack or shatter a vac suit faceplate. This result, needless to say, can be fatal, especially when an explorer is travelling alone.

Pressure Tent: The party comes upon a small inflatable shelter. There is breathable air inside but no heat or light, for the shelter's power pack has run down. If anyone undertakes a lengthy search, the owner's body may be found under a rockslide or next to a gunflower several hundred meters away.

Solar Storm: Increased solar activity makes routine radio communication Formidable for 1D6 days.

Tracks: ATV tracks cross the party's path. If the party follows them in the right direction, they will be led eventually to a sign of civilization, either a still-inhabited or abandoned outpost, or the imprints of a spaceship's landing pads, and some discarded debris.

EXPLORATION

Most of the area to which adventurers are likely to travel in the early 1200s was already explored and settled prior to the Collapse, which began in 1130. A great deal can happen in 70 years, however, and most detailed data storage systems concerning the systems have been destroyed by the virus. As a result there is a renewed need for exploration of star systems and worlds, both to fill in gaps in information and assess the changes which have taken place in the past three quarters of a century.

Survey Data

Imperial survey data roughly 80 years old is fairly widely available, and this should be made available to the players. The referee can either generate this information or consult an older **Traveller** product covering the region. Surveys will provide nothing more than astrographic information on the star system (stellar type, number of worlds, gas giants, asteroid belts) and the Universal World Profile code of the main world.

No weapons powerful enough to actually alter the astrographic characteristics of a star system were used during the Final War, and so this information will remain unchanged. The physical characteristics of the main world will probably not have changed significantly either. Its size and hydrographic rating will certainly not have changed, and its atmosphere will not have changed very much. Standard atmospheres may have become tainted, either by radioactive fallout, dust from large ground strikes, or some other war-related cause. On the other hand, long-term terraforming projects left to their own devices may have improved the habitability of a world.

The most dramatic changes will be in the ratings concerning the inhabitants. Very few large-population worlds will have maintained their population at the pre-Final War level in the face of a complete economic collapse. Inhospitable worlds will have suffered most, and uninhabitable worlds where populations were maintained in artificial environments will have, almost without exception, become gigantic tombs. Where worlds are still inhabited, government types and law levels will have changed dramatically.

Note that there are two standards of pre-Final War world statistics. First is the material dating from 1124 and earlier. This material, which is often presented as material from the Imperial Second Grand Survey of 1065, was broadly accurate for most worlds from 1065 to 1124. By 1124, many worlds began to suffer the effects of the Final War which had begun in 1116, and there were incomplete attempts to update the world data to reflect these declines in the planetary "soft tissue": starports, technology level, population, government, and law level. This work was never completed, but planetary data from 1128-1129 will be more useful to the players, as it will at least have recorded the significant changes that had taken place by that time. However, the changes from 1130-1201 are the most profound of all.

Exploring Star Systems

Procedures for surveying star systems are based on pre-Final War Imperial practices in broad outline, although less emphasis is placed on astrographic data and more is placed on world data. The following sensors are used to determine astrographic information at the following ranges.

One Parsec (One Hex on the Subsector Map): Sensors (particularly EMS sensors concentrating in and around the visible light, IR, and radio wavelengths, and densitometers) determine the number of stars and estimate the presence of gas giants in the world (with an 80% accuracy). Star spectral types and luminosity classes can also be generalized. Binary star systems can have their masses calculated. This stage of the survey takes 1D6 days, but can be done while other activities are being conducted in the current system, depending upon sensor availability. If the sensors are currently being used intensively for detailed work, their availability for interstellar scanning will be curtailed. The referee should judge whether this 1D6 figure should be modified (for example, if the sensors are only available on a half-time basis, double the time required. Also apply modifiers for system complexity, if need be (a system with a large number of anomalous large bodies and eccentric orbits might require more time).

Within System: The densitometer, in conjunction with the EMS sensors, accurately measures the mass of each star, locates all possible major bodies and planetoid belts, and measures the mass of each major body. With this information players learn the UWP world size digit for every major body in the system.

The neutrino sensor measures the stellar energy of the star, which indicates its internal structure and its stability, and adds further confirming or modifying information to the spectral and luminosity information gained earlier.

The EMS array determines the general location, types, and intensity of emissions in the electromagnetic spectrum, particularly radio emissions, both natural and artificial.

EMS spectrography can be conducted on the "cool" (nonstellar) objects in the system.

This stage of the survey takes 1D6 days, and can be conducted during the period while en route to one of the worlds in the system to be surveyed in detail.

Planetary Orbit: The densitometer locates major tectonic plate boundaries and significant near-surface mineral deposits.

The EMS array is used to provide an outline map of the surface (showing continents, major bodies of water, mountain ranges, rivers, and dense vegetation areas), locates major climatic features (icecaps,



deserts, major air and oceanic currents, etc.), determines the presence or absence of a magnetosphere, locates radiation belts (if any), determines the albedo, and provides an estimate of the greenhouse effect.

EMS spectography determines the general atmosphere composition.

If radio emissions were detected earlier, the EMS array can pinpoint the sources. Moderate technology human habitation can be located at this point by the detection of radio sources, light sources, thermal sources, and the magnetic signatures of electrical power transmission.

Low technology sentient life cannot be reliably detected from this distance, but likely locations can be inferred to be explored later.

Likely locations of animal populations can be inferred from the location of vegetation on land, and in the oceans by the location of cold upwellings that bring the nutrient-rich deep waters to the surface.

Using the above data, the players estimate the atmosphere and hydrosphere digits of the world (60% accuracy, plus or minus one digit).

This stage of the survey takes 1D6 hours per world size number. (For a world size of 6, roll 6D6 for hours required.)

Upper Atmosphere: The EMS array locates local magnetic anomalies and any major areas of surface radiation contamination.

EMS array spectography and chromatography precisely determine the atmospheric composition.

The EMS array and densitometer together finish accurate topographic mapping and locate minor faults and areas of volcanism.

Using the above data the players determine the precise atmosphere and hydrosphere digits of the world.

Based on orbital surveys, locations of animals can be examined, and with IR sensors, an approximate picture of animal distribution and density can be created. Low technology human populations can also be inferred at this level, by properly interpreting patterns of habitation and the detection of such features as artificial irrigation ditches and cultivated land.

This stage of the survey takes 1D20 hours per world size number to complete all aspects, but only 1D6 hours (total) to complete the atmospheric analysis from samples that are scooped aboard the vessel during its passage.

Exploring World Surfaces

Once on the surface of a world, a variety of exploratory data may be collected. If players were sent to the world by a patron or organization to gather specific data, that will influence the sorts of tests and procedures they undertake.

Mineral Surveys: Densitometer readings can locate areas of major mineral deposits near the surface, but cannot determine their exact type. In level terrain, core samples are obtained by core drills. In mountainous terrain, the best procedure is to obtain core samples from several river bottoms that drain the mountain range, as most minerals in the mountain range will appear in the river bottom as sedimentation (with heavier minerals deeper in the bed). In both cases 1D6 hours worth of core drilling is necessary to adequately survey a mineral deposit.

If particularly valuable or sought-after minerals are present, a detailed search of the mountains will be necessary to recover ore samples which may show the location of the desired deposit. This survey will take 3D6 days.

Biological Surveys: 1D6 days are required per terrain type to collect representative samples of plant life and microorganisms for later analysis. Animal encounters provide opportunities for adventurers to study larger fauna.

An adequate large-fauna survey of a particular terrain type should include study of three animals from each of the four major categories (herbivore, omnivore, carnivore, scavenger). Small animals may be captured and placed in suspended animation, while larger animals may be anesthetized or killed and tissue samples taken. In all cases, photographic or holographic records of the animal's movements and habitat are important additions to the record.

Ruins: If the planet was inhabited, there will be traces of that former habitation which may be explored. Although most habitable planets will still retain some human population, they will no longer retain their former distribution. The hearts of cities will for the most part be abandoned, as the requirements of life are more readily grown or caught in open country. This will generally provide evidence as to the fate of the inhabitants and may still contain useable or repairable pre-Final War artifacts.

Inhabitants: Neural activity sensors can detect electrical brainwave activity within their listed ranges and, because sentient life exhibits brainwave patterns of unmistakable complexity, these neural sensors can be used to locate surviving inhabitants. Contacting these inhabitants may be the purpose of the exploratory mission, but this can be extremely hazardous. Human cultures cut off from outside contact for 70-some years after experiencing a catastrophic collapse of their society are often extremely xenophobic.

Animals

Animals in any ecological system interact with each other by obeying instincts, defending territory, and performing as segments in food chains. When adventurers enter such an ecological system, they will naturally encounter the animals of the system.

It is not quite accurate to call the collection of creatures in this chapter *animals*. While most of them *are* animals, there are also some plants and some things which may defy exact categorization. Nevertheless, when referring to all of them we will use the term animal.

Animals play an essential part in several different ways in **Traveller** adventures. First and foremost, a setting without animals does not appear real. The tremendous detail present in a huge universe is lost when players are not reminded of the infinite number of independent ecosystems that they can find when travelling from world to world.

Animals can serve as a referee prop to pass warnings along to the PCs. A guard dog who accompanies the PCs might bristle and growl upon the approach of unusual predators or intruders. Characters with sufficient Observation skill might notice the silence and lack of routine numbers of animals in a wooded area where an enemy patrol was lying in ambush. This use of animals serves to set atmosphere. Whatever mood native animals demonstrate is naturally passed on, at least to some degree, to the PCs. If a huge storm is approaching, the native animals will sense it and go into hiding, or hunker down in tree branches to ride out the storm. The normally prevalent background noises will fade away into a creepy silence. If this action is passed onto players observant enough to notice it, the impending menace of the storm will be much more vividly and realistically communicated than if the referee had simply said, "You feel a sense of ominous menace, hint, hint."

Another major way of using animals to establish the science-fiction setting of **Traveller** adventures is by the use of alien ones. Alien animals are central to the sense of other-worldliness desirable in **Traveller**. Mutated or genetically modified Terran creatures cannot only do that, they can also convey a sense of the alienation with nature that typified the Imperial age, and a reminder to the players that they are routinely surrounded by the relics of that age.

Animals also help bridge the gap between impersonal circumstance and personal enemies. That is, animals can be as implacable as any natural force, but if handled correctly, they can also impress upon the players a sense of awe, wonder, or even superstitious fear about their own role as players in a vast tapestry of interwoven forces and motivations, much of which they don't understand. If they are being stalked by a powerful, cunning creature, they should wonder, "Does it know something we don't? Does it have powers we don't suspect? Is it toying with us? Geez, whose idea was it to crawl through this jungle after the legend of the derelict research station, anyway?" It's a big universe—make your players respect it.

If the referee tries to get inside a animal's mind, to feel its desires and fears as much as with any other NPC, that referee's portrayal will be much more effective and entertaining than if the creature is merely played mechanically. Think of animals as low-grade NPCs. Generally, they will be easier to best than human opponents, but they should not be push-overs. Remember, the PCs are supposed to be heroes. Heroes without challenges are dull and lifeless. Only in a challenging universe where the PCs can fail will they have the opportunity to draw upon their talents to overcome obstacles and blossom into the heroes they should be.

ANIMAL COMBAT

Basically, animal combat follows the same rules as human melee combat, with the exceptions and clarifications enumerated below. Note that as with normal combat, all distances here are calculated in meters.

Animal Movement

In general, animals have three different movement rates: walk, trot, or run. The number of meters moved at each rate depends upon the type of animal, and is determined by animal generation below. The movement rate generated by the die rolls is the animal's running speed. The animal's trotting speed is half of this, and the animal's walking speed is half of its trotting speed.

Animals as Mounts in Combat: Riding a draft animal or riding animal (called a mount) is considered an action in the same manner as driving a vehicle. The referee should refer to the vehicle movement rules on page 291 of the "Combat" chapter for details.

Mounts may be ridden in combat. A walking mount can be ridden safely by virtually anyone. Riding a trotting mount requires an Average test of Agility for characters without Riding skill; those with this skill pass this test automatically.

Characters with Riding skill have a maximum safe speed on a mount equal to 20+(Riding). For these characters, riding at or under the safe speed is automatically successful. Riding at greater than the safe speed—up to 40 meters per combat turn (full gallop)—is done at the risk of falling off. To avoid a fall requires a Difficult test of Riding skill (which, if the character is unskilled in Riding, becomes a Formidable test of Agility) rolled once per turn. Failure results in a fall, 1D6–3 hits being suffered to a randomly rolled hit location. Catastrophic Failure results

in some sort of serious injury to mount and/or rider, as determined by the referee, based upon the exact situation in which the mishap occurred. Injuries to a mount might include breaking a leg in a chuckhole, tearing a muscle during a leap, or becoming bogged in mud in such a way as to cause injury. It is also possible that the rider has fallen and suffered damage as per a normal failure, above.

Animal Attacks

In general, animals attack as if engaging in melee combat. Most of these attacks involve animal weapons (teeth, claws, etc.), and are resolved as armed melee combat. This means that an animal attack cannot be blocked by an unarmed character, but may only be blocked with a melee weapon. Some animal attacks, such as coil and tentacle, are treated as unarmed melee combat grapple or strangle attacks, and can be blocked or escaped according to those melee combat rules. Furthermore, the animal trample attack is treated as a diving blow attack and can be dodged using the normal unarmed melee combat rules.

When attacking, animals do not use attributes (STR, AGL, CON) in the way that characters do. In order to hit a target, an animal rolls against a fixed to-hit number that is generated in the animal-generation procedures detailed below. This number is used just like a normal character task: The 1D20 roll must be less than or equal to the number in order to succeed; however, difficulty levels, etc., are not dealt with. The use of STR and CON to generate damage values for the animals are also replaced by standard damage values generated below.

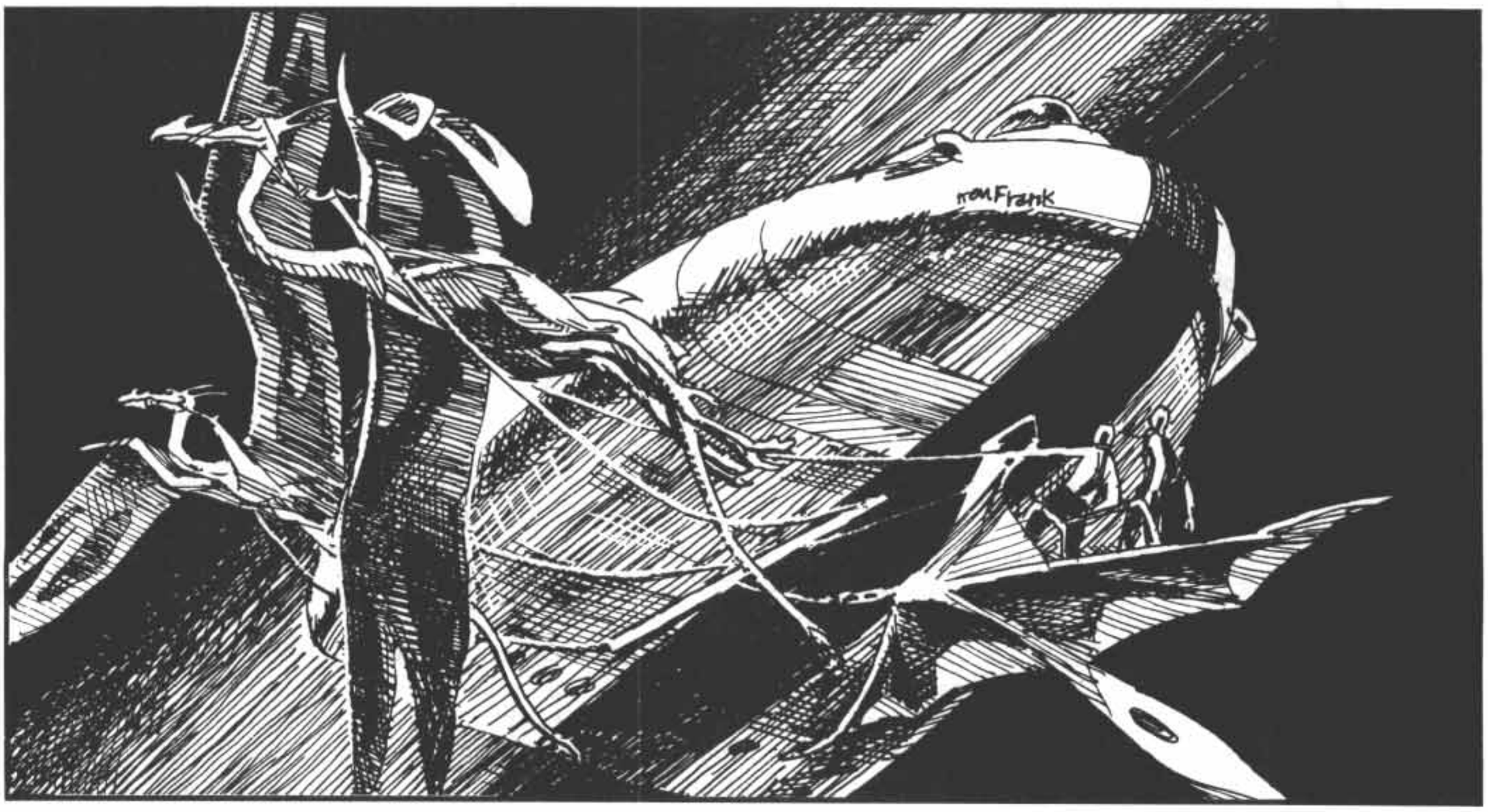
The type of attack used is determined by the type of "weapon" the animal uses to attack with.

Animal Weapons

There are 12 different types of natural weapons used by animals. Many animals have more than one of these and may attack with one or several, depending on the situation. Many of these weapons have unique characteristics as listed below.

Acid: Animals armed with acid attack as armed melee attacks. This attack cannot be blocked under the melee combat rules, but its effects can be negated by being fully covered by armor, such as combat armor or battle dress. The term *acid* as used here includes a variety of caustic fluids which plants or animals may spray onto their prey, and are called acid for ease and because they are most commonly digestive fluids of one sort or another. These seldom cause immediate serious injury, and are at first more irritating than damaging. As a result, animals which spray acid are usually herbivorous, and do so as a defense mechanism rather than as a means of predation. Predatory animals which use acid as a weapon usually combine it with some other grasping or controlling weapon, such as tentacles, coils, talons, etc.

Claws/Talons: Animals with claws or talons attack as armed melee attacks. These attacks can be blocked under the melee combat procedures. Carnivores and omnivores



with powerful limbs often have claws which are used to rake or hold an enemy. Claws typically do less damage than teeth, but have a longer reach.

Flying carnivores and omnivores usually have less powerful feet, and so claws are adapted to grasp rather than rake, and are especially useful for holding prey. Once an animal has wounded a character with its talons, it will continue to hold on until it is wounded. As soon as it is wounded, it will let go. So long as the animal holds onto its victim, the limb it is attached to is pinned in place and may not be used. In addition, the animal will hold with only one limb and will continue to attack (rake and claw) with the other.

Coils: Animals with coils attack as unarmed melee strangling attacks. These can be blocked per the normal strangling rules. An animal which attacks by constriction does so by coiling its slender but muscular body around its prey and squeezing. If an animal with coils succeeds in an attack, it indicates that the coils are in place around the character, not that the character is wounded.

Hooves: Animals with hooves attack as armed melee attacks. Attacks with hooves are made by kicking. Depending upon the size of the animal (i.e., how high it can kick), the referee may wish to assign DMs to its hit location, to skew it toward high or low hits on its target. As this is usually a defensive move, hooves are usually found on herbivores rather than carnivores.

Horn: Animals with horns attack as armed melee attacks, but horns often have a penetration value. Horns are effective defensive weapons due to their reach, but are usually not very effective when an animal is chasing prey. As a result, they are usually found on herbivores rather than carnivores. Animals with horns may block melee attacks in the same manner as if armed with a melee weapon.

Poison: Some creatures do little actual damage with their claws and/or teeth, but are able to inject poisons into their prey. Damage listings for these creatures are given in the form of a number followed by a small *p* (for *poison*), then another number. The first number represents the number of hits actually done by the delivery system (fang, stinger, etc.). If these hits are negated by armor, then no damage is suffered from the poison. However, if any damage does get through the armor, the target takes that damage on the combat turn in which it was hit, and on each succeeding turn it also takes damage from the poison. See the rules for poison on page 287 of the "Combat" chapter.

Projectile: Animals with projectile weapons attack as thrown weapon armed combat (see Thrown Weapons, page 282). Projectiles can include venom (Terran spitting cobra), super-heated chemical steam (Terran bombardier beetle), noxious liquid or gas (Terran spotted skunk), or stones picked up from the ground (Terran chimpanzee). It is easy to imagine animals which ingest small stones while eating, particularly as digestive aids (as many Terran animals do), which are then regurgitated in times of danger, perhaps coated with a noxious or poisonous mucus, and spat at hostile animals with great power. When distinguishing between the projectile form of attack with venom or noxious liquid and the acid spray above, think of the acid spray as a vaguely directional spray functioning over a short distance, and the projectile attack as a discrete slug of the material which can be directed at particular targets at longer distances.

Quill: Animals armed with quills use them exclusively for defense. Characters who come in physical contact with the quills of an animal, usually by stepping on or falling against them, are automatically hit by the quills. Many animals have poisoned quills.

Tail: Animals with tails attack using armed melee attacks. Animals with heavy, muscular tails can use them as bashing weapons against their enemies. Some tails are studded with sharp projections, and have penetration values. A tail can only be used to attack an enemy to the rear or side of an animal, not to the front.

Teeth: Animals armed with teeth attack as armed melee attacks. An animal's teeth do damage either by crushing a limb (if the animal is very large or strong) or by tearing. Teeth typically are short-ranged weapons.

Tentacle: Animals with tentacles attack as grappling unarmed melee attacks. Tentacles work in much the same way as coils, with two exceptions. First, most tentacled animals have multiple tentacles. Second, tentacles are usually used to grasp and subdue an adversary, and are seldom the principal weapon of the animal. Instead, the tentacles are used to draw the prey into the main weapon, usually teeth or digestive fluids. These attacks, like all grappling attacks, do not do real damage, but only controlling hits. Once the target is subdued, it is drawn in to be attacked by the animal's other weapon, usually its mouth.

Trample: Animals which trample attack using unarmed melee diving blows, but do not end the attack prone. These attacks may not be blocked, but may be dodged, using the unarmed melee combat rules. Some animals attack by attempting to crush their enemies, either by butting them or stepping on them. This attack form is used mainly as a defensive measure, and seldom against animals trying to flee. This is used by very large animals (such as Terran elephants and whales), very fast animals (such as Terran porpoises), and by herds of animals, whose stampede can trample predators by sheer weight of numbers.

Animal Wounds

Like NPCs, animals have their capacity for damage

abstracted into two rows of hit points. The first hit on the first row is a slight wound. Once the first row is filled, the first hit on the second row is a serious wound. Animals suffer –1 to Initiative with slight wounds, and another –2 (for a cumulative total of –3) for serious wounds. Once the second row is filled, the animal is critically wounded, loses consciousness, and will die, as discussed under Wounds Effects on page 288.

Because they do not have CON values, seriously wounded animals do not roll against their CON to remain conscious as characters do. Rather, an animal rolls to see if it flees once it is wounded to the serious level (see Animal Morale, immediately below).

Animal Morale

Animal morale is a fancy term for deciding if they attack or run away. The morale number is divided into an attack number and a flee number. Both numbers are the number that must be rolled less than or equal to on a D20 to produce that behavior.

Each animal has a chance of attacking listed with its other statistics. This is the likelihood that the creature will attack when first encountered if the PCs stumble upon it accidently. (Of course, if the referee planted the creature intentionally, whether it attacks or not is entirely dependent upon the referee.) That chance of attacking serves also as the likelihood that the animal will continue to attack even if wounded.

Whenever an animal first suffers damage from a combat, there is a chance it will flee. By the same token, whenever an animal is killed or rendered unconscious, there is an equal chance that any other animals in its group will flee. This die roll is made each time an animal is killed or rendered unconscious.

Once an animal takes its first hit on the second, serious wound, line, it rolls again to see if it will flee. A –5 DM is applied to this die roll. If the animal flees, the other members of its group also roll for flight.

Herbivores: Remember that herbivores always roll first to see if they flee. Then, if they do not flee, they roll to see if they attack. If they do not attack, they just stand around until the PCs provide further provocation.

Carnivores: Carnivores roll first to see if they attack. If not, then they roll to see if they flee. If not, they keep their distance and watch the PCs for any further provocation.

ANIMAL ENCOUNTERS

The referee should create one set of unique encounter tables for each world the PCs may travel to. This set should consist of one table for each terrain type found on the world. The encounter tables are created using the guidelines below. Of course, there will always be times when the referee has not been able to prepare complete tables for a world the PCs are exploring. The tables on pages 215-217 can also be used to generate a creature on the fly to be encountered as needed. However, for those worlds which will be visited often, or on which the players will spend a lot of time while pursuing a particular adventure, referees should take the time in advance to generate a full set of encounter tables, or at least tables for the terrain types that the PCs will visit. The adventuring will be much richer for it.

Once a set of tables has been created, it is used with the encounter procedure (covered under Encounters, beginning on page 202) to determine if and when animals are encountered. Although the precise nature of animals may change (and may prove to be quite alien), **Traveller** assumes most will conform to four categories based on their position in the food chain: herbivore, omnivore, carnivore, and scavenger.

IMPORTANT CONCEPTS AND DEFINITIONS

The animal tables introduce many important concepts and terms concerning animals. The tables used in generating animals and encounters are numbered from 1 to 12. Depending upon what the referee is trying to do, only some of the tables need to be used at one time.

Referees who are generating animal encounter tables for a world start at step 1 and go all the way through to step 12 to create the first creature. One table is created for each terrain type, and each of these tables has 20 animals (nine herbivores, four omnivores, four carnivores, and three scavengers) on it. Some of these animals can be repeats, although referees should try to have two or three different animals for each category.

Each subsequent creature begins at step 5 (although DMs from step 3 are used according to the terrain type of the encounter table being generated) and goes to 12. As each creature is completed, it is placed into the encounter table in step 4, and the next one is begun at step 5.

If the referee is generating an encounter on the fly, simply go through the list once from 1 to 12, and the result is the particular animal being encountered.

Animal Encounter Table Format (Step 4)

Whenever an animal encounter takes place, the referee rolls 1D20 on this table. If the referee has pregenerated the encounter tables, this one die roll shows the precise type of animal that is being encountered, and the encounter takes place.

If these tables have not been pregenerated, the referee must continue on to generate the encountered animal. This roll determines the general category of animal (herbivore, omnivore, carnivore, or scavenger) for which the referee rolls in step 5.

Animal Type and Quantity (Step 5)

The Animal Type and Quantity table indicates the types of animals which occur within the animal categories, according to their specific niches. Sometimes an animal type is followed by a die roll in parentheses. This roll represents the number of animals encountered as a group. If no roll is listed, the animal quantity is automatically 1.

This table is used in two ways. When generating animal encounter tables it is used to decide the type of animal that is to be generated and placed in a slot in the step 4 table above. When generating an encounter on the fly, it tells the sort of animal that has been encountered and must be generated with the tables farther below.

The types of animal within each category are intended to correspond to their relative abundance, but the particular type that results from each die roll, and the group size, may be altered to fit the needs of the referee.

Several animals of each of the four categories (herbivore, omnivore, carnivore, scavenger) should be produced for each terrain type, of various of the niche types. However, to get started only one creature of each category is required.

If several examples of each category are created, the referee may assign each one a unique encounter roll on the step 4 table. For example, the referee creates three omnivores for the forest terrain type, and decides that one of them, a hunter, is quite common, while the others, a gatherer and an eater, are relatively scarce. The hunter is assigned the numbers 10 and 11, while the other two receive the numbers 12 and 13, thus filling up all four omnivore slots in the table in step 4.

Special Attributes (Step 6)

Although the animals which adventurers will encounter tend to be walkers, some may be flyers, swimmers, amphibians, or even triphibians:

Flyers: These are animals capable of flying through the use of wings, levitating gas sacs, or other mechanisms.

Swimmers: These are animals that live in liquid and swim through the use of fins, flippers, jets, or other mechanisms.

Amphibians: These are animals that live in liquid but are capable of emerging onto land.

Triphibians: These are animals that live in liquid but are capable of walking on land and of flying in the air.

Certain entries on the table are followed by a DM which must be applied to the animal size roll; its general effect is to make flyers smaller and swimmers larger.

Animal Size (Step 7)

Animal size number is the final number rolled (after die roll modifiers) on the Animal Size table. This number is used in later calculations and so should be noted. The following additional information is provided by the Animal Size table:

Weight: The animal's weight is expressed in kilograms and may be taken as a general indication of size in relation to human beings (humans are approximately 100 kilograms). All sizes may be construed to cover a range of plus or minus 20 percent.

Hits: The Hits column indicates the number of hits an animal can take. Just as with NPCs, there are two rows each equal to this number (see Animal Wounds, above). If an animal receives wounds equal to or greater than three times its hits, it is destroyed and has lost any food or pelt value.

Damage: The Damage column indicates the general effect of size on an animal's ability to cause damage when it hits. The modification (if any) is noted and applied to the effects of the animal's weapons when they are determined. The notation "xND6" means to roll the indicated number ("N") of dice and multiply the base damage rate by that result.

Thus, for two animals armed with the same weapon, the larger generally inflicts a heavier wound.

For example, the referee is generating a size 17 animal which has tail as its weapon, which the referee decides to name the "groat." The weapons list states that tails inflict 1D6 hits of damage, and the Animal Size table shows that size 17 modifies this damage by 2D6. The referee rolls 2D6 and gets a 6, so the groat is listed in the Animal Encounter table as inflicting 6D6 hits with its tail.

Initiative: This is a die roll modifier to the Initiative roll made later. Note that larger animals tend to have lower Initiative ratings.

Armor DM: This is a die roll modifier to the armor roll made later. Note that larger animals tend to have tougher hides.

Animal Weaponry (Step 8)

Animals naturally have weapons which enable them to attack and defend. The type of weapon determines several attack characteristics, as shown on the table.

To Hit: This is a die roll modification made to the to-hit number. It is applied to the die roll made later in animal generation to determine the animal's task attribute; it is not a permanent die roll modifier to the task roll itself.

Damage: This shows the damage done by the animal's weapon. Note that the table does not show what to roll when the animal hits, but shows how to calculate the number of damage dice that the animal does with each successful attack. For example, a result of 14, Teeth, means to roll 1D6 to find out how many dice of damage that type of animal does with each hit, not to roll 1D6×D6 each time the animal hits. A roll of 3 means that the animal in question does three damage dice with each hit.

This damage value is modified by the results of the

Animal Size table. If the animal in the example were 12,000 kg on the Size table, an additional D6 would be rolled to obtain its final damage dice. If the result were a 5, then this animal would roll 15 dice for damage each time it hit its target.

A damage of 1D6 multiplied by 1/2 by the Size table becomes 1D3.

Note that poison delivery weapons are not multiples of D6, the listed delivery damage is the amount of damage done with a hit.

Penetration: This shows the penetration of the weapon. Usually it is Nil, meaning that it will not penetrate armor. Some animal weapons are capable of penetrating thin armor if the animal is large enough. In this case, the notation is "Size÷N" where N is a constant divisor. Divide the rolled animal size number by the constant, rounding all fractional results of 1/2 or more up, to determine the penetration of the weapon. If the animal's weapon penetrates the target's armor, it does full damage; if it does not penetrate, it does blunt trauma damage.

Range: This shows whether an animal's weapon is considered short or long range (See Armed Melee Combat, page 271, for melee combat ranges). A certain size is usually required before the weapon is considered long range. The range shown for projectile weapons is the effective range of the weapon (see Thrown Weapons, page 282, for discussion of range). Long range is twice this amount.

Animal Initiative (Step 9)

This determines when the animal moves and attacks in a combat turn. This number is modified by the DM from the Animal Size chart.

To-Hit Number (Step 10)

This is the animal's basic chance of hitting. The referee must roll this number or less on 1D20 for the animal's attack to hit its target. This number is modified by the DM gained from the Animal Weaponry chart.

Animal Armor (Step 11)

Some animals possess armor protecting them from attacks by other animals. Only the general effectiveness of the armor is indicated, not its specific construction. All entries provide a specific armor value. In some cases, this value is greater for the head than the rest of the body.

Animal Behaviors and Speed (Step 12)

Because animals have predispositions to attack or to flee, these details are noted on the Animal Encounter table entry. Three codes are used: A, F, and S. Each is followed by a number which indicates the dice roll involved.

A indicates attack predisposition. A7 indicates the animal will attack on a 1D20 throw of 7 or less. Special cases also exist, and they are indicated by a lower-case letter following the A. See the the Animal Behaviors table for details.

F indicates predisposition to flee. F7 indicates the animal will flee on a throw of 7 or less. Special cases are indicated by a lower-case letter following the F (see the Animal Behaviors table).

Different animals will have the A and F codes in different orders. The order in which they are listed is the priority in which they are rolled. Thus, for animals listed F, then A (herbivores), the flight roll is made first, followed by the attack roll if it does not flee. For carnivores, the order is A, then F, indicating that the chance of attack is rolled first, and then flight if the animal did not attack.

S indicates speed. The number rolled is its running speed. Half of this is its trotting speed. Half of this is its walking speed. Round up at each stage. For convenience, this number can be listed as three entries. For example, if the roll is 25, list the creature's walking/trotting/running speed as 7/13/25

Referee's Additions: You may want to invent new animal characteristics. Larger or smaller animals may be invented; other animal weaponry and armor types may be invented, with or without DMs, and so on.

ANIMAL TYPES

Animals can be described by the ecological niche they occupy. The following broad categories describe effectively all animal types. Note that some of these definitions overlap, because most animals have several available feeding behaviors and do what they need to do under the current circumstances to get a meal. For example, Terran baleen whales will scoop plankton while skimming through the sea (herbivore grazer behavior), but also take shoals of fish or mollusks from the bottom, which requires more work and is similar to herbivore intermittent behavior. Similarly, lions can take live prey as carnivore pouncers or chasers, but can take another creature's kill, thereby functioning as scavenger hijackers.

When trying to assign an animal to such a niche, use its most frequent or typical behavior, as well as the most vigorous technique which it routinely uses. For example, the lion would best be listed as a pouncer because it is not limited to hijacking behavior.

Herbivores

Animals which eat unresisting food are generally classed as herbivores. While this is usually means plant eaters, the definition here includes the eating of unresisting animals as well. Herbivores are of three types:

Grazers: Animals which devote most of their time to eating. They may be solitary or grouped in herds. Their primary defense is flight, although such action may

result in stampedes which could endanger adventurers who get in their path. When forced to fight, they will fight fiercely until killed or routed. Typical Terran grazers are the antelope and the moose. The baleen whale (which scoops krill from the sea as it swims through it) is also a grazer.

Intermittents: Herbivores which do not devote their full time to eating. They tend to be solitary. Intermittents usually "freeze" when an encounter occurs, fleeing if attacked by a larger animal. Sometimes an intermittent will attack in order to protect territory or young. Typical Terran intermittents are the chipmunk and the ele-phant.

Filterers: Herbivores which pass the environment through their bodies. Unlike grazers, which move to eat food, filterers move a flow of water or air through themselves in order to gain food. Generally, filterers suck, trip, push, or pull anything (even animals) at close range into a digestive sac. A filterer can absorb an animal up to twice its own weight. Filterers are solitary and generally slow-moving, if they move at all. Terran filterers are generally aquatic, such as the barnacle, coral, mussel, clam, etc.

Filterers attack differently than other animals. They inflict automatic wounds of 1D6 per each 150 kilograms of animal mass (weapons and wound alteration are ignored). They attack through reflex. Freeing oneself from them is a Difficult task using Strength.

This task represents a prompt struggle by an adventurer; success secures an escape. Up to four other characters may assist. Each makes a Formidable roll versus Strength, and each success lowers the escaping PC's difficulty level by one.This task is hazardous: If a Catastrophic Failure occurs, one of the characters who was aiding in the escape has also been caught. If no other characters were helping, ignore any Catastrophic Failures.

Omnivores

Animals which eat food without regard to its resistance. The bear, which will eat fruits, berries, and moths as readily as it will hunt for fish or animals, is an omnivore. Omnivores are of three types: gatherers, hunters, and eaters.

Gatherers: Animals which display a greater tendency toward herbivorous behavior. In most respects, they are similar to herbivore intermittents. Typical Terran gatherers are the raccoon and the chimpanzee.

Hunters: Animals which display a greater tendency toward carnivorous behavior. In most respects, they are similar to small or inefficient carnivore chasers. Typical Terran hunters are bears or humans. These creatures can also function well as hijackers.

Eaters: The true omnivore (in the sense that it will eat anything and everything) does not distinguish its food and consumes all that it confronts. Eaters present considerable danger since they do not avoid anything when encountered. A typical Terran eater is the army ant (where an entire colony is considered to be one organism, which it rather resembles, as it has only one reproductive unit—the queen).

Carnivores

Animals which prey on other animals by attacking and killing them in the face of resistance are carnivores. Carnivores are of five types:

Pouncers: Animals which kill their prey by attacking from hiding or by stalking and springing are pouncers. Because of the difficulty of coordinating such attacks, pouncers are usually solitary animals. In an encounter, pouncers which have achieved surprise have succeeded in their basic aim and will attack regardless of range. If they do not have surprise, they will sometimes still attack. They will flee if they themselves are surprised. Typical Terran pouncers are cats.

Chasers: Animals which kill their prey by attacking after a chase are termed chasers. They tend to be pack animals. The chased prey is not typically large animals, but small. Typical Terran chasers are wolves (and their typical prey is mice).

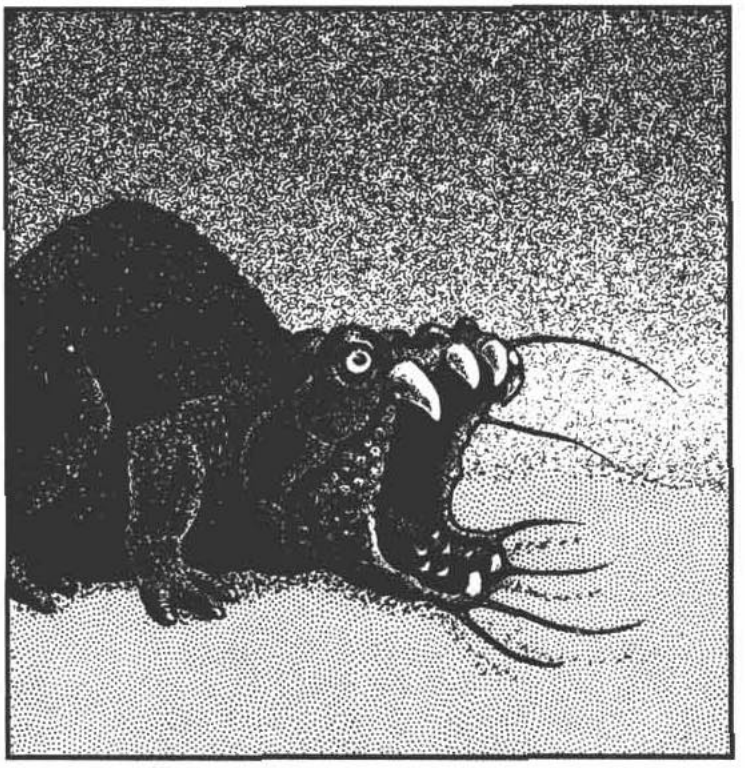
Trappers: Animals which passively allow their prey to enter a created trap wherein they are killed and eaten. Trappers tend to be solitary and slow, but will attack any animal which enters their trap. Usually, a trap will not wound or damage the trapped individual, but will tend to hold the one trapped in order for the trapper to attack. A typical Terran trapper is the spider or ant lion.

Generally, any character who is surprised by a trapper at close or short range is trapped (assuming that the creature is of sufficient size to normally feed on human-size prey). Escaping is a Formidable task using Strength.

This task represents a prompt struggle by an adventurer; success secures an escape. Up to four other characters may assist. Each makes a Formidable roll versus Strength and each success lowers the escaping PC's difficulty level by one.This task is hazardous: If a Catastrophic Failure occurs, one of the characters who was aiding in the escape has also been caught. If no other characters were helping, ignore any Catastrophic Failures.

Sirens: Distinct from the trapper, which creates a trap for its prey, a siren also creates a lure to draw prey to the trap. The trap is treated in much the same manner as that of the trapper, but the lure entails additional consideration.

In most cases, the lure will be specific to some animal but will be unnoticed by humans. In rare cases (roll 2 or less on 1D20), the lure will be universal, perhaps a smell or scent, or a mirage or a beautiful configuration, which



will attract characters into a vulnerable position. Very rarely, the lure will be psionic in nature. Typical Terran sirens are the angler fish (its mouth is the trap) and the Venus' flytrap.

Killers: A killer is a creature which is so powerful within its environment and well adapted to predation that it shows little fear of other creatures, regardless of their size. It is able to kill quite effectively when it is hungry, or when an intruder encroaches on its territory. Its ability to attack is so well-developed that attacking forms a relatively larger portion of its range of behavior than with most animals. Therefore, such creatures are more likely to attack without apparent provocation (i.e., in response to provocations that are apparent only to the creature). A Terran example is the shark.

Scavengers

Animals which share or steal the prey of others or that take the remains of kills are classed as scavengers. Scavengers are of four types:

Intimidators: These are scavengers which establish their claim to food by frightening or threatening other animals. Their standard procedure is to approach a kill and force other animals away by appearing to be a threat. A typical Terran intimidator is the jackal.

Hijackers: These are scavengers which establish their claim to food by simply taking it. They rely on their superior strength or size to allow them to hijack food because the other animals present cannot effectively object. This size and strength also allows them to function as pouncers and hunters. A typical Terran hijacker is the lion.

Carrion-Eaters: These are scavengers which take dead meat when it becomes available (often waiting patiently for all other threats to disperse before beginning). A typical Terran carrion-eater is the buzzard.

Reducers: These are scavengers which act constantly on all available food. They reduce the remains of food after all other scavengers are finished with it by consuming bone and other leavings. Terran reducers are all microscopic, such as bacteria.

ANIMAL MOTIVATIONS

Animals may be provided with more complex motivations than the simple dice rolls for attack and flight.

Carnivores base their decisions on the size of the party and size of the individuals in the party.

Large herbivores will be less likely to flee than small ones; instead, they tend to ignore a party unless it approaches too close. Humans may resemble a carnivore's natural prey or a herbivore's natural predator.

Any animal may unexpectedly attack if the party unwittingly threatens its young, nest, territory, or meal. Any animal may flee if startled or if the party appears sufficiently threatening; even the most vicious carnivore is reluctant to risk its life for a meal.

Other responses are possible beyond attack or flight. A carnivore may stalk a party, hoping to attack an isolated member. An armored animal may curl up into a ball or retract its extremities into its shell. Animals may find certain parts of the group's equipment attractive. They may fasten themselves to the outside of a vehicle or try to eat clothing. There may be responses analogous to that of the skunk or the opossum. An animal may be friendly or want to play; it might even mistake a party for members of the opposite sex.

COMMON SENSE

Airless worlds will almost never have any life of consequence on them; if they do, animal life will still tend to follow the same broad guidelines given above. Still, flyers and liquid breathers should be nonexistent.

Always be prepared to alter or restrain prescribed procedures if you feel they contravene logic or reason.

Greater Complexities: Events may be used to trigger rolls on special encounter tables; for example, if an event describes a forest clearing, a special table may be made up to handle encounters in that clearing. An event may be made specifically applicable to an adventure in which a party is involved; for example, if a party is prospecting the location of a mineral outcropping, this could be an event. Events may trigger small adventures that are separate from the main adventure; for example, an event could involve the party in the exploration of a cave previously mapped by the referee.

ANIMAL ENCOUNTER TABLE CREATION

1. World Size and Atmosphere

Using information about the world for which the animal is being produced, determine the world size and atmosphere from the world's UWP. This information is used later in step 6.

BASIC WORLD DATA

UWP digit	*Size*	*Atmosphere*
0	Asteroid	Vacuum
1	Small	Trace
2	Small	Very Thin
3	Small	Very Thin
4	Small	Thin
5	Medium	Thin
6	Medium	Standard
7	Medium	Standard
8	Large	Dense
9	Large	Dense
10+	Large	Exotic

2. Terrain Types

Determine the terrain types on the world through which the PCs will be travelling. Many worlds have most or all of the terrain types shown below in step 3, but not all are needed when only one region is explored.

One animal encounter table should be generated for each terrain type in the region being explored. Remember that a planetary ecosystem has tremendous diversity, and the animals found in the plains on one continent may differ dramatically from those found on another.

3. Animal Type and Weight DMs

Determine the animal type and weight DMs from the table below. The type DM is applied to the die roll in step 5 (Animal Type). The weight DM is used in step 7 (Animal Size). These DMs show a propensity for the animal to be larger or smaller based on the terrain type they inhabit.

ANIMAL TYPE AND WEIGHT DMS

Terrain Name	*Equivalent Terrain*	*Type*	*Weight*
Glacier	Ice Cap	—	–1
Clear	Road, Open	+3	+1
Prairie	Plain, Steppe	+4	+1
Rough	Hills, Foothills	—	—
Broken	Badlands, Lava Field	–3	–2
Mountain	Alpine	—	–2
Forest	Woods	–4	–2
Jungle	Rain Forest	–3	—
River	Stream, Creak	+1	–1
Swamp	Bog	—	—
Marsh	Wetland, Moor	—	–1
Desert	Dunes	+3	–2
Beach	Shore, Sea Edge	+3	+1
Surface	Ocean, Sea	+2	+3
Shallows	Ocean, Sea	+2	+2
Depths	Ocean, Sea	–4	+3
Bottom	Ocean, Sea	–2	+1
Sea Cave	Sea Cavern	–2	—
Sargasso	Seaweed, Kelp Bed	–4	–2
Ruins	Old City	–3	—
Cave	Cavern	–4	–1
Chasm	Crevasse, Abyss	–1	–3
Crater	Hollow	—	–1

4. Animal Encounter/ Category Table

This step is used only in rolling encounters. It is not used when generating encounter tables (rather, it is *filled in* when generating encounter tables). To find out what category of animal has been encountered, roll 1D20 and consult the following table. The result shows which table to roll on in step 5.

D20	*Animal Category*	*D20*	*Animal Category*
1	Herbivore	11	Omnivore
2	Herbivore	12	Omnivore
3	Herbivore	13	Omnivore
4	Herbivore	14	Carnivore
5	Herbivore	15	Carnivore
6	Herbivore	16	Carnivore
7	Herbivore	17	Carnivore
8	Herbivore	18	Scavenger
9	Herbivore	19	Scavenger
10	Omnivore	20	Scavenger

5. Animal Type and Quantity

This table is used in two ways. When generating animal encounter tables, it is used to decide the type of animal that is to be generated and placed in a slot in the step 4 table above. When generating an encounter on the fly, it tells the sort of animal that has been encountered and must be generated with the tables further below.

The types of animals within each category are intended to correspond to their relative abundance, but the particular type that results from each die roll and the group size may be altered to fit the needs of the referee. Roll 2D6 and consult the following table after applying the animal type DM from step 3.

Several animals of each of the four categories (herbivore, omnivore, carnivore, scavenger) should be produced for each terrain type, of various of the niche types listed below. However, to get started, only one creature of each category is required.

If several of each category are created, the referee may assign each one a unique encounter roll on the table. For example, the referee creates three omnivores for the forest terrain type, and decides that one of them, a hunter, is quite common, while the others, a gatherer and an eater, are relatively scarce. The hunter is assigned the numbers 10 and 11, while the other two receive the numbers 12 and 13, thus filling up all four omnivore slots in the table in step 4.

ANIMAL TYPE AND QUANTITY

2D6	*Herbivore*	*Omnivore*	*Carnivore*	*Scavenger*
0–	Filterer (1D)	Gatherer	Siren	Carrion-Eater (1D)
1	Filterer	Gatherer	Pouncer	Carrion-Eater (2D)
2	Filterer	Eater	Siren	Reducer (1D)
3	Intermittent	Gatherer	Pouncer	Hijacker (1D)
4	Intermittent	Eater (2D)	Killer (1D)	Carrion-Eater (2D)
5	Intermittent	Gatherer	Trapper	Intimidator (1D)
6	Intermittent	Hunter	Pouncer	Reducer
7	Grazer	Hunter (1D)	Chaser	Carrion-Eater (1D)
8	Grazer (1D)	Hunter	Chaser (3D)	Reducer
9	Grazer (2D)	Gatherer	Chaser	Hijacker
10	Grazer (3D)	Eater (1D)	Killer	Intimidator
11	Grazer (2D)	Hunter (1D)	Chaser (2D)	Reducer (1D)
12	Grazer (4D)	Gatherer	Siren	Hijacker
13+	Grazer (5D)	Gatherer	Chaser (1D)	Intimidator (1D)

6. Special Attributes

Certain terrain types suggest animals with special attributes. Roll 2D6 to determine what, if any, special attribute the animal has, and possible DMs for use in step 7 (Animal Size).

Die Roll Modifiers: World Size = Large, DM –1; World Size = Medium, DM +1; World Size = Small, DM +2; Atmosphere = Thin, DM –1; Atmosphere = Dense or Exotic, DM +2.

Die	*Beach*	*Marsh*	*Swamp*	*River*	*Sea*	*Other*
2	S+1	S–6	S–3	S+1	S+2	—
3	A+2	A+2	A+1	—	S+2	—
4	A+2	A+1	A+1	—	S+2	—
5	—	—	—	—	A+2	—
6	—	—	—	—	A	—
7	—	—	—	—	S+1	—
8	—	—	—	—	S–1	—
9	—	—	—	—	T–7	—
10	—	—	—	—	T–6	F–6
11	F–6	F–6	F–6	F–6	F–6	F–6
12	F–5	F–5	F–5	F–5	F–5	F–3
13	F–4	F–4	F–4	F–4	F–4	F–2
14	F–2	F–2	F–2	F–2	F–2	F

Results

A = Amphibian; F = Flyer; S = Swimmer; T = Triphibian.

Numbers are additional animal weight DMs for use on table 7 (Animal Size).

8. Animal Weaponry

Roll 2D6 and consult the following table to determine the weapon with which the animal attacks. **DMs:** –3 if Herbivore, +3 if Omnivore, +5 if Carnivore, +7 if Scavenger.

Die	*Weapon*	*To Hit*	*Damage*	*Pen*	*Range*	*Treat as Melee Attack*
–1	Hooves & Teeth	—	1D6	Nil	Short	Armed melee attack
0	Trample	–3	(1D3)×D6	Nil	Short	Diving blow
1	Hooves & Teeth	—	(1D3)×D6	Size+10	Short	Armed melee attack
2	Trample	–3	1D6	Nil	Short	Diving blow
3	Hooves	–2	1D6	Nil	Short	Armed melee attack
4	Horn & Hooves	—	2D6	Size+9	Long if size = 10+	Armed melee attack
5	Horn	–1	2D6	Size+7	Long if size = 10+	Armed melee attack
6	Quills	–2	1D6	Nil	Short	(Defense only)
7	Tail	–2	1D6	Size+7	Long if size = 10+	Armed melee attack
8	Projectile	—	(1D6–2)×D6*	Nil	1D6×Size+2**	Thrown weapon attack
9	Tail	–2	1D6	Nil	Long if size = 10+	Armed melee attack
10	Acid	–1	1D6	1D6–4	Short	Armed melee attack
11	Claws & Teeth	+2	(1D6)×D6	Size+8	Long if size = 9+	Armed melee attack
12	Coils	+1	1D6	Nil	Short	Strangle
13	Claws	+2	(1D6–1)×D6*	Size+9	Long if size = 9+	Armed melee attack
14	Teeth	+1	(1D6)×D6	Size+10	Short	Armed melee attack
15	Poison***	***	XpN***	Nil	Short	Armed melee attack
16	Tentacle†	+4	1D6†	Nil	Long if size = 6+	Grapple
17+	Claws	+1	(1D6)×D6	Size+9	Long if size = 9+	Armed melee attack

*If damage result is 0×D6, basic damage is 1D3 points.

**Range equals effective range in meters, and is calculated by rolling 1D6, multiplying the result by the rolled animal size number, and dividing by 2 (rounding fractions up). For long range, double this figure.

***Poison may be delivered by teeth, claws, quills, or a specialized stinger organ. Roll 1D6 for delivery weapon, then roll 1D3 for poison strength. The Delivery Weapon Table at right provides the damage by the means of poison delivery, which goes in place of the "X" in the damage column. The number rolled for poison strength goes in place of the "N," and indicates the number of D6 that are rolled for poison damage on each subsequent combat turn.

7. Animal Size

Roll 2D6 for animal weight and the effects of that weight. Use the weight DMs obtained from steps 3 (Animal Type and Weight DM table) and 6 (Special Attributes table). Record the weight number, which is the same as the final adjusted die roll, as this will be used again in step 8 (Animal Weaponry) to determine penetration and range.

The Damage column is the size modifier used with the basic damage generated in step 8 (Animal Weaponry). The Initiative modifier is used in step 9 (Animal Initiative), and the Armor DM is used in step 11 (Animal Armor).

Die	*Weight*	*Hits*	*Damage*	*Initiative*	*Armor DM*
1	1	1	×1/2	+1	—
2	3	1	×1/2	+1	—
3	6	1D3	×1/2	+1	—
4	12	1D6	—	+1	—
5	25	1D10	—	—	—
6	50	1D20	—	—	—
7	100	2D20	—	—	—
8	200	3D20	+1	—	—
9	400	4D20	+2	–1	+1
10	800	5D20	+1D6	–1	+1
11	1600	6D20	+2D6	–2	+1
12	3200	7D20	+3D6	–2	+1
13	Roll again, but with an additional +6 DM (reroll further rolls of this result)				
14	6000	8D20	×1D6	–2	+2
15	12,000	9D20	×1D6	–3	+2
16	24,000	10D20	×1D6	–3	+2
17	30,000	11D20	×2D6	–3	+3
18	36,000	12D20	×2D6	–4	+3
19	40,000	13D20	×2D6	–4	+3
20	44,000	14D20	×3D6	–4	+4

Delivery Weapons

Die	*Delivery Weapon*	*Delivery Damage*	*To Hit Modifier*
1-2	Teeth	1D3	+2
3	Claws	1D3	+2
4-5	Quills/ barbs/spines	1	N/A (defensive only)
6	Stinger	1	+1

†Damage is controlling hits only (see Grappling, page 270). On a result of Tentacle, roll 1D6 for the additional weapon which is used after the target has been subdued.

Die	*Weapon*
1	Acid
2	Poison
3-6	Teeth

Notes

Damage is base damage, and is modified by the modifiers from step 7 (Animal Size table).

Penetration is the animal's rolled size number divided by the number shown. Round to the nearest whole number.

9. Animal Initiative

Roll 1D6 and apply the DMs listed below and those from step 7 (Animal Size). The result is the animal's Initiative number used in the combat turn.

Animal Type	*DM*
Herbivore	–2
Scavenger	–1
Omnivore	+1
Carnivore	+2

10. To-Hit Number

This number serves as the animal's asset when to-hit skill task rolls are made for it by the referee. Roll the indicated number of dice and then apply any DMs for weapon type from step 8 (Animal Weaponry).

Animal Type	*D6*
Herbivore	2
Scavenger	2
Omnivore	2
Carnivore	3

11. Animal Armor

Determine what armor, if any, each individual animal has by rolling 2D6 and consulting the following table. DMs are added from step 7 (Animal Size) and the listed DMs below.

Die	*Armor*
1	(+6)
2	—
3	—
4	½
5	—
6	—
7	—
8	—
9	—
10	½
11	—
12	(+6)
13	½
14	½ (Head 1)
15	½ (Head 1)
16	½ (Head 1)
17	1 (Head 2)
18	1 (Head 2)
19	2 (Head 3)
20	3

Die Roll Modifiers

If carnivore, –1.
If herbivore, +2.
If scavenger, +1

A result of (+6) requires a reroll with an additional DM of +6 (in addition to any others). An additional (+6) result triggers another reroll, but without an additional +6 DM.

12. Animal Behaviors and Speed

Determine the range of animal behaviors and reactions that are possible.

	Animal Behaviors		
Type	*To Flee (F)*	*To Attack (A)*	*Typical Speed (S)*
Herbivore			
Filterer	1D6	If possible	1D20
Intermittent	3D6	2D6	2D20
Grazer	3D6	2D6	3D20
Omnivore			
Gatherer	2D6	2D6	2D20
Hunter	2D6	3D6	3D20
Eater	1D6	2D6	2D20
Carnivore			
Pouncer	If surprised	If surprise	3D20
Chaser	2D6	If more	4D20
Trapper	2D6	If surprise	1D20
Siren	2D6	If surprise	1D20
Killer	1D6	3D6+2	3D20
Scavenger			
Hijacker	2D6	3D6	3D20
Intimidator	2D6	3D6	2D20
Carrion-Eater	3D6	2D6	3D20
Reducer	1D6	1D6	1D20

In some cases above, a description is given in place of dice to roll for a behavior, and indicates that an animal will always behave in a certain way according to the situation. These cases are:

If Possible: A filter will attack if it possibly can. Use the code **Ap**.

If Surprise: The animal will attack if it has surprise. Use the code **As**.

If Surprised: The animal will flee if it has been surprised (as soon as it realizes this fact). Use the code **Fs**.

If More: The animals will attack if there are more of them than there are of potential prey (that they can see). Use the code **Am**.

Space Travel

Travellers do just that—they travel. Each interstellar jump places new worlds before the adventurers—exotic and faraway settings for every conceivable activity from bold commercial ventures, to quests after fabled alien artifacts, to high-tech military expeditions.

Each new encounter on a world's surface can bring with it new challenges, new unsolved mysteries, or new information. Interchange with local personalities and the conflict in goals that inevitably occurs between the locals and the characters make for some memorable moments in adventuring.

Travel is fundamental to **Traveller**: both travel on the surface of a world and travel between worlds. Travel between worlds forms the most important type of travel to be undertaken by characters. Characters can purchase individual passages aboard a vessel, they can charter a ship, and those with sufficient resources may even elect to purchase a starship.

INTERSTELLAR TRAVEL

Worlds orbiting different stars are reached by interstellar travel, which makes use of the jump drive. Once a starship moves to a safe distance from a world, it may activate its jump drive. As gravitational fields interfere with the alignment of the jump drive (and may cause a jump mishap—see page 227), ships do not usually jump until at least 100 diameters away from the nearest world. This is usually accomplished quickly and easily; by way of example, transit time to 100 diameters from a Size 8 world takes about five hours at 1G.

The jump drive pushes the ship into and through a tunnel through jump space, or "J-space," a conceptual universe with more elastic dimensions than normal space (N-space). The J-space tunnel is mathematically similar to an artificially created wormhole. Due to the unique topology of J-space, the fall through the tunnel takes about one week (150 hours), regardless of the distance travelled in N-space. This time spent in the J-space tunnel is referred to as time "in the hole" by experienced travellers.

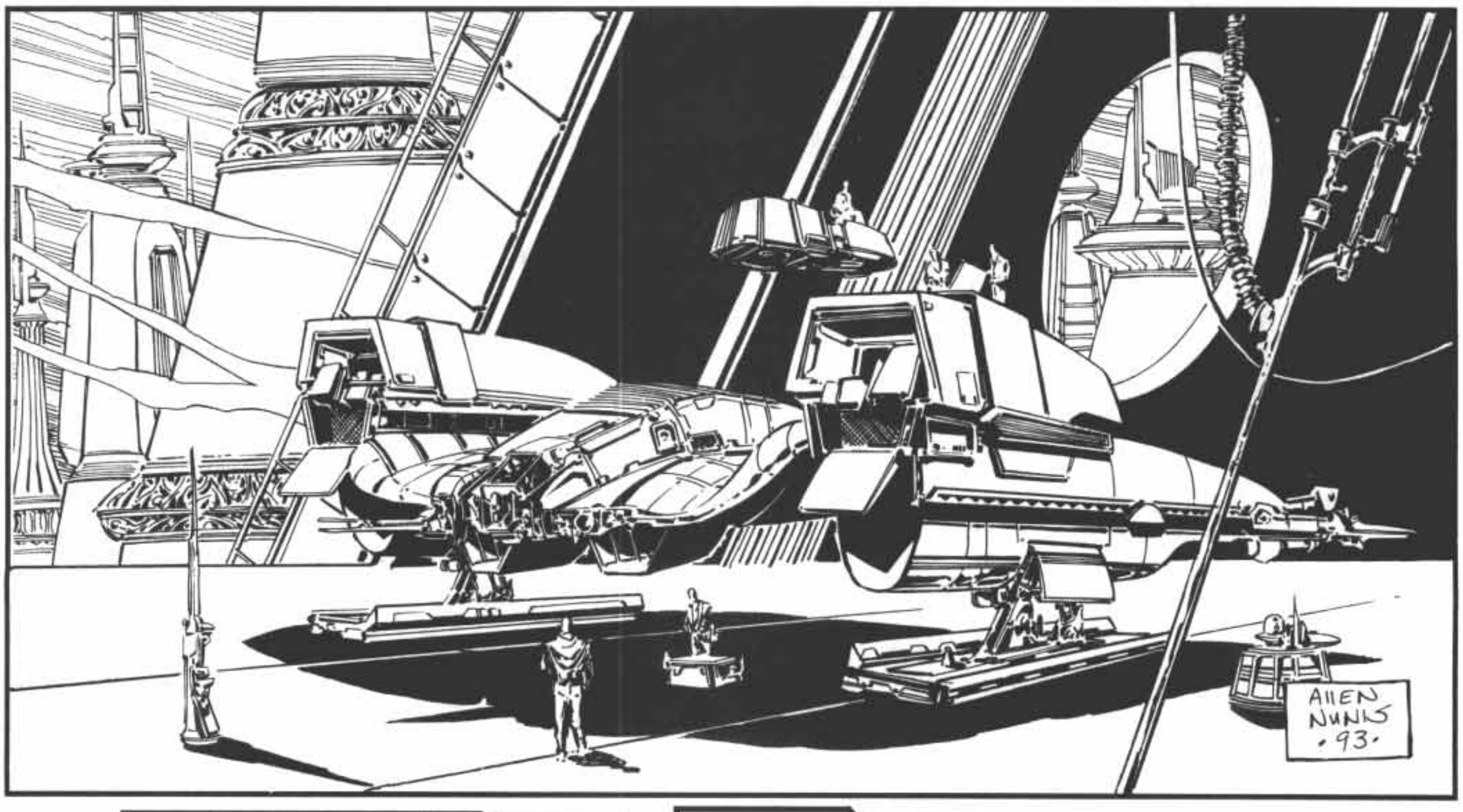
Jump drives are rated from 1 to 6, the rating being the number of N-space parsecs which can be travelled in one jump. Higher numbers indicate higher power levels and greater abilities to compress the dimensions of J-space.

Commercial starships usually make two jumps per month. They spend one week in jump, followed by one week in the star system, travelling from the jump point to the local world, refueling, marketing cargo, finding passengers, leaving the starport, and proceeding to a jump point again. The week in the system usually provides some time for crew recreation and for wandering around the planet.

Noncommercial ships usually follow the same schedule of one week in jump and one week in a system. If haste is called for, a ship may refuel immediately and rejump right away. This allows the ship to make one jump per week but makes no provision for cargo, passengers, or local stops.

Interstellar travel is priced on the basis of accommodations; prices cover a trip from starport to starport, encompassing one jump regardless of length. There are six types of passage:

High Passage: The best method of travel is called high passage, which involves first-class accommodations and cuisine. High passengers have the services of the ship's



steward, entertainment, and complete attention to their comfort. There is a baggage allowance of up to 1000 kilograms. High passage costs Cr10,000. The use of high passage fares outside the Regency is rare, as the limited ship space available militates toward the use of middle passage fares. A high passage passenger requires one entire stateroom (large or small).

Middle Passage: In order for starships to fill their staterooms with passengers, middle passage is offered on a standby basis, in the event that not enough high passages are sold. While middle passengers occupy staterooms normally similar to those occupied by high passengers, they do not receive the service or entertainment accorded the high-paying passengers. In addition, the quality of the cuisine is mediocre. Baggage totaling 100 kilograms is allowed. Middle passage costs Cr8000 and requires an entire stateroom (large or small).

A middle passenger may be "bumped" and the stateroom taken by a late-arriving high passenger; the middle passenger's ticket is returned, but no other compensation is made. (The bumped individual could, of course, then buy a high passage and in turn bump some other middle passenger if the extra cost seemed worth it.)

Outside of the Regency, the middle passage fare usually requires two passengers to share a single stateroom, rather than the one-per-stateroom standard of the high passage. Consequently, middle passages in the Old Expanses, Pocket Empires, and the Wilds usually cost only Cr5000. Bumping also works differently outside the Regency. A character may make an Average test of Bribery with the ship's financial officer (also variously known as the bursar or purser) to have another passenger bumped. There is a minimum "bribe" (usually referred to as the "priority fee," as this practice is routine, and not considered illegal or even unethical). Each additional Cr500 offered above the minimum fee allows a –1 DM on the die roll.

Working Passage: A starship captain with a crew shortage may hire an individual to fill the vacant position and pay not money but passage in return. Working passage may not continue for more than three jumps, or the individual is considered to have been hired for standard salary. In order to be hired for working passage, the individual must have some expertise in the position for which he or she is hired. Baggage totaling 1000 kilograms is allowed. Working passage costs nothing to the individual.

Steerage: This is not used in the Regency, which still operates under the old Imperial travel regulations that outlaw steerage travel. Steerage requires the passenger to travel in some small space, usually 1/2 ton to one ton, left over in the cargo bay. Steerage passengers are not fed, and must carry their own food with them. Baggage is limited to 100 kilograms, which includes whatever food they bring along. The ship's crew is not obliged to provide medical attention to steerage passengers (although a test of Persuasion might help in an emergency), and in the case of emergency, there is never sufficient life-saving equipment (vac suits, vac balls, seats on lifeboats, etc.) to care for steerage passengers.

Steerage space is not always available, as ship's crews always give priority to cargo. Some crews will pack eight or more steerage passengers into a single stateroom. The purchase of a steerage passage requires the signing of a waiver, clearing the ship owners and crew of responsibility of any mishap that might befall the passenger during the trip. Steerage passage costs Cr2500.

Low Passage: Transportation while in cryogenic sleep (suspended animation) is possible at relatively low cost to the passenger (generally Cr1000 in the Regency). The passenger is placed in a low passage berth before the ship takes off and travels the entire journey in a state of suspended animation. He does not age, and requires very little life support. Unfortunately, the low passage system involves some intrinsic dangers to the passenger, and he runs some risk of not surviving the voyage. Reviving a low passage passenger is a Difficult task performed by the attending health-care specialist at the time of deberthing, using Medical (Diagnosis) skill.

Failure results in one of several possible injuries. Roll 1D6 and consult the following table:

Die	*Result*
1-2	The subject suffers 1D6 points of damage to the chest, but healing does not begin for 1D6 days, after which healing is normal; skin loses some of its tone and color for 1D6 weeks, having a gray, wrinkled appearance.
3-4	The subject suffers 2D6 points of damage to the chest, but healing does not begin for 1D6 days, after which healing is normal; subject experiences motor function problems for 1D6 weeks with corresponding loss of 2 points of Agility during that time, in addition to the change in skin appearance, above.
5-6	The subject suffers 3D6 points of damage to the chest, which does not heal at all without surgery; the subject's internal organs are damaged; and the subject must undergo medical diagnosis and treatment to restore full health.

Catastrophic Failure indicates that the passenger has died. Low berth passengers with CON of 2 or less require a Formidable test of the attending medic.

Commercial starship lines offering low berth passage typically guarantee that deberthing will be conducted by a physician of at least skill level 3. The purchase of a low passage ticket routinely involves the signing of a waiver that the starship's crew and owners are not liable for any mishap suffered by the passenger resulting from the low passage.

Stowaways: Stowing away on a starship is a sixth form of passage and the least advisable. Sneaking aboard a starship in order to gain passage to the next world is illegal on almost all worlds, if only because it operates to the detriment of the starship owner's economic standing. It is also often a violation of various customs regulations.

Finding a stowaway is an Average task using Observation, with Starship Architecture as an enabling skill. One attempt can be made per day. Various elaborate schemes on the part of the stowaway may affect the difficulty of the search, at the referee's judgment. Upon discovery, the referee must judge

the starship captain's reaction. The historical punishment for stowaways is spacing: the stowaway is forced out the air lock without a vac suit (although this can only be done in N-space, and is not done much anymore in any case). Potential stowaways should realize that cargo holds are often depressurized during a trip.

Lesser Known Aspects of Space Travel

As interstellar travel has developed, the field has developed its own dangers and customs. The following are just a few:

Travellers' Aid Society: Once active throughout human-settled space, the Travellers' Aid Society is now confined to the area of the Regency. Individuals who have decided that they wish to pursue a life of travel and adventure may elect to join the Society in order to take advantage of its facilities and passage dividends. Members of the Travellers' Aid Society receive, as a dividend of membership, one high passage every two months. The high passage may be used, retained for later use, or sold for 90% of its cash value.

Membership in the Travellers' Aid Society may be acquired as a mustering-out benefit by certain career types as detailed under Starting Money and Initial Equipment, page 36. Membership may also be purchased provided a successful Average task roll versus Charisma. If a Catastrophic Failure occurs, the character has been "blackballed" and may not purchase a membership. Upon acceptance, the character must pay an initiation fee of Cr1,000,000. Only one application per person is allowed. Membership is for the life of the character and is not transferable.

Hijacking: Starships can be easy prey for hijackers. Starship crews maintain a constant guard against hijackers, and the ship's computer can run an anti-hijacking program which denies access to controlled areas to potential hijackers. Passengers are generally required to check all weapons into the ship's locker; they are returned at the end of the voyage.

Nevertheless, there is a chance of an attempted hijacking, for ransom or to steal the multimillion-credit vessel. Roll 3D6 for 18+ to indicate a hijacking attempt (this roll does not apply if all passengers are player characters). When an attempt occurs, randomly determine the number of hijackers, their identities, characteristics, and weapons, and implement their attempt at some point during the voyage. They will gain complete control of the ship only after defeating all other individuals on the ship.

If the anti-hijacking program is functioning, gaining access to the bridge is a Formidable task using Intrusion. If the program is not running, the task becomes Difficult. If the task fails, an alarm has sounded on the bridge, warning the bridge crew. The hijackers will know they have failed to achieve surprise only if their roll fails. Success at this task allows the hijackers to enter the bridge; subsequent combat may be called for.

The results of hijacking for the crew and passengers range from release of passengers without harm, to marooning on uninhabited worlds, to spacing and death.

Skipping: Most starships in the Regency are purchased on credit, and the monthly payments required against the multimillion-credit debt are staggering. The owner or captain may decide to steal the ship himself or herself instead of remaining under that load. Passengers have no way themselves of determining if a specific ship is in such a status. It is an Impossible test of Research to determine whether a commercial ship is of this type.

Ships which have skipped are subject to repossession attempts if detected by the authorities. Such attempts may range from the formal service of papers, to legal injunctions, to armed boarding parties.

On each world's landing with a skipped ship, a repossession attempt will occur on 3+ on 2D6; apply a DM of –1 per 5 parsecs distance from the ship's homeworld, to a maximum of –9. If the ship has called on the same world twice within the last two months, apply a DM of +2.

With skip bounties running from 1% to 5% of the value of the ship, PCs may want to enter the skip tracing business. This is a potent source of possible adventures.

Piracy: A starship may be attacked by pirates while entering or leaving a system. Similar encounters may involve customs agents or military vessels, including blockades. The Starship Encounters charts beginning on page 228 indicate the procedure.

Gas Giants: Most star systems include in their family of planets one or more gas giants—large worlds with hydrogen or methane atmospheres. These gas giants are a valuable source of fuel for starships.

In order to refuel from a gas giant, a ship must move into orbit around it and then dive deep into its atmosphere with open fuel scoops. The procedure (called skimming) takes approximately 10 hours and results in fuel tanks filled with unrefined fuel. Skimming is an Average task using Pilot (Interface/Grav).

The upper reaches of a gas giant's atmosphere are dangerous. Failures on the task rolls can include simple turbulence, excessive radiation exposure, collision with debris, heat damage to the ship's hull, getting caught in a swirling cyclone storm, or getting caught in the gas giant's gravity well.

Ocean Refueling: Ships can refuel from the water oceans of any world with a non-zero hydrographic percentage. Ocean refueling may require a permit on some worlds; roll law level or less on 2D6 to determine this. If the PCs wish to refuel their ship illegally, they should avoid populated areas, and they will have to circumvent the local world's sensors (if any).

The process calls for the ship to land in or near an ocean and fill its tanks from the local water supply. It takes approximately two hours and results in fuel tanks filled with unrefined fuel. Ocean refueling is an Average task using Pilot (Interface/Grav). Catastrophic Failures, when they occur, can include water leaks, corrosion damage from sea salts, running aground, sinking, or getting caught in a hurricane.

ECONOMICS OF STARSHIP OPERATION

Operating a starship in the interstellar market requires an understanding of how trade between the stars works. This includes an understanding of supply and demand control prices, as well as returns on effort and investment. Because starships are so expensive, many of the prices used when discussing them are expressed in megacredits (abbreviated MCr); a megacredit is 1 million credits.

Starship Purchase

Starships are available for purchase (after some fashion; see below) in many areas of the former Imperium. When calculating purchase price, see the base purchase price listed with each ship in the "Equipment & Technology" chapter. Also consult the Currency section of the "Trade and Commerce" chapter (page 230) to find what the local price of that starship would be. A starship built on a world with certain starport and tech level values will always have its purchase price modified by the currency procedure.

Bank Financing: In the Regency, bank financing is available to qualified individuals for the purchase of commercial starships. After the individual makes a down payment of 20% of the cash price of the starship, the shipyard will begin construction of a specific vessel.

Upon completion, the shipyard delivers the vessel to the buyer, and the bank pays the purchase price to the shipyard. Because the bank now holds title to the ship, the ship's purchase price must be paid off in a series of monthly payments to the bank. Standard terms involve the payment of 1/240 of the cash price each month for 480 months. Thus, interest and bank financing cost a simple 120% of the final cost of the ship, and the total financed price equals 220% of the cash purchase price, paid off over a period of 40 years.

The bank will insist that the purchaser submit an economic plan detailing the projected activity which will guarantee that monthly payments are made. This will often require that the purchaser has researched the trade routes that the ship will be worked on, to show that the ship's monthly operational cycle will generate sufficient profit to make the payments. This type of route research is often done by leasing another vessel or working as a crewmember on a ship which already works those routes. Unless a character has some form of guaranteed income (perhaps large rents from some property he or she owns), this requirement generally rules out financed purchases of yachts, military vessels, or exploratory vessels.

Subsidies: The government may subsidize larger commercial vessels (built on 400-ton hulls or larger), primarily to assure consistent service to specific worlds. These subsidized merchants are generally assigned a specific route connecting from two to 12 worlds of varying characteristics. The route will generally be determined before a subsidized merchant is purchased, to allow tailored design features as may be necessary.

When a subsidized merchant is ordered, the character himself must make the 20% down payment, with the government assuming responsibility for the payments upon delivery and taking 50% of the gross receipts of the ship while in service. The character is responsible for all expenses and costs of operation.

Subsidized merchants are also subject to mobilization (and use as auxiliaries) in the event of emergency or hostilities. At the end of 40 years, the vessel is completely paid off, and full title passes to the character, but the vessel remains subject to mobilization in case of government need.

In the Regency, vessels other than merchants are eligible for subsidy from the Regency Quarantine Service. This includes nonjump-capable spaceships in the 70-ton range, and also the Quarantine Cutter, a 150-ton stretched and modified Scout. In exchange for the subsidy, purchasers are commissioned into the Quarantine Service and accept duty assignments patrolling the border zone against virus-carrying ships.

Government Ownership: In other stellar regions, the Old Expanses and Pocket Empires, virtually all ships are owned at least in part by the local government. These societies have a great need to maintain their fragile interstellar contact and trade, and have few resources, especially high-technology items like starships. Therefore, their governments have an interest in overseeing the operation of all of these ships, which are thought of as belonging to the entire society. In most cases, these governments recognize that the encouragement of private enterprise and initiative in the operation of these ships is the best way to ensure their best use, so they encourage a financial interest in these vessels by their crews.

These governments exercise a system similar to the subsidy system above, but rather than providing financial assistance to purchasers who wish their own ships, this system ensures that the government has a piece of, and can therefore control, every ship operating in its boundaries. Functioning shipyard space in these regions is scarce, and these governments need to ensure that every hull laid down in these yards will be put to the best use of the society as a whole.

A prospective purchaser must have at least 20% of the purchase cost of a ship (which gives the government 100% ownership of the outstanding balance, and thereby the ship, what banks call the "note"), but it is pointless for the purchaser to have more than 70% of the cost, as the government will reserve a 50% share of the ship for itself. After all, it is the government that has managed to preserve the starport in operating condition against all odds for 70 years.

Once the money is assembled, the purchaser must apply to the government for a place in the shipyard's production schedule. The application process takes 1D6 months and is a Difficult test of Admin/Legal. At the referee's discretion, Persuasion, Bribery, or some other interpersonal skill might be used to enable the roll. Success means that construction can begin within 2D6 months. Outstanding Success means that a slot is available immediately. Failure means that the application process must be started again.

Once the ship is delivered, the PCs work to pay off the government in the same manner that they would pay off a

bank loan, as described above, and modified by the purchaser's initial ownership share. For example, if the purchaser puts up 50% of the price of the ship, 20% goes to the down payment, and the other 30% goes to buying a 30% share in the ship. For simplicity, monthly payments are still 1/240 the new price of the ship, but must only be paid for 480 monthsxthe government's percentage of the ship (a minimum of 240 months). However, although a bank will accept accelerated payments to pay off the ship quicker, these governments will not. It's not money they want, but control of and access to ships.

The purchaser is responsible for bearing the starship operating expenses. However, the government does not mind if the purchaser misses several monthly payments. That merely means that the government retains that much more ownership.

Note that discussion of the "shares" above is completely separate from the system used to get a ship during character generation. Although both systems result in ships that are partially owned by the local government, the system described here is only used for buying a ship once play has begun.

Starship Expenses

There are five basic expenses (in addition to paying off the ship, if necessary) which are associated with starship operation:

Fuel: Starship fuel costs Cr500 per ton (refined) or Cr100 per ton (unrefined) at most starports. Fuel consumption is based on formulae related to the size of the starship power plant and the jump drive.

Life Support: Each occupied stateroom on a starship involves an overhead cost of Cr2000 per trip (two weeks) made. Each occupied low passage berth involves an overhead cost of Cr100 per usage. There is a normal limit of one person per stateroom, and travelling couples or groups usually take adjoining staterooms. Military vessels or chartered ships may be used with a double-occupancy system (two persons per stateroom), but this requires twice the normal cost.

Routine Maintenance: Annually, a starship should be given a complete overhaul in order to ensure that it is kept in good working order. Such maintenance costs 0.1% (1/1000) of the cash price of the ship and requires two weeks at a class A or B starport. The owner must make provision for payment of the maintenance fee when it comes due. Crewmembers generally take their vacations at this time but must still receive their salaries. The ship owners must make provisions for the expected loss of revenue while the ship is out of service.

If a ship is overdue for annual maintenance, the referee should keep track of how many months it is overdue. Once a month, roll 1D100 for overdue maintenance. If the result is less than the number of months overdue, the ship's wear value increases by 1 (see Maintenance, pages 241-244). This increase can only happen once in a year, and is reversible if the postponed annual maintenance is conducted within one year of the increase. This maintenance can be conducted by the crew themselves at a B or C starport at twice the normal time (four weeks), provided the maintenance parts have already been purchased at an A or B starport (at a cost of .05% [1/2000] the cash price of the ship, and taking up a volume of 1/200 the ship's displacement tonnage). There is no additional cost above the crew salary, but they obviously get no vacation. At a D or E starport, this do-it-yourself maintenance takes four times the regular time, or eight weeks.

Crew Salaries: Crewmembers must be paid monthly. Nonplayer characters must be paid using the standard crew salary schedule (see Crew Settlement, page 227). Player characters may bargain for better pay rates, or they may elect to accept worse. In addition, player characters may participate with the owner-captain and accept shares in the proceeds of the ship's activities.

Characters who take working passage are not paid, and receive passage, room, and board in lieu of salary (continuous working passage for more than three trips results in automatic hiring and receipt of salary). The starship captain is usually the pilot or astrogator and serves as owner-aboard, drawing his pay from the profits. Not all crew positions are required on all ships, and some ships will have more than one person performing the same function. For example, a large liner may have more than one steward.

Berthing Costs: Landing fees, handling costs, facilities-use charges, and other starport fees are a common practice, and such costs must be paid as they occur. The average cost is Cr1000 to land and remain for up to six days; thereafter, a Cr100 per day fee is imposed for each additional day spent in port. In some locations, this fee will be higher, while at others local government subsidies will lower or eliminate it.

Revenue

Ships generate revenue from freight, cargo, passengers, and mail.

Freight and Cargo: Starships may inquire at a starport about the number, sizes, and destinations of freight shipments and cargo awaiting transportation. The referee should determine all worlds accessible to the starship (depending on jump number) and use the Trade and Commerce flowcharts beginning on page 236 to determine available freight shipments and cargo.

Each freight shipment and cargo is a distinct shipment and cannot be subdivided, but the ship may accept or reject specific cargos based on the best fit within the cargo hold. All freight shipments are usually carried at Cr1000 per ton. Freight to amber zone worlds is carried at Cr2000 per ton, and freight to red (war) zone worlds is carried at Cr5000 per ton. Starship owners may purchase goods locally (called "cargo" to distinguish it from standard freight) and ship them at their own expense, speculating that they can later sell at a profit. The Trade and Commerce charts illustrate the details of the speculative trading process.

Passengers: After a starship has accepted freight and cargo for a specific destination, passengers will present themselves for transport to that particular destination. The

procedure for locating passengers is illustrated on the Trade and Commerce charts.

Passengers will pay the standard fare for the class of transportation which they choose. In the Regency, standard fares are Cr10,000 for high passage, Cr8000 for middle passage, and Cr1000 for low passage. In other regions, middle passage runs Cr5000, and steerage is Cr2500. These fares are routinely doubled or tripled if passage is provided to a red zone world.

In the Old Expanses or Pocket Empires, government shares in the ship allow the government to impose a passenger (usually a government official: diplomat, scientist, project manager, etc., and a small retinue) on a ship that is scheduled to go to a particular world. There is no financial recompense for this service.

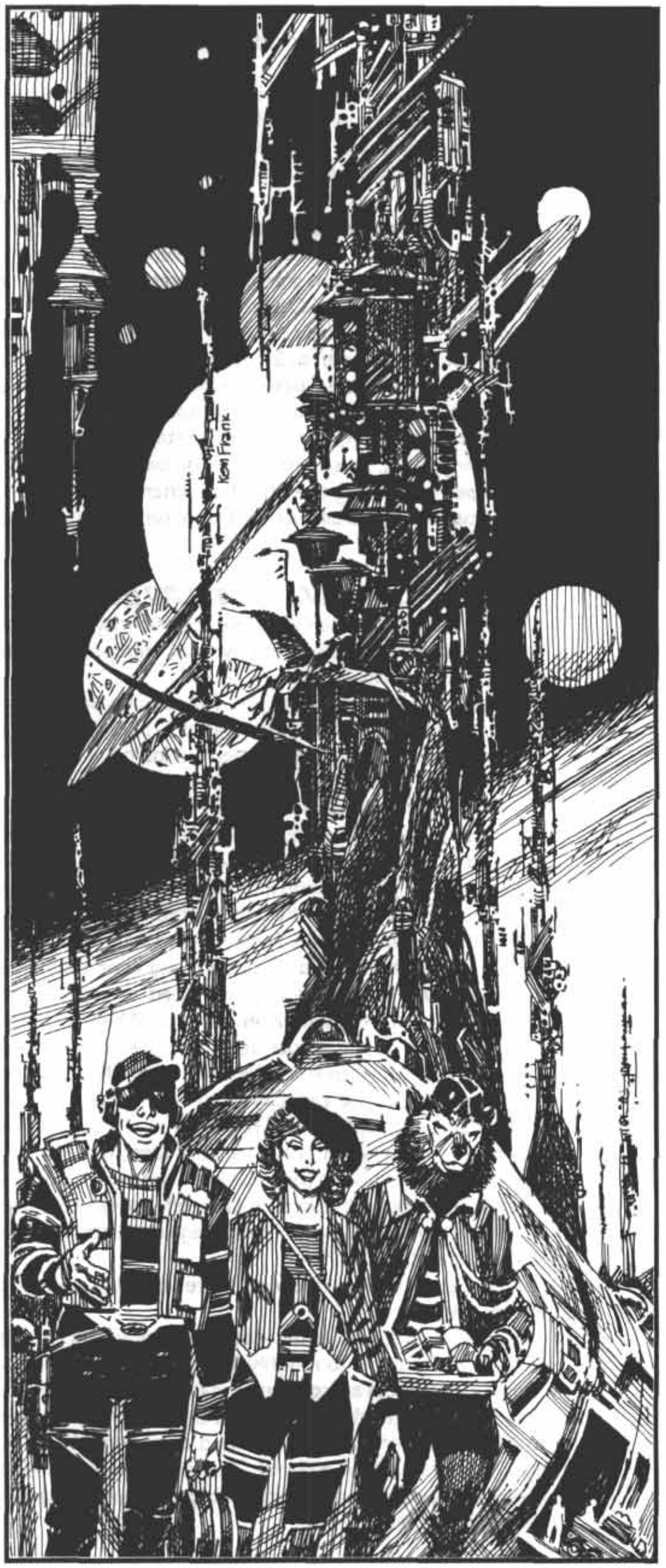
Passage is always sold to interested prospective passengers on the basis of transport to an announced destination one jump away, rather than on the basis of jump distance. Differences in starship jump drive capacity have no specific effect on passage prices.

For example, a jump-3 starship charges the same passage price as a jump-1 starship. The difference between the two passages is that a jump-3 ship can reach a destination three parsecs away in one jump, while the jump-1 ship would take three separate jumps (through two intermediate destinations, which would require three separate tickets) to reach it. Higher jump numbers also may make otherwise inaccessible destinations within reach. But for two ships of differing jump numbers going to the same destination in one jump, each would charge the same cargo or passage price.

Mail and Incidentals: Subsidized merchants in the Regency may receive mail-delivery contracts, usually serving as an adjunct to their established routes. In order to receive mail-delivery contracts, the ship must be able to dedicate five tons of ship cargo capacity to postal duty on a full-time basis; the ship must be armed; and a gunner must be a part of the crew at all times. The starship is paid Cr25,000 (which amounts to Cr5000 per ton of postal cargo area) for each trip which is made, regardless of the actual mail tonnage carried on any particular trip. The actual mail delivery tonnage will not exceed a total of five tons on each trip.

In the Old Expanses and Pocket Empires, such mail delivery is part of the reason why the government owns a portion of the ship. Although the government does not require the ship to reserve space, neither does it pay extra for the delivery of the mail. Roll 1D6–1 for the tons of mail to be carried on each trip.

Other ships may, on occasion, be approached by an individual to deliver private messages, at times through the ship's owner or captain and at times clandestinely through a crewmember. Private mail is usually intended for delivery to a specific point (such as the Travellers' Aid Society building or a tavern in startown), and is generally accompanied by a Cr20 to Cr120 honorarium. A private message can be handled by the referee as the motive for an encounter; see Encounters, beginning on page 202, for details.



Trade Customs

The following are standard procedures in interstellar commerce:

Delivery: Goods taken on in orbit are delivered when placed in orbit around the destination. Goods loaded on a planetary surface are delivered when off-loaded on the surface of the destination. This custom applies to cargo, passengers, and mail.

Shuttle Service: At any location with a class A, B, or C starport, shuttles operate on a routine basis between orbit and world surface. Typical shuttle fares are sold to interested individuals for Cr10 per ton of cargo and Cr20 to Cr120 per passenger.

Charters: Nonstarships charter for Cr1 per displacement ton per hour, usually with a 12-hour minimum. Charter price for a starship is computed based on that particular starship's revenue-generating capacity. Starships are chartered in two-week blocks; the charge for chartering a starship is Cr900 per ton of cargo hold, plus Cr9000 per high passage berth and Cr900 per low passage berth. The owner of the starship being chartered pays all overhead expenses and supplies a crew for the trip.

INTERPLANETARY TRAVEL

Worlds orbiting the same star are accessible by interplanetary travel, on ships operated by local entrepreneurs, or with a variety of small craft.

Interplanetary travel takes time. The accompanying starship operating procedure tables (pages 225-227) show the procedure used for moving between worlds in the same star system. The procedures can be used to determine time required (if distance and acceleration are known), acceleration required (if distance and time are known), and distance travelled (if time and acceleration are known).

The critical variable in long interplanetary flights is not the theoretical acceleration of the ship, but rather the amount of fuel it can expend over time. Starships tend to have large fuel capacities due to the need for coolant and jump discharge mass, and this tankage is routinely used to supplement reaction mass on long interplanetary flights. Where refueling is not possible at the actual destination world, standard starship procedure is to enter the system near the gas giant and refuel. Using the capacity of the jump fuel tanks to supplement the ship's normal reaction mass, it then heads toward the main world at high acceleration, decelerating and entering orbit there (or landing on the world surface). After completing its business, it takes off, leaves orbit, and accelerates to the gas giant, where it again refuels and then jumps out-system.

A number of important concepts are useful in calculating interplanetary travel.

Light-Second: This is the distance light travels in one second, and is equal to roughly 300,000 kilometers. Interplanetary distances are routinely measured in light-seconds as both a manageable numeric scale and as a practical guide to the limits of communication and detection. When 10 light-seconds out from a planet, for example, there will be a 20-second delay between transmitting a radio message and receipt of the reply.

Residual Velocity: When ships leave orbit and accelerate to the safe jump distance (100 diameters), they do not usually decelerate when they arrive. Instead they jump out-system while still travelling at a high rate of speed. This vector is retained by the ship when it jumps in-system at its destination, and this is called its residual velocity. Good astrogators position the jump exit window so that the residual velocity is directed toward the destination world and no additional acceleration is needed to reach it. (It is necessary to decelerate to enter orbit and land, however.)

G-Hour: In the travel time charts the basic unit of acceleration is the G-hour. A G-hour is 1G of acceleration applied for one hour. Six Gs of acceleration for one hour would produce 6 G-hours of acceleration, and 6Gs for 10 minutes (one-sixth of an hour) would produce 1G-hour.

Acceleration Limits: The combination of time and maneuver drive maximum capacity provide some upper limits of possible G-hours of acceleration. For example, the velocity generated by 10 G-hours of acceleration would enable a ship to travel 1 light-second in 0.3 hours, or 18 minutes. If the total length of the trip was 20 light-seconds, this would be a total trip time of 360 minutes, or 6 hours. Obviously, a 1G acceleration ship cannot even generate 10 G-hours of thrust in only six hours.

For game purposes, the maximum acceleration possible in a voyage is 50% of the total travel time multiplied by the maximum acceleration of the ship.

Deceleration: Ships which speed up must eventually slow down. The same G-hour expenditure to decelerate is necessary as was required to reach the craft's speed, with the same limits on acceleration as listed above.

Bingo Fuel: Bingo fuel is the point at which the remaining fuel in the ship is barely sufficient to decelerate it to bring it into orbit at its destination. Players should always be aware of their remaining fuel status and how close they are to the bingo fuel point when maneuvering. This is of life and death importance, as a ship can go gliding past its destination, unable to slow down enough to stop and refuel there, and will likely continue to coast through space to oblivion.

Bingo Jump: Bingo jump is the point at which the remaining fuel in the ship is barely enough to jump and then decelerate the ship to bring it into orbit at its destination, plus a 10% reserve for course corrections.

Encounters: Ship encounters take place when a ship is engaged in interplanetary travel. Rolls for encounters are made at critical points in the voyage, as explained on the Starship Operating Procedures flowchart. Most encounters are peaceful, but others may require use of the space combat rules.

Orbital Distances: Distances between worlds in a star system differ considerably, based on which orbits the two worlds occupy and where the worlds are in their orbital tracks. When players wish to travel from one world in a system to another, the referee consults the interplanetary distance matrix (pages 226-227), which lists the minimum distance between two orbits and the base distance variation. Multiply the base distance variation by 4D6–4 and add it to the minimum distance between orbits. The result is the current distance between the worlds in light-seconds.

STARSHIP OPERATING PROCEDURES

1. Starship Operations

Determine the ship type being operated, its capabilities, and the characteristics of the star system being travelled to.

The following steps illustrate the procedures for travelling to another world with a jump-capable starship.

2. Power Up

Normally a ship must be powered up gradually (taking 1D6×10 minutes). Successful startup is an Average task using Ship's Engineering. In an emergency the engineer may attempt to cold start the power plant. Task difficulty increases to Formidable while time decreases to 1D6 minutes.

In the event of failure, the task may be re-attempted in 1D6 minutes. Catastrophic Failure indicates damage which prevents additional cold start attempts and increases normal startup time to 1D6×20 minutes. In addition, the power plant is treated as past due for annual maintenance (until maintained/repaired).

3. Prepare Maneuver Drive

The maneuver drive must be prepared, an Easy task using Ship's Engineering and taking 1D6×10 seconds.

Desperate Jump: A desperate jump can be attempted at this point; go to step 7.

5. Travel To 10 Diameters

Take the ship to 10 diameters out from the world. This is an Easy task using Astrogation. Consult the 100 Diameters Travel Times table in step 6, below. The time to 10 diameters is one-tenth of that shown as the time to 100 diameters.

Starship Encounters: Check for a starship encounter during this journey (if referee desires).

Dangerous Jump: A dangerous jump can be attempted at this point; go to step 7.

6. Travel To 100 Diameters

Take the ship to 100 diameters out from the world. This is an Easy task using Astrogation. Consult the 100 Diameters Travel Times table, but subtract any time already spent travelling to 10 diameters.

4. Travel To Orbit

If the ship is not already in orbit, take it from the world's surface to orbit, an Average task using Pilot (Interface/Grav). The Travel Time To Orbit table shows the expected travel times and fuel expenditure required.

Travel Time To Orbit

World	*Acceleration*						*Fuel*
Size	*1G*	*2G*	*3G*	*4G*	*5G*	*6G*	*G-Hrs*
0	6m	5m	4m	3m	2m	1m	0.1
1	13m	9m	8m	7m	6m	5m	0.2
2	19m	13m	11m	9m	8m	8m	0.3
3	23m	16m	13m	12m	10m	9m	0.4
4	27m	19m	15m	13m	12m	11m	0.45
5	30m	21m	17m	15m	13m	12m	0.5
6	33m	23m	19m	16m	15m	13m	0.55
7	35m	25m	20m	18m	16m	14m	0.6
8	38m	27m	22m	19m	17m	15m	0.64
9	40m	28m	23m	20m	18m	16m	0.67
A	42m	30m	24m	21m	19m	17m	0.7

Starship Encounters: Check for a starship encounter during this journey (if referee desires).

Desperate Jump: A desperate jump can be attempted at this point; go to step 7.

7. Prepare For Jump

Preparing for jump consists of computing the jump coordinates and preparing the jump drive. This is an Average task using Astrogation. The astrogator also designates whether the destination in the system is the mainworld, a gas giant, or some other world.

If the ship is past annual maintenance, the task becomes Difficult.

100 Diameters Travel Times

Burns	*Planet Size Code*												
G-Hours	*0*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*A*	*SG*	*LG*
0.1	47m*	12.6	25.2	37.8	50.4	63.0	75.6	88.2	100.8	113.4	126.0	314.9	708.6
0.2	24m*	6.3	12.6	18.9	25.2	31.5	37.8	44.1	50.4	56.7	63.0	157.5	354.3
0.3	16m*	4.2	8.4	12.6	16.8	21.0	25.2	29.4	33.6	37.8	42.0	105.0	236.2
0.4	12m*	3.2	6.3	9.5	12.6	15.8	18.9	22.1	25.2	28.4	31.5	78.7	177.2
0.5	10m*	2.5	5.0	7.6	10.1	12.6	15.1	17.6	20.2	22.7	25.2	63.0	141.7
0.6	8m*	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0	52.5	118.1
0.7	7*	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0	45.0	101.2
0.8	6*	1.6	3.2	4.7	6.3	7.9	9.5	11.0	12.6	14.2	15.8	39.4	88.6
0.9	5*	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	35.0	78.7

Times followed by the letter "m" are in minutes. All other times are in hours. Times are calculated for average sizes within each code. Referees may re-calculate for minimum/maximum diameters using the equation: (diameter in km x 100) + (G-hours x 127,008) = travel time in *hours*. Size 0 is assumed to be 100 km.

*Specified time or time to expend the G-hours, whichever is *greater*.

To reach a distance of 10 diameters, divide travel times by 10.

For larger expenditures of G-hours of thrust, divide time by the multiple of G-hours spent. (2 G-hours of thrust spent will reduce travel time to 100 diameters of a small gas giant to 23.62 hours.)

For smaller expenditures of G-hours of thrust, multiply time by the divisor of G-hours spent. (.02 G-hours of thrust spent will increase travel time to 100 diameters of a small gas giant to 2362 hours.)

Starship Encounters: Check for a starship encounter during this journey (if referee desires).

Safe Jump: A safe jump can be attempted at this point.

8. Engage Jump Drive

Engaging jump drive is an Average task using Ship's Engineer. This task can be attempted once a successful jump preparation has been accomplished.

Safe Jump: A ship at least 100 diameters out from all massive bodies, using the proper fuel, and with properly maintained drives can make a safe jump with no chance of a mishap.

Dangerous Jump: If the ship is within 100 diameters of a massive body, this task is Difficult.

Desperate Jump: If the ship is within 10 diameters of a massive body, this task is Formidable.

If the ship is using unrefined fuel (without a fuel-purification plant), increase the difficulty level by one.

If a failure occurs, go to step 15.

9. Jump Space

The vessel enters jump space and travels to the world which the astrogator designated. This ship remains in jumpspace for about one week (under normal circumstances).

Determine how much time the ship spent in jump space by rolling 1D6.

Roll	*Result*
1	6 days
2-5	7 days
6	8 days

10. Emerge From Jumpspace

The ship emerges from jumpspace. The ship emerges at the limit of the gravity well (at about 100 diameters out) of the destination world that the astrogator designated in jump preparation. The ship must be taken from 100 diameters in to 10 diameters. Any residual vector may be used to accomplish this, provided the astrogator positioned the jump exit point correctly.

Positioning the exit point correctly is a Difficult task using Astrogation, and is rolled at this time. Outstanding Success indicates that exit point is positioned so that the ship's velocity will take it to within 100 diameters of the destination world; no course correction required. Regular success indicates the need for a course correction equal to 10% of the fuel spent to achieve the craft's current velocity. Failure indicates the need for a course correction equal to 50% of the fuel cost of the current velocity. Catastrophic Failure indicates need for a course correction equal to 150% of the fuel cost.

Making the required course correction is an Easy task using Astrogation, with failure requiring additional minor course corrections.

11. Travel to Orbit

This is an Easy task using Astrogation. Consult the 100 Diameters Travel Times table used in step 6 above. Fuel must be spent to achieve acceleration equal to that of the residual vector, but in this case the fuel spent is used to slow the ship down once it reaches orbital distance.

Starship Encounters: Check for a starship encounter twice during this journey, once at 10 diameters and once at orbit (if referee desires).

12. Travel from Orbit

The ship is in orbit. Unstreamlined ships deliver cargo to orbiting stations if the world has a type A or B starport. Small craft and streamlined ships can descend to the world surface. Descent from orbit is an Average task using Pilot (Interface/Grav). Times from orbit to the surface, and the fuel needed to decelerate, are the same as those shown in the Travel Time to Orbit table in step 4.

13. Refueling

The ship may be refueled when fuel is available.

Gas Giant Refueling: If the ship is streamlined or airframe and is in orbit around a gas giant, it can skim the gas giant's atmosphere for fuel. This takes about 10 hours and is an Average task using Pilot (Interface/Grav), with failure indicating a longer refueling time due to atmospheric turbulence. Catastrophic Failure indicates damage due to lightning strikes, pressure, excessive radiation exposure, collisions with debris, or heat damage to the hull.

Ocean Refueling: If the ship has reached the surface of a world with a non-0 Hydrographics percentage and an atmosphere of Dense or lower, it can obtain fuel from an ocean. This takes about two hours and is an Average task using Pilot (Interface/Grav).

Starport Refueling: Starports offer refuelling services. Refined fuel (at type A and B starports) costs Cr500 per ton (14 kiloliters); unrefined fuel (at type A, B, C, and D starports) costs Cr100 per ton (14 kiloliters).

14. In-System Transfer

A ship may need to move from a world to a gas giant or from a gas giant to a world. After moving out to 100 diameters, a ship can transfer within a system. This is an Average task using Astrogation, with failure adding 10% to the travel time and Catastrophic Failure adding 50%.

Distances from one world to another in a system vary based on the orbits occupied by the worlds and where the worlds are in their orbital tracks. Actual distance between any two worlds is calculated using the Interplanetary Distance Matrix.

Interplanetary Distance Matrix

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
0 (10)	100	250	400	700	1300	2500	4900	9700	19,250
1 (20)	X	150	300	600	1200	2400	4800	9600	19,150
2 (35)	X	X	150	450	1050	2250	4650	9400	19,000
3 (50)	X	X	X	300	900	2100	4500	9300	18,850
4 (80)	X	X	X	X	600	1800	4200	9000	18,550
5 (140)	X	X	X	X	X	1200	3600	8400	17,950
6 (260)	X	X	X	X	X	X	2400	7200	16,750
7 (500)	X	X	X	X	X	X	X	4800	14,350
8 (980)	X	X	X	X	X	X	X	X	9550

	10	11	12	13	14	15
0 (10)	38,400	76,700	153,300	306,500	612,850	1,225,600
1 (20)	38,300	76,600	153,200	306,400	612,750	1,225,500
2 (35)	38,150	76,450	153,050	306,250	612,600	1,225,350
3 (50)	38,000	76,300	152,900	306,100	612,450	1,225,200
4 (80)	37,700	76,000	152,600	305,800	612,150	1,224,900
5 (140)	37,100	75,400	152,000	305,200	611,550	1,224,300
6 (260)	35,900	74,200	150,800	304,000	610,350	1,223,100
7 (500)	33,500	71,800	148,400	301,600	607,950	1,220,700
8 (980)	28,700	67,000	143,600	296,800	603,200	1,215,950
9 (1935)	19,150	57,450	134,050	287,250	593,600	1,206,350
10 (3850)	X	38,300	114,900	268,100	574,450	1,187,200
11 (7680)	X	X	76,600	229,800	536,150	1,148,900
12 (15,340)	X	X	X	153,200	459,550	1,072,300
13 (30,660)	X	X	X	X	306,400	919,150
14 (61,300)	X	X	X	X	X	612,750

	16	17	18	19
0 (10)	2,451,100	4,902,100	9,804,150	19,608,200
1 (20)	2,451,000	4,902,000	9,804,050	19,608,100
2 (35)	2,450,850	4,901,850	9,803,900	19,607,950
3 (50)	2,450,700	4,901,700	9,803,750	19,607,800
4 (80)	2,450,400	4,901,400	9,803,450	19,607,500
5 (140)	2,449,800	4,900,800	9,802,850	19,606,900
6 (260)	2,448,600	4,899,650	9,801,650	19,605,700
7 (500)	2,446,250	4,897,250	9,799,250	19,603,300
8 (980)	2,441,450	4,892,450	9,794,500	19,598,500
9 (1935)	2,431,850	4,882,900	9,784,900	19,588,950
10 (3850)	2,412,700	4,863,750	9,765,750	19,569,800
11 (7680)	2,374,400	4,825,450	9,727,450	19,531,500
12 (15,340)	2,297,850	4,748,850	9,650,850	19,454,900
13 (30,660)	2,144,650	4,595,650	9,497,700	19,301,700
14 (61,300)	1,838,250	4,289,250	9,191,300	18,995,350
15 (122,570)	1,225,500	3,676,500	8,578,550	18,382,600
16 (245,120)	X	2,451,000	7,353,050	17,157,100
17 (490,220)	X	X	4,902,050	14,706,100
18 (980,425)	X	X	X	9,804,050

The orbit numbers down the left side are the orbit numbers closest to the star; those across the top are those farthest from the star. The distance shown at the intersection of the two is the base distance in light-seconds. Multiply the parenthetical number shown beside the inner orbit number by 4D6–4 and add it to the base distance to find the total distance.

For example, the distance from orbit 4 to orbit 8 is 9000 light-seconds. The distance from an object in orbit 4 to an object in orbit 8 is 9000 plus [(4D6–4)x80] light-seconds.

Once actual distance is known, travel time is a function of G-hours of acceleration spent. The Interplanetary Speed table shows the travel time per light-second for from 1 to 9 G-hours of acceleration spent.

If greater acceleration is spent, find an acceleration value on the table which is an easy fraction of the actual acceleration and divide the corresponding travel time by that value. For example, a ship spends 55 G-hours of acceleration. The referee uses the 5 G-hour entry because it is one-eleventh of 55. Dividing 28 minutes (the time for one light-second) by 11 yields a value of 2.55 minutes per light-second. If the distance travelled were 100 light-seconds, the total travel time would be 255 minutes.

If less acceleration is used than the values shown on the chart, reverse the above process.

Note that ships which accelerate to reach a destination must then decelerate when they reach it. As the table shows only the acceleration required to reach the speed, this same acceleration must also be spent at the other end of the voyage to decelerate, and so fuel expenditure should be planned accordingly.

Interplanetary Speed

G-Hours and Travel Time per 1 Light-Second

Burns G-Hours	*Time Minutes*
1	142
2	71
3	47
4	35
5	28
6	24
7	20
8	18
9	16

Note: The chart above treats G-hours as a speed; i.e., the final velocity after those G-hours are spent.

The distance travelled while burning those G-hours is not incorporated in those numbers as it is insignificant over large distances.

15. Jump Mishaps

If a failure occurs when the jump drive is engaged, handle it as follows:

Failure: A jump relativity error occurs. The ship remains in jump space 1D6+4 days (from 5 to 10 days) before emerging at the plotted destination point, otherwise unharmed.

Catastrophic Failure: A jump relativity error occurs, but when the ship emerges in the destination system, it is 2D6x100 diameters from the destination world, rather than only 100.

Aggravated Catastrophic Failure: If a Catastrophic Failure occurs while using unrefined fuel, when in need of maintenance, or when suffering from the effects of damage to the jump drive, a major jump relativity error occurs. When the ship emerges from jump, it discovers that it has misjumped.

Roll 1D6 for the number of dice to throw. Then roll that number of dice for the distance (in parsecs or map hexes) the ship travelled. Roll 1D6 for the direction of the misjump on the hex grid. The ship arrives at a random point within the system. Roll 1D20–1 for the orbit number at which the ship emerges.

16. Crew Settlement

The crew of the ship is paid every month. The following are typical salary schedules. Payment below is based on skill level, not asset.

ORN is the Officer Rank Number from character generation: O-1 rank is ORN rank 1. Any E-level rank counts as ORN 1 for purposes of payment.

Bridge Crew: Cr500 times ORN plus 5% for each level of Pilot (Interface/Grav), Astrogation, or Leadership skill above 1.

Engineering Crew: Cr500 times ORN plus 5% for each level of Ship's Engineering skill above 1.

Maintenance Crew: Cr500 plus 5% for each level of Admin/Legal, Mechanic, or Electronics skill above 1.

Command Crew: Cr1000 times ORN plus 5% for each level of Pilot (Interface/Grav), Astrogation, or Leadership.

Gunners: Cr500 plus 5% for each level of any applicable Gunnery skill above 1.

Flight Crew: Cr1000 plus 5% for each level of Pilot (Interface/Grav) skill above 1.

Ship's Troops: Cr500.

Stewards: Cr500 times Service skill above 1.

Medical Crew: Cr500 times Medical skill above 1.

STARSHIP ENCOUNTERS

These Starship Encounters tables are an aid to the referee's imagination, not a replacement for it. The referee should never allow the result of a table to supersede his or her concept of or intention for a stellar system. However, the tables below provide a random element that can fuel the referee's imagination when he isn't quite sure what to do next. Feel free to expand on the thumbnail mission characterizations that result from the tables. For example, the Distress result can mean that the vessel itself is in distress, or that it is responding to a distress call.

1. Encounter Likelihood

Determine whether an encounter takes place.

ENCOUNTER (1D6)

D6	*Result*
0-4	Encounter
5+	No Encounter

DMs

A Starport: DM –2
B Starport: DM –1
E Starport: DM +1
X Starport: DM +2
Pocket Empire: +1
Wilds: +2

2. Ship Type

Determine the ship type being encountered.

SHIP TYPE (1D6)

D6	*Type*
0	Nonstarship (go to 3)
1	Merchant (go to 4)
2	Nonstarship (go to 3)
3	Naval (go to 5)
4	Merchant (go to 4)
5	Civilian (go to 6)
6+	Scout (go to 7)

DMs

A Starport: DM –2
B Starport: DM –1
E Starport: DM +1
X Starport: DM +2
Pocket Empire: +1
Wilds: +2

3. Nonstarship

NONSTARSHIP TYPE (2D6)

2D6	*Type*
1	System Defense Boat
2	Bulk Transport
3	System Defense Boat
4	Tug
5	Launch
6	Shuttle
7	Shuttle
8	Cutter
9	Fuel Shuttle
10	Ship's Boat
11	Pinnace
12	Ship's Boat
13+	Ship's Boat

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

NONSTARSHIP MISSION (2D6)

2D6	*Type*
1	Quarantine Enforcement
2	Quarantine Enforcement
3	Smuggling
4	Charter
5	Patrol
6	Courier
7	Courier
8	Transport
9	Transport
10	Transport
11	Distress
12	Piracy/Privateer
13+	Vampire

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

4. Merchant Type Ship

MERCHANT SHIP TYPE (2D6)

2D6	*Type*
1	Freighter (5000+ tons)
2	Freighter (1000+ tons)
3	Freighter (1000+ tons)
4	Subsidized Liner
5	Subsidized Merchant
6	Subsidized Merchant
7	Free Trader
8	Free Trader
9	Far Trader
10	Far Trader
11	Free Trader
12	Free Trader
13+	Merchant Modified Scout

Note: If system unaccessible by jump 2, substitute Far Trader for Free Trader and Subsidized Merchant.

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

MERCHANT MISSION (2D6)

2D6	*Type*
1	Quarantine Enforcement
2	Smuggling
3	Trade
4	Trade
5	Trade and Transport
6	Trade and Transport
7	Trade and Transport
8	Transport
9	Transport
10	Transport
11	Distress
12	Piracy/Privateer
13+	Vampire

Note: If ship type is Seeker, replace Transport with Prospecting.

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

5. Naval Type Ship

Naval Ship Type (2D6)

2D6	Type
2	Battleship
3	Carrier (100,000 tons)
4	Cruiser (100,000 tons)
5	Cruiser (50,000 tons)
6	Cruiser (20,000 tons)
7	Fast Courier
8	Fighter
9	Patrol Cruiser
10	Close Escort
11	Escort (1000 tons)
12	Escort (5000 tons)
13+	Cruiser (50,000 tons)

DMs: +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

Naval Mission (2D6)

2D6	Mission
1	Quarantine Enforcement
2	Patrol
3	Escort
4	Escort
5	Courier
6	Training
7	Patrol
8	Patrol
9	Transfer
10	Maneuvers
11	Distress
12	Piracy/Privateer
13+	Vampire

Notes: Patrol received in Regency includes Quarantine enforcement

DMs: –1 in Regency, +3 in Old Expanses, +5 in Pocket Empire, +7 in Wilds; all results other than Fighter, Fast Courier, Patrol Cruiser, and Close Escort receive an additional +8 DM if encountered in the Old Expanses, Pocket Empire, or Wilds.

6. Civilian Type Ship

Civilian Ship Type (2D6)

2D6	Type
1	Yacht
2	Liner (1000+ tons)
3	Yacht
4	Mercenary Cruiser
5	Yacht
6	Lab Ship
7	Detached Scout
8	Seeker
9	Lab Ship
10	Seeker
11	Free Trader
12	Free Trader
13+	Free Trader

Note: If system inaccessible by jump 2, substitute Far Trader for Free Trader. In Old Expanses, Pocket Empire, and Wilds, feel free to substitute converted model ships for specialized designs, such as Lab Ships, Yachts, etc.

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

Civilian Mission (2D6)

2D6	Type
1	Quarantine Enforcement
2	Pleasure Tour
3	Smuggling
4	Charter
5	Transport
6	Courier
7	Transport
8	Business
9	Transport
10	Business
11	Distress
12	Piracy/Privateer
13+	Vampire

Note: If ship type is Lab Ship, replace Business with Research.

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

7. Scout Type Ship

Scout Ship Type (2D6)

2D6	Type
1	Scout Tender
2	Scout Cruiser
3	Scout Cruiser
4	Scout Surveyor
5	Scout Surveyor
6	Scout Courier
7	Scout Courier
8	Scout Courier
9	Scout Courier
10	Scout Courier
11	Scout Courier
12	Scout Courier
13+	Scout Courier

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

Scout Mission (2D6)

2D6	Type
1	Patrol
2	Patrol
3	Smuggling
4	Patrol
5	Courier
6	Courier
7	Exploration
8	Transfer
9	Exploration
10	Exploration
11	Distress
12	Piracy/Privateer
13+	Vampire

Note: If Scout Surveyor, replace Patrol with Survey.

DMs: –1 in Regency, +1 in Old Expanses, +2 in Pocket Empire, +3 in Wilds.

8. Ship Disposition

Ship Disposition (2D6)

2D6	Disposition
2	Hasty Departure
3	Hasty Departure
4	Leaving
5	Leaving
6	Standing By
7	Standing By
8	Standing By
9	Arriving
10	Arriving
11	Hasty Arrival
12	Hasty Arrival

Trade and Commerce

Trade between planets depends on demand for goods at each end of the trading route. Because of the expense of interstellar transportation, most worlds strive to be self-supporting; they produce their own building materials, food, and necessities. But there are still a wide variety of trade goods that can and must be carried between the stars.

Currency

Although trade invariably comes down to an exchange of goods between two societies, that exchange is regularized and facilitated by use of currency (money). By placing a monetary price on items, relative value becomes much easier to calculate. In **Traveller,** the universal unit of currency is the credit, abbreviated Cr.

The Credit: Ah, the mighty Imperial Credit. Backed by the productive capacity of the largest economy in known history, the credit was the currency against which all others were measured. Oops.

Strangely enough, 70 years after the largest social collapse in known history, the credit retains its allure in former Imperial Space. In the Regency, naturally, the Imperial Credit is still minted, although its value is backed by a much smaller economy, and most coins and notes bear images of Norris and the Bridled Steed, rather than cruel reminders of a tragic era. The RCr (as the Regency Credit is officially known, as compared to the Imperial Credit, or ICr) has retained the value of the former Imperial currency, so that the distinction between pre- and post-Collapse currency is an academic point at best. For all intents and purposes, in the Regency, a credit is still a credit.

EXCHANGE RATES

	Starport Type					
TL	*A*	*B*	*C*	*D*	*E*	*X*
15	1.00	.95	.90	—	—	—
14	.95	.90	.85	.80	.75	—
13	.90	.85	.80	.75	.70	—
12	.85	.80	.75	.70	.65	—
11	.80	.75	.70	.65	.60	—
10	.75	.70	.65	.60	.55	.45
9	.70	.65	.60	.55	.50	.40
8	.65	.60	.55	.50	.45	.35
7	.60	.55	.50	.45	.40	.30
6	—	.50	.45	.40	.35	.20
5	—	.45	.40	.35	.30	.10
4	—	—	.30	.25	.20	barter
3	—	—	.20	.10	.05	barter
2	—	—	—	.05	barter	barter
1	—	—	—	.01	barter	barter
0	—	—	—	—	—	barter

Even in the other more damaged regions, the force of long tradition means that the credit is still used as a benchmark for pricing, although credits must be minted and backed locally in order to have any real value. Despite some popular sentiment for continuing to accept the Imperial Credit, governments of pocket empires know better: The sheer number of Imperial Credits that were produced makes it too likely that the discovery of one moderately sized bank vault would destroy the basis of an entire economy. Nonetheless, a product purchased in a pocket empire or the Reformation Coalition is marked with a price that would not have attracted undue attention in the pre-Final War era.

The Imperium is dead. Long live the credit.

Exchange Rates: The basis for trade between societies is scarcity and abundance. One society has one commodity in relative abundance and another in scarcity. If a second society has these reversed, there is the basis for trade. While a planet will often produce everything that its inhabitants require for survival (although this varies widely in practice; very low population and very high population worlds have problems in this area), there will still be demand for luxury items. On high-tech worlds, luxury items are those whose manufacture is labor-intensive; on low-tech worlds, luxury items are those whose manufacture is tech-intensive. As a result, low-tech worlds will trade a relatively greater amount of human, creative labor in return for high-tech items beyond their capacity to manufacture. This tends to reduce prices (and standards of living) on lower-tech worlds while elevating them on higher-tech worlds.

One way to represent this is to have different prices for every world. Another way is to maintain constant prices but have currencies worth different amounts on different worlds; that is, a credit from a high-tech world will take you farther on a low tech world. This is similar to the situation currently found in many East European countries which need "hard" currencies to purchase Western high-tech items, and so dollars and Deutschmarks will buy more than rubles.

It is up to referees whether they wish to maintain a common currency with floating prices, or constant prices with currency exchanges at each starport. Both are acceptable, and both systems would be found to one extent or another throughout known space.

The currency table at left is used to calculate either exchange rates at starports or prices on the world. The baseline value for currency is taken as a type A starport on a tech 15 world, which is also the value of the old pre-Collapse Imperial Credit.

When calculating large prices, it is often useful to convert prices in credits to kilocredits, where 1 kilocredit (KCr) equals 1000 credits, or megacredits, where 1 megacredit (MCr) equals 1 million credits.

Using the Exchange Rates Table: If the referee chooses to have a common currency but variable prices, all wages and prices on a world for goods manufactured on that world are equal to their normal list price times the value shown on the table. Items which cannot be manufactured on the world are available at their full base price.

For example, a map box costs Cr2500 and can be manufactured on any world with a tech level of 9 or higher. On a world with a D-class starport and a tech level of 9, the map box would cost Cr1375. On a world with a B-class starport and a tech level of 13, it would cost Cr2125. On a world with an E-class starport and a tech level of 7, it would cost the full Cr2500. It would also cost that amount on a world with an A-class starport and a tech level of 15.

If the referee chooses to have local currencies with currency exchanges at starport, banks, and other financial institutions, the Exchange Rates table provides the exchange rate between currencies. To find the amount of local currency received when exchanging off-world currency, find the value for each currency on the table. Divide the value for currency being turned in by the value of the currency being received, and multiply the result by the number of credits being exchanged.

For example, the PCs are from a world with a tech level of 12 and a starport class of B. They have arrived at a class-A starport on a TL-14 world, and wish to exchange Cr10,000. The value for their original world (the currency they are turning in) is .80, while that for the world they are at (the currency they are receiving) is .95. Dividing .80 by .95 results in a value of .84. Multiplying Cr10,000 by .84 shows that they will receive only Cr8400 in local currency.

All wages and prices will be the same for goods which can be manufactured on the world. Items which must be imported will cost more. The price for such items is calculated as if being paid in the local currency of a world of the required tech level and with a type A starport.

Using the example of the Cr2500 map box above, it would cost Cr2500 in local currency on any world with a tech level of 9 or higher. On lower tech worlds, however, it would cost the equivalent to Cr2500 in the local currency of a TL-9, type-A starport world. Taking a TL-6, type-C starport world as an example, the referee would convert Cr2500 from an A-9 world to local currency. The A-9 value is .70 while the C-6 value is .45. Dividing .70 by .45 results in a value multiplier of 1.56, making the actual price of the map box Cr3900 on that world.

Note that both of the above systems produce exactly the same relative value, and which system is used is purely a matter of referee ease, preference, and atmosphere.

Barter: Those worlds with the notation *barter* are barter worlds, societies either so primitive or so remote that there is no meaningful basis of exchange between most advanced starfaring civilizations and theirs. Interaction with these societies can be the basis for extended and interesting roleplaying sessions.

Services: Starport services are generally available at local rates, including costs for fuel, life support, etc.

Maintenance is also available at local rates unless the maintenance is on equipment more advanced than the tech level of that world. In this case, maintenance costs are based on the local rates of a world with a type A starport of the required tech level, treating the maintenance as an "imported good." (In fact, it is imported. Any replacement parts would have been imported as would the instructors or manuals used to train the specialist mechanic who supervises the work. This, of course, assumes that the world is in economic contact with a world of the required tech level.)

Ship Payments: Ship payments are made to the bank or consortium conducting the financing. This organization is assumed to be based on the world of manufacture, and so payments will be made at that local rate. This will mean that a ship manufactured on a world with a very high tech level will be more expensive in real terms than an identical ship manufactured on a world with a lower tech level.

For this reason, worlds do not routinely manufacture ships which do not take advantage of all of the technological advantages of that world's tech level, which is another way of saying that they can't complete at the low end of the market and so concentrate on the top end. If, however, there are no competing low-tech worlds in the area, then they will manufacture a wider variety of ship types.

Black Markets: Concern with balance of payments and trade, a wish to limit contact with off-world cultures, or a desire to protect and develop native industries may lead a strong and/or reactionary government to artificially regulate the exchange rate of its currency. Such a government will have a separate currency, using the method explained above, but will set its exchange rate at one or two levels higher than the Exchange Rates table indicates. Thus, if the table indicates a local currency value of .40, the official exchange rate may be set at .45 or .50. This is only used when exchanging off-world currency for local currency; when exchanging local currency for off-world currency, the normal values on the table are used (so each complete transaction back and forth will lose value). Prices of imported goods on the world are calculated using the actual values from the table, not the artificial ones.

In a situation such as this, a black market in currency will flourish, and can normally be contacted by characters using their Streetwise skills. Whether or not a world sets such standards is up to the referee and should be based generally on government type and the world's unique situation. How vigorously the world attempts to suppress the black market is, of course, dependent on its law level.

Trade Transactions

The Trade and Commerce flowcharts beginning on page 236 present the procedure for locating markets and goods to be shipped. Several terms and concepts are used on the flowcharts.

Lot: A lot is a single shipment of goods. A lot is identified by its displacement in tons (one ton equals 14 kiloliters). Each lot is a distinct shipment and may not be subdivided. A ship captain may accept or reject specific lots based on their best fit within the ship's cargo hold. A lot can be freight, cargo, or mail.

Freight: Freight is a lot owned by someone who either wishes to retain ownership of it or has contracted to sell the goods to someone and is shipping them to the buyer. An individual who is shipping his personal effects to a new home is shipping freight. A company which has sold an air raft to a customer and is now shipping it to that customer is shipping freight.

The standard price for shipping freight is Cr1000 per ton. The payment covers shipment in the cargo hold from the current location to the starship's next port of call.

Mail: Mail is a lot of communications information being shipped under special contract for a postal or express service. Postal services are operated by governments; express services are operated by private companies.

Mail is always of incidental size (never major- or minor-sized lots). To be allowed to carry mail, the ship must be armed, and the crew must include a gunner. Each mail lot always consists of at least one ton. Each ton of mail is shipped at a premium rate of Cr5000.

Cargo: Cargo consists of goods purchased by a speculator or merchant and carried on the speculation that they can be sold at the destination for a profit. A merchant who buys ring laser navigation systems on an industrial world and ships them to another world in hopes of selling them for a profit is shipping cargo. A merchant who has empty cargo hold space and fills it with locally purchased goods rather than ship empty space is shipping cargo.

Speculators may buy goods and ship them: They consider the lot cargo, while the ship carrying the goods considers it freight. Starship captains may find insufficient freight available on a world: They may become speculators and buy cargo in order to fill unused freight space. The prime law of cargo trade is an ancient one: Buy low and sell high. Those who follow it make money, grow rich, and become successful; those who don't go bankrupt.

Merchant: A merchant is an individual or company that operates a cargo-carrying starship. Merchants may also be speculators.

Speculator: A speculator is an individual or company which buys goods in the expectation that they can be sold at a profit later (and usually on another world). A speculator does not necessarily operate a cargo-carrying starship; a speculator may ship its cargo as freight and pay standard freight rates in order to transport the goods to a profitable market.

Sourceworld: A sourceworld is the world where goods originate. The UWP (see World Building, page 180) of the sourceworld is required before goods can be purchased, and it is necessary in order to determine the costs of the goods when engaging in speculative trade.

Marketworld: A marketworld is the world where goods are to be shipped; it is the market or destination for trade goods. The UWP of the marketworld is required before the goods can be sold, and it is necessary in order to determine the selling price of the goods when engaging in speculative trade.

Cost: Cost is the amount paid for a cargo at its sourceworld.

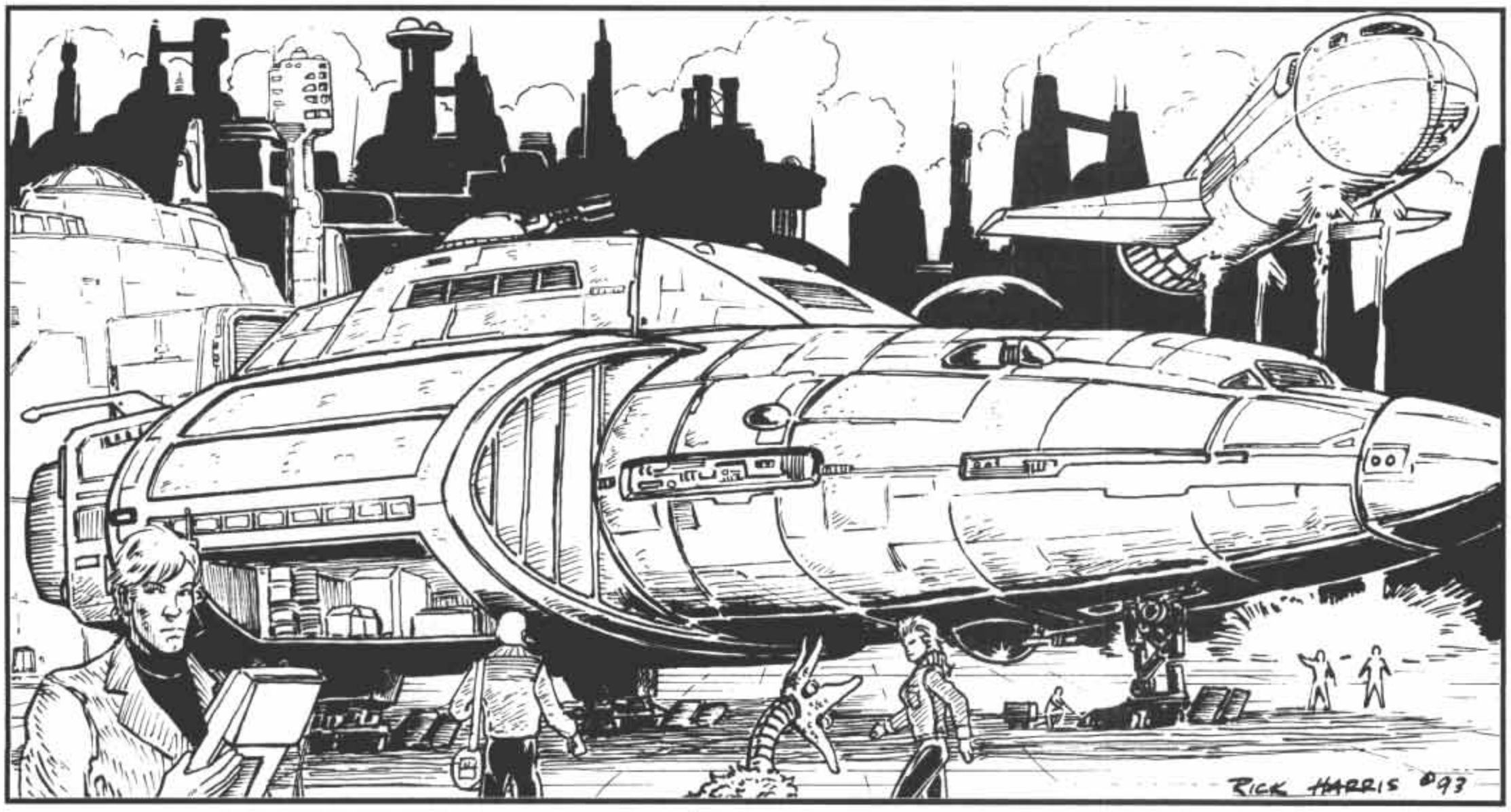
Price: Price is the amount a cargo is expected to sell for at its marketworld. It is possible to compute the base price of goods before arriving at a world simply by analyzing the marketworld's UWP. Careful merchants do this to predict the relative marketability of goods at various accessible worlds.

Price is an expected price; selling price is the actual price determined at the moment of sale.

Selling Price: Selling price is the amount a cargo actually sells for at its marketworld through the use of the Actual Value table (page 240). Selling price for goods varies as the actual market conditions fluctuate, and it is determined at the moment of sale using the Actual Value table.

Delivery: A lot is delivered when it is off-loaded at a location comparable to the location where it was loaded. Goods taken in orbit at the sourceworld are delivered when off-loaded in orbit at the destination world; goods loaded on the surface of the sourceworld are delivered on the surface of the destination world. This custom applies to both cargo and passengers.

Estimating the Sale Price: When engaging in speculative trading, it is important to be able to make accurate estimates of the likely price that can be gotten for cargos. Bargaining skill allows the partial prediction of the results of the Actual Value table rolls (page 240).



Success at an Average test of Bargaining allows one die on the Actual Value Table (the table uses two dice) to be rolled early; knowing one of the dice results beforehand allows a more accurate prediction of the sale price of goods. For example, the 2D6 roll can range from 2 to 12 and indicates actual values between 40% and 170% of base price. If one die is rolled early and it is a 6, the character knows that the final actual value must range between 7 and 12 (or between 100% and 170%).

The Trade and Commerce flowcharts (page 236) contain the exact procedure to use for estimating the sale price beforehand.

Types of Interstellar Trade Goods

Interstellar trade goods may be many things, some of which are more common than others. The flowcharts in this section provide a procedure for determining the general nature of the goods in each cargo lot, which is provided as a starting point for referee description of the cargo. Using this general guide, the examples below, and a knowledge of the unique characteristics of the world of origin, the referee should decide on a precise definition of the cargo.

Natural Resources: One of the basic trade goods in interstellar trade is natural resources. The exploration of space is driven in part by a search for essential basic raw materials in the hopes that they can be found and made available at competitive prices even after the cost of their transportation over interstellar distances. Most bulk resources are available in the planetary cores and asteroid belts of a star system, and transportation of massive amounts of common ores over interstellar distances is not economically feasible (okay, it's flat-out stupid—if you're taking the trouble to mine the stuff there you might as well go the distance and build a smelter or factory and ship processed or semi-finished goods). However, high-value resources which are scarce or absent in one star system can often be transported profitably. Such resources include rare earths, raw crystals and gems, various compounds, plants, and animals.

Processed Resources: Once the basic raw resources have been collected, they need to be processed into refined raw materials and basic finished goods. Processed resources include processed ores (from which the basic contaminants have been removed), raw organics (harvested plant or animal materials usable as food or in further manufacturing processes), and processed compounds (raw materials typically not found in nature, such as industrial chemicals).

Manufactured Goods: Some manufactured goods cannot be made on a world due to lack of sufficiently high tech level or limited production facilities, and so must be imported. Other manufactured goods may be profitably shipped across interstellar distances if their cost of manufacture is significantly lower than on the destination world, due to low labor costs, abundant cheap resources, or unusual and unique manufacturing techniques. Sometimes the existence of patent on

a product or manufacturing process by one world which is honored by another world creates the necessary basis for trade of manufactured goods.

Manufactured goods include pharmaceuticals (both for the treatment of all manner of illness or disability, and those in special demand for their effects on healthy individuals, such as anagathics to increase the human life span), various consumables (spices, beverages, aromatics and perfumes, disposable goods), clothing, protective gear, and various durable goods (mechanical parts, weapons, tools, vehicles, consumer electronics, industrial machinery, and robots).

Information: A perennial trade good is information. Books, tapes, and software all enjoy a continuing market as individuals pursue educations and find a need for basic materials. More important is information on new scientific or technological developments that can be applied in many different environments, and news of political, social, and economic events that allow recipients of that knowledge to make more informed decisions. Information is usually shipped in electronic form, although this is usually contained in its own small computer memory system, heavily encrypted, so that no one but the ultimate customer has access to it. The following are types of informational cargo and freight:

Scientific Data: Scientific inquiry depends on data for its continued existence. Raw scientific data from established research stations, data collection stations, or laboratories is marketable to research and development departments of various corporations and to research faculty at institutions of higher learning.

Social scientists also need raw materials for their research: accounts of historical events, or data on alien or alternate societies.

Most important of all for both communities is contact with other developments in their fields. Not only are these fields driven by academic competition, but breakthroughs or new data in one area can lead to insight in others, whether basic research or dramatic new manufacturing techniques. Besides, you've just got to get a copy of the latest issue of *Astrometrics and Cosmology* where they publish the letter where you really *ripped* Dr. Barberi's hare-brained paper on planetary nebulae.

News: No business can be run without news. What economic incentives package has been instituted on an important world? Who is the new president of a major competitor? What is the new administration's position on tariffs? Government and private agencies have the same need to understand the constantly changing playing field on which they must operate. Sure, interstellar travel is relatively slow. But that's what makes it so crucial to get the news as quickly as possible. A day's notice is enough time to get instructions to your field office onto the next departing ship, but if you miss it, you'll have to wait days for the next one. Timely news can make or break careers, businesses, even governments.

Bureaucratic Records: Where there are interstellar governments, the products of a bureaucracy must be distributed through its area of authority. Such shipments include originals or reproducible masters of regulations, files of information about citizenry and companies, and reports.

Much of the information shipped between worlds is not sold; it is transported at government expense as freight to archives or to other offices of the bureaucracy. But some of the information can be purchased and then shipped to other worlds where it can be sold to businesses or organizations that can use it. For example, tax records might indicate likely customers for specific goods; reports might provide clues (after analysis) for prediction of future bureaucratic decisions.

Creative Works: The products of the artistic sense are always in demand. New novels, plays, and poetry from recognized authors are highly sought after over vast areas. Other creative works are valued as decoration and ornamentation for homes and businesses. These include paintings, sculpture, holographics, photographs, and recordings (videos, audios, flat projections, movies, concerts, music). While the originals of most of these latter works are properly classified as novelties, reproductions and visual copies of these items are typically shipped as electronic information, ready to be printed into salable form at its destination. Lower tech worlds often trade considerable quantities of creative works to high-tech worlds in return for scientific data and machinery.

Novelties: New products never before seen (or sometimes just never before marketed) are powerful commodities in the marketplace. Novelties are the staple export of low-tech worlds to higher-tech worlds.

Because a novelty can be anything, if presented in the right way at the right place and time, description is difficult. Some novelties become short-lived fads or fashions. Some are pets from unusual ecosystems, and the expensive food to feed them. Some are hand-crafted knick-knacks. Novelties can be a quick route to riches, or a short trip to losing your shirt over a warehouse full of useless junk.

Special Handling Characteristics: Several of the possible trade goods may require special handling by the cargo carrier. If a questionable cargo-handling situation arises, the referee must define an appropriate task for the players to roll to prevent damage to their cargo. The types of special handling characteristics include:

Corrosive: This cargo is hazardous and needs special

containers to prevent it from doing corrosive damage to the cargo vehicle, cargo handlers, and so on. If a cargo container's sealed integrity is broken in transit, damage will result, in the form of structural or system damage to the ship, or respiratory damage to crew and passengers who inhale caustic gasses.

Flammable: This cargo is flammable. If anything that could ignite the cargo enters the cargo hold (for example, sparks from an electrical short, a laser weapon fire exchange, and so on), the cargo will burst into flames. One obvious way to save the cargo is to immediately evacuate the cargo hold's atmosphere, placing it in a vacuum, which would effectively snuff out the fire. Many captains wisely refuse to carry such cargo.

Explosive: This cargo is hazardous, and extreme heat or heavy shock may cause it to explode. Heat from a burning flammable cargo or a cargo hold hit during a starship battle are two examples of the types of conditions that could cause an explosive cargo to detonate. In some cases, a heavy jolt (for example, a jolt resulting from a rough landing) could cause an explosive cargo to detonate. Inertial compensators can mitigate this problem, but you never know when some Cr0.5 fuse will blow and wipe out a MCr50 starship.

Radioactive: This cargo is hazardous and must be stored in special sealed and shielded containers. If the cargo container's sealed integrity is broken, radiation damage to nearby life forms is sure to result.

Perishable: This cargo requires a special environment to ensure it is properly preserved and kept during the journey to market. If the narrow environmental conditions vary to a significant degree from optimum, the cargo's value may be seriously degraded or destroyed. Perishable cargos have an additional complication: They must get to market fast. A perishable cargo lot must be shipped the same day it is delivered for shipment.

Fragile: This cargo is delicate, and cannot stand rough handling or severe jolts. If a fragile cargo is damaged, its worth may be only slightly diminished, or it may be reduced to complete junk.

Living: Some cargo is listed as living. This cargo is an extreme case of both perishable and fragile. Life support, cages, and perhaps even special caretakers may need to be provided. And *somebody* has to go in there and feed the things...

Trade Classifications

The effects of trade classifications are as follows. Actual characteristics of these worlds are detailed in World Building, beginning on page 180.

Agricultural (Ag): Agricultural goods market well to Desert, Fluid Oceans, Poor, Water Worlds, and Industrial Worlds. Agricultural Worlds are good markets for Industrial Worlds, Agricultural Worlds, Barren Worlds (for new plant and animal strains), and Rich Worlds.

Asteroid Belt (As): Asteroid Belt goods market well to Industrial, Nonagricultural, Vacuum Worlds, and Asteroid Belts. Asteroid Belts are good markets for Agricultural, Industrial, Nonagricultural, and Vacuum Worlds.

Barren World (Ba): Goods from Barren Worlds are raw materials mined or gathered by a ship crew. They are poor sources of cargos and resources and cannot be markets.

Desert World (De): Desert World goods sell well to Desert and Nonagricultural Worlds. They are good markets for Agricultural, Desert, Industrial, Nonagricultural, and Rich Worlds.

Fluid Oceans (Fl): Nonwater oceans may be sources of raw materials, and the world's products sell well on Industrial and Fluid Oceans Worlds. Worlds with fluid oceans are good markets for Fluid Oceans and Industrial Worlds.

High Population (Hi): High Population World goods, because of the economy of scale for production, sell well on High Population, Low Population, and Rich Worlds. High Population Worlds are good markets for Agricultural, Industrial, High Population, and Rich Worlds.

Ice-Capped (Ic): Goods from Ice-capped Worlds sell well on Industrial Worlds; the worlds are poor markets.

Industrial (In): Industrial goods sell well on most worlds, and Industrial Worlds are good markets for most goods.

Low Population (Lo): Low Population World cargos sell well to Industrial and Rich Worlds. Low Population Worlds are rarely self-supporting; they are excellent markets for High Population and Agricultural Worlds.

Nonagricultural (NA): Nonagricultural Worlds are good sources for Asteroid Belts, and Nonagricultural, Desert, and Vacuum Worlds.

Nonindustrial (NI): Nonindustrial Worlds are markets for goods from Industrial Worlds. They are sources of goods for Industrial Worlds; their goods sell poorly on Nonindustrial Worlds.

Poor (Po): Poor Worlds are markets for Industrial Worlds. They are not good sources of cargos.

Rich (Ri): Rich Worlds are good markets for Asteroid Belts, and Agricultural, High Population, Industrial, Low Population, Rich, and Water Worlds. They are good sources of cargos for Agricultural, Desert, Industrial, High Population, Rich, and Nonagricultural Worlds.

Vacuum World (Va): Vacuum Worlds are markets for goods from Asteroid Belts, and Industrial, Nonagricultural and Vacuum Worlds. They are good sources of cargos for Asteroid Belts, Industrial Worlds, and Vacuum Worlds.

Water World (Wa): Water Worlds are good markets for Industrial and Water Worlds. They are good sources of cargos for Industrial, Rich, and Water Worlds.

Trade and Commerce Flowcharts

These flowcharts are used to help the referee generate passengers, freight, and cargo for player characters' ships. All die rolls are made with D6.

PASSENGERS AND CARGO

1. Sourceworld Details

Determine sourceworld's population and tech level.

2. Destination World Details

The ship captain must select and designate a destination world within jump range. Determine destination world's population, tech level, and travel zone.

3. Passengers

Determine how many passengers are available for the ship.

Roll once on the High column, once on the Middle column, and twice on the Low/Steerage column (once for Low, once for Steerage). Steerage not allowed in Regency, roll for Low only.

Passenger Table

Pop Digit	*Available at Sourceworld* High	Middle	Low/Steerage
0	—	—	—
1	—	1D–2	2D–6
2	1D–1D	1D	2D
3	2D–2D	2D–1D	2D
4	2D–1D	2D–1D	3D–1D
5	2D–1D	3D–2D	3D–1D
6	3D–2D	3D–2D	3D
7	3D–2D	3D–1D	3D
8	3D–1D	3D–1D	4D
9	3D–1D	3D	5D
A	3D	4D	6D

Die Roll Modifiers

If destination world Population 0-4, DM –3.
If destination world Population 8+, DM+1.

If any crewmember has Service skill, apply half of it (rounding fractions down) as a +DM on the roll for high passengers.

If any crewmember has Admin/Legal skill, apply apply half of it (rounding fractions down) as a +DM on the roll for middle passengers.

If any crewmember has Streetwise skill, apply apply half of it (rounding fractions down) as a +DM on the roll for low and steerage (where applicable) passengers.

DM+(sourceworld TL minus destination world TL).

If destination world is a red zone, DM –8, and no middle or low passengers.

If destination world is an amber zone, DM –4.

Passengers may not exceed the passenger capacity of the ship.

This table may be consulted once per week.

Income: Credit the ship with Cr10,000 per high passenger, Cr8000 per middle passenger, Cr1000 per low passenger, and Cr2500 per steerage passenger.

4. Freight and Cargo

Freight consists of paid shipments of goods. Cargo is purchased at the sourceworld and sold at the destination world. Determine the available lots from the table. Roll once in the Major column, once in the Minor column, and once in the Incidental column. For each lot, determine its size by rolling the lot size.

Available Lots

Pop Digit	*Available at Sourceworld Major*	Minor	Incidental
0	—	—	—
1	1D–4	1D–4	—
2	1D–2	1D–1	—
3	1D–1	1D	—
4	1D	1D+1	—
5	1D+1	1D+2	—
6	1D+2	1D+3	1D–3
7	1D+3	1D+4	1D–3
8	1D+4	1D+5	1D–2
9	1D+5	1D+6	1D–2
A	1D+6	1D+7	1D

Lot Sizes

Major Cargos: 1D+10.
Minor Cargos: 1D+5.
Incidental Cargos: 1D.

Lot size is stated in displacement tons. To convert to kiloliters, multiply by 14.

Die Roll Modifiers

Apply these DMs for number of available lots.
If destination world population 0-4, DM –3.
If destination world population 8+, DM +1.

If any crewmember has Liaison skill, apply half of it (rounding fractions down) as a +DM on the roll for minor cargos.

DM+(sourceworld TL minus destination world TL).

If destination world is a red zone, freight is calculated normally, but at five times the normal rate of pay (Cr5000 per ton).

If destination world is an amber zone, freight is calculated normally but at twice the normal rate of pay (Cr2000 per ton).

If the goods are freight (carried for a fixed fee per ton) and their identity does not matter, ignore further steps.

The sum of cargo and freight cannot exceed the cargo hold capacity of the ship.

This table shows the limit of freight available to a ship in a period of one week. A crewmember with Marketing skill may consult this table again once (to find last-minute cargo, but not freight).

5. Sourceworld Trade Classifications

Determine the trade classifications of the sourceworld.

Trade Classifications

Code	*Size*	*Atmosphere*	*Hydrographic*	*Population*	*Government*	*Law Level*	*Code Definition*
Ag	—	4-9	4-8	5-7	—	—	Agricultural
As	0	0	0	—	—	—	Asteroid
Ba	—	—	—	0	0	0	Barren
De	—	2+	0	—	—	—	Desert
Fl	—	A+	1+	—	—	—	Fluid Oceans
Hi	—	—	—	9+	—	—	High Population
Ic	—	0-1	1+	—	—	—	Ice-Capped
In	—	2-4,7,9	—	9+	—	—	Industrial
Lo	—	—	—	4–	—	—	Low Population
Na	—	0-3	0-3	6+	—	—	Nonagricultural
Ni	—	—	—	0-6	—	—	Nonindustrial
Po	—	2-5	0-3	—	—	—	Poor
Ri	—	6,8	—	6-8	4-9	—	Rich
Va	—	0	—	—	—	—	Vacuum
Wa	—	—	A	—	—	—	Water World

Determine all possible trade classifications. An Asteroid Belt (As) is automatically a Vacuum World, and does not have the Va code.

6. Identify Cargo and Freight

Create a standard identifier for each shipment of cargo and freight.

Freight: If the shipment is freight, its identity may not matter. The referee may assume that freight is a standard, safe, nonperishable shipment properly packaged. Its tonnage is already known. No further information is required.

Cargo: If the shipment is cargo, it should be given a standard identifier, which consists of:

1. Sourceworld starport type.
2. Sourceworld tech level.
3. All possible sourceworld trade classifications.
4. Cost.

For example, a cargo from a world with a type A starport, a tech level of 12, and a Rich world which costs Cr7000 would be identified as:

A-C Ri Cr7000

7. Nature of Cargo

More information can be determined about cargo (and about freight, if desired).

Cargo and freight are broadly classified as one of the following types:

Natural Resources
Processed Resources
Manufactured Goods
Information
Novelties

For each shipment of cargo or freight, note the trade classifications in its identifier and consult tables 8a through 8f in order until one of the trade classifications in its identifier is matched. Roll on the first table that matches to determine the broad nature of the goods.

Worlds with no classification use 8f.

8a. Ag Goods

Any goods with Ag (Agricultural) in its identification may use this table.

Agricultural Goods

Die	Trade Good Category
2	Natural Resources
3	Natural Resources
4	Natural Resources (organic)
5	Natural Resources (organic)
6	Natural Resources (organic)
7	Processed Resources (organic)
8	Processed Resources (organic)
9	Manufactured Goods
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM +1.

8b. Wa, Ri Goods

Any goods with Wa (Water World) or Ri (Rich World) may use this table.

Water and Rich World Goods

Die	Trade Good Category
2	Natural Resources
3	Natural Resources
4	Natural Resources
5	Natural Resources
6	Processed Resources
7	Processed Resources
8	Manufactured Goods
9	Information
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM+1. If population 9+, DM +1.

8c. As, Va, De, Na Goods

Any goods identified as As (Asteroid Belt), Va (Vacuum), De (Desert), or Na (Nonagricultural) may use this table.

Asteroid, Vacuum, Desert, or Nonagricultural Goods

Die	Trade Good Category
2	Natural Resources (inorganic)
3	Natural Resources (inorganic)
4	Natural Resources (inorganic)
5	Natural Resources (inorganic)
6	Natural Resources (inorganic)
7	Processed Resources (inorganic)
8	Manufactured Goods
9	Manufactured Goods
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM +1. If population 9+, DM +1. If Barren World, DM –5.

8d. Ni Goods

Any goods identified as Ni (Non industrial) may use this table.

Nonindustrial Goods

Die	Trade Good Category
2	Natural Resources
3	Natural Resources
4	Natural Resources
5	Natural Resources
6	Natural Resources
7	Processed Resources
8	Manufactured Goods
9	Manufactured Goods
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM+1. If Barren World, DM –5.

8e. In Goods

Any goods identified as In (Industrial) may use this table.

Industrial Goods

Die	Trade Good Category
2	Natural Resources
3	Natural Resources
4	Processed Resources
5	Processed Resources
6	Manufactured Goods
7	Manufactured Goods
8	Manufactured Goods
9	Manufactured Goods
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM +1.

8f. Ba, Fl, Hi, Ic, Lo, Po Goods

Any goods identified as Ba (Barren), Fl (Fluid Oceans), Hi (High Population), Ic (Ice-Capped), Lo (Low Population), Po (Poor), or no trade classification may use this table.

All Other Goods

Die	Trade Good Category
2	Natural Resources
3	Natural Resources
4	Natural Resources
5	Information
6	Processed Resources
7	Processed Resources
8	Processed Resources
9	Manufactured Goods
10	Information
11	Information
12	Novelties

DMs: If government 9+, DM +1. If law level 9+, DM +1. If population 9+, DM +1. If Barren World, DM –7.

9. Nature of Cargo and Freight

Determine the specific nature of the goods. The referee is encouraged to select a specific cargo or freight appropriate to the worlds of origin and destination, or to the adventure being played. Absent from any specific requirement, the referee may determine the nature of the cargo by rolling 2D6 and consulting the appropriate table. The columns to the right on the tables show the 2D6 roll to determine if the cargo has any special handling characteristics. The columns are Corrosive, Flammable, Explosive, Radioactive, and Perishable. On the Manufactured Goods, Information, and Novelties tables, Fragile appears in place of Flammable. "Auto" indicates that the cargo automatically fulfills that criterion.

If Natural Resources, go to step 9a.
If Processed Resources, go to 9b.
If Manufactured Goods, go to 9c.
If Information, go to 9d.
If Novelties, go to 9e.

9a. Natural Resources

D66	Trade Good	Cor	Fla	Exp	Rad	Per
11-13	Ferrous Metal Ore	—	—	—	—	—
14-15	Nonmetal Ore	10+	—	12+	—	—
16-21	Radioactive Ore	—	—	—	6+	—
22-23	Nonferrous Ore	11+	—	11+	11+	—
24-26	Raw Crystals	—	—	—	—	—
31	Raw Precious Gems	—	—	—	—	—
32-33	Nitrogen Compounds	10+	—	9+	—	—
34-36	Raw Hydrocarbons	11+	9+	11+	—	—
41-42	Plants (wood)	11+	9+	—	—	11+
43	Plants (bales)	11+	9+	—	—	10+
44	Plants (fibers)	11+	6+	—	—	9+
45	Plants (herbs)	11+	6+	—	12+	9+
46	Wild Plants (living)	11+	6+	12+	—	11+
51-54	Food Plants (living)	11+	11+	—	—	Auto
55-56	Animals (living)	11+	—	—	—	Auto
61-64	Livestock (living)	11+	—	—	—	Auto
65	Rare Plants (living)	11+	11+	—	—	Auto
66	Rare Animals (living)	11+	—	—	—	Auto

9b. Processed Resources

D66	Trade Good	Cor	Fla	Exp	Rad	Per
11-16	Composites	11+	9+	10+	—	—
21-24	Special Alloys	12+	10+	—	—	—
25-26	Precious Metals	—	—	—	—	—
31	Crystals	—	—	—	—	—
32-34	Radioactives	—	—	—	5+	—
35	Rare Earths	11+	12+	12+	12+	—
36	Isotopes	—	—	—	3+	—
41-46	Foodstuffs	11+	9+	12+	—	8+
51-54	Petrochemicals	10+	7+	8+	—	—
55	Textiles	—	9+	—	—	11+
56	Explosives	12+	10+	3+	—	10+
61-63	Polymers	—	9+	—	—	—
64-66	Fertilizers	10+	9+	9+	—	9+

9c. Manufactured Goods

D66	Trade Good	Cor	Fra	Exp	Rad	Per
11-13	Pharmaceuticals	11+	10+	—	—	9+
14-15	Spice	—	11+	—	—	10+
16	Gourmet Food	—	11+	—	—	10+
21-23	Alcoholic Beverage	11+	8+	—	—	9+
24-26	Nonalcoholic Beverage	—	10+	—	—	8+
31	Consumable Teas	—	11+	—	—	12+
31-32	Exotic Fluids	—	8+	—	—	9+
33-36	Aromatics	—	10+	9+	—	11+
41-42	Clothing	—	12+	—	—	—
43	Protective Gear	—	9+	—	—	—
44-46	Weapons	—	9+	—	—	—
51-52	Electronic Parts	—	10+	—	—	—
53	High-Tech Parts	—	10+	—	—	—
54-55	Tools	—	11+	—	—	—
56	Vehicles	—	12+	—	—	—
61-63	Entertainment Equip	—	10+	—	—	—
64	Computers	—	11+	—	—	—
65-66	Robots	—	11+	—	—	—

9d. Information

This category includes a modified meaning of the category Perishable. This indicates whether the information is of a time-sensitive nature so that it becomes useless if not delivered in a timely fashion.

D66	Trade Good	Cor	Fra	Exp	Rad	Per
11-12	Writings (paper)	—	—	—	—	8+
13-14	2-D Still Pictures	—	10+	—	—	8+
15-16	Computer Software	—	—	—	—	11+
21-22	Robotic Software	—	—	—	—	—
23-24	Starship Software	—	—	—	—	—
25-26	3-D Still Pictures	—	10+	—	—	8+
31-33	Artistic Images	—	9+	—	—	11+
34	Audio Recordings	—	—	—	—	8+
35	2-D Video Recordings	—	10+	—	—	8+
36	3-D Video Recordings	—	10+	—	—	8+
41	Raw Data (paper)	—	—	—	—	8+
42-43	Raw Data (data)	—	—	—	—	8+
44-45	Raw Data (inanimate samples)	9+	10+	11+	11+	9+
46-53	Raw Data (biosamples)	11+	Auto	—	—	Auto
54-56	Records (paper)	—	—	—	—	11+
61-66	Records (data)	—	—	—	—	11+

9e. Novelties

D66	Trade Good	Cor	Fra	Exp	Rad	Per
11	New Natural Resources	10+	—	11+	10+	12+
12	New Processed Resources	—	—	11+	—	—
13-14	New Manufactured Goods	10+	7+	11+	—	—
15-16	New Information	—	—	—	—	Auto
21-26	Natural Curiosities	12+	9+	12+	12+	—
31-36	Handmade Artifacts	—	6+	—	—	—
41-46	Living Creatures	12+	Auto	—	—	Auto
51-56	Starving Artist Reproductions	—	—	—	—	—
61-66	Counterfeit Knock-Offs	—	—	—	—	—

PURCHASE COST OF CARGO

1. Cargo Cost

Cargo cost is the amount of money that a shipment is sold to the speculator or starship captain for.

Start with base cost of Cr4000 per ton.

3. Starport Cost Modifiers

The type of starport involved in the transaction influences the cost of the goods.

Consult the Starport Effects table using the sourceworld starport type.

STARPORT EFFECTS

Starport	*Cost Modifier*
A	–1000
B	+1000
C	+1000
D	+2000
E	+3000
X	+5000

Add sourceworld's starport cost modifier to base cost.

2. Trade Cost Modifiers

Trade cost modifiers are determined from the sourceworld characteristics.

TRADE COST MODIFIERS

Code	*Trade Class*	*Cost Mod*
—	No Class	0
Ag	Agricultural	–1000
As	Asteroid Belt	–1000
Ba	Barren World	+1000
De	Desert World	+1000
Fl	Fluid Oceans	+1000
Hi	High Population	–1000
Ic	Ice-Capped	0
In	Industrial	–1000
Lo	Low Population	+1000
Na	Nonagricultural	+1000
Ni	Nonindustrial	+1000
Po	Poor	–1000
Ri	Rich	+1000
Va	Vacuum World	+1000
Wa	Water World	0

If As, ignore the effects of Va.

Total all modifiers and add to base cost.

Tech Level Modifier: Multiply sourceworld's tech level by Cr100 and add to base cost.

4. Delivery

Normal delivery to the ship is four days. Add 10% to the final cost for each day of advance delivery to the ship.

For example, instant (same day) delivery costs 40% extra.

SALE PRICE OF CARGO

1. Cargo Price

Cargo price is the amount of money that a buyer is expected (on the average) to pay for goods when delivered at a world. Cargo price is applied to the Actual Value table (page 240) to determine the final price for which the goods are actually sold.

Start with a base price of Cr5000.

2. Cargo Price Modifiers

Total all intersections between sourceworld and destination world codes and multiply by Cr1000. Add to base price.

CARGO PRICE

Source Code	*Destination Code* —	*Ag*	*As*	*Ba*	*De*	*Fl*	*Hi*	*In*	*Lo*	*Na*	*Ni*	*Po*	*Ri*	*Va*	*Wa*
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ag	—	+1	+1	—	+1	—	+1	+1	+1	+1	—	—	+1	—	—
As	—	—	+1	—	—	—	—	+1	—	+1	—	—	+1	+1	—
Ba	—	+1	—	—	—	—	—	+1	—	—	—	—	—	—	—
De	—	—	—	—	+1	—	—	—	—	+1	—	—	—	—	—
Fl	—	—	—	—	—	+1	—	+1	—	—	—	—	—	—	—
Hi	—	—	—	—	—	—	+1	—	+1	—	—	—	+1	—	—
Ic	—	—	—	—	—	—	—	+1	—	—	—	—	—	—	—
In	—	+1	+1	—	+1	+1	+1	+1	—	—	+1	+1	+1	+1	+1
Lo	—	—	—	—	—	—	—	+1	—	—	—	—	+1	—	—
Na	—	—	+1	—	+1	—	—	—	—	—	—	—	—	+1	—
Ni	—	—	—	—	—	—	—	+1	—	—	-1	—	—	—	—
Po	—	—	—	—	—	—	—	—	—	—	—	-1	—	—	—
Ri	—	+1	—	—	+1	—	+1	+1	—	+1	—	—	+1	—	—
Va	—	—	+1	—	—	—	—	+1	—	—	—	—	—	+1	—
Wa	—	—	—	—	—	—	—	+1	—	—	—	—	+1	—	+1

If the destination world is Ba, goods may not be sold. If the sourceworld is As, ignore its Va classification.

3. Tech Level Effects

Subtract destination world tech level from sourceworld tech level and multiply by 10%. This value may be a positive or a negative number. Multiply this value by the adjusted price.

5. Alien Trade Effects

When a cargo has an alien source, there may be an effect on the price. Determine the source of the goods (locally manufactured unless otherwise noted) and the market for the goods. Consult the Alien Trade Effects table and apply any price alteration to the calculated price of the goods.

ALIEN TRADE EFFECTS

Buying Race	Selling Race: Aslan	Droyne	Hiver	Former Imperial	K'kree	Solomani	Vargr	Zhodani
Aslan	—	—	—	—	–2000	—	+1000	—
Droyne	—	—	—	—	—	—	—	+2000
Hiver	+1000	—	—	–1000	—	—	—	—
Form. Imp.	—	—	—	—	—	—	—	–1000
K'kree	—	—	—	—	—	—	–2000	—
Solomani	—	—	+1000	–1000	—	—	—	—
Vargr	—	—	—	—	–4000	—	—	—
Zhodani	+1000	+1000	—	–1000	—	—	—	—

This table indicates the effects of local taste, prejudice, and novelty in the evaluation of goods by a market. For example, Zhodani goods are generally poorly received in former Imperial (Regency) markets and well-received in Droyne markets.

4. Brokers

One character may act as broker if he has Marketing skill. He applies his skill to the transaction as a DM (equal to half of the Marketing skill, not asset) on the Actual Value table in step 7, and receives 2.5% (per skill level applied) of the final market price (of which half of that is spent as expenses for the transaction).

A broker may be hired at a starport to assist in the transaction.

BROKERS AVAILABLE

Starport	Broker Available
A	Marketing 6 or less
B	Marketing 4 or less
C	Marketing 2 or less
D	Marketing 1

A broker receives 2.5% (×.025) of the final market price for each level of skill he applies to the Actual Value table.

6. Bribery

Characters may attempt bribery to gain a special merchant kickback. The base amount of the bribe should be Cr1000, but the referee may adjust this up or down based upon the value of the cargo, the local law level, and modifications to the task difficulty. (Higher bribes lower the difficulty level.)

Make a Difficult (but modified as noted above) task roll using Bribery. Success allows a +1 modification to the table; Outstanding Success allows a +3 modification. Failure results in no modification, and Catastrophic Failure results in possible arrest or fine (and at the very least loss of the bribe).

7. Actual Value

The actual value of a cargo (and thus the final market price paid for it) is determined only at the moment of sale using the Actual Value table.

ACTUAL VALUE

Die	Percentage
2	40%
3	50%
4	70%
5	80%
6	90%
7	100%
8	110%
9	120%
10	130%
11	130%
12	170%
13	200%
14	300%
15	400%

Results of less than 2 are treated as 2; results of more than 15 are treated as 15.

DMs: +one-half Marketing skill (not asset; round down). Maximum DM is +4.

If the players rolled one die in advance (allowed for Bargaining skill), remember to use the prior roll on this table.

Once goods are offered for sale and the Actual Value table is consulted, the goods must be sold at the price indicated. A sale may be stopped at any point before the final die is rolled on the table. If a sale is stopped, another sale cannot be attempted on the current world in the current week.

Equipment Maintenance and Repairs

MAINTENANCE

Sophisticated equipment requires nearly constant maintenance to keep it running, even in the best of times, and these are *not* the best of times. People used to driving civilian cars on good roads are seldom aware of how much more punishment an all-terrain exploratory vehicle takes. In the universe of **Traveller**, good mechanics and engineers are worth their weight in gold, and are indispensable if the PCs have equipment they want to keep running.

Good mechanics, for all their worth, will sometimes be considered pests by the rest of the group. They will want to spend as much of their time as possible with the vehicles, going over them and conducting minor repairs and preventative maintenance.

If operating in a region of space where regular maintenance facilities are rare, they will be constantly searching for more spare parts, whether they are needed now or not. (Someday they'll be needed and might not be available then, so "get them now" is their philosophy.)

Routine Maintenance

Outside of the Regency, very little high-tech equipment is in perfect condition. Most has been repeatedly repaired and rebuilt, sometimes with homemade parts, and many items are generally worn-out. Every major piece of equipment (vehicle, starship, large weapons system, or sensor) has a base maintenance number indicated on its description. This is the number of hours per week that should be spent in routine preventative maintenance to keep it in good working shape, assuming it is in mint condition. The actual time spent in maintenance is up to the players, but should be influenced by the actual condition of the equipment.

Equipment Condition

Whenever characters acquire a major item of equipment during the game, including during character generation, the referee should determine its wear value by rolling 1D10. The higher the wear value, the more worn-out the equipment. Whenever characters are in a position to buy or sell equipment, its true value is determined by dividing its base price by its wear number. Thus, a vehicle which would normally cost Cr200,000 but has a wear value of 8 would only be worth Cr25,000.

Potential Breakdowns

Each piece of equipment has the potential to break down when it is used for a certain period of time. The chance for a *potential* breakdown is equal to the equipment's wear value and is rolled on a D10 (thus a piece of equipment with a wear value of 2 would have a potential break down on a 1D10 roll of 2 or less).

For most equipment, including planetary vehicles (all ground vehicles, lift vehicles, and aircraft, plus small watercraft), potential breakdowns are rolled for each eight-hour period (or fraction thereof) for which the equipment is used. For heavy equipment specifically designed for continuous long-term use, the roll is only once per day (24 hours) of use (this category includes all spacecraft and starships, large ocean-going ships, hydroelectric power plants, and the like).

A potential breakdown does not mean the piece of equipment has actually suffered a serious malfunction. Avoiding an actual breakdown is a Difficult task against the skill appropriate to the equipment (Mechanic, Electronics, Gravitics, Ship's Engineering, etc.) performed by the character who did the last maintenance on the item.

If the machinery has not been maintained for the recommended number of routine preventative maintenance hours in the last week, the potential breakdown automatically results in an actual breakdown.

If a potential breakdown does not result in an actual breakdown, the characters may continue using the machinery without interruption. The occurrence of a potential breakdown is usually obvious to the characters, and the referee can tell the players that they hear ominous grinding noises in the machinery, smell a funny odor, see smoke in the exhaust, note a power spike on the readouts, etc. (although some breakdowns can be unexpected and sudden at the referee's discretion). This allows them to shut the system down and do some work on it before it goes completely. The referee may opt to allow the players to reduce the load on the system (for example, reduce power plant output to 50%) to allow the roll for actual breakdown to be postponed for another eight-hour period.

Once a potential breakdown has occurred, there will be an additional automatic potential breakdown every period (eight-hour or 24-hour, according to type of equipment) used thereafter until the item of equipment receives at least its recommended number of routine preventative maintenance hours. Avoiding an actual breakdown is a Difficult task performed by any character (using appropriate skill) during intermittent pauses in use.

If an actual breakdown occurs, go the the Breakdowns section, page 242.

Preventative Maintenance

Extra preventative maintenance can help prevent breakdowns. Spending twice the recommended number of hours will reduce the chance of a potential breakdown by 2; spending three times the amount reduces the chance by 3, etc.

For example, spending eight hours per week maintaining an item of equipment with a maintenance number of 4 and wear value of 6 will mean that the roll for a *potential* breakdown is 4 or less, not 6 or less.

Note that this allows wear value to be temporarily (for one week) reduced to 0. Under certain circumstances,

referees may allow players to use this rule to "fool-proof" a piece of equipment for an upcoming period of operation. For example, on the first day of the week, sufficient maintenance is performed on a vehicle to reduce its wear value to 0. For the remaining six days of that week, there is no chance of a potential breakdown, and no further maintenance need be performed. However, under harsh conditions (in combat, bad weather, exotic or very hot atmospheres, sandy environments, etc.) the referee may stipulate that the players must provide the normal required maintenance over the course of the week to maintain the 0 level. However, full crews are always required to operate and monitor equipment, even when maintenance loads are reduced.

Maintenance must again be performed on the first day of the following week to avoid negative effects.

Increasing Wear

After an item of equipment has suffered 10 actual breakdowns, its wear value is increased by 1. A vehicle with a wear value of 10 which suffers its tenth breakdown at that value is no longer repairable, and is good only for salvaging parts, unless it is rebuilt (below).

Starships and starship components may only be rebuilt at class A and B starports. Vehicles and other equipment may only be rebuilt in suitably equipped cities or bases. In all cases, the rebuilding facility must be of equal or greater tech level as the rebuilt system.

Once the players and the referee are very familiar with the game mechanics, they may wish to keep separate track of the wear value of the components of a starship. That is, a starship which suffers repeated power plant breakdowns would end up having a very worn-out power plant but a sound sensor suite. In this case, the tenth power plant breakdown at wear value 10 would mean the characters need to completely rebuild their power plant, not the entire starship. This rule is not suggested for beginning use; players and referee have enough to keep track of as it is.

(Referees should take care that not too many separate systems of a single object are rolled for, as this can result in continuous breakdowns. Try rolling only once per period, but against the highest wear value. The referee will then assign the exact component for a potential breakdown by pro-rating the individual component wear values.)

Rebuilds

Vehicles and major starship components may be *rebuilt*, which reduces their current wear value. The wear value to which a piece of rebuilt equipment may be rebuilt depends on how many times it has been rebuilt. The first time a piece of equipment is rebuilt it may be rebuilt to wear value 1, the second time to a wear value of 2, and so on. A rebuild costs 5% of the original purchase price of the component per wear value reduced. Thus an engine rebuilt from wear value 10 to wear value 5 would cost 25% of its original cost. That same engine rebuilt to wear value 1 would cost 45% of its original cost.

Starship Malfunctions

A starship can malfunction. The two major malfunctions are drive failure and misjump. The primary influencing factors are unrefined fuel and lack of maintenance.

Refined fuel is pure liquid hydrogen, and is available at starports (price varies with availability, but is typically about Cr500 per ton); unrefined fuel is also sometimes available at starports (around Cr100 per ton when available). Unrefined fuel can also be gotten for free: skimmed from gas giants or taken in the form of water from oceans or lakes (if there are any on the world) and used as unrefined fuel. However, both are full of contaminants in their original state (gas giant skimming also yields ammonia, methane, etc., and water must be processed into pure hydrogen).

Many starships use unrefined fuel because it is cheaper and more plentiful. In order to safely use unrefined fuel, a ship must carry a fuel purification system that prepares the fuel for use in the fusion plant. If the unrefined fuel is burned as is, there is a chance of misjump. See the Starship Operating Procedures flowcharts (page 225).

Starships require continuing maintenance as they operate and an annual maintenance overhaul to keep them in top running order. Ships which are undercrewed and do not carry enough dedicated or full-time skilled engineers, and those which avoid or delay their annual maintenance, run the risk of malfunction. See Routine Maintenance on page 222 for details.

REPAIRS

In the course of the game, PCs will be called upon to repair ships, vehicles, and other equipment which either has broken down or has suffered damage. The combat rules list the procedures used for determining battle damage to vehicle components. Breakdowns are discussed below.

Tools

If a character has the needed parts to make repairs, he must then have the tools to do so. Given the correct tools, the repairs are Difficult tasks. If a PC has the wrong type of tools, the job will take longer and become a Formidable task. Damage to a power plant or drive or large nonenergy weapon system requires mechanical tools of at least as high a tech level as the system being repaired. Suspension damage requires heavy mechanical tools. Sensors, communicators, fire control systems, energy weapons, and other electronic systems require electronic tools of at least as high a tech level as the system being repaired. Damage to hulls and structural members require cutting and welding tools capable of working the material used in the component.

Breakdowns

If an actual breakdown has occurred, the severity of the

breakdown must be determined. The current wear value of the vehicle is the D10 roll for the chance of a major breakdown. For example, a vehicle with a wear value of 8 must roll 8 or less for a breakdown to be major. A breakdown can strike any sub-system of the equipment, and the affected sub-system should be determined by the referee. For vehicles, aircraft, and watercraft, it will usually be either engine or suspension; for starships, it will usually be power plant, maneuver drive, or jump drive. However, the breakdown could affect peripheral systems, for example, a communicator, sensor, or weapon. Certain breakdowns have entertaining roleplaying value. For example, imagine telling the characters that the starship's plumbing system has seized: All of the toilets and sinks have backed up, and the showers don't work. If a breakdown is not a major breakdown, it is automatically a minor one.

Minor Breakdowns: A minor breakdown results in minor damage to the component. The wear value of the equipment is the D10 roll for the chance that parts are needed to repair the component (roll less than the wear value for parts to be required). Otherwise, repairs can be made without new parts.

Major Breakdowns: A major breakdown results in major damage to a randomly determined system, and will always require parts to repair.

Parts: All systems are assumed to include a basic parts selection which includes all commonly needed replacement parts. However, as parts are used from this assortment, they must be replaced or there is a risk that future breakdowns will result in a shortage.

If a part is not replaced, there is a chance that a future breakdown will be unrepairable for lack of parts. Roll 1D10 when the breakdown occurs. If the number rolled is equal to or less than the number of unreplaced parts in the repair set, the breakdown is not repairable until the correct part is found or fabricated.

While parts can usually be found for sale, other common sources for parts are cannibalization and fabrication, especially when repairing relic equipment (equipment left over from the Imperial era). Parts can usually be cannibalized from an identical piece of equipment.

Cannibalization: The referee may often wish to go into detail about the condition of the equipment being cannibalized. For example, say the characters are hoping to find a drive part from a crashed starship. That might be a problem, because one of the main reasons starships crash is because their drives are already ruined. The referee may wish to make a few random rolls on the damage tables (see the Space Combat section beginning on page 311 and individual starships in the "Equipment & Technology" chapter) to see what systems have been hit, and how hard. After establishing damage, the referee can calculate the number hits against a system as a percentage of the total hits that system could absorb. This creates a D100 roll to see the chance that the needed portion of the system was damaged or left intact. (For vehicles, the referee should use the normal vehicle damage rules, beginning on page 297, to assess the level of damage to the system.) For example, if the ship had a power plant hit capacity of 16 major damage hits and had taken four major damage hits to the power plant, there would be a 25% chance (4÷16) that any given power plant component will have been damaged.

If the portion of the system to be cannibalized is undamaged, the required parts may automatically be taken from it. However, if the crashed starship is in an accessible area, the characters will likely find that it has already been stripped by prior visitors. The more inaccessible the wreck, the more likely the needed parts will still be there.

If the component comes from a portion of a ship or vehicle which has sustained damage, the part might still be salvageable. Success on a Formidable test of the appropriate asset (Mechanic, Ship's Engineering, Electronics, or Gravitics) means that the character knows how to make the damaged part work for what they need (at the referee's discretion, this may require a few hours modifying the part). This roll can only be made once, so the players should select the member who has the best skill.

If several parts are required from a damaged component, the die roll is made separately for each part.

Fabrication: Characters may only fabricate new parts if they have access to a machine shop or electronics shop. Each part requires 1D10 hours in the shop. Parts for mechanical and engineering systems may be fabricated in a machine shop; electronic systems require an electronics shop.

Fabrication is at least a Difficult test of the appropriate asset (Machinist for a mechanical part, Machinist or Electronics for an electronic part). The roll is made after the part has been fabricated, and failure means the part cannot be used. The referee may decide that fabrication of some parts is Formidable or Impossible. In cases like this, the referee may allow the remanufacture of a worn or damaged part at a lower difficulty level, but stipulate that the presence of this sub-standard part increases the wear value of the system for future breakdown rolls.

Battle Damage

The vehicle/starship combat system reads out in certain specified damage severities. How these are repaired is based on the level of damage sustained.

Destroyed Components: Any starship component which has taken sufficient major or minor damage results to reach its destruction level (total possible damage) may not be repaired. Any vehicle or aircraft component which suffers major damage, and any vehicle or aircraft electronic component which suffers any damage at all, is destroyed and may not be repaired.

Minor Damage: Repair of minor damage is a Difficult task versus the appropriate asset, takes 1D6 times 30 person-minutes, and requires 1D6–2 parts.

Major Damage: Repair of each major damage result is a Difficult task versus the appropriate asset and takes 1D6 person-hours. The total repair of a system which has sustained major damage requires parts equal to 1D10 plus the number of major damage results. Such repairs are



temporary jury-rigging only, and are to allow the ship to make it to a starport. Permanent repair of this damage is possible only at a class A or B starport. Until the systems have been permanently repaired, the wear value of the system is increased by 1 for each major damage result, to a maximum of 10.

Example: A ship's power plant with wear value of 2 has received two major damage hits. Repairs took eight person-hours (1D6 results of 3 and 5), or a total of four hours each for the two engineers, and the ship is now able to make power to jump to the class A starport in the next system. However, until the ship has its power plant permanently repaired, it operates at wear level 4 (original wear level of 2 plus 2 for the major hits). Costs for repairs are based on the percentage damage to the system: Divide the number of hits the system received by the total number of hits that the system can take. Multiply the result by the new cost of the system to find the repair costs. While at the starport, the crew crew could also opt to have the power plant rebuilt (page 242). However, a system may not be rebuilt until all outstanding repairs have been made at the normal price above.

Assets: Sensors, communicators, energy weapons, controls, computers, and all other electronic components require Electronics skill to repair. Large machinery such as power plants, drives, vehicle suspensions, heavy guns, missile launchers, etc. require Mechanic or Ship's Engineering skill to repair. Very small intricate mechanical devices, such as small arms slug throwers, require Machinist skill to repair.

Repair Crew: Not every person assisting in repairs needs to be skilled in the appropriate asset. Each character with appropriate skill may have a number of unskilled assistants helping with the repairs equal to that character's skill (not asset) level.

For example, repairs to a starship will take 36 person-hours, and require Ship's Engineering skill. The ship has one engineer with skill 5, and another with skill 2. The first character may use five unskilled assistants, and the second character may use two. The repair party thus totals nine personnel, allowing the 36 person-hour task to be completed in four hours.

Electronic Components: Electronic components (all systems requiring Electronics skill to repair—communicators, sensors, master fire directors, computers, ECM, etc.) are Formidable repair jobs and require twice the number of parts rolled.

Aircraft Damage

If an aircraft has safely landed, its damaged systems may be repaired. If an aircraft made a forced landing—for example, a belly landing or open-field landing—make a Formidable roll against the pilot's appropriate Pilot cascade. If successful, the aircraft may be repaired. If unsuccessful, the aircraft may only be cannibalized for parts. If an aircraft has crashed following damage, it is not even good for parts.

Psionics

The powers of the mind are incredible, and someday the study of these powers will enable everyone to use them as an active part of their lives. Persons with the gift of psionics, however, can be frightening to those who do not understand them, and the active or public use of this power is often not well received by the general populace or the government. As a result, only a few individuals ever discover the psionic power that lies hidden in their minds.

Psionics and Society

For almost 300 years prior to the Collapse, the study and practice of psionics was officially outlawed in the Imperium, due in part to covert subversion of the Psionic Institute by the Zhodani Consulate. Although all vestiges of Imperial authority have been swept away, old habits die hard. There is still widespread hostility toward psionic practice, particularly in the Wilds, where superstition and ignorance are powerful generators of hatred.

Activities of surviving psionic organizations have done much to inflame hostility toward them by governments, as well. After generations of suppression by governments, clandestine psionic cells developed deeply ingrained animosity toward government, and in many areas this became an unconscious part of psionic training. Thus, government suppression of psionics forced institutes underground, and their illegal status attracted people alienated from government and forced them into contra-legal behaviors. Now the fear of their activities by governments is often justified, as they have sometimes become centers of antigovernment resistance, mixing strong doses of libertarian or anarchic philosophy with their scientific and educational activities.

In some areas, particularly in the Wilds, their activities have become even more extreme. Some groups have developed a philosophy of human evolution based on the belief that psionically talented individuals constitute the next step in human development. More extreme adherents of this philosophy believe that psions are superior beings, entitled to rule by their special gifts, and above any moral or legal principles laid down by their non-psionic "inferiors."

Some worlds in the Wilds have been taken over by psions, who rule as tyrannically as do the petty kings who hold power by virtue of a technological monopoly. On other worlds they have become powerful forces in the criminal underground, or have formed secret mystical terror societies, such as the Assassins of the Middle East or the Tongs of Far East.

On many primitive worlds, psions are feared or persecuted as witches, and often believe themselves to be witches or wizards.

As a general rule, psionics is either severely regulated or outlawed on High Law worlds, and on other worlds the activities of Psionic Institutes are usually limited both by official hostility and the psionic group's own insularity and paranoia.

Accurate information about psionics or quality training in psionics can be acquired only at branches of the Psionic Institute. This institute is wholly devoted to the study of mental powers. Because of the prejudices which exist in human space, the Institute maintains a low profile, and it is quite difficult to locate its facilities. Any world with a population code of High Pop (9) or greater may have a branch established on it (roll 2D6 for 11+ for a branch to exist; DM +1 per level of population above 9).

Although a branch may exist on a world, it still must be located. Finding a branch on a world is an uncertain, Difficult test of Streetwise, and the search takes about a week. A Catastrophic Failure indicates a violent encounter with anti-psionic local officials or a mob.

If the local branch is located, there is some chance (7+ on 1D10) that the branch is some distance away and will require a long trip to reach it.

Because this task is uncertain, the Institute may not actually exist on this world. A Psionic Institute definitely exists on this world only if the referee's hidden roll succeeds.

Branches of the Institute perform two principal functions: administering the examination for psionic potential, and providing training in the use of psionic talents. Both services are provided for a fee. The fee goes to support other activities of the Institute, which may be illegal or even treasonous, at the referee's discretion. There is considerable potential for adventures and terrific roleplaying situations based on the relationship of the Institute with the local government and society, and referees would be remiss if they treat this experience as nothing more than a series of die rolls to determine new skills and abilities.

Psionic Strength

The Institute's comprehensive examination provides a measure of personal Psionic Strength. The process takes two weeks' time. In more civilized times, when there was a thriving interstellar economy, the cost associated with this process was Cr5000. Nowadays this arrangement will vary considerably based on local conditions. In some cases an oath of service in kind to the Institute is required, and on worlds where the Institute is deep underground, it is typically required that the applicant join the organization and swear a blood oath to never reveal its existence to outsiders. Convincing the Institute to grant a free examination is

a Difficult test of Charisma (Persuasion asset may be used if possessed), but some form of nonmonetary service will most likely be required. Considering the likelihood of telepathy being used in the interview, PCs would be unwise to attempt to mislead the institute as to their true situation.

Examination: Each character has a basic psionic potential defined by a 2D6 roll.

Age lessens psionic potential unless training is undertaken. A DM of –1 is applied for each block of four years age above 17. These blocks correspond to the aging cycles. For example, a character who takes the examination at age 23 is in his second four-year block, and has a DM of –2. Roll 2D6 and apply the DM. The result is the character's Psionic Strength rating. The examination may only be taken once per character.

The personal Psionic Strength may range from 0 to 11. Ratings of 12 or more cannot be attained naturally once a character has passed beyond age 17; they may be achieved temporarily through the use of psi-drugs (see page 258). The maximum possible rating is 15.

Racial Variation: Certain races are naturally more or less prone to possessing psionics than others. Some, like the Zhodani, are merely adept at identifying and cultivating these talents at an early age. Others, like the Aslan, have less potential than humans, while the Hivers have no psionic potential at all. The psionics rules presented here are for characters of Solomani and Vilani descent (and all other human offshoots other than the Zhodani).

Aging and Deterioration: Untrained characters are subject to a gradual relentless deterioration of the Psionic Strength indicator. When the aging point occurs (every four years), Psionic Strength is reduced by 1. If the character has been taking anagathics, use the apparent age rather than the actual age to determine the reduction in rating for that particular character.

A trained individual is not subject to reductions through normal aging. If, through aging, permanent injury, or any other cause, the sum of a character's (trained or untrained) first four characteristics (Strength, Agility, Constitution, and Intelligence) is reduced to less than his or her Psionic Strength rating, the Psionic Strength is reduced to that sum.

Psi-drug abuse can also reduce Psionic Strength (see Psi-Drugs, page 258).

Psionic Frequency in the General Population: The procedure for determining Psionic Strength above is an abstraction allowed for player characters, and does not imply the same frequency of psionic potential within the population at large. If it did, this would imply that each and every human would have a Psionic Strength of at least 1 if tested at 16, which is simply not the case. The presence of psionic capabilities in NPCs is entirely at the discretion of the referee, but is typically quite rare.

STAGES OF PSIONIC SUCCESS

Power Level	*Stage*
0 or less	No Effect
1-9	Basic Success
10-18	Stage Two
19-27	Stage Three
28-36	Stage Four
37-45	Stage Five
46-54	Stage Six
55 or more	Stage Seven

Power Level = Psion's PSI Attribute + Skill Level + 1D10 – (Target's Willpower Skill Level + INT).

If Outstanding Success, final power level is doubled.

Psionic Tasks

Personal Psionic Strength, once determined, is treated as a seventh attribute, abbreviated as PSI. All Psionic tasks are conducted using various Psionic skills (below) added to the Psionic Strength of the character as assets.

Psionic Success: One additional rule applies to the use of Psionic skills, to reflect the varying effects these skills can have under different conditions. When a zcharacter makes a task attempt with a Psionic skill, if the attempt is successful, 1D10 is rolled to determine the exact *power level* of the success. This power level is equal to the Psionic skill rating, plus the personal Psionic Strength, plus the number rolled on D10, minus the Willpower asset of the target (if any—targets with no Willpower skill have no default Willpower asset, and make no subtraction). If the target's Willpower reduces the power level to 0 or less, then the skill attempt fails. Not all Psionic tasks are affected by the target's Willpower—only those which attempt to interact with a sentient being. Most animals and inanimate objects have no Willpower. (But the referee should feel free to create unusual animals which do have Willpower and are resistant to psionic interference.) If an Outstanding Success is rolled on the Psionic task, the final power level total (after subtracting the target's Willpower, if any) is doubled.

Power level is used in two different ways. Sometimes it is translated point for point into a unit of measure, such as range of effect in meters, or number of kilograms affected, etc. At other times, it is used to determine *stages* of effect as shown on the Stages of Psionic Success table. Each extra stage indicates another creature detected, or another sense appealed to, etc. The exact effects depend, of course, on the specific skill being used, as explained in the individual skill descriptions.

Because many Psionic tasks are by their nature uncertain, the referee should keep the power level secret so that the player is unsure of the exact level of success that was achieved. This may be done by rolling the power level D10 secretly, or simply not letting the player know what the target's Willpower asset is. For example, a PC who succeeds at Project Thought (below) will not immediately know how clearly the message is getting through to the target, and may want to make sure to clearly communicate a simple important sentence first, before going into the theatrics of a ghostly apparition.

Difficulty Levels: As a general rule, Psionic skill attempts are Average when done under relaxed conditions, such as in a safe and peaceful environment, and with willing subjects. In normal conditions—for example, standing on a public street—they become Difficult, due to general distractions and normal resistance. In a stressful condition, such as during combat, they become Formidable. Psionic tasks reach the Impossible difficulty level under incredible stress—for example, while critically wounded, falling from a cliff, or being physically tortured. The referee, of course, has the final word in determining which conditions apply to any specific Psionic skill use.

Psionic Range and Barriers: Psionic activity is influenced by the range at which it is performed. A greater level of psionic power is required to do Psionic tasks at greater ranges. Psionics have so far proven incapable of interplanetary ranges.

Range refers to simple straight line distance. Psionic activity, at the ranges given, is effectively instantaneous and is not affected by intervening matter. However, electromagnetic effects can prevent certain psionic activities, such as telepathy. Because brainwave activity is what is being read by psionic telepathy, and brainwaves are an electrical phenomenon, electromagnetic interference of the right parameters can "jam" psionic probing. This can happen accidentally—for example, someone standing in close proximity to a high-powered electrical generator would be immune to telepathic probes or attacks. This principle has been harnessed to create psionic shielding. In its simplest form, it is a small helmet that completely encases the head (requiring a clear visor in front) and generates a weak electrical field at the same wavelength as human brainwave activity. Vehicles, buildings, or even individual rooms can be psionically shielded as well, by the same principle.

PSIONIC BASE DIFFICULTY LEVELS

Situation	*Task Difficulty*
Relaxed Environment	Average
Normal Stress	Difficult
Great Stress, Combat	Formidable
Incredible Stress	Impossible

Psionic Use and Fatigue: Any four-hour period in which a character conducts any psionic activity is treated as hard work for purposes of fatigue. (See Wilderness Travel & Encounters, page 198, for discussion of fatigue.)

Psionic Training

The Institute will train individuals in the use of their latent talents. Training requires four months. As with the examination fee above, its cost was around Cr100,000 during better times. Now it is almost certain that training will require a personal or in-kind commitment to the Institute. Extremely talented individuals (PSI 9+) may apply for a scholarship if they cannot otherwise afford training. In such cases the Institute will

THE PSIONIC SUPPRESSIONS

Between 772 and 798, a series of financial, ethical, and moral scandals within the Psionic Institutes of the Imperium shifted public opinion against the Institutes. At the same time, it became clear that a good number of the Institutes were under the control of the Zhodani Consulate. In 800, the Imperium moved against the Institutes, canceling their charters, jailing their leaders, and passing laws restricting the teaching or practice of psionics. These Psionic Suppressions had a profound influence on Imperial opinion. Over the course of 26 years, the Suppressions equated psionics with the Zhodani and established in the average Imperial citizen a distaste for both that continues to the present day.

Psionic Institutes are organizations devoted to research and training in the psionic sciences. Such organizations have long existed, but reproducible results made psionics a teachable, learnable science only as recently as –1000 Imperial.

The term *Psionic Institute* is a generic one; each institution is independently organized and maintained. All such Institutes are supported by that portion of the general population which has psionic talents; because the proportion is small, Institutes are viable only on High Population worlds.

The number of Psionic Institutes in the Imperium in 800 (when the Psionic Suppressions hit) was 65; all were suppressed. By the Collapse, most of them had been secretly re-established, and dozens of additional Institutes had been formed. In the area of Daibei Sector under the control of Duke Craig, the Psionic Suppression orders had been repealed in 1129, and several Institutes were reestablished or legitimized. Many of these Institutes perished during the Collapse, but significant numbers survived. In the Regency, First Regent Norris also repealed the Psionic Suppressions, and the Psionic Institutes there are legal and thriving in the year 1200.

The climate of public opinion, except in the Regency, about psionics remains extremely negative. Individuals will find it unhealthy to admit possession of, or sympathy for, psionic powers. Persons with psionic ability will not admit their powers unless reassured that they are in no danger; this will usually involve self-revelation by a psionic talent.

PSIONIC SKILLS CLUSTER

- Telepathy (cascade) (PSI)
  - Telempathy
  - Project Emotion
  - Project Thought
  - Willpower Drain
  - Life Detection
  - Shield
  - Probe
  - Assault
- Teleperception (cascade) (PSI)
  - Sense
  - Clairvoyance
  - Clairaudience
- Telephysics (cascade) (PSI)
  - Cryokinesis
  - Pyrokinesis
  - Telekinesis
- Teleportation (PSI)
- Self (cascade) (PSI)
  - Suspended Animation
  - Orientation
  - Psionically Enhanced Strength
  - Psionically Enhanced Constitution
  - Regeneration
- Arcana sub-cluster
  - Computer Empathy (PSI)
  - Psionic Healing (PSI)
  - Prescience (PSI)

make some sort of arrangement—for example, requiring a year or so of service from the character, or 95% of the character's assets. Note that the Institute will not likely make such an arrangement with someone who does not plan to stay on the world. After all, such training of talented persons is their way of creating a body of psionic help they can call upon in times of need.

The Six Psionic Talents: Philosophers of psionic science have identified six areas of talent and learning into which all psionic knowledge fits (although one of the categories consists exclusively of talents which mostly have nothing more to do with each other than that they fit in no other category, indicating that psionics is still not a mature field of science).

The six areas of talent are Telepathy, Teleperception, Self-Awareness, Telephysics, Teleportation, and Arcana. Although there are six possible areas of psionic activity, no one person will usually be capable of activity in all areas. In training, characters will learn those areas in which they have ability or potential and those areas in which they have no talent at all. Each area of talent except Arcana and Teleportation is represented by a cascade skill. As with all cascade skills, knowledge of one specialty in a cascade skill allows some knowledge of all of the other abilities in that cascade. Arcana is not a Psionics skill, but rather a cluster of unusual skills within the Psionics skill cluster. (See the Psionic Skills Cluster table above.)

Roll 2D6 successively for each of the six talents listed in the Psionic Talents table. The indicated roll must be achieved in order to have ability in that area. A DM must be applied to each roll: The rolls may be made in any order, but there is a DM of –1 on the first roll, –2 on the second roll, –3 on the third roll, and so on. A character who is extremely anxious to understand Telepathy should throw for that talent first.

PSIONIC TALENTS

Psionic Talents	*Required Roll*
Telepathy	5+
Teleperception	6+
Telephysics	6+
Self	7+
Teleportation	9+
Arcana	9+

Effects of Training: The training sessions merely acquaint the character with the possibilities of psionic talents and impart a rudimentary control over them. For each of the psionic talents received in training, the player has a level 0 skill in that cascade skill.

For example, Yaj the fledgling psion rolls a (7–1=) 6 for Telepathy, (8–2=) 6 for Teleperception, (4–3=) 1 for Teleportation, (11–4=) 7 for Self, (10–5=) 5 for Telephysics, and (7–6=) 1 for Arcana. This means that Yaj has skill level 0 in each of Telepathy, Teleperception, and Self. Because the skill level is 0, Yaj does not yet have to choose his specialty cascades in these skills, and will not have to do so until the skill level goes from 0 up to 1 (see Experience below).

Training also instructs the character in the methods of concealing their powers and in the dangers of allowing common citizens to know of their power. When training is completed, the Institute is incapable of further assisting characters in their psionic development. From that point, all depends on experience and fortune.

It is possible for a character to have a very high Psionic Strength rating and, nonetheless, turn out very badly in training, discovering that he has few or no specific abilities. It is also possible to discover that a character has a rudimentary talent in a field but a low Psionic Strength which limits the chances of success with the tasks in that field.

Psionic training is not available in the services, nor is it available from any source except the Institute.

Unskilled Psionic Tasks: There are no unskilled default tasks permitted for Psionic tasks. No character may ever attempt a Psionic task without a skill level of at least 0 (in the case of a freshly trained character) in the appropriate skill. Note that a 0 level Psionic cascade skill allows all of the subskills of that cascade to be used at level 0.

Experience

When characters finish their initial training, they have

a basic awareness of their psionic potentials. Before the training, their psionic potential was something within them of which they were at best vaguely aware, and which they had certainly not examined to any useful extent. Psionic training enables characters to perceive these talents and exercise them, allowing them to become stronger. As characters become more familiar with their talents, their skills gradually increase.

Experience and hard work will allow the character to learn how to use greater levels of power. Psionics skill levels can be increased by spending Psionics experience points to buy higher skill levels, using the rules in Rewards and Experience on page 133.

Psionics During Character Generation

The rules on psionic examinations and testing above are for player characters who seek out psionic training after character generation is complete and play has begun. A few rare careers (such as psionic researcher) actually allow the receipt of Psionic skills during character generation. In this case, the psionic examination as discussed above is administered immediately upon entry into the career, at no cost to the character. The character does not undergo the psionic training step, however. Instead, term skills can be taken in Psionic skills as indicated by the appearances of the Psionics skill cluster in the career descriptions. Each receipt of a skill from this cluster allows the player to select a skill from this list.

PSIONIC SKILLS

Psionic skills are treated like any other skill in **Traveller: The New Era**. The controlling attribute for all Psionic skills is, of course, PSI. Most of the Psionic skills—namely Telepathy, Teleperception, Telephysics, and Self—are cascade skills. This means that the selection of one of these skills obligates the player to choose a specialty from that skill's sub-areas. The overall level of the skill then becomes the level at which that specialty is used, but the player can also use any other specialty of the skill at one-half the specialty level. Thus a character who has four skill levels of Teleperception with Clairvoyance as the specialty uses Teleperception (Clairvoyance) at skill level 4, and Teleperception (Sense) and Teleperception (Clairaudience) at skill level 2.

Telepathy

Telepathy is the ability to contact other minds directly. In rudimentary forms, it allows the communication of feelings and emotion; in advanced forms, it allows the transfer of information. The Telepathy skill includes the following cascades:

Telempathy: Success in the Telempathy task allows a character to perceive the mental and emotional state of other other creatures. The exact amount of information gained depends upon the quality of the psionic character's success and the type of creature that is being scanned.

Basic Success reveals the presence and basic emotional state of one creature (person or animal) within a sphere centered on the sensing character and with a radius, in meters, equal to the character's final power level.

Each additional stage of success allows the psionic character to improve that information in one of several ways: (1) The radius of the sphere can be doubled. (2) If dealing with simple animals, reveal the presence of all animals of a single species. (3) An additional intelligent being can be sensed. (4) The level of mental activity sensed in a single target creature can be increased, proceeding from the target's emotional state, to its surface thoughts, to deeper thoughts. (Naturally, some animals do not have deeper thoughts, or even surface thoughts, only instinctive drives that the referee should treat as emotions for purposes of Telempathy.)

For instance, a psionic character who made a Stage Three success might choose to monitor three people's emotional states within the basic radius, or one person's surface thoughts within double the basic radius, or any of several other combinations.

The major hurdle in perceiving another mind in **Traveller** is the problem of separate evolution. It is always easier to perceive the mental patterns of a mind that comes from the same evolutionary origin—in other words, a being that evolved on the same planet. Because such creatures share the same ultimate ancestors, they share basic neurological structures, and hence similar thought processes. The brain of a creature with a completely different biological origin, shaped by different evolutionary processes, will be difficult to understand. It is *alien*. From the standpoint of a human observer, there are levels of alienness. Each of these levels of alienness reduces the stage of success of the task by one level.

Description	*Stages of Success Lost*
Nonintelligent animal	1
Separate evolutionary path	1*
Very alien evolution	2*

*One or the other only, not cumulative

Of the major races, the Hivers and Droyne are considered to have very alien evolution from a human telepath. The Aslan and K'kree are only a separate evolutionary path. And, of course, the Vargr, Zhodani, Vilani, Solomani, and all minor human races are from the same evolutionary path and lose no stages when



attempting Telepathy with each other. (However, human telepaths report that they often feel the need to yell at squirrels soon after having made psionic contact with a Vargr subject.)

Thus, telempathic contact with an Aslan—an intelligent creature from a separate evolutionary path—would cost a human telepath one stage of success. A nonintelligent animal that evolved on Kusyu, the Aslan homeworld, would cost two stages, one for being nonintelligent, and one for its separate evolutionary origin.

Note that the referee may impose additional levels of difficulty based upon specific situations.

Telempathy is also important because it is the basis of several other cascades of Telepathy. Project Emotion, Project Thought, Willpower Drain, and Psionic Healing (under Arcana, below) all require that first a successful Telempathy roll be made in order to establish a telempathic link to allow those skills to be used. The success stage of this task then becomes the upper limit of the success stage of any subsequent task using that psionic link.

For example, a character with a Telepathy asset of 12 (PSI 7 + skill 5) and a primary Telepathy specialty in Project Emotion wishes to attempt Project Emotion on an animal, so must first make a Telempathy roll. His Telempathy skill is at half of his Project Emotion skill, so gives an asset of (7+[5÷2, rounded down to 2]=) 9. The conditions are normal stress, so the task is Average (2 ×Telempathy asset = target number of 18). He rolls a 12, so succeeds at the Telempathy roll, and rolls a 6 on the power level roll, giving a final power level of (7+2+6, with no subtractions as the animal has no Willpower=) 15, for a Stage Two success. Now he attempts the Project Emotion task. The conditions are still normal stress, so difficulty remains Average (2×Project Emotion asset = target number of 24). He rolls a 2, which is sufficient for Outstanding Success. He rolls a 9 on the power level roll, which gives a final power level of (7+5+9, with no subtractions for Willpower=21, which is then doubled for the Outstanding Success =) 42, or a Stage Five success. However, the animal is not intelligent, and evolved on a different planet from the character, which subtracts a total of two stages of success, which results in a Stage Three. Unfortunately, the psionic link's success of Stage Two limits the Project Emotion success to Stage Two as well, so the additional stage of success is wasted.

Project Emotion: Success at the Project Emotion task allows a character to use a psionic link to instill emotions in other creatures. This ability serves well in the handling of animals and beasts of burden, but may also be applied as a psychological weapon against intelligent beings. Sending emotions such as love, hate, fear, and so on may influence other beings.

In order to use this skill, first a psionic link must be established, by using Telempathy. The stage of success of this task then serves as a limiter of success for the Project Emotion attempt. Note that if the target's Willpower rating causes the attempt to fail (lowering the power level to 0), the target will feel the emotion but will recognize it as originating from outside themselves.

Basic Success with this skill means the target must make an Easy test vs. Intelligence to avoid acting the emotion out (running or cowering if frightened, arguing or fighting if angry, etc.). Each stage of success beyond Basic increases the difficulty of the target's Intelligence save by one level.

Project Thought: Like Project Emotion, Project Thought requires a pre-established telempathic psionic link in order to be effective. Only simple thoughts may

be communicated to nonintelligent animals ("climb the tree" or "bite the man," for example). With sentient targets, the amount and quality of information communicated depends upon the success of the psionic character's attempt (which is itself limited to the success stage of the prior telempathic link). Basic Success means that a single, simple sentence may be communicated (as with animals, above). A Stage Two success allows the psion to project a ghostly (transparent, two-dimensional) vision. Stage Three makes this vision opaque and three-dimensional. Stage Four adds auditory hallucination, and Stage Five appeals to all senses. A Stage Six success allows the psionic character to control the target like a puppet.

As with Project Emotion, if the target's Willpower reduces the power level of a Project Thought attempt to 0, the target will recognize the thoughts as originating from someone else.

Life Detection: The most elementary form of Telepathy is the ability to detect the presence of other minds. Life Detection enables a character to sense the presence of other minds, the number of minds present, the general type of minds (animal, human, etc.), and their approximate location.

Basic Success reveals the presence of all other minds within a sphere centered on the sensing character and with a radius, in meters, equal to the character's final power level. Each additional stage of success allows the radius of the sphere to be doubled.

Life Detection is reasonably sophisticated and can "ignore" bacteria or unimportant animals in the area. It functions best in detecting intelligent minds. Psionically shielded minds (whether shielded by the Telepathy sub-skill Shield or by electromechanical psionic shielding) are invisible to Life Detection. If an individual whom the telepath knows is "life detected," he or she will be recognized. This is rolled as an uncertain task: On a result of *some truth*, the character misidentifies some of the detected life forms.

Willpower Drain: Sometimes, in order to succeed at a psionic attack, a character first has to overcome a victim's Willpower. The Willpower Drain task allows a character to do so. It requires an Average opposition test of the attacker's skill level (not asset) minus the target's Psionic Strength, and each stage of success reduces the target's Willpower skill level by 1 point for the duration of the encounter. Once the Willpower skill has been reduced to 0, additional reductions are *not* taken from the target's INT attribute. Often, several successive attacks are required to "soften up" the target sufficiently for other Psionic skills to have a chance of success.

Note that when a character's Willpower skill level is reduced to 0 by Willpower Drain, the character has no Willpower *asset* for the duration of the encounter. Characters (PCs and NPCs) who have been assigned a Willpower skill level of 0 *do* have a Willpower asset (INT+0=INT) so long as they are not hit by a Willpower Drain. Basic Success in a Willpower Drain task is sufficient to invalidate the Willpower asset of a character with skill level 0. (This means that for the purposes of Willpower Drain alone, Willpower skill level 0 and 1 are the same.)

Depending upon the circumstances, the referee may choose to adjust the Willpower Drain's difficulty level upward or downward to account for such things as a wounded defender or attacker, a captive target, etc.

Shield: This is the first skill most psions learn, and is ingrained as a conditioned reflex to attack.

The stage of success of the Shield skill is added to the subject's Willpower for the purposes of resisting psionic mental attacks: assaults, telempathic attacks, and probes (Basic Success adds 1, Stage Two adds 2, etc.). Shield does not work against such things as Pyrokinesis or Cryokinesis (see Telephysics, page 253), as these act on the target's physical body, not its mind. In addition, a psionic with his shield up cannot be detected by Telempathy, Sense, Life Detection, or other mind-scanning forms of psionic detection. Shielded psionics can be detected by Psionic Clairvoyance or Clairaudience just as any other object can.

While using Shield, the psion cannot use any other psionic powers, as it requires concentration to keep the shield up. The exception is that the psion can "transfer" the shield to another person with whom the psion has established a telempathic link, protecting that person, even if that person has no Willpower asset. Once the link is in place, the shield can be erected in the next combat turn, and then transferred in the following turn.

Example: Yaj has a Willpower asset of 10 and Telepathy (Shield) asset of 12. Expecting trouble, he activates his shield, achieving Stage Three success (12+1D10 roll of 7=19) so that any psionic attacks that succeed against him have their power levels lowered by (10+3=) 13 points. Later, Yaj establishes a telempathic link with Captain Kabuki when they both come under psionic attack. As Kabuki was earlier hit by a Willpower Drain, and now has no Willpower asset, he needs help. Yaj raises a new shield, this time with only Stage Two success, and transfers the shield to his captain. With Yaj's shield protecting him, Kabuki now subtracts 2 points from psionic attack power levels.

Probe: The application of great Psionic Strength will enable a telepath to delve deep into the mind of a subject and then to read his or her innermost thoughts. Basic Success allows probe of a character in physical contact with the character attempting the task. Stage Two success allows a successful probe of a character

within one meter. Each additional stage of success doubles the range.

An individual undergoing a mind probe is aware that her mind is being invaded, and she is very uneasy about it. Questioning can be used during a mind probe to force the subject to divulge specific information. The prober can easily determine deliberate untruths told (thought) by the subject. Probe cannot be used against a shielded mind.

If a Catastrophic Failure occurs on this task, apply 2D6 temporary hits to the head of the character undergoing the probe. If these hits exceed one-half of the character's head hit capacity, the character goes into a coma, and any further mind probes are useless. The character will regain consciousness in 1D6 hours, with no permanent damage, but with a bad headache. If the hits equal the hit capacity, the character will only come out of the coma with medical help, and if they exceed the head's hit capacity, the character dies of massive brain hemorrhaging.

Assault: Violence may be dealt by a telepath. Basic Success stuns a target in physical contact with the assaulting character. Stunned characters may not engage in any activity for 1D6 combat turns.

Each additional stage of success allows the psionic character to increase this result in one of several ways: (1) The range of the attack may be increased, the first additional stage increasing it to one meter and each stage thereafter doubling it. (2) An additional person can be assaulted. (3) The level of mental damage can be increased, proceeding from stun to unconsciousness (for 1D6 minutes), unconciousness (for 1D6 hours), coma (for 1D6 days), and death.

Minds that are shielded by artificial (electromagnetic) psionic shields subtract an additional 15 points from the attacker's psionic power level roll when they are targets of Psionic Assault; telepaths may subtract their Telepathy skill, in addition to their Willpower, from the attacker's power level roll when hit by Psionic Assault.

Teleperception

Teleperception is the general talent which allows a person to sense events at some location displaced from the viewer. It is sometimes colloquially referred to as "clairvoyance" or "clairaudience."

Teleperceptive abilities allow eavesdropping as well as spying and detection-free exploration of situations. While telepathic Life Detection will determine the presence of living minds in a closed room, using teleperceptive Sense will determine if a room is occupied or empty. Teleperceptive activity generally cannot be sensed by others (including other psionic individuals).

Most Teleperception tasks have uncertain results. This does not refer to the referee secretly rolling for *no truth*, *some truth*, or *total truth* (although this is appropriate for the Sense task). Rather, this means that the player will not immediately know the power level or stage of success of the task, but must must "push the edge of the envelope" to find out how successful the task was. For example, with Clairvoyance, below, stages of success can be traded for additional range or radius of vision. A character who is interested in seeing something a fair distance away must first see if she can push her "visual footprint" out to the range desired, and once she has reached the desired point, can attempt to expand the radius of that footprint. At any point in this process, she may run out of success stages, and the referee would inform her, "You can't see any farther than that," or "Your vision starts to fade out beyond that point." Furthermore, each step of increasing range or radius of vision (where a step equals the increase in performance allowed by one stage of success) takes at least one combat turn. These steps can take longer at the referee's discretion, especially if the step of increased performance is a particularly large one that would take the character more than a mere five-second combat turn to absorb.

If a Catastrophic Failure occurs on a Teleperception task, the referee might rule that the attempt has been somehow noticed by other psionic individuals.

Clairaudience: This allows the psion to hear things beyond normal hearing distances, even through sound-deadening obstacles. The psion must concentrate and do nothing else while using this power (Exception: A psion can use Clairvoyance [see next entry] in conjunction with this power), and must know the location of the target point he or she wants to hear. The amount of area listened to and the range from the psion at which the listening can be done depends on the level of success. The psion hears an area with a basic radius of his or her Clairaudience asset in meters, at a distance away of his or her Clairaudience asset in meters.

For each stage of success above Basic, the psion may: (1) Use the stage to double the radius. (2) Use the stage to increase the range of Clairaudience by multiplying it by 10 (two stages used in this way multiply the base range by 10×10 or 100, three stages multiply by 10×10×10 or 1000, etc.). Or (3) use a combination of options 1 and 2.

For example, a psion with a Teleperception (Clairaudience) asset of 12, applying every success from a Stage Six success to range, could hear something (Stage Six equals five stages above Basic, for 10^5 times the basic range = 1,200,000 meters) 1200 kilometers away, within a spherical radius of 12 meters. Or, if she wanted to use these in combination, she could take two stages for radius and three for distance to get a radius of (12×2×2=) 48 meters at a distance of (12×10×10×10=) 12,000 meters or 12 kilometers.

The Clairaudience remains in operation at that target point unless and until the psion breaks concentration. This break of concentration can be voluntary or forced by wounds. If the psion suffers damage, he or she must make a Willpower check to maintain concentration. Scratch wounds require an Average test; slight wounds require a Difficult test; and serious wounds require a Formidable test. Critical wounds automatically cause the psion to break concentration.

Clairvoyance: The psion "sees" with his mind's eye a vision of distant occurrences. Nothing can block this power. The psion must concentrate and do nothing else while using Clairvoyance (although Clairaudience [see above] can be used in conjunction with this power), and must know the location of the target point he wants to see. The amount of area seen and the range depend on the success, using the same procedure as described for Clairaudience, above.

Clairvoyance remains in operation at that target point unless and until the psion breaks concentration. It can be broken by wounds, as with Clairaudience above.

Clairaudience and Clairvoyance can be used as one combined operation. If this is done, use the lower of the two assets to test success and determine power levels.

Sense: The Sense ability is a more rudimentary form of Clairvoyance, but is quicker and easier to use. It allows the character to get a general idea of a location that is separated from the character by obstacle or distance.

The character must have a fairly accurate idea of the location (direction and distance) to be sensed, or the task cannot be attempted. Simple line of sight to the area is sufficient for this.

The range of the Sense skill depends upon the stage of success. At Basic Success, the range is equal to the psion's final power level times 10 meters. At Stage Two, it is the asset times 100 (10^2) meters, at Stage Three it is the asset times 1000 (10^3) meters, and so on. Thus, range at Stage Seven is power level times 10,000 kilometers (10,000,000 meters).

A Sense task is performed at one difficulty level lower than usual Psionic tasks (i.e., Easy in a relaxed environment, Average under normal stress, etc.).

However, the character will become aware of only the most rudimentary characteristics of a location when applying this ability. For example, the description should include gross characteristics only, without detail—"a room containing two dogs"—or with strange details that may or may not have any significance—"a room containing two white dogs," "a wood deck with lawn chair, Hiver, and pineapple." On *some truth*, the character may have misinterpreted details (they are not white dogs, but white toy animals; the pineapple is actually a grenade, or only a photograph of a pineapple laying on the lawn chair). Note that any detail mentioned is always present (white dogs are never really black) in some form, just not necessarily the form the psion originally thought.

Telephysics

Telephysics allows the psion to manipulate the kinetic energy in objects without physically touching them. There are three cascade specialties of Telephysics: Telekinesis, Pyrokinesis, and Cryokinesis. The first, Telekinesis, involves manipulating the kinetic energy in an object on the macroscopic level. By psionically adding directed kinetic energy to an object, the psion can cause the object to move by itself. Pyro- and Cryokinesis both function by altering the kinetic energy on a smaller scale. By increasing the average kinetic energy of the particles of an object, the psion can increase its temperature. By decreasing that same kinetic energy, the psion can make it colder.

Telekinesis: Telekinesis allows the psionic movement of objects of various sizes. Each point of power level allows movement of up to 10 kilograms/meters per combat turn. That is, 1 point can move one kilogram 10 meters, or two kilograms five meters, or 10 kilograms one meter. The character conducting the task must maintain concentration and a line of sight to the levitated object the entire time.

Several telekinetic psions may combine their power levels to lift extremely large objects. If one of them loses concentration or line of sight, but there remains sufficient power to levitate the object, it does not fall, but its allowed rate of movement will be reduced.

Thrown weapons can be thrown telekinetically, but only if there is sufficient power to move the weapon completely to the target in one combat turn at a speed of 100 meters per turn (20 meters per second).

Cryokinesis: Cryokinesis is used to lower the temperature of an object.

The range at which this task can be performed is equal to the psion's final power level in meters.

- Basic Success allows the chilling of objects and people: A cup of coffee goes instantly ice-cold, or people become suddenly cold ("Is there a draft in here?").
- Stage Two success allows up to 20 liters of fresh water to be frozen solid, or the severe cooling of human-sized creatures, causing them to shiver uncontrollably. Movement rates are cut in half, and all physical tasks become one level more difficult.
- Stage Three allows up to 60 liters of fresh water to be frozen solid. The cooling of human-sized creatures becomes more severe: Movement rates are quartered; extremities (fingers and toes) become numb; effective AGL is cut in half; all tasks (physical, mental, and

psionic) become one level more difficult; and hypothermia sets in.

•Stage Four allows up to 120 liters of fresh water to be frozen solid. Human-sized creatures must pass an Average test of Constitution, or else fall unconscious from hypothermia. Those who do not fall unconscious have their movement rates reduced to 10%; effective AGL is quartered; and all tasks become two levels more difficult.

•Stage Five success allows up to 240 liters of fresh water to be frozen solid. Human-sized creatures have 1 point of wounds inflicted to every hit location from frostbite. This is not counteracted by heavy clothing. The effects from Stage Four continue, but the roll to avoid unconciousness becomes Difficult.

•Stage Six allows up to 440 liters of fresh water to be frozen solid. All human-sized targets fall unconscious and slip into comas, and will die within five minutes without emergency medical attention.

If the target has allies with Pyrokinesis abilities, they can counteract one level of Cryokinesis effects per level of Pyrokinesis success.

In the case of lower levels of success, once the peak damage level has been reached, additional tums of concentration will cause repeated infliction of the effects.

In both cases, the attacking psion must continue to concentrate on the target and maintain a line of sight for the entire time. If the psion suffers damage, he or she must make a Willpower check to maintain concentration. Scratch wounds require an Average test; slight wounds require a Difficult test; and serious wounds require a Formidable test. Critical wounds automatically cause suspension of the Pyrokinenesis task.

If the task is interrupted or stopped, the target's temperature increases back to normal at one level per five minutes (60 combat turns).

Pyrokinesis: The Pyrokinesis task is used to elevate the temperature of an object and, in cases of extreme success, set it on fire. At any given level of success, the elevation of temperature is greater in smaller objects than in larger ones, due to the greater concentration of psionic energy.

The range at which this task can be performed is equal to the psion's final power level in meters.

•Basic Success will make a human-sized creature feel feverish, or it can bring one liter of water to a boil. Because of the elevation of skin temperature relative to the ambient air temperature, this level of success can also make the target feel a sudden chill.

•Stage Two success brings 20 liters of water to a boil, and will actually cause blistering equivalent to a bad sunburn on the portion of the target's body nearest the psion (an area in square centimeters equal to the psion's Pyrokinesis asset). This also allows the heating of a small object (steering control, handle, or weapon grip) so that it causes blisters on the skin of any creature that touches it.

•Stage Three success ignites volatile fluids or fumes (such as gasoline or hydrogen/oxygen vapor), brings up to 50 liters of water to a boil, and causes heat exhaustion in human-sized creatures, which makes all tasks one level more difficult.

•Stage Four success ignites easily combustible material, such as paper and dry wood shavings, and causes human-sized creatures to suffer heat prostration. This manifests itself as headache, hot, dry skin, delirium, possible unconsciousness (Average: Constitution to avoid), and all tasks are conducted at two levels more difficult.

•Stage Five success will cause blocks of wood and other combustible material to burst into flame, melt substantial pieces of plastic, and cause explosives to detonate. Living creatures suffer heat prostration (as described above) and suffer 1D6 hits to each hit location.

•Stage Six success causes human-sized creatures to burst into flames.

Success levels higher than Basic require one combat turn per stage to progress. That is, a Stage Six success would start as a hot flash or chill, then produce blistering of the skin the next turn, and so on until the target bursts into flames.

In the case of lower levels of success, once the peak damage level has been reached, additional tums of concentration will cause repeated infliction of the effects.

In both cases, the attacking psion must continue to concentrate on the target and maintain a line of sight for the entire time. If the psion suffers damage, he or she must make a Willpower check to maintain concentration. Scratch wounds require an Average test; slight wounds require a Difficult test; and serious wounds require a Formidable test. Critical wounds automatically cause suspension of the Pyrokinenesis task.

If the task is interrupted or stopped, the target's heat decreases to normal at one level of heat per minute (12 combat tums), unless, of course, it has caught on fire.

Self

Self is the psionic talent which allows awareness of and control over one's own body. Cascades of the Self skill are not capable of affecting others and may not be used for healing or enhancing other characters.

Suspended Animation: Personal body activity may be suspended for varying periods of time. Characters may enter a suspended-animation state (similar to cold sleep in a low berth but without the intrinsic danger of death) by willing themselves into it.

While in suspended animation, characters can go

without need for food or water and with minimal air needs. Such a person could effectively travel in a cold sleep berth without actually undergoing cold sleep and its dangers. The length of hibernation depends on stage of success, with each stage allowing one full week of hibernation. Normally, a person requires 168 person-hours of oxygen in a week. While in hibernation, that is reduced by a factor of 100, so that a person in hibernation will only consume 1.68 person-hours of oxygen in a week.

Characters automatically awake at the end of the specified period of time. Suspended animation may also be stopped at any time, provided external stimulus (such as a friend's voice or a mechanical alarm) is given to awaken the sleeper. Time taken for recovery to full alertness varies with the initial stage of success, so that it takes longer to wake up from a longer period of suspended animation. When characters awake, their Initiative numbers are equal to their normal Initiative minus the stage of success of the Suspended Animation roll (treat results of less than 0 as 0). One Initiative level is regained per five minutes until the normal level is reached.

Orientation: While other Self cascades are based on the character's awareness of his or her own bodily interactions in the present, the Orientation cascade reflects the character's awareness of his or her body's interactions with its surroundings over time. Orientation allows the character to become aware of his or her relationship to other locations on the same world. These locations must be ones that the character has actually visited. Locations with which the character is intimately familiar (his or her home) are rolled at the normal difficulty level; locations which are less familiar become gradually more difficult at the referee's discretion.

Success at this task gives the character sufficient information to allow a Sense task to be made for that location.

The character retains this orientation so long as he or she does not move more than a kilometer from the point at which the Orientation task was made.

Psionically Enhanced Constitution: This cascade allows the psion to temporarily increase his or her Constitution attribute.

The amount that the attribute is raised is equivalent to the stage of success, where Basic Success equals +1, Stage Two equals +2, etc. Under no circumstances may the number of Constitution points gained exceed the character's Psionic Strength attribute, and Constitution may never be increased beyond 15.

This CON increase does not change the assets of a character's Constitution-based skills; these assets remain at the level of the permanent CON. This CON increase also does not allow the character to recompute hit points based on the higher level.

The CON increase is used for normal pure Constitution-related tasks, such as rolls to avoid unconciousness when wounded, and also allows the character to recompute his or her load-carrying capability for the period of effect.

Psionically enhanced Constitution reaches its new level immediately, and remains at that peak for 60 minutes. After that time, it declines at the rate of 1 Constitution point per minute until *1 less* than the normal Constitution level is reached. This Constitution point is regained after eight hours of rest. If the Psionically Enhanced Constitution task is used more than once in 24 hours, the second such attempt ends with Constitution at *2 less*, the third such at *3 less*, and so on. A psion can kill him or herself by attempting enough of these tasks in one day that the attribute ends at 0. Each point is regained after eight hours of rest, assuming the final level was not reduced to 0.

Psionically Enhanced Strength: This cascade allows the psion to temporarily increase his or her Strength attribute.

The amount that the attribute is raised is equivalent to the stage of success, where Basic Success equals +1, Stage Two equals +2, etc. In no case may the number of Strength points gained exceed the character's Psionic Strength attribute, and Strength may never be increased beyond 15.

This STR increase does not change the assets of a character's Strength-based skills; these assets remain at the level of the permanent STR. This STR increase also does not allow the character to recompute hit points based on the higher level.

This STR increase *is* used for normal pure Strength-related tasks (lifting objects), and also allows the character to recompute his or her load-carrying capability and throw range for the period of effect.

Psionically enhanced Strength reaches its new level immediately, and remains at that peak for 60 minutes. After that time, it declines at the rate of 1 Strength point per minute until *1 less* than the normal Strength level is reached. This Strength point is regained after eight hours of rest. If the Psionically Enhanced Strength task is used more than once in 24 hours, the second such attempt ends with Strength at *2 less*, the third such at *3 less*, and so on. A psion can kill him or herself by attempting enough of these tasks in one day that the attribute ends at 0. Each point is regained after eight hours of rest, assuming the final level was not reduced to 0.

Regeneration: This allows psions to rapidly heal their own wounds and injuries. Because the Self cascade only gives psions mastery over their own biological processes, this healing cannot be used on other characters.



Regeneration rapidly heals bodily wounds, infection, or poison effects by accelerating the natural healing process (this cannot cure cancer and similar illnesses, as these draw their strength from a misdirected aspect of that same healing process, nor can Regeneration reduce or reverse the effects of aging). Each stage of success does one of three things: (1) eliminates infection in any one body part; (2) eliminates 1D6 worth of poison damage from any one body part; or (3) cuts the normal healing time of any one wound in half (two stages spent on one wound quarters its healing time, three stages reduces it to 1/8 healing time) to a minimum time of one hour—see the Healing section of the "Combat" chapter, page 289, for normal healing rates. Regeneration may only be used one time for each injured body area.

Note that even though characters rolling a Regeneration task are willing themselves to be healed, they still must subtract their own Willpower assets when calculating power levels. This is because Willpower represents a character's innate, instinctive resistance to being psionically manipulated, and is not a defense that is raised and lowered at will.

Teleportation

Teleportation is a talent which allows instantaneous movement from one point to another point without regard to intervening matter. Psionic teleportation is limited to the movement of the teleported character's body and (for highly skilled teleports) his clothing and weapons.

Teleportation always involves the movement of one's body to another location. Independent items or other individuals may not be moved. A small animal could conceivably be carried as part of a personal load under the task to teleport one's self with equipment.

Teleportation involves certain requirements in order to be completely accurate, as well as to ensure obedience of the laws of physics.

Foreknowledge of Destination: A character must always have a mental image of the destination before teleporting. This image is acquired by personally visiting the location first (including just viewing it from a distance), having the mental image implanted in one's mind (by Telempathy) by another person who has visited the destination, or by viewing the location through Clairvoyance (not *Sense*). The referee may allow a character to teleport to a location that is very well-known to that character following a successful Orientation task.

Energy and Momentum: Teleportation involves serious restrictions on movement in order to assure the conservation of energy and momentum.

On planetary surfaces, teleportation is restricted to jumps of 500 kilometers or less.

Jumps at ranges of five kilometers or more involve disorientation for a period lasting 2D6×10 seconds. Jumps at ranges of 500 meters or more are hazardous; the character is likely to stumble or fall upon arrival (Difficult: Agility to avoid). The character should demonstrate to the referee the specific effects to be expected and then how he will go about avoiding these effects before he attempts to make any jumps at ranges greater than five kilometers. This restriction results from the law of conservation of momentum. On a rotating planet, two locations will have different rotational speeds and directions. A jump from a point on Terra's equator to its antipode (the point directly opposite the original point on Terra's surface) would result in a total velocity difference between the character and his surroundings of over 3300 kilometers per hour.

Changes in altitude (actually all movement to locations of differing gravitational potential) will result in potential energy changes manifesting themselves as changes in body temperature.

A jump of one kilometer straight down will result in a temperature increase of 2.5° Celsius; this is sufficient to cause extreme fever, brain damage, and even death. A jump up will cool the body by the same amount with equally serious results.

To be safe, a jump may not involve an elevation change of more than 400 meters, and multiple jumps should not involve a cumulative elevation change of more than 600 meters in one hour. These problems may be avoided through the use of technological devices: energy compensators, heat suits, and other means. Characters may feel driven to invent such materials, commission their invention, or seek them out from those who already have them.

Basic Success from a Teleportation task allows teleportation of the character, unclothed, for a distance of five meters. Each additional level of success improves the result either by increasing range or increasing the amount of material teleported with the character.

Each stage of success used to increase range multiplies the basic range by 10. That is, a Stage Two success allows teleportation of (5×10=) 50 meters, Stage Three success (5×10×10=) 500 meters, Stage Four success (5×10×10×10=) 5000 meters, and so on.

One additional level of success used to transport material allows teleportation of the character in light clothing. One more level of success allows teleportation with equipment, although no more equipment can be teleported than could normally be worn or carried.

Arcana

Although psionic activity generally lends itself to classification, some talents defy this very classification. Individuals with special talent are capable of some activity which does not fit into the categories above, or which is not described in this book; this latter type of talent is dispensed by the referee after deliberation.

Although unusual and difficult to classify in the above scheme, the following arcane skills have been demonstrated in the former Imperium and surrounding areas.

Computer Empathy: With the Computer Empathy skill, a character can sense the flow of data within a computer or computer network. This allows the character to react more quickly and smoothly to changes in the data flow, making Computer tasks easier. The character must be physically touching a computer (whether keyboard, screen, or processor) in order to initiate the task. When the character makes a test of this skill, psionic power level determines how much the Computer skill is enhanced.

Basic Success means the character can sense the interior workings of the single computer that is being touched, revealing any interior damage or any problem areas in its electronic flow. Stage Two success allows the character to psionically "read" any data the computer is accessing, which lowers by one level the difficulty rating of all Computer tests the character is doing (one can even "read" the computer without looking at the screen). Stage Three allows the character to sense the interior workings of any one computer to which his or her own is connected (by data link), or to "read" all data stored within the computer being touched, even data that is not presently being accessed. A Stage Four success means the character can "read" any data being accessed by a computer that is in communication with the one being touched. Stage Five allows the character to psionically "read" data stored within that distant computer. Stage Six means the character can perform Computer tasks at two levels of difficulty lower than normal (Difficult becomes Easy, for instance).

When dealing with self-aware computers (especially those infected by Virus), this talent is used the same as Telempathy is with an organic sentient being, but the referee will need to assign an effective INT attribute and Willpower skill level to the AI system. When dealing with Virus, Basic Success is enough to determine whether the computer is infected (although the referee may rule that certain infections are so good at hiding themselves that higher stages of success are required to detect them). Stage Six success or better is required to psionically "read" data from a computer inhabited by a noncooperative strain of Virus.

Psionic Healing: Unlike Regeneration above, Psionic Healing allows characters to improve the healing rate for wounds which they *or other* characters may have taken. Basic Success lowers a wound's healing time by one day, and each additional stage of success further

lowers that time by another day (to a minimum time of one hour).

To heal oneself, a psionic healer need merely make a task roll against the Psionic Healing skill. In order to heal another character, the psion must first establish a psionic link by use of a Telempathy task. The stage of success of this Telempathy task then becomes the maximum success stage that can be used in the following Psionic Healing test.

For example, suppose that Grayson, who has PSI 6 Telepathy (Telempathy) 6, and Psionic Healing 5, is trying to treat three wounds on Winfield Jackson, who has an INT of 6 and Willpower of 4. The surroundings are normal stress (combat is over, but the situation is still distracting), so all Psionic tasks are Difficult. Grayson succeeds at his Telempathy task (target number 12, rolls an 8), and rolls a 9 on 1D10 for a final power level of (6+6+9–6–4=)11, a Stage Two success. On his first Psionic Healing test, he succeeds and rolls a 9 on 1D10, just barely scoring a Stage Two success (6+5+9–6–4=10). Rolling for the second wound, he fails the skill test, but not Catastrophically (target number 11, rolls 13). For the final wound, he scores an Outstanding Success (target number 11, rolls 1), followed by a roll of 9 on 1D10, for a Stage Three success (6+5+9–6–4=10, 10×2=20). The first wound's time improves by two days (one day for Basic Success, plus one day for the additional success level). The second does not improve at all, because he failed his Psionic Healing roll. The third also improves by two days, despite the Outstanding Success at healing, because the success is limited by the Stage Two success scored for the telempathic link.

Note that only one Psionic Healing test can be performed for each wound, whether or not it was ultimately successful.

Prescience: Characters with the Prescience skill are prone to receiving impressions of events before these events actually take place. Sometimes this precognition happens days before the events occur. Other times, it is merely a second's worth of warning. Sometimes, the prescience manifests itself as a dream. At others, it comes as a waking hunch. Sometimes the warning is terribly vague. At others, it is crystal clear. The exact results are left to the referee's discretion, based upon story situation and quality of the Prescience power level rolled.

Psi-Drugs

Pharmaceutical means are available to enhance a character's Psionic Strength on a temporary basis. These drugs are as follows:

Booster: The basic psi-drug, booster is available in small one-dose pills. Booster temporarily increases an individual's Psionic Strength by +2. Additional doses of booster have no effect if taken by a character within an hour. The drug-induced additional Psionic Strength will wane and disappear at the end of one hour.

Double: A more potent form of the drug, also available in small one-dose pills. Otherwise identical to booster, double increases Psionic Strength by +4.

Special: The rarest of psi-drugs, special is available only in liquid form and must be taken by injection. Special gradually increases Psionic Strength to 15, at the rate of 1 point per hour. Psionic Strength remains at this level for four hours, and then wanes at the rate of 1 point per hour until Psionic Strength reaches a temporary level of 0. The points then return at the rate of 1 per hour until the character's permanent level is reached, so long as no psionic activity is performed during this recovery period.

Special has some dangers. Roll 2D6 each time it is used. On a roll of 11+, permanently reduce Psionic Strength by 1.

Availability: Because of the anti-psionic history in the areas of the former Imperium, psi-drugs are expensive and are extremely difficult to obtain. Psi-drugs must nearly always be located and bargained for by a character; they are not found in normal trade channels.

Locating a psi-drug dealer in the Wilds is an Impossible test of Streetwise. Most dealers will have only booster; roll 1D6 for the number of doses of booster that are available with a base price of Cr1000. Double will be available on a roll of 10+; roll 1D6–2 for the number of doses of double that are available with a base price of Cr4000. Special will be available on a roll of 12+ on 2D6; roll 1D6–4 for the number of doses available with a base price of Cr10,000. Prices may be higher but will not be lower.

If a Catastrophic Failure occurs, the character has talked to the wrong individual and will be turned over to the police or an angry mob.

Locating a psi-drug dealer in the Regency is only a Formidable test of Streetwise, but psi-drug use is frowned upon by the Regency's Psionic Institutes. Catastrophic Failure indicates that the character is turned in to his Psionic Institute for disciplinary action for abusing his gift.

Pitfalls: The abuse of psi-drugs can lead to the loss of psionic powers and to physical debilitation. If a character takes three doses in three days, there is a chance that a drug overdose will take place within six hours of the last dose; avoiding an overdose is Average: INT. If a failure occurs the character has overdosed and becomes seriously ill, lapsing into unconsciousness and taking 1D6 wounds to the head. Upon recovery from the wounds, make a Difficult: Psionic Strength roll. On a Catastrophic Failure, the character's Psionic Strength rating is permanently reduced by 1.

Robots

Robots are a special class of NPC, capable of certain preprogrammed actions and responses to external stimuli. They are not self-aware, although the more sophisticated ones can simulate self-awareness pretty well. Characters in **Traveller** will most commonly encounter two classes of robot: drudgebots and guardbots. We have provided a sample of each on page 262.

Drudgebots: Drudgebots are worker machines designed to replace humans at boring, dangerous or repetitive tasks. Some are immobile, and work on factory assembly lines. A few are multifunctional and completely mobile. Referees should make use of drudgebots to add interest to the game background.

Guardbots: These are robots specially designed to perform security functions. There are several varieties, varying in cost, sophistication, armament, and armor. We have listed a few of the more common versions in the equipment list. These are covered in considerable detail, because characters will often come into conflict with them.

Running Robots

Referees should treat most robots as equipment. A manufacturing robot that is bolted to the floor is no more interesting to the characters than a drill press or a milling machine. Other robots are capable of movement (cleaning robots, butler robots, etc.), and may be (or at least seem) very intelligent, but their interactions will not normally be important to the action of the game. (It is possible that one of these may have been specially modified by some nefarious NPC, however, and may not be completely what it seems.)

Some robots, however, must be treated as a special form of NPC, capable of a limited range of actions and able to simulate intelligent thought (in the same way that a good computer game can often seem alive). The robot's description in the equipment list will help the referee to get a handle on what each type of robot is capable of and provide clues on how to play it. Some robots are given skill ratings representing their specific programming or special equipment. Robots are unable to improvise outside the parameters of their programming, and are limited to a stimulus-response chain of action. Robots, in other words, are reactive rather than active. A point to bear in mind is that most robots are capable of sending a short-range radio message in response to a set situation: summoning reinforcements, notifying a central headquarters of the presence of intruders, etc.

COMBAT

For the purposes of combat, robots are divided into two broad categories: vehicular robots and nonvehicular robots. The particular category into which a given robot falls is defined in the equipment descriptions. The normal combat rules apply to human-robot and robot-robot fire combat, except as noted below. Melee combat can only be carried out with nonvehicular robots. Nonvehicular robots are assigned attribute numbers to enable their use in melee combat.

Weapons: The weapons installed in robots are identical in performance to those used by the characters, except that the magazine capacities are often larger. Ratings for weapons are included with the individual robot entries.

Melee Combat

Vehicular robots may not engage in melee combat. Nonvehicular robots use the normal melee combat rules, with the following exceptions.

Unarmed Combat: Robots may make strike attacks, escape attempts, or grapple attacks; they may not make diving blows. Unarmed attacks by robots are resolved normally, but the robot uses its Agility rating in place of Unarmed Martial Arts skill.

Armed Combat: Only robots which have built-in melee weapons may make armed melee attacks, and do so with the characteristic of the weapon. A robot with more than one melee weapon can attack with each of them in each turn in which it attacks, unless specifically prohibited by the robot description.

Melee Ratings: Referees may find it necessary to devise their own ratings for reprogrammed drudgebots or the like. For melee combat, robots must have the following ratings:

Agility: This is their chance of connecting with a blow or a grapple attempt and is a measure of the speed and agility of their striking/cutting appendages.

Unarmed Combat Damage: This is the number of hit points inflicted by a simple blow from an arm or other appendage.

Melee Weapon: Not all robots have melee weapons, but those with drills, screwdrivers, cutting saws, welding torches, and so forth do. If they have multiple tools like this, they may have several weapon listings. If the robot cannot use more than one at a time, it should be specifically noted, as the rules say they can attack with each weapon each combat turn unless specifically prohibited in the robot description.

The only function of this weapon name is to enable players to visualize the type of attack. Its game effects are defined by the following three characteristics:

Range: Either short or long. Long covers things on the end of long servo arms, while short covers things mounted close to the torso.

Hit Modifier: Some weapons are clumsier than others, while others have a real advantage. Hit modifiers can be –1, –2, +1, and +2.

Damage: This is the amount of damage the weapon does if it hits. This should be phrased as 1D6 plus or minus 1 or 2, depending. (Melee weapons average about 1D6 damage.)

Fire Combat

Fire combat against nonvehicular robots is carried out according to the conventional fire combat rules beginning on page 272. Fire combat against vehicular robots is carried according to the vehicle combat rules beginning on page 291. To-hit procedures are identical in all cases; battle damage differs, as noted below.

Battle Damage (Nonvehicular Robots)

Nonvehicular robots sustain damage as if they were people or animals. The robot's description will state which column on the Personal Hit Location chart (page 269) is to be used for that robot.

The specific results for robots are:

Head: This represents the electronic center of the robot, and contains sensor systems and the robot's CPU or brain. Slight damage has no effect, serious damage means one sensor system is out of action. Critical damage means the robot's CPU is damaged and the robot is "dead."

Right/Left Arm: Robots with a number of arms other than two require some common sense on the part of the referee. If a robot has only one arm, the right/left designation is unneeded. If a robot has more then two arms, the referee should distribute hits among the arms at random regardless of whether a right or left hit was rolled. Slight damage has no effect (although when moved, the arm may begin to smoke or make grinding noises at the referee's option); serious damage means the arm loses the use of any tools or attached weapons; and critical damage means the arm has been blown off.

Chest: The chest on a robot is where weapons and ammo are kept. Slight damage means one weapon (chosen randomly if more than one is present) becomes inoperative for the remainder of the tum. If no weapons are present, the damage has no effect. Serious damage means a weapon (chosen randomly if more than one is present) is put out of action permanently (if no weapon is present, it represents damage to the fuel or batteries in the abdomen, and the robot's speed is halved). Critical damage means that an ammunition explosion has occurred, and the robot is rendered inoperative (dead).

Abdomen: This represents the power plant of a robot. Slight damage means the robot begins to smoke or make grinding noises (but otherwise there is no effect). Serious damage means the robot is reduced to half speed. Critical damage means the fuel has exploded or the batteries have been hit (drenching the insides of the robot with acid), in either case rendering the robot inoperative.

Right/Left Leg: Legs can either mean a literal leg or another means of propulsion such as a track unit or wheel. As in the case of arms, robots may have a number of legs other than two or four, and leg hits should be distributed at random. Slight damage to a leg/track/wheel has no effect (although again, at the referee's option, smoke and grinding noises may occur). Serious damage reduces the speed by half (per leg), critical damage means the leg is unusable. When 50 percent or more of a robot's legs are unusable, it is immobilized (although all other systems may be operational).

Battle Damage (Vehicular Robots)

With the exception of different specific results, the damage implementation system is the same as that used in conventional vehicle combat. The specific results for robots are as follows:

Crewmember/Passenger: If as a result of a hull hit, this represents damage to the robot's CPU (central processing unit, its "brain"). Minor damage means that each task the robot attempts to perform (firing one of its weapons, sending a message for help, etc.) becomes two levels more difficult. Major damage puts the robot out of action—killing it, in other words. If the result is a turret hit, this represents damage to one of the robot's sensor systems, picked at random by the referee. Any damage whatsoever puts this system out of action (the type of damage is significant only when repairs are attempted).

Radio: This represents damage to a robot's communications equipment. This means the robot falls back on its default programming, and can no longer receive instructions or communications from elsewhere.

Engine: This represents damage to the robot's power plant (either electrical or internal combustion). Minor damage means that the robot can only move at half normal speed, and that it cannot move and fire at the same time. Major damage means that the robot may not move, and can only fire one weapon at a time.

Weapon: One weapon system is destroyed. If no weapon is present in the location damaged, the hit becomes an ammunition hit. If no ammunition is present in the location damaged, the hit has no effect.

Fuel: This represents damage to the robot's power source, either the fuel tank or its rechargeable batteries. Fuel hits are adjudicated as in conventional vehicle combat. Battery hits result in the immobilization of the robot.

Ammo: Ammo hits are adjudicated as in conventional vehicle combat.

Burn Damage

Burn damage against nonvehicular robots is halved, to reflect the fact that machines are harder to damage by heat than people. Being on fire completely destroys IR sensors, however.

Robots in the New Era

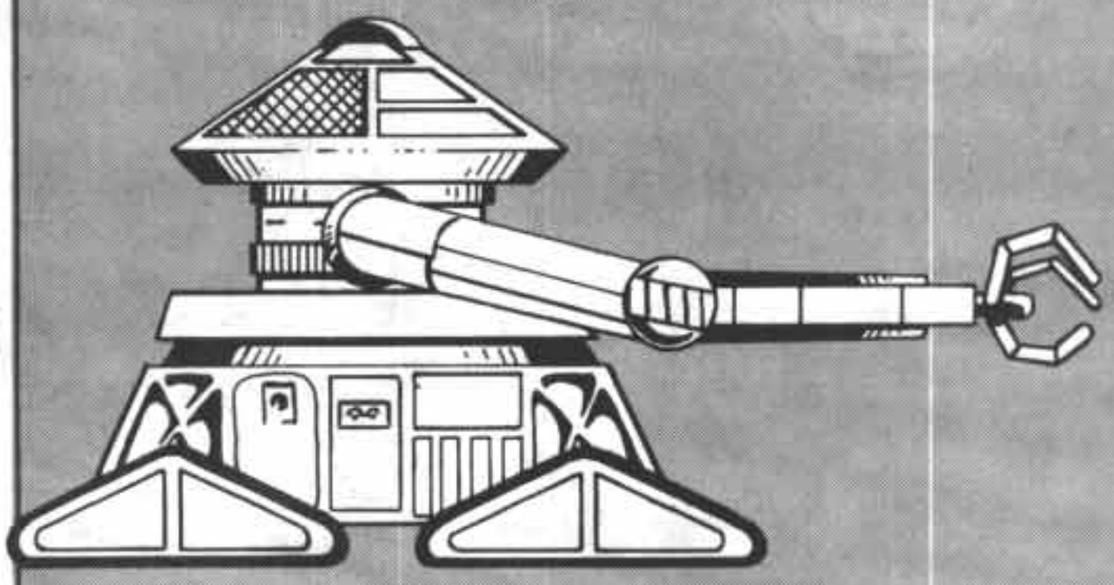
Although there are virtually no robot-production facilities still operational outside of the Spinward States, a substantial number of robots of Imperial manufacture have survived. All of these robots were originally made to carry out a specific function: heavy manual labor, repetitive actions in the manufacturing process, security, agricultural work, transportation, and even personal service. Aside from their original purpose, however, robots can be divided into two critically important groups: dull and aware.

"Dullbots" are those which are still operating under their original design parameters. They are not self-aware and simply follow pre-programed behavior patterns. Sometimes these programs—called expert systems—are quite sophisticated and can provide a fair imitation of a self-aware being. But that is all that it is—an imitation. The robot is nothing more than a machine.

Aware robots are those which have become infected with Virus and which have sufficient internal memory to become self-aware. Robots with insufficient memory simply cease operation upon infection, as do many more advanced models. A significant proportion, however, develop self-awareness and manage to psychologically adjust to it sufficiently to continue to function.

Aware robots provide terrific opportunities to add a bizarre element to your campaign, because all of these beings are, to a greater or lesser degree, mad. A number of typical personality disorders or delusions experienced by aware robots are discussed on page 98, but these are by no means all of the options available. Sometimes aware robots will pretend to be dullbots, and in the case of expert system robots it is very hard to tell the difference. At other times, they will be open concerning their sentience. In any case, it is important for the referee to play these nonplayer characters with imagination and care.





GSBAG-1000

This low, broad, nonvehicular robot is mounted on four treads. The top is a small turret-like structure containing a smoke detector, electronic motion sensor, siren, flashers, a spotlight, a small loudspeaker, and two heavy-duty cargo-loading arms.

The robot was usually programmed to off-load or move heavy goods from one area to another and was very popular in warehousing operations and starports. It also had a limited security ability. It is intended for indoor work, or paved areas such as parking lots where it doesn't have to cross rough terrain.

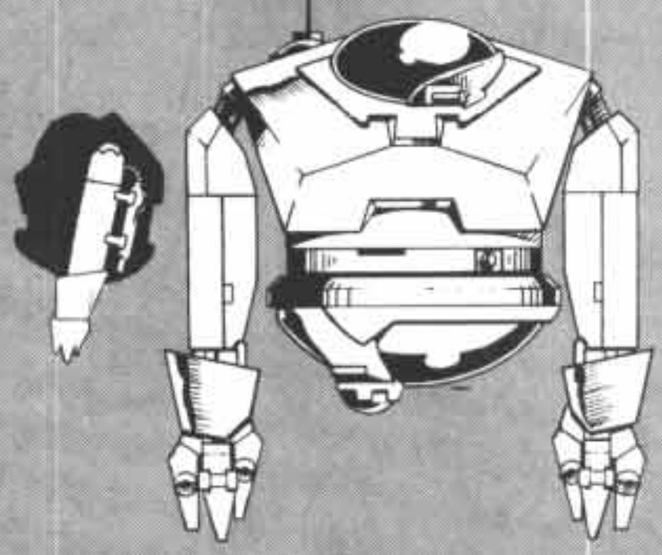
It uses the Biped column on the Personal Hit Location chart (page 269).

Com Move: 15/6
Fuel Cap: 12
Fuel Cons: 6

Armor Values:
Head: 1
Chest/Abdomen: 2
Arms/Legs: 1

Melee Weapons: 2 arms
Initiative: 2
Agility: 2
Strength: 8
Constitution: 6
Assets: Observation 12
Armament: Paint pellet gun
Sensors: IR motion detector, pattern recognition software (video only)
Armor: 1
Wt: 110 kg
Price: Cr500,000
Fuel Type: Hydrocarbon
Mnt: 1

Damage Record
Sight/Sensors: IR Motion Detector ☐ Video Camera ☐
Radio: ☐
Power Plant: ☐
Fuel (% Consumed or Destroyed): ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐ Immobilized ☐



LSP PR-317

The Ling Standard Products PR (Police Robot) Model 317 was a widespread security robot in Diaspora Sector before the Collapse. It had a fairly sophisticated artificial brain and weaponry which allowed a graduated response to a variety of security situations. It resembles a 1.5-meter-tall clam with two manipulative arms to restrain tranqed suspects and a small weapon mount attached to each side under the arm.

This is a gravity-suspended robot which relies on small ducted fans for maneuverability. It has several magnetic arms which can extend from the chassis to grip walls and secure the robot's position. (The ducted fans do not have enough power to overcome an average human's strength.)

This robot is powered by internal batteries which require recharging approximately every four days.

The PR-317 uses the Biped column of the Personal Hit Location chart (page 269), but disregards Leg hits.

Com Move: 30/18
Endurance: 100 hours

Armor Values:
Head: 4
Chest/Abdomen: 6
Arms: 4

Initiative: 6
Agility: 4
Strength: 14
Constitution: 10
Assets: Observation 15, Slug Weapon (Slug Pistol) 13, Energy Weapon (Energy Rifle) 13, Armed Martial Arts 13, Unarmed Martial Arts 13
Armament: Chemical projector, paint pellet gun, tranq dart gun, integral 9mm Tranq-8
Sensors: IR motion detector, voice/pattern recognition software (audio/video, UV included), ultrasonic and subsonic sound detectors, white light spotlight, IR/UV spotlight, ultrasonic motion detector
Price: Cr1,750,000
Fuel Type: Electricity
Veh. Wt: 240 kg
Mnt: 1

Weapon Data

Weapon	*ROF*	*Dam*	*Pen*	*Bulk*	*Magazine*	*Short Rng*
10mm Tranq-8	SA	–1*	Nil	1	14	4

*See tranq effects, page 350.

Weapon	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Rng*
Laser Rifle-9 (8cm)	SA2	7-4-2-1	Nil	4	50	160

Damage Record
Sight/Vision: Motion Detectors ☐ Sound Detectors ☐ Spotlights ☐
Radio: ☐
Laser Rifle: ☐
Paint Pellet Gun: ☐
Tranq Dart Gun: ☐
Traverse: ☐
Engine: ☐
Batteries (% Consumed or Destroyed): ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐ Immobilized ☐

COMBAT

Combat in **Traveller** is of two types: planetary and space. Planetary combat consists primarily of ground combat, although it also includes aerial combat that takes place over the battlefield. Space combat takes place outside of the atmosphere, typically the area within a few hundred thousand kilometers of a world or other point of value.

Planetary and space combat are handled in very similar manners. This is because they are both based on **Traveller**'s core task resolution system. All fire at a target, whether with a pistol at a range of 50 meters, or a laser bay at a range of 300,000 kilometers, is resolved by a task roll using a character's combat skill. Other combat-related actions as well, such as damage control, obtaining sensor locks, and even recovering from stun results, are also handled with task rolls. This means that every military unit or starship is critically dependent upon the quality of its personnel. While a weapon's performance characteristics are certainly important, the success with which it can be handled has everything to do with the attributes and skill levels of the character using it.

The combat chapter begins with personal combat between individual characters. Then, building on these concepts, more detailed topics such as indirect fire, and vehicles are added. Rules for specialties such as chemical warfare and combat engineering round out combat on the planetary surface. Moving out into space, players and referees will find many familiar concepts in space combat, as fire resolution and damage implementation are handled with the same system, although these take place over much greater distances and with much more destructive power. The space combat system is unique in that it uses realistic vector movement as its central mechanic, but is abstracted so that it can be played without a map, and deals with the pure relationship between two maneuvering platforms in space.



PLANETARY COMBAT

From time to time, characters will find themselves in situations where violence (combat) is the only way out. Combat is divided into two broad arenas: planetary, or ground combat, and space combat. Note that the arena of planetary combat includes watercraft and aircraft. Although these are not really on the ground, remember that **Traveller** represents a starfaring culture. From the point of view of people who do most of their travelling across billions of kilometers of space, anything that takes place within a planet's atmosphere is ground combat. Air, water, land, is all quibbling detail. To a spacer, it's all "dirtside."

Planetary combat is further divided into personal combat and vehicle combat. Discussed first are the basic concepts of planetary combat, such as movement and the conduct of personal combat. Vehicle Combat, beginning on page 291, then adds the use of vehicles. Planetary combat will generally be referred to as simply *combat*, while space combat will always be referred to specifically as *space combat*.

Combat is resolved in a series of *combat turns*. Within each combat turn, characters may conduct one (or sometimes more than one) discrete action. These actions include movement, certain maintenance tasks, and of course, attacks. Many of these actions, especially the attacks, require task rolls.

This division of the Combat chapter is divided into the following sections: Basic Concepts, Combat Resolution, Effects of Fire and Combat, Wound Effects and Healing, Vehicle Combat, Other Combat-Related Issues, and Environment.

Basic Concepts

THE COMBAT TURN

Each combat turn is five seconds long. At least one action may be performed by a player in a combat turn, and each action is completed in one combat turn. Some characters with higher Initiative ratings may be able to perform more than one action in a combat turn.

An action is a precisely defined activity as listed below.

INITIATIVE

The number and order of actions that a character may conduct in a turn are determined by the character's Initiative number. This number usually ranges from 1 to 5, but this limit can be exceeded by player characters with large amounts of experience. The Initiative number can also be temporarily reduced in the course of combat as a result of panic or wounds. Player character Initiative is determined as described in Character Generation (page 35). NPC Initiative depends on how the NPCs are generated. A detailed NPC as created by the referee using the character generation rules receives Initiative according to the character generation rules. Simplified, or template, NPCs have Initiative according to their described experience level. This is in the table at right.

TEMPLATE NPC INITIATIVE

NPC Type	*Initiative*
Elite	5
Veteran	4
Experienced	3
Novice	1

Burden Effects on Initiative: The amount of weight carried by characters may affect their current initiative. Characters carrying their normal load (see "Load," page 35) or less are not affected, but those who are carrying between one and two times their normal load are *burdened*, and have their initiative reduced by 1 (to a minimum of 1) for as long as they are carrying that load. Characters carrying between two and four times their normal load have their initiatives reduced to 1 for as long as they are carrying that load.

Load includes the weight of armor worn by a character, plus the weight of equipment carried in backpacks or on belts, etc., and the weight of equipment or weapons carried in the hands.

Wound Effects on Initiative: A character's Initiative is reduced by 1 when slightly wounded, by 3 (total) when seriously wounded, and by 5 (total) when critically wounded. A character whose Initiative level is reduced to 0 or lower may not act at all. (See the Wound Effects and Healing section, page 288, for more information.) The Initiative as adjusted by wounds is called the current Initiative, as opposed to the character's permanent Initiative when fully healthy.

Wounds have other effects on conducting actions. Scratch wounds, knockdowns, and stun results can deprive characters of a turn's action, although they do not change their Initiative numbers. Again, see page 288 for exact details.

Panic Effects on Initiative: Panic has no effect on a character's Initiative number *per se*, but characters who have panicked lose their actions for the duration of the panic effect. See "Involuntary Actions," page 268, for details.

Sequence of Actions: Actions in each turn are conducted in order based on Initiative number. The characters with the highest current Initiative number go first, followed by the next highest Initiative, then the next, and so on. Each set of actions grouped by Initiative number is called a *step*. Thus, there is the Initiative 5 step where all characters with current Initiative of 5 may act, followed by the Initiative 4 step, and so on.

The referee moderates this flow of actions by calling out Initiative steps in order (highest to lowest). When a player's current Initiative number is called, the player will tell the referee the action he or she is conducting (as in "firing at the soldiers behind the wall"). The referee will announce the actions for any NPCs acting at that

point, provided they are detectable to the PCs. The referee then resolves all combats and calls the next Initiative step.

It is likely that not every step will be used each turn. Before beginning play, the referee should establish the range of Initiative numbers present in the group so that the group can be aware of which Initiative steps would be empty and can be skipped. Some referees organize their sessions by having their players sit around the table in order of Initiative, so that the sequence of actions proceeds around the table. However, the effects of wounds will change not only the order of certain characters' actions, but also the Initiative steps that are used.

For example, a group with Initiative numbers of 7, 5, 3, and 2 would skip Initiative steps 6 and 4, as there is no one to act in those steps. However, if the character with Initiative 5 takes a slight wound (reducing him or her to Initiative 4), now steps 6 and 5 are skipped, and 4 is used. If the Initiative 7 character is seriously wounded (reduced to Initiative 4), each combat turn now begins with step 4, as there are no longer any Initiative numbers above that level.

When every character has acted, the turn is over and a new turn begins.

High Initiative Characters: Characters may achieve Initiative levels higher than 5. Any character with a current Initiative higher than 5 receives an extra action each turn. This action is conducted in the Initiative step equal to one-half of the character's Initiative number (rounding fractions down).

For example, a character with an Initiative of 7 would conduct one action when the referee called out "7" and one when the referee called out "3." Once such characters receive wounds to reduce their current Initiative to 5 or lower, they lose this second action. In the example of our Initiative 7 character, a slight wound (minus 1 to Initiative) would still allow two actions: one at 6 and one at 3. However, a serious wound (minus 3 to Initiative) reduces the character to only one action per combat turn, at step 4. If the character took this wound during step 6 or 5, he would lose his second act immediately, and would not get his second act that turn.

Resolving Ties: If two characters are conducting actions at the same time which may interfere with each other (such as firing at each other), the character with the highest Agility goes first. However, for purposes of this determination, subtract the bulk rating of the character's weapon from his or her Agility. If there is still a tie, roll a die, with the high die roll going first.

Interrupting Initiative Sequence: There are two sorts of circumstances which allow characters to act out of their Initiative sequence:

Opportunity Fire: Opportunity fire indicates that a character is aiming in a specified direction or at a specific area, and that if an enemy character passes through his or her line of sight, he or she may immediately fire on the enemy. This is resolved as if it happened simultaneously with the enemy movement. Thus, a character may fire opportunity fire in a turn during an Initiative step in which he or she would normally not be able to act. However, executing this opportunity fire does use up the character's action for the turn. High Initiative characters who have two actions may use their second action only if the opportunity fire was resolved before the step when the second action would normally be conducted.

A player may only conduct opportunity fire once during a turn. See "Special Cases," page 278, for more on opportunity fire.

Ambush: An ambush consists of one or more characters firing from previously undetected positions at an enemy force. The ambushers may open fire when one or more of their troops reaches an Initiative point or, if they are using aiming to conduct opportunity fire, when the moving force enters their line of fire.

MOVEMENT

Movement during combat can be resolved in whatever detail the situation warrants. In many cases, no map is needed—long-range sniping between parties on foot, for instance. In others, the referee can do well enough by just drawing a map and positions on a piece of paper.

If greater detail is needed, the referee can make a map beforehand, and the positions of characters and vehicles can be represented by pins, drawing on plastic overlays, counters, or miniatures figures. Any scale may be used; movement rates and weapon ranges are given here in meters.

Combat movement rates are expressed in meters moved per five-second combat turn. Vehicles and animals have unique combat movement rates listed with the specific vehicle or animal description.

Personnel Movement

People may move at four different rates: crawl (two meters), walk (10 meters), trot (20 meters), or run (30 meters). A character who is burdened (see "Load," page 35) travels half this fast. Characters who are crawling are prone. These speeds are for human characters, and are identical for most of the major intelligent races in **Traveller: The New Era**.

MOVEMENT RATES IN METERS

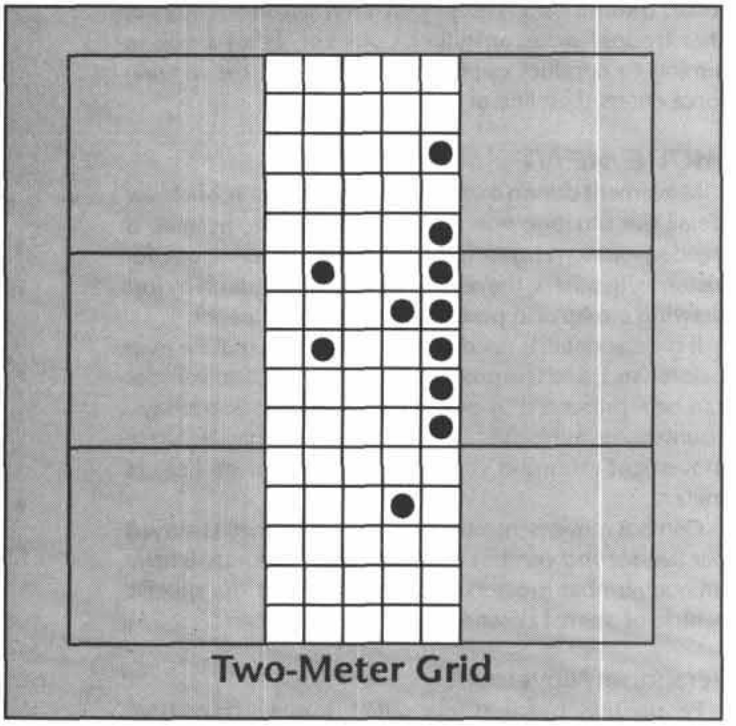
Race	*Crawl*	*Walk*	*Trot*	*Run*
Human	2	10	20	30
Vargr	2	10	20	30
Aslan	2	10	20	30*
Hivers	2	10	20	—
Droyne	2	10	20	30
K'kree	—	10	30	60

*May sprint at 60 one out every six turns.

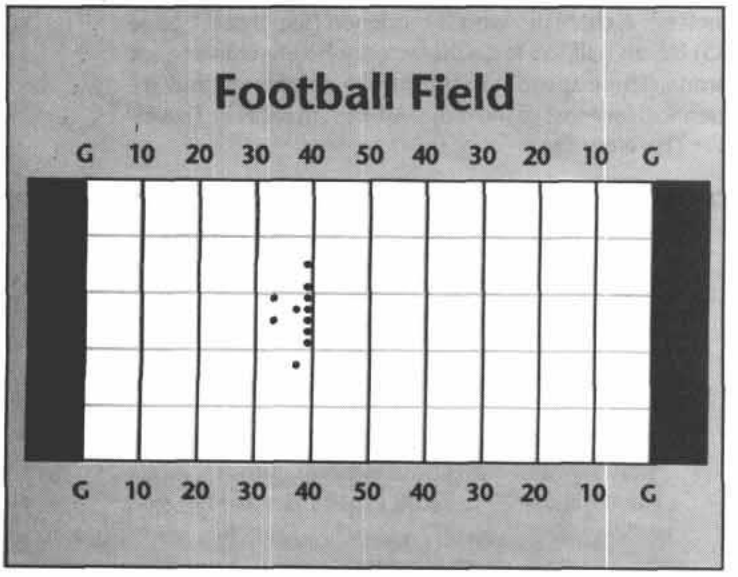
The notation "—" indicates that this rate is not available for this race.

Grid System

The maps included in **Traveller** are all provided with a square grid to control movement and measurement of firing ranges. Two different scales of grids are used, one for outdoor encounters, and one for buildings and other interiors. The outdoor grid uses squares representing 10 meters from side to side (sometimes referred to as tactical grid squares). The illustration below shows an American-style 100-yard football field with an outdoor grid system superimposed on it. The offensive team is shown lined up for a play with the ball on its own 40-yard line.



Two-Meter Grid



This should provide you with a good feeling for the actual area covered by one of these grid squares. Obviously, it is fairly easy for people to conduct activity in such a square without interfering with each other.

Interiors generally require more detailed coverage, and in any event cover much smaller areas. As a result, we use a two-meter grid for these.

This grid can also be used for outdoor encounters which take place at close quarters, such as in an alleyway or in a small clearing in the woods.

The same offensive line shown on the 10-meter grid is shown again on a two-meter grid.

Note that three large 10-meter grid squares are reproduced and broken into their component two-meter squares. In this case, each man occupies a single square. Although it is possible for more than one man to stand in a two-meter area, it is difficult for both to then conduct any sort of activity without interfering with each other.

These grid sizes have been chosen to make them as easy as possible to use with the movement rates and ranges in **Traveller**, particularly when used in conjunction with miniatures (See Using Miniatures with Traveller, page 327).

- When using the interior two-meter grid, a character can crawl one grid square, walk five, trot 10, and run 15 squares per turn.
- When using the outdoor grid, the same character could walk one, trot two and run three squares per turn. It would take that character five turns worth of crawling to move one square.
- It is possible to move and fire diagonally through a square as well as orthogonally (straight up and down or side to side), but the diagonal distance is greater. Count a square as being 50% longer diagonally than orthogonally. That is, it counts as three meters of range or movement to cross a two-meter square diagonally, and 15 meters of movement or range to cross a 10-meter square diagonally.

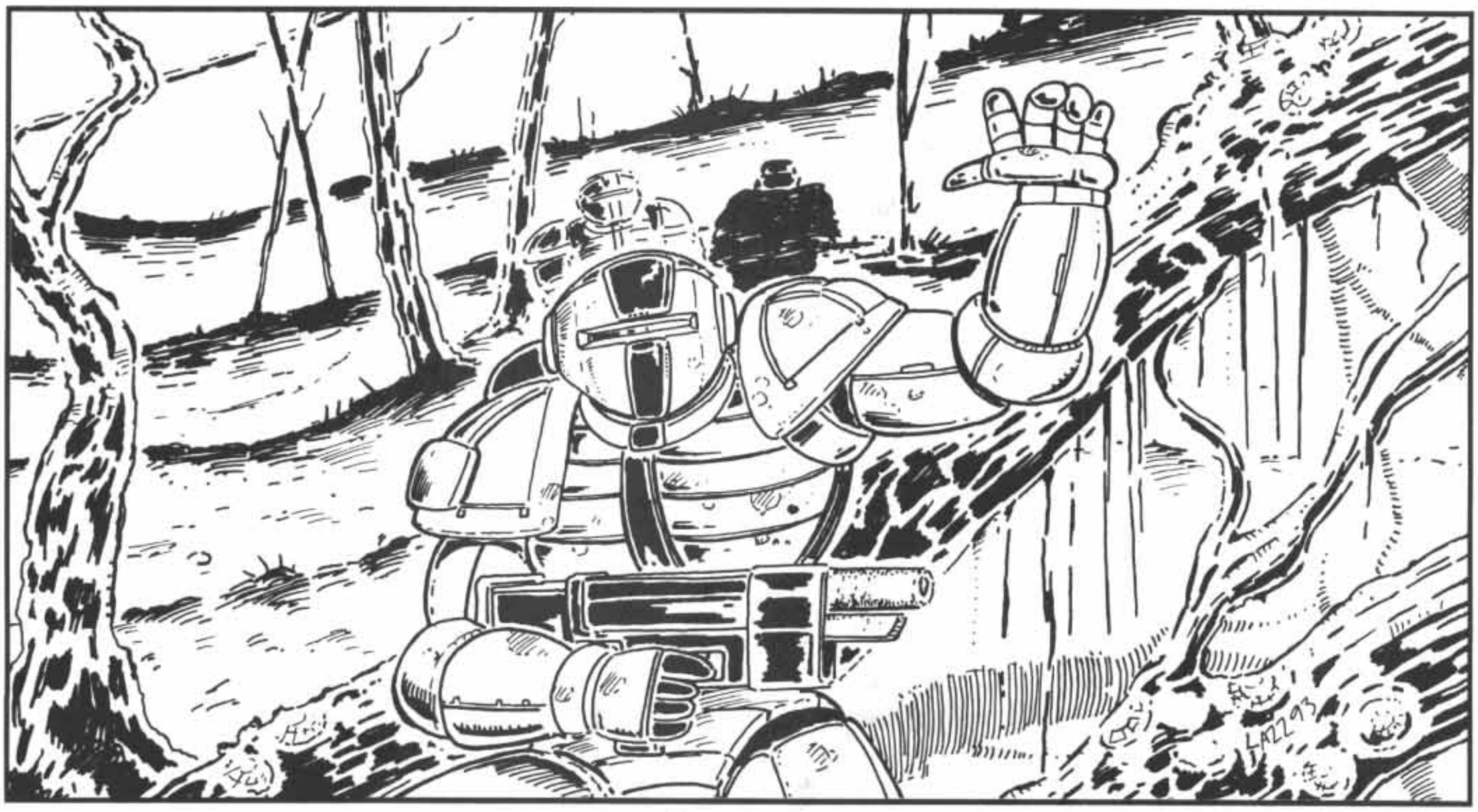
ACTIONS

A character may perform one action in each combat turn (except as specifically noted elsewhere). Actions are chosen when it is actually time for the character to act. The possible combat actions are listed below.

Combat Actions

Aim: Aiming allows the best possible chance to hit a target. The aim action can be used in two different ways. First, it can be done immediately before a fire action in order to aim at a specific announced target. This allows resolution of the subsequent shot against that target (conducted in the following combat turn, or, by a high-Initiative character, later in the same turn) as an aimed shot (aimed shots are explained under

Planetary Combat—Basic Concepts 5



"Direct Fire," page 273).

Second, a character may aim at a certain target or area in order to conduct opportunity fire.

Aiming at a target or area also enables a character to fire at any target which later moves through his or her line of sight. This is called opportunity fire. To continue waiting for a target to come into view, merely continue to conduct an aim action each turn.

Approach Fire: This is the action taken by turretless aircraft to fire at ground targets. It allows the firing of weapons, and also simultaneously includes the drive action (see below).

Crawl: The character moves two meters in a prone posture.

Drive: This is the action used by the driver of a vehicle to move the vehicle during the turn. The movement rate varies with vehicles and with the risks that a driver is willing to take to drive faster. These details are discussed on page 291.

Fire: The character fires his or her weapon at any target which is currently visible to the character or which has been visible during the current turn at some point. With some weapons this may be combined with a walk or trot. If the fire action is conducted against a target which the character is currently aiming at (having expended his or her previous action to do so), the fire is executed as an aimed shot.

If the fire is made at a target that the character was not aiming at, it is executed as a quick shot. Aimed and quick shots are explained on page 274.

Go Prone/Stand Up: A crawling character is prone. A prone character may stand up at any time, either as an action by itself or as part of a walk, trot, or run action. Standing up cuts the distance moved in an action in half.

Melee: This constitutes either an armed attack with a melee weapon (which may be combined with a walk or a trot) or an unarmed attack. There are several types, one of which must be specified, any of which may be combined with a walk or a trot. These are discussed in detail beginning on page 269.

Mount/Dismount: Get on or off of a vehicle or riding animal.

Ready/Change Equipment: This can consist of putting down your rifle and taking out a knife, drawing a pistol, linking two ammo belts together, readying a radio to transmit, etc.

Reload: It generally takes one combat turn to reload a weapon, although some take longer (and thus require several reload actions to finish).

Run: The character moves 30 meters (three grid squares).

Take Cover: The character dodges behind any close-by cover (see "Cover" on pages 286 and 298).

Talk: Players will want to discuss their plans, but the referee should be careful to keep these discussions within the bounds of reality. Since each action is only five seconds long, the referee should not allow a player to say more than one sentence or so during a combat turn. While talking can be combined with most other actions,

it cannot be combined with firing.

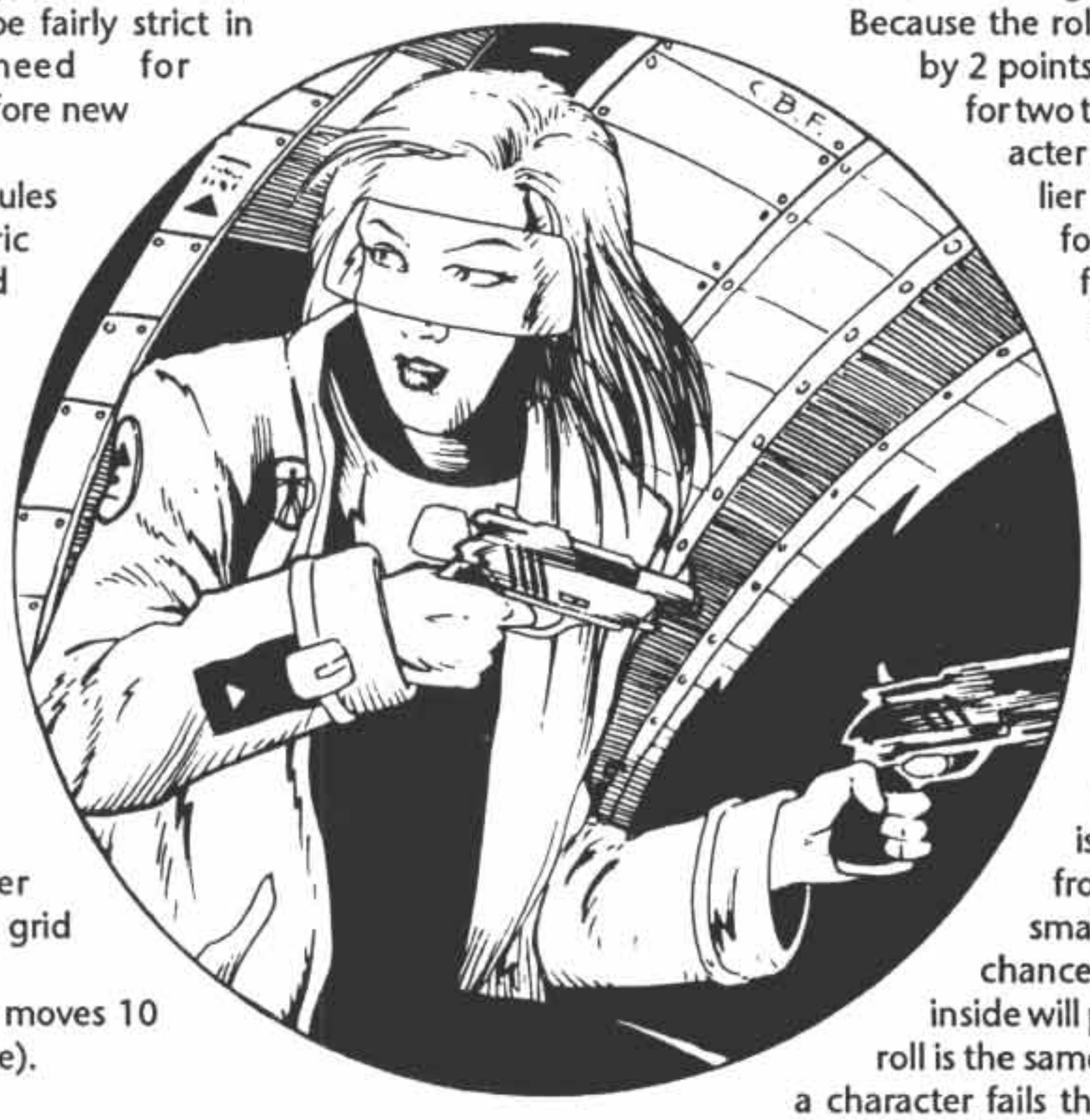
If trying to talk on a radio, laser, maser, or meson communicator, a player must first spend a turn opening contact. Each communicator has its listed short range, at which difficulty is Average. Ranges and difficulty levels increase the same as fire combat (i.e, Difficult at medium [2xshort] range, Formidable at long [4xshort] range, Impossible at extreme [8xshort] range). The player must also give his or her call sign and that of the character being called, as in "Devil 6, this is Jayhawk 6. Over." Unless the other character has a communicator ready to transmit, it will probably take an action to ready it and then another to transmit a reply. The reply may be "Jayhawk 6, this is Devil 6. Go ahead. Over," but is more likely to be simply, "Devil. Go."

The referee should be fairly strict in enforcing the need for acknowledgements before new transmissions are sent.

We do not include rules for static, atmospheric conditions (smoke and bad weather degrade laser communicators), weak batteries, etc., although referees may make allowances for these. For simplicity, referees can disregard these complexities, and simply require a deliberate and clear communications procedure.

Trot: The character moves 20 meters (two grid squares).

Walk: The character moves 10 meters (one grid square).



Involuntary Actions

Certain conditions in combat require the character to conduct an involuntary, mandatory action rather than one of the normal actions listed above.

Panic: Whenever a character is knocked down by wound damage (see Wound Effects and Healing, page 288) or surprised (attacked from an unexpected direction, ambushed, or surprised by an encounter as defined in the encounter rules), there is a chance that he or she will panic. This is not blind panic which sends the character screaming away, but panic which causes him or her to momentarily freeze.

To determine if a PC panics, roll 1D6. If the result is greater than his or her Initiative rating, he or she panics. The PC may not conduct any action for the number of turns by which the die roll exceeds his or her Initiative. However, if the character is forced to freeze for more than one combat turn, he or she may go prone on the second turn and remain there until able to move again. If the character has already conducted his or her action for the turn, the following turn counts as the first turn frozen. If the character has not yet acted in the turn in which he or she panicked, the current turn becomes the first turn frozen.

NPCs use the same system as PCs. Note that player characters or detailed NPCs with an Initiative of 6 or more never panic, while even Elite template NPCs may.

For example, a character with Initiative 3 is knocked down in Initiative step 2 of the third combat turn. The PC rolls a 5, indicating that he has panicked. Because the roll exceeds his Initiative by 2 points, the character freezes for two turns. Because the character had already acted earlier in the third turn, the fourth turn counts as his first turn frozen. The PC is still frozen on turn 5, but may elect to fall prone during that turn. Unless he has been further injured while frozen, the character may begin normal actions again on turn 6.

Bail-Out: If a vehicle is penetrated by fire (final penetration is greater than armor) from anything other than small arms fire, there is a chance that each character inside will panic and bail-out. The roll is the same as for panic, above. If a character fails the roll, he or she must immediately climb out of the vehicle, seek the best available cover within two meters, and remain there for two turns (in addition to any time spent getting out of the vehicle). After the two turns are over, the character may get back in. It takes one turn to get out of or into a side or rear door, and two turns to get out of or into a top or turret hatch.

Charge: If a character on foot is being charged by a powered vehicle or running animal within 100 meters (that is, he or she is about to be run over by something large and fast), he or she must check for panic. Player characterss that panic do not freeze; instead, they run. Subtract 1 from the panic roll if the character has a weapon with a good chance of stopping the attacker and is prepared to fire it.

Combat Resolution

The sections below describe how the various combat actions listed above are played out. They are divided into two broad areas: Melee Combat and Fire Combat.

MELEE COMBAT

Melee combat covers close quarters combat, either hand-to-hand or with melee weapons, such as knives, swords, bayonets, and clubs. All of the actions listed below under "Unarmed Melee Combat" and "Armed Melee Combat" are included under the combat action "Melee," page 267.

Unarmed Melee Combat

Characters must be within two meters of each other to make unarmed combat actions. There are eight types of unarmed combat actions: hand strikes, kicks, leaping kicks, throws, diving blows, grapples, escapes, and strangling. Hand strikes, kicks, leaping kicks, throws, and diving blows attempt to do damage to the target; grapples attempt to seize and hold the target, while escapes seek to escape from such holds; strangling is a variation of grappling which attempts to do damage to the target.

A character may make only one unarmed combat attack per combat turn.

Note that many of the actions listed below are resolved as tasks using the Agility attribute. Characters engaging in melee combat who have any skill level in Acrobatics may use their Acrobatics asset in place of their Agility attribute at the same difficulty level as listed for Agility alone.

Strike Attacks: There are two types of strike attacks: hand strike and kick. Both are resolved in exactly the same way, with the exception of damage and hit location. Either type of strike attack is a task—Difficult: Unarmed Martial Arts. Success means that the attack hits. In the case of a surprise attack (unexpected attack from behind), no roll is made; the attack automatically hits.

Blocking Strike Attacks: If a character successfully hits an opponent, the opponent may be able to block the blow. Blocking is also a task—Formidable: Unarmed Martial Arts. Success means that the attack has no effect. Surprise attacks cannot be blocked (if they could, they wouldn't be a surprise, now would they).

A character may attempt to block at any time when a blow is directed at him or her, but a successful block counts as an action for the combat turn. However, an Outstanding Success on a block roll means that the block did not count against the character's actions. Once a character has made a number of successful blocks equal to his or her allowed actions for a turn, the character may attempt no more blocks during the turn.

For example, Brigadier Duro, with a current Initiative of 2, is hit in Initiative step 6 and blocks the unarmed melee strike. In Initiative step 2, he could usually conduct his normal action, but cannot this turn because he blocked, using one turn's actions. Had he rolled an Outstanding Success on the block, he would still have his action for step 2.

Aimed Strike Attacks: A character may decide to concentrate a hand strike or kick against one particular body part—Formidable: Unarmed Martial Arts. If the attack succeeds, the die roll for location (see below) is not made; the attacker chooses the hit location.

Hit Location: Hit location (if the attack succeeds and is not blocked) is rolled on the Personal Hit Location chart (biped or multiped, as necessary). A normal (non-aimed) strike attack is rolled on 1D6, and a nonaimed kick is rolled on 1D6+4, yielding results of 5-10.

The die roll for hit location is not made for a surprise strike (an unexpected attack from behind) or an aimed attack. The attacker is allowed to pick his or her target in these two cases.

Damage: Damage inflicted from a hand strike is equal to the attacker's unarmed combat damage rating. Damage from a kick is equal to 1.5 times the unarmed combat damage rating (round fractions to the nearest whole number).

Armor: Armor absorbs points equal to twice its value from each strike attack and suffers no damage. (See the Body Armor Protection chart on page 359.) One hit is inflicted on the attacker on the body part (right arm, left arm, right leg, or left leg) used in the attack for every two hits absorbed by the armor (round off to nearest whole number). Thus, if Trooper McTavish punched Roots Marlowe in the torso and caused 6 points of damage, and Marlowe was wearing a flak jacket (melee armor value 2), Marlowe would only suffer two hits (6–[2×2]=2), while McTavish's right arm would suffer two hits (4+2=2).

Leaping Kick: A leaping kick is an attempt to put more force behind a kick by throwing oneself feet-first at the enemy. It is a Difficult test of Agility. Success indicates that

PERSONAL HIT LOCATION

Die	*Biped*	*Multiped*
1	Head	Head
2	Right arm	Forequarter
3	Left arm	Forequarter
4	Chest	Forequarter
5	Abdomen	Chest
6	Abdomen	Chest
7	Right leg	Abdomen
8	Right leg	Hindquarter
9	Left leg	Hindquarter
10	Left leg	Hindquarter

Biped: Table assumes front/rear shot.
Side Shot: Far side hit equals near side hit.
Prone Biped: Table assumes top shot.
Side Shot: Far side hit equals near side hit.
Front Shot: Leg or abdomen hit equals miss.
Rear Shot: Head, arm, or chest shot equals miss.
Multiped: Table assumes side shot.
Front Shot: Hindquarters or abdomen hit equals miss.
Rear Shot: Head or forequarters hit equals miss.



the character has hit the enemy and also that the attacker has managed to land on his or her feet. Failure indicates that the attacker has misjudged his or her leap. While the leap still hits the target, the attacker is also knocked down and suffers damage.

Avoidance: If a character is surprised (an unexpected attack from behind), the attack always hits. If not surprised, the character may attempt to avoid the attack (Difficult: Agility). If the kick is avoided, the attacker lands on his or her feet or falls to the ground, according to his or her original Agility roll, but the target is missed by the attack.

Effects: A successful leaping kick which is not avoided knocks its target to the ground and inflicts damage points equal to twice the attacker's CON, while leaving the attacker undamaged and on his feet. A successful leaping kick which is avoided knocks neither character down and inflicts no damage on either character. An unsuccessful leaping kick which is not avoided knocks both the target and the attacker down, and inflicts damage points equal to the attacker's CON on each of them. An unsuccessful leaping attack which is avoided only inflicts damage points on the attacker equal to the attacker's CON.

Grappling: Grappling is an Average: Agility task. It is somewhat simpler to resolve than a strike. Blocking is not possible; there is no hit location; and armor has no effect. Grappling "damage" is calculated in the same way as for a strike; however, the results of the attack are termed *controlling hits*. They are not damage, but rather are a measure of the extent to which one character has physically controlled another (with a hammerlock, by pinning him or her to the ground, etc.). Once a character has inflicted controlling hits on another character equal to or in excess of that character's Strength, the target character is totally controlled and ceases struggling. The controlled character may not move; the controlling character may not move without releasing control (all controlling hits disappear). Until that time, however, the character may attempt to escape or grapple with the original attacking character.

If both characters grapple, the first one to achieve hits equal to his or her opponent's Strength controls the other.

Escape: An escape attempt is resolved in the same way as a grapple (i.e., an Average test of Agility), except that if the attempt is successful, controlling hits equal to the unarmed combat damage rating of the character making the successful attempt are removed from the accumulated total which the other character has already built up.

Strangling: Strangling is handled like grappling, with three main differences: (1) It *may* be blocked by an Average test of Agility. (2) Armor *does* have effect. (3) A character who becomes "totally controlled" becomes unconscious and begins to suffer head wounds equal to the attacker's unarmed combat value *each turn* thereafter, for as long as the hold is maintained. If the hold is released before death ensues, the victim rolls to regain consciousness per the serious wound rules. *Note:* Garottes double the attacker's unarmed combat damage rating for strangling attacks.

Throws: A throw is a defensive move, similar to an escape or a block. However, it allows the defender to turn the tables on the attacker and not only avoid being damaged, but inflict damage on the attacker.

A character who is hit by a successful grapple, strangle, hand strike, or kick (not a leaping kick) may attempt a throw. The character must first make a successful block roll (grapples may not be blocked; this roll is merely to set up for the throw). If the block is not successful, the attack does

damage to the character normally, and the throw may not be attempted. If the block roll succeeds, the character may attempt the throw.

A throw is a Formidable test of Unarmed Martial Arts, and cannot be avoided by the object of the throw. Success indicates that the opponent is knocked down and suffers damage. Failure means that only the block was successful (except in the case of a "blocked" grapple—because grapples cannot be blocked, the grapple attack's effect is unchanged), but that the character has used up an action. The action is used up even if the block was unsuccessful. Note that the block to set up for the throw is considered part of the throw action, so does not count as an additional action.

Effects: A successful throw inflicts damage points on the attacker equal to twice the attacker's own CON. Although victims of a successful throw may not avoid being thrown, they may attempt a Difficult: Agility roll to limit damage by controlling their landing (if the throw roll was an Outstanding Success, no roll may be made to limit the damage). If the Agility roll is successful, only half damage is applied.

Diving Blows: A diving blow is an attempt to throw oneself at the enemy and knock him or her down. Blocking is not possible (although avoidance is), and armor has no effect. Note that unlike other forms of unarmed melee combat, the attacker does not make a roll to succeed: The diving blow always succeeds unless the target succeeds at an avoidance roll.

Avoidance: If a character is surprised (an unexpected attack from behind), the attack always hits. If not surprised, the character may attempt to avoid the attack (Average: Agility). If the blow is avoided, the attacker falls to the ground, having missed the target. If the attack is not avoided, it automatically hits.

Effects: If a diving blow hits, either the attacker or defender is knocked down and suffers hits. If 1D6+(2×Constitution) of the attacker is greater than Strength+Constitution of the defender, the defender is knocked down and suffers hits equal to the difference of the two totals. Otherwise, the attacker is knocked down and suffers hits equal to the difference between the two values. Defenders who are surprised use only their Constitution for the comparison.

Armed Melee Combat

Armed melee combat is conducted with melee weapons.

Range: The two general categories of melee weapons are short range and long range. Characters must be within two meters of each other (the same as for unarmed combat attacks) for short-range attack and within three meters for long-range attacks. If a character with a short-range weapon (including an unarmed character) encounters a character with a long-range weapon, the character with the short-range weapon may not attack in the first turn of contact (although a short-range melee weapon may block).

The ranges of melee weapons are given on the Melee Weapons chart, page 359.

Hit Procedure: An armed melee attack is a task—Difficult: Armed Martial Arts. In the case of a surprise attack (unexpected attack from behind), no roll is made; the attack automatically hits.

Modifiers: Certain melee weapons add a hit modifier to the character's Armed Martial Arts asset, also shown on the Melee Weapons chart, page 359. This modifier is added to or subtracted from the character's asset; however, it may never reduce the skill portion of a PC's asset to below 1.

Blocks: If a character successfully hits an opponent, the opponent may be able to block the blow. A block is a task—Formidable: Armed Martial Arts. If the task is successful, the attack misses. The character blocking must also be armed with a melee weapon (it doesn't make much sense to block a cutlass with one's hand). A character may attempt to block at any time when a blow is directed at him or her, but a successful block counts as an action for the combat turn. An Outstanding Success on a block roll means that the block did not count against the character's actions. Once a character has made a number of successful blocks equal to his or her allowed actions for a turn, the character may attempt no more blocks during the turn.

Hit Location: Hit location is rolled on the Personal Hit Location chart on page 269.

The die roll for hit location is not made for a surprise attack; the attacker picks his or her target. The attacker may attempt to pick his or her target in any melee attack; this is a task—Formidable: Armed Martial Arts. If the attacker hits, he or she chooses where he or she hits. Additionally, the referee may mandate certain hit locations if the situation warrants it. If an injured player crawls up to an enemy with a knife, he or she is unlikely to hit the enemy anywhere but in the legs. Likewise, a character mounted on horseback and swinging a club is not going to hit the leg of a man on foot.

Damage: Damage inflicted from a melee attack varies with the weapon used. The Melee Weapons table (page 359) gives the damage value of each weapon.

Armor: Armor absorbs hits equal to twice its armor level from each armed combat attack, and suffers no damage.

FIRE COMBAT

Fire combat can be conducted at considerably greater distances than either unarmed melee combat or armed melee combat. Fire combat weapons (and hand grenades) are listed in the "Equipment & Technology" chapter (pages 350-357), which gives a variety of information on each weapon. Weapons capable of firing more than a single type of round have a separate listing per type of round. The use of this information is explained in the subsequent rules.

There are two general varieties of fire combat: direct fire and indirect fire. Direct fire is conducted when the gunner can actually see his or her target and fires a round directly at it with the intention of obtaining a direct hit. Indirect fire is usually conducted when the gunner cannot see the target and instead fires at a high angle to lob his or her round over intervening terrain obstacles with the intention of it coming down in the close vicinity of the target. For the most part, only certain heavy weapons and artillery (grenade launchers, mortars, and howitzers) are capable of indirect fire.

Weapon Parameters

All weapons have restrictions based on their use according to the way in which they function and the way in which they are supplied with ammunition.

Human Limits: A single character can fire only one weapon at a time (including a vehicle gunner, who usually has several weapons in his or her turret).

Rate of Fire: Each shot in the game represents a single shot (bullet or pulse of energy). It is possible to fire more than a single shot from most weapons in a five-second combat turn. All weapons in the game have either a reloading (Rld) rating or a rate of fire (ROF) rating.

Weapons with a reloading rating hold only one round in the weapon at a time, may only fire the one round which is loaded during a fire action, and must then be reloaded before firing again. The reload rating is the number of reloading actions necessary to reload the weapon. If the weapon has more than one loader as part of its crew, each loader must spend the indicated number of actions reloading. For each loader missing from the gun crew, add 1 to the reloading time for the others.

Weapons with a rate of fire listing have either a letter code or a number. The various letter codes are defined as follows:

SS (Single Shot): This weapon can only fire once per firing action and must then be reloaded.

BA (Bolt Action): Each time the rifle is fired, the bolt mechanism must be worked to eject the spent cartridge and move a fresh cartridge from the magazine to the chamber. Bolt-action rifles may be fired once per fire action. The working of the bolt is assumed to take place as part of the same action.

LA (Lever Action): Each time the rifle is fired, the lever must be worked to eject the spent cartridge and move a fresh cartridge from the magazine to the chamber. Lever-action rifles may fire once per fire action, the same as bolt-action rifles.

PA (Pump Action): Each time the shotgun is fired, the lever must be worked to eject the spent shell and move a fresh shell from the magazine to the chamber. Pump-action weapons may fire three rounds per fire action.

DAR (Double-Action Revolver): A double-action revolver does not have to be cocked between shots, as the first part of each trigger pull cocks the hammer. This makes the trigger pull somewhat harder than on a semiautomatic pistol. A double-action revolver can fire three rounds per fire action.

SA (Semiautomatic): This weapon will fire one shot with each squeeze of the trigger, and the weapon reloads itself for the next shot. There are several different types of semiautomatic weapon.

Semiautomatic slug weapons use the force of each firing round to recock the weapon and pull another round into the firing chamber. They may fire up to five shots per fire action, and have the listing "SA" in the ROF column of the weapon data.

Some energy weapons (which fire pulses or bolts of energy rather than bullets) are considered to be semiautomatic for rate-of-fire purposes. There are two types of semiautomatic energy weapons: those fed from power packs (mostly lasers), and those that have their energy stored in chemical form in cartridges much like those of a slug weapon (some lasers and most plasma and fusion weapons). The rate of fire of power-fed weapons is limited by the capacitor cycle, which is the time taken for the weapon to recharge to fire the next pulse, and the cooling cycle. Cartridge-fed energy weapons also have a cycle time, based on the cooling cycle that keeps the weapon from being melted by the tremendous amounts of energy being passed through it. The rate of fire of either type of energy weapon will vary, depending upon how the weapon is designed, but will never exceed the standard SA rate of five shots.

All semiautomatic energy weapons have a number following the "SA" notation in the ROF column. This is the number of shots the weapon can fire per combat turn. Note that energy weapons, because of their absolute time requirements for cooling or recharging, do not fire at this rate for each fire action. Thus a high-Initiative character who acts twice in a turn will either have to split the allowed shots for the turn between the two actions, or or conduct a nonfiring act with one of the actions. However, for characters that only act once per turn this distinction is irrelevant, as for them one fire action equals one combat turn.

Some lasers have the capability to fire their energy in varying numbers of pulses of greater or lesser power. This is shown by multiple combat performance lines for each such weapon, showing its performance at each available pulse rate.

These pulse rates may be different SA rates (for example one high-powered pulse per turn vs. two lower-powered pulses per turn), or burst pulse rates with different numbers of shots per burst (note that the number of such bursts per turn is always equal to the laser's maximum SA rate of fire per turn). Pulse rates listed as SA are resolved as normal direct fire, while the burst pulse rates are resolved as automatic fire (page 276), and never as separately aimed shots. Note that, unlike automatic slug-firing weapons, these lasers are not necessarily capable of firing five such bursts per action. These lasers have burst ROFs which show the number of bursts allowed per five-second combat turn and the number of shots in each burst. For example, the ROF listing "3×5" indicates a laser capable of three bursts per turn, with five shots (pulses) in each burst (as mentioned above, this laser would also have a maximum semiautomatic ROF of SA3).

For direct energy input (DEI, also called "power pack") lasers, the performance line shows how many shots or bursts at these ROFs are available in the power pack. This requires players to be careful when keeping track of electrical "ammunition," as one double-powered shot is worth the same amount as two single-powered shots in the laser's power pack. Note, however, that when recording ammunition expenditure for automatic bursts, each *burst* consumes ammunition at the listed rate, not each shot in the burst. For example, the TL-9 DEI rifle on page 354 has ROFs SA2, 2×3, and 2×10. A single semiautomatic shot at the SA2 rate, a single 3-shot burst, and a single 10-shot burst, all consume the same amount of power from the

power pack: 1/100 of the energy available. (One shot at the SA1 level, however, consumes twice as much power, 1/50 of that available.)

The situation with chemical (CLC) lasers is similar: each individual semiautomatic shot or automatic burst consumes one cartridge, as each cartridge contains a given amount of laser energy which can be allocated as one shot or several rapid pulses in a burst.

However, these different rates of fire may *never* be mixed within one combat turn. Pulse rates may be freely changed each turn at no time penalty, but once a pulse rate is selected for a turn, all shots or bursts fired that turn must be at that same pulse rate.

SAR (Single-Action Revolver): A single-action revolver needs to be cocked between shots. A single-action revolver can fire one round per fire action.

A single-action revolver may be fired three times per fire action by "fanning" (holding the trigger down while rapidly working the hammer with the heel of the other hand). All shots while fanning are at +1 difficulty level.

Automatic Fire Weapons: Weapons with a number instead of a letter code are capable of fully automatic fire as well as semiautomatic fire. The number shown is the number of bullets or energy pulses in each burst from the weapon.

As a practical matter, no character may fire at more than three different targets in the same action due to restrictions in changing targets.

Each automatic weapon can fire up to either five individual shots or five bursts per action turn.

Some automatic weapons have more than one automatic ROF listed. Characters firing such weapons may freely switch from one allowed ROF to another each fire action, but all shots or bursts fired in a single action must be at the same ROF.

Reloading: All small arms have a Magazine listing which consists of a number and, in some cases, a letter code. This shows the type of feed device used for ammunition in the weapon and the number of rounds in it. The most common form of magazine in slug-firing small arms is a box magazine which attaches through the stock or pistol grip. *Weapons with no letter code after their Magazine value are fed by box magazines,* each of which contains the number of rounds shown.

Energy weapons have several different forms of "magazines," including power packs carried on the back or belt or, in some cases, cartridges which store energy in chemical form and are handled in box magazines just like slug-firing weapons.

One reloading action is sufficient to detach most empty box magazines and insert a full one. To calculate the time necessary to change a box magazine, divide the loaded weight of the magazine (in kilograms) by 5 and round fractions up. The result is the number of reload actions necessary to remove an empty box magazine and insert a new one.

Other forms of magazines are noted by letter code as explained below:

R (Revolver): A revolver's feed device is a nondetachable revolving cylinder which usually holds six bullets. If loaded individually, three bullets can be loaded into the cylinder per reloading action. If a quick-loader is available (a circular clip holding six cartridges which enables all six to be dropped into the open cylinder at once), one reloading action is sufficient to reload the weapon.

i (Individual): Weapons with nondetachable magazines, particularly underbarrel tubular magazines, often have to be reloaded one bullet at a time. Up to three bullets may be loaded into a individual feed device per reloading action.

B (Belt): The weapon, a machinegun or automatic weapon of some type, is fed by a belt usually containing from 50 to 100 bullets. Two reloading actions are necessary to replace a belt. However, if the machinegun has a two-man crew (gunner and loader), this requirement can be met by both expending one action reloading in the same turn.

C (Cassette): A cassette is a large, self-contained ammunition feed system which takes five actions to replace.

PP (Power Pack): A power pack is a large, self-contained energy source, usually a battery pack powering a capacitor, and is usually carried on a load-bearing harness. It takes one action for each of four steps: disconnect the power cable from the weapon, take off the power pack, put on a new power pack, and connect the new power cable to the weapon.

Direct Fire

Direct fire is the most common form of combat in the game. In direct fire, the target is visible to the firing character. Direct fire is conducted with both small arms and heavy weapons.

Small arms are rifles, pistols, machineguns, and similar similar-sized energy weapons. Their two principal distinguishing characteristics are that they are generally man-portable and they fire either a pulse of energy or a nonexploding round of less than 20 millimeters in diameter. Small arms fire can be directed at any sort of target, but is usually directed against personnel.

Heavy weapons fire more powerful bolts of energy or rounds which are 20 millimeters in diameter or greater and which are capable of containing a significant explosive filler. Some heavy weapons (such as grenade launchers, rocket launchers, and some tac missiles) are man-portable, but many must be mounted on vehicles or heavy field carriages (such as howitzers or fusion guns). Projectile-firing heavy weapons use high explosive (HE) and other similar ammunition to attack troops and soft vehicles, but many also have an array of specialized rounds for attacking armored targets.

General Procedure: The chance of hitting a target with individual shots depends primarily on three things: marksmanship, range, and recoil. The combination of these factors will produce a D20 chance of hitting a target, defined as a task, using the tasks and skills rules. The player or referee then rolls 1D20 for each shot fired. If the target number or less is rolled, the target is hit. Any other roll is a miss. In fire combat, the task's target number is often referred to as the *hit number*. When a hit is scored, see Wounds and Damage, page 285.



Outstanding Success: Whenever an Outstanding Success is rolled when firing at a target, double damage is applied to the target. See "Outstanding Success," page 285.

Automatic Hit: An unmodified roll of 1 in a direct fire task is an automatic hit, regardless of skill, asset, or the difficulty of the shot.

Automatic Miss: An unmodified roll of 17-20 in a direct fire task is an automatic miss, regardless of skill, asset, or the difficulty of the shot. This is a modification of the automatic failure rule on page 108 (where auto failure results only on a 20), and applies *only* to direct fire tasks.

Marksmanship: All small arms use skills from the Gun Combat cluster as their marksmanship skill. (Note: Although bows are not small arms in the conventional sense, nor does their use literally constitute fire combat, they are handled under these rules in **Traveller**, and are therefore listed here.) SMGs are used with either the Slug Pistol or Slug Rifle cascade, whichever is higher.

Skill	*Weapons*
SW (Slug Pistol)	Revolvers, automatic pistols, snub pistols, submachineguns
SW (Slug Rifle)	Carbine, rifle, automatic rifle, assault rifle, ACR, gauss rifle, accelerator rifle, submachineguns, shotguns
EW (Energy Pistol)	Laser pistols
EW (Energy Rifle)	Laser rifles and carbines, plasma and fusion rifles
Early Firearms	Crossbows, muskets, arquebus, all black-powder firearms
Archery	Short, long, and composite bows

The various Heavy Weapons skills are used as marksmanship for the following weapons:

Skill	*Weapons*
Autogun	Automatic cannon or grenade launcher, machinegun, VRF gauss gun
Heavy Gun	Large-caliber direct fire guns including mass drivers
Energy Artillery	Carriage- and vehicle-mounted plasma guns, fusion guns, and lasers
Grenade Launcher	Nonautomatic grenade launchers and unguided antiarmor rockets
Tac Missile	Guided tactical missile launcher

Aimed Shots: An *aimed shot* is one which takes place after the character has spent one action aiming the weapon. A target must be visible in both the aiming and firing turns for an aimed shot to take place, and the player must tell the referee which target he or she is aiming at when the player character conducts the aiming action.

Quick Shots: If more than one shot is fired in a turn, only the first shot can count as aimed; a subsequent shot must be a *quick shot.* In addition, any shot fired which does not follow an aim action, or which is fired at a target other than the one aimed at, counts as a quick shot. All quick shots are

conducted at one difficulty level higher than aimed shots.

Range: The four ranges for direct fire are short, medium, long, and extreme. The value printed in the Range column of the weapons tables is the weapon's *short range* in meters. *Medium range* is twice short range; *long range* is twice medium (or four times short); and *extreme range* is twice long (or eight times short).

For example, a weapon with a printed range of 50 has a short range of 50 meters, a medium range of 100 meters, a long range of 200 meters, and an extreme range of 400 meters.

Hitting a target with an *aimed shot* at short range is an Average task. At medium range it is a Difficult task. At long range it is a Formidable task. At extreme range it is an Impossible task. For quick shots, raise the difficulty one level.

Note that a character firing a quick shot at long range would have to succeed at an Impossible task (Formidable for range, increased one difficulty level for firing a quick shot) in order to hit the target.

Telescopic Sights: Sniper rifles come with a telescopic sight, or "scope" fitted to them. Any other rifle may have one fitted at additional cost by a gunsmith (they may not be initially acquired so equipped). The fitting of a telescopic sight increases the short range (and by extension the other ranges as well) of the rifle. The combat performance tables allow the player to determine rifle's basic short range, called its "iron sight" range because this is its range over simple metal sights without additional enhancement. For most weapons, there is a single short range listed; this is its iron sight range. Some weapons also have a parenthetical value in the range column which is the iron sight range (players will also notice in the features column of these weapons that they are already fitted with optic or electronic sight enhancements, so the effects of these enhancements must be removed to get the shorter iron sight range).

If a scope is mounted, add 15 to the iron sight range figure *when conducting aimed shots*. In addition, aimed shots at extreme range are conducted as if at long range for purposes of hit difficulty. Note that scopes have no effect on quick shots.

For example, a rifle with an iron sight range of 75 and a telescopic sight would be treated, for purposes of aimed fire, as having a short range of 90 meters, a medium range of 180 meters, a long range of 360 meters, and an extreme range of 720 meters. Telescopic sights may not be fitted to pistols.

Electronic Sights: A more advanced version of the telescopic sight is the electronic sight. This confers the same benefits as the telescopic sight, but adds 20 meters to the short range for aimed fire instead of only 15. In addition, it provides night fire capabilities; see page 344 for details. Some electronic sights also simplify the use of grenade launchers and include a laser rangefinder. The rangefinder allows the character to measure accurate ranges to distant points, and can be used to designate targets for direct or indirect fire by target-designated weapons. Electronic sights may be fitted to pistols.

Laser Sights: Laser sights do not increase the short range of a weapon, but project a small visible dot onto the point the weapon will hit, allowing quicker and more accurate aiming. A laser sight allows up to three shots fired during a turn to count as aimed shots (instead of only the first one). All other shots fired during the turn count as quick shots. The sight may only be used at ranges up to its maximum listed range (see page 344). Laser sights *may* be fitted to pistols.

FIRING RANGE DIFFICULTIES

	Difficulty	
Range	*Aimed Shot*	*Quick Shot*
Short	Average	Difficult
Medium	Difficult	Formidable
Long	Formidable	Impossible
Extreme	Impossible	Not Allowed

Recoil: Recoil is a measure of how much a weapon kicks when it is fired, which affects accuracy. Recoil affects only small arms in the game, not heavy weapons. Each small arms weapon has a recoil value for a single shot. If it is capable of automatic fire, it also has a recoil value for firing a burst. Whenever a character fires a small arms weapon, total the amount of recoil the weapon generates that turn by multiplying the recoil of a single shot or a burst by the number of single shots or bursts fired.

Once you know how much recoil the weapon generates in a turn, compare the total to the firing character's Strength. If the recoil is equal to or less than his or her Strength, fire is resolved normally. If it is greater than his or her Strength, reduce the hit number by the difference.

For example, a character with a Strength of 7 is firing two single shots from a pistol which has a single shot recoil value of 5. The cumulative recoil is 10 (2×5), and the final hit number would be reduced by 3 (10–7). If the character were firing an aimed shot with a chance of hitting on a 7 or less and one additional quick shot with a chance of hitting on a 3 or less, the hit chances would be reduced to 4 for the aimed shot and 1 for the quick shot (all other factors being equal). The same character firing one shot from the pistol would have no reductions in hit chance. While high-recoil weapons can physically be fired as quickly as low-recoil weapons, it is often counterproductive to do so. The effects of recoil on automatic fire are different and are treated in the automatic fire recoil section on page 276.

Pistol Recoil: Pistols may be steadied by using both hands and bracing oneself. This may only be done while stationary, and reduces the printed recoil by 1.

Rifle Recoil: Rifles (and other two-handed weapons) may also be fired from braced positions. If standing erect, this requires an aim action (for a total of two aim actions to fire an aimed shot from a braced position). If lying prone, this requires no additional action. Either way, reduce the printed recoil value (single shot or burst, as appropriate) by 1.

Characters firing weapons from a tripod or bipod cannot gain this benefit as they are already using the reduced tripod or bipod recoil values (note that the bipod value may only be used when lying prone or firing from behind a wall, etc.).

Two Weapons: If a character is carrying two weapons at



once (one in each hand), he or she may fire either one, but not both. For purposes of controlling the recoil of either weapon, the character's Strength is reduced by 1.

Automatic Fire

The hit procedure for automatic direct fire differs from that for individual shots. Whenever a character fires a weapon on its automatic fire setting, he or she fires one or more bursts of rounds.

The number of rounds in a burst is the number listed in the weapon's ROF column. Each individual shot fired in a burst is resolved separately as a marksmanship task at the Impossible difficulty level, regardless of range.

For example, a weapon with an ROF of 5 fires five shots per burst, and any automatic weapon may fire up to five bursts in a fire turn (as discussed under "Rate of Fire," page 272). A character who fired all five allowed bursts would have fired 25 rounds and rolls a total of 25D20 task rolls for hits. If the character had, for example, a Strength attribute of 2 and a marksmanship skill of 1, the combined total of 3 would be reduced to 0.75 for an Impossible task (3+4), which rounds down to 0. Remember, however, that a roll of 1 always succeeds on a task roll (and the chances of getting a 1 on 25D20 rolls is pretty good).

The actual number of dice rolled per burst is reduced by either range and/or recoil.

Range: Subtract one die from each three-round burst, two dice from each five-round burst, and three dice from each 10-round burst for each range band beyond short.

For example, a small arms weapon which fires 10-round bursts would roll 10D20 per burst at short range, 7D20 at medium, 4D20 at long, and 1D20 at extreme.

A weapon which fires five-round bursts would fire 5D20 at short range, 3D20 at medium, and 1D20 at long.

Burst Size (rounds)	*Dice Lost per Range Band Beyond Short*
3	1
5	2
10	3

Recoil: Recoil is calculated the same way as individual shots. If the recoil number is greater than a character's Strength, the number of dice rolled per burst is reduced according to the difference Recoil – Strength.

For three- and five-round bursts, reduce the number of dice rolled per burst by the difference.

For weapons with 10-round bursts, reduce the number of dice rolled per burst by *twice* the difference.

For example, Glorinna Firella, with a Strength attribute of 7, fires her TL-6 submachinegun (see data on page 353) in an action turn. The SMG fires five rounds per burst, and Glorinna decides to fire a total of three bursts (15 rounds). The SMG statistics show that the SMG has a burst recoil of 3.

Since she is firing three bursts, the total recoil in the turn is 9, which is 2 higher than her Strength.

As a result, she subtracts two dice from each burst fired, leaving her with a total of 9D20 rolled for hits instead of 15D20 (short range is assumed).

Burst size (rounds)	Dice Lost per Point of Extra Recoil
3	1
5	1
10	2

Danger Zone: The danger zone is the area where persons not actually aimed at may be hit by stray shots from a burst of automatic fire.

The danger zone is an area five meters to either side of a line drawn between the firing character and the target, and includes all potential targets which are within the same range band as the target. However, the danger zone is never wider than the distance to the target from the firing character. That is, if firing at a target at short range, the danger zone is one meter wide one meter away from the firing character, two meters wide two meters away, and so on until it reaches its maximum width (10 meters at a range of 10 meters).

Once a player has rolled all of his or her automatic fire hit dice and noted how many rounds hit, the player takes half of the dice which missed (rounding fractions down) and rolls them again, using the same Impossible skill roll rolled for the original hits. Each hit rolled on this second set of dice is inflicted on another target in the danger zone. The referee will assign these hits to the other targets, beginning with those closest to the intended target.

Any dice which missed from this second roll (or half of all dice which missed from the first roll, if there were no other potential targets) are set aside and will be used to attack any character moving through the weapon's danger zone for one full turn. A full turn for the purposes of this rule is the remainder of the current turn and all of the next until the firing character's Initiative. However, if the firing character does not act in the next turn due to wounds, etc., then the fire lasts only until the end of the current turn. Note that by careful use of this effect, automatic weapons fire can be used to interdict movement or keep enemy troops under cover by simply firing through open doorways, over the tops of walls, etc.

Minimum Dice: A three- or five-round burst will never be reduced to less than one die per burst, regardless of the number of reductions for range and/or recoil made. A 10-round burst will never be reduced to less than two dice per burst.

Long Bursts: Some weapons have a burst size of 50. Treat these as 10-round bursts for purposes of hit determination, but each hit achieved counts as three actual hits.

Movement and Fire

Movement by either the firing character or the target reduces the chance of scoring a hit.

Advancing Fire: Characters may not fire while crawling or running. No aimed fire is possible while walking or trotting, but characters may fire quick shots or automatic bursts normally. For purposes of controlling recoil, however, a walking character's Strength is reduced by 1 and a trotting character's Strength is halved, rounding fractions down.

Fire From Moving Vehicles: Characters may not conduct aimed fire from a moving vehicle. They may fire quick shots or bursts normally.

All such fire, however, is conducted at one higher difficulty level than the actual range for purposes of determining hits.

Aimed shots may be made from a moving boat, but *all* shots are conducted at one difficulty level higher. Grounded boats are not considered to be moving; unpowered boats adrift in water are considered to be moving unless in absolutely calm water.

The firing of vehicle-mounted armament from moving vehicles is discussed under Fire from Moving Vehicles, page 294.

Fire From the Saddle: Characters firing while mounted on an animal do so the same as dismounted characters, with two exceptions:

First, their movement category is based on the movement of the animal. Thus, characters on a running animal may not fire at all.

Second, the marksmanship skill used to determine the chance of hitting with single shots is either the character's appropriate marksmanship skill or his or her Riding skill, whichever is lower.

Target Movement: If the target is moving 30 meters or more in the current turn, it is more difficult to hit. See the Target Movement Difficulty Modifiers table, page 294, for increases in difficulty level due to target speed. If a character is using automatic fire to fire at such a target, each increase in difficulty level is treated as an increase of one range band in order to change the number of dice rolled for hits.

Ammunition

Every time a weapon fires it uses ammunition. Slug weapons use up physical cartridges and bullets; lasers use up power stored in power packs. These are all called *shots*, no matter their physical form. A weapon can only store so many shots before it must be reloaded.

Ammunition record forms have been provided in the appendix, and permission is specifically given to photocopy them.

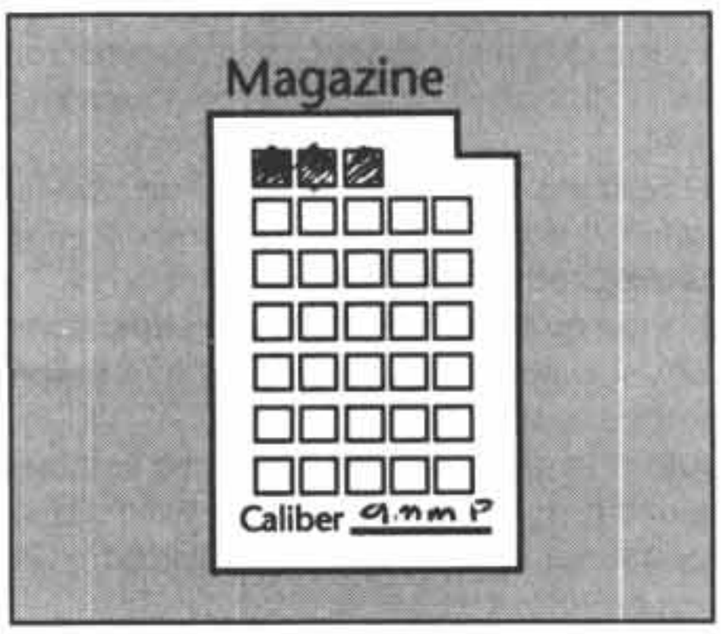
Players should each have one or more copies of this form to keep track of the ammunition they are carrying.

Write down by each magazine the type of ammunition loaded and mark off the excess rounds so that the number of boxes is equal to the number of rounds loaded. When a magazine is loaded into a weapon, the player simply circles it on his or her form, and marks off shots as they are fired. Energy weapons that draw their energy direct from power packs have their ammunition use recorded in a similar way, where the energy for a shot is recorded as a "round" of ammunition, and the power pack is thought of as an electrical magazine holding a certain number of rounds. However, some of these weapons can fire powerful pulses that consume the same energy as two or more less powerful pulses. For example, the TL-9 laser rifle on page 354 has a power pack which holds 100 shots at the SA2 pulse rate, but only 50 at the SA1 rate. Players should think of this power pack of holding 50 shots, but that each SA1 shot consumes two shots. Remember that each burst from this

weapon consumes 1/50 of the power pack capacity, the same as the SA2 rate of fire (rather than each shot in the burst, as would be the case with a burst-firing slug weapon).

It is suggested that individual shots be marked off from the top of the magazine form and bursts marked off from the bottom.

A 30-round box magazine for a submachinegun is shown below.



Special Cases

Special cases modify the basic firing rules.

Target Obscured: If the target is partially obscured (in brush, fog, mist, light smoke, etc.), the difficulty level to hit is increased by one level. See the Environment section beginning on page 307, for further discussion.

Folding Stocks: In order to reduce their bulk, some weapons have folding stocks (indicated in the weapons data as two values separated by a slash indicating folded and unfolded bulk, as "3/4"). *Aimed fire is only possible with the stock extended.* Folding or extending a stock counts as an action.

Firing at Riders: If the target is a rider on an animal, motorcycle, grav bike, or similarly sized conveyance, the firing PC must declare whether he or she is firing at the rider or mount. In either case, fire is resolved normally, but if a single shot misses its intended target, it has a 10% chance of hitting the other. For automatic fire, misses are rerolled for additional hits on other targets in the danger zone, but half of all additional hits are taken on the other target (rider or conveyance).

Grav Belts: See the vehicle movement rules beginning on page 291.

Opportunity Fire: Another use of the aim action is to sight along a certain line of sight to a target or area and wait to shoot at any enemy that crosses that line. This is called *opportunity fire* and allows the aiming character to act out of turn, by shooting at the enemy during the enemy's Initiative step, as that enemy crosses the line.

If the enemy character was already visible to the opportunity-firing character at the beginning of the action which triggered the opportunity fire, the first shot fired counts as an aimed shot; otherwise, all individual shots are quick shots. (Automatic fire is possible instead, but then no shots count as aimed fire. See Automatic Fire on page 276.)

Guided Weapons: Tac missiles are guided weapons, and have several different types of guidance systems that are handled slightly differently. For game purposes, there are three main types: command or operator guided, designated, and homing.

Operator Guided: The missile must be aimed all the way to the target by its operator. This usually involves the act of keeping the launcher's sight on the target, and the sight automatically transmits course corrections to the missile (via wires, laser comm-link, etc.). This sometimes requires the operator to remain exposed to the target, although some systems use periscopic sights for this reason. A subset of operator-guided missiles is teleguided. This missile also requires the operator to guide it all the way in, but in this case the operator views the target from sensors on the missile itself, and so does not need to remain in the line of sight of the target. Both these types of operator-guided missile are rolled against the Tac Missile skill of the operator. If the target moves from view of the operator before the missile impacts, the missile misses.

Unlike other direct fire weapons, *the range given on the combat charts for an operator-guided missile is its maximum range.* Within this range, the chance to hit is the same regardless of distance—it is always an Average task. The character must aim before firing and must continue to aim during the entire flight of the missile or it will miss the target. All missiles have a listed speed in meters per five-second turn. If the character is hit by any sort of attack, he or she will stop aiming, and the missile will miss.

Designated: Designated missiles home in on a signal, either laser or radar, that is aimed at, and bounces off of, the target. So long as this signal is held on the target, the missile cannot miss. The target can be designated by someone other than the firer, allowing the firer to clear the area. However, the designator must continue "painting" the target until impact, and must therefore remain in the line of sight of the target.

Hits with designated missiles are rolled by the designator, who may or may not be the firer. The task for the designator to hold the laser on the target is rolled as a normal direct fire task using the asset and range of the designating weapon, but at one additional difficulty level higher. Radar designation is automatic, so long as the radar-equipped vehicle remains pointed at, and within line of sight of, the target.

As with operator-guided missiles, the listed range for designated missiles, is their *maximum range.*

Homing: These are the true "fire and forget" missiles. The missile carries its own sensors which allow it to follow the target once it has had the target identified to it by its operator. Proper operation of these missiles requires the operator to give the missile's guidance system a clear view of the target and proper firing parameters before firing. Once the missile is away, it requires no further attention from its firer. Hits with homing missiles are rolled against the Tac Missile skill of the operator. See "Firing at Flying Vehicles," page 294, for full details.

The guidance system is listed with missile types in the Equipment and Technology chapter, page 357.

Shotguns and Flechettes: Some weapons, primarily shotguns and grenade launchers, can fire rounds that consist of many smaller antipersonnel projectiles that spread out in flight to increase the chance of hitting. Such rounds fired by shotguns are called buckshot. Those fired by grenade launchers and some heavy guns are called flechette (or sometimes "beehive," for their distinctive sound), and consist of many small darts.

Shotguns may fire either slugs or buckshot rounds. Slugs are fired in the same way as any other small arms fire using the ratings provided with the weapon. If the shotgun fires buckshot, however, the rules below apply.

Buckshot and flechettes behave as follows.

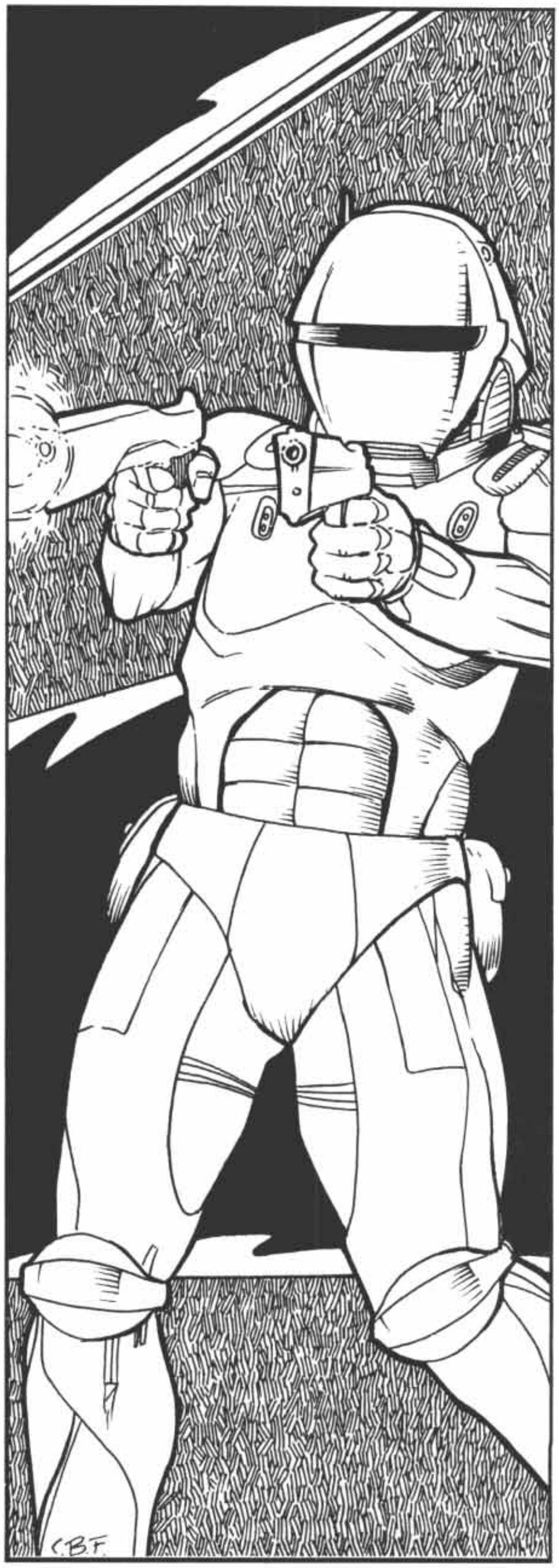
At short range, they are treated as normal single-shot weapons with their listed short-range damage, as the pattern of buckshot or flechettes has not yet spread out.

At medium and long range, each shot is treated as a multi-round burst using the automatic fire rule, including the reduction of dice rolled for hits for recoil and range. Most shotgun and flechette shots are rolled as 10-round "bursts," but three- and five-round "bursts" are also possible. The number of dice rolled for the shot is indicated parenthetically with the weapon's ROF. For example, SS (10) is a single shot weapon firing a 10-dice burst, while SA (5) would be a semiautomatic weapon rolling five dice per shot. Each rolled hit does damage as indicated in the damage column.

Some shotguns or flechette-firing weapons are capable of automatic fire. The listed burst size of the weapon is the number of multi-dice "bursts" of buckshot or flechettes that are actually fired. At short range the player rolls a number of standard direct fire tasks (as modified by recoil) equal to the burst size, with each hit doing the indicated short range damage. At medium or long range use the range rule from automatic fire to calculate the number of dice rolled for hits based on the appropriate burst size (i.e., subtracting one die per range band from a three-round burst, two dice from a five-round burst, etc.). This shows the number of multi-dice bursts to be rolled for at that range. Each of these bursts must also have its number of hit dice reduced for range and recoil.

For example, an automatic grenade launcher firing a five-round burst of flechette, each rolling 10 dice (listed in the ROF column as "5(10)") would roll five dice for hits at short range. At medium range, there would be only three flechette bursts to roll for (because a five-round burst loses two rounds per range band), and each of these 10-round bursts would be reduced to seven dice rolled for damage (because 10-round bursts are reduced by three dice per range band). At long range, there would only be one flechette burst left (the five-round burst has lost two more rounds for the next range band), and that burst would be further reduced to only four dice rolled for hits. For simplicity, this example did not include the effects of recoil, which would further reduce the number of dice.

Bukshot and flechette differ in that flechette darts are more aerodynamically shaped, and therefore have better range performance. Buckshot can fire out to only medium range (no effect at long or extreme), while flechette can fire



out to long range (no effect at extreme). Flechettes also often have better penetration performance. Penetration for both buckshot and flechettes is listing in the penetration rating column of the combat performance tables (pages 350-357).

Bursting Flechette Rounds: The above rules apply to flechettes that are fired shotgun-style from small arms. Larger weapons, rockets, and missiles fire bursting flechette warheads which are fired as single warheads but which explode at a certain distance. The flechettes fly outward in an advancing cone from the exploding warhead, then stabilize to form a wide cylinder or disk of flechettes travelling along the path on which the round was fired.

Bursting flechette rounds can be recognized in the weapons listings because they are rated with a *danger zone* of a certain width in meters x a certain length. This danger zone is the round's *primary* danger zone, the *secondary* danger zone has the same width and length, and begins at the end of the first danger zone (along the path of flight). Within these danger zones, whose width is centered on the line along which the round was fired, all targets roll as if they were within the primary (if in primary danger zone) or secondary (if in secondary danger zone) burst radius of an artillery shell, see page 283. Each flechette hit in the primary danger zone does 2D6 points of damage with a penetration rating of 1, each hit in the secondary danger zone does 1D6 points of damage with penetration rating of Nil.

When firing a bursting flechette round, the firing character or crew must make a normal direct fire to-hit roll using the appropriate skill (depending on whether the weapon is a large-bore gun, rocket or missile launcher, etc.), and incorporating all normal modifiers. Success indicates that the warhead bursts so that the selected target is exactly at the midpoint of the primary danger zone, in length and width. If it misses, roll 1D10. 1 indicates that the round burst high, firing over the target (no damage), 2 indicates a low burst, firing into the ground (no damage), 3-4 indicates that the round burst off to the left, 5-6 burst off to the right, 7-8 burst short (farther in front of the target), and 9-10 burst long (farther beyond the target). Roll 1D10 for the number of meters left, right, long, or short, using the aim point to measure from (multiply number of meters by 5 if catastrophic failure was rolled). Once the danger zones are established, roll normally for any targets that may be in the deviated danger zones.

The centerline of the danger zones is always the line drawn directly from the firing unit to the adjusted burst point.

Bursting flechette rounds may only be fired as direct fire, never as indirect fire.

Shotgun and Small Arms Flechette Danger Zone: Small arms flechette rounds (i.e., non-bursting flechette rounds) and shotguns firing buckshot have danger zones like those described in the Automatic Fire rules on page 276, except that shotguns and small arms flechettes do not create a danger zone at short range, because they are treated as single shots at this range: Either they hit their target or they don't. Large caliber flechettes do create a danger space at short range.

Type of Round	*Maximum Range*	*Danger Zone Begins*
Shotgun Buckshot	Medium	Medium
Small Arms Flechette	Long	Medium

As with the automatic fire danger zone, dice that do not hit their targets are rolled against other targets in the danger zone and against other targets that move through the danger zone during the turn.

Energy Weapons: Some energy weapons have a fractional penetration rating. This rating is used the same as the penetration rating of any other small arm, and means that, instead of losing one or more damage dice per armor level penetrated, the weapon will penetrate more than one armor level *per damage die.*

When such an energy weapon hits its target, multiply the target's armor value by the penetration value of the weapon, rounding fractions up. The result is the number of damage dice absorbed by the armor. Subtract this from the weapon's damage value and, if the remainder is a positive number, inflict that many damage dice on the target.

Lasers do not cause blunt trauma damage (see page 285); fusion guns and plasma guns do.

Multiple Modifiers: All modifiers to the number of dice rolled or the range at which fire is delivered are cumulative. When a weapon is firing bursts, the number of dice is never reduced to 0 (see "Minimum Dice," page 277).

Direct Fire Deviation: Certain weapons deviate if they miss when fired in direct fire—rifle grenades and grenade launchers, for example (also bursting flechette rounds, which use their own deviation system detailed above). The die is rolled for distance and direction in the same way as for indirect fire, as noted below; however, the distance die roll is multiplied by only one meter.

Indirect Fire

Indirect fire is fire at a target which the firing character cannot see, following the directions given to the firer by a forward observer who can see the target. Only weapons with an indirect fire range—IFR (listed on the weapons charts)—may use indirect fire.

Calling Fire: In order for indirect fire to be possible, the firing character or gun crew must be in communication (usually by remote communicator) with a character (called a forward observer) who can see the target. The target is a stationary position; it can be a building, but it can't be a moving vehicle (although it can be the place where the forward observer believes the vehicle will be when the fire hits). Before fire begins, the forward observer must talk to the firer for six combat turns. After fire has begun, the forward observer may want to call in corrections to make the fire more accurate. The same restrictions on both characters' actions apply as with other communication; in particular, the firer may not fire his or her weapon during the conversation.

Calling Orbital Fire: A forward observer may also call fire from spaceships or starships in orbit above the battlefield (sometimes called "ortillery"). This fire is actually direct fire from the point of view of the ship, but is controlled from the ground like indirect fire. Orbital fire is resolved as above, except that only the skill level of the forward observer is used. This orbital fire may also be target-designated. See Target Designation, page 282.

Hit Number: Hitting the target is a Formidable task using either the appropriate weapons asset of the firing character or the Forward Observer asset of the observing character, whichever is less (in a crew-served weapon, the skill of the gunner in command is used). If firing a hand-held grenade launcher (either a rifle grenade or a hand-held grenade launcher), the gunner's task difficulty level becomes Impossible.

The following skills are used by gunners when firing weapons in indirect fire:

Skill	*Weapon*
Grenade Launcher	All grenade launchers and mortars
Energy Artillery	Battlefield meson guns
Heavy Artillery	All indirect fire field guns, howitzers, mortars, mass drivers, and rocket launchers
Archaic Artillery	Black-powder cannon, catapults, bombards, etc.
Gunnery (cascade)	Starship-mounted weapons

Note that mortars may be fired by PCs with either the Grenade Launcher or Heavy Artillery skill. Characters with both skills may chose which to use.

Use the appropriate asset and difficulty level to compute the indirect fire "to-hit" number.

Deviation: If the round misses, it deviates—i.e., lands somewhere near (or not so near) its aim point. The referee determines the distance and direction of the deviation from the target of the intended impact point. First the referee rolls 1D10 for distance of deviation. For grenade launchers and rifle grenades, multiply the result by five meters. For mortars, guns, and howitzers, multiply the result by 10 meters. For artillery rockets and orbital fire, multiply the result by 20 meters.

Type of Weapon	*Deviation multiplier (meters)*
Grenade launcher, rifle grenade	5
Mortars, guns, howitzers, mass drivers, meson guns	10
Artillery rockets	20
Orbital fire	20

If the indirect fire weapon is firing at greater than half its indirect fire range, double the result of the deviation roll. The referee then rolls 1D10 and consults the Scatter Diagram to determine the direction of deviation.

Corrections: If the shot doesn't hit, the forward observer may call in corrections. After each correction, subtract 1 from the to-hit die roll and subtract 1 from the die roll for distance of deviation if the round misses. Thus, four corrections would allow 4 to be subtracted from the to-hit die roll (thereby increasing the chance of a hit by 4) and would lower the deviation die roll by 4. A deviation roll of less than 0 is changed to 0.

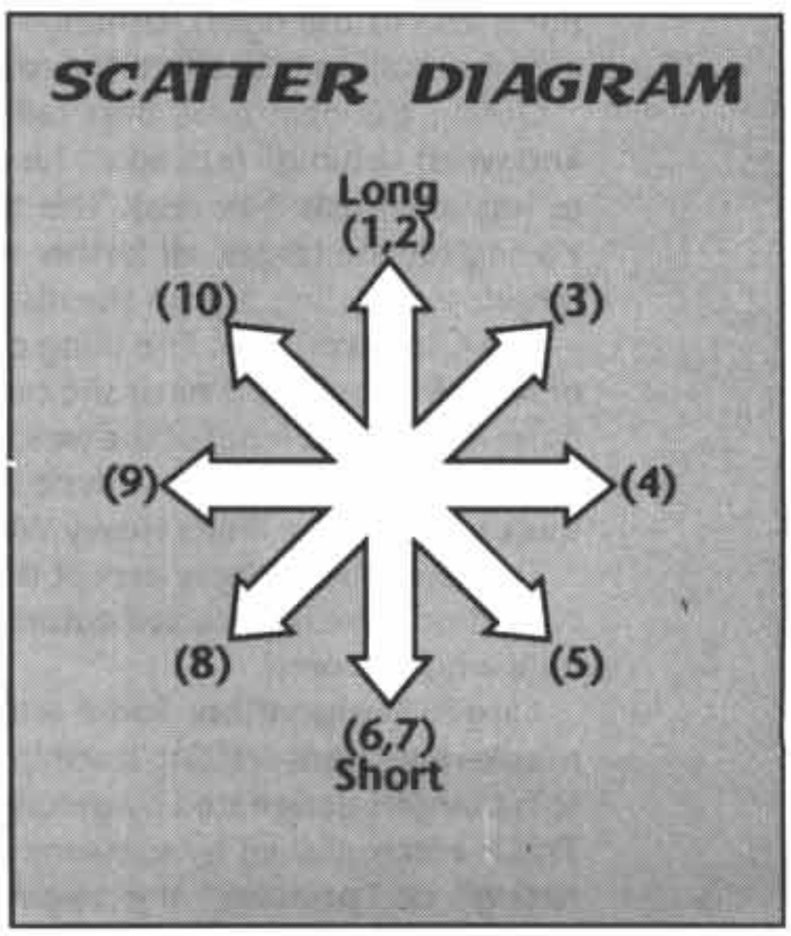
At least one additional shot must be made after each correction before another correction is possible.

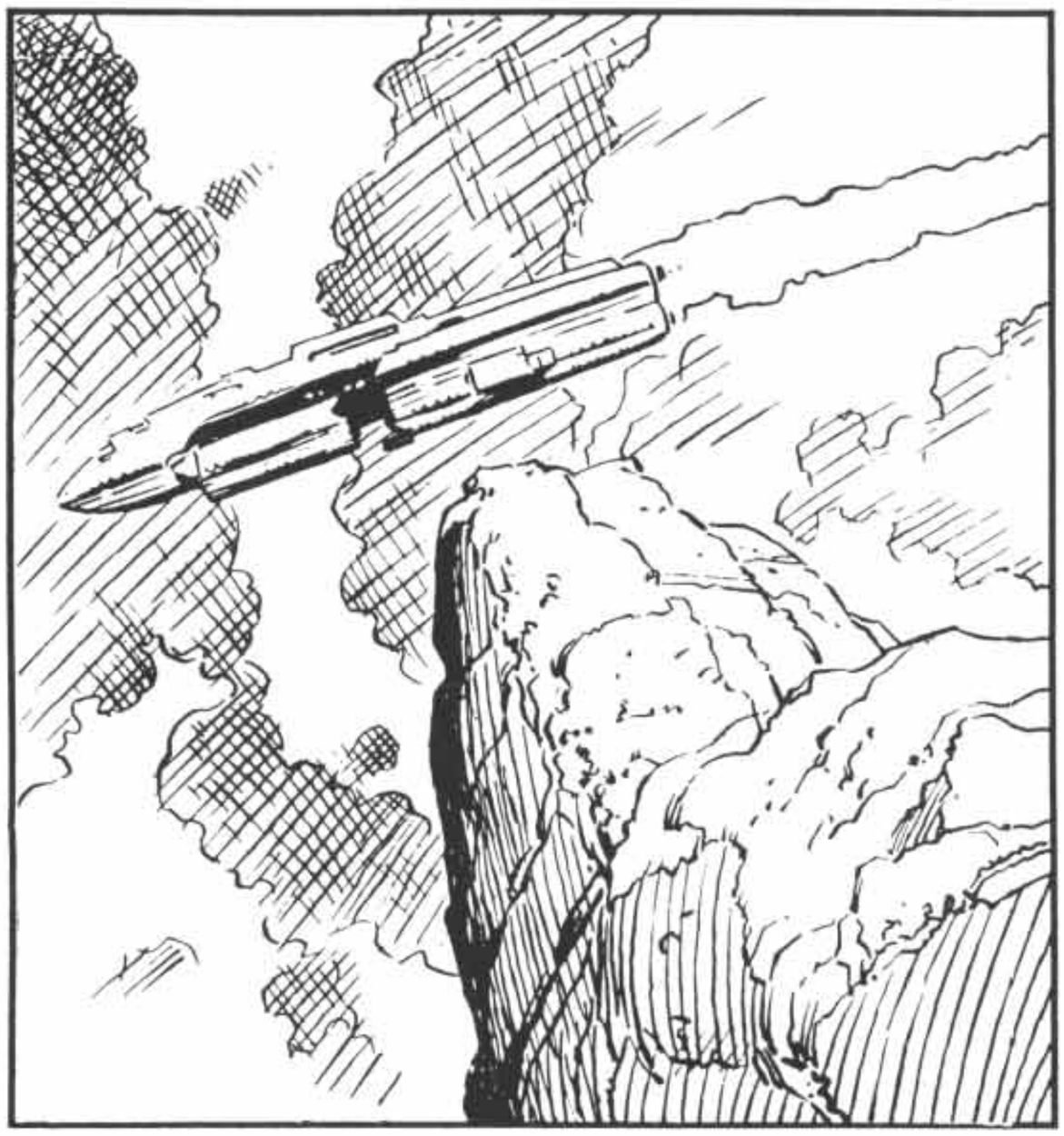
Accuracy: There is a maximum limit to the accuracy of indirect fire. The maximum "to-hit" number for ground-based indirect fire is 14; for rifle grenades and hand-held grenade launchers, the maximum "to-hit" number is 10; for called orbital fire, the maximum "to-hit" number is 16. In addition, the deviation distance roll may never be reduced by more than 5 for ground-based indirect fire; for rifle grenades and hand-held grenade launchers, the roll may never be reduced by more than 3; for orbital fire, by more than 7.

Weapon	*Max Hit No.*	*Max Dev. Reduction*
Orbital fire	16	7
Mortar, howitzer, gun, mass driver, rocket	14	5
Grenades	10	3

Subsequent Shots: If a shot hits, subsequent shots will continue to deviate around the target because of the maximum limits of accuracy. If a shot does not hit, subsequent shots will deviate around the initial impact point (not the target). In both cases, the deviation distance roll is reduced by 5 (for most weapons) or 3 (for rifle grenades and hand-held grenade launchers).

For example, Ushimgii has a grenade launcher and Grenade Launcher asset of 12. Bors has Forward Observer asset of 14. Bors is on a hillcrest observing enemy soldiers coming up the hill. Ushimgii is on the other side of the hill. Bors radios Ushimgii and tells him to fire. Ushimgii fires one grenade, which hits on a 3 or less. He rolis a 6, indicating a miss. For deviation distance the referee rolls a 5—the grenade misses the target by 25 meters. He then rolls a 2, indicating that the grenade goes long. Ushimgii fires another grenade; this time there is no roll to hit, and the grenade deviates





from the point where the first grenade hit. The referee rolls a 3 for distance, reduced by 5, which makes the deviation distance 0; a direction roll is unnecessary, and the grenade hits in the same place.

Bors radios a correction, which takes the next combat turn. This correction increases the chance of a hit to 4 (i.e., –1 allows a die roll of 4 or less to make the 3 or less to-hit number). On the turn following, Ushimgii fires again, but rolls a 6, missing again. The referee rolls a 5 for distance. Because of the correction, this is reduced to a 4, or 20 meters from the target. The referee rolls a 3 for direction (long and to the right). Ushimgii's next shot follows the above deviation procedure (no roll to hit).

During the next turn, Bors radios another correction, and when Ushimgii fires again he will hit on a 5 or less (5 or less –2 equals 3 or less). This time he hits the target. Having hit the target, all further deviation is around the target, subtracting 5 from the distance roll.

Self-Observed Fire: The firing character may act as his or her own observer if he or she can see the target. (This is done if the target is out of the weapon's direct fire range or if the weapon is a mortar with no direct fire capability.) In this case, only the firer's Heavy Weapons skill is used.

The rules above apply except that there is no delay for corrections; fire is corrected automatically after every shot *until a hit* is scored.

Target Designation: Some artillery rounds, including missiles fired from orbiting starships, can guide themselves to hit targets designated by ground-based lasers or radar. This is accomplished by someone near the target "illuminating" or "painting" the target with a hand-held or vehicle-mounted laser designator or vehicle-mounted radar. So long as the target remains illuminated, the round will hit the target without deviation. If somehow the illumination is stopped or interrupted, the projectiles "go stupid" and the fire is resolved as normal indirect fire.

Keeping a target illuminated until the ordnance arrives may require a character to roll a task. This task is equivalent to the task to designate a target for a target-designated tac missile as discussed on page 278. For radar designation, it is automatic.

Designated rounds, the weapons capable of firing them, and the system used for designation will always be noted with the weapon.

Thrown Weapons

Any hard object can be thrown at another character or animal. Hitting the target is Difficult: Thrown Weapon at effective range and Formidable: Thrown Weapon at long range. Effective range is equal to the character's throw range if the object weighs one kilogram or less. If the object weighs more than one kilogram, effective range is equal to the character's throw range divided by the weight of the object. Long range is twice effective range. Thus, if a character had a throw range of 20 meters, he or she would have an effective range of 10 meters with a two-kilogram object, five meters with a four-kilogram object, etc.

If a thrown object hits its target, it causes hits equal to the sum of the throwing player's Strength plus 1D6, regardless of the weight of the object. Thrown objects have an armor penetration of Nil.

A throwing knife will always inflict 1D6 hits, regardless of the range or Strength of the thrower. Its armor penetration is likewise Nil.

Hand Grenades: Hand grenades are a subset of thrown weapons, and also are thrown at specific targets. Hand grenades may be thrown at either effective range or long range, as explained above.

If the throw misses, roll for distance and direction of deviation in the same way as for indirect fire, but multiply the distance of deviation die roll by one meter if throwing within effective range and two meters if within long range. The total deviation may never be greater than half the range of the throw. Thus, if a grenade is thrown at a target 20 meters away, the grenade cannot deviate more than 10 meters.

GRENADE DEVIATION

Range	*Deviation*
Effective	×1 meter
Long	×2 meters

A PC may throw additional grenades at the same target. If the target does not move, add 1 to the thrower's Thrown Weapon skill for all grenades after the first.

The referee can alter the chances of a hit based upon the difficulty of the throw; he or she might reduce the difficulty level by one for throwing a grenade at a large target like a tank or increase it by one for trying to throw a grenade through the firing slit of a bunker.

Effects of Fire and Combat

Once a target is hit by a weapon, the weapon's destructive effects upon the target must be calculated.

EXPLOSIONS

Many types of ammunition do damage solely by virtue of their kinetic energy. That is, they slam into the target and damage it by sheer brute force. All small arms fall into this category, as do many antitank rounds.

Other types of ammunition, however, explode when they hit, and this section describes their effects.

Descriptive Terms: The power of an explosion is described by two ratings: concussion and burst. Concussion is the effect of the massive overpressure wave generated by the explosion, while the burst radius is the area filled with small, high-energy fragments (often called shrapnel). These jagged metal fragments can cause severe injury. But they lose energy quickly due to their eccentric ballistic shape and thus do not carry anywhere near as far as a bullet.

Concussion: The listed concussion value for an explosion is the number of damage dice rolled if in contact or in the same 10-meter grid square as the explosion. If a character is in an adjacent 10-meter grid square, the explosion does half of this value, rounding fractions down. If one square farther away, it does half of this value, rounding down, and so on until the concussion is reduced to 0.

Concussion can affect part or all of the body, so the number of concussion damage dice called for are rolled and divided evenly among the various body parts. Simply divide the total damage suffered by 7 and add that many points to each body part. All points left over which are not evenly divisible by 7 are added to body parts as instructed by the referee. At least 1 of the extra points should be to the head, and the remainder should be distributed on the side facing the explosion or to any previously injured part.

If the target character is actually in physical contact with the explosive, the full concussion value is taken first as damage to the body location in contact with the explosion. Then the character suffers the full cuncussion value *again,* but divided among all of the hit locations, the same as a character standing in the square but not in contact with the explosion.

The following example table shows the reduction of concussion damage at successive ranges for an explosion with a concussion value of 30.

CONCUSSION EXAMPLE

Range	*Concussion*
Contact	30+30
Same square	30
1 square away (adjacent)	15
2 squares away	7
3 squares away	3
4 squares away	1
5 squares away	None

Cover: Characters completely behind solid cover, such as behind a thick wall, completely inside a trench or foxhole, or inside an armored vehicle, do not suffer the effects of concussion. Characters under partial cover (such as partially exposed behind a wall, in a foxhole, or in the hatch of an armored vehicle) and prone characters halve the concussion value of any attack on them. (This does not apply to explosions which are in physical contact with them, such as grenades dropped into their trench.)

Characters in a small, tight enclosure, such as an armored vehicle or small concrete room, into which an explosive is delivered, suffer double concussion damage divided evenly among their hit locations.

Burst: The burst rating for an explosion is its primary burst radius—the area saturated with a high density of fragments. The secondary burst radius, which has a lower concentration of fragments, is twice this. The burst radii are expressed in meters, but are stepped in increments usable with the tactical grid system. (See Sample Burst diagrams on the following page.)

Hit Procedure: Roll 1D10 for each character within either the primary or secondary burst radius of an explosion. Characters within the primary burst radius are hit by multiple fragments on a roll of 1-3, a single fragment on a roll of 4-6, and no fragments on a roll of 7-10. Characters in the secondary burst radius are hit by multiple fragments on a roll of 1-2, a single fragment on a roll of 3-4, and no fragments on a roll of 5-10. If a character is hit by multiple fragments, roll 1D6 to determine the number.

Damage and Penetration: Fragments do damage as small arms fire. Fragments closer to the explosion are more dangerous than those farther away. Fragments in the primary burst area do 2D6 damage and expend one damage die per level of armor value (AV) struck. (Thus, they may penetrate armor of AV1 and still do 1D6 damage). Fragments in the secondary burst area do 1D6 damage and will not penetrate armor.

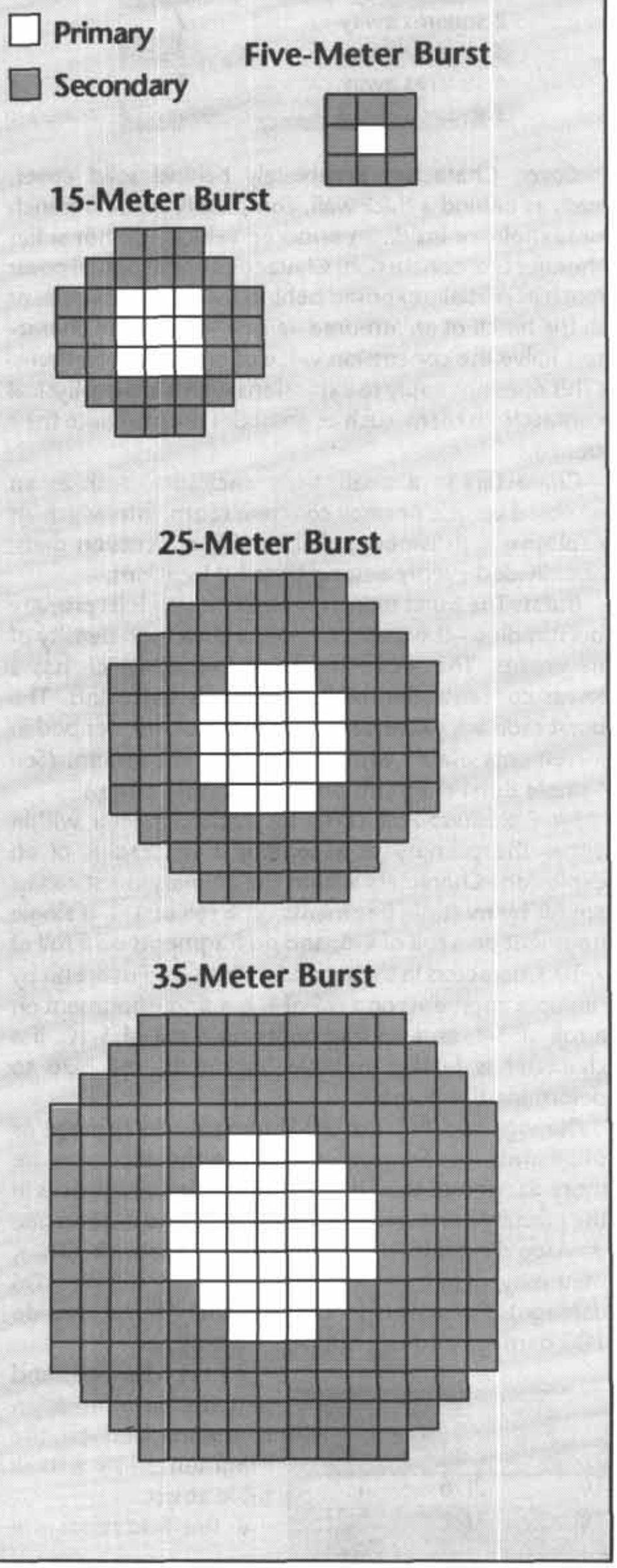
All hit, damage, and penetration information is summarized on the Fragmentation *Attack* table at left.

If the fragments are

FRAGMENTATION ATTACK

Burst Radius	*Range*	*1D6 hits*	*1 hit*	*No hits*	*Dam*	*Pen*
Primary	1×Burst	1-3	4-6	7-10	2D6	1
Secondary	2×Burst	1-2	3-4	5-10	1D6	Nil

SAMPLE BURST DIAGRAMS
(Ten-Meter Grid)



from an incendiary warhead (such as white phosphorus), also see "Burns" on page 286.

Exploding Round Penetration: All exploding rounds have a listed penetration value expressed as the minimum armor value of penetration. The actual penetration of the round is the listed penetration plus the roll of 2D6 (except for rounds with a listed penetration of Nil). Compare this to the armor value of the target vehicle and consult the vehicle damage tables. (See "Damage from Fire" in the Vehicle Combat chapter on page 296.)

Submunitions

Submunition ammunition includes bombs and artillery rounds filled with grenades. The round bursts at a high altitude and scatters grenades throughout its listed burst radius. In the case of HE (high-explosive) submunition rounds, these are high-explosive/fragmentation grenades. In the case of DP (dual-purpose) submunition rounds they are HEAP (high-explosive, armor-piercing) grenades capable of penetrating the roofs of armored vehicles.

When a character or vehicle is in the burst zone of an HE- or DP-carrying submunition round, consult the Submunitions Attack table on page 285. On the numbers listed under the Close column on 1D10, a grenade lands in the same grid square as a character or vehicle. (Roll once per grid square containing one or more characters or vehicles, not once per character or vehicle in the square.) On the numbers listed under the column labeled Adjacent, a grenade lands in the adjacent grid square. The Concussion, Burst, and Penetration columns list those values for the individual grenades in a round.

The chance of a direct hit on a character or vehicle in the grid square is also noted on the Submunitions Attack table. This is rolled for only if it has already been determined that a grenade landed in the same grid square.

Roll once for each character and vehicle in the square. If more than one hit is achieved, then the referee should randomly determine which of the characters or vehicles actually suffered the hit.

All direct hits on vehicles are resolved as overhead attacks.

Guided Submunitions: Some submunitions have homing sensors and seek out individual vehicular targets after being dispersed, sometimes hanging beneath parachutes to give them time to find a target.

Roll normally to see if a submunition lands in a grid square, and then roll for direct hits. Guided submunitions are specified as being antivehicle or antipersonnel. Increase the chance of a direct hit on the specified target type by 2 on the 1D10 hit roll (i.e., personnel are hit on 1-3 rather than 1, or vehicles on 1-7 instead of 1-5).

WOUNDS AND DAMAGE

A character can be injured as a result of combat in several ways. The following three pages explain how damage is assessed against characters. The next section, Wound Effects and Healing, beginning on page 288, shows how this damage actually affects its targets.

Gunshot Wounds

Each time a character is hit by fire, he or she is wounded. The extent of the injury is determined by three factors: hit location, weapon damage, and target protection.

Hit Location: Whenever a character is hit, roll 1D10 and consult the Personal Hit Location chart on page 269. This indicates the body part struck and injured by the shot.

Weapon Damage: Most weapons do the same anti-personnel damage at all ranges. This is true for slug-firing small arms, for large-caliber chemically propelled guns (which have a constant antipersonnel damage value) and high-energy weapons (plasma and fusion guns whose damage value remains constant but whose penetration ratings decline over distance). The damage value of the weapon is listed on the weapons charts and is the number of D6 rolled. Some weapons have a damage value of –1. In this case, roll 1D6 and subtract 1 from the result.

Lasers are an exception; their damage varies with range. The laser combat performance chart (page 354) shows the amount of damage dice done at each of the four range bands. (Lasers are also an exception in that their listed personnel damage dice are not the same as their damage value, see page 297 for further discussion.)

Some weapons fire exploding rounds. These weapons have a damage rating consisting of two separate listings: concussion and burst. These effects are calculated with the explosion rules on page 283.

Target Protection: If the target is wearing body armor and the shot strikes a protected body part, the shot may not be able to penetrate the armor. Flak jackets and Kevlar vests protect both the chest and abdomen. Helmets partially protect the head. If a character is hit in the head, roll 1D6. The shot strikes a helmet on a roll of 1-4. On a roll of 5-6, it hits the unprotected head.

Each weapon has a penetration rating that reflects its ability to punch through armor. This rating may consist of the simple notation Nil, indicating that the shot will be stopped by any armor protection, or it may have up to three different numeric ratings. If so, *the first rating applies to both short and medium range*, the second to long range, and the third to extreme range. If a weapon's penetration drops to Nil at any range band, it remains unable to penetrate armor at longer ranges, so no additional entries are made.

The penetration value of a weapon is the number of damage dice it loses for each armor value it is required to penetrate. *Multiply the target's armor protection by the weapon's penetration value and subtract the result from the weapon's damage value.* If the remainder is a positive number, the shot penetrates, and the referee rolls that many dice for damage. If the remainder is 0 or a negative number, the shot fails to penetrate.

For example, a character fires a 5mm rifle at short range and hits his or her target in the chest, which is protected by a flak jacket. The 5mm rifle has a damage value of 3 and a penetration of 1 at short range, and the flak jacket has an armor value of 1. Multiplying the penetration (1) by the armor value (1) and subtracting the result (1) from the weapon's damage value (3) shows that the 5mm penetrated the flak jacket and did 2D6 of damage.

Laser Penetration: Most small arms lasers will have a penetration rating of Nil, which means they are stopped by armor values as low as 0. However, this only applies to rigid metallic or ceramic armors. Non-metallic or ceramic armors are treated as *no armor* by lasers, and are thus disregarded. Likewise, non-rigid metallic armor like chainmail is also treated as no armor. See Personal Armor on pages 358-9 for more details.

Outstanding Success: Any time that an Outstanding Success is rolled when firing at a character, double the damage caused by the shot.

Quick Kill: Any shot which hits the chest or head may constitute a killing shot. Roll 1D20. If the roll is less than or equal to the damage value of the shot, the target is instantly killed except on a roll of 20 exactly.

If the hit was scored on an area protected by armor, roll versus the remaining damage value of the round.

For automatic fire, roll only once per turn (regardless of the number of shots that hit).

This rule should be applied only to NPCs. It is recommended that PCs who suffer a killing wound instead double the damage inflicted by the round. (Note: We know this is unrealistic, but this is, after all, a game. Referees should consult their players before disregarding this recommendation.)

Blunt Trauma: When the bullet from a slug-firing small arm or the plasma from a plasma or

SUBMUNITIONS ATTACK

Round	*Close*	*Adjacent*	*Concussion*	*Burst*	*Pen*
Light Arty HE	1-3	1-2	3	15	Nil
Light Arty DP	1-3	1-2	3	15	4C
Med Arty HE	1-4	1-3	3	15	Nil
Med Arty DP	1-4	1-3	3	15	4C
Hvy Arty DP	1-5	1-4	3	15	4C

Submunitions Direct Hit Chance: Personnel, 1; Vehicle, 1-5 on 1D10.
Guided Submunitions Direct Hit Chance: Personnel, 1-3 *or* Vehicle 1-7 on 1D10.
See notes in Submunitions section on page 284.

fusion gun strikes a person, it packs considerable force and will cause injury even if it does not penetrate the target's body armor. This is called blunt trauma. A target suffers 1 actual point of damage for each D6 worth of damage absorbed by the armor. Note that bullets which penetrate and cause some normal wound damage will also still cause blunt trauma.

In the example of the 5mm rifle firing above, the target would take 1 point of blunt trauma damage for the one damage die absorbed by the flak jacket.

Note that, by their nature, lasers cannot cause blunt trauma.

Cover: Characters and vehicles may hide behind obstacles as protection from fire. If the hit location rolled is covered by the obstacle, the shot has no effect unless it is able to penetrate the obstacle. The Armor Equivalency table on page 298 allows calculation of the armor values of common types of cover.

For example, a character is under cover behind a tree which is 60 cm in diameter. The referee decides that, since the character is firing a weapon, his or her head and right arm are exposed. If the PC is hit in the chest, the shot strikes the tree instead and provides an armor value of (60÷5=) 12.

Similarly, a character sticking her head out of a foxhole is likewise protected. Any hits fired from ground level (overhead shots obviously negate her protection) that are rolled to hit her legs, arms, abdomen, and torso are no effect, because the thickness of the dirt between the firer and target is too great to be reasonably penetrated. However, if the surface in front of the character were reasonably hard, such as rocky surface or a metal vehicle hull if the character were instead sticking his or her head out of a tank's hatch, there is a chance that some of the "hits" rolled against the character's protected body parts may ricochet or "skip" off the surface at a low angle and hit the PC's head. This chance should not exceed 1 in 10 (a 19-20 on a D20), and should be related to the slope of the surface (but a lot of tank drivers have died this way).

Damage dice absorbed by an obstacle do not cause blunt trauma injuries against the target character.

Burns

Many chemicals and grenades burn at very high temperatures (2200° to 2700° Celsius) and cause burn damage. Large plasma and fusion guns also cause explosions which throw melting and burning debris. Characters may also suffer burn damage from exploding vehicles and open flames.

Characters come in contact with burning chemicals or other materials when they are hit by fragments from the explosion of a plasma or fusion weapon, incendiary bomb, shell, or grenade (such as WP, white phosphorus), or are hit by plasma/fusion splatter (page 356). Whether the character is hit and by how many fragments is determined exactly as for normal fragments, as explained in the explosions burst rule on page 283, but if a character is hit by a burning fragment, burn damage is suffered instead of a normal wound.

Characters come in contact with burning fuel by being inside or near a vehicle when its fuel tanks explode. The primary burst radius of an exploding vehicle is 15 meters. All characters inside the vehicle when it explodes are covered with burning gasoline.

Characters come in contact with open flames when moving through a burning structure or a grass fire, usually to escape but perhaps to rescue a wounded companion.

The amount of burn damage caused is determined by the temperature of the flame and the length of exposure.

Temperature: Incendiary chemicals cause 2D6 damage *per second* in contact with a body part. Burning fuel causes 1D6 points of damage *per second* in contact with a body part. Moving through a burning structure causes 1D6 damage *per turn* per body part in proximity to the flame. This is summarized on the Burn Damage table.

BURN DAMAGE

Source	*Damage*
WP	2D6
Thermite	2D6
Fuel	1D6
Structure/grass fire	1D6
Plasma/fusion gun debris	2D6

All damage dice are *per second,* except for structure/grass fire, which is *per turn.*

Exposure Time: In the case of open fires, the exposure time is measured in terms of combat turns actually in close proximity to the fire. In the case of fuel or incendiary fragments, exposure time begins at the start of the combat turn immediately after the character was hit. Characters hit by burning fragments will instantly attempt to remove them. They will make one such attempt per second in the turn, by making an Average task roll against Agility. Each successful attempt removes or extinguishes the fragment or fragments on one body part. The character still suffers burn damage for the second in which he or she succeeds in extinguishing a flame.

For example, a character is hit by three burning fragments of fusion gun debris, two on her arm and one on her leg. In the first second, she fails to extinguish any fires and takes 4D6 damage to her arm and 2D6 damage to her leg. In the next second, she brushes off the burning debris from her arm, but still takes 4D6 damage to her arm and 2D6 to her leg. In the third second, she brushes the debris from her leg and suffers 2D6 damage. Her total damage has been 8D6 to her arm and 6D6 to her leg.

If a character suffers sufficient damage to lose consciousness part of the way through a turn (say, after

three or four seconds), he will remain conscious until the end of the turn. Other characters may help extinguish the burning character, making one attempt per second of the turn in the same way as described above.

Protection: Any sort of helmet will protect the head against an open flame. Fuel and incendiary fires will burn through the helmet, or their heat will be conducted through it after 30 seconds (six combat turns). The helmet may be removed and discarded in one second without need for an Agility roll. Most flexible vests will protect characters against open flames, but they will catch fire if contacted by fuel or incendiaries. Rigid armor (such as battle dress and combat armor), if sealed, will protect characters against open flames, fuel, and incendiaries.

Falls

Characters falling from a height take damage upon hitting the ground. This damage is equal to 2D6 per meter fallen. Damage is distributed according to the Personal Hit Location chart (page 269) as follows: Roll three locations. The first location takes half the total damage points. The second takes one-quarter the total, and the third takes the remainder. If the same location is rolled twice, it takes additional damage accordingly. It is possible for one location to receive the full damage.

Damage from falls is reduced by Agility. Roll a number of D6 equal to the falling character's Agility and reduce the damage by that amount (removing hit points from locations at the character's choice). Unconscious characters may not use their Agility in this manner.

For example, a character with Agility 4 falling from three meters would take 6D6 damage, reduced by 4D6.

Referees may adjust the total number of damage dice at their discretion to reflect intangibles and variables such as type and hardness of surface landed on. For example, most characters should be able to handle a jump from a one- or two-meter-high object onto dry, level ground without damage (a two-meter fall is 4D6, which averages 14. A character with an average Agility, 6, would roll 6D6, averaging 21, hence no damage). But if the surface beneath had slick mud and sharp rocks hidden beneath a layer of leaves, the referee should increase the number of damage dice. Also, characters who were pushed or fell involuntarily from even a low object should have the number of damage dice increased.

Falls from Moving Vehicles: Characters who fall out of a moving moving vehicle take damage as if they had fallen one meter per 10 meters of combat move (7.2 kph) of speed. Characters who fall out of moving flying vehicles add the damage dice due to speed to the damage dice due to height for one total roll. For example, a character who leaped from an air raft moving at 30 meters per combat turn, and at an altitude of four meters, would roll 14D6 for damage (four meters for altitude, plus the equivalent of three meters for speed is seven meters, times 2D6).



Poison

Some creatures, such as vipers, snakes, scorpions, and spiders, do little actual damage with their claws and/or teeth, but are able to inject poisons into their prey. Damage listings for these creatures are given in the form of a number followed by a small *p* (for *poison*) then another number. The first number represents the number of hits actually done by the delivery system (fang, stinger, etc.). If these hits are negated by armor, then no damage is suffered from the poison. However, if any damage does get through the armor, the target takes that damage on the turn in which was hit, and on each succeeding turn it also takes damage from the poison. Poison damage is always applied to the target's chest, and it is expressed as a number of dice, as indicated by the number following the *p*.

For example, imagine that Grayson has been stung by a small venomous animal twice in the right arm, once in the head, and once in the chest, which is protected by a flak jacket. This particular animal has a damage rating of 1p1, so on this turn Grayson takes 2 points of damage to the arm and 1 point to the head, but the jacket stops the chest wound. On the next turn and each thereafter, Grayson will take 3D6 points to the chest, from the wounds to head and arm.

For simplicity's sake, poison damage is considered to continue until the character's chest wound level becomes critical. If the referee desires more realism (and more complexity), each poison wound can be considered to cause damage for 2D6 turns (up to one minute), after which the toxin becomes dispersed enough to lose its potency.

Wound Effects and Healing

WOUND EFFECTS

A variety of effects result from wounds, some temporary and some more lasting.

Immediate Effects

These temporary effects apply to a character who has just been wounded. These are in addition to the lasting effects of the wound itself, which are discussed below, under Wound Severity.

Knockdown: If a character suffers more points of damage in a combat turn than his or her current Agility, he or she is knocked down and may not conduct any other action for the rest of the current turn. Concussion damage counts the same as gunshot and fragmentation wounds for determining knockdown, but burn damage does not.

Stun: Any damage to the head, including burn damage, has a chance of stunning the character. To avoid stun, roll 1D6 and add the damage suffered from the wound. If the result is equal to or less than the character's Constitution, he is unaffected. If the result is greater than his Constitution, he is stunned. Stunned characters must make a roll against their Constitution each turn in order to regain consciousness. The task is Difficult if the result was equal to or less than twice the character's Constitution, and is Formidable if the result was greater than twice the character's Constitution. This roll is made during the character's normal Initiative step of the turn. If successful, the character is conscious, but may not act in the current turn. The character may act normally in the following turn.

For example, a character suffers a wound to the head with a damage of 6 and rolls a 5, for a total of 11. His Constitution is 9. He must make a Difficult roll against his CON (rolling a 9 or less) at his Initiative step each turn until he regains consciousness.

Stunned characters are automatically also knocked down.

Wound Severity

There are four levels of wound severity: scratch, slight, serious, and critical. If one of a character's body parts has taken damage less than or equal to half its hit capacity (round down), it is "scratched." If one of a character's body parts has taken damage more than half of its hit capacity up to equal to its hit capacity, it is slightly wounded. If it has taken more damage than its hit capacity, but less than or equal to twice its capacity, it is seriously wounded. If it has taken damage in excess of twice its hit capacity, it is critically wounded.

Note: If a character takes enough damage from a hit to immediately take a part of his or her body from unwounded to slightly wounded, the effects of a scratch wound are superseded by the effects of the slight wound.

Scratch Wounds: Scratch wounds mainly represent the initial shock of suddenly being *hurt*. The first time that characters take damage during combat, the characters lose their next action. Characters never suffer more than one lost action per day (24-hour period) for scratch wounds, regardless of how many they suffer in a combat.

Slight Wounds: A slight wound immediately reduces the character's Initiative rating by 1 point. However, characters never suffer more than one Initiative reduction for slight wounds, regardless of how many they suffer. Slight wounds have no other effect on combat, although the referee may decide to penalize actions making use of slightly injured arms or legs.

Serious Wounds: A serious wound reduces a character's effective Strength by half (rounding the final Strength rating down) and causes an additional immediate 2-point reduction of the character's Initiative rating (for a total of 3, including the slight wound reduction). Characters whose Initiative ratings are reduced to 0 or less may not take any further actions during this combat.

Characters who suffer a serious injury must also make a special roll to avoid losing consciousness. This is a Difficult task roll versus the Constitution attribute. The roll must be repeated every combat turn in which the character attempts to conduct any activity. A serious injury to the head automatically causes loss of consciousness. Unconscious characters make a Formidable task roll against their Constitution each 30 seconds (six combat turns) to attempt to regain consciousness.

Finally, a serious wound to the leg or arm causes the character to lose the use of that limb until it is healed.

Critical Wounds: A critical head injury causes immediate death. Critical injuries to other body parts cause immediate loss of consciousness and require medical attention within 10 minutes, or the character will die from loss of blood.

Characters who lose consciousness due to a critical wound make a percentile roll against their Constitution at the start of every combat turn to attempt to regain consciousness. Once such characters regain consciousness, their Strength is halved (round down) and they also receive an additional immediate 2-point reduction to their Initiative rating (for a total of –5 to Initiative). Characters whose Initiative ratings are reduced to 0 or less may not take any further actions during this combat.

Wounded NPCs: It is neither necessary nor desirable to keep rigorous records on the number and location of all hits on every NPC. As a result, a simplified wound system is used.

All NPCs have the same hit capacity: 40. The referee is provided with NPC record forms in the appendix at the end of the book (and you are given permission to photocopy them for your own game use). The form has two rows of 20 boxes each labeled "Wounds."

As soon as an NPC takes any hits in the first row, he or she is slightly wounded and suffers a –1 Initiative penalty.

As soon as the first row of boxes is full and the character takes one or more hits in the second row, the NPC is seriously wounded. The character suffers an additional –2 Initiative penalty (for a total of –3), and his or her Strength is reduced by half (round final Strength down).

As soon as the second row of boxes is filled and the character takes one or more additional hits, the NPC is either dead or unconscious (but in either case is no longer a threat.)

Whenever an NPC is hit by fire, roll for hit location normally. If a head hit is scored, all damage is doubled. If either a head or chest hit is scored, there is a chance of a "quick kill" (see page 285). Otherwise, hit location is used only to determine if the bullet hit a body part protected by cover or armor.

HEALING

Each of the body's seven hit locations may be wounded to one of four levels: scratch, slight, serious, or critical (as explained under "Wound Severity," above). In general, as wounded body parts heal, their wound level decreases through those levels in reverse order until they are no longer wounded—critical heals to serious; serious heals to slight; and slight heals to *unwounded* (healed). (Note that scratch wounds are a special case covered below.)

When a wound level decreases from critical to serious, the damage points are reduced to the midpoint of the serious level. When a wound level decreases from serious to slight, the damage points are reduced to the midpoint between slight and zero (which is technically the high mark for the scratch wound level—but the scratch wound level is ignored once a wound reaches slight, so this status is still considered slightly wounded). When a wound level decreases from slight, it reduces to unwounded.

For example, a character's arm has a hit capacity of 28 points and has taken 32 points of damage. It is seriously wounded. When it heals to slightly wounded, the damage points are reduced to 14, which is halfway between the top end of the limb's slightly wounded status and 0.

Note that penalties caused by a wound level (such as Initiative reductions) remain in effect until that wound level is reduced to the next level (at which point penalties for the next level remain in effect).

First Aid: It is best to treat wounds as soon as possible after they are incurred. In order for first aid to be effective, then, it must be applied within 36 turns (three minutes) of the time the wound was received. Effective first aid will reduce a critical wound to a serious one, or reduce the healing time of a serious wound by two days. First aid has no effect on slight or scratch wounds, except to prevent infection. To administer first aid to damage caused by poison requires an antivenin autoinjector or a doctor's medical kit (which contains them, see pages 334-335).

First aid is a Difficult task versus Medical (Trauma Aid), assuming a doctor's medical kit is on hand. If one is not available, the task becomes Formidable. Use of a pocket or computer medical scanner (page 334) adds +1 to the Medical asset of characters performing first aid. Conscious characters can attempt first aid on themselves.

The use of a personal medical kit (page 334) allows a character with neither Medical skill nor a doctor's medical kit to avoid the unskilled penalty when attempting a first aid task (thus it is a Formidable task using the character's EDU attribute as a substitute Medical asset). One such use uses up the medical kit. Use of a computer medical scanner (page 334) also allows unskilled characters to avoid the unskilled penalty, or adds +1 to the substitute asset of unskilled characters using a personal medical kit.

Stabilizing Critical Wounds: Critical wounds must be stabilized within 10 minutes or the injured character dies. (Remember, though, that death is automatic with a critical wound to the head.) Stabilizing a critical wound is a Difficult task versus Medical (Trauma Aid), but certain types of equipment add points to the effective skill level of the character performing the treatment. Blood plasma, strong sedatives, a doctor's or personal medical kit, or a medical scanner (page 334) each add +1 to the skill level, and these things can be used in conjunction with one another for a collective bonus. In a hospital or clinic setting, whole blood may be used instead of blood plasma, for a bonus of +2 instead of +1. Use of an automed (page 333) uses the automed's Medical bonus *only*.

Basic Healing Rate: A character without medical attention may heal from a slight wound level to unwounded in three days. To go from serious to slight takes four days, and from critical to serious takes one week. Note that healing of various body parts goes on simultaneously.

For example, on Monday, Paul Currin is shot up pretty badly in a violent boarding action and receives a slight wound to his head, a serious wound to his chest, and a critical wound to each leg. A medical team stabilizes his critical wounds, and Currin is taken to his quarters to recover. Three days later, on Thursday, his head wound has healed. By Friday, his chest wound has reduced to slight. On the next Monday, both critical wounds reduce to serious, and his slight chest wound reduces to unwounded (it has been three days since Friday). Four days later, on Friday, both legs reduce to slight, but Currin gets out of bed and is involved in an accident on the hangar deck during pistol practice, taking another slight wound to the head (accidents will happen). By the next Monday, all three slight wounds have healed completely. Despite recent setbacks, Currin is ready to go out and look for more trouble.

Recovery From Scratch Wounds: Scratch wounds require 24 hours to heal to an unwounded state. If a scratch wound is taken to a body part, and then further wounds to that body part during the day push that body part's wound level to slight, the rates and rules for healing from a slight wound are used. Slight wounds do not heal to a scratched state; they heal to unwounded without passing through the scratch wound level status.

Medical Care

Medical care and supervision will increase an injured character's basic healing rate. If a character is under successful medical care while healing, two days are trimmed from each stage of healing. In other words, critical wounds heal in five days, serious wounds in two days, and slight wounds in one day. (In the example above, Currin would have healed completely in eight days, rather than two weeks.)

Successful medical care requires two things. First, the caregiver must spend half an hour per wound level, per body area damaged, per day, tending to the wounds. (For instance, when Currin was first injured, he would require four and a half hours of care per day. When he reached only three slight wounds, only an hour and a half of care was required per day.) Second, once per day the caregiver must pass an Average check of his or her Medical asset. If no medical equipment is available (a doctor's kit is minimum), then the task check becomes Difficult.

Failure means that one of the two days' worth of time to be saved was lost. In other words, if the task is failed one day during the treatment period, only one day is saved from the normal healing time. If the task is failed twice, no days are saved. Note that failing the task a third time (or more) does not add time to the basic healing rate unless a Catastrophic Failure is rolled on this third check (or beyond).

Surgery: Surgery can reduce a critical wound drastically. Like any other medical care, it will usually be performed at a hospital, where all necessary equipment is available and quality post-operative care is available. But occasionally a character might have reasons for not going to a hospital for this care (such as being several parsecs away from the nearest operating room). In these cases, a friend might be asked to perform the surgery.

Surgery requires the use of surgical instruments (page 334). It is a Formidable task versus Medical (Surgery) to reduce a critical wound to serious, but if the task roll is successful, the reduction occurs immediately after surgery is completed. The use of blood plasma and local anesthetic each add +1 to the Surgeon asset, and are cumulative. If whole blood is used instead of plasma, it adds +2 to the effective asset level. General anesthetic adds +3 if it is used instead of local anesthetic. Automed units add their listed modifier to the surgeon's skill (page 333).

Only one surgery attempt can be performed per critical wound. Failure means that the wound remains critical. Catastrophic Failure can result in extra healing time, loss of limb, or loss of life, depending upon the hit location receiving surgery, the severity of the Catastrophic Failure, and the referee's judgment of the situation as a whole.

Adequate Food and Shelter: If the referee decides that a wounded character has inadequate food or shelter, each wound level will require an extra day to reduce to the next level. These penalties are additive, meaning that a character with both inadequate food and inadequate shelter will take two extra days to reduce each wound level. For instance, imagine that Currin, in the example above, is left stranded in the derelict enemy ship and subsisting on nothing but a few snack tubes in his vac suit emergency pouch. This is certainly an inadequate diet, so he'll suffer an additional day to heal each wound level. If the derelict's heating system cuts out from the battle damage, the cold ship will also qualify as inadequate shelter, so Currin will require two extra days to heal each level. Now, instead of healing his slight head wound on Thursday, it will take until Saturday, the serious chest wound will take until Sunday to become slight, and the two critical leg wounds will take until the next Wednesday to reduce to serious.

Treating Poison Wounds: Poison wounds can be treated just like regular wounds, with the exception that either a doctor's kit or an antivenin autoinjector is essential rather than optional and confers no bonus point to the task. Note that a successful first aid roll has the normal effect on wounds incurred and halts any further damage from the poison.

Infection: Every time a character suffers damage from melee combat, fire combat, or burns, there is a chance of infection. After every firefight (or accident), each injured body part has a chance of becoming infected on a roll of 2 or less on 1D20. If a person with at least Medical (Trauma Aid) 1 treats the wounded body area with antibiotic within eight hours, the chance of infection is reduced to 1 or less on 1D20.

If anyone uses a personal medical kit in an attempt to prevent infection, no infection results (but the kit is, of course, used up). This use of a personal medical kit may be combined with its use in a first aid attempt, above.

Infection is a major danger. Any time a character's wound is infected, healing (in all body parts, not just the infected one) stops until the infection is dealt with. In addition, for each week an infection lasts, the character takes an additional 1D6 damage points to the infected injured body part.

A character with a critical wound caused by an infection loses consciousness and remains that way until all wounds (even those not caused by the infection) are recovered to slight or he or she dies.

If, for example, a character takes a slight wound and that wound becomes infected, no healing takes place. After one week, the character takes an additional 1D6 hits in that arm (which may increase its wound level); after two weeks, another 1D6 is taken, and so on.

Treatment of Infection: Treating an infection is a Difficult: Medical (Diagnosis) task. If any antibiotics are used in the treatment, the task becomes Average. One attempt may be made per week.

A successful treatment means that the treated body part is no longer infected, and healing may take place if no other body areas are infected.

Vehicle Combat

These rules cover the use of land vehicles in combat. Incorporating vehicles into the combat sequence involves adding a few adaptations to the basic combat rules.

VEHICLE MOVEMENT

Any scale may be used; movement rates and weapon ranges are given here in meters. There are several different mobility classes of vehicles, each with particular rules for movement.

Ground Vehicles: Ground vehicles are those which maintain contact with the ground. In general, these vehicles' propulsive power is provided by frictional contact with the ground. Wheeled vehicles, tracked vehicles, and leg-powered vehicles (for example, horse-drawn wagons) are examples of this. Some unusual ground vehicles maintain contact with the ground via skis, runners, or wheels, but derive their propulsion from jets, propellers, or sails. Ground vehicles of all types are able to make better speed on roads than on unimproved terrain. How much better depends on the vehicle.

Movement rates for ground vehicles, in meters per combat turn, are given in the Aircraft and Vehicles section, beginning on page 360. Note that the listed speeds are the *safe* combat movement speeds on- and off-road. A vehicle may travel faster than this safe speed at the risk of a mishap (see page 292).

Amphibious Vehicles: Some ground vehicles are capable of movement across relatively calm water. Such amphibious vehicles have a third combat movement speed noted on their vehicle card, to the right of the Road Speed/Cross Country speed (X/Y/Z instead of X/Y). This is their *safe* combat movement speed in water. If a vehicle requires special preparation before entering the water, this will be noted with the vehicle description, along with the time required. Otherwise the vehicle may enter the water at no additional expense in time.

Hovercraft: Hovercraft are a special subset of ground vehicles, because they treat terrain differently. Rather than being in contact with the ground, they ride atop a trapped bubble of high-pressure gas. Because of their extremely low ground pressure, hovercraft can go where people on foot would sink. For combat movement, hovercraft can go anywhere, including water, but cannot traverse ravines, steep slopes, dense woods, or linear obstacles, such as walls, more than one meter in height. Like other ground vehicles, hovercraft are able to travel faster over roads. Hovercraft speeds are also given as safe speeds.

Aircraft: Aircraft are specifically vehicles which fly by creating aerodynamic lift with wings or other lifting surfaces (rotor blades, body shapes). For short periods, certain aircraft (VTOL, vertical takeoff and landing) make use of direct thrust or vectored thrust for lift, usually when forward speed cannot generate sufficient lift to keep the machine in the air.

Aircraft speeds vary with their *flight mode*. There are two modes: *high*, and *NOE* (nap of the earth). All aircraft may fly in high mode. NOE mode is available only to helicopters and VTOL aircraft. Nap of the Earth flight involves flying so low that the aircraft actually flies *around* obstacles rather than over them.

The speed given as an aircraft's high mode speed is an *absolute speed*, not a safe speed, i.e., the speed cannot be exceeded, and requires no task rolls. Aircraft which are given NOE speeds use these as safe speeds, with the mishap rule.

Movement rates for aircraft are given in 10-meter increments moved per combat turn. When using a two-meter grid, multiply this number by five; when using individual meter measurement, multiply it by 10.

Water Vessels: Water vessels include displacement hull and SWATH ships, displacement and planing hull boats, submarines, hydrofoils, and surface effect ships. Hovercraft may also move on the water, and are described above. Movement rates for water vessels are also given in 10-meter increments moved per combat turn as described under Aircraft, above. Note that many water vessels have a movement allowance of 0.5, 1.5, 2.5, etc. When moving on the 10-meter grid, these vessels move an extra square every other turn. Watercraft speeds are given as safe speeds.

Grav Vehicles: Grav vehicles are vehicles that fly by using contra-gravitic technology as their primary lifting agent, and not aerodynamic lift. Most spaceships and starships that are able to enter planetary atmospheres have contra-grav drives, so can function as grav vehicles by the movement rules, although a small percentage are also fully aerodynamic. Ships which are fully aerodynamic might or might not also have grav drives; these details are presented in the Starships section, pages 366-379. Vehicles that have both full aerodynamic and full gravitic technology may use either movement rule, depending upon the operations that they are attempting.

Like aircraft, grav vehicle movement depends on their mode. All grav vehicles are given high mode speeds (as with aircraft, these are absolute speeds) as well as NOE speeds. As with aircraft, NOE speeds are safe speeds, subject to the mishap rules.

DRIVE ACTION

When vehicles are involved in combat, drive is the action used to move them. Drive includes the operation of all types of vehicles, from bicycles to oil tankers to star cruisers. In some cases, performing this action will require a skill check. In others, the action is considered to be automatically successful. For instance, a character who was using the drive action to pilot a helicopter beneath a bridge might have to make a Difficult: Pilot check, while another character who was driving a family car along a city street in good weather, or who was coming to a safe halt at a well-marked stop sign, would be required to make no check at all.

A few other actions can be combined with the drive action. Talking and driving can be done together freely. The ready/change equipment, reload, and fire actions can each be done while driving, but any necessary driving checks are at one level more difficult (sometimes requiring a check that might not otherwise be required).

Mishaps: Characters may drive a ground vehicle at up to 3 times the safe speed, but they run the risk of a mishap. Driving at up to twice the safe speed is a Difficult test; the asset used is the appropriate vehicle skill. Driving at up to 3 times the safe speed is a Formidable test. Driving at twice or 3 times the safe speed is sometimes referred to as *overdriving.*

If a Catastrophic Failure is rolled, a serious mishap occurs. Serious mishaps include breaking an axle, throwing a track, rolling the vehicle, or in some other way putting it out of commission until major repairs are undertaken.

The referee should determine the exact nature of the mishap according to circumstances. On a crowded road, there may be a collision. A light vehicle is easy to overturn; a tank is almost impossible to overturn. Passenger injuries are also up to the referee.

Ground Vehicles: The roll is made once per turn. If a mishap occurs to a ground-contact vehicle (wheeled or tracked), the vehicle has become stuck in a pothole or ditch, or bottomed out in rough ground; the vehicle is stuck in place. Once per minute, the driver may attempt to get it moving again (Difficult: appropriate Vehicle skill); this occupies his or her time for the entire minute.

If the mishap was the result of a Catastrophic Failure, however, the vehicle suffers some sort of severe damage. The referee will determine the exact effects, based upon the situation at the time and the amount by which the die roll exceeded the minimum for catastrophic failure. It may be that the vehicle suffers a collision (perhaps with passenger injuries), for example, or simply that it has become too mired down to become unstuck without the aid of a towing vehicle.

A mishap on a motorcycle means that the rider has fallen off. The rider suffers 1D6–3 damage to a random location unless he or she makes a Difficult: Agility roll.

Amphibious Vehicles and Swamping: When travelling in water, a normal mishap means that the driver loses control of the vehicle, and it is hung up on an underwater obstruction, or swept from its desired course by the current, wind, or other conditions. The driver must attempt a Difficult task each turn in order to regain control of the vehicle. Catastrophic failure indicates that the vehicle has been swamped and is beginning to sink. Crewmembers must succeed at a Formidable test of Swimming to avoid drowning.

Hovercraft: A mishap indicates that the vehicle has struck an obstruction or has lost lift due to violent maneuvers. The vehicle's speed is immediately reduced to its safe speed (even if this results in greater than normally allowed deceleration). Damage is at the referee's discretion.

Grav Vehicles and Aircraft: Note that grav vehicles and aircraft only suffer driving mishaps when moving in NOE modes. A mishap means that the vehicle has struck an obstruction (tree, tower, antenna, or power line) with the possibility of serious damage to the vehicle or its occupants. Catastrophic Failure with an aircraft indicates that the craft crashes and is destroyed. Grav vehicles are usually more robust than aircraft, but will suffer severe damage.

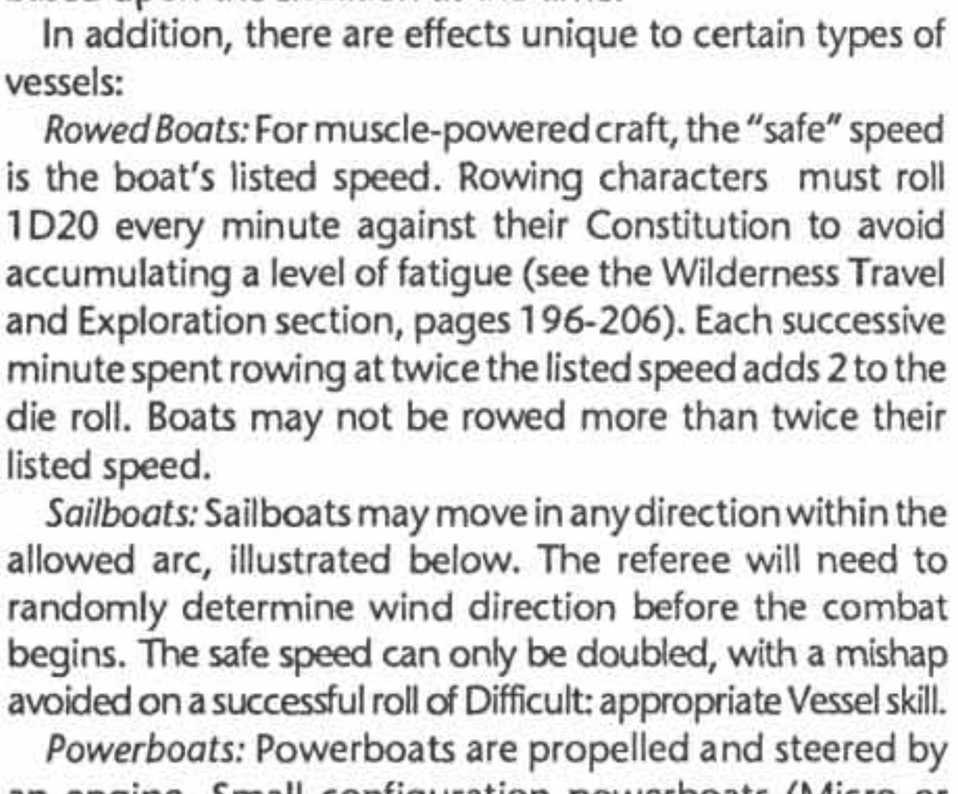
Vessels: Water vessel mishaps usually mean the vessel suffers a "stall" of some sort. Engines die, sails break loose, oars are dropped, and the like. To get the vessel under way again, the character in charge can attempt an Average roll versus appropriate Vessel skill once per minute, as the sole activity for that minute. Success means the problem has been resolved. If the mishap was the result of a Catastrophic Failure, however, the vessel has suffered some sort of permanent damage, as determined by the referee, based upon the situation at the time.

In addition, there are effects unique to certain types of vessels:

Rowed Boats: For muscle-powered craft, the "safe" speed is the boat's listed speed. Rowing characters must roll 1D20 every minute against their Constitution to avoid accumulating a level of fatigue (see the Wilderness Travel and Exploration section, pages 196-206). Each successive minute spent rowing at twice the listed speed adds 2 to the die roll. Boats may not be rowed more than twice their listed speed.

Sailboats: Sailboats may move in any direction within the allowed arc, illustrated below. The referee will need to randomly determine wind direction before the combat begins. The safe speed can only be doubled, with a mishap avoided on a successful roll of Difficult: appropriate Vessel skill.

Powerboats: Powerboats are propelled and steered by an engine. Small configuration powerboats (Micro or Sub-Micro size, see table on page 294) can be rowed as well (if the engine is damaged).The safe speed can only be doubled, with a mishap avoided on a successful roll of Average: appropriate Vessel skill.



Acceleration and Deceleration: Acceleration and deceleration are the amount by which a vehicle can change its speed each combat turn. All vehicles can accelerate by 10% of their maximum speed (rounding fractional values down) plus the driver's appropriate Vehicle skill.

For example, a vehicle with a maximum speed of 30 meters per combat turn could accelerate three meters per turn plus the driver's skill. A driver with no skill could only accelerate three meters per turn, while a driver with a skill of 6 could accelerate nine meters per turn.

All vehicles may decelerate at twice their acceleration rate. Thus the vehicle listed above would decelerate six meters per turn with an unskilled driver and 24 meters per turn with a skill 9 driver.

Water Vessels: Water vessels have the following additional considerations with respect to movement:

Current: Rivers, streams, and oceans will have currents, which will affect the speed of a boat by impeding or adding to it, and which can cause unpowered boats to run aground or collide with obstacles. Canals and small bodies of water will usually not have significant currents. Currents will usually flow at a constant velocity and in a constant direction, and thus will need to be established by the referee before combat begins.

Current velocity is expressed in number of 10-meter squares per combat turn. Most large rivers have a current of one-half square per combat turn, which will move the vessel one meter down river every other combat turn. Near rapids or in narrow, swift-flowing parts of the river, this will increase to one square per turn, and near waterfalls it can increase to two, three, or four squares per turn.

Turning: Each vessel has a turning value which is the number of 45° turns it can make each combat turn. Vessels with a fractional turn value (1/2, 1/3, 1/4, etc.) may make only one 45° turn every two, three, or four combat turns, as indicated.

Towing: Boats may tow other boats. Speed and acceleration are each reduced by 0.5 for every fivefold increase in tonnage. If speed is reduced below 0.5, the boat may not conduct the tow. If acceleration is reduced below 0.5 due to towing, the acceleration remains 0.5.

For example, a 200-ton vessel with a speed of 1.5 and an acceleration of 1 is towing a 1400-ton vessel. This is a sevenfold increase in tonnage, which counts as one fivefold increase (but not a second). Speed and acceleration are each reduced by 0.5 to 1 and 0.5 respectively.

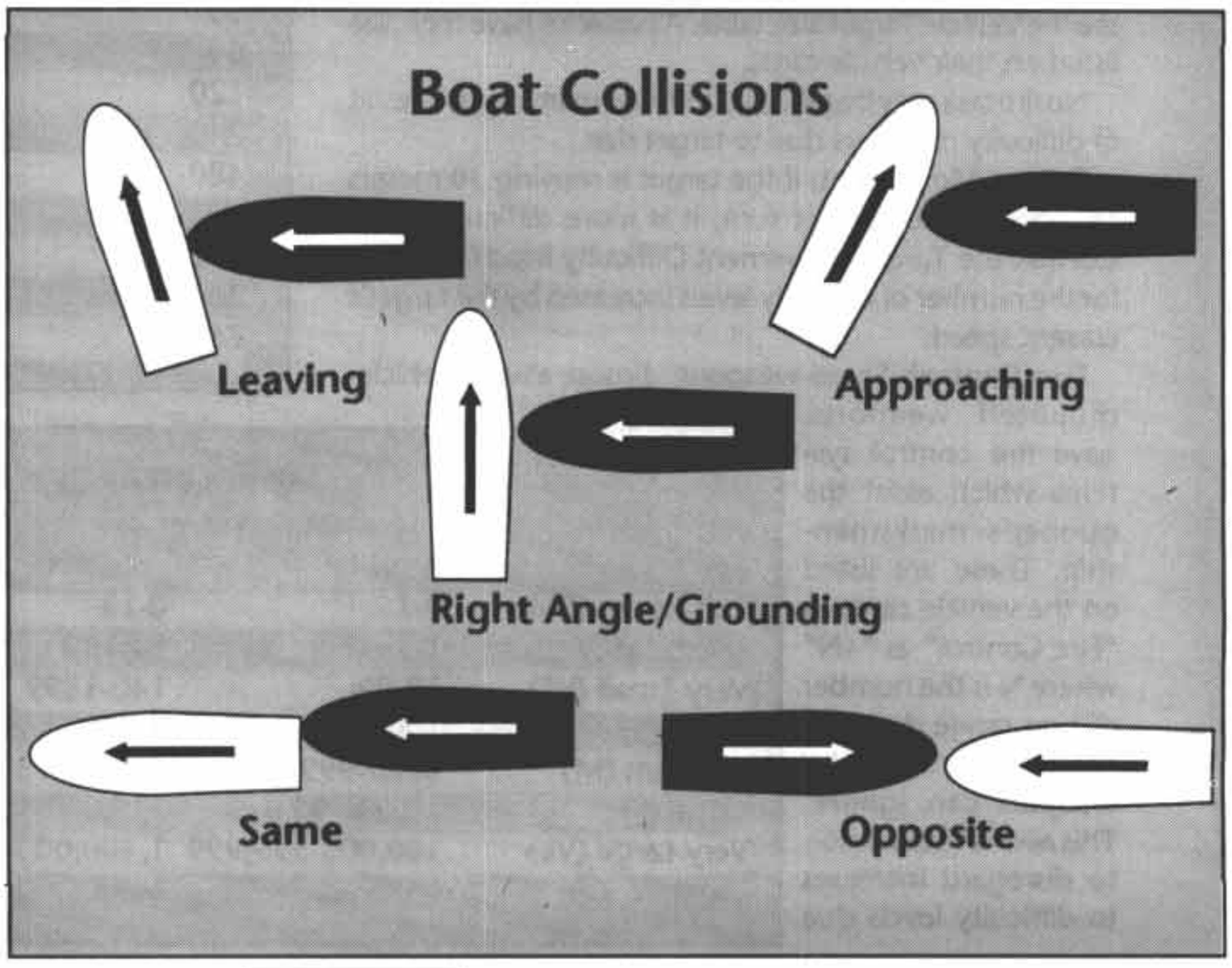
NAVIGATION HAZARDS

D6	*Result*
1	Boat aground. 10 miles travel lost pulling it off.
2	Boat aground. One full travel period lost pulling it off.
3	Screw or rudder damaged. Speed halved until repaired.
4	Hull damaged. 1D6+3 flotation hits.
5	Hull damaged. 1D6+2 flotation hits.
6	Hull crushed. Vessel is grounded to avoid sinking. Cannot be refloated unless a large work crew and vessel are brought to the site.

Running Aground: Each boat has a listed draft and will run aground whenever it enters water shallower than this. Unless this is a deliberate grounding (as on a beach) and conducted at very low speed, the vessel suffers damage to its hull or running gear. Roll 1D6 and consult the Navigation Hazards table above to determine the result.

The referee should indicate water depths on the playing surface in three increments: less than one meter, one to three meters, and more than three meters. This can be accomplished by contour lines, shading, color, or any other convenient means. Deeper draft vessels may require additional depth gradations.

Collisions: Likewise, boats may collide with each other, or with floating objects such as logs, and suffer potential damage. Damage depends on the size of the boat and the net speed at the time of grounding, as explained under the Collision Damage entry on page 301.



VEHICLES AND FIRE

Fire From Moving Vehicles

Characters may not conduct aimed fire from a moving vehicle. They may fire quick shots or bursts normally.

All such fire, however, is conducted at one higher difficulty level than normal for purposes of determining hits.

Weapon Stabilization: Some vehicles have stabilized main armaments classified as basic, good, or advanced. Vehicles with basic stabilization may fire aimed shots while moving at their safe speed. Vehicles with good stabilization may fire aimed shots while moving at twice their safe speed. Fire from vehicles with advanced stabilization may be made at any speed.

Grav Belts: Personnel in grav belts use the vehicle movement rules. Grav belts may fly in high mode or NOE mode, as described under Aircraft and Grav Vehicles, page 291. Maximum absolute speed in High mode is 300 meters per turn (although troops flying at such speeds must wear protection such as combat armor or battle dress).

The safe speed for grav belt flight at NOE is 30 meters per turn. Grav belts may be overdriven like any other vehicle. Fire from moving grav belts follows the rules above for fire from moving vehicles.

Firing at Vehicles

Firing at vehicles is similar in general principles to firing at individuals, but there are a few differences. Some additional die rolls must be made when dealing with vehicular weapons and vehicular damage.

Firing at Vehicles and Vessels: All vehicles and vessels have a size rating that indicates their size and ease to hit, see the Vehicle Target Size table. All vehicles have their size listed on their vehicle cards.

No fire task may be adjusted to lower than Easy as a result of difficulty modifiers due to target size.

Target Movement: If the target is moving 30 meters or more in the current turn, it is more difficult to hit. Consult the Target Movement Difficulty Modifiers table for the number of difficulty levels increased by the target's current speed.

Fire Control: Some weapons, almost always vehicle-mounted weapons, have fire control systems which assist the gunner's marksmanship. These are listed on the vehicle cards as "Fire Control" as "+N" where N is the number of non-range difficulty modifiers that the weapon can ignore. This allows the weapon to disregard increases to difficulty levels due to target speed or obscuration. This does not allow the weapon to decrease the base difficulty level due to range; only to disregard additional difficulty increases above that level.

Multiple Modifiers: All difficulty modifiers due to target size, target speed, and firing from a moving vehicle are cumulative.

Overhead Attacks: Some tactical missiles are programmed to fly over the target and attack it from above, and all submunition (SM) direct hits are overhead attacks. For overhead hit locations, never add 1 to the die roll for a side shot, and treat all suspension hits as hull hits instead. All attacks are resolved using the vehicle's turret-side armor value (unless the vehicle has no turret, in which case use the hull's side armor value).

Firing at Flying Vehicles

Flying vehicles are fired at using the fire procedures described above. However, personnel or vehicles without fire control bonuses will find it difficult to hit flying vehicles at their typical speeds.

Furthermore, hits on aircraft are resolved differently from fire at flying grav vehicles. Because aerodynamic craft are relatively lightly constructed, hits on aircraft do not handle issues of penetration and are resolved using the Aircraft Damage table (page 300). Hits on grav vehicles use

TARGET MOVEMENT DIFFICULTY MODIFIERS

Speed in meters	*kph*	*Diff. Increase*
30	22	+1 level
60	43	+2 levels
120	86	+3 levels
240	172	+4 levels
480	344	+5 levels
960	688	+6 levels
1920	1376	+7 levels
3840	2752	+8 levels
7680	5504	+9 levels

VEHICLE TARGET SIZE

Size	*Displacement (tons)*	*Displacement (kiloliters/cubic meters)*	*To-Hit Difficulty Mod.*
Sub-Micro (SM)	0-1	0-13	—
Micro (MC)	1-9	14-139	—
Very Small (VS)	10-99	140-1399	–1
Small (S)	100-999	1400-13,999	–2
Medium (M)	1000-9999	14,000-139,999	–3
Large (L)	10,000-99,999	140,000-1,399,999	–4
Very Large (VL)	100,000-999,999	1,400,000-13,999,999	–5
Gigantic (G)	1,000,000+	14,000,000+	–6

the Vehicle Damage tables and the normal ground vehicle penetration rules (see Damage from Fire, page 296).

Ground Weapons: Any ground weapon may attempt to fire at flying vehicles, but ground weapons without fire control bonuses will usually have a hard time hitting. Exceptions to this are automatic weapons and antiaircraft missiles.

Automatic Weapons: Automatic weapons fire at flying vehicles at one lower level of difficulty. All small arms automatic weapons cause minor damage to aircraft; larger caliber automatic weapons cause major damage to aircraft. When firing on grav vehicles, weapons use the penetration rules to establish damage.

Each firing automatic weapon can only achieve one hit per combat turn, regardless of the actual number of hit rolls successfully made.

Antiaircraft Missiles: Antiaircraft homing missiles are fired using Tac Missile asset. The weapons listing shows the missile's short range, at which the task roll has a base difficulty level of Average, which increases with range as normal direct fire. The missile also has a listed Agility, which shows the number of difficulty modifiers due to target speed which the missile can ignore. Agility can never reduce the difficulty to less than the base difficulty for range. A successful task roll indicates that the target aircraft suffers minor damage; an Outstanding Success roll indicates major damage. Hits on grav vehicles must use the normal vehicle penetration rules.

Evasion: When a ground-fired missile has rolled a hit on a flying vehicle, the flying vehicle still has a final chance to evade the missile, if the missile is visible to the pilot. Spotting a missile is a Difficult test of Observation, and this may be adjusted by weather and other factors. Aircraft with multiple crewmembers may allow rolls against the Observation of several crewmembers, at the referee's discretion. (This is based on their other tasks. A crewmember who does not have a window or is in the midst of firing at another target or guiding an operator-guided missile may make no such Observation roll.)

If the missile is visible, the pilot may make a roll to break the lock of the missile by violent, evasive maneuver. The task is a Formidable test of the proper cascade of the Pilot asset, and becomes Impossible if the missile rolled an outstanding success on the hit. Success on this roll means that the missile misses the aircraft, even though it had already rolled a hit. Other ground fire may not be evaded in this way.

Air-to-Air Combat: Aircraft may also be fired at by other aircraft using either automatic weapons or antiaircraft missiles. This combat is best resolved outside of the context of ground combat, as these air-to-air combat rules use abstracted time increments, and also because the aircrafts' movement will usually take them far away from the ground combat location.

All rules for firing are the same, with the following additions:

All hostile aircraft engaged in combat are either advantaged or disadvantaged with respect to each other. The advantaged aircraft is the aircraft with the higher total of speed points plus Pilot skill plus maneuver points. Advantage/disadvantage is recalculated each turn.

Speed points are equal to the current combat speed of the aircraft in 10-meter grid squares divided by 10, rounding fractions down. For example, an aircraft flying at speed 80 (equivalent to 800 meters per turn) has 8 speed points.

Pilot skill is the actual skill level of the pilot in the Pilot cascade appropriate to the craft being flown.

Maneuver points are gained by attempting difficult maneuvers. A Difficult skill roll maneuver gains 1 point, Formidable gains 2, and Impossible gains 4. Failure is treated as a mishap.

If the advantaged aircraft's total of speed+skill+maneuver exceeds the disadvantaged aircraft's total by 50% or more, the advantaged plane may break off contact and successfully escape. Otherwise it must stay and fight.

If a fight (exchange of fire) ensues, the advantaged aircraft picks the range of the combat, provided the distance chosen is still within range of at least one of the disadvantaged aircraft's weapons. If the disadvantaged aircraft has no weapons, it must be within range of at least one of the advantaged aircraft's weapons.

Fixed weapons (machineguns and cannon fixed to fire forward) and antiaircraft missiles may only be fired at hostile aircraft if the firing aircraft is advantaged with respect to the target.

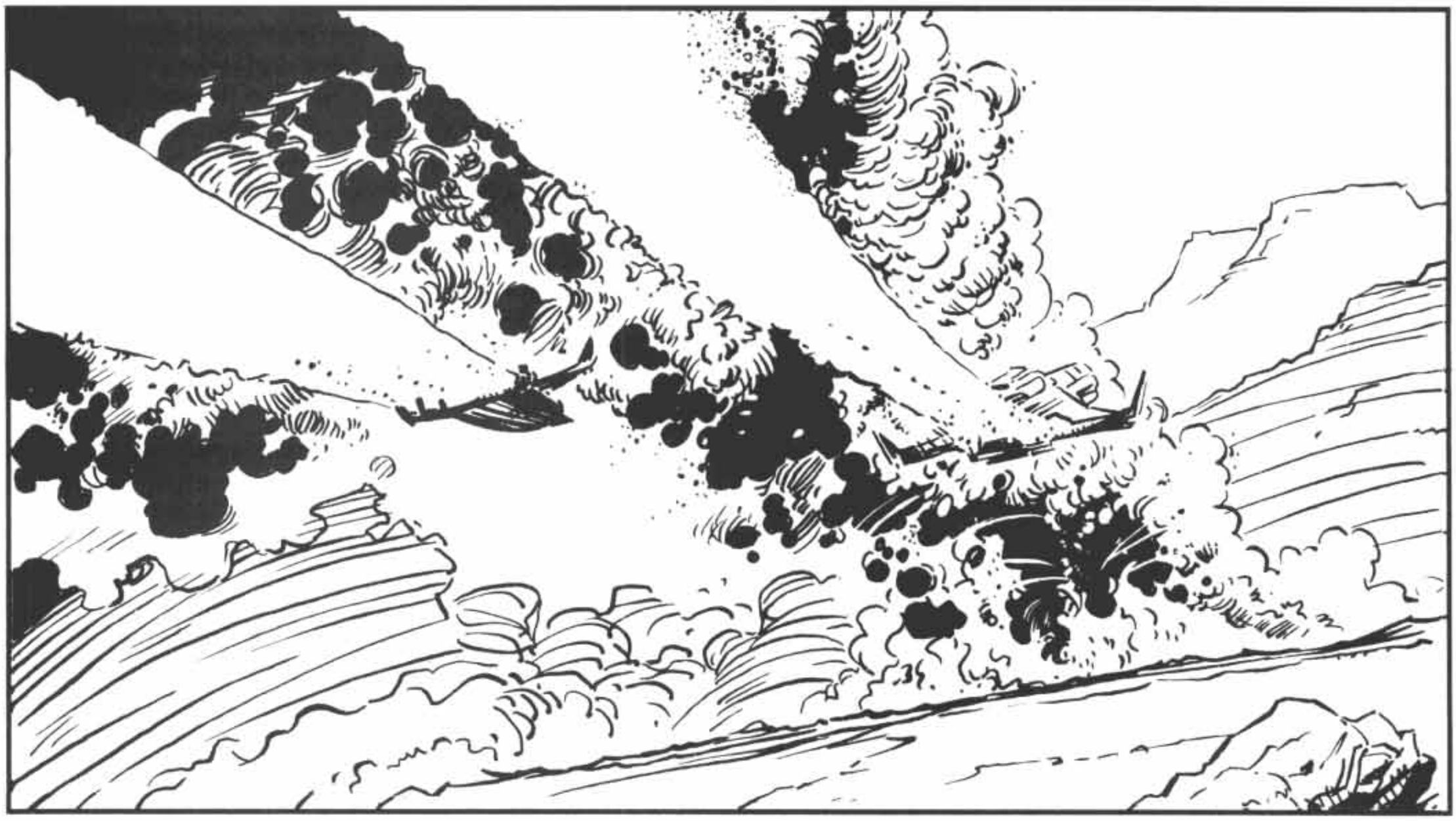
Flexible-mount weapons (such as gun turrets or door-mounted machineguns) may fire at enemy aircraft whether advantaged or disadvantaged with respect to them. Normal rules for firing aircraft, fire control, and stabilization also apply. If disadvantaged, however, the fire is conducted at one difficulty level greater.

Firing From Flying Vehicles

Flying vehicles firing at ground targets do so in one of two ways, by turreted fire and approach fire. Fire onto vehicles from flying vehicles naturally is resolved according to the Overhead Attacks rules, page 294.

Turreted Fire: Some flying vehicles have turrets mounted on their bellies to direct fire at ground targets. These are typically helicopters and grav vehicles, but some fixed wing aircraft mount them as well. These vehicles are not limited to any particular movement pattern with respect to their ground targets, but must merely be within range and within the arc of fire of their turrets. Additionally, a flying vehicle's turret-mounted weapons must be equipped with advanced quality stabilization if they are to fire at ground targets at anything greater than NOE speed. Good quality stabilization is required for fire at NOE speed.

Approach Fire: Aircraft firing nonturret-mounted weapons must do so via approach fire. This includes fixed forward-firing projectile or energy weapons, as well as rockets and missiles.



Approach fire requires the aircraft to fly directly at its target for the full combat turn (if in NOE mode, a helo or grav vehicle may also be motionless, while facing the target). Altitude is also specified by the pilot, but must be within at least long range of the weapon being fired.

Only one type of weapon may be fired per approach fire action. The skill is rolled as a direct fire task at one difficulty level higher than usual, using the Pilot or appropriate weapons skill of the pilot, whichever is higher. If firing tac missiles, the task is rolled by the weapons operator crewmember, if one is present.

Aircraft with only one crew may not fire operator-guided missiles. Aircraft with two crew (pilot and weapons operator) may do so, as the weapons operator may be obliged to continue guiding the weapon for more than one turn.

Shots which miss will deviate. Roll 1D10. On a 1-5, the shot falls short, along the aircraft's approach path. On a 6-10, the shot is long, also along the approach path. Roll 1D10 for distance, and use 10% of the aircraft's current speed in grid squares per combat turn as the distance multiplier.

Bombs: Bombs may also be dropped using approach fire. Hitting a target with a bomb is an Average test of the appropriate Pilot cascade asset at zero to 100 meters altitude, Difficult at 100-500 meters, Formidable at 500-1000 meters, and Impossible at over 1000 meters. Bombs that miss roll deviation as above.

Bombs may have guidance systems. Operator-guided bombs and designated bombs are handled like tac missiles of the same type.

Damage from Fire

Once a hit is scored, vehicle damage is determined by following the steps listed below.

Penetration: First, determine the penetration of the weapon. This is done differently for different classes of weapons. **Traveller** has two ways of expressing penetration performance: as *penetration value*, and as *penetration rating*.

Penetration value is a measure of the weapon's absolute ability to penetrate armor, and is the measurement most often used in vehicle combat.

Penetration rating is most often used in personal combat (page 285) and describes the relationship between a weapon's damage value and its penetration value. Penetration value = Damage value ÷ Penetration rating. Likewise, Damage value = Penetration value × Penetration rating.

Penetration rating is the number of points of damage value lost for each level of armor value penetrated (thus the smaller the penetration rating, the better the penetration performance). Penetration ratings become higher (i.e., penetration performance becomes worse) as range increases. Penetration ratings are given by range, short/medium-long-extreme (penetration rating for medium is the same as for short). If a weapon's penetration rating is *Nil*, it has no penetration capability.

Small arms are usually listed with their damage value and penetration ratings listed separately, while weapons intended primarily for use against vehicles are listed with their damage value and penetration ratings combined into

their penetration values at the various ranges.

Thus, a small arms fusion gun might be described as having a damage value of 10 with penetration ratings of 1/2-1-4. That same fusion gun, if it were rated as a vehicle gun, would have listed penetration values of 20-20-10-3 (short-medium-long-extreme).

Damage is expressed as *damage value* which is related to penetration value and penetration rating as described above. Damage value is equivalent to the damage dice which are inflicted on personnel (or other creature targets, page 285) in all cases but one: lasers. Lasers have damage values as described above, but their damage values are not used to damage personnel. Each point of a laser's damage value is equal to 20 personnel damage dice. Small arms lasers in the equipment listings have their damage listed in terms of personnel damage dice, but if a personnel target were hit by a starship-mounted laser, that laser's damage value (at the appropriate range) would have to be multiplied by 20 to see how many dice of damage was done to the target.

Although damage value is used to damage spacecraft in space combat (pages 311-326), *damage done to vehicles in the vehicle combat sequence is always done by penetration value.*

When a hit is scored, calculate the *final penetration value* of the weapon, according to its class.

Small Arms: This includes all slug-firing man-carried firearms. For attacks on vehicles, divide the number of damage dice by the correct penetration value for range and round down. This is the weapon's *final penetration value.*

Lasers: Lasers have a separate damage value and penetration value listed for each range band. If the laser does not have a listed damage *value* (as opposed to damage *dice*), it has no antiarmor penetration value, and has a penetration rating of Nil. Laser penetration ratings of better than Nil will either be 1 or a fraction, indicating that the laser penetrates more than one armor level per point of damage value lost. Divide the damage value by the penetration rating to get the penetration value. When firing at vehicles, add 2D6 to the result. This is the laser's *final penetration value.*

Exploding Rounds: Exploding projectiles have only one penetration value listed, either a number followed by the letter C (indicating that the penetration value is "constant" throughout its range), or the notation Nil. For hits against vehicles with non-Nil values, roll 2D6 and add it to the penetration value. The result is the *final penetration value.*

Penetrators: Penetrators include weapons with high penetration values which decline over range, and a constant damage value (which is used against personnel targets only). This class includes large-bore kinetic energy rounds and plasma and fusion weapons. Find the correct penetration value for range, and add 2D6. This is the weapon's *final penetration value.*

Particle Accelerators: Particle accelerators have only one set of values, penetration value, which declines over range. However, these penetration values are also used as the particle accelerator's damage value/damage dice (in other words, particle accelerators have a penetration rating of 1 at all ranges). When a hit is scored on a vehicle, find the correct penetration value for range and add 2D6 to get the *final penetration value.*

Special Armor Protection: There are two active defensive systems which provide enhanced protection vs. weapon penetration of the vehicle's hull.

Explosive Reactive Armor: Some vehicles may be fitted with explosive reactive armor (ERA); this will be indicated on their data cards. ERA consists of explosive blocks which are detonated by the penetrator jets from HE, HEAP, and high energy (plasma and fusion) weapons. The detonation propels a metal plate into the jet, breaking it up and reducing its effectiveness. However, this uses up the block, leaving the vehicle's basic hull exposed.

ERA is listed with an armor value (AV), a detonation number, and a list of which of the vehicle's faces are covered by the ERA. Each face is covered by 20 ERA blocks (each protecting 1/20 of that face). When a face protected by ERA is hit by an HE, HEAP, or high energy weapon with a final penetration value of 10 or greater, an ERA block at that location detonates and adds its AV to the AV of the vehicle's hull. However, 1/20 of that face's ERA protection is now used up. Keep track of the number of ERA detonations on each face. For each subsequent HE/HEAP/high energy hit, roll 1D20, and if the result is greater than the number of ERA blocks already detonated, then another ERA block detonates and adds its AV against the round. If not, the round has hit bare hull where a block has already detonated and there is no ERA benefit.

In addition, each time an ERA block detonates, roll 1D20. If the result is less than the detonation number, a multiply detonation results, using up another 1D20 ERA blocks on that face.

Other type rounds do not detonate ERA, and therefore are not affected by ERA on a surface.

Electrostatic Armor: Some vehicles may be fitted with electrostatic armor (ESA) as indicated on their data cards. ESA consists of a low-power static field which is generated around the defended vehicle and linked to a high-energy capacitor. When an incoming projectile enters the static field, it triggers the discharge of the capacitor which produces enough energy to vaporize or degrade the effectiveness of the projectile. The ESA will be simply listed as an armor value (AV). Half of this AV is added to the actual hull armor value vs. kinetic energy projectiles, and all of this AV is added vs. HE, HEAP, plasma, and fusion gun hits. ESA adds no armor vs. laser or particle accelerator attacks.

Hit Location: Roll once per individual shot or burst and consult the Vehicle Hit Location chart on page 298. Add 1 to the die roll if the shot was from the side of the vehicle. The four possible results for vehicles are small turret, turret, hull, and suspension. Water vessels may be hit in the hull, superstructure, or waterline while aircraft may be hit in the hull (fuselage) or wing.

VEHICLE HIT LOCATION

Die	Vehicle	Vessel	Aircraft
1	Hull	Hull	Wing
2	Hull	Hull	Wing
3	Hull	Hull	Wing
4	Small Turret	Superstructure	Hull
5	Turret	Superstructure	Hull
6	Suspension	Waterline	Hull
7	Suspension	Waterline	Hull

+1 to die roll for side shots.

Suspension Damage: Minor damage cuts speed in half; major damage immobilizes. Two minor damage results equal major damage.

Some vehicles are configured differently than others, and so treat different hit location rolls as different results. Vehicles with small or remote turrets treat "small turret" hits as turret hits and "turret" hits as hull hits. Vehicles with regular turrets treat "small turret" and "turret" hits as turret hits. Vehicles without turrets treat all "small turret" and "turret" hits as hull hits.

A vehicle with both a regular turret and a small turret is a special case. If the vehicle is hidden with only the small turret raised, "small turret" hits always hit the elevated small turret, while other hit results are read normally. If the main turret is exposed as well, roll again on "small turret" results, with even rolls treated as small turret hits and odd rolls as main turret hits.

Open Vehicles: Some vehicles have their hull front, side, and rear armor listed in brackets, for example, [1]. This indicates that the vehicle is an *open vehicle*. Open vehicles have a slight armor protection provided by their metal bodies, but it is an incomplete cover. Whenever a shot hits an open vehicle, there is a 50% chance of the shot hitting the vehicle's body and a 50% chance of it going through a window or other open portion. If it hits the body, the shot is resolved normally, and the vehicle receives the benefit of its armor value. If it goes in through a window, the shot is always resolved as minor damage, and any damage result is ignored except for crew or passenger (these may also be resolved as cargo damage) result.

Motorcycles: All small arms hits on a motorcycle (this also includes grav cycles) result in damage. All hits by larger weapons result in destruction. A damaged cycle can no longer be ridden. Characters riding a cycle when it is hit must make a Formidable: Agility roll or be thrown from the cycle. Depending upon the altitude of a grav cycle, the character may also suffer falling damage (see page 287).

Cover: Often vehicles park with part or all of the vehicle concealed behind terrain features, such as walls, road embankments, or low hills. The referee must determine which vehicle locations are covered by the terrain and any hit location result in those areas hits the terrain instead.

Armor: Once the location is known, consult the vehicle's combat statistics on its vehicle card and note the armor value of that part. Hulls and turrets each have a front, side, and rear armor value. Tracked vehicle suspensions have one armor value which is used when the suspension is hit from all angles. Grav vehicle suspension hits use the armor value of the hull face that was hit. Wheeled and hovercraft suspensions do not have an armor value, but do have a critical damage value, which is listed in parentheses to differentiate it from armor values.

If covering terrain is hit, the referee should determine the armor value of the terrain as well. In many cases this will be enough to stop the round. If not, however, the armor value of the terrain is first subtracted from the final penetration value of the round before applying it to the vehicle's armor. The armor value of terrain is calculated by multiplying the thickness of the terrain feature (in centimeters) by the armor toughness shown on the Armor Equivalency table at left.

For example, a vehicle is parked behind a low stone wall which the referee decides covers the vehicle's suspension. The stone wall is 30 centimeters thick. Stone has a toughness of 0.2, and so the wall has an armor value of 6.

Extent of Damage: Subtract the correct armor value of the target from the final penetration value of the weapon and consult the Vehicle Damage Resolution chart, page 299. If the result is 0 or a negative number, the shot has no effect. If it is a positive number, read the result from the chart. The result will read out as from one to three damage results and will indicate whether these damage results are minor or major.

Lasers: Lasers are more efficient at penetrating armor than they are at delivering damage. Once the target's armor value has been subtracted from the final penetration value, multiply the remaining penetration value by the laser's penetration rating (rounding all fractions down). The result (if it is a positive number) is the result used on the Vehicle Damage Resolution chart on page 299.

ARMOR EQUIVALENCY

Material	Toughness	Centimeters per Armor Value of 1
Coherent Superdense	40	0.025
Bonded Superdense	28	0.035
Superdense	14	0.07
Crystaliron	8	0.125
Composite Laminates	6	0.167
Light Composites	4	0.25
Armor Plate	2	0.5
Sheet Steel, Light Alloy	1.7	0.6
Reinforced Concrete	0.4	2.5
Concrete and Bricks	0.3	3.3
Stone, Packed Dirt, Wood	0.2	5
Loose Dirt	0.04	25

For example, a laser has a damage value of 10 and a penetration rating of 1/3. The player rolls 7 on 2D6 giving the laser a final penetration value of 37 ([10÷1/3]+7). The laser hits a vehicle armor face with a protection of 18, leaving 19 points of penetration value left. This is multiplied by 1/3 (the laser's penetration rating) and rounded down, for a final result of 6, which is the result on the Vehicle Damage Resolution chart at right.

Damage Implementation: See the Vehicle Hit tables on the next page. Find the correct section (minor or major damage, hull, or turret damage) and roll 1D6 once for each required damage result. For suspension hits, see Suspension Hits on page 299-301.

Note also that some rolled results convert the damage into a different type. For example, if a minor turret hit is achieved against a turreted vehicle, but a 6 is rolled on the Turret Minor result table, the hit is converted into a major turret hit. In this case roll again on the Turret Major result table. If a 6 is rolled on this table, the damage is converted to a minor hull hit. If a 6 is then rolled on that table, it is converted to a major hull hit. There is no possibility of any alteration to a major hull hit. The following results are possible:

1 Crewmember: This must be a crewmember stationed in the part of the vehicle or vessel which was hit. Which crewmember is hit is determined randomly. The crewmember suffers 1D6 hits, each of which does 1D6 damage. Determine a hit location separately for each hit.

2 Crewmembers: Exactly as above, but two crewmembers are hit, and they are selected randomly from the entire vehicle crew, not just those individuals in the area hit.

N Passengers: The indicated number of passengers are selected at random and are hit exactly as noted under 1 Crewmember above. If this is not a passenger-carrying vehicle, then this is treated as an N crewmember hit. If this is a passenger-carrying vehicle but none are present, this becomes a no effect. (The referee may substitute a cargo destroyed result for this result at his or her discretion if cargo is present.)

Sensor: Either the gun sight, range finder, night vision equipment, radar, or some other sensor device is damaged. (The referee will determine which, depending on the amount of equipment installed.)

Traverse: The turret traverse is jammed, and the turret will no longer turn. This makes it impossible to fire any fixed weapon (such as the main gun or coaxial gun) in the turret until it is unjammed. Repairing the traverse is a Difficult task using Mechanic skill. It takes half an hour and cannot be done from inside the vehicle. (See Maintenance, pages 241-244.)

If the vessel or vehicle has several turrets, roll to determine randomly which was hit.

Secondary: One machinegun, grenade launcher, or similar light secondary weapon is destroyed.

Loader: Either the human loader is hit, as for a crewmember hit above, or the vehicle's autoloader is put out of action. This becomes a driver hit if neither are present in a vehicle and main armament hit if neither are present in a vessel.

VEHICLE DAMAGE RESOLUTION

FPV–AV	*Result*
0 or less	No effect
1 to 10	1 minor damage result
11 to 20	2 minor damage results
21 to 40	1 major damage result
41 to 60	2 major damage results
61 or more	3 major damage results

FPV–AV: Final Penetration Value minus armor value.

Commo: One of the vehicle's communication systems is destroyed.

Main Armament: The vehicle's main armament is damaged and can no longer fire. If several such results are possible, roll to determine randomly which is hit.

Ammo: The ammunition storage of the vehicle has been hit. The amount by which the final penetration exceeded the vehicle's armor value is the percentage of stored ammunition lost (rounding fractions up). If the vehicle is armed with any exploding rounds or large-caliber gun rounds, this number is also the percentage chance that the ammunition will explode. If the ammunition explodes, the vehicle is destroyed, and the crew is killed.

In the case of a vessel, explosion of the ammunition will sink the vessel and each crewmember will escape death by rolling a Formidable: Swimming task. (If below decks when the explosion takes place, this becomes Impossible: Swimming.)

Engine: The engine is hit and rendered inoperable. The vehicle may not move. If the vehicle is an aircraft or grav vehicle at NOE, it settles to the ground. The pilot/driver must make a Formidable roll against the appropriate Pilot cascade asset to settle to the ground without suffering further damage. An aircraft at terrain following or higher altitude suffering this hit makes a Difficult: Pilot roll to retain control for long enough to bail out.

Fuel: The fuel tank of the vehicle has been hit. The amount by which the final penetration exceeded the vehicle's armor is the percentage of fuel capacity lost (and fuel, if the tank was fuller than the new capacity). This number is also the percentage chance that the fuel will ignite. If the fuel ignites, the vehicle catches fire, and the crew must immediately bail out.

Suspension Hits: No damage tables are provided for suspension hits. One minor damage result to a vehicle's suspension halves its movement. A second minor damage result, or any major damage, immobilizes the vehicle, or in the case of a grav vehicle, causes it to settle to the ground.

Tracked and grav vehicle suspensions are treated like any armored part of the vehicle using the armor rating listed. Wheeled and hovercraft suspensions do not have an armor value, but instead have a critical damage level (shown in parentheses). Each time a weapon hits the suspension, it

Vehicle Hit Tables

WATER VESSEL DAMAGE

Die	Waterline Minor Result	Die	Hull Minor Result	Die	Superstructure Minor Result
1	Waterline hull	1	1 crewmember	1	1 crewmember
2	Waterline hull	2	1 crewmember	2	Radio/radar
3	Waterline hull	3	Auxiliary mach.	3	Sight/vision
4	Waterline hull	4	Auxiliary mach.	4	Secondary
5	Cargo	5	Secondary	5	Secondary
6	Major waterline	6	Major hull	6	Major s'structure

Die	Major Result	Die	Major Result	Die	Major Result
1	2 crewmembers	1	Main armament	1	2 crewmembers
2	Rudder/screw	2	Main armament	2	2 crewmembers
3	Engine	3	2 crewmembers	3	Fire
4	Fuel	4	2 crewmembers	4	Fire
5	Ammo	5	Ammo	5	Ammo
6	Minor hull	6	Fire	6	Major hull

VEHICLE DAMAGE

Die	Turret Minor Result	Die	Hull Minor Result
1	1 crewmember/loader*†	1	1 crewmember
2	1 crewmember/sensor†	2	Loader*
3	Sensor	3	2 passengers**
4	Traverse	4	2 passengers**
5	Secondary	5	Radio
6	Major turret	6	Major hull

Die	Major Result	Die	Major Result
1	2 crewmember/main arm.†	1	Engine
2	2 crewmember/main arm.†	2	Engine
3	Main armament	3	Fuel
4	Main armament	4	Fuel
5	Ammo	5	Ammo
6	Minor hull	6	Ammo

AIRCRAFT DAMAGE

Die	Hull Minor Result	Die	Wing Minor Result
1	1 crewmember	1	No effect
2	Controls	2	No effect
3	Controls	3	Controls
4	2 passengers**	4	Controls
5	Radio	5	Controls
6	Major hull	6	Major wing

Die	Major Result	Die	Major Result
1	Engine	1	Controls
2	Engine	2	Fuel
3	Instruments	3	Fuel
4	Instruments	4	Fuel
5	Weapon/ammo	5	Fuel
6	Minor wing	6	Fireball

*Loader is either a hit on the autoloader mechanism or the actual crewmember loading the gun. This becomes a driver hit if neither are present.

**2 passengers becomes a 1 crewmember hit if this is not a passenger-carrying vehicle. If it is a passenger-carrying vehicle but no passengers are present, the hit has no effect. Cargo destroyed may be substituted for this result at the referee's discretion.

†If turret is an unmanned remote turret, use the result after the slash.

inflicts damage equal to its final penetration. Once the cumulative damage reaches the critical damage level, the suspension suffers minor damage. Once it reaches twice the level it suffers major damage. (In most cases, any hit on a wheeled suspension will immobilize the vehicle. Only in the case of small arms fire is the cumulative damage on a wheeled vehicle likely to be important.)

Cargo: So many variations in cargo exist that it is not possible to give any concise rules for damage. The referee must use his or her own judgment in such situations.

Fire: Water vessels are usually quite succeptible to fire, as even steel-hulled boats tend to be full of combustible material. Whenever a fire result appears on the damage table, the boat has caught fire. The final penetration value of the gun which caused the damage is the initial level of the fire. The fire will increase in level by 1 every combat turn.

Characters may attempt to put out the fire by spending a turn fighting it. Extinguishing a fire is Difficult task versus Constitution. For every successful task roll made by a character, the fire is reduced in level by 1. Outstanding Success reduces the fire by 2 levels. Catastrophic Failure results in a burn injury.

If the level of the fire exceeds the vessel's tonnage (fully loaded weight in metric tonnes) divided by 10, the fire will begin burning out of control and cannot be extinguished. Roll 1D6 at the start of each turn thereafter. The fuel and ammunition on board will detonate on a roll of 6, destroying the vessel.

Waterline Hull: Vessels which suffer waterline hull damage will begin to flood. Each vessel has three rows of floatation hit boxes, with boxes in each row equal to the vessel's tonnage. Subtract the vessel's armor from the final penetration value, and divide the result by 6. This is the number of flotation boxes marked off each turn. All flooding hits are marked in the top row of flotation boxes until the row is full, then in the second row, then in the third.

When the first row of boxes is full, the vessel's speed is halved. When the second row is full, the vessel is "dead in the water" and may not move under its own power. (It will drift with the current.) When the third row of boxes is full, the vessel will sink.

If a vessel has pumps, each point of pump rating will reverse 2 points of flooding per minute. A person who spends six consecutive turns bailing can bail 1 point of water.

Rudder/Screw: When a boat suffers a rudder/screw result, it must travel at half speed until the damage is repaired. On boats without a screw, this indicates that the rudder is jammed, and the boat cannot alter course until the damage is repaired.

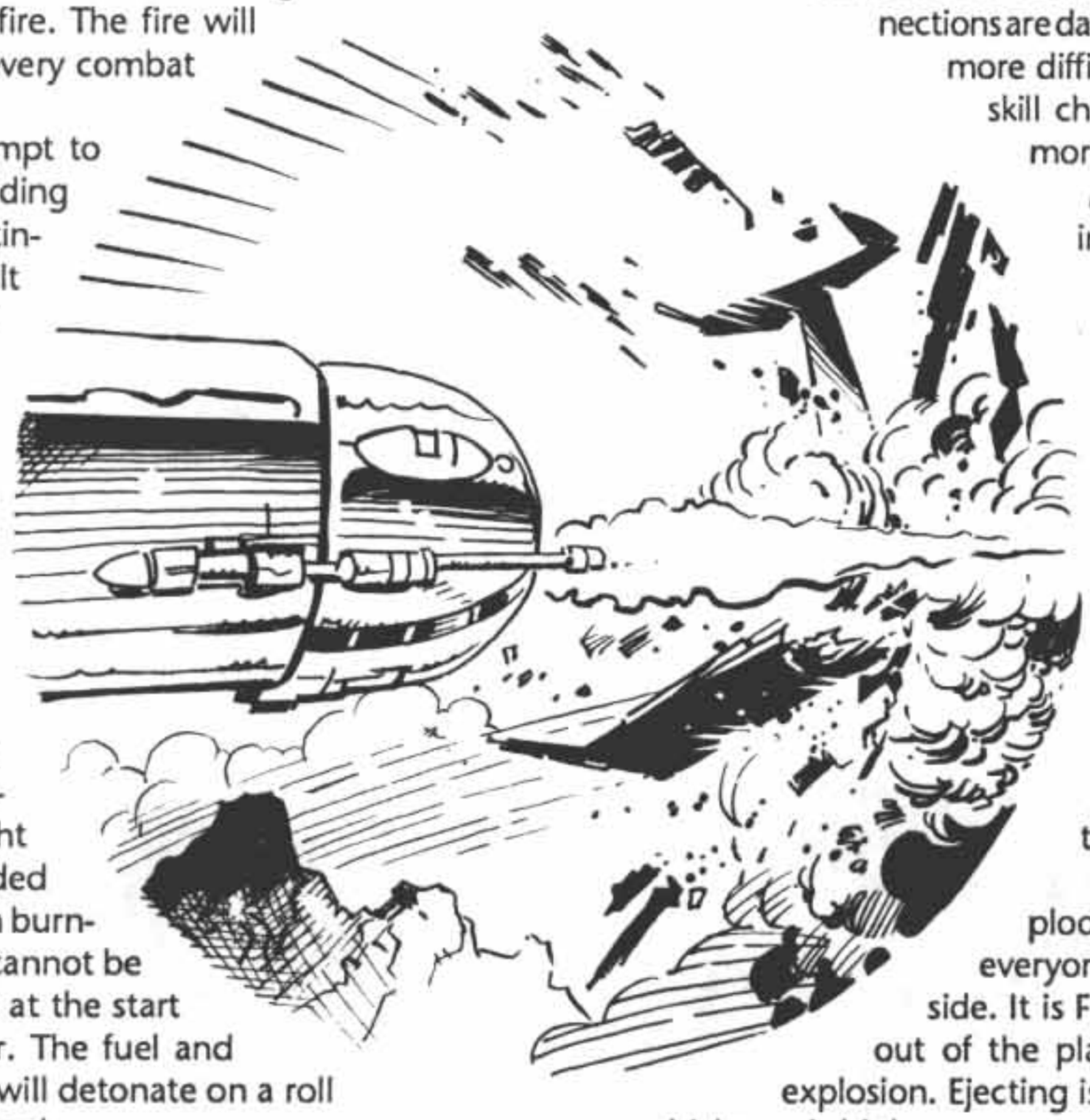
Auxiliary Machinery: Auxiliary machinery is rendered inoperable until repaired. The choice of precisely which piece of equipment is damaged is up to the referee.

No Effect: The round passes through the aircraft's wing with no serious effect.

Controls: The control surfaces and/or connections are damaged, making the craft more difficult to control. All Pilot skill checks become one level more difficult.

Instruments: The craft's instrument panel is damaged and instruments begin to fail (altimeter, speed indicator, fuel indicator, compass, and the like). The pilot must make an Average task roll to avoid a mishap at the start of each subsequent turn. Additional damage results to the instruments raise this additional difficulty levels.

Fireball: The craft explodes in flame, destroying everyone and everything inside. It is Formidable: AGL to bail out of the plane the instant before explosion. Ejecting is Difficult: AGL or Pilot, whichever is higher.



Collision Damage

It is entirely possible for vehicles to collide with one another in combat. The following general rules apply in those situations.

Damage done depends upon the size of the vehicle and the *net combat speed.* Net speed depends upon the relative direction and speed of the two colliding vehicles. Vehicles headed in opposite directions add their speeds together. Those travelling in the same direction subtract the slower's speed from the faster's. All others use the speed of the faster for determining collision damage.

Ground and Water Craft: For ground vehicles and water vessels, the damage value caused by a collision is

equal to the tonnage of the object collided with, times the net speed of the collision, divided by 10. For ground vehicles, this number is used as a penetration value against a randomly rolled hit location. For water vessels, the hit location is automatically considered waterline hull; the collision value is divided by the armor value of the given location, and the resultant number is then applied as waterline hull damage, causing flooding.

Aircraft and Spacecraft: For aircraft and other flying vehicles, collision damage value equals tonnage times net speed, but *not* divided by 10. A random roll is made as normal to determine hit location, then the damage value is used as a penetration value versus the hit location's armor value, the result being used on the Vehicle Damage Resolution table on page 299.

Vehicle Collisions With Creatures: When a vehicle collides with a human or other figure, including those riding bicycles or motorcycles, severe injury can result. In order to calculate the effects of this injury, first multiply the collision speed times the vehicle tonnage. If the target character is riding a bike or motorcycle, this number is the percentage chance that the bike or motorcycle is damaged enough to become inoperable. Next, the number is divided by two and becomes damage applied to a randomly rolled hit location on the target. Target figures have a chance to leap out of the way of an oncoming vehicle, by succeeding at an Average check versus Agility. If they succeed, they take no damage; otherwise they are struck by the vehicle.

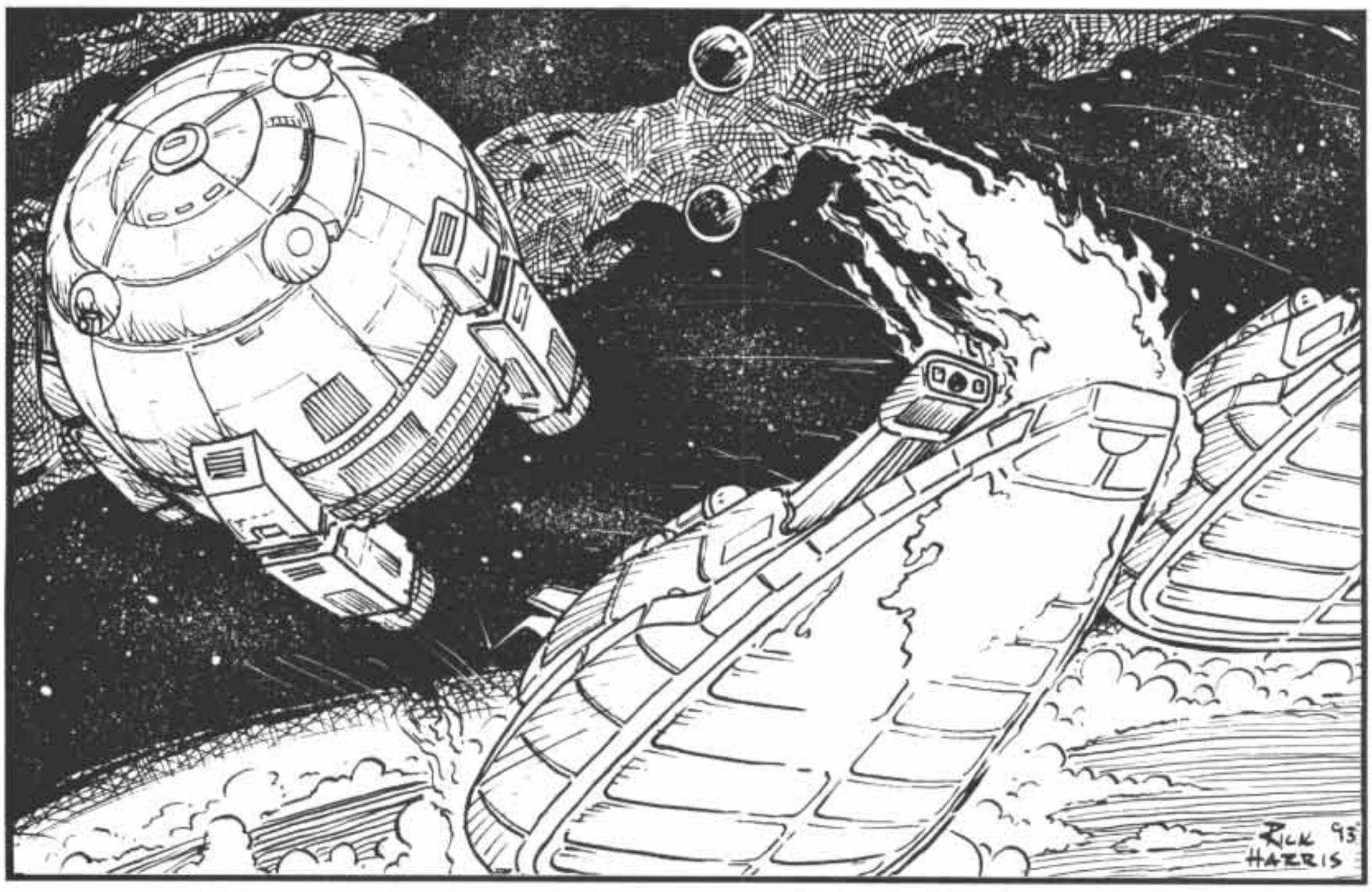
Examples: For instance, imagine that a large cargo truck going 60 and a small ground car going 35 were to collide head on. The collision speed in this case is 95. The truck weighs two tons, which means the car is hit with a value of (95×2)÷10, or 19. Regardless of the hit location rolled, the car's armor is 1, which means that (19–1=) 18 is referenced on the Vehicle Damage Resolution table, for "2 minor damage results."

The truck takes less damage from the lighter car. The collision speed of 95, times the car's weight of 1, yields 95, which when divided by 10 results in 9. Again, regardless of hit location, the armor value is 1. As a result, (9–1=) 8 points are taken to the Vehicle Damage Resolution table (page 299) for a result of "1 minor damage result." The referee must now roll the actual minor results and apply them.

In another example, a 20-ton boat collides with a 140-ton boat, with a net collision speed of 5 (remember, boats and aircraft are rated in 10-meter increments instead of meters). The 140-ton boat suffers a waterline hull hit which is worth 10 [(20×5)÷10] damage points, which will cause 10 flotation hits worth of flooding per combat turn until repaired. The 20-ton boat suffers a waterline hit worth 70 [(140×5)÷10] damage points, enough to immediately sink it.

Finally, two characters on a tandem bicycle are being run down by a truck moving at 45. The vehicle's speed is 45, times two tons weight equals a 90% chance that the bicycle is ruined. If the characters fail an Average check versus their Agility, they will each take 45 damage points to a random location.

Loss of Control: After all damage effects are calculated, operators of vehicles involved in collisions must immediately make a Difficult test of the appropriate skill in order to remain in control of their vehicle. Failure at this check means the vehicle goes out of control. Ground vehicles will skid to an uncontrolled stop, possibly colliding with something else and requiring a second damage check (at the referee's option). Water vessels will drift with the current, spinning slowly until control is regained. Aerospacecraft will plummet toward the ground at maximum speed. It is a Difficult test versus the appropriate vehicle skill to regain control, which can be made once per turn in which the driver is allowed an action. A Catastrophic Failure at the original test means the vehicle is damaged so severely that control cannot be regained.



Other Combat-Related Issues

Demolitions

Explosives, in addition to providing the bang for high-explosive rounds, are used to demolish structures and breach barriers.

Types of Explosives: For simplicity, the game deals only with the two most common types of explosives: dynamite and plastic explosive. The units used in the game are the quarter-kilogram stick of dynamite and the one-kilogram block of plastic explosive. All demolition effects are resolved in terms of the number of demolition points (DP) used. A stick of dynamite has 1 DP; a block of plastic explosive has 6 DPs. Plastic explosive is flexible and may be molded to any shape desired or broken into smaller charges of 1 or more demolition points. Several sticks of dynamite and/or blocks of plastic explosive may be joined to form larger charges.

Setting Charges: Each demolitions charge takes 15 minutes to emplace. A demolition charge is defined as one or more sticks of dynamite and/or blocks of plastic explosive connected to each other (up to a maximum weight of 10 kilograms). Additional explosives may be attached as extra charges, but require additional time to emplace. If several larger charges are emplaced, several characters may work on emplacing them at once.

Setting a charge requires a detonator and may require fuses or electrical wire. A character must have an engineer demolitions kit (see page 333) or must have improvised the required parts (see Combat Engineer skill, page 117). Improvised fuses/detonators will have a mishap on a D10 roll of 8+. Such a mishap is a hangfire (5-10 1D10) or a complete dud (1-4 on 1D10). A hangfire will detonate 1D10 turns later than expected; a dud will not detonate at all. The referee should make these rolls in secret.

Setting a charge is an Easy task using Combat Engineer skill, with failure indicating that the charge does not go off when triggered and with Catastrophic Failure indicating that the charge goes off while being set.

Tamping: Tamping consists of covering a charge so that the force of the explosion is contained and directed in toward a structure. Tamping must be done with dense or heavy material, such as rocks, sandbags, steel plates, etc. Tamping adds five minutes to the time required to set the charge. The referee may increase this time requirement for difficult tamping jobs. (It is very difficult, for example, to tamp a charge taped to the side of a freestanding girder.)

Effects: Like anything which blows up, explosives have a concussion, burst, and penetration value.

Concussion: It requires progressively larger quantities of explosives to produce a linear increase in concussion. To determine the concussion of a charge, consult the Demolitions table at right. This lists demolition points and their corresponding concussions. In reading the chart, you will notice that there are several gaps in the listing of demolition points. The DP value listed for a given concussion is the minimum number of DPs required to achieve that value.

For more precise results, the following formulae can be used to calculate the concussion value of a given demolition charge and the size of charge needed to achieve a given concussion:

To determine the concussion of a charge, divide the DP value of the charge by 2, extract the square root of the result, and multiply by 5. To determine the number of demolition points needed to achieve a given concussion, divide the concussion by 5, square the result, and multiply it by 2.

$C=5(\sqrt{DP+2})$. *C:* Concussion *DP:* Demolition points.

$DP=2[(C+5)^2]$. *C:* Concussion *DP:* Number of demolition points needed to arrive at a certain concussion.

Burst: Once the concussion of the explosion has been calculated, determine the maximum concussion radius of the explosion the same way as for a high-explosive round, as described on page 283. This maximum radius of concussion is also the primary burst radius of the explosion. The secondary burst radius is twice this.

Unlike a high-explosive artillery round, a demolition charge does not contain the material necessary to produce a large quantity of fragments. However, these are usually produced by the destruction of the object being demolished. If the demolitions charge is simply lying on the ground or is used to demolish an earthen or timber and earth fieldwork, it does not produce fragments.

Penetration: The base penetration value of a demolition charge is the same as its concussion value, but is modified by its means of emplacement. If the charge is tamped, its penetration value is doubled. If the charge is simply laying on top of or leaning against a structure (as in the case of a thrown satchel charge or stick of dynamite), its penetration value is halved. Unlike other explosions, the listed penetration value of a demolition charge is its actual penetration; players do not add the roll of 2D6 to it.

DEMOLITIONS

DP	Concussion/Penetration*
1	3
2	4
3	6
4	7
5	8
7	9
8	10
9	11
11	12
13	13
15	14
18	15
32	20
50	25
72	30
96	35
128	40
162	45
200	50

*Penetration value is modified by emplacement. *Tamped:* Pen×2. *Laying on or Leaning Against:* Pen+2.

Breaching Barriers: Breaching a barrier basically means blowing a hole in it. Demolitions charges can be used to breach walls, armor plate, embankments, etc.

To determine the size of the breach made by a demolition charge, first determine its maximum penetration. To do so, divide the penetration value of the charge by the toughness of the material of the barrier. This constant is listed on the Armor Equivalency table on page 298. The result is the number of centimeters penetrated by the charge.

For example, a charge with a penetration value of 12 would penetrate 1.5 centimeters of crystalliron (12÷8), 6 centimeters (12÷2) of armor plate, 40 centimeters (12÷0.3) of brick or concrete, and 60 centimeters (12÷0.2) of stone, packed dirt, or wood.

Now determine the actual diameter of the breach made. The diameter of the breach, in centimeters, is the penetration (in centimeters) of the charge minus the thickness (in centimeters) of the barrier.

For example, a character wishes to breach a 50-centimeter-thick (about a half yard) reinforced concrete wall. The character is using nine one-kilogram blocks of plastic explosive (total of 54 DP). Consulting the Demolitions table on page 303 he or she uses the 50 row for DPs and notes that this has a penetration value of 25. The character spends an extra five minutes carefully placing and tamping the charge for maximum effect, thus doubling the penetration value to 50.

The PC divides the penetration value of 50 by the reinforced concrete's toughness of 0.4, obtaining a total penetration of 125 centimeters.

Subtracting the thickness of the wall from this leaves a hole 75 centimeters (0.75 meter, or over two feet) across.

Characters should take cover from the blast as an explosion with a concussion value of 25 will injure characters within four 10-meter grid squares (40 meters) of the explosion, and it will throw concrete shards to twice this distance.

Mines

Mines are placed in the ground and are detonated when a creature or vehicle passes over them. Antitank mines are detonated by vehicles.

Detonation: Minefields are always described in terms of their width and depth in 10-meter tactical grid squares, and their density of mines per grid square. Once this has been calculated, the chance of detonating a mine per grid square entered is determined. For personnel, multiply the density by 0.1; for vehicles, multiply the density by 0.5. The result is the percent chance per square that a vehicle or character will trigger a mine.

It is too time-consuming to roll for every square entered, so the referee should instead note how many squares of the minefield a character or vehicle moved through, multiply this by the detonation chance, and use the result as the chance that a mine was triggered at some point during the move. Since a good many variables are actually at work here other than simple density of the field and distance travelled, the referee is strongly encouraged to make a quick approximation of the chances, round to the nearest 10% (but never down to 0 or up to 100), and roll a few D10. This is not an absolutely precise system to begin with, so speed of resolution is more important than precision.

For example, the referee determines that three characters are walking through an antipersonnel minefield with a density of 0.08 mines per square. One character walks through six squares of the field; one walks through five; and one walks through two. For personnel, the chance of detonation is 0.008 per square moved through. The referee decides that they have walked through an average of about four squares each, for a detonation chance of roughly 0.04 (4%) each. The referee makes a D100 (percentile) roll for each character, with a 4 or less indicating a mine was detonated. For more detail (and time), he could have rolled a D100 for each character for 5 or less, 4 or less, or 2 or less, respectively.

Damage: Detonation of a mine has the same effect as any other explosion, causing concussion and fragmentation. However, if a character triggers an antipersonnel mine, the full concussion value of the mine is only suffered by one leg (determine which one randomly), with the rest of the body parts suffering half concussion. Damage to a vehicle is resolved against the vehicle's suspension. If the mine has a penetration value, then an additional attack is made against the hull of the vehicle using the vehicle's hull rear armor value.

Detection: Detection of a minefield is an Average task using either Combat Engineer or Observation skill. It may only be attempted while crawling or walking, not while trotting, running, or mounted. Detection of a camouflaged minefield is a Difficult task, subject to the same restrictions. Conditions of reduced visibility (fog, night, smoke, etc.) raise the difficulty of the task by one level.

Marking and Removal: Once a minefield is discovered (either by detection or by setting off a mine), characters may either probe for the mines and mark their location or may attempt to remove them.

Probing and marking mines is an Average task using Combat Engineer skill and a Difficult task using Observation. Failure indicates that a mine present in the grid square has been missed, while Catastrophic Failure indicates the accidental detonation of a mine. It takes five minutes (60 combat turns) to probe and mark a five-meter wide path through one tactical grid square (10 meters).

If PCs wish to remove the mines from a field, they must first probe and mark the field as explained above. The referee will determine where the actual mines are in the marked part of the field, and each one must be removed. Removing a mine takes 10 minutes (120 combat turns) and is a Difficult task using Combat Engineer skill or a Formidable task using Observation. Failure indicates a complication in the removal

which will take extra time. Spend another 10 minutes and roll the task again. Catastrophic Failure indicates accidental detonation of the mine.

Directional Mines: Directional antipersonnel mines are not buried. They instead are generally emplaced at or near ground level and detonated either by remote control or a sensor of some kind. At low tech levels this sensor is a 30-meter tripwire. At higher tech levels this sensor can be a sound, vibration, magnetic, or infrared sensor.

Personnel passing over the tripwire will detonate the mine on a D10 roll of 6 or less. The detonation rolls for the more sophisticated sensors vary with tech level, and are given with the sensor listings. The range of these sensors is usually limited to the mine's effective range, so is also usually in the 30-meter range.

Anyone can detonate a directional mine by remote control at any time, provided he or she is in possession of the control (which is a radio control or is connected to the mine by a wire). Concussion is resolved normally. Fragmentation, however, is suffered only in the direction of the blast (predetermined when the mine is emplaced). The burst area is a 30-degree cone, so at any given distance from the mine, the cone is half that distance wide. For example, at a distance of 50 meters, the cone is 25 meters wide; at 100 meters, it is 50 meters wide. Two burst templates are provided below for use with the tactical grid. The primary burst zone of the directional mine extends to 60 meters, and the secondary burst zone to 120 meters.

RDM: Remote-delivered mines (RDM) may be fired by artillery or dropped by aircraft. The two types of RDM rounds are antiarmor mines (RDAAM) and area denial mines (RDADM). The first type delivers antitank mines, while the second delivers antipersonnel mines. Because the antipersonnel mines are smaller, RDADM rounds provide for a higher minefield density than do RDAAM. The densities of the two types of fields are provided on the RDM Density table. On the table, the unit of deliverable mines is equivalent to a medium-caliber artillery round. Larger artillery rounds or various sizes of aircraft mine dispensers will deliver more than one of these units.

For example, a round that was described as holding four RDAAM mine units would cover the area listed at a density of 0.04. Aircraft dispensers can be used to spread mines at the listed density over a larger area, so a four-RDAAM mine unit dispenser could either spread a 0.04 density RDAAM field over the listed area, or a 0.01 density field over four times the listed area.

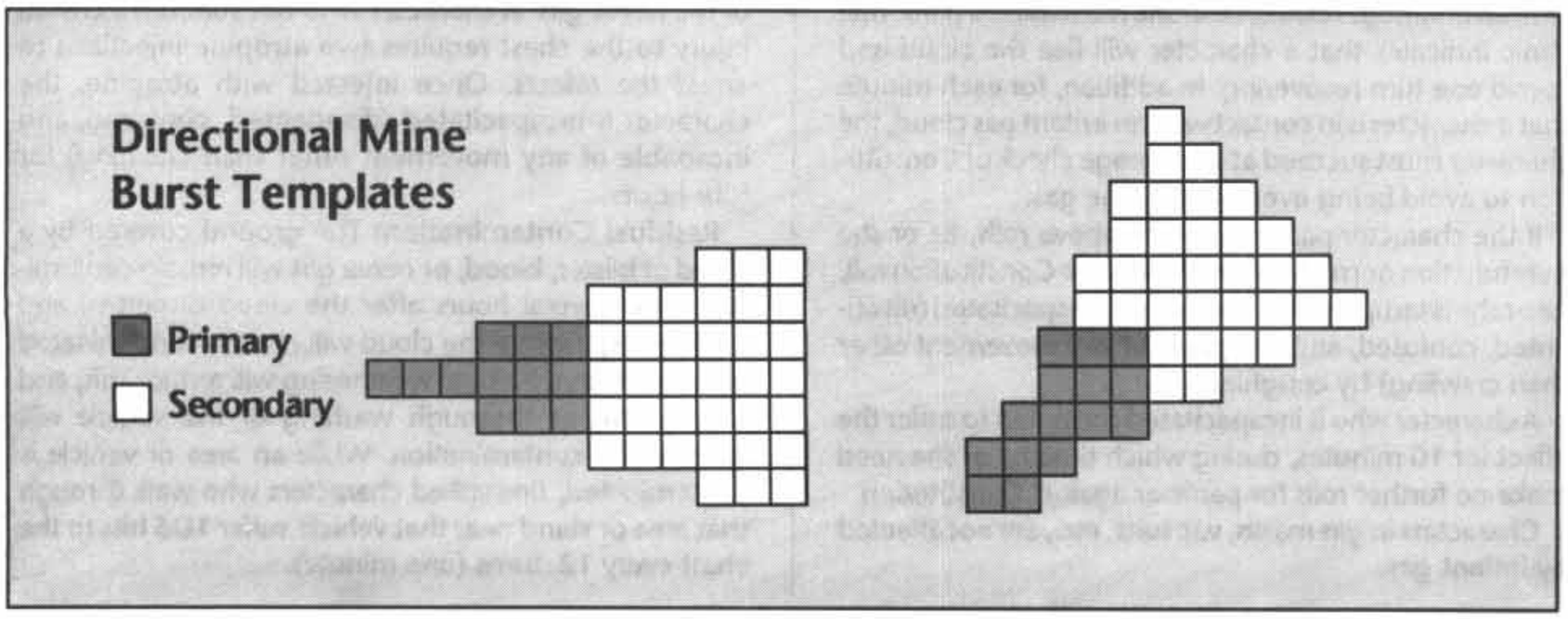
RDM DENSITY

Type	*Density*	*Dimensions of Mined Area*
RDAAM	0.01	250m (25 squares) by 250m
RDADM	0.04	250m (25 squares) by 250m

Due to the low density of mines delivered by a single mine-unit round, it is common practice to fire more than one round to make a field. When emplacing a minefield using RDM, players should tell the referee how many mine-units they are firing into each 25 10-meter grid square by 25 10-meter grid square area (the area covered by the mines from one round). The density of the minefield is the density of one round times the number of mine units fired.

For example, each RDAAM round provides a density of 0.01 mines per grid square. A group of characters has 12 one-unit RDAAM rounds and wants to mine an area roughly 500 meters across (roughly 50 grid squares). Each round covers an area 25 squares wide and 25 deep. The players tell the referee that they will fire six rounds into the middle of the left half of the area and six rounds to the right. This will give them a minefield 50 grid squares wide and 25 grid squares deep, with a mine density of 0.06 per square.

Standard Minefields: Standard antitank and standard antipersonnel minefields already in place (i.e., laid previously by NPCs) are assumed to have a density of 0.1. The referee can increase or decrease this, and determine widths and depths to fit the situation. The 0.1 density is an easy rule of thumb, however.



Chemical Warfare

Chemical bombs, missiles, artillery rounds, and grenades are filled with a chemical agent and are intended to do damage by dispersion of their contents rather than by their explosive power.

The listed burst radius of the round or grenade is the width of the chemical cloud it releases. The length of the chemical cloud is 4 times its width. The actual cloud starts at the point of impact of the round or grenade and extends downwind.

For example, a chemical grenade with a burst radius of 5 would have a chemical cloud five meters wide and 20 meters long.

Characters may suffer fragmentation damage if they are within the burst radius of the round or grenade, but since such weapons have only enough explosive force to scatter their contents, this is restricted to 1D6+2 damage with Nil penetration to a random location if hit by a fragment. Roll on the Personal Hit Location chart (page 269) for location.

A chemical round can contain one of five different chemical agents: smoke, irritant gas (such as tear gas or vomit gas), blood agent (such as phosgene), blister agent (such as lewisite or mustard gas), or nerve gas.

The cloud of gas from a smoke round does not form immediately. When the round hits, the referee should secretly roll 1D6 to see how many combat turns it will take the cloud to form. Once the cloud has formed, the effects below are instituted.

Smoke: Smoke causes no damage and is used to the obscure vision. The first 30 seconds of effect is thin smoke, followed by two minutes of dense smoke, then another turn of thin smoke, and then no smoke.

Irritant Gas: This category covers a variety of compounds usually known as tear gas or riot gas. The gas cloud lasts for four turns. Irritant gas causes no permanent damage, but can cause choking and temporary blindness.

When an unprotected character (one without a gas mask, vac suit, or air-tight armor) first comes into contact with an irritant gas cloud, he or she must make a panic roll. Panic indicates that a character will flee the cloud and spend one turn recovering. In addition, for each minute that a character is in contact with an irritant gas cloud, the character must succeed at an Average check of Constitution to avoid being overcome by the gas.

If the character passes both the above rolls, he or she may function normally. If the PC fails the Constitution roll, he or she is temporarily blinded and incapacitated (disoriented, confused, and incapable of any movement other than crawling) by coughing.

A character who is incapacitated continues to suffer the effect for 10 minutes, during which time he or she need make no further rolls for panic or against Constitution.

Characters in gas masks, vac suits, etc., are not affected by irritant gas.

Blood Agent: This category covers a variety of inhaled poisonous gases. The cloud lasts for 20 turns.

Each combat turn that a character is in the gas cloud of a blood agent, he or she receives 2D6 hits to the chest. A character in a blood agent cloud can hold his or her breath for six combat turns and only suffers 1D6 hits per combat turn while doing so. (The agent can enter the bloodstream through the eyes as well as through inhalation, but in less damaging concentrations.) Characters wearing gas masks, vac suits, etc., are not affected by blood agents.

Blister Agent: The gas cloud of a blister agent is the same as for a blood agent. A blister agent has the same effect on masked characters as irritant gas does on unmasked characters. If a character is not wearing a gas mask, blister agent has the same effects as both irritant gas and blood agent. Characters wearing masks and protective suits (or vac suit, air-tight armor, etc.) are unaffected by blister agents.

Nerve Gas: Nerve gas attacks the central nervous system of the victim, eventually causing convulsions and respiratory failure. It can be inhaled or absorbed through the skin. The gas cloud of a nerve gas round is the same as for a blood agent round. Each three turns (15 seconds) that a character is in a nerve gas cloud, he or she receives 1D6 points of damage to the head and 1D6 to the chest (referees should pro-rate lower exposure times).

Characters wearing a gas mask suffer damage only to the chest. Those wearing a protective suit but no gas mask suffer full damage. If wearing a pressure suit (such as a vac suit or combat environment suit) or a protective suit with a gas mask, he or she is not affected.

Once a character's damage level reaches serious injury (equal to a serious wound) to either the head or chest, he or she continues to suffer damage from the gas, even if the character is no longer in the gas cloud. This damage will continue until the character either dies or receives an injection of atropine.

A character who has suffered serious injury to the chest requires one atropine injection to arrest the effects of the nerve gas. A character who has suffered a critical injury to the chest requires two atropine injections to arrest the effects. Once injected with atropine, the character is incapacitated (disoriented, confused, and incapable of any movement other than crawling) for four hours.

Residual Contamination: The ground covered by a cloud of blister, blood, or nerve gas will remain contaminated for several hours after the cloud disperses, and vehicles exposed to the cloud will remain contaminated for several days. Natural weathering will reduce this, and a rainstorm or thorough washing of the vehicle will remove the contamination. While an area or vehicle is contaminated, unmasked characters who walk through that area or stand near that vehicle suffer 1D6 hits to the chest every 12 turns (one minute).

Environment

For sheer simplicity, the combat rules described have assumed a Terran environment (1G surface gravity, atmosphere of 20% oxygen and 80% nitrogen at 1 standard atmosphere of pressure at the surface, with lighting and surface temperatures similar to Earth).

Gravity

The surface gravity of a world in Gs will affect the movement rates and load carrying ability of personnel and vehicles, and affect the range of weapons.

Falling: For purposes of computing falling damage, multiply the distance fallen in meters by the planet's G rating to calculate the number of damage dice rolled. Gravity does not affect the damage dice rolled due to falling from moving vehicles.

Movement: Vehicles and personnel have two conceptually different types of movement rates, absolute and safe. Absolute movement is a vehicle's maximum straight-line speed while safe speed is the vehicle's true useful speed under actual operating conditions of terrain, maneuver, etc. Remember that for the purposes of **Traveller** ground combat it is the safe movement rate that is the most important.

Ground Vehicles: The effects of different gravity fields on ground vehicle performance is very complicated, and has to do with power-mass ratios, torque, and vehicle ground pressure. However, for the purposes of these basic rules, the following generalizations can be made.

On perfectly flat terrain, variations in gravity have no effect on a ground vehicle's maximum speed. Only in sloping terrain, where the vehicle is having to fight the pull of gravity, will vehicles have to work harder on high-G worlds or work less hard on low-G worlds.

One counter-intuitive effect of gravity is that it is often harder to accelerate on a level surface on a low-G world, and easier to accelerate on a high-G world. This is because lower gravity results in less traction (the vehicle's tires or treads are being pulled downward less hard, so have less bite into the ground), meaning that the vehicle's power cannot be applied to the ground as efficiently, much like a car spinning its tires on a slick road. Tracked vehicles tend to do better on low-G worlds than wheeled vehicles because of the greater amount of friction generated by their greater area in contact with the ground. Conversely, high-G worlds give vehicles greater surface adhesion, thus greater capacity for acceleration, if the vehicle has the available power. In general, a vehicle with excess power for its weight on its design world will do better on a high-G world, and much worse on a low-G world.

For this same reason, it is primarily the safe speeds of ground vehicles that are changed on worlds with different G fields. On a low-G world, a moving vehicle will have a harder time maneuvering or stopping, as its wheels don't bite into the ground as well, while on a high-G world the opposite is true. In the **Traveller** rules, a 1G design world is assumed, for simplicity.

If the local gravity is greater than 1G, multiply the safe movement rate of vehicles by the planet's gravity in Gs. Calculate the new speed and its double speed and triple speed overdrive rates, and compare these to its permanent (1G) rates. The vehicle's permanent 1G movement rates are still used for movement, but the new safe speed rates are used when calculating the difficulty of driving tasks.

For example, a wheeled utility vehicle has safe combat movement rate of 15, and overdrive rates of 30 and 45. On a 1.5G world this vehicle's safe rates become 22, 45, and 67. Since the 15, 30, and 45 permanent rates are all less than or equal to the vehicle's new double overdrive rate, movement at these speeds uses the difficulty level of the double overdrive rate: Difficult. On this world it is not possible to drive this vehicle fast enough to have to roll the triple rate Formidable driving test.

Thus high gravity actually makes driving tasks safer, in that mishaps are less likely. Remember, however, that any mishaps, once they occur, tend to be more dangerous. In the example, if the vehicle fell into a ravine, it would fall 1.5 times as hard, and would crush any passengers trapped beneath it 1.5 times as badly.

If the local gravity is less than 1, a vehicle's safe speed should be divided by the local gravity in Gs.

For example, on a 0.5G world, the same utility truck has its permanent combat movement rates of 15, 30, and 45. But its new safe speeds are 7, 15, and 22. Thus an attempt to drive at a rate of 15 would now be a Difficult task, driving at up to 22 would be a Formidable task, and an attempt to drive at 45 would be well beyond the vehicle's new triple overdrive rate and become an Impossible driving task. It is probably a good thing that such acceleration takes longer on low-G worlds. Characters would do well to exercise discretion when driving on low-G worlds and recognize that much of the vehicle performance they are used to far surpasses their local safe speed rates, and is wasted.

Aircraft: Most aircraft cannot function on a world that does not have the same atmosphere and gravity characteristics of the world it was designed for. This is especially the case with high-performance aircraft that are designed to take full advantage of their home environment. Referees may rule that certain general purpose low- or medium-performance aircraft may function on a world so long as the atmosphere is at least as dense, and the gravity is no greater, than those characteristics of the world it was designed for.

Grav Vehicles: Grav vehicles do not have their anti-gravity performance affected by differing gravity fields. Since what a grav drive does is negate the local effects of gravity on its mass, it is all the same to a grav drive if that grav field is 0.5G or 3Gs.

Load: A character's load-carrying capacity and thrown weapons ranges as calculated in the character generation rules are divided by the gravity in Gs. This allows loads to still be calculated using their mass in kilograms against a reduced load capacity, rather than multiplying the weight of every object and calculating it against a character's 1G load ratings. Characters with High-G Environment skill may disregard the effects of each 0.1Gs for each skill level possessed. See also pages 196-198 for the fatigue effects of high gravity.

Weapons Ranges: Divide ranges of all projectile weapons by the gravity in Gs. For example, a slug weapon with a short range of 50, medium of 100, long of 200, and extreme of 400 meters on a 1.5G world would have ranges of 33, 67, 133, and 267 meters respectively. On a 0.5G world, its ranges would be 100, 200, 400, and 800.

Energy weapons are unaffected by changes in gravity.

Horizon

The sight distance to the horizon varies with surface curvature and, therefore, world size. This distance not only limits the distance the eye can see, but also radar, laser sensors, etc. The table below shows the distance to the horizon on worlds of various sizes.

These distances are as viewed from eye-level of an average human standing at sea level. Greater altitude, as in a watchtower, aloft in a ship's mast, or in an aircraft allow greater line of sight distances. For situations where greater accuracy is required, the following formula may be used.

$$H = \sqrt{2AR + A^2}$$

H is the horizon distance in meters, R is the planetary radius in meters, and A is the sum of the altitude above sea level of the sighting and target unit in meters. For example, an A value of 100 meters would describe either an observer 100 meters above sea level attempting to sight a target at sea level, or an observer at the top of a 50-meter tower attempting to sight the top of another 50-meter tower.

Atmosphere

Atmosphere has several effects. Some are on combat specifically, but most are general effects that complicate any activity.

Weapons Effects: Atmospheric friction and opacity to bolts of energy can change weapons' performance characteristics. Less dense atmospheres require shots to give up less of their energy merely to pass through the atmosphere, while dense atmospheres absorb energy from projectiles and energy bolts alike. These changes are characterized as changes in range for purposes of penetration only, and do not affect difficulty levels of hitting targets at various ranges.

DISTANCE TO HORIZON

World Size Code	*Mean World Diameter (km)*	*Distance to Horizon (km)*
1 (Small)	1600	1.8
2 (Small)	3200	2.5
3 (Small)	4800	3.1
4 (Small)	6400	3.6
5 (Medium)	8000	4.0
6 (Medium)	9600	4.4
7 (Medium)	11,200	4.7
8 (Large)	12,800	5.1
9 (Large)	14,400	5.4
A (Large)	16,000	5.7

Atmospheric taint does not affect these figures, only relative density. Atmosphere adjustments for lasers appear with the laser listings; the rules below apply to plasma, fusion, and slug weapons.

In Vacuum or Trace atmospheres, weapons use their short-range penetration number at all ranges. In Very Thin, weapons use the penetration value for one range band less than the target is at. In Thin, Standard, and Dense atmospheres, weapons use normal values, and in Exotic, Corrosive, and Insidious atmospheres, they use the penetration for one range band farther than the target really is, except that fire at short range is not modified.

Atmosphere	*Weapons Effects*
Vacuum, Trace	Use short range penetration at all ranges
Very Thin	Use penetration from one range band closer
Thin, Standard, Dense	Use normal values
Exotic, Corrosive, Insidious	Use penetration from one range band farther, but no effect at short range

Personnel Effects: Worlds with Thin, Standard, or Dense atmospheres are all breathable without additional preparation. Tainted atmospheres require personnel to use filtering systems, either masks on individuals, or vehicle filter systems.

Worlds with Trace or Very Thin atmospheres require the use of oxygen tanks and eye and ear protection, or sealed vehicles with life support. Worlds with no atmosphere require the use of vacuum suits. Worlds with Exotic, Corrosive, or Insidious atmospheres all require the use of oxygen tanks plus additional protection: eye protection in Exotic, and vac suits, combat armor, or battle dress in Corrosive or Insidious atmospheres.

Naturally, combat effects that compromise the effects of these survival necessities allow the atmosphere itself to damage personnel. Personnel with breached vac suits or breached vehicles suffer the ill effects of no atmosphere or poisonous atmospheres, and personnel whose life support or oxygen tanks are destroyed will die if help is not immediately forthcoming.

Other Technical Effects: No air-breathing machinery (such as jet engines, internal combustion engines, etc.) can function on Vacuum, Trace, Exotic, Corrosive, or Insidious atmospheres. They can function in Very Thin atmospheres only with specially designed intake compressors.

Aircraft cannot fly at all in Vacuum, Trace, or Very Thin atmospheres, nor can they fly in an atmospheric density less than that of the world for which they were designed. For example, an airplane designed for use in a Standard atmosphere could fly in a Dense atmosphere, but not a Thin atmosphere. Exotic, Corrosive, and Insidious atmospheres are considered to have the same approximate pressure for this purpose.

Hovercraft cannot function in Vacuum or Trace atmospheres. Hovercraft absolute movement rates are quartered in Very Thin and halved in Thin atmospheres, multiplied by

1.5 in Dense, and multiplied by 2 in Exotic, Corrosive, and Insidious atmospheres.

Finally, Exotic, Corrosive, and Insidious atmospheres do cumulative damage to all vehicles and equipment. This is handled by increasing the maintenance requirements (see Maintenance, page 241). In Exotic atmospheres, multiply the time required for routine maintenance by 1.5. In Corrosive atmospheres, double this number, and in Insidious atmospheres, quadruple this number.

Completely sealed vehicles and equipment, such as spaceships, submarines, or battle dress, use the multipliers 1, 1.5, and 2 respectively.

	Maintenance Multiplier	
Atmosphere	*Unsealed*	*Sealed*
Exotic	1.5	Unmodified
Corrosive	2	1.5
Insidious	4	2

Tactical Visibility

The tactical visibility rules below again assume a Terran environment for simplicity. However, the concepts should be used in conjunction with the planetary variables above and applied by analogy. For example, the rules for smoke and/or bad weather and vision enhancement could apply in the middle of a relatively "clear" day on a world with an Exotic atmosphere. And a world which has no moon would always be treated as a moonless night.

The attempt to spot something, whether it is a building, vehicle, or group of personnel, is a task rolled against the Observation asset or the Intelligence attribute (the Intelligence attribute is not used as a non-skilled, i.e., at one higher difficulty level, default for this purpose, but is used without penalty). Equipment below which is described as adding 1 to a character's Observation asset also adds 1 to the Intelligence attribute for purposes of spotting tasks. Task difficulty is based upon the short range of the sensor, and difficulty increases just as with aimed shots (see the Firing Range Difficulties chart, page 275), i.e., Average at short, Difficult at Medium, etc.

Referees should exercise common sense when requiring their players to roll to see things. In broad daylight and good weather when looking for a town, sighting should be automatic. However, when looking for a camouflaged enemy position, or trying to spot anything at night or in bad weather, Observation rolls are appropriate.

Vision Devices: Standard human eyes have the best short range of all vision devices, but are limited by certain visibility conditions as noted below. It is under these conditions that the shorter-ranged vision enhancement devices come into play.

Vision Device	*Short Range*
Unaided eyes	1000 meters
IR (Infrared) Goggles	100 meters
LA (Light Amplification) Goggles	100 meters
Image Intensifier	250 meters
Thermal Viewer	400 meters

Once the basic difficulty level of the Observation task is established based on range, difficulty modifiers due to visibility conditions are applied. Although some vision aids are not affected by certain visibility conditions, unaided eyes are affected by all of them.

Visibility Conditions: Visibility conditions are of three types: night, weather, and smoke. Each of these conditions adds one or more levels of difficulty to the basic Observation task. Some of these conditions actually prevent the use of some vision aids, as discussed with each aid.

Night: Visibility at night varies considerably, depending on the amount of background light. The referee should assign a background light level of from 1 to 3, with 1 being the brightest, representing a clear night with one or more full moons high in the sky, and 3 being the darkest, a cloud-covered, moonless night. The background light level equals the number of + diff mods applied to the task. However, night modifiers do not affect some systems, see below.

Weather: Weather is characterized as poor (+1 diff mod) and very poor (+2 diff mods), although referees may stipulate even worse conditions. Weather mods apply during daylight as well as night, although these mods do not affect some vision aids.

Smoke: Smoke can be of varying densities as established by the referee, and imposes difficulty modifiers starting with +1 for light smoke. At higher tech levels, artificially generated smoke can prevent the use of radar or ladar by the use of suspended particles.

Visibility Conditions	*Difficulty Modifier*	*Notes*
Night	+1 to +3*	Applies to unaided eyes and light amplifiers
Poor Weather	+1	Does not apply to Thermal Viewer
Very Poor Weather	+2	Affects all vision aids
Smoke	+1 or more	Affects all vision aids

*Diff mod is equal to the background light level.

Other Modifiers: The following modifiers apply to all Observation tasks with all vision devices.

Target Size: Large targets are easier to spot than small targets. This includes buildings, vehicles, and personnel. See the Vehicle Target Size table on page 294, for specific size data for the size classes. A human-size target is Sub-Micro.

Moving Target: Moving targets are easier to see that motionless targets.

Halving of Short Range: Targets are easier to spot if they are within the vision device's short range. For each halving of the short range, the spotting task is reduced one difficulty level. For example, a character using a vision aid with a short range of 400 would have a –4 diff mod to spot a target at 25 meters (400 halved four times)

Other Modifiers	*Diff Mod*
Target Size Sub-Micro	+2
Target Size Micro	+1
Target Size Very Small	—
Target Size Small	–1
Target Size Medium	–2
Target Size Large	–3
Target Size Very Large	–4
Target Size Gigantic	–5
Target moving	–1
For every halving of short range	–1

Multiple Modifiers: All modifiers, from visibility conditions as well as other modifiers, are cumulative.

Encounter Ranges: Player character parties will periodically run into other groups. Roll for the range at which the PC group first becomes aware of the other group, based on terrain and modified by visibility. In poor weather, halve all encounter ranges (except in woods). In very poor weather, quarter all encounter ranges (except in woods). At night, divide all encounter ranges (except in woods) by 3× the background light level, then modify for poor or very poor weather. Woods are unaffected by reduced visibility, as visibility is already so limited that encounter range depends as much on hearing the encounter as seeing it anyway.

ENCOUNTER RANGES

Terrain	*Range*
Open	1D10×300m
Hill	1D10×100m
Swamp	1D10×30m
Woods	1D10×10m

Vision-Enhancement Devices: A number of vision aids are available. They have the following effects.

Binoculars: Binoculars are useful only during periods of good visibility (daylight and good weather). Characters equipped with binoculars and who have a good field of view have their Observation asset increased by 1. If they spot a group before it spots them, double the range of the encounter. Binoculars have no effect in woods and smoke.

Image Intensifier: An image intensifier has the same effect as binoculars, except that characters add 2 to their Observation assets. The device incorporates both telescopic and low-light intensification, and has a short range of 250 meters. Image intensifiers allow their users to disregard up to 2 night diff mods (i.e., in background light level 3, only takes a –1 difficulty modifier rather than –3), but are fully affected by weather diff mods. Image intensifiers have no effect in woods or smoke.

Color Enhancement: Color enhancement assists in resolving detail at long distances, and is helpful in detecting camouflage. Color enhancement devices add 1 to the Observation asset, but are useless in other than daylight and good weather.

LA Goggles: Light-amplification goggles allow characters to see in all but absolute darkness by intensifying ambient light. They have a short range of 100 meters. LA goggles allow characters to disregard up to 2 night + diff mods, but they are fully affected by weather diff mods, and have no effect in woods or smoke.

IR Goggles: Infrared goggles allow characters to see heat sources at night, and have a short range of 100 meters. In addition, characters wearing infrared goggles can see the beam of an IR spotlight (immediately below). IR goggles are not affected by night diff mods, but have no effect in woods, smoke or poor or very poor weather.

IR Spotlight: An infrared spotlight can illuminate an area 20 meters across at a range of up to 1000 meters. Only characters wearing IR goggles can see the light, and they make Observation rolls against targets within the illuminated area as if it were daylight. However, any character within 3000 meters and wearing IR goggles will see the searchlight. IR spotlights have no effect in woods, smoke, or poor or very poor weather.

White Light Spotlight: A white light spotlight will illuminate an area 20 meters across at ranges up to 2000 meters, and allow characters to make Observation rolls against targets within the illuminated area as if it were daylight. The light itself can be seen by any character at any distance who has a clear line of sight to it. White light spotlights have no effect in woods, smoke, or poor or very poor weather.

Thermal Viewer: A thermal viewer is an advanced form of infrared imaging, sometimes called forward-looking infrared (FLIR), although this is a misnomer when the device allows all-around visibility. Thermal viewers are not affected by night diff mods, and the thermal viewer allows characters to disregard up to 1 + diff mod due to weather (thus poor weather has no effect and very poor weather only applies a +1 diff mod), and up to 1 + diff mod due to smoke. It has a short range of 400 meters.

Thermal viewers have no effect in woods.

Wide Spectrum Visual: This device combines the capabilities of light intensification and thermal viewing above. It has a short range of 400 meters and adds 2 to the Observation asset of characters using it. It is not affected by night diff mods, and allows characters to disregard up to 1 + diff mod due to smoke. The WSV viewer is affected by weather mods, and has no effect in woods.

Illumination Rounds: An ILLUM round will illuminate the area within its burst radius as if it were full daylight. ILLUM rounds have no effect in woods, smoke, or poor or very poor weather.

Sensors: All of the above weapons are vision aids, and are used with the Observation asset. The equipment below allows objects to be detected under poor conditions, although not visually, and are used with the Sensors asset instead of Observation.

Radar: Personnel with all-weather radar sensors (usually vehicle-mounted or as portable ground sets) do not have their visibility within the radar's range and line of sight affected by any atmospheric conditions. Radars have a listed short range and calculate difficulty in the normal ways, and use all of the modifiers from the "Other Modifiers" section above. Radar can, however, be jammed. See Jamming, page 315.

Ladar: Ladar works like radar, but uses laser instead of radio pulses. Ladar cannot be jammed, but is degraded by smoke and bad weather at tech levels below 13.

Space Combat

In the uncertain environment of the New Era, conflict is inevitable. Space combat addresses the handling of such conflicts between space-faring craft.

A space combat situation occurs when adventurers (in a spacecraft) encounter another space-faring craft—and violence is offered by either side.

Space combat is task-based. As with personal combat, the players are familiar with the concepts of tasks, so they can immediately make reasonable decisions about when to fight and when to prudently make a run for it.

These rules are intended for a situation in which the referee is running ships from no more than two different forces, where all the craft of each force begin on similar headings and within a few light-seconds of each other.

OVERVIEW

The space combat system presented here is abstract and does not require a map. It is based on the fact that interplanetary space is so vast that spacecraft will encounter each other only near certain points of interest: worlds where ships stop to trade or undergo repairs, or gas giants where ships stop to fill their fuel tanks. Ships that encounter each other at such locations will either be moving toward or away from the point of interest, or maintaining a position near the point of interest (perhaps guarding it). Because ships are moving with relation to this common point, their courses will tend to converge, or at least come close enough that some interaction is possible. In this abstract system, attention is concentrated on the relation of these ships' vectors to each other. A more detailed and tactical system is presented in the boxed **Brilliant Lances: Traveller Starship Combat** set.

A hostile encounter involves detecting the hostile vessel and maneuvering to intercept or avoid it. Combat involves pinpointing targets with fire control sensors, and performing successive attacks (such as missile fire, laser shots, or spinal meson fire) on the located targets.

A basic "to-hit" task is used in every case to obtain a hit; the basic task is modified by such considerations as range between the attacker and the target, the type of weapon used, the defensive abilities of the target spacecraft, and other such factors. If a hit is obtained, the weapon must penetrate the target's screens and active defenses (such as laser fire destroying incoming missiles). The damage inflicted depends on the type of weapon.

Combat continues until one side is vanquished, flees, surrenders, or is destroyed.

DEFINITIONS

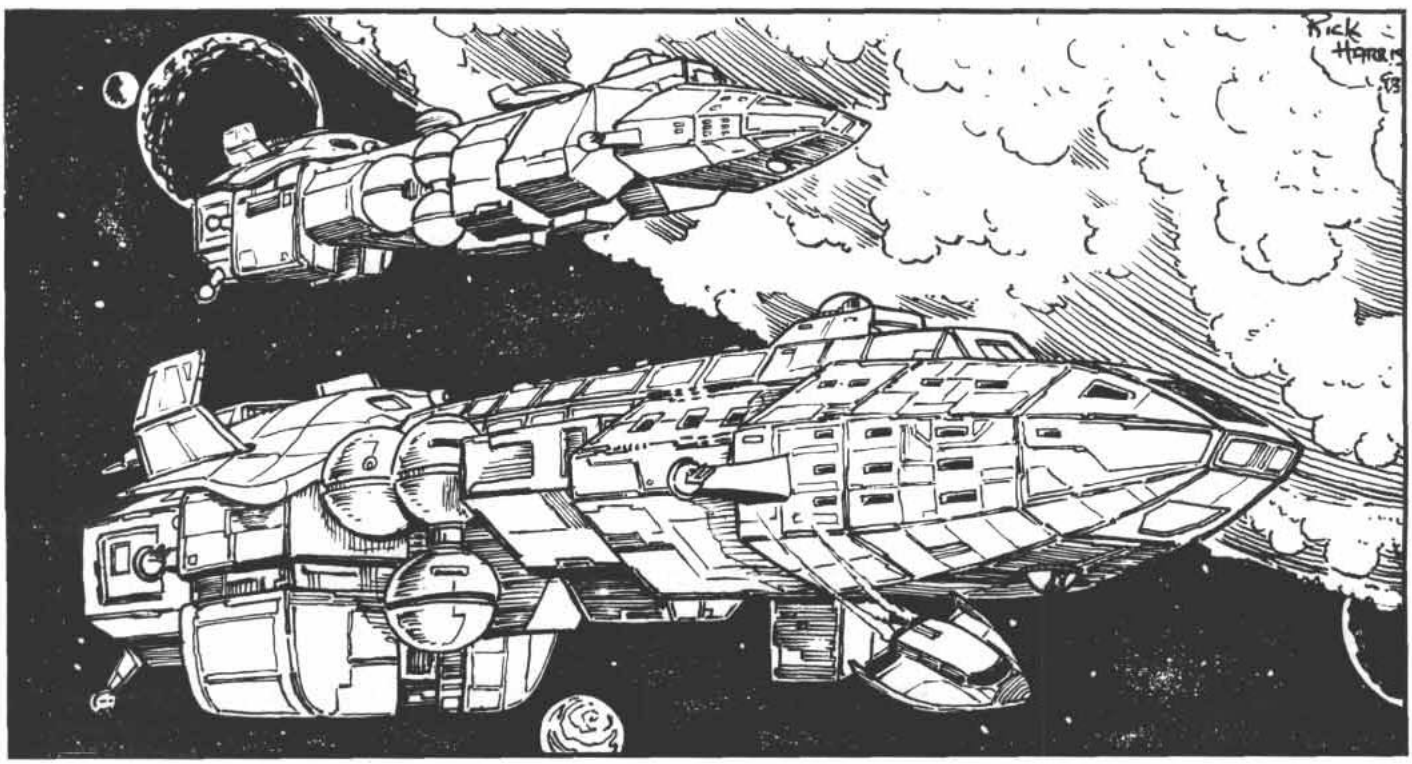
The following terms are used repeatedly in the combat rules.

Combat Turn: Combat is resolved in turns. Each combat turn represents 30 minutes of elapsed time. Thus, two combat turns equal one hour.

Within a single turn, each individual spacecraft is allowed opportunities to maneuver and to attack. Each may be attacked by one or more enemy spacecraft.

Once all spacecraft in the battle have been provided with the opportunity to act, the combat turn is over, and the next combat turn begins.

Range Band: Combat is conducted abstractly without a map or other graphic representation of the vessels. Distance between vessels (used to calculate sensor and weapon



range) is measured in increments of 30,000 kilometers (one-tenth of a light-second), each of which is called a range band.

Velocity: The speed of a vessel or missile expressed in range bands per combat turn. For reference purposes, a velocity of 1 is equal to a real speed of 60,000 kilometers per hour.

G-Turn: An acceleration of 1G for one combat turn (30 minutes). Two G-turns equal one G-hour.

Target: The vessel or vessels belonging to adversaries or potential adversaries.

Friendly: The player characters' spacecraft and those of any potential allies.

Tasks: All combat activities use tasks. Most combat tasks have an absolute time increment of one combat turn. Also, in starship combat, unless specifically stated otherwise, all tasks are "nonrepeatable" tasks. In other words, try the task once, and if it fails, you are finished for the turn.

ENCOUNTER RESOLUTION

Once the referee has determined that a starship encounter has taken place and determined the exact nature of that encounter, the encounter resolution procedure begins. This procedure has up to five steps, depending on whether combat actually takes place. Steps 1 and 2 are only conducted once per encounter, at the beginning. Once the encounter begins, steps 3, 4, and 5 are conducted in order each turn until one side is destroyed or breaks contact.

Step 1: Determine Surprise

Surprise is determined only once per combat encounter. Surprise is possible for either side, and the element of surprise gives an advantage both in attacking and in avoiding the enemy.

Surprise is a Difficult task using the Fleet Tactics skill of the captain. This roll is made one level easier with a successful enabling roll at the same difficulty level by the highest Sensors asset available among the crew. It is rolled by the side which first sights the enemy (referee's decision, based on the relative sensor and crew qualities of the ships). While in most attack situations the chance of surprise is Difficult, the referee must weigh each situation and set the difficulty accordingly. For example, if the defending side has no reason to expect an attack, the surprise may become Average. On the other hand, if the attacking side consists of a pirate vessel known to be in the system attacking some local system defense boats with high-quality sensors, achieving surprise may be a Formidable task. Another common consideration is relative sophistication of sensor suites. If one vessel has a much more sophisticated sensor suite, its chance of achieving surprise will be one level easier, while its opponent's will be one level more difficult.

Benefits of Surprise: The vessel which was surprised may not maneuver or fire on the first turn it was surprised, unless it is able to man battle stations. Manning battle stations is a Formidable task against the vessel captain's Leadership. Battle stations are always manned on the first full turn following surprise.

Readiness: Under certain circumstances, players may stipulate that their vessels are operating at alert status, with some battle stations already manned, or at battle stations. If operating under alert status, the roll to man battle stations is one difficulty level easier (–1 Diff Mod), and obviously no roll is necessary if the crew is already at battle stations. However, these levels may not be maintained indefinitely. There is a maximum number of consecutive four-hour periods for which these conditions can be maintained, shown on the table below. Each additional consecutive four-hour period beyond these limits imposes a one difficulty level penalty on every task attempted by every crewmember (–1 Diff Mod). Thus, if Captain Queegulii kept his crew at battle stations for 20 hours, beginning at (3×4=)12 hours and one minute all tasks would be one difficulty level higher. Beginning at 16 hours and one minute, all tasks would be two levels higher. These penalties remain in effect until at least three consecutive periods (12 hours) are spent at condition 0. So, in the example, if Queegulii let his crew stand down after 20 hours, but called them back to battle stations after only four hours, they would still perform their tasks at two difficulty levels higher.

In addition, once the crew has returned to normal cruising status, the roll to man battle stations is increased in difficulty if the crew had been standing at alert status or battle stations for a long period of time. For each consecutive period at battle stations or two consecutive periods at alert status, the roll to man battle stations is increased in difficulty by one level. This penalty is decreased by one level for each subsequent period spent at normal cruising. Thus, a crew who had been at alert status for four consecutive periods (16 hours) would be at +2 difficulty levels to man battle stations during the first period after they stood down, +1 level the period after that, and back to normal after two full periods of normal cruising.

Furthermore, no maintenance or repairs (see the Maintenance section, pages 241-244) can be conducted under either condition 1 or 2, although damage control may be (see page 323).

Step 2: Determine Target Aspect

This step is only performed once, at the beginning of the encounter, after surprise is determined. At the beginning of the encounter, all ships on the same side have the same speed and course.

The target aspect is the target's (ship or force) position, course, and velocity relative to the friendly ship or force, using the following discrete steps.

READINESS CONDITIONS

Name	*Description*	*Effects on Readiness*	*Max Periods*	*Side Effects*
Condition 0	Normal cruising	Normal	—	None
Condition 1	Alert status	–1 Diff Mod	6	+1 Diff Mod per two periods
Condition 2	Battle stations	Automatic	3	+1 Diff Mod per period

1. Range: Roll on the Detection Range table (page 324); the result is in range bands. For purposes of initial range, a military vessel is considered to be any vessel that is making extensive use of active sensors, a common tactic of military vessels that are "showing the flag." Vessels, even military ones, which are "running silent", using only passive sensors, do not fulfill this criteria.

2. Target Vector: A vector consists of both speed and direction; its general direction and speed are indicated by the target disposition (as rolled on the Ship Disposition table (table 8, page 229) when the encounter is generated). This will tell whether the target vector's direction is inbound (moving toward the nearby gravity well that the friendly vessel is either approaching or departing), outbound (moving away from the well), or neutral (standing by), and will indicate the die roll to determine velocity. The result of the velocity die roll is the target's velocity in range bands per turn.

3. Target Bearing: The target bearing is the angular deflection from the axis of the friendly ship's course. A target directly ahead of the friendly ship or force has a bearing of 0 degrees; a target directly behind it has a bearing of 180 degrees.

To determine target bearing, roll a die and consult the Target Bearing table (page 324). If both the friendly and the target are inbound or outbound, roll 1D10. If the result is 1-3, use the column labeled Same, as the ships are actually following the same course; if one is inbound and the other outbound, if either is neutral, or the D10 result was 4-10, use the column labeled Converging.

4. Friendly Velocity: Multiply the accumulated G-hours of acceleration of the friendly ship by 2. The result is the speed of the friendly vessel in range bands per turn.

5. Closing Velocity: This is the speed at which the target and friendly vessel are approaching each other. This is determined by either adding or subtracting one speed from another, and sometimes conducting a multiplication step. The precise formula is given on the Closing Velocity table (page 324), and the formula used is determined by whether the ships are on converging or parallel courses and by the bearing.

Note that some formulas may yield a negative number. In this case, the two ships are actually moving away from each other at that speed. On parallel courses this means that a faster ship is pulling away from a slower one; on converging courses this means that the current courses, were they projected backward as straight lines, have already reached their closest point at some time in the past, and the ships are now growing farther apart. (Had both ships been on these courses all along, they wound have obviously encountered each other already. However, ships may have maneuvered from other courses to arrive on their current course, or have emerged from jump space, and were therefore not on those courses at their imaginary closest point.) For purposes of simplicity, this number will be referred to as the closing velocity whether its value is positive (a true closing velocity) or negative (in actuality an opening velocity).

6. Closest Approach: Ships moving in opposite directions which are approaching each other on oblique angles will usually not meet at the same point and same time, and will instead pass each other at some distance apart. For simplicity's sake these "closest approach" distances are assumed to be half of the initial detection range. Ships whose courses will intersect (or which already coincide with each other, in the case of the "same" courses) have a "closest approach" of 0. These are a function of course and bearing and are shown on the Closing Velocity table (page 324).

Once a vessel reaches its closest approach, its closing velocity then becomes an opening velocity (assuming it does not maneuver to remain closer to its opponent) and it will begin to move away at that speed.

Step 3: Resolve Maneuver

Once the encounter begins (after steps 1 and 2 above have established the starting conditions), each turn begins with this step.

At this point, one or both of the vessels in the encounter may begin to maneuver, either to intercept (come as close as possible to) the other or to avoid interception. Each vessel maneuvers by firing its thrusters in an attempt to alter the closing velocity. Although the ships are actually changing their vectors relative to each other, for purposes of space combat resolution, only their net closing velocities relative to each other is considered. The following considerations affect interception.

Fuel: Each G-turn of acceleration uses 1/2 of a G-hour of fuel (the spacecraft listings on pages 366-379 list fuel consumption per G-turn under the "G-Turns" heading).

Speed Change: Each ship may spend a number of G-turns limited by its G rating (maneuver performance) in order to modify the current closing velocity. Each G-turn of acceleration spent by a ship changes the closing velocity for the current turn by one. The closing speed may be either increased or decreased. As G-turns of acceleration are spent, the players must declare whether they are going to increase or decrease the closing velocity.

Compute New Range: At the end of each turn, subtract the current closing velocity (after the speed changes above) from the current range to get the new range for the next turn (when the closing velocity is a negative number, remember that subtracting a negative number is the same as adding a positive number, thus actually increasing the current range).

Planned Deceleration: If one or more of the ships in the encounter are moving toward the orbit of a world, they must begin decelerating at a certain point to avoid overshooting the world. This maneuvering will obviously affect the forces' vector relative to the opposing force, usually by constraining its options for maneuvering to escape or intercept the other force. The referee must determine how far the ships are from the planned start of deceleration so that they ships may avoid overshooting their destinations.

Closest Approach: Once the range closes to the predetermined closest approach, the closing velocity becomes an opening velocity (i.e., the current closing velocity becomes a negative number with the same value), and the ships begin moving away from each other.

Matched Vectors: If the closing velocity is ever reduced to 0, this means that the ships have matched vectors. Once two

ships have matched vectors, the closest approach range becomes 0, regardless of what it was initially. Any new vector changes will place them on converging courses. However, depending on how the players choose to spend the maneuver Gs, they may have a closing velocity on this converging course or an opening velocity.

If an interception is not possible (i.e., the aggressive spacecraft cannot close the distance to practical combat range) combat does not take place and the encounter is over.

Firing Range: Once the range becomes small enough, the players may begin to attempt to fire on each other as detailed in step 4.

Step 4: Resolve Combat

If a close approach and/or interception is possible, combat may take place. In each combat turn, each side may maneuver, launch craft, evade and/or fire.

Maneuver: At the beginning of each turn, ships continue to maneuver, that is, increase or decrease the closing velocity by means of acceleration, in step 3 above.

Launch Craft: Each ship can launch small craft that it is carrying, based on its fitted launch facilities (see Starships section, starting on page 366). Small craft which are served by a launch tube are launched at the rate of 10 per 30-minute combat turn per launch tube. Small craft which use normal launch facilities may be launched at the rate of one per (30-minute) space combat turn per launch facility. Unless specified otherwise, each ship has one normal launch facility.

Evasion: Space vessels evade by spending G-turns of acceleration on evasive maneuvers. Each vessel may spend G-turns up to its G rating on maneuver (to change closing velocity), evasion, or a combination of the two. The total number of G-turns spent on maneuver and evasion cannot exceed the vessel's G rating. G-hours already spent in step 3 for maneuver are not available for evasion.

Evasion Procedure: In order to conduct a successful evasion maneuver, the vessel's commander must achieve success at an Impossible test of Ship Tactics. This task is reduced in difficulty one level (–1 Diff Mod) for each G-turn spent for evasion for the turn. Success indicates that all enemy sensor lock attempts and fire attempts against the ship for that turn are resolved at one difficulty level higher. Outstanding Success indicates that all enemy sensor lock attempts and fire for the turn are resolved at a number of difficulty levels higher equal to the number of G-turns spent on evasion divided by two (round fractions down). Catastrophic Failure indicates that not only is there no evasion effect on the enemy fire, but that the unpredictable gyrations have thrown off the ship's own gunnery: All sensors and fire tasks attempted by the ship for the turn are resolved at one difficulty level higher than normal.

This evasion roll is only made once per turn, and its results remain in effect for the entire turn.

Fire: Each weapon on each ship may fire once per turn. Starship weapons are actually powered so that they fire at least 10 times in each 30-minute turn, but the fire control solutions at space combat ranges are so formidable that the roll is only made once to see if any hits at all were scored.

Outstanding Success: An outstanding success on a to-hit roll indicates that two hits were scored, not only one.

Ship fire is resolved in three steps—sensor lock, hit procedure, and defensive weapons.

1. Sensor Lock: Most spacecraft have a number of sensors, each with differing ranges and capabilities. Once the encounter begins, players may attempt sensor locks using the sensors available to them. Each sensor may attempt as many locks per turn as there are enemy targets, but may only make one detection attempt per enemy target. However, different sensors on the same spacecraft may each attempt to detect the same enemy target. Sensor tasks are rolled for following the Resolve Maneuver step. The results of these sensor tasks are in effect through the remainder of the turn.

Obtaining a sensor lock is a task using Sensors skill, with the task difficulty based on the range to the target, just like an aimed shot in direct fire combat (page 274). Each sensor has a listed short range. (Because the ship listings are compatible with **Brilliant Lances,** which uses *hexes,* the ranges are given in hexes. Range expressed in range bands is identical to range expressed in hexes.) Sensor tasks at short range are Average, at medium range (twice short range) are Difficult, at long range (four times short range) are Formidable, and at extreme range (eight times short range) are Impossible (see the Sensor Lock Difficulty table on page 324).

Before any sensor lock tasks are rolled, any and all players involved (particularly when two groups of player characters are opposing each other for whatever reason) must decide which sensors they intend to use, and must announce these decisions to the referee. These decisions are considered simultaneous, so that each of them will affect all sensor lock rolls for that turn. These decisions are important for two reasons, going active, and using folding passive arrays.

Going Active: Ships which go active, by using radar or active EMS sensors, make it easier for ECM-equipped ships to detect them, see under ECM/ECCM below.

Folding Passive Arrays: Some ships carry high-resolution thermal (HRT) sensors or passive EMS arrays that are so large they must be folded to fit on the ship, but must be unfolded to be used. Unfolded arrays make these ships larger targets, therefore easier to detect by active sensors, see under Radar and Active EMS below.

Retaining or Handing Off Sensor Locks: Sensors roll each turn to maintain locks from previous turns, but at one difficulty level easier than normal. Sensor locks may also be "handed off" to other sensors on the same ship or to other friendly ships, so long as both ships have functional communicators with sufficient range to contact each other. This hand-off takes place on any turn following the turn in which sensor lock was gained by the original sensor, and allows a –1 difficulty modifier to the sensor receiving the hand off. Handing off allows active sensors to be shut down, or ships with less capable sensor suites to acquire sensor locks.

The different types of sensors have differing capabilities as follows:

Radar: This is an active sensor which detects its targets by emitting radio energy across wide angles, and detecting the radio energy which bounces back from distant targets. When a spacecraft is using radar, it suffers the penalties of

going active, "lighting up." When a radar is attempting a lock on a target with an extended passive sensor array, it does so at one difficulty level lower (–1 diff mod).

Ladar: This is similar to radar, except that it uses laser rather than radio energy, and does not emit its energy across wide angles. Ladar may not be used to make an initial sensor lock, as it cannot scan broad areas. However, another sensor which has already locked on the target may hand off its lock to the ladar, which can then maintain the lock as if it were its own. Ladar does not carry the same penalties for "going active" as do radars, active EMS, and radio broadcasts. However, if its target is using sandcasters, it is one level of difficulty higher to maintain the sensor lock with a ladar set.

HRT (High-Resolution Thermal): This is a passive sensor that detects targets by their infrared radiation. The more heat the target is giving off, the easier it is for the HRT to detect it. Targets that are heading directly away from the sensor, either to reduce the closing velocity or increase the opening velocity, are pointing their fusion exhausts directly at the HRT sensor and are much easier to detect—see the Sensor Lock Difficulty table (page 324).

EMS Active: This is an advanced version of radar, which incorporates the use of wavelengths other than radio, and adds in sophisticated computerized image enhancement. It is an active sensor, and when used, carries the same penalties for going active (see ECM/ECCM below). When an active EMS sensor is attempting a lock on a target with an extended passive sensor array, it does so at one difficulty level lower (–1 diff mod).

EMS Passive: This is an advanced passive sensor that has the capabilities of the HRT plus EMS direction finders and computerized image enhancement. It has the capabilities of the HRT above, plus the direction-finding capabilities discussed under ECM/ECCM, below.

Other: There are several other types of sensor installed aboard spacecraft, such as densitometers, neutrino sensors, and neural activity sensors, but these do not come into play in space combat.

ECM/ECCM: Although not all of these devices are sensors, they do affect the sensor lock procedure and should be mentioned here. The effects of the ECM and ECCM below only affect task rolls for sensor locks, and not the subsequent to-hit rolls for weapons.

First are direction finders. EMS direction finders are useful in detecting the location of any emitting radar, radio, radar or radio jammer, or active EMS array. These direction finders are built into all passive EMS sensors, and may also be built into radars and active EMS sensors, and their presence is indicated on the spacecraft data pages starting on page 366.

EMS direction finders provide a –1 difficulty modifier to *all sensors* on the ship vs. targets which have gone active (i.e., are using radios, radars, or active EMS sensors), provided the following conditions are met: The direction finder must be within twice the extreme range of the enemy active system (16 times its short range), and must be of a tech level equal to or greater than the enemy active system. If the direction finder is part of a folding array, it must be unfolded in order to provide this benefit.

Ships which are equipped with electromagnetic masking (EMM) increase the difficulty of an HRT or radar lock on them by two levels, and the difficulty of an EMS (active or passive) sensor lock by one level.

A ship equipped with a laser sensor can detect when a ladar set has a sensor lock on it, allowing it to fire sandcasters to increase the difficulty of maintaining sensor lock on the following turn (see Sandcasters, page 317).

Jamming: Vessels equipped with EMS jammers may attempt to jam *active* enemy sensors. Each jammer has a listed short range. Its other ranges, and the base difficulty levels at each of these ranges, are defined the same as for sensors (see under "Sensor Lock" on page 314). The only modifiers made to the task difficulty are for relative tech level, +1 difficulty level for each tech level by which the sensor exceeds the jammer, or –1 difficulty level for each tech level by which the jammer exceeds the sensor.

The jamming task is rolled for each active sensor which attempts a lock on the jammer-equipped vessel, and the jamming result only applies to the sensor against which it is rolled.

Success indicates that the opposing sensor is jammed, and must therefore roll its sensor lock task at one difficulty level higher (+1 diff mod). Outstanding success requires the opposing sensor must roll at +2 difficulty levels.

These are deceptive jammers, not area noise jammers, and therefore their use does *not* count as going active.

2. Hit Procedure: A vessel's weapons can only fire on targets for which the ship has a sensor lock on the current turn. Obtaining a hit on a target is a task using the Gunnery skill of the gunner controlling the weapon, with the difficulty determined by the range to the target, the weapon's fire control parameters, the target's size, and successful evasive maneuvers by the target. The gunner controlling the weapon uses the Gunnery cascade specialty appropriate to the weapon.

Gunnery Cascade	*Weapons Controlled*
Energy Weapons	Lasers, Particle Accelerators, Meson Guns
Missiles	Missiles

All fire is considered to be simultaneous (with the exception of pre-emptive beam and damper antimissile fire, see page 317) which means that all weapons in a turn are fired before any damage is assessed.

Types of Weapons: Lasers use focused beams of coherent light to impart energy to enemy targets over a very small area. Relative to other beam weapons, lasers have good penetration performance, but generate less explosive force and damage. Space combat missiles are also a form of laser weaponry, as their warheads are nuclear weapons which explode to create powerful X-ray laser pulses. Lasers are direct fire weapons and are limited to hitting enemy hit locations visible from the arc of fire they are firing from.

Particle accelerators, as the name implies, accelerate particles, almost exclusively neutral atoms such as hydrogen, to very high speeds at enemy targets. These have less penetrative ability than do lasers, but generate a much greater explosive force. Like lasers, particle accelerators are

limited to hitting only visible hit locations when firing at enemy vessels.

Meson guns also accelerate sub-atomic particles at enemy targets. But in this case the particle is a meson, which does not interact with matter, and therefore passes through all objects without resistance. However, the meson has only a short life, after which it decays into other more destructive particles. By accelerating the meson to relativistic speeds, its subjective passage of time slows, and its decay is delayed. By timing the decay to occur as a group of mesons pass through an enemy ship, powerful explosions can be created within enemy targets without having to penetrate the armor. Because mesons travel through spacecraft hulls to explode within, meson guns are not limited to hitting only visible hit locations on an enemy ship, but roll 1D20 for hit location from any direction of fire (see below).

Fire Control: Each weapon will have at least one, but perhaps two components of its fire control. Every weapon has an on-mount fire control system (OMFCS), which for beam weapons, is called a beam pointer. The capability of this OMFCS provides the weapon's range performance. Each weapon has a listed short range. Medium range is twice short, long range is four times short, and extreme range is eight times short. Just as with sensor and jamming tasks above, the range to the target gives the basic difficulty level of the fire task, see the Fire Control Difficulty table on page 324.

Difficulty modiers to this basic difficulty level are based on range (see below), target size, and evasion, and are all shown with the Fire Control Difficulty table.

Although the basic difficulty level is *already* based on range, this only shows the ability of the weapon using its on-mount fire control to put the weapon's fire on a selected target point in space. The additional difficulty modifier for range is based on the fact that in the time that it takes sensor data to arrive from the target and for a laser (or some other weapon) pulse to get back to the target, the target will have moved some amount, and may not be at the anticipated point the weapon is fired at. The longer the range, the greater the difficulty.

Target size is based on the capability of very large or very small targets to get themselves out of the way of incoming fire aimed at their centers. Obviously small targets need not move as far to be missed.

The effects of target evasion or catastrophic evasion failure of the firing ship are as with sensors.

Some weapons may be fired by control of a master fire director (MFD). An MFD allows one gunner to fire a number of separate weapons at a single target. All of the weapons under the control of a single MFD are referred to as a battery, and must be equipped with the same type of beam pointer (tech level and range), and the weapons must all be of the same type (laser, particle accelerator, meson gun, or missile), although they may be of different power. The difficulty level of an MFD-directed fire task is calculated the same as it would be for the individual weapons of its battery, based on their short ranges and range to the target. However, when calculating increased difficulty levels due to target range and evasion, the MFD allows the gunner to ignore a certain number of increases in difficulty level (see the Master Fire Directors table, page 325, or the individual ship listings). The MFD may only counteract difficulty level modifiers that apply; it may not *reduce* a difficulty level.

To-hit rolls are made separately for each weapon controlled by the MFD, so that each has a separate chance to hit or miss.

Missiles: Missiles use the rules above, but with slight modifications. For purposes of these space combat rules, all missiles are assumed to be armed with a nuclear-pumped X-ray laser warhead. The missile must maneuver to arrive in the same range band as the target (first maneuvering to get the closest approach distance to zero, which may require it to first maneuver to match courses, and then spending the requisite number of turns travelling until its closing velocity reduces the current range to 0). Once in the same range band, the missile makes final targeting adjustments, then deploys a number of laser-generating rods, and detonates its nuclear warhead. The energy of the nuclear explosion creates high-energy (X-ray) photons within the rods, which are focused along the rods' lengths into X-ray beams which travel to the target, and do damage as normal lasers. Mere milliseconds after firing, the rods are themselves consumed by the nuclear explosion.

All missiles are given with their maneuver characteristics in maximum Gs of maneuver per turn and total G-turns, the number and damage values of their lasers, the range of their communicators (laser or maser), and the characteristics of on-board sensors (if any). Most missiles are controlled by operators aboard the firing ship, and are the type assumed by these rules. Fully independent missiles also exist, but are not included in these basic rules.

Each missile launcher (see Starships, page 366) may launch up to 10 missiles per turn, so long as a supply of missiles remains.

When a missile is fired, it behaves just like a vessel, expending G-turns to maneuver to change the closing velocity and arrive at the target. Some missiles have a single amount of Gs, all of which are expended on the turn they are fired, while others maneuver each turn like any other vessel.

If the missile does not carry its own sensors, the firing vessel must maintain sensor lock on the missile's target in order for the missile to fire upon arrival (the firing vessel may lose the lock while the missile is travelling, but the missile requires a final sensor lock on the turn it fires to generate a fire control solution). If the missile has its own sensors, it may generate its own lock (using the Sensor skill of the controlling gunner), and have the sensor lock handed off to it from the firing vessel according to normal hand-off rules.

The missile needs telemetry from its controller in order for it to maneuver and fire. So long as the missile remains within its listed communicator short range from its launching vessel, this communication is considered automatic (and laser and maser communicators cannot be jammed). Beyond this range, the controlling gunner must roll a communications task (this is rolled just like a sensor or fire task, based on the short range of the communicator, and using the gunner's Communications asset) to retain control of the missile. If control is lost, the task may be re-attempted once per turn to regain control.

Each gunner in a missile turret or barbette may control one missile at a time. However, missiles may be controlled several at a time by MFDs, where the number of missiles it can simultaneously control is equal to the number of difficulty modifiers it may ignore.

When the missile arrives in the same range band as the target, the fire task is computed normally as above (all missiles with a listed fire range of 0 have a base difficulty level of Average). If the missile carries its own sensors which have a lock on the target, the range difficulty modifier is calculated from the missile to the target (if 0, there is no modifier). If the missile is relying on a target lock held by the vessel controlling it, the range modifier is computed on the range between the target and the vessel controlling the missile (because of the time lag in sending the targeting data to the missile).

A missile may be fired upon by enemy vessels at any point in its movement. Most missiles are Micro or Sub-Micro-sized targets, although larger missiles can be built. Any hit on a Micro or Sub-Micro-sized missile which can penetrate its armor is sufficient to prevent it from accomplishing its mission. (All missiles listed on page 349 have a hull armor value of 3. Referees who desire more detail may use the Drones column on the Damage Type chart and Critical Hits vs. Unmanned Craft and Missiles table on page 326.)

Missiles which are listed as carrying their own sensors are called semi-independent missiles (SIMs) because, although they are still reliant on control from the firing vessel, they can provide their own sensor locks. Fully independent missiles (FIMs), which require no outside control once they are fired, are not covered by these rules.

3. Defensive Weapons: Defenses on the target vessel may be used to attack specific "hits" which have been scored. Each defense must be directed against a specific "hit." Although more than one weapon may be directed against a specific hit, if one defensive weapon stops the hit, the others may not then be re-targeted against a different one.

Beam Weapons: Beam weapons can be used in a *de facto* defensive role to destroy missiles before they get close enough to fire. Once a missile arrives in its target range band, any beam weapons that are able to fire may fire at it before it detonates and fires its own lasers. This pre-emptive defensive fire takes place in the short period of time that the missile is deploying its laser rods and making adjustments for its final fire control solution. This fire is resolved as any other beam weapon fire, but does count as a beam weapon's fire for the turn, preventing it from firing at other targets. This pre-emptive fire is the single exception to simultaneity of fire in space combat.

Sandcasters: Sandcasters fire cannisters of magnetic ablative crystals. Each sandcaster contains a generator which creates an electromagnetic field which manipulates the location and shape of the cloud of crystals. These clouds are placed in the path of incoming beam weapons, and cause the beam weapon to expend its energy burning through the cloud. The sandcaster operator uses laser warning sensors installed in the sandcaster to detect fire control locks and anticipate incoming beam fire. The roll to intercept a beam weapon with a sandcaster is a Difficult test of the Screens (Sandcaster) asset of the operator, and is modified one level up for each *two* tech levels by which the firing beam weapon exceeds the sandcaster, or downward one for each two tech levels by which the sandcaster exceeds the beam weapon's tech level.

A successful sandcaster "hit" on a beam reduces its damage value (for particle accelerators, damage value = penetration value). See the Sandcasters table (page 325, or the ship data sheet) for the amount of this reduction, based on the sandcaster's tech level. Each such successful sandcaster hit requires that a cannister be used to replace the sand that was burned up by the beam weapon. On Outstanding Success, double the amount of the beam reduction, but still only one cannister is required to replenish the sand cloud.

In order to function against incoming fire, sand must be out in advance of that fire, which means that each sandcaster which is to function in combat must fire one cannister of sand before combat begins. It is this sand which is then replenished following successful hits. Although sand cannot be recovered, it is not lost except by being burned up by incoming fire. Because it is held in an energy field, sand is held in place around the spacecraft regardless of maneuver or evasion (but it is lost when a ship enters jumpspace, as the jumpfield does not extend around the sand cloud).

Nuclear Dampers: Nuclear dampers manipulate the so-called strong and weak forces to prevent nuclear warheads from detonating. By sufficiently strengthening the strong force, atomic nuclei can be prevented from fissioning, and by weakening the strong force, nuclei can be prevented from fusing. Selectively controlling the strong and weak forces can also cause the decay of fissile elements to non-fissile elements, also preventing nuclear detonation. In practice, the actual application varies by tech level and type of target warhead.

The nuclear damper turrets and barbettes on page 349 have a range that permits their use only in the same range band, and are therefore fired using the same pre-emptive antimissile rule as beam weapons. The task to hit a missile (and more importantly, to keep the damper focused on its warhead for long enough to accomplish its purpose) with a nuclear damper is a Difficult test of the operator's Screens (Nuclear Damper) skill. Modifiers are based on tech level of damper and closing velocity of the missile. See the Nuclear Dampers table on page 325. Success indicates the missile's warhead becomes inert and cannot fire.

Meson Screens: Meson screens project an energy field which interacts with incoming mesons, causing them to decay outside of the vessel's hull.

Meson screens come with a listed protection value. Stopping a hit with a meson screen is a Difficult task if the firing meson gun and meson screen are of approximately the same power. Difficulty becomes one level harder if the meson gun's damage value is two or more times the meson screen's protection value, or two levels if the weapon is four or more times the screen's protection value. Difficulty is reduced one level if the screen's protection value is twice the gun's damage value or more, and reduced two levels if the protection value is four or more times the gun's damage value. Success indicates that the meson gun "hit" does no damage to the vessel.

Facing: Facing is not a step in combat, but is a consideration which affects the way fire is conducted. Spacecraft must face in the direction that they are accelerating. This affects which of their beam weapons they can bring to bear on the enemy and which hit locations can be hit by enemy beam weapons.

Any missile launcher on a ship may fire its missiles at any enemy vessel, regardless of facing. Beam weapons (lasers, particle accelerators, meson guns) may only fire if the facing of the firing ship allows the weapon to bear on the target.

Facing also affects the portions of a ship which can be hit by enemy fire. Missiles may hit any point on an enemy vessel, regardless of the enemy vessel's facing, but laser and particle accelerator weapons may only hit hull locations that are facing the firing vessel. Meson guns, because they pass through the hull, may also, like missiles, hit any point on the enemy vessel regardless of facing.

Surface Locations: Each ship has 20 different surface locations as seen in the Hull Surface Locations diagram. Each weapon, sensor, and communicator has an assigned surface location which shows the direction in which it can be used, as well as the direction from which it can be hit.

Attitude: For purposes of this rule there are five possible attitudes with respect to the enemy: bow-on, forward quarter, broadside, after quarter, and stern-on. Any time that a ship is attempting to decrease the closing velocity (or increase the opening velocity) it is stern-on to its opponent. Any time that a ship is attempting to increase the closing velocity (or decrease the opening velocity) it is bow-on to its opponent. Any time that it is evading it is broadside. If none of the above situations are in effect it may chose any attitude desired. If the ship is both accelerating and evading it is either in the bow quarter or after quarter attitude with respect to its opponent, depending on the direction of the acceleration.

Note that ships are always rolling about their long axes in order to bring all of their weapons to bear.

A spacecraft's hull form dictates which surface locations are visible from which attitudes (see the Arcs of Fire and Hit Locations by Hull Form table on page 325). For example, a spherical hull form vessel is in a bow on attitude with respect to its enemy. Enemy laser fire can only hit it in locations which are visible in the bow-on arc: locations 1-11. Likewise, it may only fire beam weapons which can fire into the bow arc, i.e., those which are located in hit locations 1-11.

Each spacecraft data profile (pages 366-379) lists the craft's hull form, and also shows the arcs into which its weapons can fire (assuming it is armed). For reasons of space, the five attitudes above are coded as numerals: 1 is Bow On, 2 is Bow Quarter, 3 is Broadside, 4 is After Quarter, and 5 is Stern On. For example, a ship's laser turret that had listed arcs of 2, 3, and 4 could fire at enemy targets only if the ship were in an attitude of bow quarter, broadside, or after quarter with respect to the enemy. If the ship were bow on (arc 1) or stern on (arc 5) to the enemy, the laser turret could not fire at them.

Note that just as missiles may hit any location on a ship regardless of facing, defensive weapons may pre-emptively fire at missiles in the same range band without regard for arc of fire.

Spinal Mount: A spinal mount is a large, long, weapon which is built into the longitudinal axis of the ship. In a sense, the ship is built around this central spine. A ship must point its long axis directly at an enemy ship in order to engage it with its spinal mount, which fires from surface location 1. While it is doing this, it may not evade or maneuver, except to accelerate directly at the target. Since the weapon is only targeted for part of a combat turn, the ship's available G-turns for evasion or for maneuver in any direction other than straight at the target are halved, rounding fractions down.

Note: ships which are specially built with rearward pointing "stern chaser" or "stinger" spinal mounts use exactly the opposite of this rule.

Step 5: Allocate Damage

Once hits are obtained, and they have successfully made it through the target's defenses, determine what systems were damaged and how much actual damage was sustained.

Weapons are listed with penetration and damage figures that are used to calculate the amount of damage they do when they hit a target. These figures vary with range; make sure to use the correct numbers for the range at which the hit was scored.

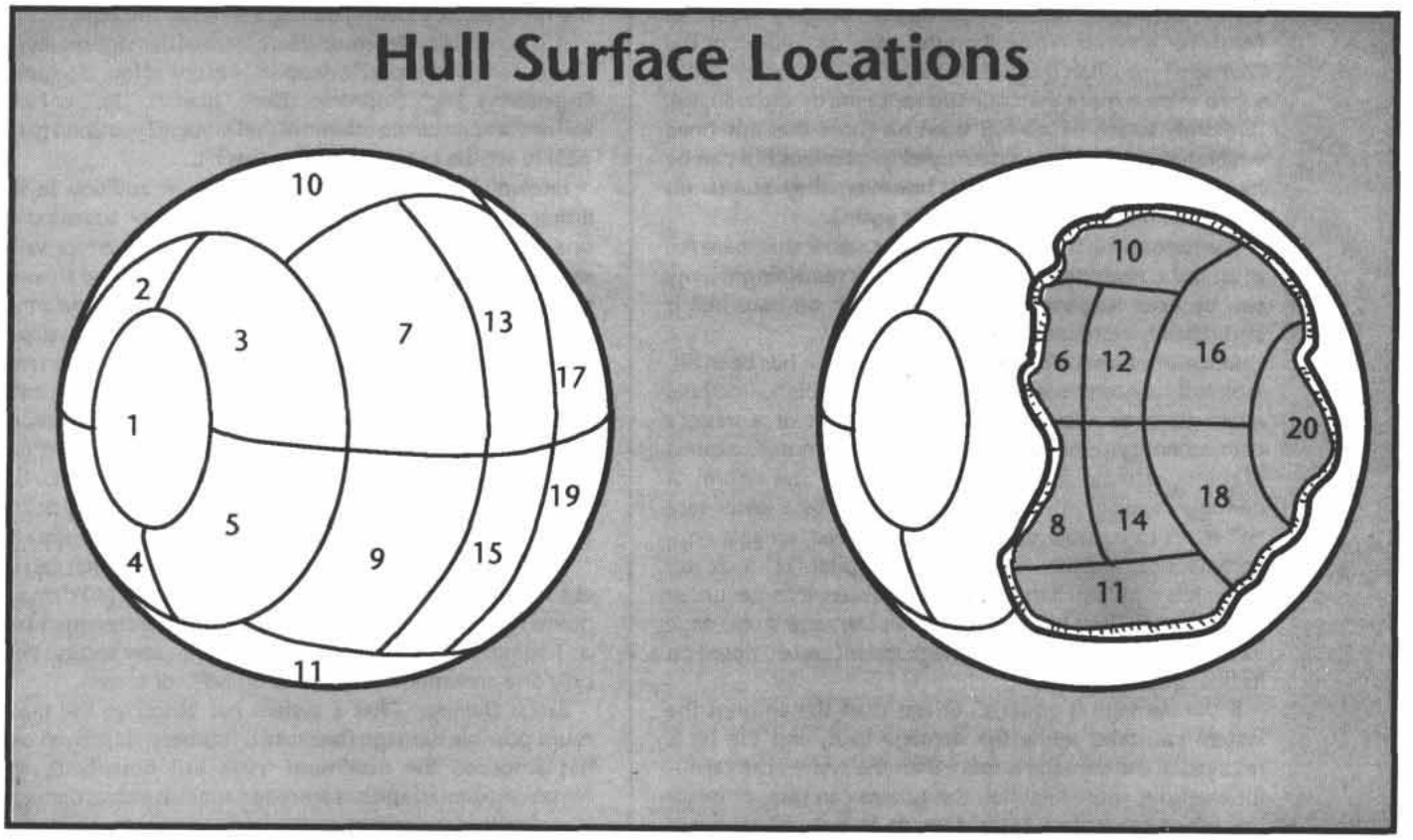
Terms and Concepts: There are two ways for a hit to affect its target: by penetrating (punching holes through) armor, and by explosively damaging equipment. There are several important terms used to describe these effects and capabilities.

Penetration value is a quantification of a weapon's ability to penetrate through heavy structural objects such as starships and their armor and machinery.

Damage value is a quantification of the amount of damage a weapon can inflict on a variety of objects, including heavy machinery.

Penetration rating is a conversion factor used to describe the relationship between a weapon's penetration value and its damage value. The penetration rating is the number of damage value points lost per point of armor value penetrated. For example, a laser with a penetration rating of 1/6 and a damage value of 19 would spend 2 points of damage value to penetrate an armor level of 12, and still have 17 damage points remaining to do interior damage. The penetration rating allows a weapon's performance in terms of damage value to be translated to penetration value (damage value + penetration rating = penetration value), or from penetration value back to damage value (penetration value x penetration rating = damage value).

Not all weapons have a penetration rating. For some types of weapons, such as particle accelerators, the ability to punch holes in armor and the ability to cause explosive damage to heavy equipment are effectively the same. For our purposes, these weapons do not need a penetration rating, because their penetration value is an accurate assessment of their performance in both cases. On the other hand, some weapons, such as lasers, by their very nature have very different penetration and explosive damage effects. The energy contained in a laser is more efficient at punching holes than it is at causing explosions in machinery. For this



reason, lasers use a penetration value for punching holes and a damage value for blowing up equipment, and are also given a penetration rating in order to convert the two values back and forth.

Damage points are the units that are used to describe the amount of damage caused by a hit. Damage points are inflicted on a starship in different ways by different weapons.

Particle accelerators penetrate armor and inflict damage points with their *penetration value*. They also do additional radiation and EMP damage—see that section under "Effects of Damage," below.

Lasers penetrate armor with their *penetration value*, but inflict damage points with their *damage value*.

Meson guns do not worry about penetrating armor, and inflict damage points with their *damage value*.

Lasers and particle accelerators hit the surface of a ship first and do explosive damage to any surface fixture they encounter. If they have remaining energy after damaging the surface fixture, or if they hit bare hull surface instead of a fixture, they hit the hull itself and expend energy for penetration. If they penetrate all the way through the hull armor, they cause internal explosions with their remaining energy.

Meson guns do not follow this pattern. Meson gun beams pass through the hull without interacting with or damaging it and simply cause interior explosions. Because they do not penetrate armored hulls *per se*, they do not have a penetration value or penetration rating.

Final Damage Point Value: A weapon's damage and penetration characteristics vary with the range at which the hit was made. Look at the weapons data on the ship data page to find the values for the correct range.

Because of intangibles in relative target motion, angle of the hit, "lucky shots," etc., there is some variation in the final force of each hit. To simulate this, roll 2D6 for each hit prior to finding the hit location. For particle accelerators, add the result to its penetration value. For lasers, calculate the penetration value (damage value + penetration rating) and add the result to it. Do not make this roll for meson guns. This result is the *final damage point value*.

1. Hit Location: When a weapon hits a ship, roll on the ship's hit location table, as adjusted by the facing/attitude above. Each ship has its own unique Hit Location table, with the entries determined by the actual placement of systems within the ship and on its surface (see the spacecraft data pages, 366-379). In some cases a certain hit location will require an additional roll to determine the exact component hit.

When a hit location line gives numeric ranges for certain hits (such as 1-2 Ant, 3-4 AL), this is always resolved by a D20 roll. For surface hits, the range will not always go up to 20, so a die roll result not listed merely hits the bare hull surface. For internal explosions, all results 1-20 will be present, or else there will be only one possible result with no die roll necessary.

2. Surface Damage Determination: For lasers and particle accelerators, first resolve surface damage. Meson guns skip surface hits and proceed directly to "Internal Hits," below. If the result is not bare hull, the hit will either be against a specific object such as air lock (AL), launch port (LP),

cargo hatch (CH) etc., or against the category Antennae (Ant). For antenna hits, roll on the antenna column of the Damage Type Chart (page 326) to see the exact antenna hit. When there is more than one such antenna on the craft, roll randomly to see which has been hit (note that antennae which have already been destroyed by previous hits can be hit again by this random roll, however, they absorb no additional damage points when hit again).

A weapon which hits such an object rather than bare full must first damage or destroy it before its remaining energy can be used to penetrate the hull. A hit on bare hull is immediately resolved as penetration, below.

Once it has been determined which system has been hit, look at the systems section of the damage table to find how much damage the system can take. Each of a vessel's component systems has a damage capacity noted in terms of minor or major hits required to destroy the system. A damage capacity in parentheses followed by a lower-case "h" refers to number of minor hits required, while a non-parenthetical number followed by a capital "H" indicates major hits required. If the system is not listed, it comes under "All Others." Then use the Spacecraft Damage table (page 325) to find the amount of damage the hit can do based on its final damage points.

If the damage is equal to or less than the amount the system can take, apply the damage to it, and the hit is resolved. If the damage is more than the system can take—for example, more hits than the system can take, or major hits when the system takes damage in only minor hits—reduce the number of damage points by the maximum amount required to destroy the system (e.g., 20 damage points would be absorbed by a system that could take 2 minor hits, 40 points by a system which could take 1 major). Note that while a minor hit could be caused by only 1 damage point when the damage was less than or equal to the maximum sustainable damage, that same minor hit would absorb 10 damage points when absorbing energy from a damage quantity greater than it could completely absorb.

Note that cargo hatch, launch port, and air lock surface hits have no real effects in the game, but are included to help in visualizing the lay-out and functioning of the ship for roleplaying purposes. "Small craft" surface hits do damage to externally carried craft. If such craft are not present, the hit does damage to the grapple used to hold the small craft in place.

Any leftover damage points are then taken to the hull penetration step.

3. Hull Penetration: This is only conducted if damage points remain from particle accelerator or laser hits after the surface damage step. Meson guns skip this step.

If the hit is by a particle accelerator (whose damage points and penetration value are the same), subtract the hull's armor value from the hit's final damage points to see if the hull was penetrated. For lasers, whose damage points represent their damage value, multiply the armor value by the penetration rating for that range to see how many damage points are used up (round all fractions *up*) in penetration.

If there are damage points remaining, the weapon has penetrated the hull. Go to the internal hits step. If there are no damage points remaining, the hull armor has absorbed the hit without allowing damage to enter the hull.

4. Internal Hits Determination: Internal damage results will read out either as a specific weapon or as one of four categories: Engineering (Eng), Electronics (Elec), Quarters (Qtrs), or Hold. Roll on the appropriate column of the Damage Type Chart (page 326) to see the exact system that was hit.

Internal Armor: Some starships have, in addition to the armor of their hull, additional internal armor surrounding one or more systems. These systems and their armor value are indicated on the ship data page. If one of these armored areas is hit, the weapon must first penetrate the additional armor on that area before proceeding to the internal damage step.

Determining internal damage is conducted in the same basic manner as surface damage. However, there are additional limits on the amount of damage that can be absorbed by internal systems. There is a maximum amount of damage that can be deposited in one system by one hit. This maximum is 5 major damage results or 120 damage points, even if the system's damage capacity is more than 5 major hits.

There is also a maximum amount of damage that can be absorbed by a crew hit result; this is 1 major hit (40 damage points) for a crew section with more than one crewmember, or 1 minor hit (10 damage points) for a crew section with only one crewmember (such as an MFD or turret).

Excess Damage: After a system has absorbed the maximum possible damage (because it has been destroyed or it has absorbed the maximum levels just described), any remaining damage points are rolled again as excess damage, meaning that the energy goes to damage another system in the same or adjacent hit location.

Roll 1D6 on the Excess Damage Location table (page 326) to see where the excess damage goes. Use the following notes to interpret the results:

-1 or +1 internal means that an adjacent internal area has been hit, either 1 place lower or higher on the hit location chart (i.e., hit location 15 becomes 16 on +1, 14 on -1). If this would move the hit location off the chart (by reducing it to 0 or increasing it to 21), the hit instead becomes additional surface damage in the same hit location.

The notation "same internal area" indicates that an additional component in the same area absorbs the excess damage.

The notation -1 or +1 surface area indicates that the additional damage is applied to a surface area adjacent to that original hit, either one higher or one lower on the chart. If this would move the location off of the chart, reverse the sign.

Once the new hit location is determined, determine damage normally using the damage tables. If the excess damage has moved to another internal location and there is still excess damage remaining after the new hit is resolved, roll for excess damage again (and again and again until all damage points are used up). If the hit has been taken back to a *surface* location, first spend whatever damage points are required to penetrate through the hull armor again. Then apply damage to surface fixtures there according to the normal procedure. However, if the hit result at the location is bare hull, all remaining damage points are vented to space with no further damage. If a surface fixture was hit and excess damage remained after destroying it, that remaining excess damage is also vented to space.

Example: Our friend the *Gazelle* is hit by a 300 Mj Laser Barbette at a range of eight hexes (short range—see the barbette listed on the *Gazelle*'s data page, page 370) through its bow quarter arc (hit locations **1-19** for a wedge hull form). At this range the damage value is 43 and the penetration rating is 1/14. A hit location of 1 is rolled, and a 6 is rolled on 1D20 for the surface hit column, showing that an antenna was hit. A roll of (5+1 as the Gazelle has no defensive screen =) 6 on the Antenna column of the Damage Type chart shows that the antenna hit was for a communicator. The *Gazelle* has two communicators, a radio and a maser. A roll of 2 on 1D6 indicates that the radio antenna was hit.

The radio antenna can take 1 minor hit, so absorbs 10 damage points of the 43 and is destroyed.

33 damage points remain to penetrate the hull, which has an armor value of 62. Multiplying 62 by the penetration rating gives (62 × 1/14 = 4.43 rounded up to) 5 damage points used up in penetration, leaving 28 for internal hits.

Location 1's internal column requires another 1D20 roll to decide between an Electronics and a Quarters hit. The roll is 9, so it is Electronics. Going back to the Damage Type Chart, this time using the Electronics column, we roll a (2, again adding 1 for no defensive screen, =) 3, again getting a Communicator result. As this is an internal hit, this would be a hit on the communicator's internal controller, rather than its external antenna. Rolling a D6, we get a 3, indicating a hit on the radio controls. The player is lucky; this was essentially a free hit, as the radio was already useless without its antenna. The radio controller takes 1 minor hit, so absorbs 10 damage points and is destroyed, leaving 18 excess damage points.

Rolling on the Excess Damage Table, a roll of 4 indicates that the damage goes to +1 internal area: hit location 2. All internal damage in location 2 is rolled on the Electronics column of the Damage Types Chart. A D10 roll of (9+1=) 10 indicates a Bridge Crew hit. The remaining 18 damage points are enough for 2 minor hits against the crew, which indicates that two casualties are taken.

5. Effects of Damage: Damage is taken and recorded in two basic ways: by systems which are divided into the number of minor and major hits they can sustain ("hit-type systems"), and systems which are recorded in other terms (such as crew, fuel, and cargo, "quantity-type systems").

Hit-Type Systems: As damage is taken by ship's systems, mark off the proper number of hits from the system's total hit capacity. Once all of the hits are marked off, the system is destroyed and cannot function or be repaired. As long as some hit capacity remains, the system may still function, although at reduced levels. Note that systems which are defined in terms of minor hits may only take minor hit damage, while systems that are defined in major hits may take either. However, only major hits cause major hit capacity to be marked off; minor hits on these systems have different effects (see "System Resets and Degraded Performance," below).

The specific effects of a system losing hit capacity and being destroyed or out of service due to system resets are as follows:

Weapons, MFDs, Defensive Weapons or Screens, Communicators, Sensors, and ECM: The destroyed system may not be used nor provide its benefits (e.g., EMM), and for weapons and defenses, any listed crewmembers are casualties when the system is destroyed. Non-destroying hits cause system resets and degraded performance (below). Systems which have an antenna are useless if the antenna is destroyed. Degraded performance or system resets on the antenna confer these effects on the entire system.

Missile Launchers: Damage to missile launchers (turrets and barbettes) also destroys their missiles. Each non-destroying hit destroys missiles: one per minor hit and 1D6 per major hit.

Computers: If there is more than one computer, each time a computer is destroyed, the next computer takes over its functions. Once all computers on a ship are destroyed, all tasks become one difficulty level harder (+1 Diff Mod), and the ship may not use its jump drive.

Staterooms and Low Berths: These are "free hits" from a combat standpoint, although passengers or crew with no battle stations occupying the rooms or berths may be killed by such hits, as ruled by the referee.

Life Support and Emergency Life Support: Once both these systems are destroyed, all crew must be in vacuum suits and all tasks become one level more difficult (+1 Diff Mod). See also Critical Hits, below.

Gravitic Compensators: If this system is not functioning, each turn in which the ship expends more than 1 G-turn maneuvering, all tasks are conducted at +1 Diff Mod for each additional G-turn of maneuver. Crewmembers strapped into a workstation ignore 1 additional G-turn of maneuver before Diff Mods set in. Any G-turns spent on evasion increase difficulty by +1 per G-turn, crewmembers in workstations ignore the first +1 Diff Mod. Crewmembers not in workstations (i.e., damage control parties) may not function at all at 2 G-turns or more of evasion.

Sickbay, Labs, Machine, and Electronic Shops: These have no immediate combat effects, but have obvious roleplaying and campaign consequences.

Jump Drive: If destroyed, the ship may not enter jump space. If not destroyed, find the percentage of hits that have been marked off. Multiply the ship's standard jump performance by this number, and round fractions down. This is the current jump performance number. A jump of this or lesser range may be attempted, but with a +1 Diff Mod, in addition to any degraded performance Diff Mod. If the jump performance has rounded down to 0, the ship may attempt a jump 1, but with an *additional* +1 Diff Mod, thus the highest possible Diff Mod is +3.

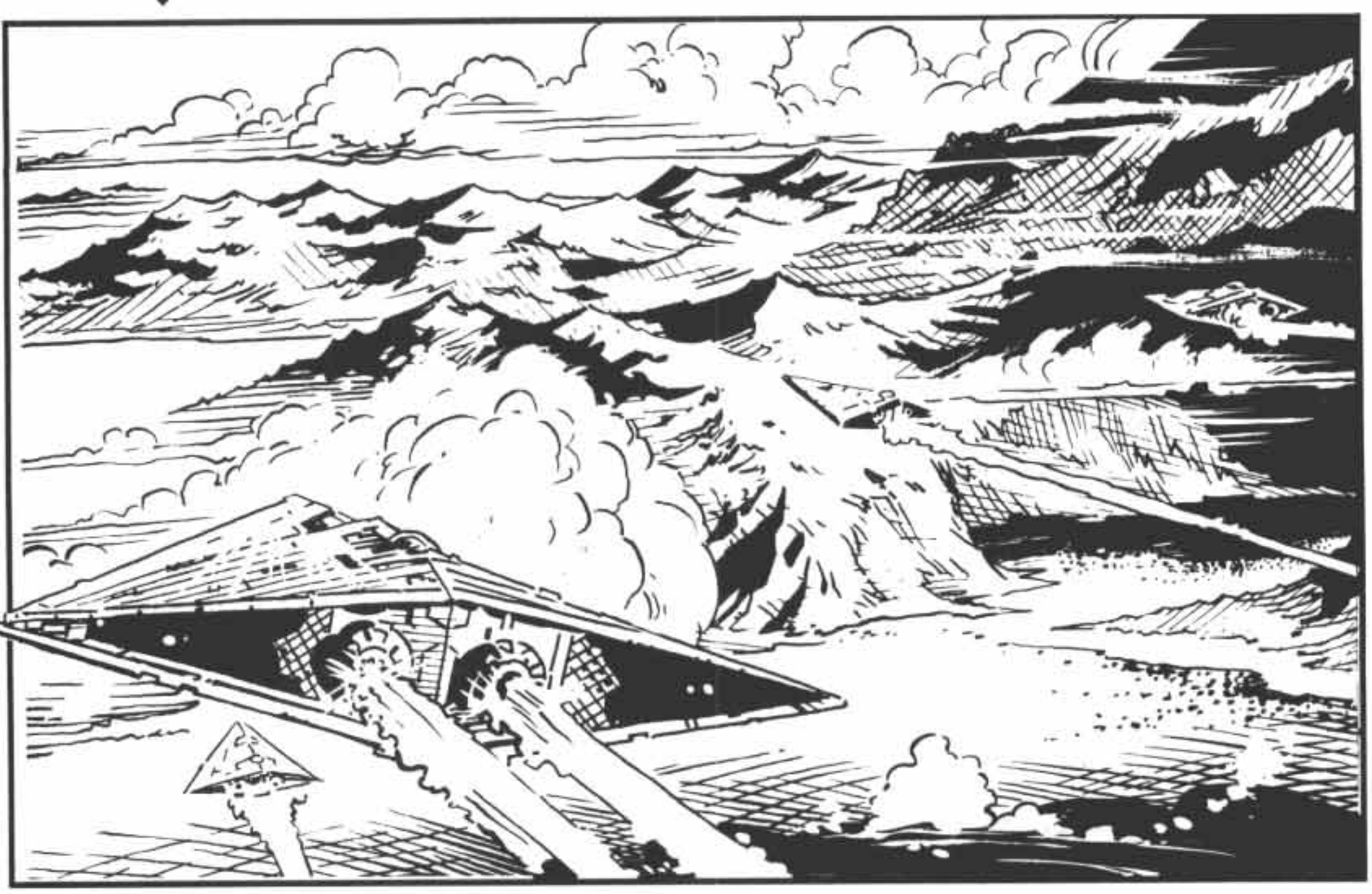
Power Plant: Each hit on the power plant eliminates the listed portion of the ship's power generation capability. System Reset (below) results only affect one hit worth of power as well, with only one system reset allowed at a time.

Contra-Gravity: Landings on and take-offs from planetary surfaces are impossible unless craft as airframe hull configuration.

Quantity-Type Systems: These systems have specific instructions regarding the effects of damage, as follows:

Crew: A minor Crew hit causes one casualty, and a major hit causes 1D6. (Note that an MFD operator may become a casualty on either an MFD hit or a bridge crew hit.

Fuel: Starship fuel tanks have self-sealing features. A minor hit causes the loss of 1D6 displacement tons of fuel before



tanks re-seal. A major hit causes the loss of 1D20 displacement tons of fuel before tanks re-seal.

Objects: Objects include cargo, vessels carried in the hangar, and other items not actually a part of the ship. If these objects are not being used in the battle, the major damage should be recorded and determined later for their campaign effects.

System Resets and Degraded Performance: Whenever a system suffers damage (major or minor) which does not destroy the system (this includes systems which are defined in terms of major hits and suffer minor or major hits), roll a die and consult the Minor and Non-Destroying Damage table (page 326). The two results are System Reset and Degraded Performance.

System reset means that the system is off-line for the next combat turn and may not be used, but that it comes back on-line the following turn and may be used normally. If the ship's computer suffers a reset result, and there are no backup computers available, all ship's systems reset. Note that a System Reset on a power plant does *not* affect the entire power plant, but only one hit worth of the plant, as discussed under Hit-Type Systems above.

Degraded Performance means that all tasks conducted with that system are conducted with a +1 Diff Mod. This applies principally to sensors, weapons, jammers, jump drives, etc., which have clearly defined tasks associated with their use. However, the following systems experience special effects from DP results:

Computer: All ship tasks are conducted with a +1 Diff Mod. However, if another undamaged computer is available, this computer takes over with no penalty.

Life Support and Emergency Life Support: Degraded Performance has no game effects.

Gravitic Compensators: All damage control tasks are one difficulty level harder (+1 Diff Mod).

Power Plant: All damage control tasks to repair the power plant are performed with a +1 Diff Mod.

Contra-Gravity: Any attempt to land on or take off from a planet becomes a Difficult task (Pilot [Interface/Grav]) instead of automatic. Failure indicates an abort back to the planetary surface or orbit; Catastrophic Failure indicates a crash, and the vessel is destroyed.

Maneuver Drive: The ship may no longer divide its acceleration between maneuver and evasion; it must do one or the other in any given turn.

System Redundancy: Most ships carry more than one computer, and so whenever the computer suffers damage, one of the backup systems will automatically take over without interrupting the function of the other ship systems. For simplicity, all computer hits are assumed to be on the computer currently on-line. This means that if two different weapons scored computer hits in the same turn, and the first hit took the primary computer off-line, then the first backup computer would come on-line and be damaged by the second hit.

Carried Vehicles and Vessels: If damage is taken on a carried vehicle or vessel, it should be treated as a hit on the vehicle or vessel just as if it were in combat (except that, if unmanned, it cannot suffer personnel hits, and these are rerolled).

Radiation and EMP Damage: Any hit by a particle accelerator on any part of a ship will automatically cause all computers, except those with fiber-optic circuits (Model Fb), to suffer a System Reset result (fiber-optic computers suffer no additional ill effects). Also, any particle accelerator damage that rolls a Crew hit does twice the normal number of casualties (2 on a minor, and 2D6 on a major hit).

Critical Hits: Under certain circumstances, a weapon may cause one or more critical hits. This is a function of the damage value of the weapon compared to the size of the target ship. The Critical Hits Table (page 326) indicates whether a critical hit is achieved by a weapon and, if so, how many.

If one or more critical hits are achieved, there is a chance that the ship will be vaporized by massive internal explosions. Roll 1D20. If the roll is less than the number of critical hits achieved, the ship is vaporized. If it is equal to or greater than the number of hits achieved, the ship suffers only the actual number of critical hits shown. Roll the appropriate

number of critical hits on the Critical Hits table and apply the result immediately.

There are 11 distinct critical hits possible. As critical hits are scored and applied differently than normal hits, keep track of them separately.

Bridge Destroyed: The ship's bridge explodes, destroying all controls located there (including maneuvering, astrogation, sensors, MFDs, and communication equipment) and killing or incapacitating the entire bridge crew. The ship is no longer capable of maneuvering, entering jump, acquiring new sensor fixes, detecting new targets, communicating, or operating screens. Individually crewed weapons (those with gunners in them, rather than controlled remotely from MFDs) may continue to engage targets which have already been acquired by the ship's sensors, but do so at one difficulty level higher (+1 Diff Mod). Ships equipped with more than one bridge (main operating, auxiliary operating, fire control, flag, etc.) roll to see which is destroyed. Ships with another crewed operating bridge may shift control functions there beginning the following turn. Mark off all appropriate crew as casualties, and MFDs if they were located on the destroyed bridge.

Fire Control: Destroyed circuitry and power spikes disable the ship's fire control interface between weapons, sensors, and targeting processors. The ship may not fire any energy weapons, nor may it operate missiles (all non-fully independent missiles currently in flight are considered lost), nor use MFDs to operate any systems. Ship's defenses (sandcasters, nuclear dampers, meson screens) continue to operate, and fully independent missiles may still be fired.

Power Plant: The power plant is seriously damaged and goes off-line. It may not be repaired or restarted. The ship goes on auxiliary power/batteries. The ship may not maneuver, fire energy weapons, nor operate any active sensors or screens. The ship may fire missiles and operate sensors in passive mode at +1 Diff Mod.

Sensors: Destroyed circuitry and power spikes disable all sensors. The ship may no longer acquire new sensor locks. All weapons may continue to engage targets which have previously been acquired by the ship's sensors, but do so at +1 Diff Mod.

Life Support: The ship's life support has failed and the hull's integrity has been breached, and the crew must rely on their vacuum suits for survival. All tasks are conducted on +1 Diff Mod. This has no additional effect on crews which were at battle stations in their vacuum suits, as these suits have sufficient air and power to keep the crew alive for the remainder of the battle. However, this result does have potentially dire consequences for the long term. Crews which were for some reason not suited up must spend the entire next turn suiting up and may not conduct any other action.

Fuel Explosion: Liquid hydrogen and oxygen escape from shattered storage tanks, combine in the internal spaces of the ship, and explode. Roll for one damage result on the internal explosion table, with the damage value of the explosion determined by the ship size. See the Fuel Explosion Damage Value table on page 326.

Artificial Gravity: The ship's artificial gravity and G compensators fail. See the Gravitic Compensators destruction effects above.

Jump Drive: The ship's jump drive is seriously damaged and the ship may not enter jump space until it is repaired.

Maneuver Drive: The ship's maneuver drive is seriously damaged and it may not maneuver or evade until it is repaired.

Spine: The ship suffers serious structural damage that throws the vessel out of alignment. Any spinal mount weapons are rendered inoperative. In addition, the maneuver drive thrust line is no longer centered on the ship's axis of mass, and so any acceleration must be accompanied by constant attitude correction. Each time the ship accelerates, a Difficult task (Pilot [Interface/Grav]) is required to avoid inducing a tumble. For each G less than the full rating of the power plant used, reduce the task difficulty level by 1. Failure results in the ship beginning to tumble, and Catastrophic Failure indicates a severe tumble. In the case of a tumble, the ship may not maneuver or evade in the next combat turn, as it corrects the tumble, and all tasks are conducted at +1 Diff Mod. The same is true of a severe tumble, except that tasks are at +2 Diff Mod.

Computer: Destroyed circuitry and power spikes disable the ship's data bus and information processing systems. The ship may not launch small craft or enter jump. All other tasks are conducted at one higher difficulty level (+1 Diff Mod).

6. Damage Control: After all damage has been allocated for the turn, players may attempt to repair damage suffered during the current or previous turns. Crewmembers may be used singly or in groups of no more than three to repair major hits, minor hits, or system resets. Major and minor hits may only be repaired if there are hits left in the system (systems which have taken all of their hits are destroyed and may not be repaired). External (surface hits) systems may not be repaired by damage control.

The number of crew available for damage control are equal to one half of the vessel's engineering crew (round fractions down), plus any player characters with Ship's Engineering skill that are not active crewmembers. In addition, the other half of the engineering crew may be used for damage control on Jump Drive, Power Plant, Maneuver Drive, Contra-gravity hits. Each crewmember may be assigned to one damage control task per turn. Difficulty is shown on the Damage Control chart on page 325.

Success indicates that the repair is effective immediately and has no effect on the upcoming turn. Outstanding Success indicates that a degraded performance result on the system is also removed. Asset used should be appropriate to the system being worked on, and the average of the crewmembers involved.

Energy Allocation and Powering Down Systems: As combat damage reduces the power produced by the ship's power plant, players must power down certain systems in order to make sure that energy consumption does not exceed current energy production. The ship data pages include the power draw in megawatts for all systems to enable players to do so.

STARSHIP COMBAT CHARTS

Step 1: Surprise

Difficult task: Fleet Tactics; Sensors enables at same difficulty level.

Step 2: Target Aspect

Detection Range

Range = 1D6×20.

If either vessel is a naval vessel, range = 2D6×20.

Target Vector

Disposition	*Direction*	*Velocity*
Hasty Departure	Outbound	1D20
Leaving	Outbound	1D10
Standing By	Neutral	1D6
Arriving	Inbound	1D10
Hasty Arrival	Inbound	1D20

Note: Velocity given in range bands per turn.

Target Bearing (1D6)

1D6	*Converging*	*Same*
1	0°	0°
2	0°	0°
3	0°	0°
4	45°	180°
5	45°	180°
6	90°	180°

If both are inbound or outbound, courses are the same on a D10 roll of 1-4 and converging on 5-10; if one is inbound and the other is outbound, or if either one is neutral, courses are converging.

Friendly Velocity

V = 2×A.

V = friendly ship velocity in range bands per turn.

A = accumulated acceleration in G-hours.

Closing Velocity

Target is:	*Closing Velocity*	*Closest Approach*
Converging at 0°	Vf+Vt	0
Converging at 45°	0.5(Vf+Vt)	50%
Converging at 90°	0.5Vt–Vf	50%
Parallel at 0°	Vf–Vt	0
Parallel at 180°	Vt–Vf	0

Vf = Friendly velocity.

Vt = Target velocity.

A negative number indicates that range is opening rather than closing.

Step 3: Interception

Maneuvering

1 G-turn = velocity change of 1.

Step 4. Resolve Combat

Sensor Lock Difficulty

Range	*Difficulty*
Short	Average
Effective	Difficult
Long	Formidable
Extreme	Impossible

Difficulty Modifiers

Tasks may be reduced to no lower than Easy difficulty level.

All Sensors:

–1 difficulty level if the sensor had a lock on the target on the previous turn.

–1 difficulty level if target being "handed off" from a sensor aboard the same or another friendly ship which had a lock on the target the previous turn.

+1 difficulty level if target made successful Evasion task roll. +1 difficulty level per G-turns+2 spent evading if target had Outstanding Success on Evasion task roll.

+1 difficulty level if own ship rolled Catastrophic Failure on current turn's Evasion task roll.

Ship Size (in Displacement Tons):

Sub-Micro (less than 1 ton): +2 difficulty levels.

Micro (1-9 tons) targets: +1 difficulty level.

Very Small (10-99 tons) targets: No change.

Small (100-999 tons) targets: –1 difficulty level.

Medium (1000-9999 tons) targets: –2 difficulty levels.

Large (10,000-99,999 tons) targets: –3 difficulty levels.

Very Large (100,000-999,999 tons) targets: –4 difficulty levels.

Gigantic (1,000,000+ tons) targets: –5 difficulty levels.

EM Masking:

+2 difficulty levels for radar and HRT sensors if target equipped with EM masking.

+1 difficulty level for EMS active and EMS passive sensors if target equipped with EM masking.

ECM-Equipped Ships:

If ship is equipped with radio, radar, or EMS direction finder, –1 difficulty level if target ship is using radio, radar, or active EMS sensors on the current turn.

Active Sensors:

If target has a folding passive EMS array which is extended, –1 difficulty level.

Passive EMS and HRT Sensors Only:

Difficulty levels above assume target expending thrust for maneuver or evasion.

+1 difficulty if target coasting (using no thrust for any reason).

+2 difficulty if target in cold mode (laying low with all systems shut down and power plant reduced to bare minimum levels).

–3 difficulty levels if target is accelerating directly away from the sensor (attempting to decrease closing velocity or increase opening velocity).

Ladar:

+1 difficulty level if target is using sandcasters.

Fire Control Difficulty

Range	*Difficulty*
Short	Average
Effective	Difficult
Long	Formidable
Extreme	Impossible

Difficulty Modifiers

Tasks may be reduced to no less than Easy difficulty level.

Range:

Total range in hexes +3 equals +difficulty levels.

Ship Size (in displacement tons):

Sub-Micro (less than 1 ton) *or* Micro (1-9 tons) targets: +1 difficulty level.

Very Small (10-99 tons) targets: No change.

Small (100-999 tons) targets: –1 difficulty level.

Medium (1000-9999 tons) targets: –2 difficulty levels.

Large (10,000-99,999 tons) targets: –3 difficulty levels.

Very Large (100,000-999,999 tons) targets: –4 difficulty levels.

Gigantic (1,000,000+ tons) targets: –5 difficulty levels.

Target Evasion:

+1 difficulty level if target made successful Evasion task roll.

+1 difficulty level per G-turns+2 spent evading if target had Outstanding Success on Evasion task roll.

Own Ship Evasion:

+1 difficulty level if own ship rolled Catastrophic Failure on current turn's Evasion task roll.

Master Fire Directors

Tech Level	Difficulty Mods Ignored
8	1
9	2
10	3
12	4
14	5
15	6

Sandcasters

Base Difficulty: Difficult.

Modifiers

+1 difficulty level per 2 TLs sandcaster is exceeded by firing ship tech level.

Or –1 level per 2 TLs sandcaster exceeds firing ship's tech level.

If sandcaster intercepts beam, beam damage value reduced as below.

TL	Beam Reduction
8	1D6×5
9	1D6×5
10	1D10×5
11	1D10×5
12	1D10×5
13	2D6×5
14	2D6×5
15	2D10×5

Nuclear Dampers

Base Difficulty: Difficult.

Modifiers: Based on tech level.

TL	Difficulty Modifier
12	+1 per closing velocity+2
13	+1 per closing velocity+3
14	+1 per closing velocity+4
15	+1 per closing velocity+5

Meson Screens

Base Difficulty: Difficult.

Modifiers: Based on meson gun Damage Value compared to screen Protection Value.

+2 If meson gun damage value+meson screen protection value = 4+
+1 If meson gun damage value+meson screen protection value = 2+
–1 If meson screen protection value+meson gun damage value = 2+
–2 If meson screen protection value+meson gun damage value = 4+

Spacecraft Damage

Damage Points	Result
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than five major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

Damage Control

# Pers	System Reset	Minor Hit	Major Hit
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

Arcs of Fire and Hit Locations by Hull Form

Configuration	(1) Bow On	(2) Bow Quarter	(3) Broadside	(4) After Quarter	(5) Stern On
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

Table shows the weapon locations that can fire into the listed arcs (e.g., a laser in location 10 on a sphere hull form could fire into arcs 1, 2, 3, 4, and 5, but on a cylinder hull form could only fire into arcs 2, 3, and 4), as well as the hit locations which can be hit from those listed arcs. When rolling for hits from a particular arc, re-roll all hit locations which are not listed in the appropriate column.

Note: Firing meson guns are subject to arc of fire limitations, but always roll 1D20 for hit location, regardless of the facing of the target. Missiles also roll 1D20 for hit location, rather than worrying about the target's facing.

Damage Type Chart

D10	*Engineering*	*Electronics*	*Quarters*	*Hold*	*Weaponry*	*Antenna*	*Drones*
1	Jump Drive	Def Scrn	Ship's Troops	Lab/Hangar	Mount	Def Scrn	Weapon
2	Jump Drive	ECM	Ship's Troops	Lab/Hngr Crew	Mount	ECM	Weapon
3	FPP	Comm.	Sick Bay/LB	MES	Mount	ECM	Sensor
4	Power Plant	Comm.	Life Support	Cargo	Mount	MFD	Sensor
5	Power Plant	Sensor	Life Support	Cargo	Mount	MFD	Computer
6	Power Plant	Sensor	ELS	Fuel	Crew	Comm	Comm
7	Man Drive	MFD	DCP	Fuel	Crew	Comm	Fuel
8	Eng Crew	Computer	Grav Comp.	Fuel	Crew	Comm	Fuel
9	Eng Crew	Computer	Staterooms	Fuel	Crew	Sensor	Pow Plant
10+	Contra-Grav	Bridge Crew	Staterooms	Fuel	Crew	Sensor	Man Drive

Abbreviations: **DCP:** Damage Control Personnel; **Def Scrn:** Defensive Screen; **ECM:** ECM and ECCM; **ELS:** Emergency Life Support; **FPP:** Fuel Processing Plant; **Grav Comp:** Gravitic Compensators; **Hngr:** Hangar; **LB:** Low Berths; **Man Drive:** Maneuver Drive (heat exchanger/ignition chamber); **MES:** Machine or Electonics Shops; **MFD:** Master Fire Director (roll on Weaponry column for Mount or Crew)

DMs: **Engineering:** If no jump drive, +2; **Electronics:** If no Defensive Screens, +1, If no Def Screens or ECM, +2; **Quarters:** If no Ship's Troops, +2; if no Ship's Troops or Sick Bay, +3; **Hold:** If no Labs or Hangar, +2; if no Labs, Hangars, or Shops, +3; **Antenna:** If no Defensive Screens, +1, If no Defensive Screens or ECM, +2, If no Defensive Screens, ECM, or MFD, +4; **Drones:** If unarmed, +2

Minor and Non-Destroying Damage

Die	*Damage*
1-3	System reset: Operation interrupted for 1 turn
4-6	Degraded performance: All tasks using system at +1 Diff Mod.

Note: If damage is against the crew, a minor damage is 1 crew casualty.

If damage is against fuel, ship loses 1D6 displacement tons of fuel before the tanks re-seal.

If damage is against sensors, all locks are lost and must be re-rolled when operations resume.

Major Damage

Major damage always causes 1 major damage point to component or 1D6 casualties to the crew. If damage is against fuel, ship loses 1D20 displacement tons of fuel before the tanks re-seal.

Excess Damage Location

Die	*Area*
1	–1 internal area
2-3	Same internal area
4	+1 internal area
5	–1 surface area
6	+1 surface area

Critical Hits Table

Weapon Remaining Penetration Value (after penetrating the hull)

Ship Size	*1-20*	*21-40*	*41-60*	*61-80*	*81-100*	*101-120*	*121-140*	*141-160*	*161-180*	*181-200*	*201+*
SM	2	3	4	5	6	7	8	9	10	11	12
Mc	1	2	3	4	5	6	7	8	9	10	11
VS	0	1	2	3	4	5	6	7	8	9	10
S	0	0	0	1	2	3	4	5	6	7	8
M	0	0	0	0	0	1	2	3	4	5	6
L	0	0	0	0	0	0	0	1	2	3	4
VL	0	0	0	0	0	0	0	0	1	1	2
G	0	0	0	0	0	0	0	0	0	0	1

(The number is number of Critical Hits applied to the target.)

Critical Hit

Vs. Manned Craft

Die	*Hit*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Fuel Explosion*
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

*See Fuel Explosion Damage Value table.

Vs. Unmanned Craft and Missiles

1D6	*Result*
1-2	Control system (missile goes inert)
3	Payload (warhead, sensor, or ECM package)
4-6	Fuel (target destroyed)

Fuel Explosion Damage Value

Ship Size	*DV*
SM	Destroyed
Mic	5
VS	10
S	20
M	30
L	40
VL	50
G	60

Using Miniatures with Traveller

Roleplaying is all about visualization. Being able to visualize the action, the threat, and even the characters in the adventuring party adds a lot to the enjoyment of the game.

If miniatures are available, the most obvious use is to show the spatial relationship between members of an adventuring party. For example, players exploring a corridor on a derelict starship would place their figures to show who was in the lead, who was trailing, etc. This saves a considerable amount of mental energy on the part of the referee.

The **Traveller** combat system is simple enough that it can easily be used to fight out small unit actions. To do so, first determine ground scale. If a grid system is used, the grid may either be two meters or 10 meters, usually depending on whether it is indoors or outdoors. In larger games, a grid won't be available, so instead use inches as a substitute for the grid. In most tabletop skirmish games, one inch to 10 meters is a good scale.

Really huge battles can be fought by compressing scale even more. Use one inch equals 100 meters as a ground scale and one figure equals 10 actual troops as a figure scale. Player characters should still be single figures, but double all damage rolls against them by 1:10 scale figures and cut the PC's damage die rolls in half when firing at 1:10 scale figures. (Yes, this still makes them much stronger than an average grunt. You got a problem with that?)

Terrain: The heart of any miniatures game is the table top, and this is even more true for science-fiction miniatures. Here are a couple of ideas for science-fiction terrain that we have used.

Ground Cover: Avoid really bright and garish colors for your basic ground cover. I have seen science-fiction games where everything was bright, vivid colors "because they look weird." Yes, but they also look like crap.

Stick to a subdued color for your basic table covering. Most plant life will be green, so a green covering is okay. We prefer a tan or light brown covering because desert seems to play well visually in science fiction.

For fields, use sheets of felt (available in any craft or dime store). These come in a riot of colors, and here is your chance to spark up the board. A nice neutral tan ground cover enables you to have yellow and orange plowed fields that look like they belong there. For green ground, earth tones are better, but there are still plenty of those, and the contrast with the green will look good.

Buildings: There are plenty of model buildings available, and some of them are even designed for science-fiction games. You don't need much help finding those. We use two additional sources of buildings, though, which have a genuine science-fiction flavor:

First, never throw away the Styrofoam that electronic components come packaged in. If computers are used where you work or go to school, the odds are they throw the stuff away; ask nice and they'll give it to you. Friends often have access to this material as well. These things are great because they come in a variety of really weird shapes, all of which look like interesting buildings when painted gray.

The drawback of these is that they tend to be large, and a couple large buildings go a long way in a miniatures game. For smaller buildings, we are always careful to save the clear plastic blisters whenever we buy something that comes in a blister card. These are often very unusual shapes and make very interesting buildings. Glue the blister card to a piece of balsa wood or plastic and paint it. If you intend to take your buildings on the road, it's a good idea to fill the blister card with a lightweight filler, like Spackle, as the blister is fairly fragile and crushes easily.

Two additional easy touches add a lot to their appearance.

If your wife, girlfriend, or mother uses L'Eggs pantyhose, have them save the plastic eggs for you. If they don't, wait for Easter time and buy a couple bags of hollow plastic eggs at your local variety store. Now glue the halves to the tops of the Styrofoam buildings in strategic places, no more than one or two per buildings. After it dries, run caulk, Spackle, or putty around the bottom to ensure a permanent seam.

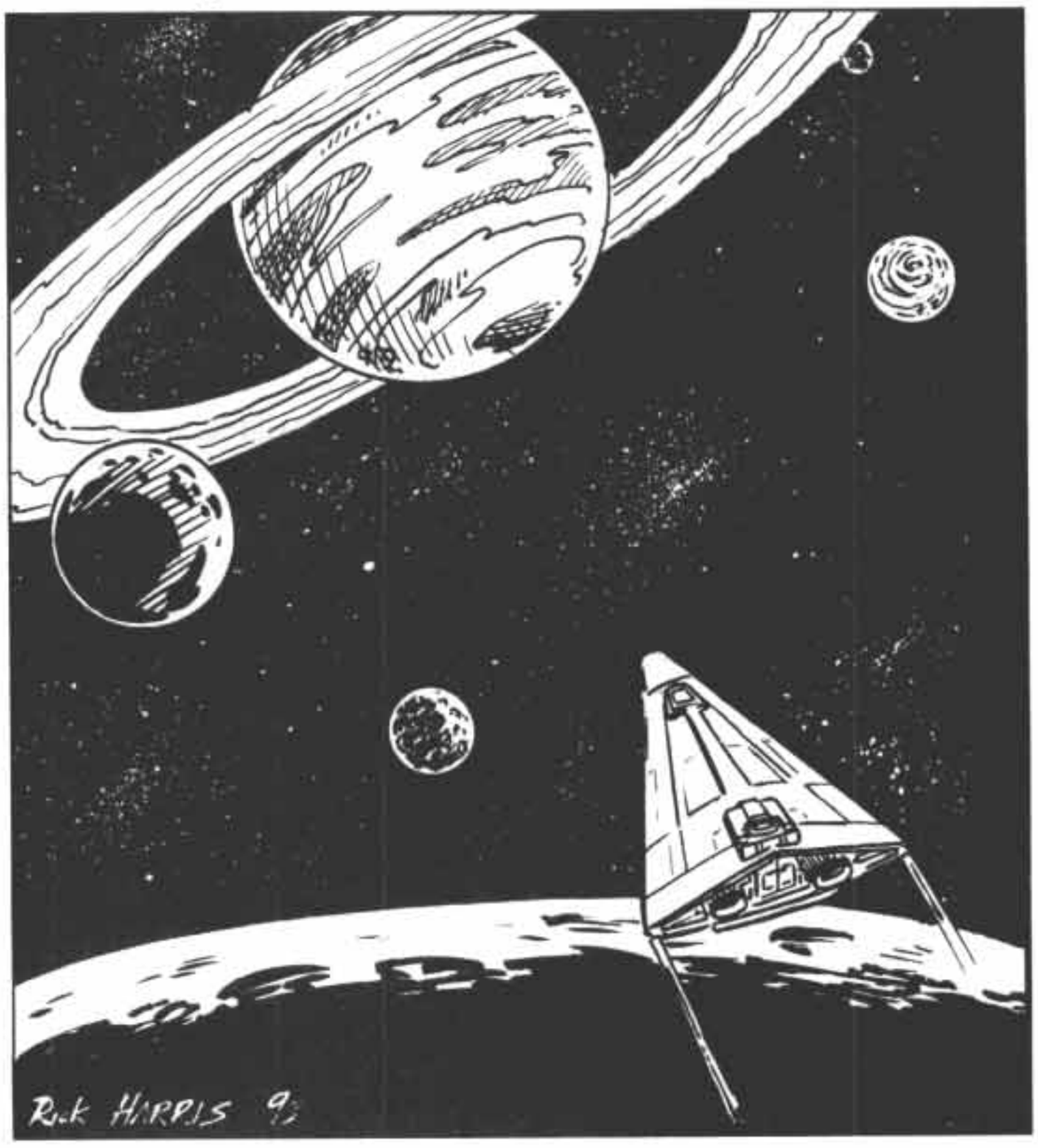
Second, put doors and windows on the buildings. These can be as simple as a square or rectangular piece of balsa wood or can be as elaborate as you want. Or you can wait until the building is painted and then draw doors and windows on with permanent marker.

PAINTING MINIATURES

Everyone has seen beautifully painted miniatures, but most people's efforts to paint a character figure fall far short of what experts are capable of. Given years of practice you can be that good, but what do you do in the meantime?

There are lots of ways to paint a miniature, and there are lots of great instructional works available that will show you how, with time, to become an expert painter. Find them. Read them. Practice. But in the meantime, cheat.

A few years ago, Frank Chadwick won a painting contest at a convention with a regiment of Soviet World War II infantry (about 100 figures in the scale wargaming unit). He hardly ever paints miniatures; he is far



from an expert (trust us), and he painted the regiment in two evenings. Interested?

The technique he used is called stain painting. Experts can do a better job with other techniques, but for average painters it's hard to beat this for ease, speed, and look of the finished figure. This technique works only with acrylic paints—don't bother trying it with enamels.

Step 1: Paint the Figure White. It's better to cover the figure with two thin coats than one thick coat, as this will do less violence to the surface detail of the figure. Let the undercoat dry completely (overnight) before proceeding.

Step 2: Stain the Clothing. A stain is a thin wash of paint applied over the white undercoat. Make the wash by mixing about one part of paint with two parts of water. (More paint for light colors, like yellow and sky blue; less paint for deeper colors, like dark brown and navy blue.) Now take a large brush and slop the stain on all over the area of the clothing. Don't worry about getting it on things like boots, flesh, or equipment, but try to keep it off areas of clothing that will be a different color.

As the stain dries, it will look very light, as if it has mostly run off. Don't worry about it for two reasons. First, as the paint dries, it will tint the white slightly more than when it is wet. Second, the color looks washed-out because you have only it and white to look at. Once there is more contrasting color on the figure, it will look great.

Dark hair should be stained the same as clothing.

Step 3: Paint the Flesh and Equipment. Now paint the exposed flesh and all equipment (including belts, boots, backpacks, etc.) using either full-strength paint or paint slightly thinned (to enable it to flow better). Paint the lower surfaces first and deliberately overlap raised detail that you will paint later. For example, if a figure is holding a rifle, paint the rifle barrel first, then the gun stock around it, then the hand holding it. It is much easier for your brush to catch a raised surface and miss the lower one than vice versa. Light-colored hair should be painted in this step.

When you are done with this step, you will see that the clothing color is much more obvious and has lots of shadows and highlights that add a genuine three-dimensional feel to the figure.

Note that figures that have only equipment rather than clothing, such as troops in combat armor or battle dress, can be stained instead of solid painted, but the stain should be a heavy one rather than a light one.

Step 4: Detailing Washes. A wash is a much thinner version of a stain—anywhere from five to 10 parts water to paint (depending again on how dark the paint is, but washes are almost always done with dark shades). Coat the flesh with a medium brown or dark brown wash. This will bring out facial detail by settling in the folds of the skin. If you don't mind the extra time, hold the figure upside down while letting the facial wash dry; this lets the wash gather in the eye sockets and gives a good shading effect.

Use a light brown wash on light-colored hair (the lighter the hair color, the lighter the wash) and a black or dark brown wash on equipment and clothing. Use black on cooler colors (such as blue and green) and brown on warmer colors (yellow, brown, red). Don't overdo the wash—a little goes a long way, and you can always add more.

An exception to the "little goes a long way" rule is when you want figures to look weather-beaten. In that case, use plenty of brown wash. (A light black wash picks out detail; a heavy black wash makes the figure look oily.)

Step 5: Admire Your Work. That's all there is to it. What you will have is a figure that won't necessarily win a painting contest, but it will be realistic-looking, and your painting will have brought out all of the character and detail that the sculptor put into the figure design. If you like it a lot, do yourself a favor and spray one or two light coats of a flat protective coating on it. This is available at any hobby shop. Most of the paint will adhere well, but it will tend to rub off on raised small detail features (like noses).

EQUIPMENT & TECHNOLOGY

The vast amounts of technology available in the **Traveller** universe can only be briefly touched upon in the chapter that follows. Every imaginable piece of technology was manufactured not only to the capabilities of different technology levels, but also built to satisfy the tastes of individual societies or races.

In this chapter you will find medical and pharmaceutical goods to maintain health, from antibiotics to life-extending anagathic drugs. Following that is equipment to sustain life in exotic, alien environments: vacuum and hostile environment suits, and wilderness survival and exploration equipment. Other essential equipment for travel is also included: communications gear, navigation equipment, data processing technology, and high-technology sensors to allow characters to get around by night or in opaque atmospheres.

And because travel often involves danger, there are a number of weapons. Personal arms such as pistols and rifles function on principles varying from kinetic energy slug throwers to rocket launchers, to plasma and fusion weapons, to lasers. Heavy weapons are based on the same principles, but pack a more powerful punch.

Finally are the vehicles themselves that allow travel. Contra-grav air rafts, personnel carriers, and tanks, all the way up to the starships that form the tissue of interstellar society. The chapter also includes add-on equipment to customize these ships: laser and missile turrets, defensive screens, and advanced sensor suites.

This chapter is only intended to get you started, and cannot cover all of the possibilities of the **Traveller** universe, nor even all the rules presented in this book. Future **Traveller** products will provide greater detail on individual pieces of technology, and the **Fire, Fusion, & Steel** handbook will allow you to design your own custom-made technology to suit any need.



Technology Assumptions

Traveller: The New Era is intended to not be limited to a single campaign background or to a single set of future science assumptions. Its rules are intended as a framework that will ultimately allow the play of a wide variety of science-fiction visions. Such different visions have distinctive technologies that separate them from speculative universes without such technologies. Matter teleportation, stardrives, and antigravity are all forms of technology whose presence in or absence from a setting have a major influence on the overall feel of that science-fiction setting, and are all directions that can be explored with another **Traveller** product, **Fire, Fusion, & Steel: Traveller Technical Architecture** sourcebook.

However, like any roleplaying game, **Traveller** must have a basic set of assumptions which drive a basic campaign setting. Not all referees wish to design their own unique universes. Many would rather start playing in a standard campaign setting that they know will be supported by future products and source material. For **Traveller**, this standard campaign is the Imperial campaign that was started with the first **Traveller** edition. This campaign will continue to be supported as the standard default campaign of **Traveller: The New Era**. Because this initial rulebook does not have enough space to detail all of the different approaches to technology, this rulebook uses the historical and technological assumptions of the standard Imperial campaign background.

The purpose of this chapter is to explain to referees and players how the technological assumptions of this standard Imperial campaign fit into the variable technology schemes presented in **Fire, Fusion, & Steel**. Players and referees who have no desire to use a campaign other than the Imperial campaign need not worry about this chapter.

Different Universes

The approach taken by **Traveller: The New Era** is that each of these different technological visions are actually different universes. The different technologies seen in these universes are the result of differing physical laws. These physical laws will make certain technological breakthroughs more or less difficult, perhaps even impossible. The more a universe's physics resist a certain development, the longer it will take to make the initial breakthrough, and the more time will pass between successive improvements. Likewise, the physics of a universe will allow one form of stardrive to be developed, but not another—say the use of naturally occurring warp points instead of **Traveller**'s standard jump drive.

Traveller divides the technology of the future into two types: baseline technology and projected technology.

Baseline Technology: Baseline technology is technology based on physical laws that we understand and can effectively manipulate in the 20th century. This includes such things as firearms, internal combustion engines, nuclear fission, ballistic computers, etc. Baseline technology also includes one important set of extrapolated technologies: advanced power generation. The ability to create power at a certain level and using a certain amount of fuel is the most important consideration for the use of any other technology, and hence is included in **Traveller**'s baseline technology. This particularly refers to the harnessing of fusion technology at ever increasing levels of efficiency. It is this baseline technology that defines the **Traveller** technology, or tech, level.

Tech Level: Tech level is a shorthand scale to show the level of baseline technology available. See the table for examples.

In different universes, different projected technologies may be added at different tech levels, indicating the point on the baseline scale at which they initially become possible. But not all projected technologies will be possible in a given universe, nor will they become possible at the same time as in other universes.

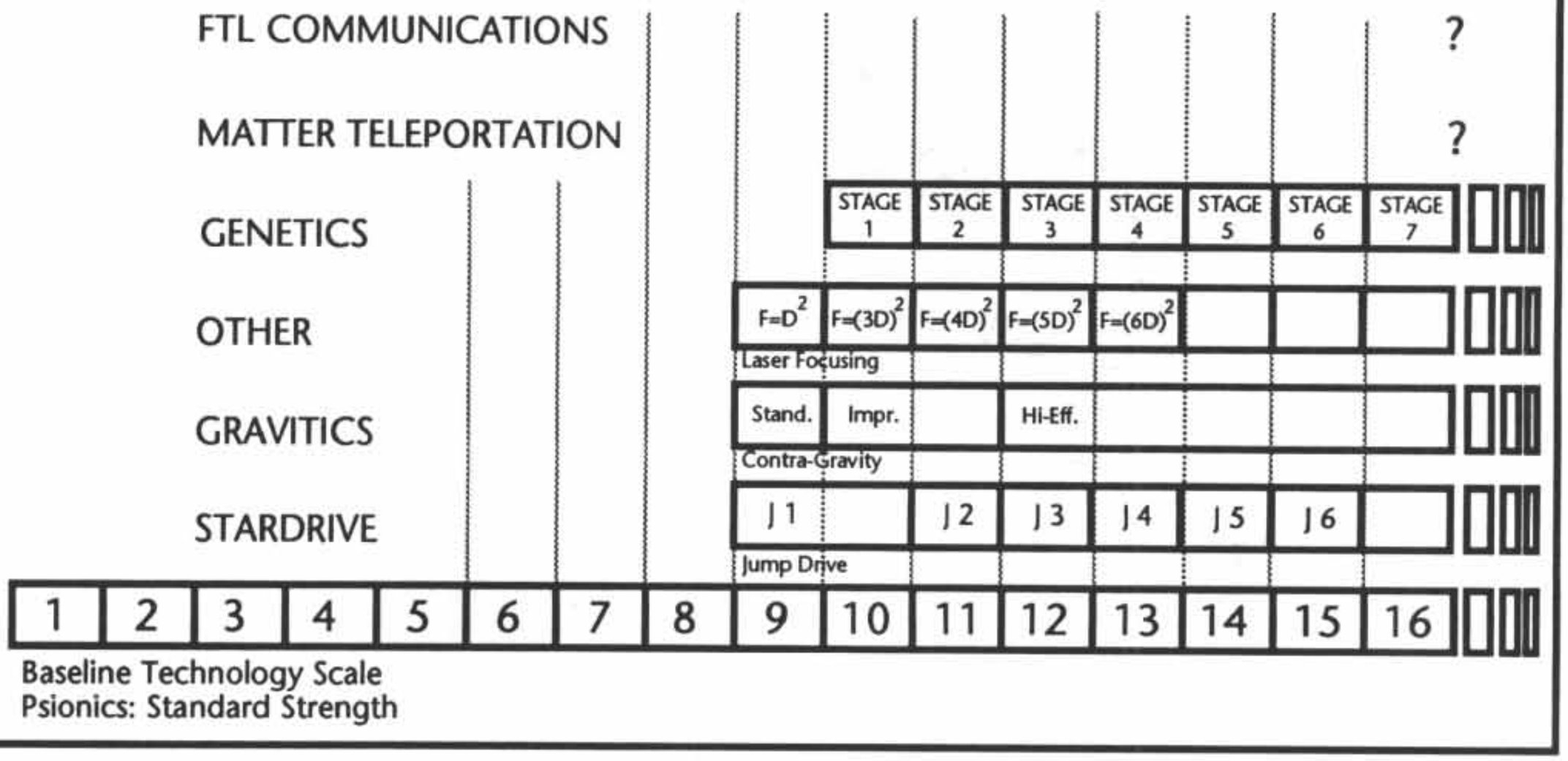
Note that baseline technology levels have fuzzy borders. Certain technologies become available as experimental systems before they are routinely useful and economically practical. Furthermore, the model of Earth history can be misleading when applied to an interstellar community, because worlds do not need to individually discover basic scientific principles. The best example is the discovery in Earth's history of microbes and the medical revolution that this brought about. A low-tech world would not have to develop its own microscopes to learn about these facts. Such a world would only have to be told about certain principles of infection and sanitation in order to realize the great health benefits that come from boiling water, maintaining standards of cleanliness, etc.

Also note that baseline technology allows unusual technical breakthroughs under spe-

AVAILABLE BASELINE TECHNOLOGY

Baseline Tech Level	*Period in Earth's History*	*Available Technology*
0	Stone Age	Fire, stone tools
1	Middle Ages	Wind power
2	c. 1600	Early firearms
3	c. 1800	Steam power
4	c. 1900	Internal combustion engines, electricity
5	c. 1930	Radio, radar, rocketry
6	c. 1950	Jet engines, nuclear fission
7	c. 1970	Low-power lasers, printed circuits
8	c. 1990	Fiber-optics, microchips
9	Beyond 2000	Fusion power
10+	Farther beyond	Increasingly efficient fusion power

Imperial Campaign Technological Fields



cific local conditions. For example, on a world with a dense atmosphere and low gravity (an unlikely combination to be sure), practical aircraft will become available before they were on Earth, as it would be easier to generate sufficient power to keep an aircraft in the air.

Projected Technology: Projected technology refers to breakthroughs using physical laws not currently known (for example, stardrives and antigravity), or physical laws that we do know and understand to some extent, but which we do not yet understand how to completely manipulate (the cloning of higher animals is an example of this). Because projected technology deals with the ability to do certain things in a universe because the physical laws there allow it, projected technology also refers to things not normally thought of as technology, like psionics. Psionics is not a technology *per se*, but rather a natural phenomenon which can be exploited.

The Imperial Campaign as Example

In order to clearly explain these concepts, we will examine the technological underpinnings of the standard Imperial campaign. This campaign is a variant universe like any other described above. It has its own set of technological assumptions which reveal the background physics of the universe.

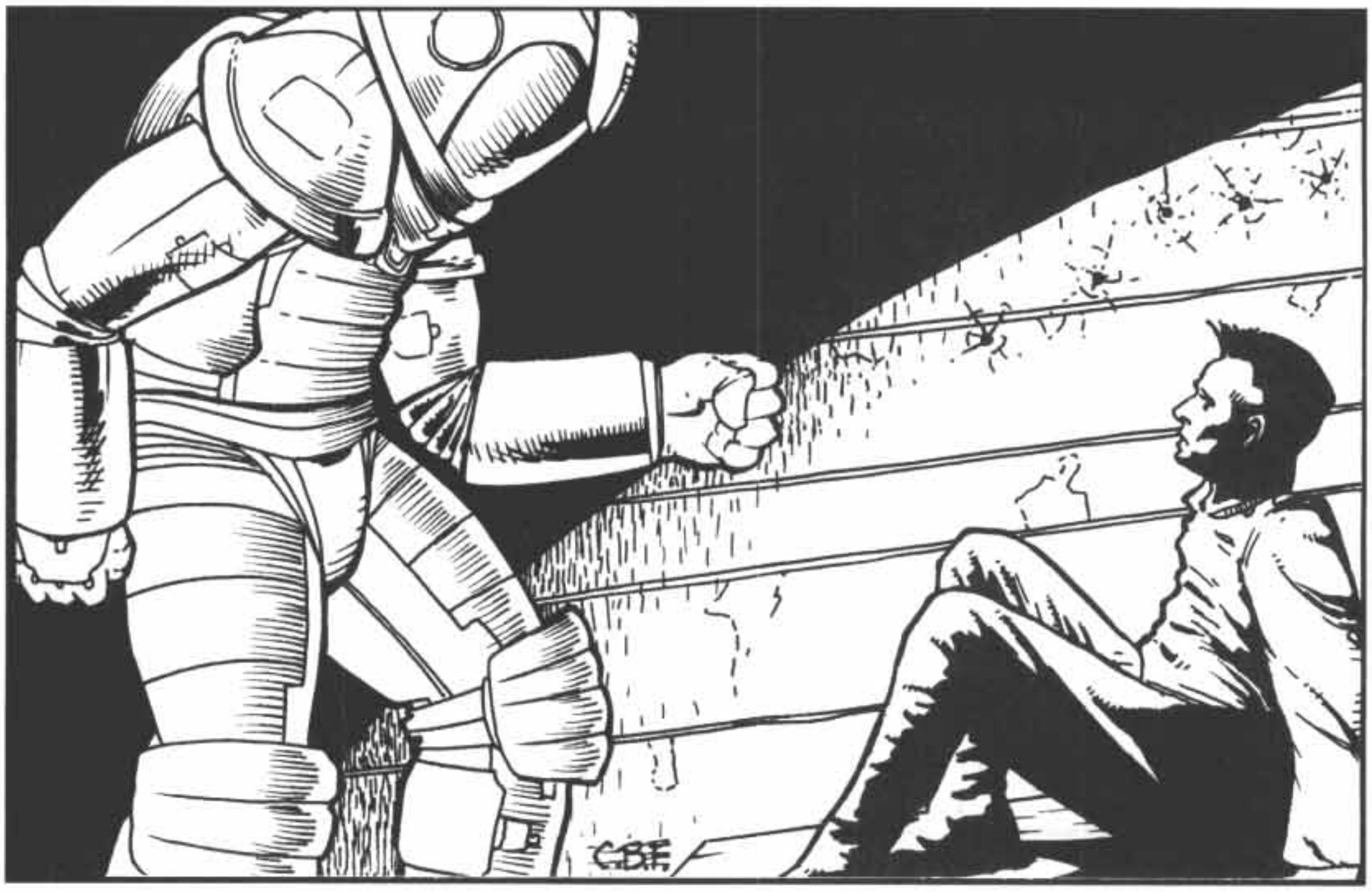
A universe can be thought of as having "settings" which dictate the sort of things that can and cannot be done in that universe, and how difficult these things are. The harder a certain technology is to perfect, the later it will be introduced on the baseline technology scale.

Looking at the technology chart above for the Imperial campaign, we see that, like any **Traveller** universe, it begins with the baseline tech level scale. To this baseline are added the projected technology fields.

Projected technology is divided into several different fields. Each field represents a solution to a problem or goal. For example, the stardrive field answers the problem of how people get from star to star. Some of these fields present alternative approaches to those goals. In the case of the stardrive field, a universe's projected technology can be jump drive, stutterwarp, natural warp points, star gates, hyperspace, or psionic shifting (as a rule of thumb, only one type of stardrive should be included in a universe). Other fields have just one approach and effect (matter teleportation, for example).

When a field is selected to use in a universe, it must be given an initial availability point in relation to the baseline tech level scale. For example, in the Imperial campaign, the stardrive type chosen, jump drive, becomes available at tech level 9.

After setting the tech level of initial availability, the field's "slope" must be set. Most fields will have scales of improvement within them (for example, jump drive availability starts out with jump 1, then advances to jump 2, jump 3, and so on). The slope determines how rapidly these improvements are made with respect to the baseline tech level. The standard 1:1 slope allows one of these improvements per baseline tech level. A shallow slope reflects the fact that each incremental improvement takes



longer. A shallow slope could be designated by the referee as requiring two (a 1:2 slope) or even three (a 1:3 slope) tech levels per improvement. For example, if jump drive technology were placed on a 1:2 slope, jump 1 would become available at tech level (TL) 9, jump 2 at TL 11, jump 3 at TL13, and so on. A universe might also have a steep slope, showing that once a certain breakthrough was made, further development proceeded rapidly. At a 2:1 slope, jump 1 and 2 would appear at TL9, jump 3 and 4 at TL10, and so on. In the Imperial campaign, there is an initial flat spot immediately following introduction at TL9 and 10, but once TL11 is reached, jump performance increases at the 1:1 rate.

Note the other fields used in the Imperial campaign. There is contra-gravity technology appearing at TL9. This is one of the subset approaches to the gravitics field. Contra-gravity means the negation of gravitational attraction. Another gravitic approach is thruster plate technology, in which gravitic force is transformed into directional thrust. Both these also allow the generation of artificial gravity fields aboard spaceships.

Laser focusing technology is another field included in the Imperial campaign, also appearing at TL 9. This allows laser beams to hit targets beyond a mere few thousand kilometers.

Psionics is given at the standard strength level. Some universes may not allow psionics at all, while some might use weaker or stronger variations. Note that psionics has no introduction tech level, as it is not limited by technology, but only by human awareness of its existence.

Genetic manipulation, which allows genetic modification at early tech levels, followed by limb regeneration, accelerated regeneration, cloning, and cultured replacement limbs is also introduced at TL10.

Some fields are not included here, as they do not appear by TL16, which is the current limit of the **Traveller: The New Era** Imperial campaign. Whether such fields as FTL (faster-than-light) communications or matter teleportation become available after TL 16 or are altogether impossible in this universe cannot be known to characters in the universe, as everything is impossible until the first time it is done.

The Representative Fields and Effects table shows certain representative fields and their general effects. All universes should have at least a stardrive and a defined tech level for the beginning of genetic manipulation techniques. All of the other fields are optional, although most campaigns will have a gravitics approach and some form of psionics.

Some of these fields are linked to each other. For example, if using the psionic shifting approach to stardrive technology, not only would the psionic shifting capability have to be assigned to the tech level at which it becomes available, the universe would also require a powerful set of psionic abilities to use with the drives.

For more information on technological settings and underpinnings, see **Fire, Fusion, & Steel.**

REPRESENTATIVE FIELDS AND EFFECTS

Representative Fields	*Effects*
Stardrive	Several styles of approach (jump drive, star gates, etc.)
Gravitics	Several styles of approach (antigrav, thruster plates, etc.)
Psionics	Levels of approach (weak, standard, powerful, etc.)
Genetic manipulation	Initial tech level and slope
Laser Focusing	Yes or no, plus initial tech level and slope
Matter teleportation	Yes or no, plus initial tech level and slope
FTL communications	Yes or no, with styles of approach, tech level, and slope

Equipment

EXPLOSIVES

Black Powder: Generally the only explosive available on low-tech worlds. Each kilogram of black powder has a DP value of 1. Black powder usually comes in 10kg kegs.

TL	Vol	Wt	Price
3	10 liters	10 kg	Cr40

Dynamite Stick: The most common explosive used by civil engineers for demolitions, it is relatively easy to manufacture and is coming into more common military use. A quarter-kilogram stick has a DP value of 1. Dynamite is sold in cases of 100 quarter-kilo sticks.

TL	Vol	Wt	Price
5	30 liters	30 kg	Cr1200

Plastic Explosive: Plastic explosive can be molded to desired shapes and will adhere to desired surfaces. It will not explode if burned, and can only be detonated by another explosion, usually provided by a blasting cap. A 1-kilogram block has a DP value of 6.

TL	Vol	Wt	Price
6	1 liter	1 kg	Cr70

Engineer Demolitions Kit: This kit contains an assortment of items to enable a character to rig explosive charges and fuse them for detonation. Weight and price are given for individual items as well as for the kit as a whole. The explosives must be purchased separately.

A single charge uses up one blasting cap, and whatever fuse, detonators, and so on that the character chooses to use. Wire, tools, and the blasting machine can be recovered after a blast, but all other items are used up. Quantities in a kit are noted in parentheses.

Tools (1 Set): Pliers, knife, tape, cap crimper, and other items needed to prepare explosive charges. *Wt:* 4 kg *Price:* Cr50.

Cap, Blasting, Electric (50): At least one is required to set off a charge. *Wt:* Negligible *Price:* Cr4.

Cap, Blasting, Nonelectric: (50): At least one is required to set off a charge. *Wt:* Negligible *Price:* Cr4.

Wire, Electrical (2×100m Spools): For use with electrical blasting caps. Any length can be fastened to up to 10 caps. Not normally reused. *Wt:* 5 kg/spool *Price:* Cr100.

Wire, Trip (1×500m Spool): A thin wire used in booby traps and the like. Tripwires can be of any reasonable length, but it makes no sense to have them longer than the blast radius of the explosive. *Wt:* 2 kg/spool *Price:* Cr20 per spool.

Blasting Machine (1): A hand-cranked electrical igniter which can fire up to 10 caps electrically. The machine generates current by muscular motion and never needs recharging or battery changes. *Wt:* 0.5 kg *Price:* Cr100.

Fuse, Instant (2×100m Coils): Burns 5900 meters per second; for use with nonelectric blasting caps. May be ignited by any igniter or by flame, and it can be combined with itself (to set off more than one cap) or with time fuse. *Wt:* 3 kg/coil *Price:* Cr100/coil.

Fuse, Time (2×100m Coils): Burns 100 seconds per meter; for use with nonelectric blasting caps. May be ignited by any igniter or by flame, and it can be combined with itself (to set off more than one cap) or with instant fuse. *Wt:* 3 kg/coil *Price:* Cr75/coil.

Igniter, Fuse (50): A weatherproof pull igniter, which can be used to light either instant or time fuse. This igniter can be used in simple (pull-only tripwire) booby traps. Only one tripwire per igniter. It can be fixed directly to a nonelectric blasting cap. *Wt:* Negligible *Price:* Cr3.

Timer (5): This detonator has a digital timer which can be set to any time from 30 seconds to 48 hours, in 30-second increments. It will fire up to 10 electrical caps. Once set and sealed, it is waterproof, but it cannot be set underwater. *Wt:* 0.25 kg *Price:* Cr20.

Igniter, Manual (5): A pull/release detonator, used for sophisticated booby traps. It will detonate either when pressure is placed on a tripwire or released from the tripwire (if a wire is cut, for example). Up to three tripwires may be attached. *Wt:* Negligible *Price:* Cr20.

Full Kit: All of the above, packed in a wooden chest for transport.

TL	Vol	Wt	Price
6	60 liters	30 kg	Cr500

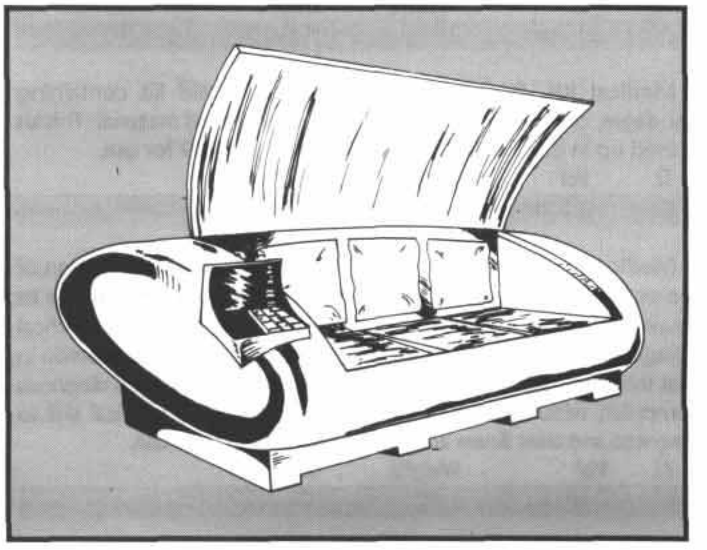
Primercord: A rope-like plastic explosive used in various demolition jobs. Primercord can be wrapped around conduits or small girders to sever them or taped to a wall (in a circle) to blow an entry hole. It can also be used to link other explosive charges together for almost instantaneous detonation (it will detonate other explosives by itself, without need for a blasting cap). Primercord itself requires a blasting cap. Primercord has a DP value of 3 per meter. All values below are per meter of primercord.

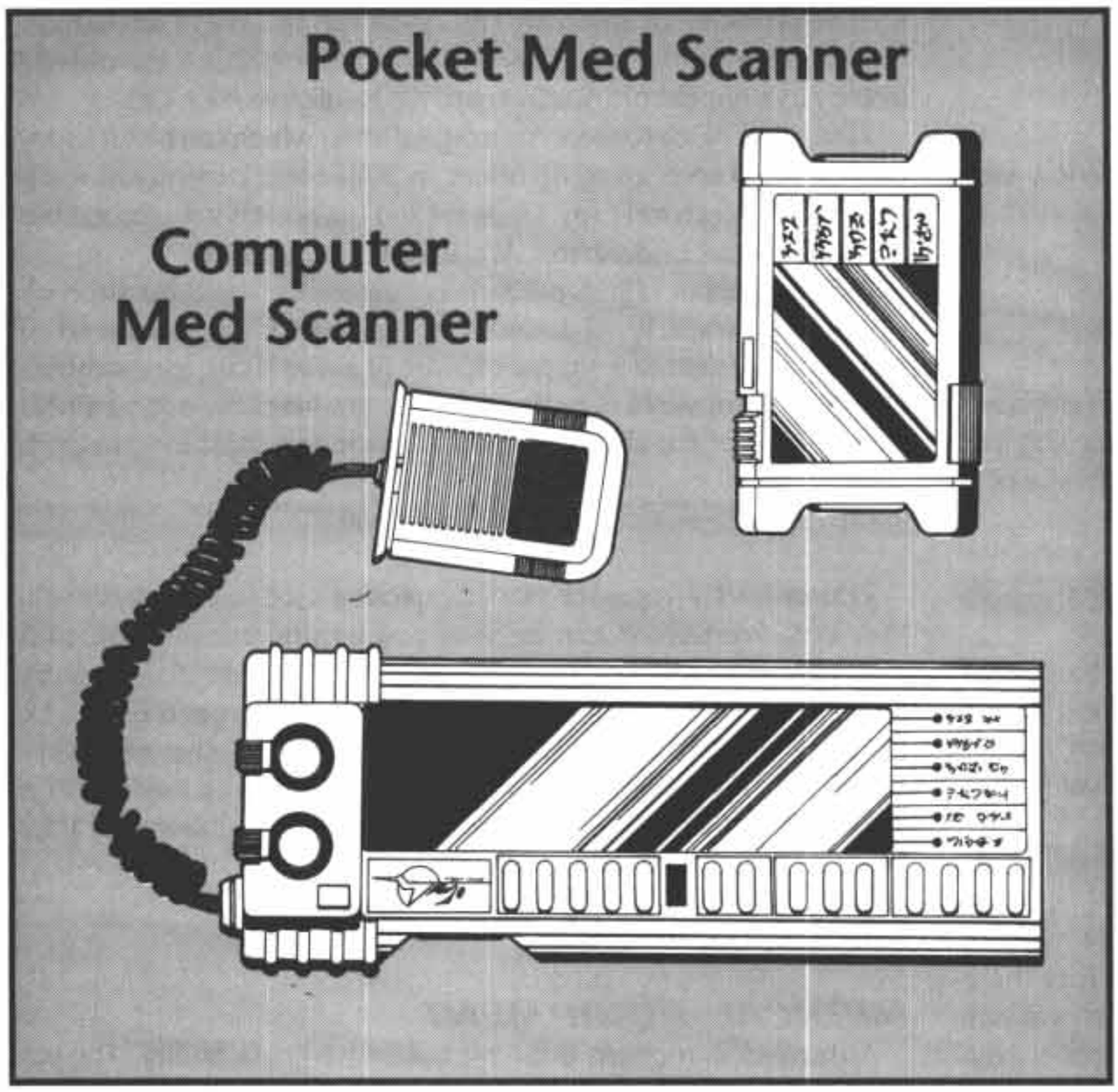
TL	Vol	Wt	Price
6	1 liter	0.5 kg	Cr15

MEDICAL EQUIPMENT

Automed: A modern one-unit automated care facility. The patient is placed in the unit after being stabilized, and the automed monitors vital signs, makes suggestions as to treatment options, regularly injects prescribed medication, and will initiate emergency resuscitation procedures, unless overridden, if the patient's vital signs drop below certain minimum levels. The Medical Modifier shows the number added to a doctor's Medical asset when performing any medical task on a patient in an automed.

TL	Vol	Weight	Price	Medical Modifier
9	3 kiloliters	6 tonnes	MCr0.5	+1
11	3 kiloliters	6 tonnes	MCr0.2	+2
13	3 kiloliters	4.5 tonnes	MCr0.3	+3
15	2 kiloliters	2 tonnes	MCr0.4	+4





Instruments, Surgical: Scalpels, forceps, hemostats, clamps, and other tools for major surgery. See page 290 for use.

TL	*Vol*	*Weight*	*Price*
7	2 liters	5 kg	Cr1000

Medical Kit, Doctor's: A modern first-aid and medical treatment kit containing drugs, surgical supplies, and diagnostic materials for use by doctors and emergency medical technicians. This medical kit is sufficient for both minor and serious wounds, and it can be used for the treatment of animal injuries, radiation burns, chemical burns, poisoning, and drug overdoses. See pages 289-290 for use.

TL	*Vol*	*Weight*	*Price*
7	20 liters	10 kg	Cr1000

Medical Kit, Personal: An individual first-aid kit containing bandages, one unit of antibiotics, and other first aid material. This kit is used up in one first aid operation. See page 289 for use.

TL	*Vol*	*Weight*	*Price*
7	0.5 liters	0.2 kg	Cr100

Medical Scanner, Computer: This larger, hand-held version of the pocket med scanner (below) takes rapid readings just like its smaller cousin, and thus greatly reduces the time spent on a Medical (Diagnosis) task. The larger scanner differs from the pocket version in that this handheld model includes a complete expert system diagnosis computer, which allows individuals with little or no medical skill to diagnose and treat illness and injury. See page 289 for use.

TL	*Vol*	*Weight*	*Price*
12	2 liters	1 kg	Cr25,000

Medical Scanner, Pocket: The pocket med scanner is an indispensable device in the satchel of any physician. Medical skill is not needed to operate the scanner, but the skill is necessary to properly interpret the readings. A doctor or nurse needs only to press against the patient's chest with the small disk-shaped probe. In five to 10 seconds, the scanner accurately determines body temperature, blood pressure, pulse rate, respiration rate, level of neural activity, and fluid balance. This useful device greatly reduces the time needed to make a Medical (Diagnosis) task, effectively reducing to zero the time needed to take a patient's vital signs. The scanner probe can actually be used anywhere on the subject's body, but no respiration rate is available apart from the chest site.

Once the reading is made, pressing a small button on the device records the values in the scanner's memory. These records can be called up later for review. Set points on the scanner can be keyed in, so if readings reach a certain level (either high or low), the scanner beeps to alert the attending physician. Small adhesive pads are used to attach the scanner temporarily to the chest for this purpose.

The med scanner is optimized for use on a given race, so using it on members of another alien race does not work. An individual with Electronics and Medical skill could, however, try to modify a particular device to work accurately for another species. (One exception to this rule does exist: The same device can be used for humans and Vargr.)

Vac suits at tech level 12 and above are designed with special contact points to allow a med scanner to be used without requiring removal of the suit. See page 289 for use.

TL	*Vol*	*Weight*	*Price*
12	0.2 liters	0.1 kg	Cr10,500

DRUGS

A variety of pharmacological developments are available to travellers for medicinal (and other) purposes.

Drug availability, reliability, and price vary considerably from world to world depending upon the local law and tech levels.

Medicinal Drugs: Four types of drugs are useful in preventing or treating contagious diseases: vaccines, antitoxins, antibiotics and metabolics. Antibiotics are also essential to prevent or cure wound infection while blood plasma, whole blood, and anesthesia are important when conducting surgery. Finally, broad-spectrum antivenin and atropine are useful in countering poisons and toxins.

These drugs can generally be obtained only from a physician or with a physician's prescription on worlds with high law levels, but they are generally available at retail on worlds with low law levels. Since all are administered by injection, they must be given by a character with Medical skill.

Vaccines: First appearing at tech level 5, these help prevent illness if administered once per year by reducing both the chance of contracting a disease and the severity of any disease caught. Vaccines against a single disease are available for Cr15 per inoculation. Vaccines that prevent several similar diseases on the world

where they are produced are available at a tech level of 10 or above for Cr20 per inoculation. A separate vaccine must be taken for each disease. Antiviral vaccines are available at tech level 10 as well.

Antitoxins: At tech level 6, antitoxins hasten recovery by combating poisons generated by microorganisms which have infected the patient, again by reducing both the severity and duration of illness. Antitoxins can also help if the patient is in a coma. Antitoxins must be administered once a day throughout the duration of the illness at a cost of Cr20 per injection. Antitoxins are disease-specific, and each affects only one disease.

Antibiotics: At tech level 6, these drugs attack the microorganisms that have invaded the body and thus hasten recovery while lessening severity. While generally effective, antibiotics have drawbacks: They may not be effective against the specific microorganisms in a patient's body, and they sometimes cause allergic reactions. Antibiotics have a cost of Cr50 per injection, and they must be taken once per day during illness.

Metabolics: First used at tech level 8, these are extremely expensive drugs similar to interferon, which are effective against a wide spectrum of diseases. They function by altering the metabolism of the patient, and they enable the patient's body to resist the disease by reducing both the severity and duration of illness. They are always effective, but they are not always available, even on high-tech worlds. Metabolics must be taken once per day of illness at Cr1000 per injection.

Blood Plasma: Each unit of blood plasma weighs 0.5 kg.

Whole Blood: Each unit of whole blood weights 0.5 kg and requires refrigeration or, if it is to be stored for a long period of time, freezing.

Local Anesthetic: Local anesthetic is available in liquid form for injections. Weight is negligible.

Total Anesthetic: Total anesthetic is available in liquid form for injections and gaseous form for inhalation (which is easier to control and so less dangerous to the patient). In liquid form, the anesthetic's weight is negligible. In gas form, a one-dose tank weighs 1 kg.

Antivenin: Antivenin comes packaged in autoinjectors, each of which weighs 0.3 kg.

Atropine: Atropine is useful in combating the effects of military, industrial, and natural nerve agents and comes packaged in autoinjectors, each of which weighs 0.3 kg.

Nonmedicinal Drugs: Each of the following drugs has its own advantages and disadvantages; users should be aware of the effects. For the sake of uniformity and ease of use, all are available in consistent, one-dose pill form. Other drugs not listed here may be available in a variety of forms and dosages.

If more than one drug is taken at a time, the combination may cause an adverse reaction in the individual and result in injury or death. The use or possession of certain drugs may be restricted by local law.

Combat Drug: Taken by fighters (usually military personnel) prior to combat, this drug increases STR and CON by 1 point each. The effect begins 30 seconds after being taken and lasts for about 10 minutes. When the effect wears off, the user suffers 1D6 damage to the chest.

Anagathics: Drugs which counteract the aging process: Supposedly, a regimen of regular monthly doses enables an individual to ignore the debilitating effects of advancing years. Because of the rarity and demand for anagathics, they are quite expensive and are often unavailable at any price. More details on the use of anagathics can be found in Character Generation, pages 33-34.

Truth Drug: Used to compel individuals to answer interrogation truthfully, one dose is sufficient to assure truthful answers for approximately two minutes, after which the user experiences one hour of unconsciousness, and suffers 1D6 damage to each the head and chest.

DRUGS

TL	*Drug*	*Per Dose*
5	Antibacterial Vaccine	Cr15
5	Whole Blood	Cr100
5	Local Anesthetic	Cr20
5	Total Anesthetic	Cr100
6	Antitoxins	Cr20
6	Antibiotics	Cr50
6	Blood Plasma	Cr10
6	Truth Drug	Cr5000
7	Atropine	Cr50
7	Antivenin	Cr50
8	Metabolics	Cr1000
10	Broad Spectrum Vaccine	Cr20
10	Antiviral Vaccine	Cr20
11	Combat Drug	Cr750
15	Anagathics	Cr20,000

PERSONAL TRANSPORT

Grav Belt: A standard-issue tech level 12 grav belt looks like a parachute harness with a "stiffener" that runs down the back, has a series of artificial gravity modules around the waist, and a series of low-energy thrusters for lateral motion. The grav belt weighs about 10 kg, but once it is turned on, a neutral control setting eliminates this weight.

The grav belt has a maximum speed in an atmosphere of 300 kph, a cruising speed of 225 kph, and a nap-of-earth speed of 40 kph.

TL	*Vol*	*Weight*	*Price*
12	25 liters	10 kg*	Cr100,000 (4 hours per charge)
15	15 liters	10 kg*	Cr110,000 (8 hours per charge)

*When not activated

Parachute: The parachute is a large canopy of cloth or other material held to the jumper's body by lines attached to a harness. The simple parachute affords only a small degree of control of the direction and rate of descent, for it is largely at the mercy of wind and drift effects.

Parachutes can use either static cord release (the chute is tripped automatically as the individual jumps) or ripcord release (either activated by the individual or by an automatic device preset for a given altitude). A static cord jump must be made from a minimum of 100 meters altitude and results in immediate deployment of the chute. The ripcord deployment requires 200 meters minimum altitude, but it also permits jumps from much greater altitudes with the chute opening delayed until the 200-meter level is reached.

A basic parachute weighs 10-15 kilograms; when packed, it fits into a pack worn either on the back or the front of the jumper's body. Many parachute packs incorporate a reserve parachute for use in case of faulty deployment of the main chute.

TL	*Vol*	*Weight*	*Price*
4	20 liters	15 kg	Cr250



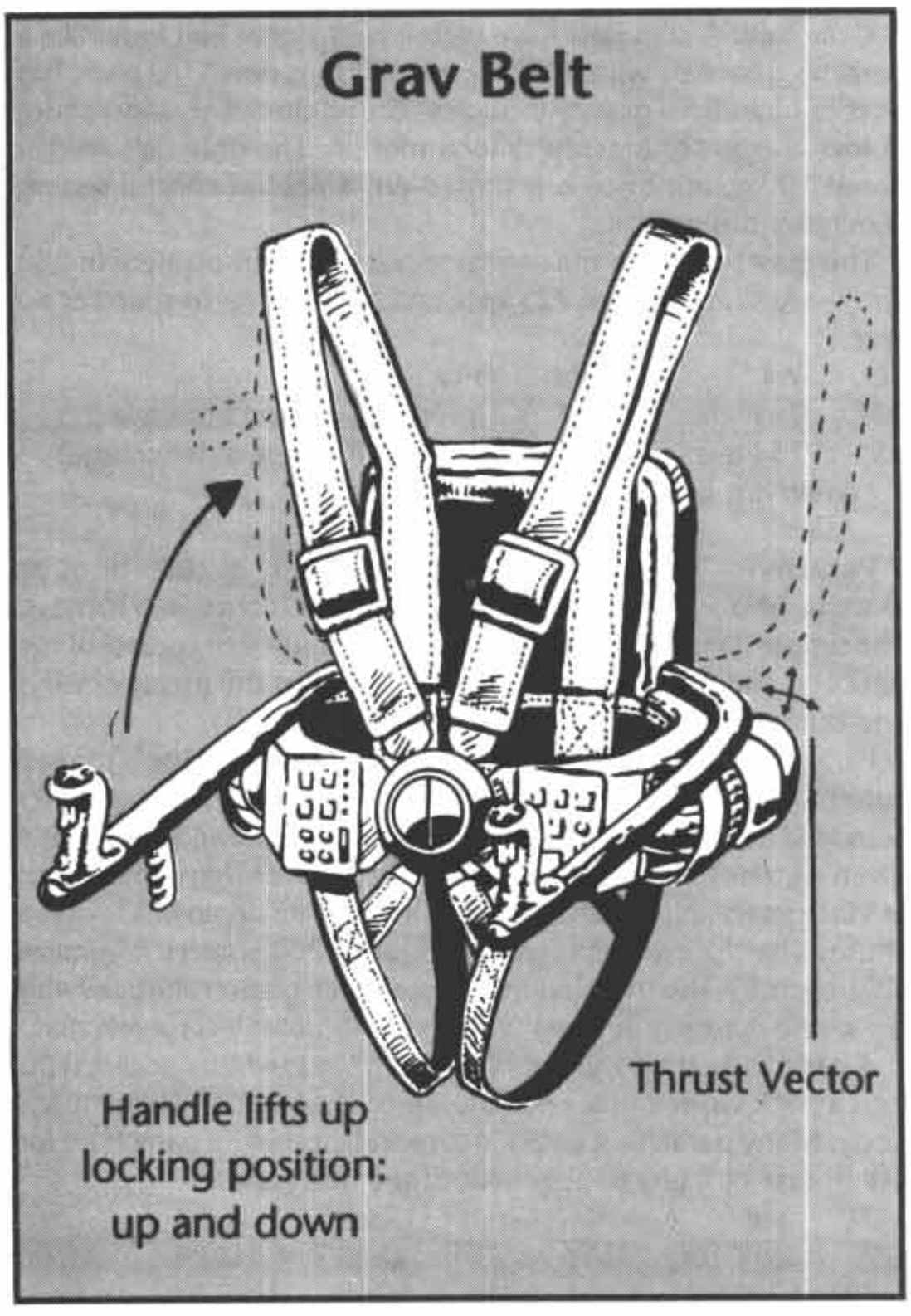
Parachute, Grav: Utilizing a basic grav technology, the grav chute is a compromise between the expense of grav equipment and the basic problems of regular parachutes. A simple grav module capable of nullifying a portion of the individual's body weight (but not of providing motive power, as with the grav belt) is worn as part of the chute harness; a conventional parawing is also deployed. Because the grav module can alter the effective weight of the jumper, it can be used to reduce the distance required for chute deployment by a factor of roughly three-fourths (thus chute deployment is not necessary until an altitude of about 50 meters). Varying the grav setting can also be used to alter the rate of descent, which is a particularly useful ability when staging a military raid.

The grav chute cannot fully offset body weight (normally) and certainly cannot provide lift; the small size of the power pack and the nature of the grav module itself will not permit this.

The parawing is used for steering, to back up the module in case of failure, and is necessary to check the final portion of the descent. It is virtually impossible for a jumper to miss a given target area using a grav chute.

The power pack is capable of operation for a total of five minutes. Power packs can be recharged from the usual power services or replaced at a cost of Cr500.

TL	*Vol*	*Weight*	*Price*
10	15 liters	15 kg	Cr2500



Parawing: More sophisticated than the parachute, the parawing is an airfoil-shaped chute which permits much more control of the descent. Hitting a given target area is easier with a parawing; other performance characteristics are as for the parachute.

Parawings are lighter but somewhat more expensive than standard parachutes. A ripcord release is standard for parawing chutes.

TL	*Vol*	*Weight*	*Price*
7	5 liters	5 kg	Cr400

Personal Reentry Kit: Originally invented as a means of emergency atmospheric reentry from a crippled space vessel, the personnal reentry kit was quickly adopted by the military and provided the glamorous *raison d'etre* for jump troops. So appealing is the image of meteoric descent from orbit that these kits have even enjoyed some popularity among hobbyists.

Each kit consists of an inflatable hemispheric mold, a pressurized cannister of ablative foam, a chemical thruster for attitude control and limited vector adjustment, and a soft landing system (usually a parachute).

TL	Vol	Weight	Price
8	20 liters	14.5 kg	Cr15,000
10	16 liters	11 kg	Cr12,000
13	12 liters	8 kg	Cr10,000

VAC SUITS

The rigors of alien environments contrast with shipboard conditions. When people face extremes of temperature, pressure, and atmospheric composition, a vac suit is the principal survival tool. At lower tech levels, these are unwieldy and uncomfortable, but they become lighter and more flexible with each technological advance. At the higher tech levels, the suits provide improved armor protection. At an additional cost, suits may be made self-sealing at tech level 13. At tech level 15, all suits are self-sealing. Vac suits consist of a suit, gloves, boots, and standard helmet; they protect against temperatures from +100 °C to –110 °C and pressures of up to 5 atmospheres.

At tech level 14, tailored vac suits become available. These include a soft helmet which is more comfortable but is wasteful of air supply: PLSS (see below) air supply duration is divided by two. Other advantages of a tailored suit are style and status.

At tech level 10, holographic heads-up displays become common in hard-helmet suits. The display shows the condition of the suit and the current battery level and air supply.

General-Purpose Vac Suits

TL	*Armor*	*Volume*	*Weight*	*Price*	*AGL Mod*
9	0(1)	3.6 kl	8 kg	Cr7000	–3
10	0(1)	2.7 kl	6 kg	Cr7000	–3
11	1	8 kl	4 kg	Cr7000	–2
12	1	0.9 kl	2 kg	Cr7000	–1
13	1	0.5 kl	—	Cr7000	
	Self-Seal Option		1 kg	+Cr6000	–1
14	1	0.2 kl	—	Cr7000	
	Self-Seal Option		0.5 kg	Cr5000	
15	1	0.2 kl	—	Cr9000	

Note that kl is kiloliters, 1 kl = 1000 liters.

Tailored Vac Suits

TL	Armor	Volume	Weight	Price	AGL Mod
14	1	0.2 kl	—	Cr9000	—
	Self-Seal Option		0.5 kg	+Cr6000	—
15	1	0.1 kl	—	Cr10,000	—

Hostile Environment Vac Suits

TL	Armor	Volume	Weight	Price	AGL Mod
8	0(1)	3.8 kl	35 kg	Cr12,000	–3
9	1	3.8 kl	40 kg	Cr16,000	–3
12	2	3.0 kl	40 kg	Cr18,000	–3
13	2	2.0 kl	10 kg	Cr20,000	–2
14	3	2.6 kl	25 kg	Cr150,000	–2

Accessories: Portable life support systems (PLSS) are a necessity; they can be purchased with different supplies of air. Batteries power the air supply recycler; a recharge lasts as long as the PLSS oxygen supply. Oxygen tanks provide oxygen, price and weights are included; separate table is for spares or replacements.

Portable Life Support Systems

TL	Type	Tanks	Duration	Volume	Weight	Price
9	A	2 std	4 hours	11 liters	7 kg	Cr3000
9	B	3 std	24 hrs (recycle)	20 liters	14.5 kg	Cr5000
9	C	6 std	48 hrs (recycle)	55 liters	29 kg	Cr8000
12	A	1 HP	4 hours	7 liters	4 kg	Cr3000
12	B	1 HP	24 hrs (recycle)	16 liters	11 kg	Cr5000
12	C	2 HP	48 hrs (recycle)	30 liters	18 kg	Cr8000
14	A	1 UHP	12 hrs (recycle)	1.5 liters	0.5 kg	Cr3000
14	B	2 UHP	24 hrs (recycle)	3.5 liters	2 kg	Cr5000
14	C	4 UHP	48 hrs (recycle)	7 liters	3.5 kg	Cr8000

Oxygen Tanks

TL	Type	Volume	Weight	Price	Refill
5	Standard	5 liters	2.5 kg	Cr500	Cr10
12	High-Pressure	4 liters	2.0 kg	Cr400	Cr10
14	Ultra High-Pressure	1 liter	0.5 kg	Cr200	Cr10

Hard Bubble Helmets

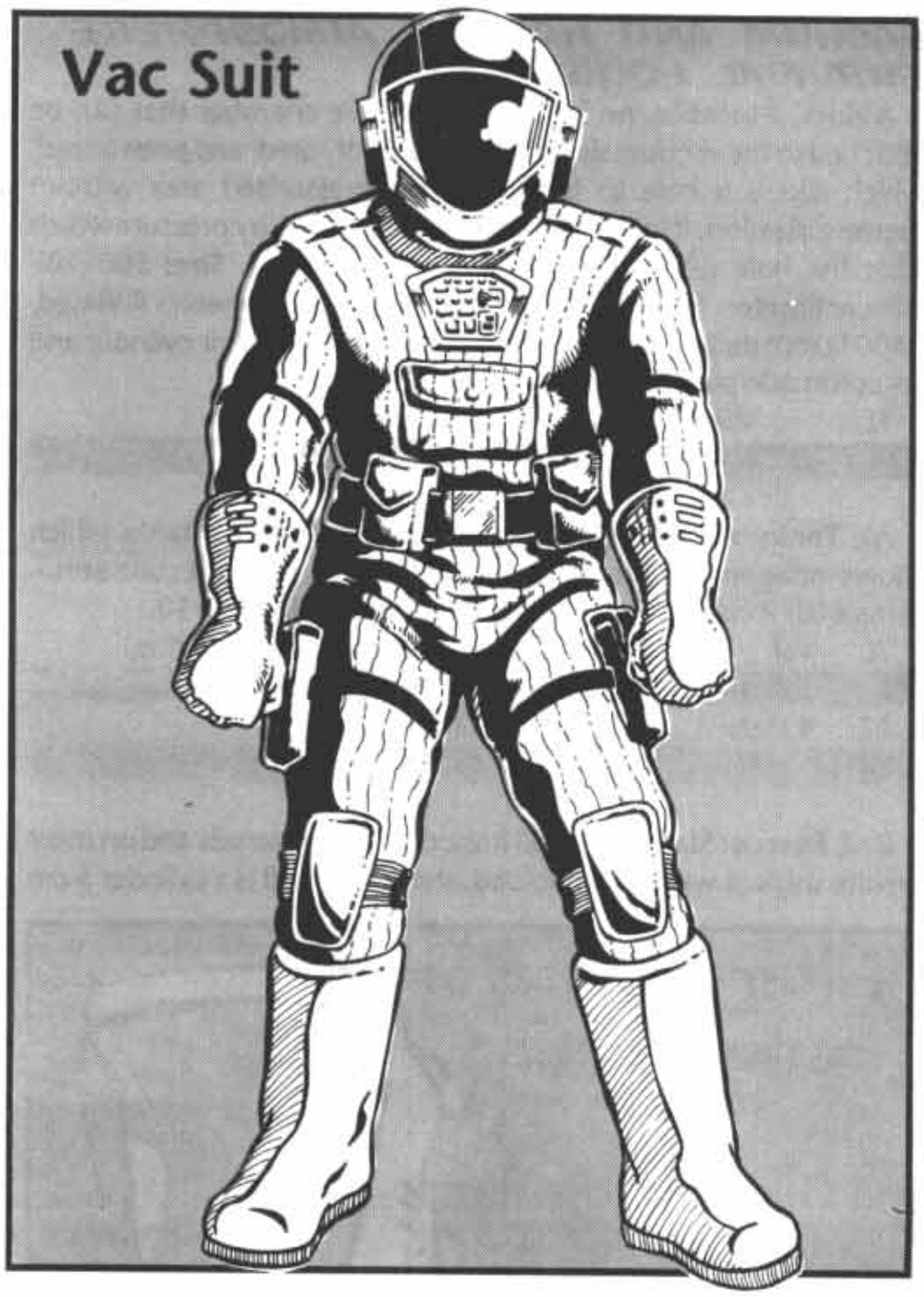
TL	Special Features	Volume	Weight	Price
8	None	14 liters	2 kg	Cr800
14	Integral Heads-Up Display	10 liters	1 kg	Cr1200

Miscellaneous Accessories: Magnetic grips, hand-held or fastened on boots, can make movement easier in low-gravity situations.

Suit patches come in handy in the event of a vac suit breach. They are unnecessary for small holes on self-sealing suits.

The thermal-meteoroid garment is a hooded, coverall-like garment added over the top of a regular vac suit. It lessens the risk from micrometeoroids, and can be used to temporarily "harden" a soft suit. It protects from +130C to –160C.

The long-range thruster pack (LRTP) is bulky, but it provides 1G acceleration for up to 24 hours, using standard starship fuel. It includes a TL-12 Type C PLSS (above) in its volume, weight, and price.



Miscellaneous Accessories

TL	Special Features	Volume	Weight	Price
5	Magnetic Grips	0.5 liter	—	Cr20
7	Suit Patches (pack of 5)	0.2 liter	—	Cr2
8	Thermal-Meteoroid Garment (Armor Value 1)	1 liter	—	Cr400
12	Long-Range Thruster Pack	65 liters	68	Cr8200

Special Purpose Vac Suits: The body pressure suit is light and comfortable (no encumbrance to Agility) to work in for short periods of time under mildly hostile atmospheric conditions. It can be worn under clothes but is of no benefit in pressures less than 0.43 atmosphere (Thin atmosphere) without the vacuum belt. The suit protects against temperatures +50 C to –40 C and pressures up to 2.5 atmospheres.

Body Pressure Suit

TL	Special Features	Volume	Weight	Price
10	Armor	0.2 liters	—	Cr12,500
10	Gloves, Helmet	16 liters		
	Air Charge (20 min)	0.75 liters	—	Cr250
10	Vacuum Belt	2 liters	1.5	Cr2500

VACUUM AND HOSTILE ATMOSPHERE SURVIVAL EQUIPMENT

Airlock, Portable: An inflatable, portable chamber that can be attached to the vacuum side of a bulkhead, entered, and pressurized, which allows a hole to be cut into a pressurized area without depressurization. It includes a patch held in place by pressure which seals the hole when the airlock is depressurized. Size: 500×20×200centimeters (deflated, 2000 liters); 1.5×1.5×2 meters (inflated, 4500 liters); deflated volume includes a pressurized air cylinder and an automatic pump.

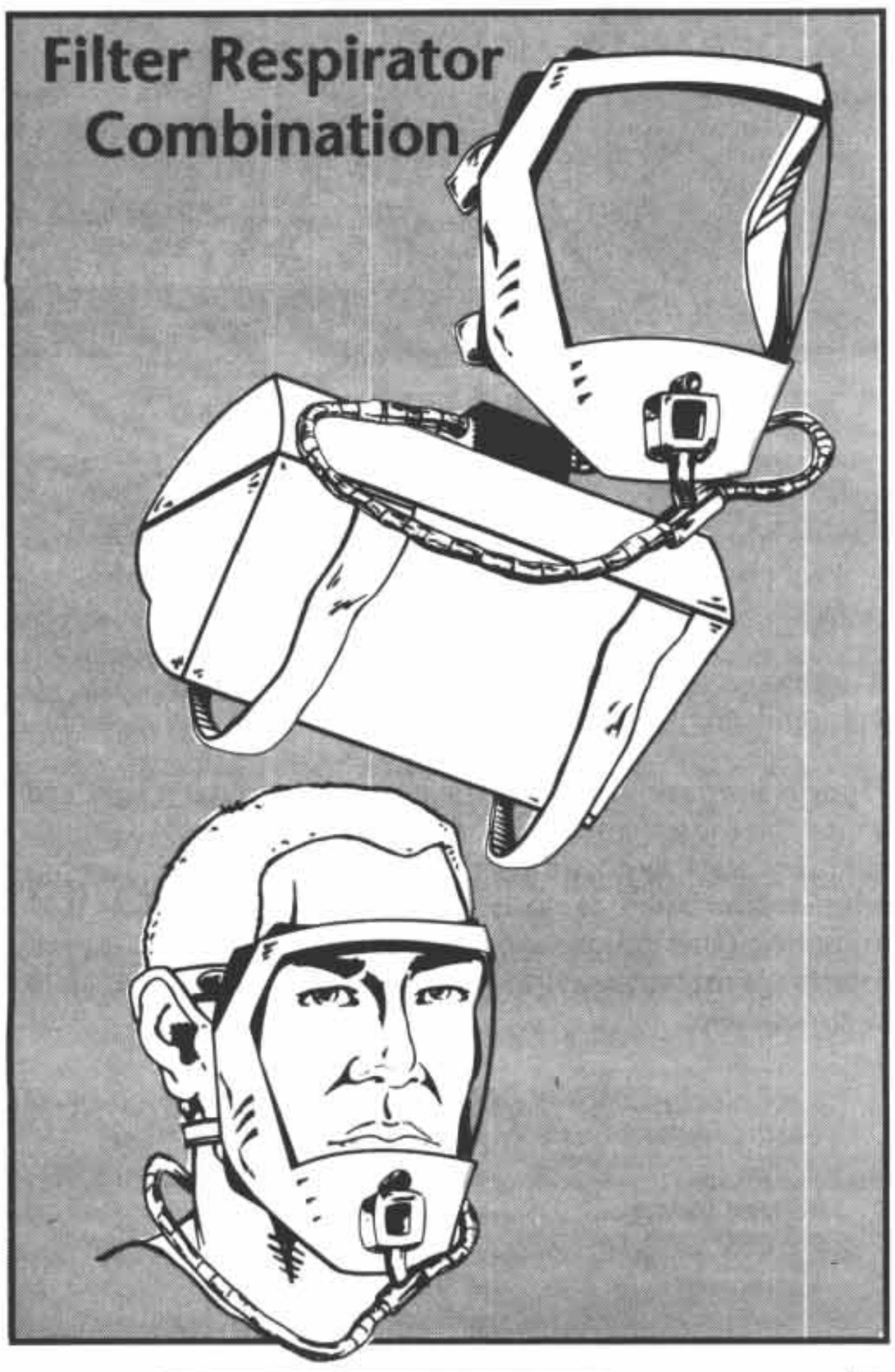
TL	*Vol*	*Weight*	*Price*
9	2000 liters	6 kg	Cr1000

Air Tanks: A complete set of compressed oxygen tanks which allows independent breathing in smoke, dust, gas, or Exotic atmosphere (UPP code A-C) and special situations. *Refill:* Cr10.

TL	*Vol*	*Weight*	*Price*	*Duration (hrs)*
5	5 liters	2.5 kg	Cr500	2
12	4 liters	2.0 kg	Cr400	4
14	1 liter	0.5 kg	Cr200	12

Ball, Rescue: Standard on all Imperial military vessels and on most private ships as well. When folded, the rescue ball is a cylinder 5 cm in diameter and 10 cm long. When deployed, it forms a sphere one meter in diameter which contains air sufficient to last one person for two hours. In the event of explosive decompression or other loss of air, a rescue ball allows an individual not in possession of a vac suit to survive until aid arrives. The user pulls a lanyard, climbs inside and seals the zip closure. The ball is made of a metal-coated plastic film for ease of location by radar and contains a bottle of compressed air, a first aid kit, and a transparent window through which the occupant may observe conditions outside the ball. Rescue balls provide some protection from stellar radiation and Corrosive and Insidious atmospheres for five to seven hours.

TL	*Vol*	*Weight*	*Price*
7	1 liter	5 kg	Cr150



Base, Advanced: Modular pressurized quarters for six persons, with airlock and atmosphere recirculating system. Can be carried in the hold of a starship.

TL	*Vol*	*Weight*	*Price*
8	72 kl	6000 kg	Cr50,000

Filter Respirator Combination: A combination filter mask and respirator which allows breathing of very thin, tainted atmospheres.

TL	*Vol*	*Weight*	*Price*
5	1 liter	0.5 kg	Cr150

Mask, Filter: A filter set which allows an individual to breathe tainted atmospheres.

TL	*Vol*	*Weight*	*Price*
3	1 liter	0.5 kg	Cr10

Mask, Protective: For use in irritant atmospheres, the protective mask covers the wearer's mouth, nose, and eyes, and it hooks up to an oxygen supply, which makes it ideal for use in atmospheres containing mild amounts of ammonia, sulfur compounds, or minimal amounts of chlorine.

TL	*Vol*	*Weight*	*Price*
6	1 liter	0.5 kg	Cr25

Respirator: A small compressor which allows an individual to breathe in very thin atmospheres.

TL	*Vol*	*Weight*	*Price*
5	1 liter	0.5 kg	Cr100

Survival Bubble: A large (two-meter-diameter) plastic sphere with alternating clear and opaque panels, and a small oxygen tank (capable of supporting one person for two hours) for inflation. Access to the interior is through a conforming plastic seal which functions similarly to an air-lock. The bubble can be used for life support in a vacuum (it can be moved by walking on the inside, treadmill fashion), and it can also be used for protection against weather or as a lifeboat on a sea surface.

TL	*Vol*	*Weight*	*Price*
9	3000 liters	3 kg	Cr600

Tent, Pressure: Basic shelter for two persons, which provides standard atmosphere. There is no airlock: The tent must be depressurized to enter or leave.

TL	*Vol*	*Weight*	*Price*
7	30 liters	25 kg	Cr2000

Wall Patches: Steel-backed plastic patches faced with adhesive, activated by peeling off a backing and placing the patch over a hole or leak. These will serve for several days, but must be placed on the interior surface of the leak so that pressure helps hold it in place.

TL	*Vol*	*Weight*	*Price*
10	1 liter	4 kg	Cr150

WILDERNESS EXPLORATION AND SURVIVAL EQUIPMENT

Backpack: Backpacks increase a character's carrying capacity.

TL	*Vol*	*Weight*	*Price*
3	40 liters	3 kg	Cr45

Beacon, Emergency: A combination long-range communicator and signal transponder, the commlink beacon is a very sophisticated emergency signaling device. The internal transponder monitors common emergency search-and-rescue channels (one at a time). When traffic is picked up on this channel, the device simultaneously emits a shrill warning tone to alert users to the possibility that help is at hand and transmits a coded distress signal. Some more expensive models have provision for a taped, auto-repeat distress call, instead of the automatic code signal. In either event, the commlink beacon serves as a means of establishing contact when there is any search being mounted within 500 kilometers, and then it serves to continue communications after that initial contact. The transponder operates for 30 days.

TL	*Vol*	*Weight*	*Price*
9	2 liters	1 kg	Cr750

Cabin, Prefabricated: Modular unpressurized quarters for six persons. 2x6x6 meters. Can be carried in the hold of a starship.

TL	*Vol*	*Weight*	*Price*
6	72,000 liters	4000 kg	Cr10,000

Crampons: Crampons are special spiked attachments strapped to boots to assist in climbs in icy conditions. Wearing crampons decreases the difficulty of crossing ice.

TL	*Vol*	*Weight*	*Price*
4	—	—	Cr20

Desert Survival Kit: A kit containing a variety of items useful in the desert. Includes a one-liter canteen; first-aid kit; salt tablets; folding shovel; plastic, watertraps, straws, and directions for building three solar stills; a knife and sheath; a signal mirror (for attracting the attention of searchers in the day-time); and a water purification kit (see below). The kit comes in a 30x12x12 centimeter pack which can be worn on the back or hip or attached to a larger pack.

TL	*Vol*	*Weight*	*Price*
5	4.5 liters	1 kg	Cr450

Machete: Blade used in cutting vegetation to clear a path, campsite, etc. As a melee weapon, treat as blade.

TL	*Vol*	*Weight*	*Price*
4	2 liters	1 kg	Cr125

Snowshoes: Large, somewhat awkward, but highly effective, snowshoes permit a character to increase speed over snow by 50%.

TL	*Vol*	*Weight*	*Price*
1	4 liters	1 kg	Cr60

Solar Vaporator: A device which collects moisture from the air, especially at night. Yield is two liters per 24 hours in standard or dense atmospheres; one liter per 24 hours in thin atmospheres; and 0.5 liter per 24 hours in very thin atmospheres. The vaporator is stored in a compact (50x20x20 centimeter) package, but it unfolds (an operation requiring five minutes) to 200x10x50 centimeter and stands on a tripod which takes up one square meter.

If the vaporator is not running throughout an entire 24-hour period, partial yields can be calculated by assuming that three times as much water can be collected at night as during the day (0.5 liter during the day on a standard atmosphere planet, 1.5 liter at night).

Solar panels provide power directly during the day and accumulate and store power for operation at night.

TL	*Vol*	*Weight*	*Price*
10	See above	8 kg	Cr1250

Still, Fusion: A bulky device which breaks water molecules free from material placed within it. The amount of water delivered will vary with the type of material fed to the still, but ranges from 1% for very dry sand to 70% for organic material such as wood, plants, or bodies. This percentage of weight in kilograms gives a one-to-one yield of water in liters (thus, 100 kg of sand will yield one liter of water). The still requires one hour to set up, and 30 minutes for each 10 kg of material processed; the hopper must be cleaned out after each load, which requires another 30 minutes.

TL	*Vol*	*Weight*	*Price*
13	150 liters	60 kg	Cr4500

Tarpaulin: A canvas or waterproof cloth sheet used for temporary shelter, measuring 2x4 meters.

TL	*Vol*	*Weight*	*Price*
1	4 liters	2 kg	Cr10

Tarpaulin, Reflectorized: An aluminized sheet which reduces incoming radiation by reflection, measuring 5x10 meters.

TL	*Vol*	*Weight*	*Price*
7	2 liters	1 kg	Cr400

Tent: Basic shelter for two persons. Larger, more elaborate tents weigh and cost more.

TL	*Vol*	*Weight*	*Price*
2	6 liters	3 kg	Cr200

Water Filtration/Distillation Unit: Purifies water for drinking. The unit includes a distilling plant, filters and purification tablets.

TL	*Vol*	*Weight*	*Price*
7	4 liters	1 kg	Cr75

Water Purification Kit: A bottle of 250 tablets to make contaminated water safe. One tablet in one liter will render water safe in 30 minutes. *Reliability:* NA at tech level 7 or higher; reliability equals tech level if tablets are over six months old at tech level 5 or 6.

TL	*Vol*	*Weight*	*Price*
5	—	—	Cr5

COMMUNICATION EQUIPMENT

Communicator: A communicator is defined as a radio transmitter/receiver combination capable of operating off an internal power source; it is portable in the sense that it need not be connected to a power supply. It may transmit and receive both voice and data. Communicators 0.1 liters and under can be worn as earpieces, which are unnoticeable to the casual observer.

TL	*Volume*	*Weight*	*Price*	*Range*
5	50 liters	100 kg	Cr225	3 km
5	100 liters	200 kg	Cr750	30 km
6	150 liters	300 kg	Cr10,000	3000 km
7	10 liters	20 kg	Cr250	30 km
8	0.1 liter	0.2 kg	Cr75	3 km
9	1 liter	2 kg	Cr500	300 km
9	10 liters	20 kg	Cr5000	3000 km
10	1 liter	2 kg	Cr250	30 km
12	1 liter	2 kg	Cr5000	3000 km
14	0.1 liter	0.2 kg	Cr500	300 km

Communicator, Laser: The laser communicator is a line-of-sight device with a 300-km range. This distance is seldom needed on a world's surface since the distance to the horizon limits the range first, but this range usually allows contact with an orbiting ship.

The laser communicator's main advantage is that it provides a tight beam and therefore a private means of communication. Series of laser communicators are often set up in a "repeater" network. Spaced at a horizon-to-horizon distance, the units can almost instantaneously convey a message around a world by retransmitting it from station to station.

TL	*Volume*	*Weight*	*Price*	*Range*
10	8 liters	16 kg	Cr11,000	300 km

Communicator, Video: The video communicator transmits a voice and two-dimensional image over a range of 300 km. The unit is small enough to be carried in a pocket or hung on a belt.

By opening the unit up, interior controls can preselect five different frequencies for current use; one of these can then be chosen using the frequency selection knob on the front of the communicator. The communicator can transmit and receive simultaneously.

TL	*Vol*	*Weight*	*Price*	*Range*
14	0.4 liters	0.8 kg	Cr1000	300 km

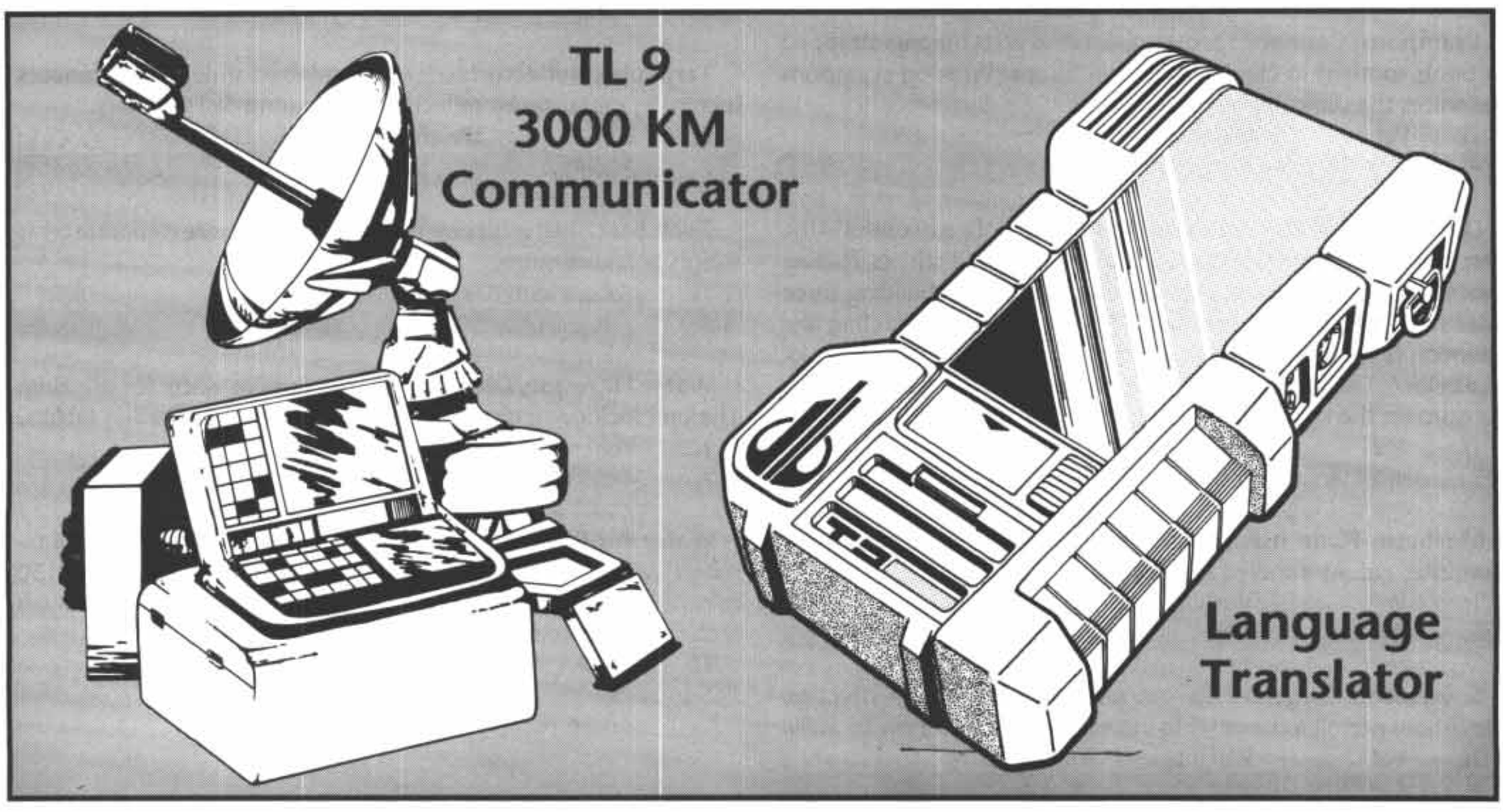
Translators, Language: With the diversity of languages in the former Imperium and neighboring regions, computer language translators (CLTs) became a fundamental element of interstellar trade and communication. Dozens of models could be purchased on worlds throughout the Imperium, and many are still available on worlds with a tech level of 10 or higher (even though it is a TL12 item).

The basis of all portable CLTs is a program package called a memclip. Each memclip contains programming for one language. These clips can be purchased with preloaded language programs for Cr100 to Cr150. Blank memclips cost Cr10 and are programmed by duplicating a preloaded program.

All CLTs work the same way. Two beings, each with a CLT and memclips for both his own and the other's language, adjust their units to a common radio frequency. Each speaks in his own language and the words are translated by the other's CLT and relayed to an earphone worn by the receiving being.

More than 700 languages were on memclips. The CLT can be carried in a hip pouch or by hand. CLTs have two to eight receptacles for memclips, plus the earphone. Prices vary. A standard CLT can be purchased for Cr2000. More expensive units have program correction features, more complete handling of idiomatic phrases, smaller size, bone implant speakers, greater durability, and a large capacity for multi-language conversations.

TL	*Vol*	*Weight*	*Price*
12	1 liter	0.5 kg	Cr2000



DATA STORAGE AND PROCESSING EQUIPMENT

Battle Computer: Man-portable battle-coordination system, capable of collating intelligence estimates, providing approximations of enemy forces, and suggesting tactics. It can be linked to unattended ground sensors to increase its potential, and can provide visual displays overlaid on maps when combined with a map box. When linked to a communicator, it can direct laser/maser-communication beams to ground or orbital stations, and it can automatically switch to secondary beam paths if primaries become unavailable.

TL	*Vol*	*Weight*	*Price*
9	28 liters	15 kg	Cr10,000

Calculator, Hand: Provides basic mathematical calculations.

TL	*Vol*	*Weight*	*Price*
7	0.25 liters	0.10 kg	Cr10

Computer, Hand: This is a small, powerful multi-function computer that can be used to store and recall basic factual data, perform complex calculations, and control other electronic devices.

Hand computers can be optimized for certain fields of knowledge by the use of modular data clips which can be easily inserted and removed (Cr200 each). When fitted with the proper data clip, the hand computer adds +1 to a character's asset for tasks of a purely factual or technical nature, such as Research tasks. Data clips for particular applications allow characters to use the hand computer to calculate jump parameters, ballistic performance, chemical formulae, etc.

The hand computer can be linked to various sensors (pages 346-7) and allows them to be monitored or controlled from a distance. The hand computer also serves as a computer terminal when linked to a larger computer (such as on board a ship).

TL	*Vol*	*Weight*	*Price*
11	0.2 liters	0.5 kg	Cr1000

Data-Display Recorder Headpiece: This headpiece represents a significant breakthrough in holographic display technology at tech level 13. A small rectangle of polylucent cuprothallium provides a constant heads-up three-dimensional display for the wearer. Although useless by itself, the headpiece can be interfaced with virtually any number of tech level 13+ devices.

Their use is common among bridge and engineering personnel on starships as well as smaller craft. For example, someone flying in a grav belt while using a neural activity sensor handset would find it inconvenient (to say the least) to refer to the readout on his backpack. Instead, the sensor's output is immediately displayed on his headpiece. At the same time, he can monitor his altitude, airspeed, position, and the operational status of his grav belt batteries and grav units. If he is also wearing a vac suit, he can read off his oxygen supply and internal temperature besides.

When desired, the headpiece can be swung out of the way above the head; when the display is turned off, the cuprothallium is transparent. About 3% of the population find it difficult to focus properly on the headpiece and are unable to use the device.

TL	*Vol*	*Weight*	*Price*
13	0.1 liters	0.1 kg	Cr5000

BATTERIES

A wide variety of equipment types require power, and an even wider variety of batteries are manufactured to provide that power. Rather than describe specific battery configurations, the following tables can be used to generate the characteristics of any size battery desired at any tech level.

The main table below lists the characteristics of batteries at each tech level assuming a constant discharge time of one hour. Batteries with longer discharge times have lower output per cubic meter, but usually provide more power over time.

To design a battery, follow these simple steps.

1. Determine the tech level of the battery and identify its row on the table.

2. Determine the power duration of the battery. This can be either 1 hour, 10 hours, 100 hours, or 1000 hours.

3. Multiply the maximum power output of the battery (at its tech level, found in the MW column of the table) by the output multiplier on the Battery Discharge Rate table (page 342). The result is the actual output per cubic meter of the battery.

4. Determine the power output level required of the battery. This will be determined by the power needs of the equipment the battery is to power.

5. Divide the required output per cubic meter of the battery (determined in step 4) by the actual output (step 3). The result is the volume (in cubic meters) of the battery. (Multiply this by 1000 to find the volume in liters).

6. Multiply the volume of the battery by the value shown in the Mass column to find the weight of the battery in tonnes. (Multiply this by 1000 to find the weight in kilograms.)

7. Multiply the volume by the value shown in the price column to in the price of the battery in MCr. (Multiply this by 1,000,000 to determine the price in credits.)

Basic Battery Data

TL	*Description*	*MW*	*Mass*	*Price*
4	Storage Batteries	0.04	2	.001
5	Storage Batteries	0.06	2	.001
6	Storage Batteries	0.08	2	.0008
7	Storage Batteries	0.1	2	.0008
8	Storage Batteries	0.2	2	.001
9	Storage Batteries	0.4	2	.002
10	Storage Batteries	0.8	2	.003
11	Storage Batteries	1	2	.004
12	Storage Batteries	1.5	2	.005
13	Storage Batteries	2	2.5	.008
14	Storage Batteries	2.5	2.5	.01
15	Storage Batteries	3	2.5	.015
16	Storage Batteries	3.5	2.5	.02
17	Storage Batteries	4	2.5	.025
18	Storage Batteries	6	3	.03
19	Storage Batteries	8	4	.04
20	Storage Batteries	10	5	.05
21	Storage Batteries	12	6	.1

MW: Maximum output at highest discharge rate, per cubic meter of battery.

Mass: Tonnes per cubic meter.

Price: Price in MCr per cubic meter.

Battery Discharge Rate

The battery's discharge time is the time it takes to drain the battery's charge. The energy output on the table below assumes a discharge time of one hour. If the output is lowered, the discharge time is increased, as shown below. Values may be interpolated.

Output	*Time*	*TL*
×1	1 hour	4
×0.1	10 hours	4
×0.02	100 hours	5
×0.004	1000 hours	6

Solar Arrays

Solar arrays consist of solar collectors, which collect solar radiant energy, and solar cells, which convert radiant energy to electrical energy. Each cubic meter of solar cell requires 10-square meters of solar collectors if deployed in the inner zone of a star system, 100 square meters of solar collectors if deployed in the habitable zone of a star system, and 10,000 square meters of solar collectors if deployed in the outer zone of a star.

TL	*Description*	*Price*	*Mass*	*Vol*
6	Solar Collector	.005	.008	.3
7	Solar Collector	.004	.006	.2
8	Solar Collector	.003	.004	.15
9	Solar Collector	.002	.003	.1
10	Solar Collector	.001	.002	.06
11+	Solar Collector	.001	.001	.04

Price: Price in MCr per square meter.

Mass: Tonnes per square meter.

Vol: Cubic meters of volume required per square meter of surface area if permanently installed.

The values above are for rigid, permanently installed solar collectors. If the solar collector can be retracted and deployed, double the price, mass, and volume requirement.

TL	*Description*	*MW*	*Price*	*Min Vol*
6	Solar Cell	0.01	.5	0.01
7	Solar Cell	0.015	.4	0.01
8	Solar Cell	0.02	.3	0.01
9	Solar Cell	0.025	.25	0.01
10	Solar Cell	0.03	.2	0.01
11	Solar Cell	0.035	.15	0.01
12+	Solar Cell	0.04	.1	0.01

MW: MW output per cubic meter.

Price: Price in MCr per cubic meter.

Min. Vol.: Smallest possible power plant in cubic meters.

Mass: All solar cells mass two tonnes per cubic meter.

Generators

Portable generators run on hydrocarbon fuels and are available in various increments of output power. The entry below shows the values for a generator per 10 kilowatts of output.

TL	*Vol*	*Weight*	*Price*	*Fuel (liters per hour)*
5	25 liters	25 kg	Cr50	2.5 (Cr0.25 per liter)
7	20 liters	20 kg	Cr100	3 (Cr0.25 per liter)
8	17 liters	17 kg	Cr170	2 (Cr0.25 per liter)
12	13 liters	13 kg	Cr267	2 (Cr1 per liter)

VISION ENHANCEMENT EQUIPMENT

Binoculars: Allows improved vision at greater distances than would unaided eyes.

TL	*Vol*	*Weight*	*Price*
3	2 liters	1 kg	Cr75

Binoculars, Electronic: Vision aid providing electronic enhancement of images. Electronic binoculars feature color enhancement (page 310) and range-finding capabilities in addition to the normal binocular benefits. Comes in an over-the-shoulder carrying case; a sling is also provided for separate carrying.

TL	*Vol*	*Weight*	*Price*
8	2 liters	2 kg	Cr750

Binoculars, Image Converter: Many night-vision devices and electronic sights either are sensitive to infrared (heat) radiation or use light amplifiers to detect their targets. Both have minor disadvantages: IR images can be camouflaged by insulation and LA requires background light to amplify. In addition, the user can only see as far as the unaided eye.

Commercially available at tech level 10, the image converter is sensitive to both infrared and visible light, and thus picks up both heat images and visible-light pictures. The converter intensifies these images, allowing night-vision, and magnifies them up to 20 times. Automatic polarizers cut in if the image is bright enough to blind. A laser rangefinder is also included to measure the precise distances to selected objects.

The Image Converter Binoculars combine the features of Image Intensification and IR goggles (page 310), and have a short range of 250 meters in either mode.

Special hardware/software clips are available for hand computers that expand the capabilities of the image converter. When hooked up to a computer using a graphics clip, the image converter can be tied into a map box (allowing others to see what the user sees), and electronic "photographs" can be stored in the computer's memory. Another clip allows the computer to calculate the speed of a target relative to the user.

Physically, the image converter is similar to a set of binoculars. Power packs are mounted inside the converter casing and average one week of constant use.

TL	*Vol*	*Weight*	*Price*
10	1 liter	1.25 kg	Cr3500

Binoculars, PRIS: The portable radiation imaging system (PRIS) has many more capabilities than binoculars from previous tech levels. The PRIS combines the features of the WSV viewer with color enhancement (page 310).

The PRIS can be set to observe images in the spectral range from infrared to gamma rays. (The PRIS will not detect radio waves.) The front surface of the PRIS is transparent to all radiation; just behind it is a series of lenses tailored to various specific bands. Besides this, a tight beam laser rangefinder gives an accurate reading on the target within sight up to about 20 km, depending on conditions, with the range displayed as a digital readout in the viewfinder. The PRIS also has a built-in clock and limited memory, so the rangefinder can determine the velocity of the object being viewed by comparing its distance from the observer over time.

The unit can be calibrated to a standard self-precessing gyrocompass, in which case the bearing of the direction viewed will be digitally displayed in the corner of the viewfinder. The magnification strength of the PRIS is adjustable up to 225. A built-in flywheel for gyro-stabilization ensures a steady field of view at all magnifications.

Besides its obvious uses in the field, the PRIS also finds itself used in a variety of industrial and engineering applications. Its infrared images can be color-coded to show the ambient temperatures of objects in the viewfinder. A PRIS can therefore be found near every jump drive, to be used by engineers looking for "hot spots" on the drive housing. In other areas of a ship, the PRIS can detect problems in electrical circuits, again by finding an area of higher temperature.

TL	*Vol*	*Weight*	*Price*
12	3 liters	2 kg	Cr12,000

Goggles, Combination IR/LA: These goggles combine light-amplification and infrared radiation detection in one unit and are worn like eyeglasses. They have the features of both IR and LA vision aids, see page 310. Most types have automatic sensitivity control in the LA mode to prevent blinding by a bright light source, and they can be adjusted manually in both the LA and IR mode by a knob mounted on the earpiece.

TL	*Vol*	*Weight*	*Price*
9	0.3 liters	0.2 kg	Cr1250

Goggles, Infrared: Allow wearer to see heat-emitting sources in the dark such as animals, fires, or hot engines. The quality of vision is necessarily distorted as heat sources and not reflected light images are being viewed. IR goggles also provide protection from wind-blown particles. See page 310.

TL	*Vol*	*Weight*	*Price*
6	1 liter	1 kg	Cr1000
8	—	0.1 kg	Cr500

Goggles, Light Amplifier: Allow vision by amplifying ambient light and are usable in anything less than total darkness. LA goggles may allow darkness penalties in night or combat situations to be reduced or ignored. LA goggles also provide protection from windblown particles. See page 310.

TL	*Vol*	*Weight*	*Price*
7	1 liter	1 kg	Cr1000
10	—	0.1 kg	Cr1000

Lamp, Gas or Oil: Provides about six hours of light (and heat). Refills of oil or gas cost Cr2 each.

TL	*Vol*	*Weight*	*Price*
2	1 liter	0.5 kg	Cr10

Lantern, Cold Light: The flashlight provides three days of light (no heat) in continuous use.

TL	*Vol*	*Weight*	*Price*
6	0.5 liters	0.25 kg	Cr20

Spotlight, Infrared: Powered by a vehicle or generator. IR goggles must be worn to see by this light.

TL	*Vol*	*Weight*	*Price*
6	3 liters	3 kg	Cr150

Spotlight, White Light: Powered by a vehicle or generator.

TL	*Vol*	*Weight*	*Price*
5	5 liters	5 kg	Cr100

Torches: Each lasts about 20 minutes.

TL	*Vol*	*Weight*	*Price*
1	1 liter	0.25 kg	Cr1

Torches, Electric: Each lasts about 10 hours in continuous use.

TL	*Vol*	*Weight*	*Price*
5	1 liter	0.5 kg	Cr10

Viewer, Tactical Thermal: This is a compact HRT (high resolution thermal) viewer which is tripod-mounted and battery-powered (with power for 10 hours of continuous use before recharging is necessary) and has a short range of 400 meters and is treated as a thermal viewer (page 310). The tactical thermal viewer allows users to "see" through fog, smoke, and in low-light conditions, provided the object is a different temperature than its background. This makes the viewer particularly useful for locating living beings and running machinery or vehicles.

TL	*Vol*	*Weight*	*Price*
9	10 liters	10 kg	Cr2250



Telescopic Sight: A telescopic sight may be mounted on any slug rifle. The sight increases the short range of the rifle by 15 meters (and by extension increases other range bands as well) when conducting aimed shots. In addition, all aimed shots at extreme range are conducted with the difficult of a shot at long range. Note that telescopic sights have no effect on unaimed fire (either quick shots or auto fire).

TL	Vol	Weight	Price
6	0.8 liters	0.1 kg	Cr200

Electronic Sight: An electronic sight has features identical to those of a telescopic sight (see above) with two exceptions. First, it increases short range for aimed shots by 20 meters, not 15 meters. Second, their image enhancement and light amplification characteristics allow firing at night. This second feature is not limited to aimed fire only, although unaimed fire using the night sight feature will not have the range bonus of the system.

TL	Vol	Weight	Price
9	1.5 liters	0.2 kg	Cr2000

Laser Sights: Laser sights do not increase the short range of a weapon, but project a small visible dot onto the point the weapon will hit, allowing quicker and more accurate aiming. A laser sight allows up to three shots fired during a turn to count as aimed shots (instead of only the first one). All other shots fired during the turn count as quick shots. The sight may only be used at ranges up to its maximum listed range. Laser sights *may* be fitted to pistols.

TL	Mass	Range	Price
8	1 kg	40 m	Cr400
9	1 kg	240 m	Cr1000
10	0.5 kg	240 m	Cr300



PROTECTIVE CLOTHING

Clothing, Cold Weather: At low tech levels, cold weather clothing consists of boots, pants, hooded coat, mittens, and face mask, made from animal skins sewn together. These items may be manufactured from local materials provided several large furs, properly cured, are available. At higher tech levels, the protection is afforded by a head-to-toe garment made of several layers of fabric around an insulating layer of fluffy fibers. Below tech level 7, immersion in water renders cold weather clothing totally ineffective.

TL	Vol	Weight	Price
1	16 liters	4 kg	Cr200
6	12 liters	3 kg	Cr200
10	8 liters	2 kg	Cr800

Goggles: Lightweight, plastic eye goggles which provide protection against both windblown sand or dust and sun glare.

TL	Vol	Weight	Price
5	—	—	Cr15

Heatsuit: A skin-tight, head-to-toe covering which provides protection against extreme cold. A power source drives a network of heating filaments in the fabric. An internal thermostat allows any apparent temperature, negating the effects of low temperatures and wind chill. The suit is powered by a disposable battery that powers the suit's filaments for 10 hours.

	TL	Vol	Weight	Price
Suit	8	—	—	Cr300
Battery	8	—	0.5 kg	Cr40

Heatsuit Power Pack: An energy source designed to replace the battery for a heatsuit. It powers the suit for up to 100 hours without recharging, and it is capable of recharging in one hour from any standard power source.

TL	Vol	Weight	Price
10	1 liter	2 kg	Cr500

Helmet, Transparent: A "goldfish bowl" type of helmet, this protective device has certain advantages over the protective mask. It is lighter, offers more complete protection against irritant atmospheres, and does not hamper the wearer as much as the clumsier mask. The helmet can also be worn with a protective suit or vac suit in corrosive atmospheres.

TL	Vol	Weight	Price
8	6 liters	0.75 kg	Cr30

Psionic Shield Helmet: Battery-powered helmet creating a weak electrical field at human brainwave frequencies; psionic-talented individuals perceive this as static, which prevents undesirable telepathic influences or psionic assaults. The helmet gives little physical protection, but it gives the wearer an automatic Psionic Strength rating of 15 (for purposes of defense against psionic assault only). Shielded individuals cannot be detected by characters possessing Life Detection, nor can they receive telepathic suggestions, nor can they be probed or have their thoughts read. The electronics of a psionic shield helmet are relatively simple, but one can break down or be sabotaged; a small meter on the unit allows testing of the helmet's effectiveness.

TL	Vol	Weight	Price
12	0.5 liter	1 kg	Cr4000
13	0.5 liter	—	Cr4000

Suit Air Conditioner: A cooling unit designed to function in hot atmospheres like the suit heater functions in cold.

TL	Vol	Weight	Price
8	6 liters	3 kg	Cr200

Suit, Desert Survival: Cover-all garment with shiny outer surface which prevents major water loss in the desert. The wearer is cooled through evaporation of perspiration, but a series of traps and chemical filters condenses and purifies lost body liquid and stores it as pure water in pouches within the suit. A hood, goggles, and breathing mask (which traps moisture exhaled through the nose and mouth) are included. The chemical filters must be changed once a month, at a cost of Cr50.

Besides keeping the wearer comfortable in sweltering conditions, the suit supplies one liter of water every three daytime hours, and one liter every night.

The suit has certain disadvantages. At TL 11 and lower, the bulkiness of the suit causes a –1 loss to Agility. Also, the suit is extremely shiny, which makes it almost impossible for the wearer to sneak up on anyone, even in rocky terrain. (This last disadvantage could be an advantage for characters lost in the desert who are hoping to be spotted by aircraft.)

Note that vac suits and combat armor will also, by their very nature, provide complete protection for desert travellers, at least as long as their air supply holds out.

TL	Vol	Weight	Price
9	20 liters	5 kg	Cr7000
13	5 liters	—	Cr9000

Suit Heater: A suit heating unit to combat the effects of low-temperature corrosive and insidious atmospheres. Without a heater, a protective suit is worthless in these conditions.

TL	Vol	Weight	Price
8	6 liters	3 kg	Cr250

Suit, Protective: Protects against corrosive atmospheres. The protective suit is sealed, air-conditioned, and has its own air supply (good for six hours). The suit has no water supply of its own, nor will it protect the wearer once the air supply gives out, but so long as it works, the wearer will not suffer the ill effects of the outside environment.

TL	Vol	Weight	Price
6	8 liters	7 kg	Cr1000

Suit, Protective, Heavy: Protects against insidious atmospheres. In other respects, it is similar to the protective suit.

TL	Vol	Weight	Price
7	10 liters	7 kg	Cr1400

TOOLS

Arc Welder: Operates off of an integral generator, which cannot be modified for other use.

TL	Vol	Weight	Price	Fuel Consumption
6	50 liters	75 kg	Cr1000	10 liters per hour

Carpentry Tool Set: Includes basic tools necessary to cut, shape, and build with wood. Woodworking may include construction and repair of shelters, buildings, or furniture.

TL	Vol	Weight	Price
2	30 liters	25 kg	Cr300

Electronic Tool Set: Necessary tools for basic assembly and repair of electronic devices such as communicators, detectors, sensors, and control instruments.

TL	Vol	Weight	Price
7	10 liters	5 kg	Cr2000

Excavating Tools: Picks, shovels, mattocks, and so on.

TL	Vol	Weight	Price
1	20 liters	20 kg	Cr250

Machine Shop, Portable: A trailer containing powered machine tools, including a bench grinder, horizontal and vertical boring machines, a milling machine, metalworking and woodworking lathes, and numerous other machine tools. Exact components and uses are left to the discretion of the referee. It can be towed by most ground vehicles with a cargo capacity of 0.5 tonnes or greater.

TL	Vol	Weight	Price	Power Requirements
6	8 kiloliters	2 tonnes	Cr1000	0.06 MW

Mechanical Tool Set: Includes basic tools necessary to repair and alter mechanical devices, including vehicles and guns.

TL	Vol	Weight	Price
5	30 liters	20 kg	Cr1000

Metalwork Tool Set: Includes basic tools necessary for metalworking, welding, and shaping. Metalwork may include the construction and repair of shelters, vehicle bodywork, and alteration of metal structural items.

TL	Vol	Weight	Price
4	50 liters	50 kg	Cr1500

NAVIGATION EQUIPMENT

Compass, Magnetic: Indicates direction of local magnetic north, if the world has magnetic poles. May be influenced and give false readings in the vicinity of large masses of iron.

TL	Vol	Weight	Price
3	—	—	Cr10

Map, Electronic: The "map box" is a compact (25x25x1 cm, which expands to 100 x100 x1 cm when opened) display system for computerized maps of a world. Scale may be adjusted. Most inhabited planets have mapclips (diskettes until tech level 13, holocrystals at higher levels) available for Cr150. When not available, two orbital sweeps of the world are required to obtain the necessary photographs to construct a map chip. Blank map chips are available for Cr30.

A map box automatically functions as a SatNav receiver (see next page).

TL	Vol	Weight	Price
9	1 liter	1 kg	Cr2500

Mirror, Return: A device consisting of several mirrors in combination such that they will reflect any incoming beam exactly 180 degrees within a field of 15 degrees. Largely a curiosity, the mirror is used in laser surveying. It is also effective in reflecting back any weapons laser which does not have a penetration value (i.e., Nil). A laser with any penetration value will immediately destroy the reflective surface of the mirror.

TL	Vol	Weight	Price
9	15 liters	20 kg	Cr500

Navigator, Inertial: A small (10×6×1 centimeters) inertial navigation computer which allows the user to backtrack on his path by "remembering" movements and turns. Switched on at the point from which the user sets out, it will allow him to find his way back later from any distance. A simple math function can also allow the user to determine a straight line distance and direction to his starting point no matter where he is.

TL	*Vol*	*Weight*	*Price*
8	0.2 liter	0.15 kg	Cr1500
10	—	—	Cr750

Satellite, Navigational: A small satellite placed in synchronous orbit over the hemisphere where exploration is taking place. It provides moment-by-moment information on the precise location of a tracking unit on the ground with an accuracy of one meter or less. For twice the size and price listed below, the satellite can relay the tracking unit (which would then include a TV-like viewscreen) to a plot projected on an accurate map of the region, which is created by the satellite through a combination of laser and radar mapping techniques. A small nuclear power plant provides over a year of operation without servicing, and the satellite can be retrieved and used over and over.

In order to use a navigational satellite, the personnel must have some form of SatNav (satellite navigation) receiver. This can be the small separate SatNav Receiver listed immediately below, or a receiver which is built into another piece of equipment. All standard, (St), fiber-optic (Fb), and flight (Flt) computers include integral SatNav receivers, although flight computers do not include viewscreens. There is also a SatNav Receiver clip available for the hand computer. The electronic map (previous page) also includes an integral SatNav receiver.

TL	*Vol*	*Weight*	*Price*
9	300 liters	100 kg	Cr35,000

SatNav Receiver: This is a small hand-carried receiver for use with the navigational satellite (above), used by personnel who lack access to larger equipment with integral receivers. All of these receivers can be linked into other electronic data systems to display their data. The different entries at each tech level are without and with viewscreens, respectively. Those without viewscreens merely display numeric coordinates which must be placed on maps that are scaled in the proper units.

The receivers include integral batteries which are good for 100 hours (TL 8) or 1000 hours (TL 10+) between recharges. The small tech level 10+ receiver is about the size of a wrist watch.

TL	*Vol*	*Weight*	*Price*
8	1 liter	1 kg	Cr1000
8	8 liters	8 kg	Cr20,000
10+	—	—	Cr300
10+	2 liters	2 kg	Cr4000

SENSOR DEVICES

Atmosphere Tester: A solid-state device with read-outs indicating the atmospheric percentages of elements present. In addition, a red light glows if the atmosphere is not breathable, and a green light glows if the atmosphere is breathable.

TL	*Vol*	*Weight*	*Price*
7	2 liters	1 kg	Cr150

Bugs and Detectors: Bugs are near-microscopic, difficult to detect monitoring devices, which enable an individual to hear conversations or to record them for later monitoring. Typically, a bug array is packaged as a small rod containing fifty implantable bugs, together with a bug detector. Placed by touching the rod to a wall joint, light switch, or some other feature of a room, implanted bugs are not recoverable, but they can be destroyed. Bugs send a constant signal to a central monitor. Bugs, once placed, are impossible to detect without a bug detector. A detector is calibrated to detect the signals of bugs and to note their location. A bug detector can be set on one of three settings: detect, smother, or destroy. "Detect" merely indicates the presence and location of a bug. "Smother" prevents a bug from sensing conversations, but allows the bug to remain active. "Destroy" actually destroys the bug which has been detected.

TL	*Vol*	*Weight*	*Price*
15	1 liter	1 kg	Cr1000

Counter, Radiation: Indicates presence and intensity of radioactivity in the immediate vicinity. Can be preset to give a warning signal if levels of radioactivity rise to dangerous levels. Readouts are given in specifics and in terms of danger to humans.

TL	*Vol*	*Weight*	*Price*
5	2 liters	1 kg	Cr250
10	—	—	Cr100

Densitometer, Hand-Held: An outgrowth of gravitics technology, the remote densitometer uses an object's natural gravity to measure its density.

The densitometer is able to map and display areas of different relative densities, which makes them useful for detecting and mapping the extents of mineral deposits. They can also be used to detect the presence of objects in empty areas, such as spacecraft or asteroids in open space.

TL	*Vol*	*Weight*	*Price*
14	15 liters	7 kg	Cr15,000
15	3 liters	2 kg	Cr25,000

Detector, Metal: Indicates presence of most metals, although degree of reaction depends on amount of metal present and on proximity.

TL	*Vol*	*Weight*	*Price*
6	2 liters	1 kg	Cr300

Detector, Stress: The linear descendant of the polygraph, the stress detector uses readings of a suspect's physical responses, voice stress, and similar phenomena to establish the individual's degree of truthfulness under questioning. It is not, however, necessarily accurate in its readings, and the interpretation of readings is a complex matter.

TL	*Vol*	*Weight*	*Price*
14	2 liters	6 kg	Cr1500

Echo Sounder: A device which sends out a pulse of high-frequency sound and then reads returning echoes to give a range between the sounder and any obstruction. Low-cost models are usually effective to no more than 80 meters, and at ranges of over 40 meters they have little accuracy. More sophisticated models (available at tech level 7) are capable of showing a fairly detailed display of the area at which they are aimed, including animal life and other details.

Echo sounders are usually mounted aboard boats and submersibles, where they serve as depth finders. Portable models, however, can be mounted in waterproof camera housings and used by divers. They not only determine depth but also can be used to find horizontal ranges.

TL	*Vol*	*Weight*	*Price*
6	2.5 liters	1 kg	Cr300
10	0.4 liters	0.2 kg	Cr150

Sensor, NAS, Portable, and NAS Handset: Developed from tech level 12 psionic helmet theory, the neural activity sensor (NAS) was first used medically. It remotely detects the electrical activity of a life form's central nervous system and classifies it according to amount and complexity. The data system compares the activity pattern to known types of life, especially intelligent life.

The portable unit has a short range of 75 meters. It consists of a backpack and a handset with a retractable parabolic dish focuser. The handset in fact is not attached to the backpack, and it can be operated up to 100 meters distant, which further extends the range.

Description	*TL*	*Vol*	*Weight*	*Price*
NAS Backpack	15	20 liters	10 kg	Cr15,000
NAS Handset	15	0.5 liters	0.3 kg	Cr20,000

"Sniffer" Bioscanner: The bioscanner "sniffer" scans for evidence of biological, metabolic activity in the area. It is a highly advanced combination sampler/analyzer. The tech level 15 sniffer is a breakthrough in molecular analysis. The device provides both improved analysis speed and a cheaper price than sniffers of tech level 14 and less. Not only is the bioscanner useful for biological studies, but it also helps with regular chemical analysis. (A cheaper and smaller tech level 15 chemical analyzer is available, but it is not very useful for biological scanning).

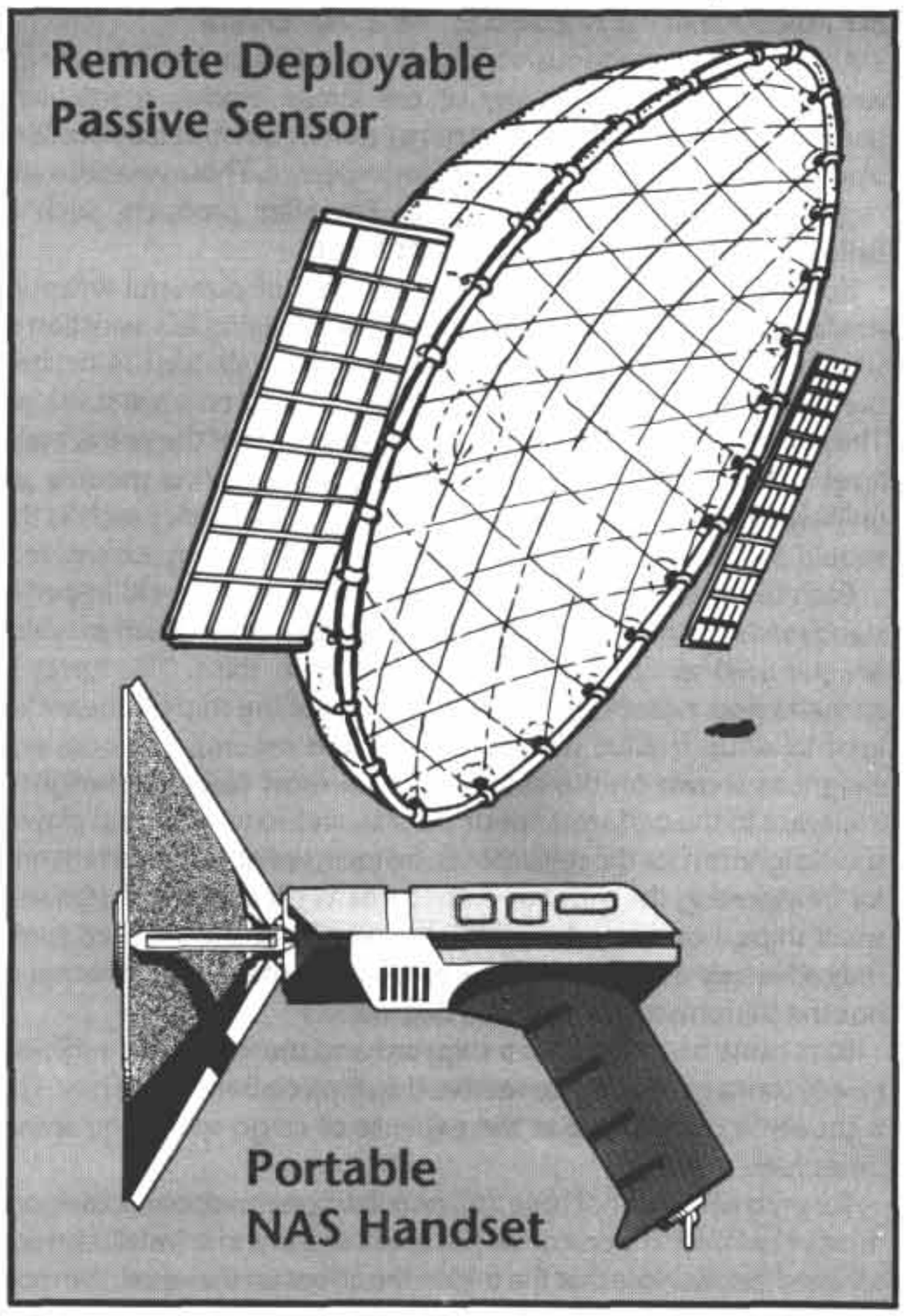
The portable tech level 15 unit listed here incorporates both analyzer and collector into one. It has two modes and corresponding equipment: one mode for mass sampling of atmospheric content and the other for minute sampling.

The evidence of biological activity must be within short range of the scanner, for anything beyond short range is undetectable. The bioscanner helps a user to recognize or categorize evidence of familiar and unfamiliar organisms, which allows ecological classification, determination of potential hazards to other life forms, and estimation of potential uses (form of food, commercially valuable).

TL	*Vol*	*Weight*	*Price*
15	8 liters	3.5 kg	Cr350,000

Radar, Field Surveillance: The field surveillance radar is designed to provide surveillance of open approach areas in conditions of limited visibility when personnel limits make regular sentry duty impractical. It has a short range of 300 meters (extreme range of 2400 meters) and comes with a tripod mount. The detection roll is made based on the Sensors skill of the operator who installed the radar, even if it is left untended and operating in a remote mode. The radar will detect moving objects with a gross volume of about 0.1 kiloliter or more. The radar must be connected to a vehicle power source or a generator of some kind with output of 0.002KW to function.

TL	*Vol*	*Weight*	*Price*
9	10.5 liters	20 kg	Cr5000



Radar Power Pack: A battery pack which provides sufficient energy to power the field surveillance radar for 100 hours.

TL	*Vol*	*Weight*	*Price*	*Power*
9	250 liters	500 kg	Cr500	0.002 MW

Remote Deployable Passive Sensor (RDPS): This is a very large passive EMS array, whose antenna size precludes deployment as part of a starship's sensor suite. Instead, the array is collapsible, with all structural supports made of hollow flexible tubing with sensor receivers attached along their length. The entire sensor folds into a comparativly compact continer. Upon release by the starship (usually through an open cargo hatch) it deploys by inflating the structural members with inert gas at low pressure.

The deployed sensor array is 400 meters in diameter and includes a laser communicator for tight-beam data transfers to the mother ship. Once launched the array drifts freely, as it has no means of propulsion. The sensor does include a closed-cycle fuel cell with fuel sufficient for 24 hours of continuous operation. Permanently deployed RPDS units are usully supplied with a solar array (illustrated) for power.

TL	*Vol*	*Wt*	*Power*	*Price*	*Short Range*
10	26/260*	260 tonnes	0.45 MW	MCr2600	8 range bands

*Volume collapsed/deployed in kiloliters.

STARSHIP ENERGY WEAPONS

Although a tremendous variety of performance levels in energy weaponry is available, many of the larger models (particularly particle accelerators and meson guns) cannot be carried by the fairly small ships shown in the basic roleplaying game. These weapons and larger vessels are covered in other **Traveller** products, such as **Brilliant Lances** and **Fire, Fusion, & Steel.**

However, even small ships have a variety of powerful weapons available to them, particularly lasers. The following is a selection of standard modular three-ton (42 kiloliter) turrets, six-ton (84 kiloliter) barbettes, and larger bays which can be installed on small starships. They are available at most functioning shipyards of the correct tech level, although this means that the higher tech level mounts are unlikely to be routinely available. Higher tech weaponry such as this should only be provided as the result of a roleplaying adventure.

Each turret and barbette is designed to fit into the old Imperial-standard turret hardpoint socket or barbette socket, both of which are still used as common design features in ships. The turret or barbette does not add to the displacement of the ship (as the socket itself takes up the full displacement of the mount), but does add weight as shown on the chart below. In most cases this weight is irrelevant to the performance of the ship and so referees and players should ignore it for those purposes. Instead, weight is important only for transporting the turret or barbette before it is installed. (On very small ships, however, the additional weight of the installed turret may adversely effect performance. It is up to the referee whether or not the performance should be degraded.)

Bays must be installed at a shipyard and there must be sufficient empty tonnage in vessel to receive the displacement of the bay. This is usually accomplished at the expense of cargo space and sometimes fuel.

For ships which do not have a turret or barbette hardpoint socket, one must be installed. The cost of the hardpoint socket and its installation cost are listed below. Note that the thicker the armor on the vessel, the more expensive it is to install the socket.

Installing the turret or barbette itself into an already installed socket costs 5% of the cost (MCr ×0.05) of the turret or barbette itself.

Turret Hardpoint Socket

Displacement: 3 displacement tons; **Mass:** None
Starport Required: Type C+ (double price at type C starport)
Price (Including Installation): MCr = (hull armor+50) ×.0001

Barbette Hardpoint Socket

Displacement: 6 displacement tons; **Mass:** None
Starport Required: Type C+ (double price at type C starport)
Price (Including Installation): MCr = (hull armor+50) ×0.0001

Bays

Bays are built in 50-ton and 100-ton versions. There are no standard sockets for bays, and they are instead custom installed. Installation price of a 50-ton bay in MCr is equal to (hull armor+50)×0.001. Installation price of a 100-ton bay in MCr is equal to (hull armor+80) ×0.001.

Weapons Listing

Each weapon includes a fire control workstation for a gunner and may either be fired from the turret/barbette workstation or patched into a master fire director (if the ship has such a device).

TL: This is the tech level of the weapon, and determines the lowest tech level world on which the weapon can routinely be purchased. Turret and barbette weapons and their beam pointers are self-contained systems and so the tech level of the ship's computer does not limit the tech level of mounted turrets. A TL-15 laser turret, for example, can be mounted in any turret hardpoint socket in any tech level ship.

Description: This indicates power of the laser's pulse (in megajoules) and the mount type: turret (3 displacement tons), barbette (6 displacement tons), or bay (either 50-ton or 100-ton displacement).

MW: This is the continuous power requirement of the mount.

If more power is provided to the weapon it increases the rate of fire. This does not allow the weapon to make more hit rolls in a turn, but rather allows it to ignore difficulty level increases the same as if it was using a master fire director. If power input is multiplied by 5, the laser may ignore one difficulty level increase. If power input is multiplied by 10, the laser may ignore two difficulty level increases.

For example, the TL10 laser turret requires 1.6 MW per turn. If 1.6 MW were allocated to the turret, it would fire normally. If 8 MW were allocated, it could ignore one difficulty level increase. If 16 MW were provided, it could ignore two difficulty level increases.

Wt: The weight of the weapon in tonnes.

Short: The first number is the short range of the weapon in starship combat range bands (tenths of a light-second). The first number following the colon is the penetration rating of the weapon and the second number (following the dash) is the damage value of the weapon.

Medium, Long, Extreme: These show the same values as above but for the weapon's medium, long and extreme range.

Socket Laser Turrets and Barbettes

TL	Description	MW	MCr	Wt	Short	Medium	Long	Extreme
9	70 Mj laser, 100-ton bay	1.9	267	1402	1:1/7-21	2:1/3-10	4:1/2-5	8:1-3
10	60-Mj laser turret	1.7	1.56	55	1:1/6-19	2:1/6-19	4:1/3-9	8:1/2-5
10	450 Mj laser, 50-ton bay	12.5	104	873	4:1/17-53	8:1/17-53	16:1/9-28	32:1/4-14
11	80-Mj laser turret	2.2	2.08	59	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10
11	150-Mj laser barbette	4.2	6.56	119	10:1/10-31	20:1/5-17	40:1/3-8	80:1-4
12	120-Mj laser turret	3.3	0.94	65	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9
13	150-Mj laser turret	4.2	0.72	68	1:1/10-31	2:1/10-31	4:1/10-31	8:1/10-31
13	106-Mj laser turret	2.9	1.45	59	10:1/8-26	20:1/6-20	40:1/3-10	80:1/2-5
14	150-Mj laser turret	4.2	0.72	63	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
14	300-Mj laser barbette	8.3	2.16	131	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
15	150-Mj laser turret	4.2	0.86	57	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

STARSHIP MISSILES

Starship missiles are launched from missile turrets or barbettes which fit into the standard hardpoint sockets. Missile turrets and barbettes are equipped with a gunner's workstation and a 300,000km range communication laser, which is used to control the missile in flight. The only difference between turrets and barbettes is the number of missiles carried.

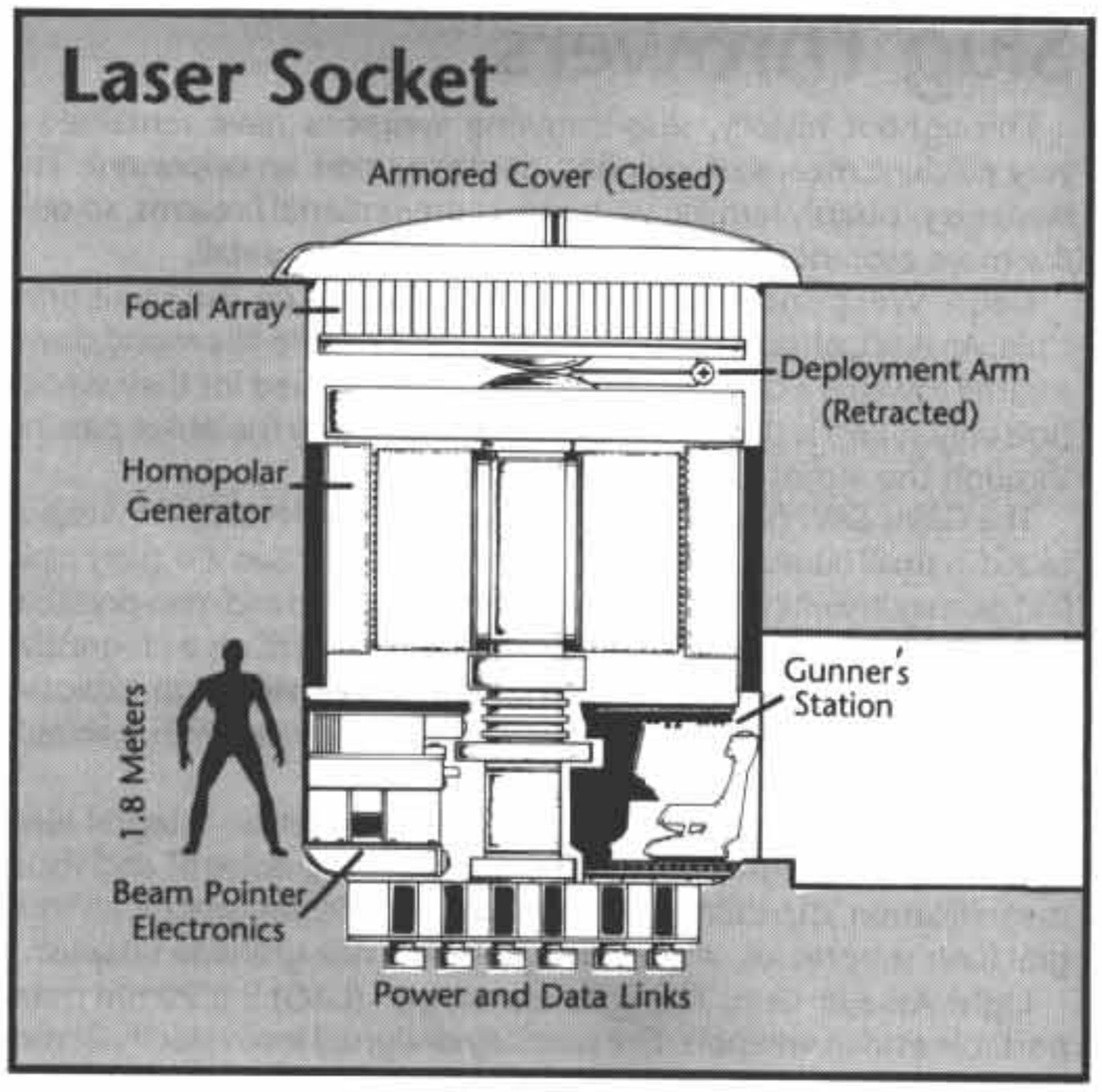
Additional missiles may be carried in cargo spaces, but an hour is required to reload a turret or barbette once its missiles are expended.

Missile Launchers

Type	TL	Missiles	Volume (kl)	Mass (tonnes)	Power (MW)	Price (MCr)
Turret	8	2	42	28.4	0.15	0.08
Barbette	8	5	84	70.4	0.15	0.11

All of the missiles listed below are all of the nuclear detonation variety. The table below gives their warhead yield for those who are interested, as well as the number of G-turns of fuel carried, and the damage value of its laser. Note that each of these missiles can, if desired, spend all of its G-turns of fuel in a single turn, or spread it out over several turns.

Each time one of these missiles hits its target, roll 1D6, the result being the number of actual laser pulses which hit. Roll hit location and damage separately for each of these hits.



Missiles

TL	Guidance	Yield	Mass	MCr	G-Turns	Hits	Damage	Range	Comm	Sensor	Signatures
8	Controlled	50	7	0.85	10/10	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
9	Controlled	50	7	0.85	12/12	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
11	Controlled	100	7	0.95	12/12	1D6	1/18-56	0	10L	—	+2/+2/+2/+2/+1
12	Semi-Ind.	500	7	2.0	8/8	1D6	1/25-79	0	10L	1P	+4/+3/+4/+3/+1
13	Controlled	200	7	1.15	12/12	1D6	1/21-66	0	10L	—	+2/+2/+2/+2/+1
14	Semi-Ind.	500	7	2.7	8/8	1D6	1/25-79	0	10L	3P	+4/+3/+4/+3/+1
15	Controlled	500	7	1.25	12/12	1D6	1/25-79	0	10L	—	+2/+2/+2/+2/+1

Yield: Warhead yield; **Mass:** In tonnes; **MCr:** Price in millions of credits; **G-Turns:** Number of G-turns of fuel carried (followed by maximum number of G-turns which can be used in a single turn; **Hits:** Die roll for number of hits from the laser; **Damage:** Damage value of each laser hit; **Range:** Absolute range in range bands (0 = same range band only); **Comm:** Type of communicator (L = laser) with short range in range bands; **Sensor:** Sensor short range (in hexes) and type (P = passive EMS); **Signatures:** Missile's signature vs. radar, active EMS, HRT, passive EMS, and fire

Nuclear Dampers

A nuclear damper unit manipulates the strong and weak forces to render nuclear warheads incapable of detonating.

Damper units are mounted in barbettes and turrets and fit into standard hardpoint sockets. Each has space for one crewmember.

TL	Description	Mass (tonnes)	Price (MCr)	Power (MW)
12	Damper Barbette	75.2	1.95	15
13	Damper Barbette	72.2	2.7	9
14	Damper Barbette	60.2	4	6
15	Damper Turret	33.2	4.5	3

Sandcasters

A sandcaster is a turret-mounted anti-laser defensive system. The turret projects an electromagnetic field and uses the field to hold in place a cloud of highly reflective crystals of silicon, called sand (although it is artificially manufactured, not the kind found on beaches). The turret contains a gunner's workstation, a series of linked laser sensors to warn the gunner (or fire director) when a ranging or targeting laser is focused on the ship, an electromagnetic field generator, and a magazine of sand canisters.

All sandcaster turrets fit in the standard turret hardpoint socket. Each turret masses 50 tonnes, requires 1MW of continuous power while in operation, and has space for one crewmember.

The table below lists the price of the turret in megacredits, the number of sand canisters carried in the turret, and the beam reduction made per successful beam interception. Additional sand canisters may be stored in cargo but it takes one hour to resupply a turret.

TL	Price (MCr)	Cannisters Carried	Beam Reduction
8	0.6	16	1D6×6
9	0.65	18	1D6×5
10	0.7	20	1D10×5
11	0.75	24	1D10×5
12	0.8	30	1D10×5
13	0.85	35	2D6×5
14	0.9	40	2D6×5
15	1	50	2D10×5

Slug Throwers

Throughout history, slug-throwing weapons have remained a very efficient means of inflicting damage upon an opponent. The reader is probably familiar with most conventional firearms, so only the more esoteric weaponry will be described in detail.

Gauss Weapons: Gauss weapons all operate on the same principle: An electromagnetic field accelerates a needle-like round down a barrel towards a target. Gauss weapons are valued for their silence (the only sound is that of the shockwave made by the bullet passing through the atmosphere), and deadliness.

The Gauss SAW (squad automatic weapon) is a fire support weapon issued in small numbers to infantry units. Ratings for two VRF (very rapid fire) gauss gun variants are included: vehicle mounted and man-portable.

Advanced Combat Rifle: The advanced combat rifle is a progressive development of the assault rifle. The ACR fires either a high-explosive round or a discarding-sabot kinetic energy penetrator with a muzzle energy of 4800 joules.

Standard equipment with most ACRs includes an integral electronic battlefield sight (with light amplification, passive IR and visual magnification capabilities), a laser rangefinder/designator, an integral flash suppressor, and an integral RAM rifle grenade adaptor.

Light Assault Gun: The light assault gun (LAG) is a 20mm man-portable assault weapon. The specially designed low-velocity 20mm round and recoil compensation mechanisms keep the recoil down, making the LAG a popular close-assault weapon.

LAGs are normally fitted with flash suppressors. Laser, electronic, and telescopic sights can be fitted at extra cost.

Tranq Rounds: Some weapons can fire tranquilizer rounds (as noted below). At TL6-8, these are hypodermic rounds containing a measured dosage of drug, and fired at low pressures for reduced velocity, minimal tissue damage, and reduced performance. At tech level 9 and above, the round consists of thin-walled plastic capsule containing a measured dosage of drug and a "carrier" compound to help the drug's absorption through the skin of the target.

Any armor is enough to prevent a tranq round from taking effect, but ordinary clothing provides no protection.

For each tranq round that strikes any part of the body of the target, the targeted character must make a successful roll versus their constitution to remain conscious, as follows:

TL of Tranq Round	*Difficulty Level*
6-8	Difficult
9-10	Formidable
11+	Impossible

Failure means the character loses consciousness for 1D6 minutes. The roll must be repeated each turn until the targeted character loses consciousness.

WEAPON DESCRIPTIONS

Slug throwers are presented below, broken down by broad classes. The weapons' physical characteristics are presented in tabular form, followed by their combat performance in tabular form.

Physical Characteristics: TL = Tech level. **Ammo** = Ammo type, given in the format: cartridge diameter (millimeters) × cartridge length (millimeters). **Empty Weight** = the weapon's weight with no ammunition, but including the weight of an empty magazine (where applicable). **Loaded Weight** = weapon's weight with a full load of ammunition. **Ammo Weight** = weight of a full load of ammunition (does not include magazine weight which is included in weapon empty weight). **Magazine** = indicates number of rounds in a full load of ammo. If there are two entries separated by a slash, left entry is number of rounds, right entry is weight of an empty magazine or ammo/battery box in kg. Letter notations indicate feed type for non-box magazine weapons (see page 273). **Weapon Price** = price of unloaded weapon in credits (includes one empty magazine). **Ammo Price** = price per round in credits/price of full load of ammo or loaded magazine if weapon uses detachable magazine. Unless specifically indicated otherwise, ammo price is for "ball" (basic solid slug) rounds; discarding sabot, HE, and tranq are ×2; HEAP is ×3. **Features** = codes for special capabilities of these weapons. See notes beneath each table.

Combat Performance: ROF = weapon's rate of fire, defined and described on pages 272-3. If a weapon has more than one rate of automatic fire, these are separated by slashes. **Dam Val** = weapon's damage value in personnel damage dice (D6). **Pen Rtg** = weapon's penetration rating at short and medium range-long range-extreme range. If only two values are given, second number is for long and extreme; if only one value given, value is for all four ranges. **Bulk** = weapon's bulk for use in resolving ties, page 265. **Magazine** = weapon's ammunition capacity and type of feed system (see page 273). **SS Recoil** = weapon's single shot recoil (page 275). **Burst Recoil** = weapon's burst recoil (page 276). If there are two or more numbers separated by slashes, these are for the different rates of fire in the ROF column. **Short Range** = weapon's short range in meters. Medium range is 2×short, long is 4×short, extreme is 8×short. If a number is given in parentheses, this is the weapon's "iron sight" short range, its basic short range used when calculating the improved performance resulting from the addition of telescopic or electronic sights.

Archaic Firearms

These weapons are typical of a variety of muzzle loading black powder firearms used on primitive worlds.

			Weight (kg)				Price (Cr)	
Caliber	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon*	*Ammo*
Musket	3	18mm P&B	5.1	5.14	.04	1*	60	0.5
Rifle-Musket	4	12mm P&B	4.1	4.14	.04	1*	100	0.5

*The weapon holds one individually loaded round. These muzzle loading weapons require two actions to reload.

						Recoil		
Weapon	*Rld*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
Musket-3	2	2	Nil	6	1i	1	—	20
Rifle-Musket-4	2	3	1-Nil	6	1i	3	—	60

Slug Rifles and Carbines

Most rifles shown are combat weapons, although the 12mm rifle is a big game rifle used for hunting and sport.

			——Weight——				Price	Price	
Caliber	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon*	*Ammo*	*Features*
7mm carbine	5	7x26mm	2.985	3.085	0.1	10/0.084	385.2	0.2/3	F, B
7mm carbine (fold stk)	5	7x26mm	2.785	2.885	0.1	10/0.084	415.2	0.2/3	F
7mm carbine (civilian)	5	7x26mm	2.555	2.605	0.05	5i	381.2	0.2/1	—
7mm rifle	5	7x57mm	5.254	5.694	0.44	20/0.317	855	0.44/9.8	F, B
7mm rifle (Civilian)	5	7x57mm	4.967	5.077	0.44	5i	796	0.44/2.2	—
9mm rifle	7	9x44mm	8.462	9.022	0.56	20/0.403	1157	0.56/16.2	F, B
12mm hunting rifle	5	12x45mm	3.35	3.555	0.205	5i	558	1.8/9	—
7mm autorifle	6	7x57mm	5.254	5.694	0.44	20/0.317	998	0.44/12.8	F, B, RG
4mm gauss rifle	12	4x20mm	4.923	4.943	0.02	40/1.483	1092	0.01/3.4	F, B, O, RG
5mm assault rifle	7	5x50mm	3.653	3.953	0.3	30/0.252	737	0.2/9	F, B, RG
7mm assault rifle	7	7x70mm	4.325	4.805	0.48	30/0.327	920	0.32/13.6	F, B, RG
7mm ACR	10	7x46mm	5.895	6.135	0.24	20/0.553	4097	0.24/107.8	E, L, F, B, RG
2cm LAG	8	20x35mm	11.4812	11.921	0.44	5/0.475	2476	1.76/13.8	F

Features: B = Bayonet lug; E = Electronic sight; F = Flash suppressor; L = Laser sight; O = Optic sights; RG = RAM rifle grenade adapter.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7mm carbine-5 ball	SA	2	1-Nil	5	10	3	—	50
7mm carbine (fold stk)-5 ball	SA	2	1-Nil	3/5	10	3	—	50
7mm carbine (Civilian)-5 ball	SA	2	1-Nil	4	5i	3	—	50
7mm rifle-5 ball	SA	4	2-Nil	7	20	3	—	60
7mm rifle (Civilian)-5 ball	SA	4	2-Nil	7	5i	3	—	60
9mm rifle-7 ball	SA	4	2-3-Nil	8	20	3	—	90
9mm rifle-7 HEAP-9*	SA	5	2-2-2	8	20	3	—	60
9mm rifle-7 tranq-8*	SA	–1**	Nil	8	20	3	—	30
12mm hunting rifle-5 ball	BA	4	2-Nil	5	5i	3	—	150
12mm hunting rifle-5 tranq-6*	BA	–1**	Nil	5	5i	3	—	30
7mm autorifle-6 ball	5	4	2-Nil	7	20	3	8	60
4mm gauss rifle-12 dart	5/10	4	1-2-Nil	5	40	2	5/9	(85) 100
4mm gauss rifle-12 tranq	5/10	–1**	Nil	5	40	2	4/8	(30) 30
5mm assault rifle-7 ball	5	3	1-Nil	7	30	2	6	50
7mm assault rifle-7 ball	5	4	2-Nil	6	30	3	6	40
7mm ACR-10 DS	5	5	1-2-3	7	20	1	2	(97) 120
7mm ACR-10 HE	5	5	Nil	7	20	1	2	(61) 80
7mm ACR-10 HEAP	5	5	2-2-2	7	20	1	2	(61) 80
7mm ACR-10 tranq	5	–1**	Nil	7	20	1	2	(30) 30
2cm LAG DS	SA	6	1-3-5	6	5	2	—	250
2cm LAG HE	SA	9	Nil	6	5	2	—	160
2cm LAG HEAP-9	SA	9	2-2-2	6	5	2	—	160
2cm LAG tranq	SA	–1**	Nil	6	5	2	—	30
2cm LAG flechette (Short)	SA	18	1	6	5	2	—	70
Medium-Long	SA(10)	2	1-Nil					

*Shows round available at a later tech level than the weapon is manufactured.
**1D6–1 points of damage plus tranq effect on page 350.

Shotguns

Originally developed as hunting weapons, shotguns are also widely used in law enforcement and have some military application as well. Their principal features are that they are large bore (for a small arm), fairly low in muzzle velocity, smooth bore (instead of rifled), and capable of firing buckshot as well as large slugs. Both versions shown carry thier ammunition in a tubular magazine under the barrel.

			Weight				Price	Price	
Caliber	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon*	*Ammo*	*Features*
18mm pump shotgun	4	18x70mm	3.846	4.217	0.371	7i	578	0.53/3.71	—
18mm auto shotgun	7	18x70mm	3.941	4.471	0.53	10i	434	0.53/5.3	—

						Recoil		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18mm pump shotgun-4 Slug	PA	4	3-Nil	6	7i	4	—	50
18mm pump SG-4 Shot (Short)	PA	9	Nil	6	7i	4	—	30
Medium	PA	1	Nil					
18mm auto shotgun-7 Slug	SA	4	3-Nil	8	10i	4	—	80
18mm auto SG-7 Shot (Short)	SA	9	Nil	8	10i	4	—	50
Medium	SA	1	Nil					
18mm auto shotgun-7 HE	SA	6	Nil	8	10i	4	—	60

Pistols

Slug pistols fall into two general categories: revolvers and automatics. Revolvers hold their bullets in a cylindrical chamber which revolves one space each time the pistol is fired. Automatics hold their rounds in box magazine usually inserted in the pistol grip.

			Weight				Price	Price	
Caliber	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon*	*Ammo*	*Features*
5mm revolver	5	5x22mm	0.658	0.679	0.021	6R	89.7	0.14/0.84	—
7mm revolver	5	7x23mm	0.783	0.832	0.049	7R	107.5	0.28/1.96	—
9mm revolver	4	9x20mm	0.816	0.876	0.06	6R	110	0.4/2.4	—
9mm revolver	5	9x20mm	0.836	0.896	0.06	6R	114	0.4/2.4	—
9mm magnum rev.	5	9x33mm	1.132	1.234	0.102	6R	158	0.68/4.08	—
10mm snub revolver	8	10x17.5mm	0.915	0.981	0.066	6R	117.8	0.44/2.64	—
10mm snub auto	8	10x17.5mm	1.044	1.198	0.154	14/0.119	160	0.44/8.16	—
5mm body pistol	8	5x27mm	0.55	0.662	0.112	28/0.077	280.8	0.48/16.44	—
7mm autopistol	6	7x30mm	0.884	1.01	0.126	14/0.097	173.6	0.36/6.04	—
9mm autopistol	6	9x20mm	0.908	1.018	0.11	11/0.09	169.6	0.4/5.4	—
4mm gauss pistol	13	4x20mm	0.768	0.785	0.0175	35/0.207	248.5	0.01/1.35	—

						Recoil		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5mm revolver-5 ball	DAR	-1	Nil	1	9R	3	—	8
7mm revolver-5 ball	DAR	1	Nil	1	7R	3	—	10
9mm revolver-4 ball	SAR	1	Nil	1	6R	4	—	10
9mm revolver-5 ball	DAR	1	Nil	1	6R	4	—	11
9mm magnum revolver-5 ball	DAR	2	1-Nil	1	6R	3	—	13
10mm snub revolver-8 HE	DAR	3	Nil	1	6R	3	—	3
10mm snub revolver-8 HEAP-9*	DAR	3	2-2-2	1	6R	3	—	3
10mm snub revolver-8 tranq	DAR	-1**	Nil	1	6R	3	—	4
10mm snub auto-8 HE	SA	3	Nil	1	14	3	—	4
10mm snub auto-8 HEAP-9*	SA	3	2-2-2	1	14	3	—	4
10mm snub auto-8 tranq	SA	-1**	Nil	1	14	2	—	4
5mm body pistol-8 DS	SA	1	Nil	0	28	3	—	5
7mm autopistol-6 ball	SA	1	Nil	1	14	3	—	11
9mm autopistol-6 ball	SA	2	Nil	1	11	3	—	13
4mm gauss pistol-13 dart	5	2	Nil	1	35	2	6	12
4mm gauss pistol-13 HEAP	5	3	2-2-2	1	35	2	6	9
4mm gauss pistol-13 tranq	5	-1**	Nil	1	35	2	4	7

*Shows round available at a later tech level (9) than weapon is originally manufactured.
**1D6-1 points of damage plus tranq effect on page 350.

Submachinegun

Submachineguns are short, lightweight, fully automatic weapons usually firing low-powered pistol cartridges. They have tremendous firepower but restricted range and penetration. The example below is representative of the class.

			Weight				Price	Price	
Caliber	TL	Ammo	Empty	Loaded	Ammo	Magazine	Weapon	Ammo	Features
9mm SMG	5	9x24mm-5	2.403	2.763	0.36	30/0.245	400	0.24/8.2	—
9mm (fold stk) SMG	6	9x24mm-5	2.203	2.563	0.36	30/0.245	430	0.24/8.2	—

						Recoil		
Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	SS	Burst	Short Range
9mm SMG-5 ball	5	2	1-Nil	3	30	1	3	40
9mm (fold stk) SMG-6 ball	5	2	1-Nil	2/3	30	1	3	40

Autoguns

Autoguns include a variety of heavier weapons used almost exclusively in the automatic fire mode. These include light, medium, and heavy machineguns, rotary (or Gatling) guns, and very rapid fire (VRF) gauss guns. At lower tech levels these are belt-fed weapons, but higher rate of fire weapons at the higher tech levels substitute linkless-feed hopper cassettes. The tripod column shows the weight of the weapon's tripod to the left of the slash, and its price in credits to the right.

			Weight				Price	Price		
Caliber	TL	Ammo	Empty	Loaded	Ammo	Magazine	Weapon	Ammo	Features	Tripod
7mm MMG	5	7x57mm	9.953	12.153	2.2	100B	2223	0.44/44	F	4 kg/Cr140
7mm LMG	6	7x57mm	10.074	12.274	2.2	100B	2248	0.44/44	F	—
5mm LMG	7	5x50mm	6.676	7.676	1	100B	1594	0.2/20	F	—
13mm HMG	6	13x75mm	30.8	40.8	10	100B	6458	2/200	F	11 kg/Cr210
5mm rotary	7	5x50mm	20.187	45.187	25	2500C/2	6472	0.2/600	—	31 kg/Cr410
7mm rotary	7	7x57mm	32.686	87.686	55	2500C/2	7827	0.44/1320	—	54 kg/Cr640
5mm rotary	8	5x50mm	23.427	73.427	50	5000C/2	7730	0.2/1100	—	30 kg/Cr400
7mm rotary	8	7x64mm	40.602	103.102	62.5	2500C/2	12961	0.5/1470	—	78 kg/Cr880
4mm gauss SAW	12	4x20mm	12.599	12.649	0.05	100/6.219	1252	0.01/14	O	—
VRF gauss gun (veh)	10	4x20mm	26.68	41.68	15	30000C/2	4213	0.01/320	—	—
VRF gauss gun (mp)	10	4x20mm	162.68	162.43	0.25	500C/137	5103	0.01/915	—	39 kg/Cr490

						Recoil		
Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	SS	Burst	Short Range
7mm MMG-5 ball	10	4	2-Nil	8	100B	3	13	70
Bipod	10	4	2-Nil	8	100B	2	7	100
Tripod	10	4	2-Nil	8	100B	1	3	150
7mm LMG-6 ball	5	4	2-Nil	8	100B	2	4	80
Bipod	5	4	2-Nil	8	100B	1	2	100
5mm LMG-7ball	5	3	1-Nil	7	100B	2	5	50
Bipod	5	3	1-Nil	7	100B	1	3	70
13mm HMG-6 ball	5	7	2-3-4	9	100B	4	11	80
Tripod	5	7	2-3-4	9	100B	1	3	160
5mm rotary-7 ball	5/50	3	1-Nil	6	2500C	3	3/31	60
Tripod	5/50	3	1-Nil	6	2500C	3	1/8	120
7mm rotary-7 ball	50	4	2-3-Nil	7	2500C	2	54	110
Tripod	50	4	2-3-Nil	7	2500C	1	14	230
5mm rotary-8 ball	5/50	3	1-Nil	7	5000C	3	3/30	80
Tripod	5/50	3	1-Nil	7	5000C	3	1/8	150
7mm rotary-8 ball	50	5	2-3-Nil	10	2500C	3	78	130
Tripod	50	5	2-3-Nil	10	2500C	1	22	270
4mm gauss SAW-12 dart	5/10	5	1-3-Nil	6	100	2	4/8	130 (110)
Bipod	5/10	5	1-3-Nil	6	100	1	2/4	170 (140)
4mm gauss SAW-12 HEAP	5/10	6	2-2-2	6	100	2	4/8	100 (90)
Bipod	5/10	6	2-2-2	6	100	1	2/4	130 (120)
VRF gauss gun (veh)-10 dart	50	6	1-3-5	8	30000C	†	†	300
VRF gauss gun (veh)-10 HEAP	50	7	2-2-2	8	30000C	†	†	230
VRF gauss gun (mp)-10 dart	50	6	1-3-5	8	500C	1	19	150
Tripod	50	6	1-3-5	8	500C	1	5	300
VRF gauss gun (mp)-10 HEAP	50	7	2-2-2	8	500C	1	19	110
Tripod	50	7	2-2-2	8	500C	1	5	230

Note: All autoguns fired from vehicle mounts have negligible recoil (noted as †) and use the short range listed for use with tripods.
Features: F = Flash suppressor; O = Optic sights.

LASERS

Lasers damage their targets with concentrated pulses of focused light. Laser pistols are small, readily portable weapons; carbines are larger, more powerful versions with shoulder stocks; and rifles are the largest.

Lasers are of two types: DEI (direct electrical input) lasers which draw their energy directly from an electrical power pack, and CLC (chemical laser cartridge) lasers which use the chemical energy stored in a cartridge (similar to that of a slug-firing small arm) to power their laser pulses.

Laser Sights: All of the lasers below incorporate an integral laser sight (see pages 275 and 344). For the DEI lasers, this laser sight is a very low power level of the laser itself, while the CLC lasers incorporate a dedicated battery powered laser sight. Slight pressure on the trigger activates the laser sight which projects a visible dot on the target, and full trigger pressure fires the laser.

Optic Sights: All the lasers below incorporate optic sights. However, no iron sight range is given for these weapons, as telescopic sights or electronic sights (pages 275 and 344) cannot further increase the short ranges already listed. Electronic sights may be fitted (to rifles and carbines) in order to gain their night-firing capabilities, but the listed short range is not changed.

Recharge Times: Power Packs for DEI lasers can be recharged in ten minutes (120 turns) from a high-energy power source such as a starship power grid. CLC lasers are not recharged, they use ammunition like slug-firing firearms.

The tables below display the following information.

Physical Characteristics: Pulse = the laser's "typical" pulse energy, used by its first line on the combat performance table. **TL** = the laser's tech level. **Ammo** = describes the laser's energy source, either DEI or the CLC cartridge diameter and length in millimeters. **Weapon Weight** = for DEI lasers, this is weight of the weapon without its power pack. For CLC lasers, this is weapon's empty weight, without magazine or ammunition. **Loaded Weight** = for DEI lasers, this is weight of the power pack *only*. For CLC lasers, this is the weight of the weapon with a magazine and full load of ammunition. **Magazine** = For DEI lasers, this is number of shots available in the power pack for the laser's "typical" pulse energy (that used on its first line of the combat performance table). For CLC lasers, this shows number of cartridges in a loaded magazine. **Weapon Price** = price of the laser itself, without power pack, ammunition, or magazine. **Ammo Price** = for DEI lasers, price of a power pack, for CLC lasers, price of a single cartridge/price of a fully-loaded magazine. **Features** = special capabilities as noted beneath the table.

Combat Performance: ROF = laser's rate of fire, see pages 272-3. Lasers with multiple ROFs have a separate line for each. **Dam Dice (S-M-L-E)** = the laser's personnel damage dice at short-medium-long-extreme ranges. These are damage *dice*, not damage value (see page 297). **Dam Dice (W-X-Y-Z)** = damage dice ratings for use in non-standard atmospheres—see facing page. **Pen Rtg** = the laser's penetration rating, usually nil. **Bulk** = the laser's bulk, for resolving ties, page 265. **Magazine** = for DEI lasers, shows number of shots or bursts for that rate of fire contained in the power pack. Some ROFs use up the power pack's energy at different rates. For CLC lasers, the number of cartridges in a loaded magazine. **Short Range** = laser's short range in meters.

Lasers

				Weight			Price		
Type	*Pulse*	*TL*	*Ammo*	*Weapon*	*Loaded*	*Magazine*	*Weapon*	*Ammo*	*Features*
10 cm DEI Carbine	0.01	8	DEI	4.33	19.5 PP	50 PP	2310	215 PP	H, L, O, R
5 cm DEI Pistol	0.01	9	DEI	1.67	19.6 PP	50 PP	1250	320 PP	H, L, O, R
8 cm DEI Rifle	0.02	9	DEI	4.21	44.3 PP	100 PP	2855	656 PP	H, L, O, R, RG
2 cm CLC Pistol	0.01	13	10x30 CLC	2.64	3.26	14	2535	1.5/24	H, L, O, R
3 cm CLC Carbine	0.02	13	13x39 CLC	4.78	5.7	10	4650	3/34	H, L, O, R, RG
4 cm CLC Rifle	0.04	13	16x48 CLC	8.87	10.71	10	8800	6/68	H, L, O, R, RG
6 cm CLC SSL	0.06	14	27x80 CLC	59.39	132.5*	100	57,835	27/2981	H, L, O, R

*Weapon is fired from a tripod with mass: 66.25 kg and price: Cr763 not included in figures above.

Features: H = weapon is capable of firing a high-capacity pulse, i.e., fewer high-powered shots in a combat turn rather than the several less powerful shots permitted by the weapon's ROF; L = Laser sight; O = Optic sights; R = ruggedized to grenade standards; RG = RAM rifle grenade adapter

Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
10 cm DEI Carbine-8	SA1	5-3-1-1	0-0-0-0	Nil	4	50 PP	200
	1x3	3-1-1-0	0-0-0-0	Nil	4	50 PP*	200
	1x10	2-1-0-0	0-0-0-0	Nil	4	50 PP*	200
5 cm DEI Pistol-9	SA2	5-3-1-1	0-0-0-0	Nil	2	50 PP	90
	SA1	7-4-2-1	1-0-0-0	Nil	2	25 PP**	90
	2x3	3-2-1-0	0-0-0-0	Nil	2	50 PP***	90
	2x10	2-1-0-0	0-0-0-0	Nil	2	50 PP***	90
8 cm DEI Rifle-9	SA2	7-4-2-1	0-0-0-0	Nil	4	100 PP	160
	SA1	10-5-3-1	1-0-0-0	Nil	4	50 PP**	160
	2x3	4-2-1-1	0-0-0-0	Nil	4	100 PP***	160
	2x10	2-1-1-0	0-0-0-0	Nil	4	100 PP***	160
2 cm CLC Pistol-13	SA3	5-5-3-1	1-0-0-0	Nil	2	14†	90
	3x3	3-3-2-1	0-0-0-0	Nil	2	14†	90
	3x10	2-2-1-0	0-0-0-0	Nil	2	14†	90
3 cm CLC Carbine-13	SA3	7-5-3-1	1-0-0-0	Nil	4	10†	300
	3x3	4-3-2-1	0-0-0-0	Nil	4	10†	300
	3x10	2-2-1-0	0-0-0-0	Nil	4	10†	300
4 cm CLC Rifle-13	SA3	10-10-7-3	2-1-0-0	Nil	5	10†	300
	3x3	6-6-4-2	1-1-0-0	Nil	5	10†	300
	3x10	3-3-2-1	1-0-0-0	Nil	5	10†	300
6 cm CLC SSL-13	SA5	21-21-21-16	8-4-2-1	Nil	8	100†	300
	5x3	12-12-12-9	5-2-1-1	Nil	8	100†	300
	5x5	10-10-10-7	4-2-1-1	Nil	8	100†	300
	5x10	7-7-7-5	3-1-1-0	Nil	8	100†	300
	5x50	3-3-3-2	1-1-0-0	Nil	8	100†	300

Parenthetical figure in range column is the iron sight short range.
ROF column shows number of bursts "N" per combat turn and number of shots "S" in each burst in the format "NxS."
*Each *burst* consumes ammunition energy equivalent to one shot at the SA1 rate.
**Each shot at the high-powered rate (SA1) counts as two shots at the low-powered rate (SA2).
***Each *burst* consumes ammunition energy equivalent to one shot at the SA2 rate.
†One CLC cartridge is used per SA shot or per burst, not one cartridge per shot in the burst.

Laser Atmospheric Adjustments

Lasers have widely differing performance in different atmosphere types. The combat performance chart on the facing page shows performance in a standard atmosphere (codes 6, 7). For performance in other atmosphere types, use the following procedure. Use the listed short range from the SR column to resolve hits, and then find damage at that range by consulting the column for the correct atmosphere type, Vacuum (code 0), Trace (code 1), Very Thin (codes 2 and 3), Thin (codes 4 and 5), Dense (codes 8 and 9), and Exotic (codes A-C). All of these columns provide four entries, for short-medium-long-extreme ranges (for atmosphere codes D-F, use the other atmospheres listed here, depending upon altitude). The entry will usually be a letter code, showing which damage entry on the facing page to use. For example, in a trace atmosphere, a TL-8 10 cm carbine which scores a hit at extreme range will do the damage listed for its *medium* range on the facing page. The entries W-Z are listed in a separate column on the facing page, and are used for heavy atmospheres. If the entry reads "0," the laser does no damage at that range.

Note that some of the weapons listed on the facing page have their performance optimized for standard atmospheres, and use a lower short range in order to maximize their damage performance. The column on this page for standard atmospheres will allow players to use the maximum theoretical short range for these weapons in a standard atmosphere, but with a penalty in damage performance.

For dense and exotic atmospheres, there is an additional parenthetical listing. This shows the weapon's short range in meters in this atmosphere to achieve the same S-M-L-E damage performance it would have in a standard atmosphere as listed on the facing page. This allows players to use their weapons at shortened ranges in thick atmospheres. If the entry reads "NA," there is no shorter range that may be used to regain damage performance.

Weapon	*SR*	*Vacuum*	*Trace*	*Very Thin*	*Thin*	*Standard*	*Dense*	*Exotic*
10 cm DEI Carbine-8	290	S-S-S-M	S-S-S-M	S-S-M-L	S-M-L-E	M-L-E-0	L-E-0-0 (100)	0-0-0-0 (20)
5 cm DEI Pistol-9	90	S-S-S-S	S-S-S-S	S-S-S-M	S-S-M-M	S-M-L-E	M-L-E-W (50)	W-0-0-0 (10)
8 cm DEI Rifle-9	300	S-S-S-S	S-S-S-S	S-S-M-L	S-M-L-E	M-L-E-W	L-E-W-0 (80)	0-0-0-0 (16)
2 cm CLC Pistol-13	90	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-M	S-M-L-E	S-L-E-W (100)	W-0-0-0 (20)
3 cm CLC Carbine-13	300	S-S-S-S	S-S-S-S	S-S-S-M	S-S-M-L	S-M-L-E	M-L-E-W (230)	W-0-0-0 (45)
4 cm CLC Rifle-13	300	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-M	S-M-L-E	S-L-E-W (NA)	W-X-0-0 (80)
6 cm CLC SSL-13	300	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-S	S-M-L-E	S-S-E-W (NA)	W-X-Y-Z (180)

Heavy Weapons

Assault Rocket Launcher: The assault rocket launcher (ARL) is a shoulder-fired infantry support weapon that fires a variety of 6 cm direct fire rockets. As the ARL is merely a rocket launching tube with a box magazine-fed autoloader on top of it, it generates no recoil. However, the backblast from the rocket motor generates a quite visible signature, and makes it impractical for firing from enclosed structures.

The weapon comes with simple optical sights, and the range listed is its maximum acheivable range, as free-flight unguided rockets are only so accurate. Laser or electronic sights (to enable night vision) can be fitted at additional cost.

			Weight				*Price*	
Weapon	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon*	*Ammo*
6 cm ARL	10	6 cm rocket	6	18.32	1.2/12.32	4	Cr210	Varies

The table below shows the combat values for the types of rockets that may be fired by the 6 cm ARL-10. *Con-Brst* is the warhead's concussion and burst values, *Pen Val* is the warhead's penetration value, *Dngr Spc* is the width × length of the flechette primary danger space in meters, *Dam Val* is the damage value of flechettes in the primary/secondary danger space, and *Pen Rtg* is the penetration rating of flechettes in the primary/secondary danger space.

Weapon	*ROF*	*Con-Brst*	*Pen Val*	*Dngr Spc*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*	*Ammo Price*
6 cm HE	1*	9-35	2C	—	—	—	12	4	200	Cr12.4
6 cm HEAP	1*	6-25	65C	—	—	—	12	4	200	Cr18.4
6 cm WP	1*	2-15	Nil	—	**	—	12	4	200	Cr24.4
6 cm Flechette	1*	—	Nil	10x50	2D6/1D6	1/Nil	12	4	200	Cr60.4

*One shot per combat turn, not per fire action. **See burns, page 286.

Plasma Bazooka: Earliest and least sophisticated of the plasma weapons, the plasma bazooka is designed to give light ground troops an antiarmor capability vs. advanced AFVs, albeit at closer range than many would consider healthy.

Unlike the more sophisticated plasma rifles which separate their firing units from their support hardware, the plasma bazooka comes in one piece, and is fired from the shoulder. It fires an individually loaded chemical plasma cartridge (CPC). The cartridge contains the ignition chamber for the plasma stream and a disposable chemical laser ignition system. The cartridge also vents a significant amount of its energy out of the rear of the bazooka, effectively negating all recoil. However, this creates considerable backblast, and the weapon may not be fired from inside an enclosure (such as a building or bunker).

The plasma bazooka takes two combat turns to reload (one turn is spent on the cooling cycle, the second is spent loading the new CPC).

Weapon	*TL*	*Pulse*	*Ammo*	*Empty Wt.*	*Loaded Wt.*	*Round Wt.*	*Weapon Price*	*Round Price*
9 cm Plasma Bazooka	10	2	90x320 CPC	27	43.2	16.2	Cr67,500	Cr400

Weapon	*Rld*	*Dam Val*	*Pen Rating*	*Pen Value*	*Bulk*	*Magazine*	*Recoil*	*Short Range*
Plasma Bazooka 10	2	16	1-2-10	16-16-8-2	5	1i	—	60

PLASMA RIFLES AND FUSION RIFLES

Plasma weapons use a chemical laser to heat hydrogen to a plasma state, containing it in a magnetic bottle until it reaches maximum energy, then opening an aperture in the bottle, releasing the plasma in a high-temperature, high-velocity jet (in excess of 8600 meters per second). Fusion weapons contain the plasma until it reaches a higher energy state, and actually begins to undergo nuclear fusion.

Plasma and fusion weapons each consist of a weapon, a backpack, and tube (containing the power cable and cooling/purge line) connecting the two. Plasma and fusion weapons make use of plasma or fusion cartridges as their ammunition. Each high-temperature ceramic cartridge is laser ignited and serves as the liner for the magnetic bottle that contains the plasma generated inside it. Part of the energy of the explosively expanding plasma is bled off to pump a homopolar generator which in turn powers a "pilot" laser. The pilot laser vaporizes a tunnel through the atmosphere through which the plasma pulse is discharged. (Without the pilot laser the plasma bolt dissipates far too quickly.)

Recoil energy activates a purge cycle, during which liquid nitrogen is bled into the cartridge to cool it before a new one is fed into the chamber from the magazine, kicking what's left of the spent one out of the weapon (some of the mass of the cartridge becomes a part of the plasma jet). After the purge/eject cycle, the action locks closed, and the weapon is ready to fire again. The spent cartridge case is still hot enough to inflict burns on unprotected skin, although the purge cycle cools it enough so that it is no longer a fire hazard.

The backpack contains the cooling system and the power pack for the magnetic bottle, and the homopolar generator for the pilot laser. The cartridges are loaded into the weapon in detachable box magazines.

The heat of the ejected cartridges and the incidental heat from the plasma stream require users to wear protective clothing of some sort. The flame-retardant properties of most standard military uniforms provide adequate protection.

The plasma rifles that appear at tech levels 12 and 13 are intended for powered troops (i.e., those equipped with battle dress), due to the high recoil of the weapons, not to mention their great weight. In place of a conventional stock, these weapons are built with a combination data socket and recoil cylinder which fits into the distinctive two-prong sockets present on the left and right breast of most battle dress. When the weapon is fitted, a targeting prompt is displayed on the firer's faceplate.

Recoil compensators (gyroscopic at TL 10, replaced by more effective inertial compensators at TL 14+) may be fitted to these weapons, allowing their use by troops not operating in battle dress. The recoil compensator is actually in the backpack, which is connected to the weapon by an articulated arm which allows the weapon to be traversed freely, but which inertially locks when the weapon fires, transmitting the recoil to the backpack where the compensator reduces its force.

Plasma Splatter: When plasma from plasma or fusion weapons strikes a target, some of the shot splatters, scattering fragments of white-hot plasma in all directions. Plasma/fusion splatter has a primary burst radius of five meters. All characters within the primary and secondary burst radii are subject to hits by fragments of plasma, including the target. Plasma fragments are the equivalent of white phosphorus fragments for damage purposes (see page 286).

Plasma and fusion weapons which strike armor produce blunt trauma for those damage points absorbed, the same as slug throwers.

The table below shows the important physical information for an assortment of plasma and fusion rifles. The weapon is identified by the diameter of the pulse plasma cartridge (PPC) or pulse fusion cartridge (PFC) used in the rifle. Each PPC or PFC has a length three times its diameter. Empty weight is the weapon alone without ammunition or magazine, while loaded weight adds the weight of a full magazine. BP weight is the weight of the weapon's backpack, which is not included in the previous figures. Magazine shows the number of rounds in each fully loaded box magazine. Price is in credits for an empty weapon, and for a single round of ammunition/fully loaded magazine.

Dam Val is the weapon's damage value and its number of personnel damage dice. The *Dam Val* and *Pen* (penetration) *Rating* (short/medium-long-extreme) columns are used for firing against personnel. The *Pen* (penetration)*Value* column (short-medium-long-extreme) is used for firing at vehicles.

High-Energy Weapons

				Weight				Price (Cr)	
Weapon	*TL*	*Pulse*	*Ammo*	*Empty*	*Loaded*	*BP*	*Magazine*	*Weapon*	*Ammo*
4.3cm plasma rifle	12	0.6	4.3 PPC	2.4	17.4	4.8	5	18,000	15/153
4.7cm plasma rifle	13	0.8	4.7 PPC	3.2	35.53	4.8	10	20,000	20/361
4.1cm plasma rifle/comp	14	0.8	4.1 PPC	3.2	14.5	6.4	4	40,000	6.4/87
4.7cm fusion rifle	14	1.2	4.7 PPC	4.8	40.1	4.8	10	72,000	9.6/257
4.7cm fusion rifle/comp	14	1.2	4.7 PPC	4.8	21.7	9.6	4	156,000	9.6/131
5.1cm fusion rifle/comp	15	1.5	5.1 PPC	3	24	6	4	97,500	12/163

The notation "comp" indicates that the weapon is fitted with a recoil compensator in the backpack.

							Recoil		
Weapon	*ROF*	*Dam Val*	*Pen Rating*	*Pen Value*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
4.3 plasma 12	SA1	9	1-2-10	9-9-5-1	5	5	11	—	20
4.7 plasma 13	SA1	10	1-2-10	10-10-5-1	5	10	8	—	20
4.1 plasma 14c	SA1	10	1-2-10	10-10-5-1	4	4	7	—	20
4.7 fusion 14	SA1	13	1/2-1-4	26-26-13-3	6	10	8	—	60
4.7 fusion 14c	SA1	13	1/2-1-4	26-26-13-3	6	4	6	—	60
5.1 fusion 15c	SA1	14	1/2-1-4	28-28-14-4	3	4	5	—	80

The notation "c" indicates a weapon fitted with a recoil compensator.

4 cm TL-8 Low Velocity Grenade Launcher

This is a folding stock shoulder-fired weapon which can fire a wide variety of indirect fire and direct fire warheads. Versions of it can also be fitted beneath the barrels of rifles and serve as attached grenade launchers.

Weapon	*TL*	*Ammo*	*Empty*	*Loaded*	*Ammo*	*Magazine*	*Weapon Price*	*Ammo Price*
4 cm Low Vel GL	8	4cm LVGL	2.1	2.34	0.24	1i	Cr450	Varies

In the table below, *ROF* is rate of fire, *Round* is type of round, *SR* is (direct fire) short range in meters, and *IFR* is maximum indirect fire range (meters). *Dam* is listed as concussion (C) and burst radius (B) in meters, or as simple damage dice for flechettes. *Pen Val* and *Pen Rtg* are penetration value and penetration rating. *Bulk* is given with the stock folded/extended.

										—*Recoil*—	
Weapon	*ROF*	*Round*	*SR*	*IFR*	*Dam*	*Pen Val*	*Pen Rtg*	*Bulk*	*Mag*	*SS*	*Burst*
4 cm LVGL-8	SS	HE	100	400	C: 3, B: 15	Nil	—	3/4	1i	2	—
	SS	HEAP	100	400	C: 2, B: 5	33C	—	3/4	1i	2	—
	SS	WP	100	400	C: 2, B: 5	Nil	—	3/4	1i	2	—
	SS	Flech (S)	13	—	5	Nil	Nil	3/4	1i	2	—
	SS (10)	Flech (M-L)	13	—	–1	Nil	Nil	3/4	1i	2	—

The two lines for the flechette round show its performance at short range and at medium and long ranges. Ammo Price: HE, Cr2.4; HEAP, Cr3.6; WP, Cr4.8; Flechette (shotgun), Cr2.4.

4 cm RAM Rifle Grenades

The 4 cm RAM (rocket-assisted multipurpose) rifle grenade may be fitted to and fired from the barrel of any small arm fitted with the proper rifle grenade adapter (usually indicated by the note "RG" in the *Features* column). These provide an inexpensive means to distribute moderate heavy weapons or indirect fire capabilities throughout small units.

The RAM rifle grenade is launched simply by firing the weapon to which it is fitted (after pulling a safety pin from the grenade). A small launching charge kicks the grenade a few meters away from the weapon, at which time the main propelling rocket ignites, carrying the grenade downrange to its target. RAM rifle grenades are designed so that the launching charge may be ignited by laser energy, electromagnetic energy (in gauss weapons), or by the hot gases produced by a slug-firing weapon, and so may be used on any type of small arm.

RAM rifle grenades are manufactured with numerous warhead types, a small sample of which are shown here. RAM rifle grenades are fired using the Grenade Launcher skill.

Type	*TL*	*SR*	*IFR*	*Conc-Brst*	*Pen Val*	*Dngr Spc*	*Dam Val*	*Pen Rtg*	*Mass*	*Price*
4 cm RAM HE	8	30	500	C: 3, B: 15	Nil	—	—	—	0.48 kg	Cr48
4 cm RAM HEAP	8	30	500	C: 2, B: 5	33C	—	—	—	0.48 kg	Cr72
4 cm RAM Flech	8	30	500	—	Nil	2 x 6	2D6/1D6	1-Nil	0.48 kg	Cr240
4 cm RAM HE	9	40	550	C: 3, B: 15	Nil	—	—	—	0.48 kg	Cr48
4 cm RAM HEAP	9	40	550	C: 2, B: 5	41C	—	—	—	0.48 kg	Cr72
4 cm RAM Flech	9	40	550	—	Nil	2 x 8	2D6/1D6	1-Nil	0.48 kg	Cr240

Flechette penetration value is for the entire round, should it hit an armored surface. To use flechettes, see the Bursting Flechettes rule, page 280.

Tac Missiles

The assortment of missiles shown below is a representative sample of weapons from different tech levels. The laser designated missiles may be designated by any laser. The columns show tech level of the missile, the guidance system used, the missile weight (in kilograms), the launcher weight (in kilograms), the missile price (in credits) the launcher price (in credits), the concussion and burst radius of the explosive warhead, the penetration value of the warhead, the range of the missile in meters (maximum range for command-guided and designated missiles, short range for homing missiles), the movement of the missile in meters per five-second combat turn, and the agility rating of the missile.

All missiles and launchers have a volume of one liter per kilogram.

TL	*Guidance*	*MWt*	*LWt*	*MP*	*LP*	*C-B*	*Pen Val*	*Range*	*M/turn*	*AGL*
7	Laser Cmnd	11.2	110	249	7128	6-25	57C	7575	975	4
7	Homing	7.6	4.3	1018	538	4-25	1C	10,735	2500	5
9	Laser Desig.	13.8	126	614	13572	11-35	101C	12,470	1250	4
9	Homing	14.2	7.6	1536	571	7-25	2C	10,560	3900	6
11	Laser Desig.	19.4	167	646	16,036	17-45	113C	15,030	1950	6
11	Homing	14.2	7.6	1536	571	9-35	2C	15,835	3900	7
13	Laser Desig.	21	176	670	16,740	20-45	125C	13,530	1950	6
13	Homing	16.4	8.7	1539	582	4-25	53C	8900	7785	8

Hand Grenades

Mass: 0.35 kg; **Price:** HE/Frag: Cr3.5

Type	*Rng*	*Dam*	*Pen*
HE/Frag TLs 6-7	*	C: 3, B: 15	Nil
Concussion TLs 6-7	*	C: 5, B: —	Nil
HE/Frag, TLs 8-9	*	C: 4, B: 15	Nil
Concussion TLs 8-9	*	C: 6, B: —	Nil

* See Thrown Weapons (page 282) for range and deviation.

Personal Armor

The following items of armor and personal protection are generally available. The weight of personal armor is kept track of as part of the character's load (see page 35; normal clothing is assumed to have negligible weight), with the exception of battle dress, which is treated as having no weight as its powered operation allows for its own mass. Only one form of personal armor may be worn per body part.

Parenthetical Armor Values: Personal armor which has a parenthetical armor value affects only melee attacks (both armed and unarmed); it has no effect on fire combat. Armor with both a non-parenthetical and a parenthetical armor value use the non-parenthetical value vs. fire combat and the parenthetical value vs. melee combat only.

Armor Value Zero: Armor with a 0 value prevents penetration by weapons with a penetration of Nil, but has no effect on weapons with a higher penetration. These types of armor will have a second parenthetical value showing their effect on melee attacks.

Armor vs. Lasers: Armor that is not made of solid metal or ceramic plates is treated as no armor when hit by lasers. The "AV vs. Lasers" column displays the information for convenient reference. The notation "—" indicates no armor value vs. lasers.

Agility and Initiative: Some armor reduces the Agility of the wearer and, in extreme cases, the wearer's Initiative. These reductions are noted in the AGL and INIT columns.

Helmets: In its original usage, a helm provided full coverage of the head while a helmet (little helm) covered only part of the head, leaving the face exposed. The modern usage of the term helmet, however, applies to all protective head coverings. Those helmets which cover the entire head have the notation H in the hit location column, while those which cover only half have the notation (H).

Split Values: Some examples of combat armor have two armor values separated by a slash. The higher value is for the chest and head; all other areas are protected by the lower value.

Leather: A natural or synthetic leather or heavily padded and quilted fabric vest covering the chest and abdomen. Leather armor is effective only versus melee attacks, not fire combat.

Jack: As above, but also covering the arms.

Mail Vest: A jacket made of natural or synthetic leather and either covered or lined with a flexible metal mesh, made either of linked rings or individual scales riveted or sewn in place. Mail is effective only versus melee attacks, not fire combat. A mail vest covers only the chest and abdomen.

Half Mail: As described above, but half mail is only the upper half of a mail vest, protecting only the chest.

Full Mail: As described above, but full mail covers all of the body except for the head.

Flak Jacket: A cloth vest covering the chest and abdomen in which solid sheets of ceramic or metallic armor are inserted.

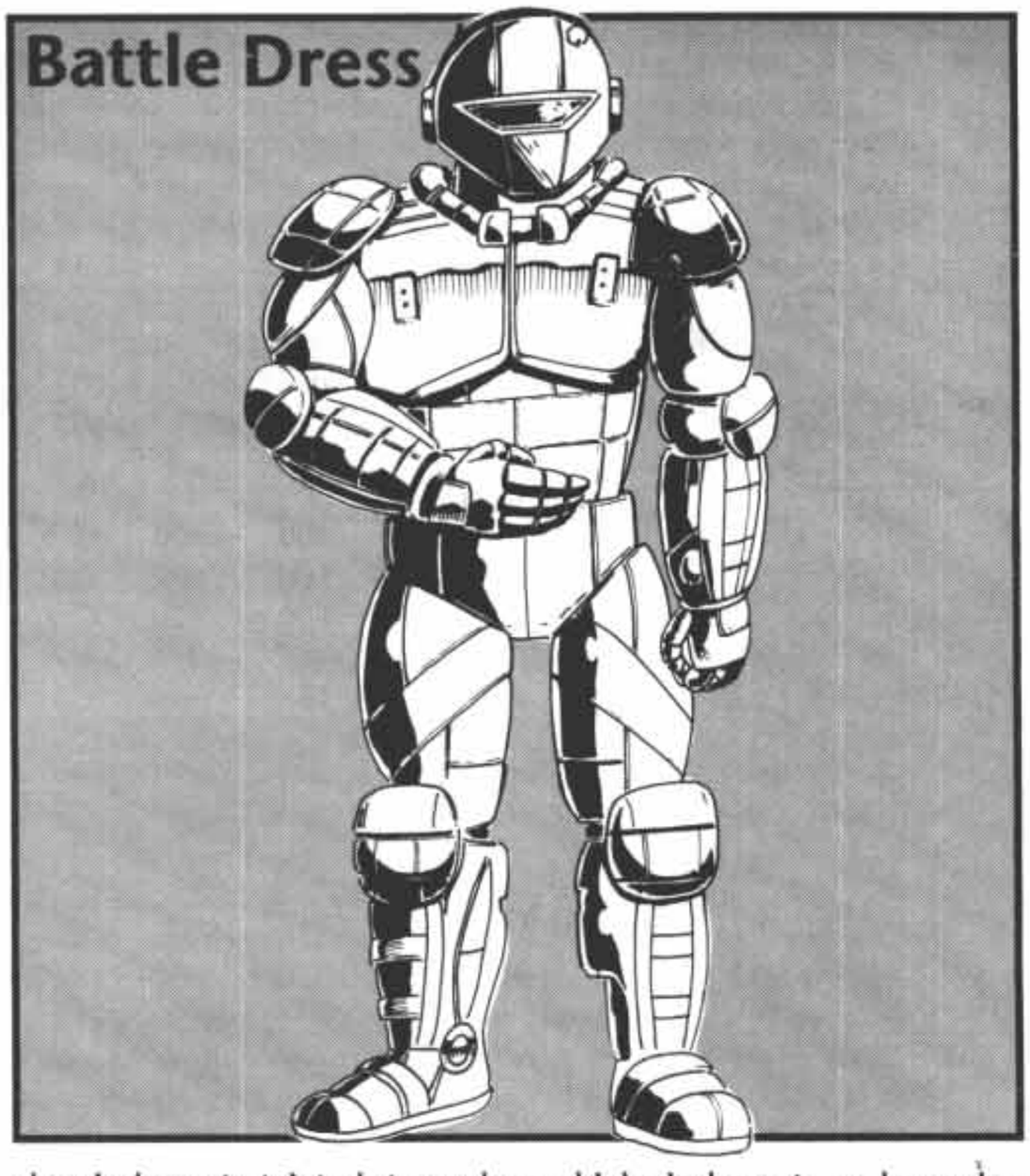
BC Vest: A vest covering the chest and abdomen made of ballistic cloth. The fabric absorbs impact energy of a projectile and distributes the blow over the body. Ballistic cloth, however, has no effect against armed melee attacks conducted with edged weapons.

BC Body Suit: As described above, but the ballistic cloth body suit covers all hit locations except the head.

BW Vest: Identical to a ballistic cloth vest, but constructed of ballistic weave, which has reinforced fibers added to increase armor protection and which allows the armor to withstand edged weapon attacks as well. Ballistic weave is also sometimes called mesh.

BW Body Suit: As described above, but the ballistic weave body suit covers all hit locations except the head.

Combat Environment Suit: Identical to the BW body suit, but with an air-tight liner. Generally worn open at the neck and wrists, the combat environment suit can be sealed by donning gauntlets and a clear plastic flexible headpiece. The suit gives complete protection against most



chemical agents, tainted atmospheres, biological agents, and a moderate defense against radiation. Heat buildup in the suit is handled by a simple solid-state cooling system that is woven into the garment and which eliminates all infrared signature except on the exposed face, hands, and heat exhaust. The heat exhaust is a very pronounced IR source, but this can be dampened by inserting a chill can into the cooling system. The chill can completely eliminates the signature for from 45 minutes to two hours, depending on the background temperature. At the end of that time the can is used up and discarded.

Combat Armor: A neck to toe air-tight array of metallic and synthetic armor, with a separate visored helmet. Most surfaces are rigid armor, although surfaces requiring flexibility (such as joints) are made of advanced forms of ballistic weave. None of the combat armor suits listed have communicators or other extra features included; these may be added at additional cost.

Battle Dress: The ultimate in individual protection, battle dress is an advanced and powered version of combat armor. Battle dress enhances the strength and senses of individuals wearing it with variable feedback personal controls, servo-powered limbs, and various electrical assistance. The individual wearing battle dress is effectively doubled in Strength and given unlimited Constitution. Integral batteries power the suit for 10 hours of continuous operation. (Tech Level 14 suits have an endurance of 100 hours.) None of the battle dress suits listed have communicators or other extra features included; these may be added at additional cost.

Chameleon Option: At tech level 12, a chameleon surface becomes available for the combat environment suit, combat armor, and battle dress, at an additional cost of Cr1000. It selectively bleeds heat to match background IR levels and effectively renders the wearer invisible to IR sensors.

Psionic Shield Option: Beginning at tech level 12, psionic shielding is available as an option for any helmet (and for battle dress, which includes a helmet as part of the armor), for an additional Cr4000. Psionic shielding protects the wearer from psionic mind reading and life sensing.

Body Armor Protection

Description	TL	Vol (liters)	Weight (kg)	AV	AV vs. laser	Hit Location	Price (Cr)	AGL	INIT
Leather Vest	0	1	0.5	0(1/2)	—	C,A	5	—	—
Jack	0	1.5	1	0(1/2)	—	C,A,Ar	10	–1	—
Mail Vest	1	2	10	0(1)	—	C,A,	200	—	—
Half Mail	1	1	5	0(1)	—	C	100	—	—
Full Mail	1	3	23	0(1)	—	C,A,Ar,L	460	–1	—
Helmet	1	1	1.6	0(2)	0	(H)	30	—	—
Visored Helmet	2	2	2.6	0(2)	0	H	50	—	–1
Breastplate	2	20	8	0(2)	0	C,A	160	–1	—
Plate	2	40	18	0(2)	0	C,A,Ar,L	360	–2	—
Flak Jacket	5	2	12	1(2)	1	C,A	180	–1	—
Helmet	5	1	1	1(2)	1	(H)	30	—	—
Flak Jacket	7	2	8	1(2)	1	C,A	200	–1	—
BC Vest	7	1	4	1(2)	—	C,A	320	—	—
BC Body Suit	7	2.5	9.3	1(2)	—	C,A,Ar,L	750	–1	—
BW Helmet	8	1	0.5	1(2)	—	(H)	50	—	—
BW Vest	8	1	4	1(2)	—	C,A	400	—	—
BW Body Suit	8	2.5	9.3	1(2)	—	C,A,Ar,L	930	–1	—
Combat Environment Suit	9	2.5	9.3	1(2)	—	C,A,Ar,L	6930	—	—
Visored Helmet	10	2	1.4	2	2	H	880	—	—
Combat Armor	10	40	13.3	2/1(2)	2/1	H,C,A,Ar,L	7950	–1	—
Battle Dress	10	100	419	4	4	H,C,A,Ar,L	114,750	–3	–2
Visored Helmet	12	2	1.8	3	3	H	920	—	—
Combat Armor	12	40	20.4	3/2	3/2	H,C,A,Ar,L	8700	–1	—
Battle Dress	12	100	197	6	6	H,C,A,Ar,L	146,000	–2	–1
Visored Helmet	14	2	1.2	4	4	H	975	—	—
Combat Armor	14	40	18	4	4	H,C,A,Ar,L	10,080	–1	—
Battle Dress	14	100	296	8	8	H,C,A,Ar,L	218,250	–1	–1

Hit Location Abbreviations: C = chest, A = abdomen, Ar = arms, L = legs, H = full head coverage, (H) = partial head coverage (face exposed)

Melee Weapons

A variety of lethal weapons are available, particularly on primitive worlds, for armed melee attacks.

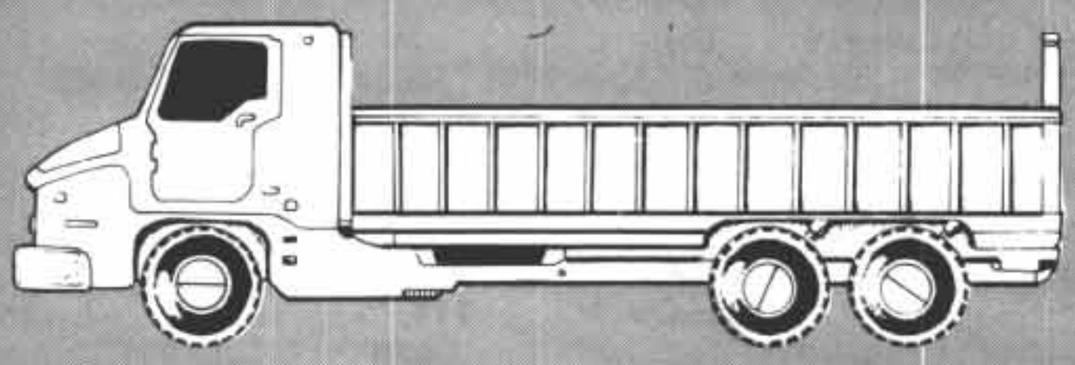
Weapon	TL	Vol (liters)	Weight (kg)	Price (Cr)	Range	Hit Mod	Damage
Club	0	2	2	—	S	–1	1D6+(STR+2)
Spear	0	2	2	10	L	—	1D6+(STR)
Dagger/Knife	1	0.2	0.2	10	S	+1	1D6
Hatchet	1	1	1	50	S	—	1D6+(STR+2)
Blade	1	0.2	0.3	50	S	+2	1D6
Pike	1	3	2.5	40	L	+1	1D6+STR
Axe	1	2	2	100	L	–2	1D6+STR
Sword	1	1	1	100	L	—	2D6
Cutlass/Sabre	1	1	1.2	150	L	+1	2D6
Broadsword	1	1.5	2.5	300	L	—	2D6+(STR+2)
Rapier/Foil	2	0.6	0.5	200	L	+2	1D6
Battle Axe	2	2	3	200	L	–1	2D6+STR
Halberd	2	2.5	2.5	200	L	—	2D6+STR
Bayonet*	3	0.2	0.2	20	L	+1	1D6+(STR+2)

*Combat values are for a bayonet mounted on the end of a rifle or carbine. If used by itself, a bayonet uses the dagger combat values.

Vehicle Data

Tech Level: The tech level at which the vehicle was constructed. **Price:** Includes all weapons listed under Armament, all ammunition listed under Ammo, and one full load of fuel. **Size:** Volume in kiloliters (cubic meters), followed by its standard rated displacement in starship tons (14 cubic meters each), and its target size abbreviation. **Weight:** Gross weight, including ammo and fuel but not cargo. **Power:** Power output of the vehicle's power plant. **Maint:** Maintenance number. **Fuel Capacity:** Fuel capacity, in liters, followed by fuel type. **Fuel Consumption:** Fuel consumption rate, in liters of fuel per hour, followed by endurance in hours. **Travel Move:** Travel movement. Road movement is followed by off-road movement and water speed, if applicable. For aerial vehicles high flight speed is followed by NOE speed. Movement rates are expressed in kilometers travelled per period (4 hours). **Combat Move:** Combat movement. Road movement is followed by off-road movement. For aerial vehicles high flight speed is followed by NOE speed. Ground vehicle movement rates are expressed in meters moved per combat turn (5 seconds). Aircraft and grav vehicle movement is expressed in 10-meter grid squares per 5-second turn. **Controls:** The type of controls used and the type and number of computers, if any. **Commo:** All communication equipment. **Sensors:** All sensor devices, including flight avionics. **Life Support:** All life-support features of the vehicle. **Load:** Interior cargo capacity, given in tonnes unless otherwise noted. **Crew:** Number of crew. **Passengers:** Number of passengers. **Fire Control:** Fire control bonus. **Armament:** The weapon or weapons with which the vehicle is normally equipped and which are included in the vehicle price (*MG:* Machinegun). **Stabilization:** Any special weapon stabilization machinery. **Ammo:** The amount of ammunition carried in ammunition stores (additional ammo may be purchased and carried, but counts as cargo). **Weapons Mounts:** Most weapons are fired by the vehicle's gunner. Weapons fired by other crewmembers are mounted in weapons mounts. The entry for each vehicle explains the location of its weapons mounts (if any) and who fires weapons in them (*C:* Commander *P:* Passenger). **Susp:** Suspension type. W = Wheel; T = Track; G = Grav, A = Air Cushion. The number following the suspension type is its armor rating or, if in parentheses, its cumulative damage level. **T:** Turret armor. The face of the turret is indicated by the second letter (F = Front, S = Side, R = Rear) **H:** Hull armor. The face of the hull is indicated by the second letter (F = Front, S = Side, R = Rear). If the values are in brackets, the vehicle is partially open and characters receive only partial cover from the armor. **Deck:** Top or overhead armor of both the hull and turret (if present). **Belly:** Hull belly armor.

Heavy Cargo Truck



Primitive cargo carriers such as this are common on emerging and recovering worlds. Larger versions carry 10 or 20 tonnes. This version is effectively open on the top (and provides no protection) while the front, rear, and sides of the vehicle provide only partial cover (which is why their values are shown in brackets).

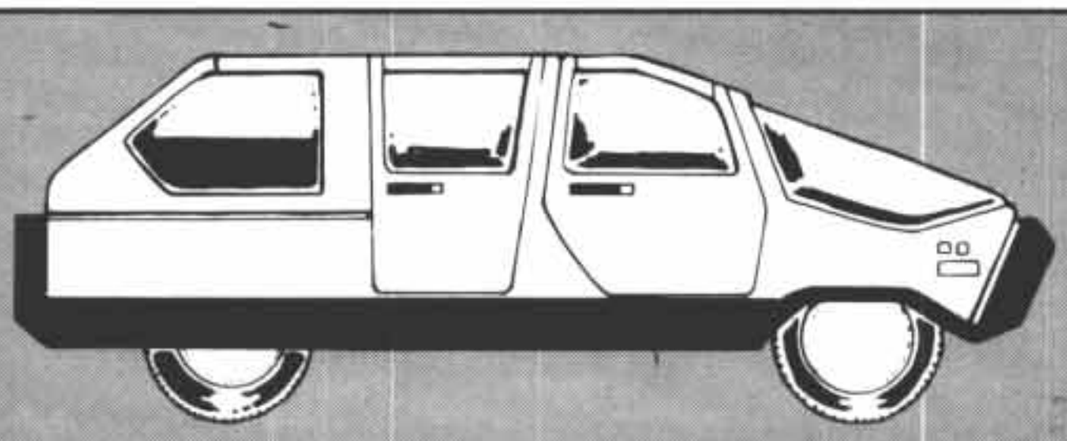
Tech Level: 5
Price: Cr2540
Size: 28 kiloliters displacement = 2 tons (Mc)
Mass: 3.6 tonnes empty, 8.9 tonnes loaded
Power: 0.15 MW internal combustion engine
Maint: 5
Controls: Primitive mechanical
Life Support: Light, heat
Cargo: 4.5 tonnes
Crew: 1
Passengers: 1

Travel Move: 110/20
Combat Move: 25/5
Fuel Capacity: 600 liters hydrocarbon distillates
Fuel Consumption: 30 liters/hour (endurance of 20 hours)

Combat Statistics

Config: Open vehicle	**HF:** [1]
Susp: W (3)	**HS:** [1]
	HR: [1]
Deck: Open	**Belly:** 1

Ground Car



The ground car is a personal transport vehicle used widely on recovering worlds. This version has fairly high performance characteristics. It is also effectively open on the top (and provides no protection) while the front, rear, and sides of the vehicle provide only partial cover (which is why their values are shown in brackets).

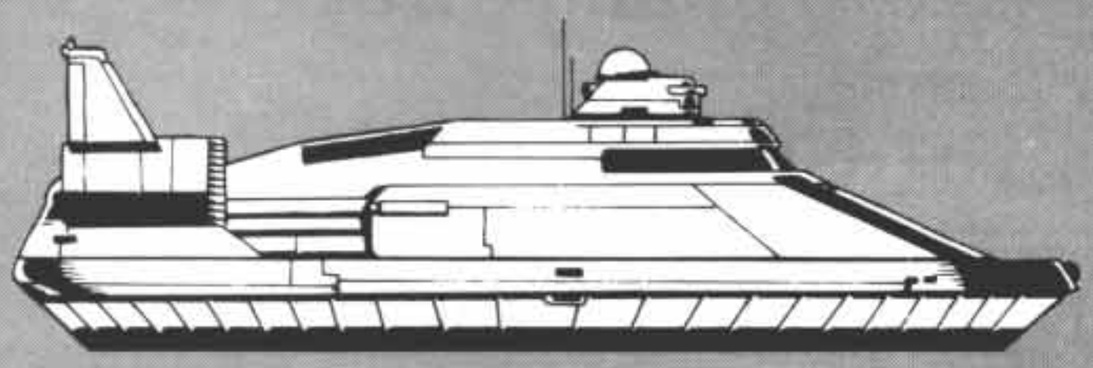
Tech Level: 6
Price: Cr2695
Size: 14 kiloliters displacement = 1 ton (Mc)
Mass: 2.96 tonnes empty, 3.79 tonnes loaded
Power: 0.2 MW improved internal combustion engine
Maint: 2
Controls: Primitive mechanical
Life Support: Light, heat
Cargo: 175 kilograms
Crew: 1
Passengers: 3

Travel Move: 325/65
Combat Move: 75/15
Fuel Capacity: 250 liters hydrocarbon distillates
Fuel Consumption: 50 liters/hour (endurance of 5 hours)

Combat Statistics

Config: Open vehicle	**HF:** [1]
Susp: W (2)	**HS:** [1]
	HR: [1]
Deck: Open	**Belly:** 1

Hovercraft



This is an early version of an air cushion vehicle used to transport passengers and light cargo over water or flat terrain. Hovercraft were among the most versatile surface transports available until the appearance of grav vehicles, and are highly prized on worlds which do not have access to contra-gravity lifter technology.

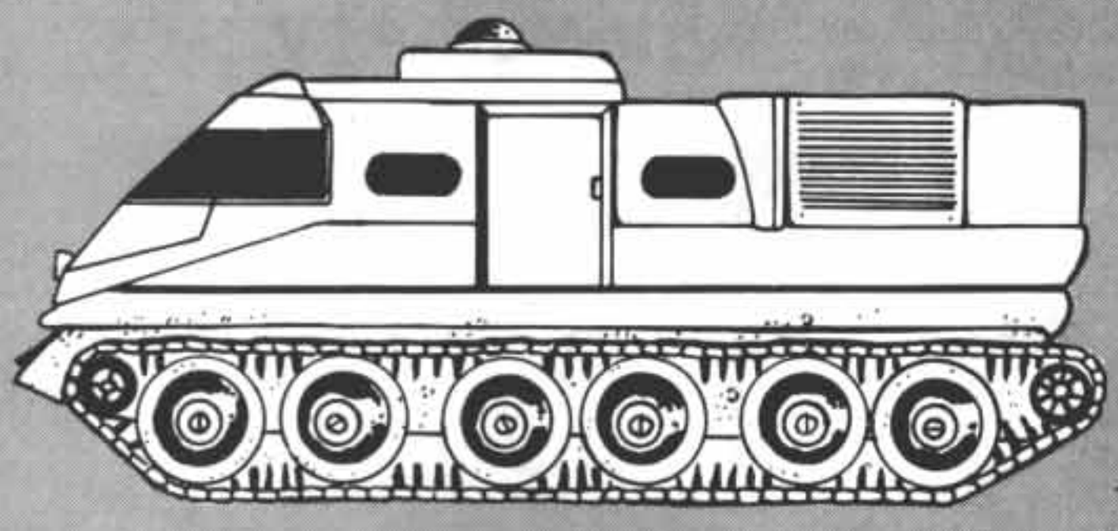
Tech Level: 7
Price: Cr289,025
Size: 56 kiloliters displacement = 4 ton (Mc)
Mass: 8.4 tonnes empty, 13.8 tonnes loaded
Power: 0.45 MW gas turbine power plant, plus a turbofan thruster generating 5.4 tonnes of thrust. (0.0274 MW excess power)
Maint: 5
Controls: Electronic, with tech level 7 land navigation
Commo: 300-km radio
Sensors: 0.3-km HRT
Life Support: Light, heat
Cargo: 1.25 tonnes
Crew: 1
Passengers: 7

Travel Move: 800/605
Combat Move: 185/140
Fuel Capacity: 3400 liters hydrocarbon distillates
Fuel Consumption: 783 liters/hour (endurance of 4.34 hours)

Combat Statistics

Config: Standard	**HF:** 1
Susp: H (4)	**HS:** 1
	HR: 1
Deck: 1	**Belly:** 1

Tracked ATV



The tracked all terrain vehicle is a rugged, enclosed vehicle with excellent cross-country performance. It is used for wilderness exploration, particularly on lower tech level worlds. They are sufficiently well protected that some governments arm them and use them as combat vehicles.

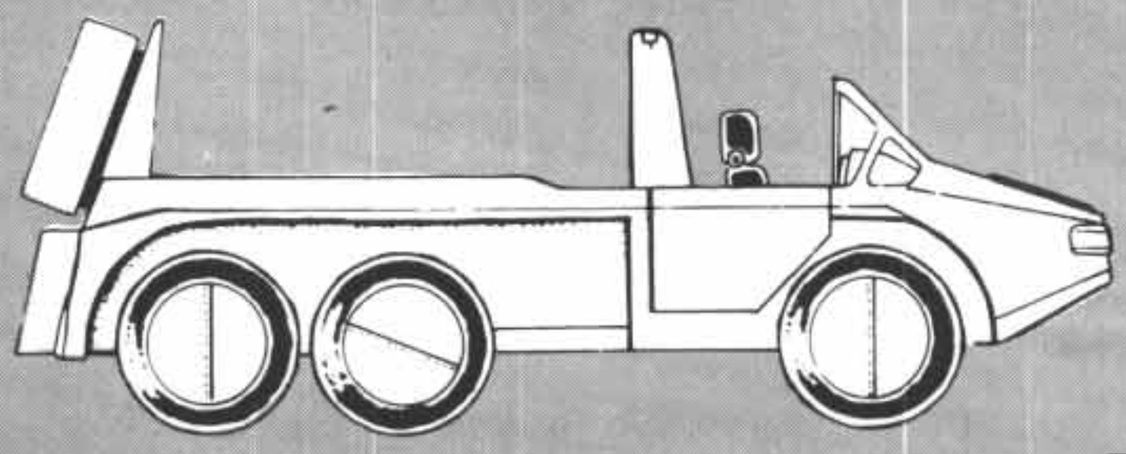
Tech Level: 7
Price: Cr56,520
Size: 42 kiloliters displacement = 3 tons (Mc)
Mass: 18.3 tonnes empty, 27 tonnes loaded
Power: 0.6 MW gas turbine power plant. (0.0095 MW excess power)
Maint: 9
Controls: Electronic, with tech level 7 land navigation
Commo: 300-km radio
Sensors: 0.3-km HRT
Life Support: Light, heat, pressurized, extended life support.
Cargo: 1.75 tonnes
Crew: 1
Passengers: 4

Travel Move: 110/85/13
Combat Move: 25/20/3
Fuel Capacity: 6500 liters hydrocarbon distillates
Fuel Consumption: 180 liters/hour (endurance of 36 hours)

Combat Statistics

Config: Standard	**HF:** 2
Susp: T 6	**HS:** 2
	HR: 2
Deck: 2	**Belly:** 2

Range Truck



This small cross-country utility vehicle also is often called a jeep, hummer, or landrover. It has good off-road performance for a wheeled vehicle and is a handy way to explore wilderness areas when the environment is not hostile and continuous ground contact is required.

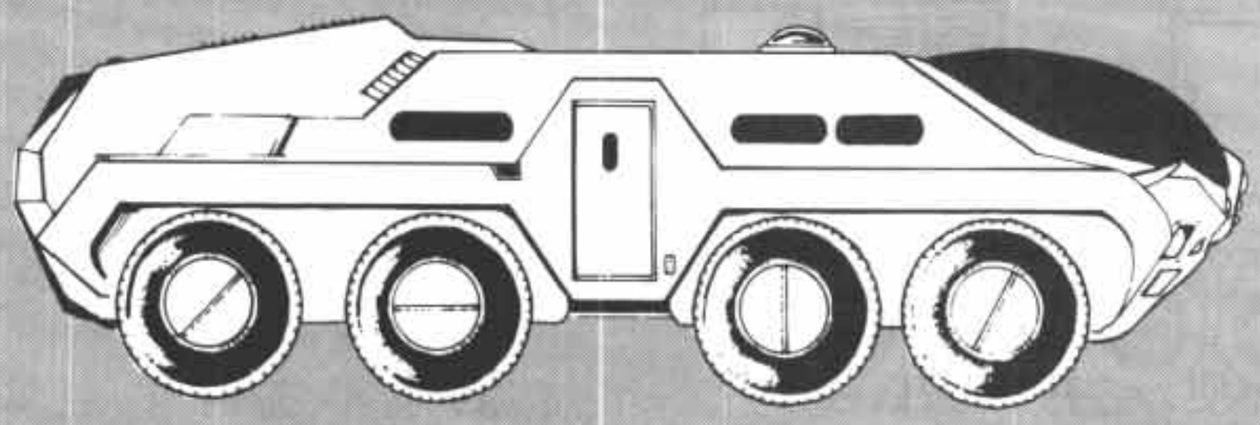
Tech Level: 8
Price: Cr3948
Size: 14 kiloliters displacement = 1 ton (Mc)
Mass: 1.9 tonnes empty, 3.65 tonnes loaded
Power: 0.2 MW improved internal combustion engine. (0.0295 MW excess power)
Maint: 1
Controls: Enhanced electronic
Life Support: Light, heat
Cargo: 1 tonne
Crew: 1
Passengers: 1

Travel Move: 300/130
Combat Move: 70/30
Fuel Capacity: 550 liters hydrocarbon distillates
Fuel Consumption: 50 liters/hour (endurance of 11 hours)

Combat Statistics

Config: Open vehicle	**HF:** [1]
Susp: W (2)	**HS:** [1]
	HR: [1]
Deck: Open	**Belly:** 1

Wheeled ATV



This massive all-terrain vehicle is designed for extended ground exploration in hostile environments.

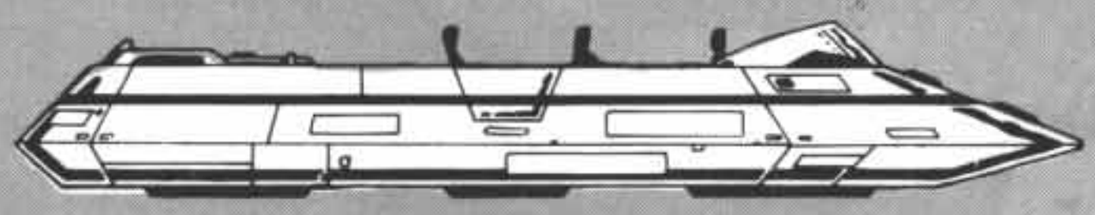
Tech Level: 8
Price: Cr126,308
Size: 98 kiloliters displacement = 7 tons (Mc)
Mass: 14 tonnes empty, 44.4 tonnes loaded
Power: 1.44 MW MHD turbine power plant. (0.0456 MW excess power)
Maint: 11
Controls: Enhanced electronic, with TL-8 land navigation
Commo: 300-km radio
Sensors: 0.3-km HRT
Life Support: Light, heat, pressurized, extended life support (1 bunk), air lock.
Cargo: 3 tonnes
Crew: 1
Passengers: 4

Travel Move: 175/85/20
Combat Move: 40/20/5
Fuel Capacity: 27,000 liters hydrocarbon distillates
Fuel Consumption: 288 liters/hour (endurance of 93.75 hours)

Combat Statistics

Config: Standard	**HF:** 2
Susp: W (8)	**HS:** 2
	HR: 2
Deck: 2	**Belly:** 2

Air Raft (Open)



Common on higher tech worlds, the air raft is a fast, efficient, and reliable means of transportation. Its ability to make vertical takeoffs and landings and to hover using its contra-grav lifters makes it the most versatile of light transport vehicles. This version is completely open on the top (and provides no protection) while the front, rear, and sides of the vehicle provide only partial cover (which is why their values are shown in brackets).

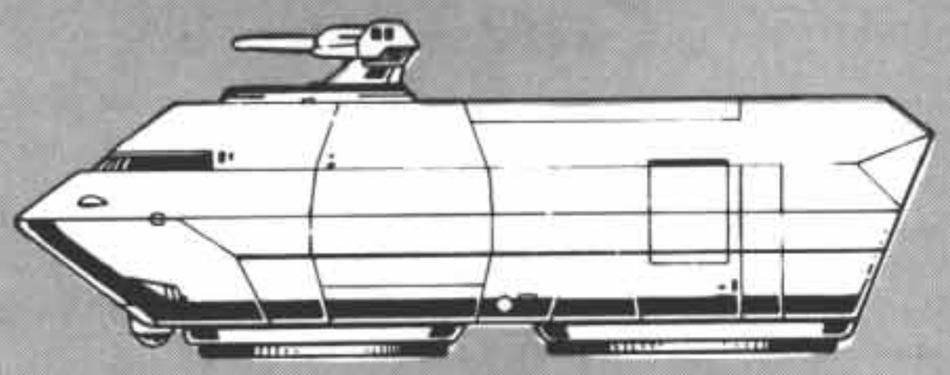
Tech Level: 10
Price: Cr118,401
Size: 28 kiloliters displacement = 2 tons (Mc)
Mass: 3 tonnes empty, 4.8 tonnes loaded
Power: 0.75 MW MHD turbine power plant, with HEPlaR thruster generating 3 tonnes of thrust. (0.129 MW excess power)
Maint: 1
Controls: Computer linked, TL-6 flight avionics, 2×TL-9 FLT computers
Commo: 300-km radio
Life Support: Light, heat
Cargo: 1 tonne
Crew: 1
Passengers: 5

Travel Move: 1200/240
Combat Move: 56/6 grid squares
Fuel Capacity: 2600 liters liquid hydrogen
Fuel Consumption: 187.5 liters/hour (endurance of 13.9 hours)

Combat Statistics

Config: Open vehicle	HF: [2]
Susp: Grav	HS: [1]
	HR: [1]
Deck: Open	Belly: 1

G-Carrier



The G-carrier is an enclosed military or quasi-military grav vehicle. Similar in concept to an armored air raft, the G-Carrier has a gun mount and an armored rear hatch.

Tech Level: 11
Price: Cr719,204 (Cr200 per pulse cartridge for the plasma gun)
Size: 84 kiloliters displacement = 6 tons (Mc)
Mass: 25 tonnes empty, 29.4 tonnes loaded
Power: 2.008 MW MHD turbine power plant, with HEPlaR thruster generating 12 tonnes of thrust. (0.0016 MW excess power)
Maint: 6
Controls: Dynamic linked, TL-10 flight avionics, TL-11 terrain following avionics, 2xTL-11 FLT computers
Commo: 300-km radio, 30-km laser
Sensors: 3-km passive EMS
Life Support: Light, heat, basic life support (pressurized)
Cargo: 1 tonne
Crew: 2
Passengers: 10
Fire Control: –3 Diff Mods
Armament: Remote turret with 2-Mj cradle-mount plasma gun, 7.5mm coaxial MG
Stabilization: Advanced
Ammo: 200 pulse cartridges, 1800 rounds 7.5mm

Travel Move: 1890/900
Combat Move: 88/21 gr. sq.
Fuel Capacity: 3400 liters liquid hydrogen
Fuel Consumption: 551.6 liters/hour (endurance of 6.16 hours)

Combat Statistics

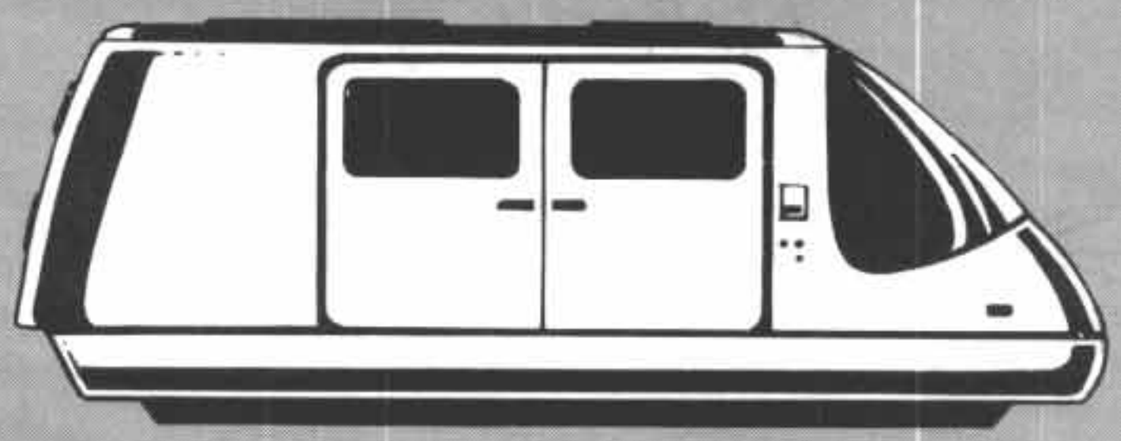
Config: Small Turret	TF: 16	HF: 16
Susp: Grav	TS: 8	HS: 8
	TR: 8	HR: 8
	Deck: 8	Belly: 8

Weapon Values

Type	*ROF*	*Range*	*Dam Val*	*Pen Rtg*
2-Mj plasma cradle gun	SA1	60*	16	1-2-10
7.5mm coax MG	5	300	7	2-3-4

*The plasma gun's accuracy does not go down (and thus gunner task difficulty does not increase) with range. Range bands change the weapon's performance only by reducing penetration and defining the weapon's maximum range.

Enclosed Air Raft



Tech Level: 12
Price: Cr400,728
Size: 42 kiloliters displacement = 3 tons (Mc)
Mass: 4 tonnes empty, 7.06 tonnes loaded
Power: 0.9 MW MHD turbine power plant, with HEPlaR thruster generating 6 tonnes of thrust. (0.0928 MW excess power)
Maint: 1
Controls: Dynamic linked, TL-10 flight avionics, TL-12 terrain following avionics, 2xTL-12 FLT computers
Commo: 300-km radio, 30-km laser
Life Support: Light, heat, basic life support (pressurized)
Cargo: 2.375 tonnes
Crew: 1
Passengers: 3

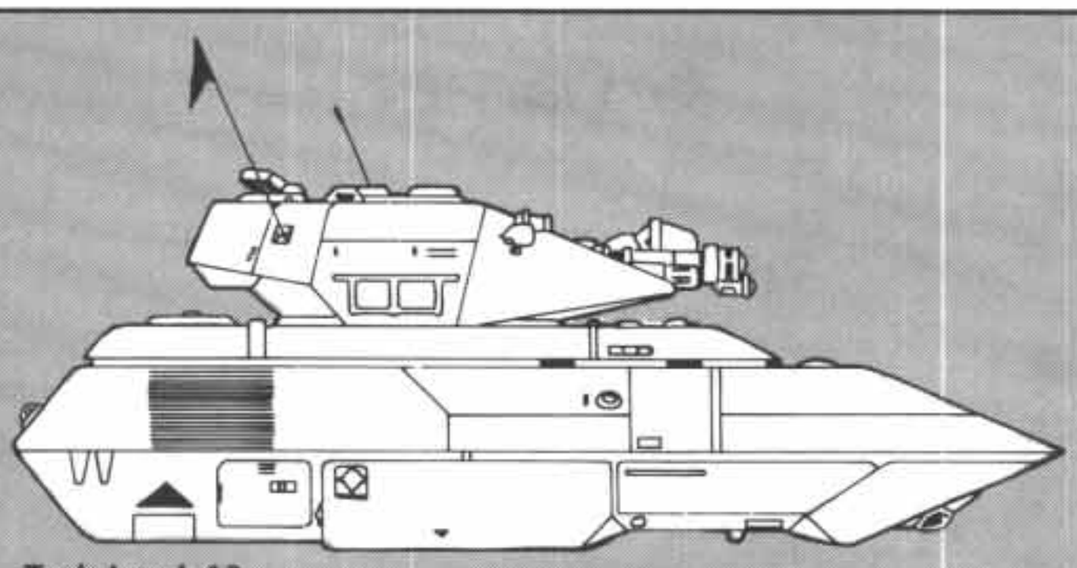
The enclosed air raft is another version of this common and versatile vehicle. It is not only more comfortable than open-topped versions, but it is also capable of extended operation in hostile environments.

Travel Move: 1890/945
Combat Move: 88/22 grid squares
Fuel Capacity: 3450 liters liquid hydrogen
Fuel Consumption: 255 liters/hour (endurance of 13.5 hours)

Combat Statistics

Config: Standard	**HF:** 2
Susp: Grav	**HS:** 1
	HR: 1
Deck: 1	**Belly:** 1

Grav Tank



Tech Level: 13
Price: Cr2,010,979 (Cr300 per pulse cartridge for the plasma gun)
Size: 98 kiloliters displacement = 7 tons (Mc)
Mass: 25.5 tonnes empty, 41.8 tonnes loaded
Power: 3.3 MW fusion reactor (1 year endurance) with HEPlaR thruster generating 16 tons of thrust (0.0572 MW excess power)
Maint: 7
Controls: Holographically linked, TL-10 flight avionics, TL-13 terrain following avionics, 2×TL-13 FLT computers
Commo: 300-km radio, 30-km laser communicator
Sensors: 30-km passive EMS, 3-km active EMS, 3-km EMS jammer.
Life Support: Heat, light, pressurized, basic life support
Cargo: 4 tonnes
Crew: 3
Passengers: 1
Fire Control: –4 Diff Mods
Armament: 12-Mj plasma cradle gun, coaxial 7.5mm MG, coaxial painting laser
Stabilization: Advanced
Ammo: 400 pulse plasma cartridges, 3000 rounds 7.5mm

The grav tank is a heavily armed and protected combat platform intended to fight the main close action battle on a planetary surface. This example was intended to work in concert with either static or vehicle-mounted tac missile launchers. For long-range action it uses its laser to designate targets for the tac missiles while at closer ranges it relies on its own plasma gun. Without supporting missile units the tank is at a disadvantage at long range and in open terrain.

Travel Move: 2160/1020
Combat Move: 100/24 grid squares
Fuel Capacity: 4000 liters liquid hydrogen
Fuel Consumption: 200 liters/hour (endurance of 20 hours)

Combat Statistics

Config: Turret	**TF:** 60	**HF:** 60
Susp: G	**TS:** 8	**HS:** 8
	TR:4	**HR:** 4
	Deck: 8	**Belly:** 4

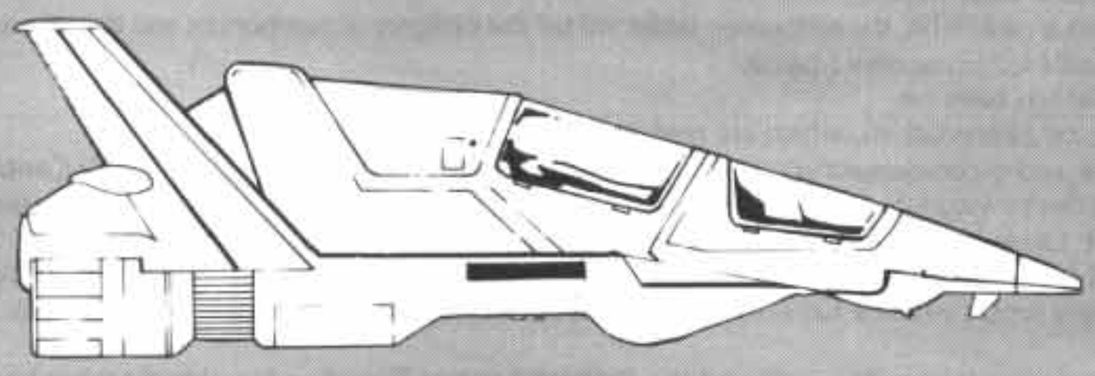
Weapon Values

Type	*ROF*	*Range*	*Dam Val*	*Pen Rtg*
12-Mj plasma cradle gun	SA1	360*	40	1-2-10
7.5mm MG	5	300	7	2-3-4
8cm coax laser rifle	SA3	300	—†	—†

*The plasma gun's accuracy does not go down (and thus gunner task difficulty does not increase) with range. Range bands change the weapon's performance only by reducing penetration and defining the weapon's maximum range.

† The laser is powered direct from the tank's power plant, but only at target designation intensities.

Speeder



Tech Level: 15
Price: Cr396,067
Size: 28 kiloliters displacement = 2 tons (Mc)
Mass: 2.2 tonnes empty, 3 tonnes loaded
Power: 0.9 MW fusion power plant (1 year endurance), with HEPlaR thruster generating 8 tonnes of thrust. (0.0747 MW excess power)
Maint: 1
Controls: Holographic linked, TL-10 flight avionics, TL-15 terrain following avionics, 2×TL-15 FLT computers
Commo: 300-km radio
Sensors: 3-km passive EMS
Life Support: Light, heat, basic life support (pressurized)
Cargo: 0.25 tonne
Crew: 1
Passengers: 3

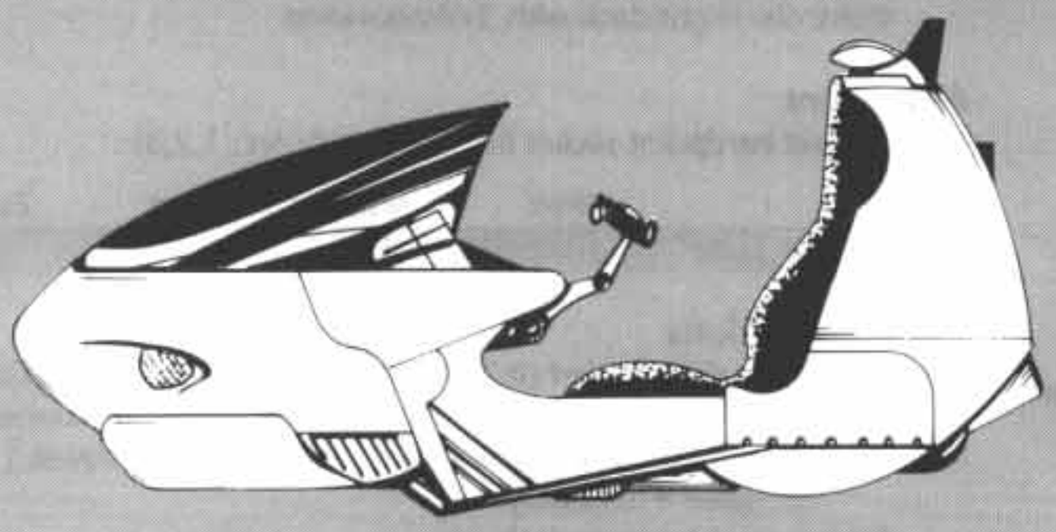
The speeder is a streamlined grav-craft intended for high-speed transport between points on a world surface. Contra-grav units provide lift while a fusion-powered jet provides thrust.

Travel Move: 3600/1140
Combat Move: 167/26 grid squares
Fuel Capacity: 2000 liters liquid hydrogen
Fuel Consumption: 100 liters/hour (endurance of 20 hours)

Combat Statistics

Config: Standard	**HF:** 2
Susp: Grav	**HS:** 1
	HR: 1
Deck: 1	**Belly:** 1

Grav Bike



Tech Level: 15
Price: Cr69,525
Size: 7 kiloliters displacement = 0.5 ton (SM)
Mass: 0.78 tonnes empty, 1.38 tonnes loaded
Power: 0.135 MW fuel cell, with HEPlaR thruster generating 0.7 tonne of thrust. (0.01475 MW excess power)
Maint: 1
Controls: computer linked, TL-6 flight avionics, 1×TL-9 FLT computer (no back-up)
Life Support: Light, heat
Cargo: 0.25 tonne
Crew: 1
Passengers: 1 (restricted seat)

A small contra-grav sport and utility vehicle capable of carrying its driver and one passenger.

Travel Move: 1200/240
Combat Move: 56/6 grid squares
Fuel Capacity: 148.5 liters high grade hydrocarbon distillates, 50 liters LHyd
Fuel Consumption: 27 liters HGHD, 8.75 liters LHyd/hour (endurance of 5.5 hours)

Combat Statistics

Config: Motorcycle	**HF:** [2]
Susp: Grav	**HS:** [1]
	HR: [1]
Deck: Open	**Belly:** 1

STARSHIP LISTINGS — Scout/Courier

The following pages contain an assortment of starships and interplanetary "slow boats" that are representative of the sorts of vessels which have survived into the New Era. The main data listings are largely self-explanatory, and provide a listing of the components in the ship and its capabilities. Unless otherwise stated, all weights are in tonnes, all lengths in meters, and all volumes in cubic meters (kiloliters).

The damage section lists the components found in each part of the vessel. When an area is hit, the hit location tables will tell the category of component and the referee or player then rolls on the appropriate component damage table (page 326) to find the specific system or crew type hit.

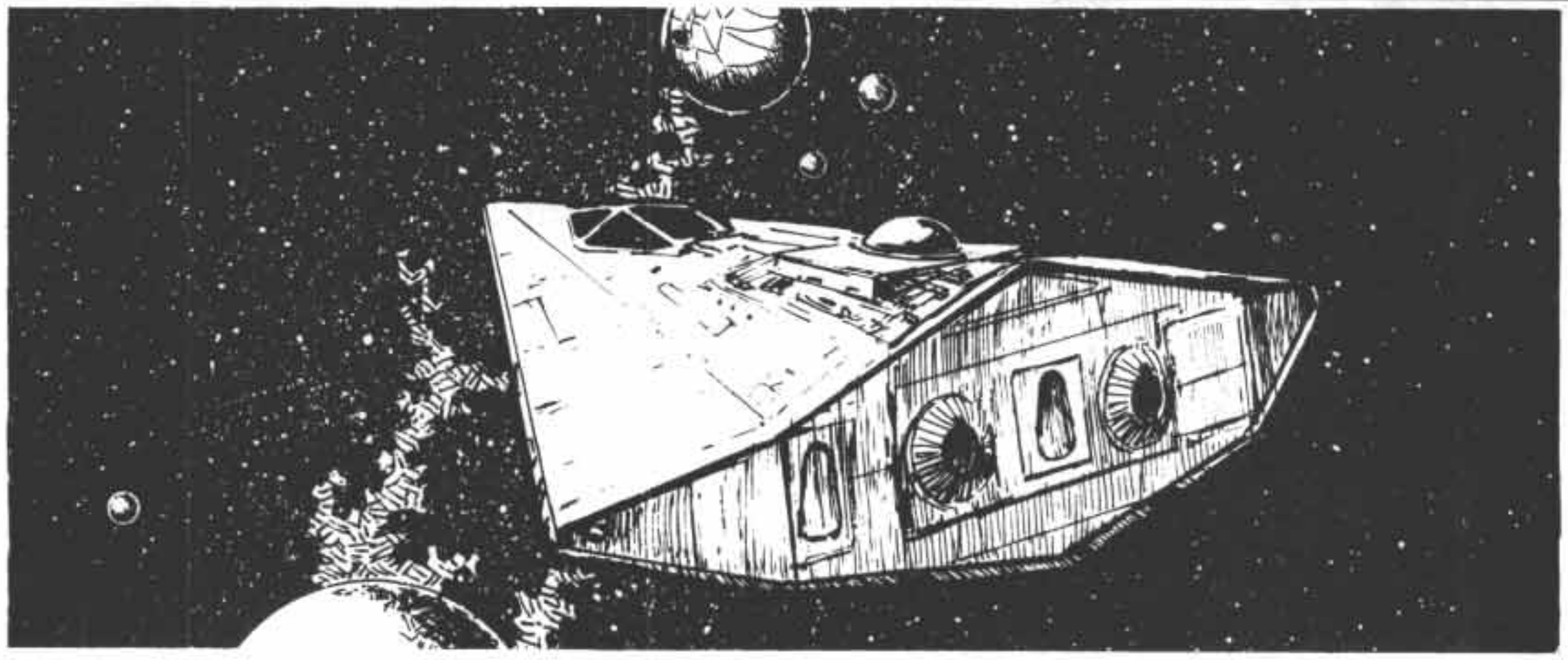
If an antenna is hit, roll randomly to determine which antenna on the vessel has been hit.

The listing of system and their damage capacities relies, for sake of brevity, on abbreviations, which are read as follows:

AEMS: Active Electromagnetic Sensor; **AG:** Artificial Gravity (environmental and g-compensating); **AL:** Air Lock; **Ant:** Antenna; **Bs:** Barbette Socket; **CG:** Contra-Gravity Lifters; **CH:** Cargo Hatch; **Elec:** Electronics; **ELS:** Emergency Life Support; **EMM:** Electromagnetic Masking; **EMMR:** Electromagnetic Masking Radiators; **Eng:** Engineering; **FPP:** Fuel Processing Plant; **JD:** Jump Drive; **LB:** Laser Barbette; **LS:** Life Support; **LSR:** Large stateroom; **LT:** Laser Turret; **MB:** Missile Barbette; **MD:** Maneuver Drive; **MFD:** Master Fire Director; **MT:** Missile Turret; **PEMS:** Passive Electromagnetic Sensor; **PEMS Ant:** Passive Electromagnetic Sensor Antenna; **PP:** Power Plant; **Qtrs:** Quarters; **RC Ant:** Radio Communicator Antenna; **SSR:** Small Stateroom; **TS:** Turret Socket, i.e., an empty socket where a turret could be installed. All empty sockets take 1 minor hit (1h). If a turret or barbette is in the socket, it takes damage normally.

Note: The listings below are fully compatible with the TNE Space Combat system (pages 311-326) and the **Brilliant Lances: Traveller Starship Combat** boardgame. Maneuver performance is given in G-turns. Number of G-hours available equals G-turns + 2. Fuel consumed per G-hour is fuel per G-turn listed below x 2. Communicators and sensors have their short ranges listed below (in parentheses) in hexes for use with **Brilliant Lances**. Their range in TNE Space Combat range bands is identical, merely read "hexes" as "range bands." Fuel capacity is given under "Notes" in cubic meters and displacement tons (used when resolving fuel hits).

Prices: Prices for ships do *not* include carried small craft, cutter modules, vehicles, etc., which must be purchased separately.



General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr50.48
Configuration: Wedge SL
Mass (Loaded/Empty): 697.9/477.0
Hull Armor: 28
Volume: 1400m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 147 MW Fusion Power Plant (147 MW/hit), 1 year duration (0.557 MW excess power)
Jump Performance: 2 (210 m³ fuel)
G-Rating: 2G (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 80 (113.6 using jump fuel), 6.25m³ fuel each
Maint: 23

Electronics

Computer: 3×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 300,000km radio (10 hexes, 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 3×Workstation

Armament

1 turret hardpoint socket fitted (Loc: 10; Arc: 1,2,3).

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (0.28 MW), Grav Compensators (6G; 7 MW)
Crew: 3 (2×Maneuver, 1×Electronics). Seeker adds 1×Gunner.
Crew Accommodations: 2×Large Stateroom (0.001 MW ea.), double occupied if necessary.
Passenger Accommodations:
2×Small Stateroom (0.0005 MW ea.)
Cargo: 161.8 m³, one large cargo hatch
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal) and one launch port
Air Locks: 1.

Notes

Standard practice is for one maneuver crewmember to double as the ship's electronics operator. Fuel purification machinery (1.05 MW), 20.28 hours to refine 710 m³ (50.7 tons).

The Seeker is built on the Scout/Courier design, converting the two small staterooms and 116 m³ of the cargo hold into a special 172 m³ ore bay, and the addition of a 150-Mj TL-15 mining laser turret to the socket already installed, adding MCr0.86 to the price and 57 tonnes to its mass. (Turret Loc: 10; Arc: 1,2,3; 4.2 MW, 1 Crew)

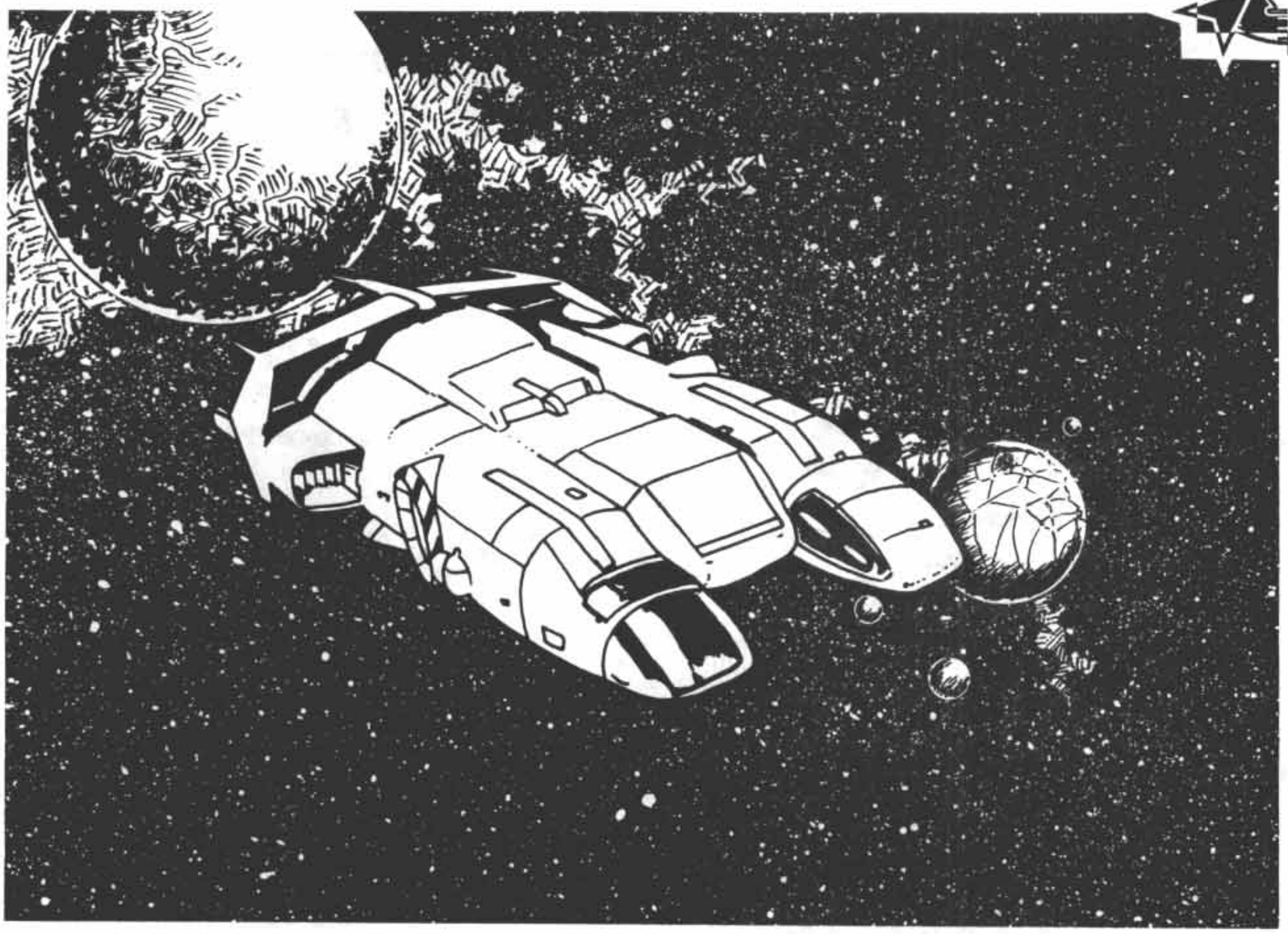
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	1-18: Elec, 19-20: Hold
2-3	Ant	1-12: Qtrs, 13-20: Hold
6-7, 12-13		1-10: Qtrs, 11-20: Hold
4-5, 8-9, 11, 14-15		Hold
10	1: AL	1-12: TS, 13-20: Hold
16-17		1-5: Eng, 6-20: Hold
18-19	1-5: Ant, 6-9: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems

JD-1H	LS-1H
PP-1H	SSR (2h)
CG-(4h)	Hangar-1H
ELS-1H	All Others-(1h)
MD-(2h)	
FPP-1H	
AG-1H	
LSR-1H	

Jayhawk-Class Far Trader



General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr57.21
Configuration: Wedge SL
Mass (Loaded/Empty): 1918.38/1093.78
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 148 MW Fusion Power Plant (49 MW/hit), 1 year duration (0.7705 MW excess power)
Jump Performance: 2 (420 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (81.6 using jump fuel), 12.5 m³ each
Maint: 89

Electronics

Computer: 3×TL-12 Model St (0.4 MW ea.)
Commo: 30,000 km radio (1 hex, 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex, 0.03 MW), Active EMS 3000 km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 3×Workstation, 1 other workstation

Armament

2 turret hardpoint sockets fitted (Loc: 8,9; Arcs: 1,2,3)

Accommodations

Life Support: Extended (0.56 MW), Grav Compensators (3 G; 14 MW)
Crew: 5 (2×Maneuver, 1×Electronics, 1×Engineering, 1×Steward)
Crew Accommodations: 5×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.)
Cargo: 743.8 m³, 2 large cargo hatches
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal), 1 launch port
Air Locks: 2

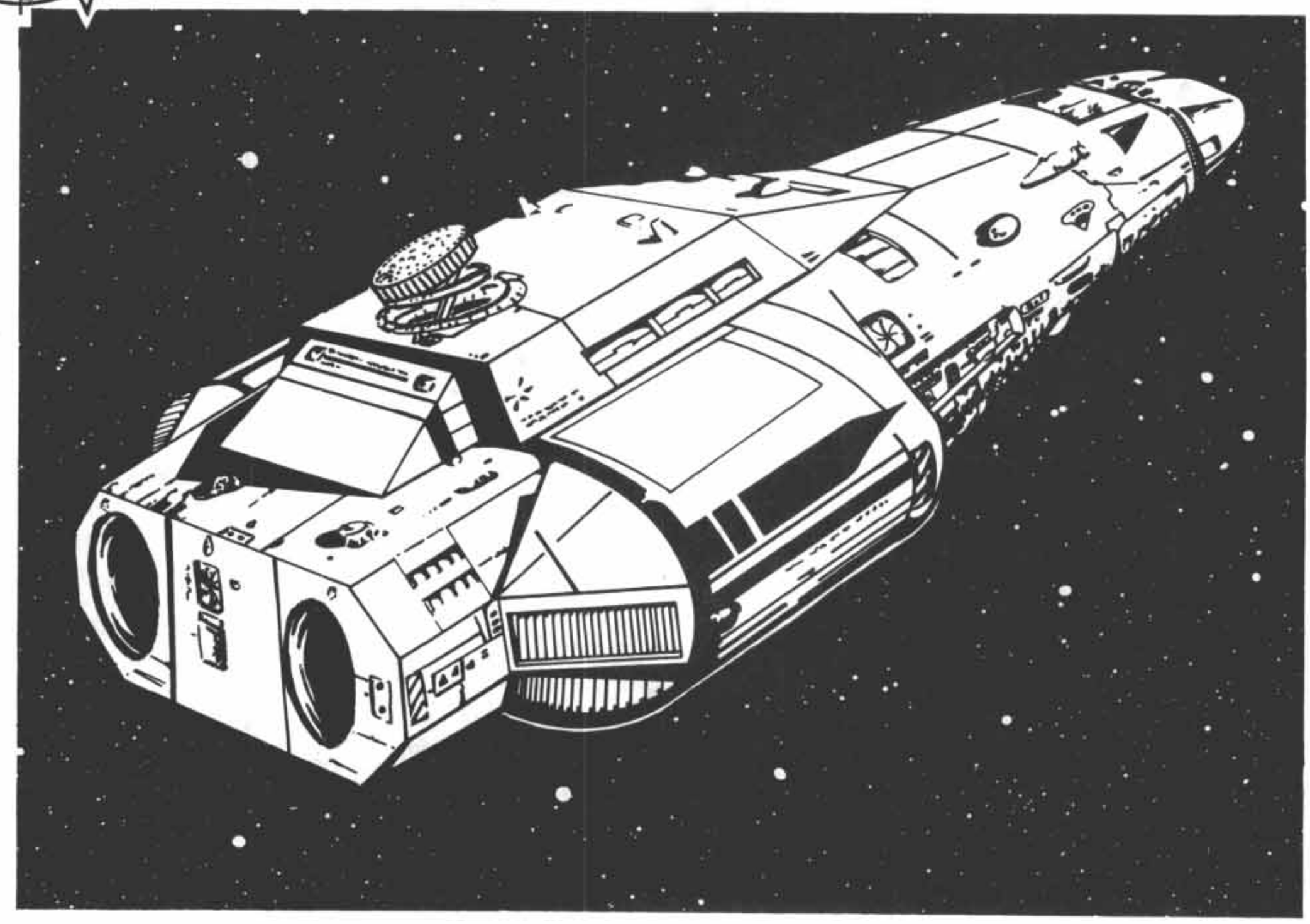
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*System*
1	1-4: CH, 5-9: LP, 10: Ant	Hold	JD-3H
2, 3	1: Ant	1-2: Elec, 3-20: Qtrs	PP-3H
4-5	1: Ant	1-2: Elec, 3-19: Qtrs, 20: Hold	FPP-2H
6-7, 10-15		Hold	AG-1H
8-9	1-4: CH	1-6: TS, 7-20: Hold	ELS-1H
16-17		1-7: Eng, 8-20: Hold	LS-2H
18-19	1: AL	1-7: Eng, 8-20: Hold	SSR-(2h)
20		Eng	MD-(2h)
			CG-1H
			All Others-(1h)

Notes

Fuel purification machinery (1.53 MW), 24 hours to refine 1020 m³ (72.86 tons).

Moraine-Class Free Trader



General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr46.47
Configuration: Wedge SL
Mass (Loaded/Empty): 1908.146/1074.746
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 10

Engineering Data

Power Plant: 156MW Fusion Power Plant (52 MW/hit), 1 year duration (17.967 MW power shortfall)
Jump Performance: 1 (280 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 56 (78.4 using jump fuel), 12.5 m³ fuel each
Maint: 89

Electronics

Computer: 3×TL-10 Model St (0.3 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.06 MW), Active EMS 300km (0 hexes; use extreme range for task difficulty in same hex; 15 MW)
Controls: Flight deck with 3×Workstation, plus 2 other workstations

Armament

2 turret hardpoint sockets fitted (Loc: 16/17, 18/19; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (1G; 14 MW)
Crew: 6 (2×Maneuver, 1×Electronics, 2×Engineering, 1×Steward)
Crew Accommodations: 6×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 8×Small Stateroom (0.0005 MW ea.), 8×Low Berth (0.001 MW ea.)
Cargo: 764.8 m³, 2 large cargo hatches
Air Locks: 2

Notes

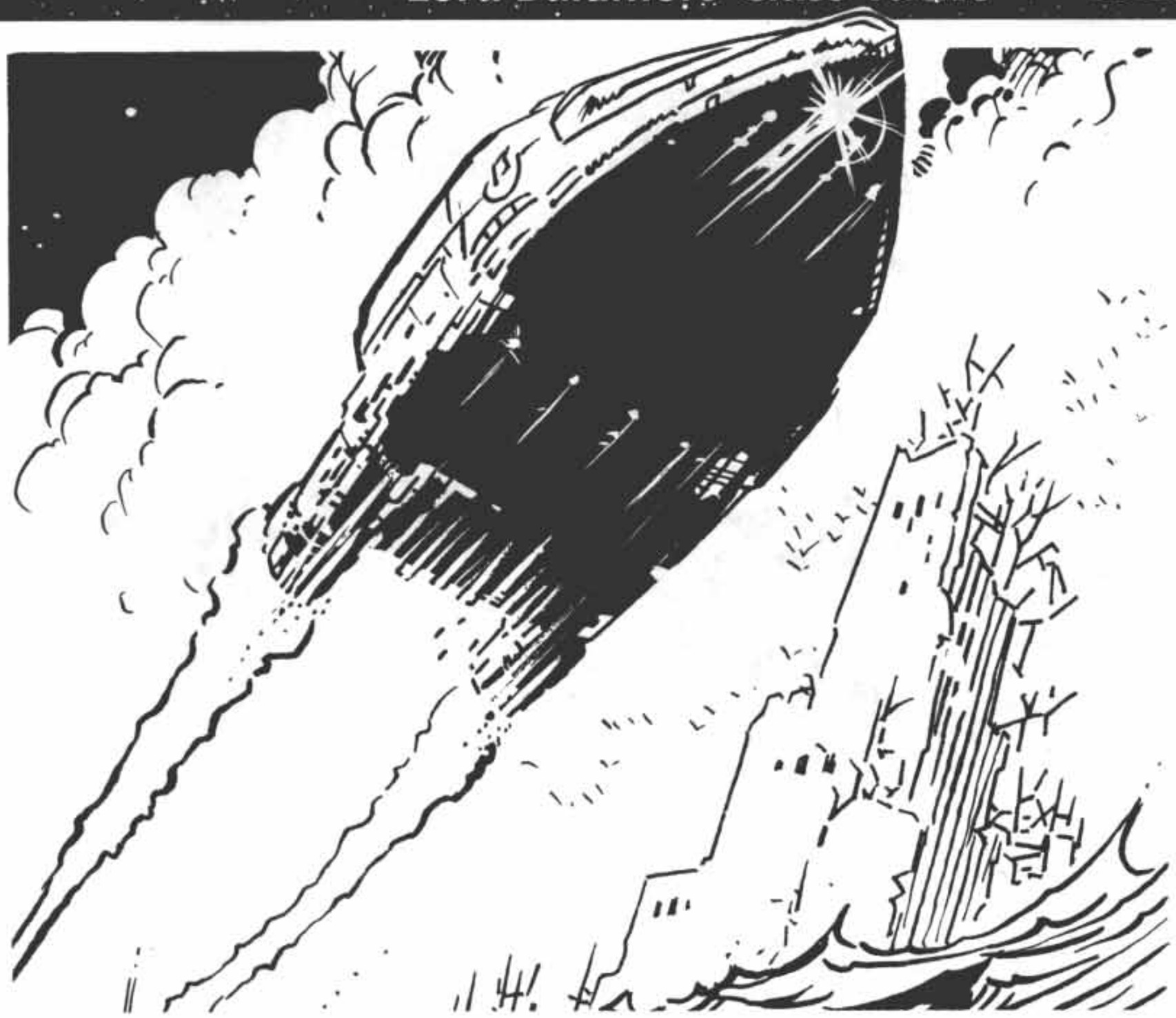
The *Moraine* is the TL-10 version of the more popular and useful *Beowulf*-class. The *Moraine*'s systems consume 174 MW of power, meaning that it cannot operate them all at once with its 156 MW plant. In space, the contra-grav drive is shut down to conserve power. When taking off from a planet, the *Moraine* cannot power its G-compensators, and thus all crew and passengers must be strapped in for this evolution.

Fuel purification machinery (1.53 MW), 30.8 hours to refine 980 m³ (70 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-6: Ant	1-9: Elec, 10-20: Hold	JD-2H
2	1: AL	Qtrs	PP-3H
4		1-3: Eng, 4-20: Hold	FPP-2H
5, 8-9, 11		Hold	CG-1H
12-15	1-3: CH	Hold	SSR-(2h)
3, 6-7		Qtrs	AG-1H
10		1-3: Qtrs, 4-20: Hold,	LS-1H
16-19		1-3: TS, 4-8: Eng, 9-20: Hold	ELS-1H
20		Eng	MD-(2h)
			All Others-(1h)

Lord Baltimore-Class Yacht



General Data

Displacement: 200 tons
Length: 51 meters
Price: MCr84.8
Configuration: Needle USL
Mass (Loaded/Empty): 1502.83/1207.44
Hull Armor: 42
Volume: 2800m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 456MW Fusion Power Plant (228 MW/hit), 1 year duration (0.2275 MW excess power)
Jump Performance: 4 (700 m³ fuel)
G-Rating: 4G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 32 (88 using jump fuel), 12.5 m³ of fuel each
Maint: 48

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Flight deck with 3×Workstation, plus 3 other workstations

Armament

1 turret hardpoint socket fitted. (Loc: 10; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (6G; 14 MW)
Crew: 9 (2×Maneuver, 3×Engineering, 3×Small Craft Flight Crew, 1×Command). Air raft pilot doubles as Steward
Crew Accommodations: 9×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.), 1×Large Stateroom (0.001 MW) (owner's suite)
Cargo: 125 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton launch and internal hangar (Minimal), air raft with internal hangar (Minimal), one launch port each
Air Locks: 2

DAMAGE TABLES

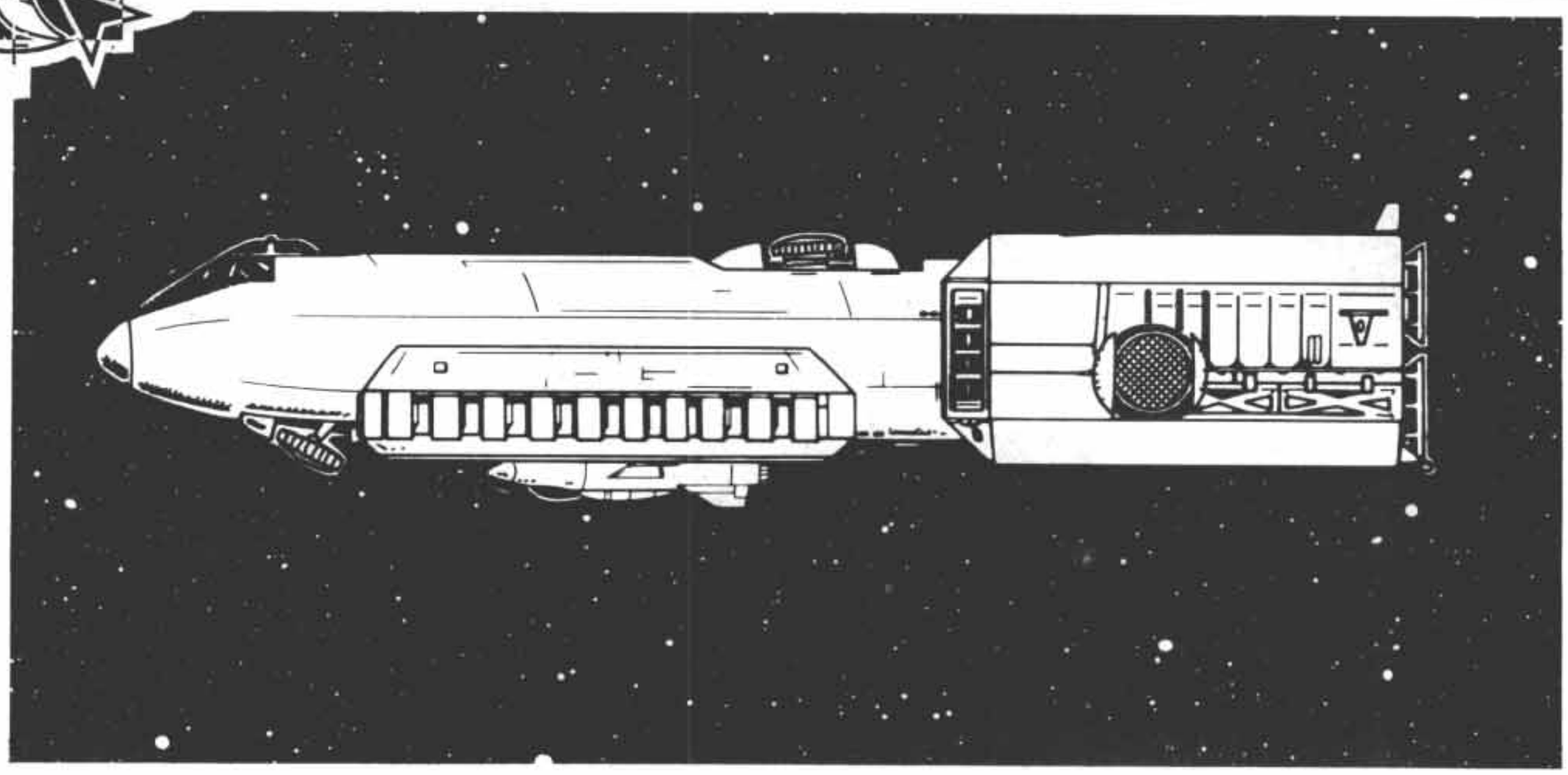
Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-9: Ant	1-10: Elec, 11-20: Qtrs
2, 4		Qtrs
3	1: AL	Qtrs
5-6		1-10: Qtrs, 11-20: Hold
7		1-5: Qtrs, 6-20: Hold
8-9	1: LP	Hold
12-17		Hold
10		1-6: TS, 7-20: Hold
11	LP	Hold
18		1-19: Eng, 20: Hold
19-20		Eng

Systems
JD-3H
PP-2H
CG-1H
LS-2H
AG-1H
FPP-2H
LSR-1H
ELS-1H
Hangar-3H
SSR-(2h)
MD-1H
All Others-(1h)

Notes

Fuel purification machinery (2.5 MW), 13.2 hours to refine 1100 m³ (78.57 tons)

Gazelle-Class Close Escort



General Data

Displacement: 280/400 tons
Length: 48.5 meters
Price: MCr224.65 (+MCr6.78 tanks)
Configuration: Wedge SL
Hull Armor: 62
Volume: 3920 m³/5600 m³
Target Size: S
Tech Level: 14
Mass (Loaded/Empty): 4662.15/4155.53 with tanks
4154.87/3742.43 without tanks

Engineering Data

Power Plant: 891 MW Fusion Power Plant (99 MW/hit), 1 year duration
Jump Performance: 3 with tanks attached (1120m³), 5 without (1260 m³)
G-Rating: 3G with tanks (200 MW/G), 5G without (150 MW/G), Contra-Grav lifters (30 MW)
G-Turns: 112, 25 m³ fuel each, with tanks attached; 77.6, 18.75 m³ each, without tanks
Maint: 143

Electronics

Computer: 3×TL-14 Model Fb (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EMS jammer (10 hexes; 30 MW), EM masking package (5.6 MW)
Controls: Bridge with 7×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW, 1 crew ea.), 2×TL-14 300-Mj Laser Barbette (Loc: 4/5, 10; Arcs: 1,2,3; 8.3 MW, 1 crew ea.)
Master Fire Directors: 1 TL-14 (5 Diff Mod; Non-Msl; 10 hexes; 1.62 MW, 1 crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
300-Mj Laser Barbette	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (0.784 MW), Grav Compensators (5G; 19.6 MW)
Crew: 22 (7×Engineering, 1×Electronics, 2×Maneuver, 5×Gunnery, 1×Maintenance, 3×Small Craft Flight Crew, 3×Command)
Crew Accommodations: 2×Small Stateroom (0.0005 MW ea.), 8×Large Stateroom (0.001 MW ea.) (multiple-occupancy)
Cargo: 10.8 m³, one small cargo hatch
Small Craft and Launch Facilities: SL external grapple for 20-ton small craft
Air Locks: 3

Notes

As with many other small military designs, the *Gazelle* is very tight. Its 22 crewmembers share accommodations for 18, requiring some "hot bunking."

Without drop tanks, the *Gazelle* consumes 899.465 MW, requiring the contra-grav to be shut down, or the EMS jammer to function with a six-hex short range to make up the difference. With tanks attached, only 749.465 MW are needed.

Although it is streamlined with the drop tanks attached, the *Gazelle* only has contra-grav performance for 300 tons, not 400.

2800 m³ of fuel total (200 tons), 1345 (96 tons) carried in 2 50-ton drop tanks, 1455 (104 tons) internal. 1120 m³ fuel for jump 3 with tanks attached, 1260 m³ for jump 5 without tanks. Fuel purification machinery (7.6 MW), 11.05 hours to refine 2800 m³.

Drop tanks are armored to same level as ship, and equipped with EMM.

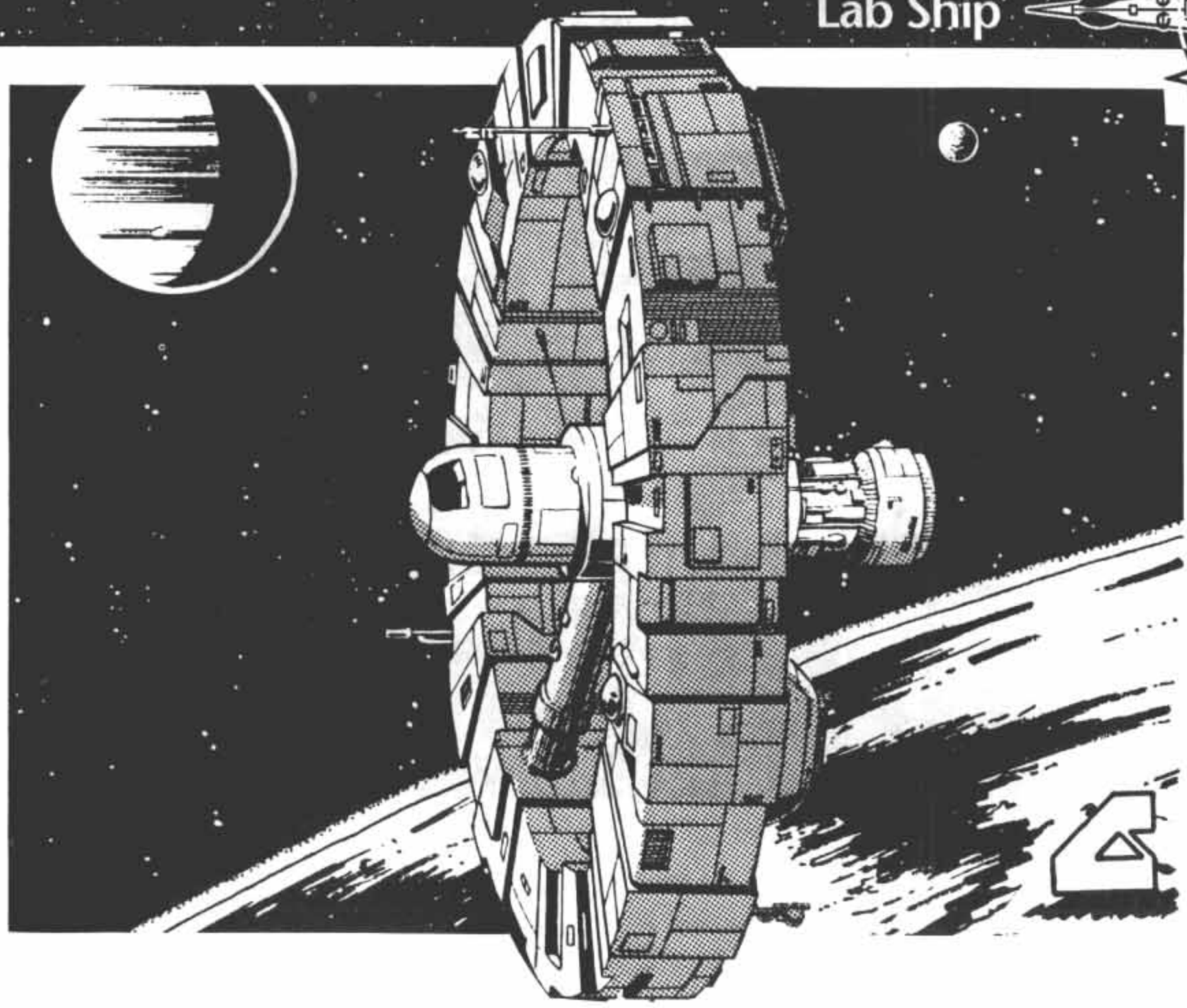
Damage tables below assume drop tanks are attached.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-14: Ant	1-12: Elec, 13-20: Qtrs
2	Ant	Elec
3		Qtrs
4-5	1-10: Small Craft	1-4: LB, 6-20: Qtrs
6-7		Hold
8-9	1: EMMR, 2-14: Small Craft	Hold
10	1-2: EMMR, 3: AL	1-8: LB, 9-20: Hold
11	Small Craft	1-12: Eng, 13-20: Hold
12-13	1-2: EMMR	1-12: Eng, 13-20: Hold
14-15	1: EMMR, 2-14: Small Craft	Hold
16-17	1-2: CH	1-5: LT, 6-7: Hold, 8-20: Eng
18-19	1: Small Craft	1-14: Eng, 15-20: Hold
20		Eng

Systems	
PP-9H	EMMR-(5h)
JD-7H	CG-1H
LS-5H	SSR-(2h)
LB-2H	MD-1H
LT-1H	LSR-1H
FPP-8H	EMM-1H
Hangar-1H	MFD-(4h)
ELS-2H	All Others-(1h)
AG-1H	

Lab Ship



General Data

Displacement: 390/400 tons
Diameter: 76 meters
Price: MCr129.41
Configuration: Open USL
Mass (Loaded/Empty): 2032.38/1352.49
Hull Armor: 10
Volume: 5460/5600 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 265.2 MW Fusion Power Plant (265.2 MW/hit), 1 year duration (0.355 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1 (200 MW/G), no contra-grav
G-Turns: 96 (129.6 using jump fuel), 25 m³ of fuel each
Maint: 74

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 4×workstation, plus 11 other workstations

Armament

4 turret hardpoint sockets fitted. (Loc: 12-15; Arcs: All)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (6G; 27.3 MW)
Crew: 17 (2×Maneuver, 1×Engineering, 1×Electronics, 2×Small Craft Flight Crew, 1×Command, 10×Science Personnel)
Crew Accommodations: 17×Small Stateroom (0.0005 MW ea.)
Cargo: 359.7 m³, one large cargo hatch
Small Craft and Launch Facilities: USL External Grapple for 10-ton Launch, Internal Hangar (Minimal) for Air Raft (one of the crew doubles as air raft pilot), one launch port for air raft
Air Locks: 4

Notes

The Lab Ship itself displaces 390 tons, and with its launch attached displaces 400. Its jump, maneuver, contra-grav drives, and controls are configured to work with the 400-ton figure.

Workstations are provided for all 10 scientists.

Fuel purification machinery (3.55 MW), 27.38 hours to refine 3240 m³ (231.4 tons).

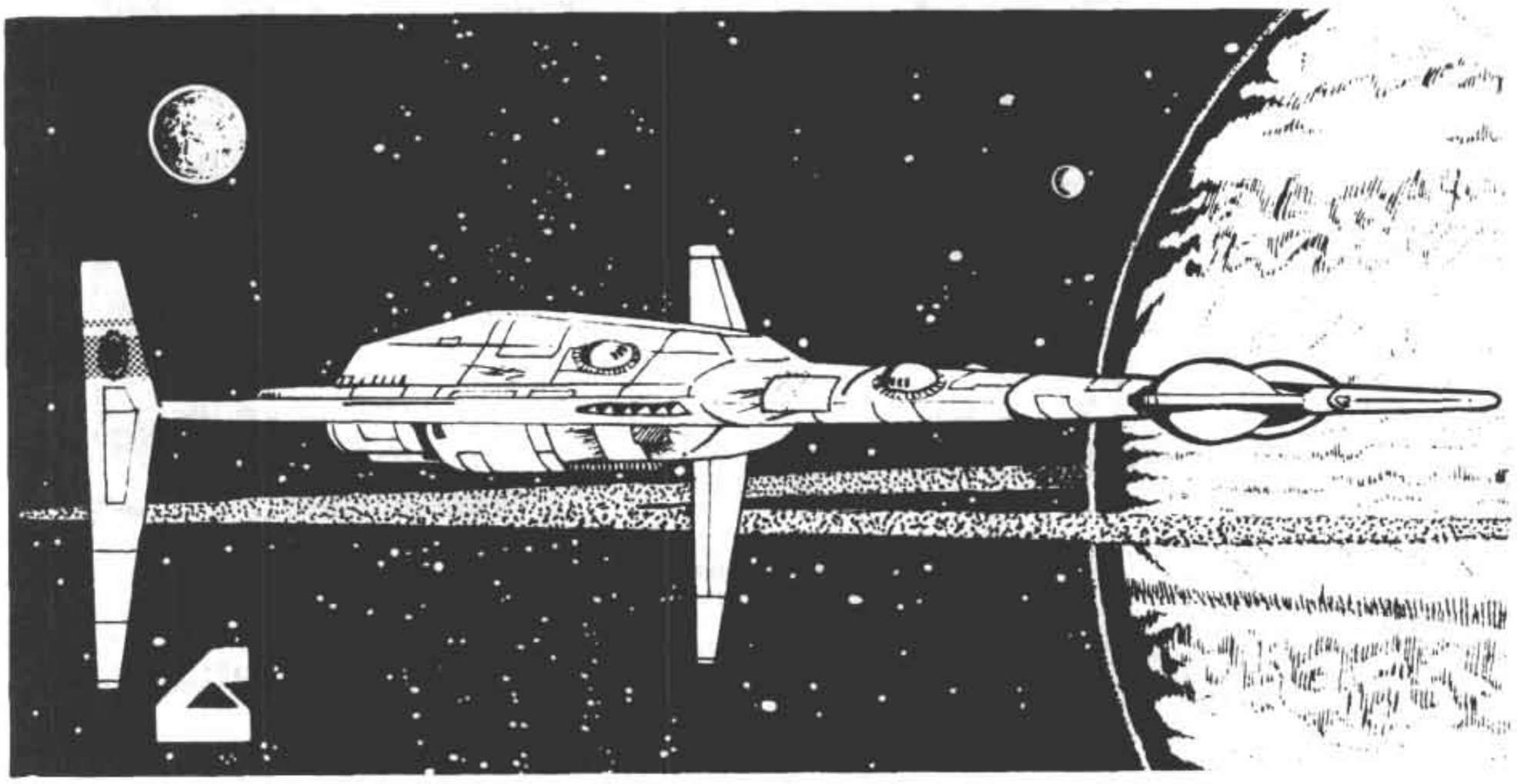
4×Laboratory

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-4: LP, 5-9: CH	Hold
2-9, 16-20		Hold
10-11		1-13: Eng, 14-20: Hold
12-13	Ant	1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
14		1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
15	1-16: Ant, 17-18: AL	1-4: Elec, 5-7: TS, 8-18: Qtrs, 19-20: Hold

Systems	
JD-4H	Grapple-(3h)
PP-1H	MD-(4h)
LS-2H	FPP- 3H
Lab-1H	SSR-(2h)
AG-1H	All Others (1h)
ELS-1H	
Hangar-1H	

Patrol Cruiser



General Data

Displacement: 400 tons
Length: 66 meters
Price: MCr197.5
Configuration: Needle AF
Mass (Loaded/Empty): 3545.28/2933.8
Hull Armor: 42
Volume: 5600 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 886.5 MW Fusion Power Plant (295.5 MW/hit), 1 year duration (39.65 MW power shortfall)
Jump Performance: 3 (1120 m³)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (104.8 using jump fuel), 25 m³ of fuel each
Maint: 106

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 5 other workstations

Armament

Offensive: 2×TL-15 150-Mj Laser Turret (Loc: 2,3; Arcs: 1,2,3,4; 4.2 MW, 1 crew ea.), 2×Missile Turret (Loc: 12,13; 2 ready Msls ea.; 0.15 MW; 1 crew ea.) (total of 4 ready Msls, plus 8 in cargo).
Master Fire Directors: 2 TL-15 (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW, 1 crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (6 G; 28 MW)
Crew: 19 (2×Maneuver, 1×Electronics, 5×Engineer, 6×Gunnery, 3×Small Craft Flight Crew, 2×Command)
Crew Accommodations: 2×Small Stateroom (command crew; 0.0005 MW ea.), 5×Large Stateroom (multiple-occupancy; 0.001 MW ea.)
Cargo: 0 m³, plus storage for eight missiles, one large cargo hatch
Small Craft and Launch Facilities: 30-ton Ship's Boat with internal hangar (Minimal), and one launch port
Air Locks: 4

Notes

The Patrol Cruiser is a rather tight design. The 19 crewmembers share accommodations for 12, requiring "hot bunking" for the gunnery and engineering crew.

The cruiser's total power requirement is 926 MW, limiting it to only 3G performance when the contra-grav is engaged.

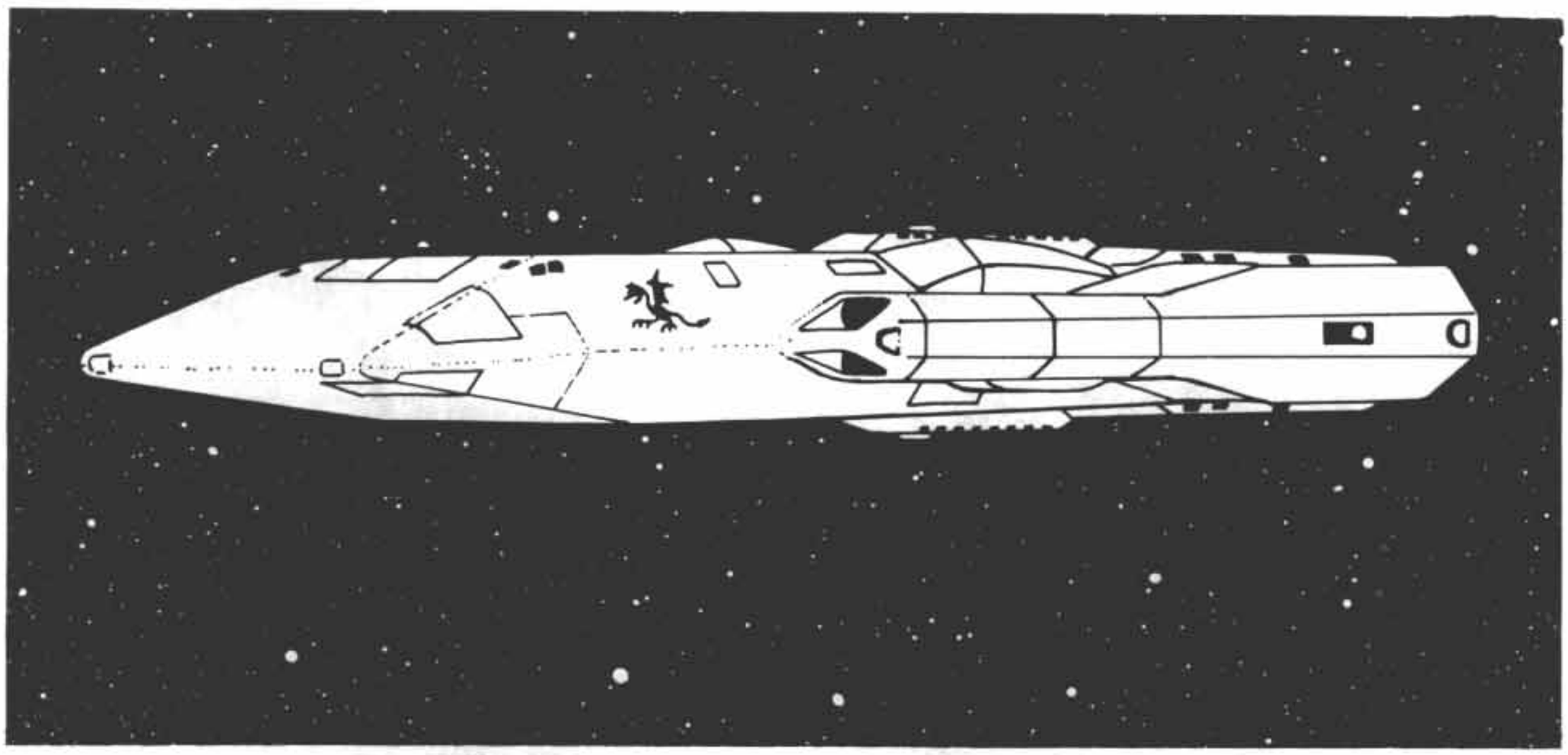
Fuel purification machinery (9.7 MW), 8.1 hours to refine 2620 m³ (187.14 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	1-6: Ant	1-3: LT, 4-17: Hold, 18-20: Elec
3		1-3: LT, 4-20: Hold
4-5, 8-11, 14	Hold	
6	1: AL	Qtrs
7		1-15: Qtrs, 16-20: Hold
12-13		1-3: MT, 4-20: Hold
15		1-19: Hold, 20: Eng
16-19	1-2: EMMR	1-12: Eng, 13-20: Hold
20		Eng

Systems	
JD-5H	MD-1H
PP-3H	LSR-1H
CG-1H	LT-1H
LS-5H	MT-1H
AG-1H	FPP-8H
ELS-2H	MFD-1H
SSR-(2h)	Hangar-8H
EMM-1H	All Others-(1h)
EMMR-(5h)	

Shukugan (Dragon)-Class System Defense Boat



General Data

Displacement: 400 tons
Length: 61 meters
Price: MCr166.79
Configuration: Slab SL
Hull Armor: 101
Volume: 5600 m³
Target Size: S
Tech Level: 12
Mass (Loaded/Empty): 6075.18/5799.18

Engineering Data

Power Plant: 920 MW Fusion Power Plant (48 MW/hit), 1 year duration (7.64 MW excess power)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 112, 25 m³ of fuel each
Maint: 203

Electronics

Computer: 3×TL-12 Mod Fb Computer (0.8 MW ea.)
Commo: 300,000km radio (10 hexes; 10MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), Active EMS 3000km (0 hexes; 8 MW) (use long range for task difficulty in same hex)
ECM/ECCM: EM Masking Package (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 10 other workstations

Armament

Offensive: 2×TL-11 80-Mj Laser Turret (Loc: 10, 11; Arcs: All; 2.2 MW; 1 Crew ea.), 2×Missile Barbette (Loc: 12, 13; 5 ready Msls ea.; 0.15 MW; 1 Crew ea.; 10 ready Msls total, plus 12 in cargo)
Master Fire Directors: 2 TL-12 (4 Diff Mod; Msl 10 hexes; 2 hexes; 1.44 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
80-Mj Laser Turret	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (3G; 28 MW)
Crew: 23 (1×Maneuver, 1×Electronics, 10×Engineering, 6×Gunnery, 2×Maintenance, 3×Command)
Crew Accommodations: 12×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Cargo: 80 m³ (plus storage for 12 missiles), one small cargo hatch
Air Locks: 4

Notes

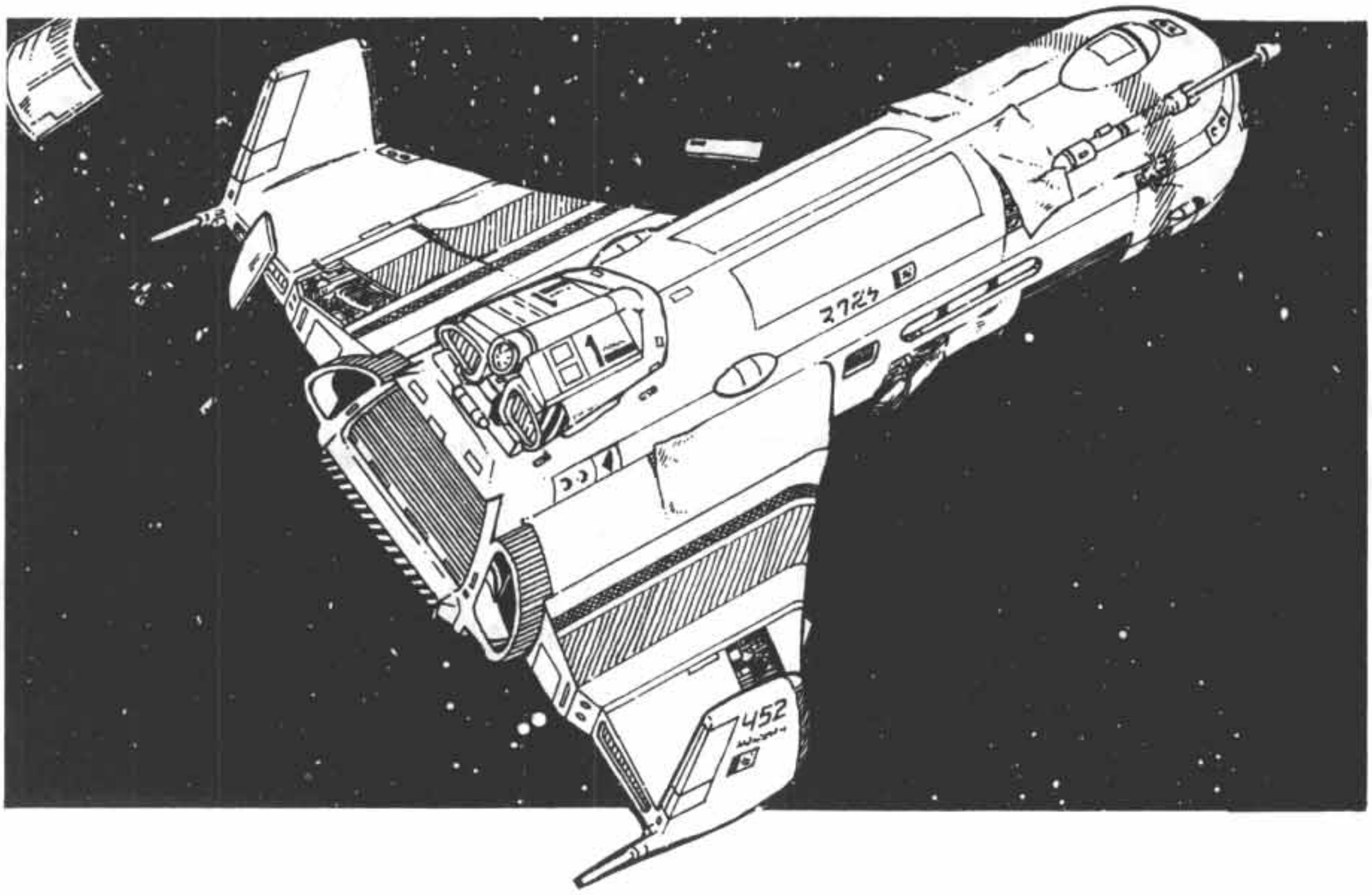
Fuel purification machinery (8.4 MW), 12 hours to refine 2800 m³ (200 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-10: Eng, 11-20: Qtrs
3	1: AL	Qtrs
4-5, 20	1-2: EMMR	Hold
6-7		1-6: Qtrs, 7-20: Hold
8, 14-15		Hold
9		1-10: Eng, 11-20: Hold
10	1-3: Ant, 6-7: CH	1-3: LT, 4-8: Elec, 9-20: Hold
11		1-3: LT, 4-10: Eng, 11-20: Hold
12		1-6: MB, 7-20: Hold
13		1-6: MB, 7-20: Hold
16-17	1-2: EMMR	Eng
18-19		1-10: Eng, 11-20: Hold

Systems	
PP-19H	EMMR-(5h)
FPP-11H	MFD-(2h)
LS-15H	MD-1H
ELS-8H	SSR-(2h)
CG-1H	All Others-(1h)
LT-1H	
MB-1H	
EMM-1H	
AG-1H	

Petty-Class Subsidized Merchant



General Data

Displacement: 390/400 tons
Length: 44 meters
Price: MCr87.65
Configuration: Cylinder AF
Mass (Loaded/Empty): 3906.28/2371.59
Hull Armor: 10
Volume: 5460/5600 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 286 MW Fusion Power Plant (48 MW/hit), 1 year duration (0.04 MW excess power)
Jump Performance: 1(560 m³ fuel)
G-Rating: 1G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (82.4 using jump fuel), 25 m³ of fuel each
Maint: 180

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.06 MW), Active EMS 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 3 other workstations

Armament

4 turret hardpoint sockets fitted (Loc: 2-5; Arcs: 1,2,3)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (3G; 27.3 MW)
Crew: 9 (2×Maneuver, 1×Electronics, 3×Engineering, 2×Steward [double as Small Craft Flight Crew], 1×Command).
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW ea.), 4×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.), 13×Low Berth (0.001 MW ea.)
Cargo: 1306.5 m³, four large cargo hatches
Small Craft and Launch Facilities: 10-ton Launch in AF External Grapple
Air Locks: 4

Notes

The ship itself displaces 390 tons; with its launch, it displaces 400. Jump, maneuver, and contra-grav drives are all configured to support the 400-ton figure.

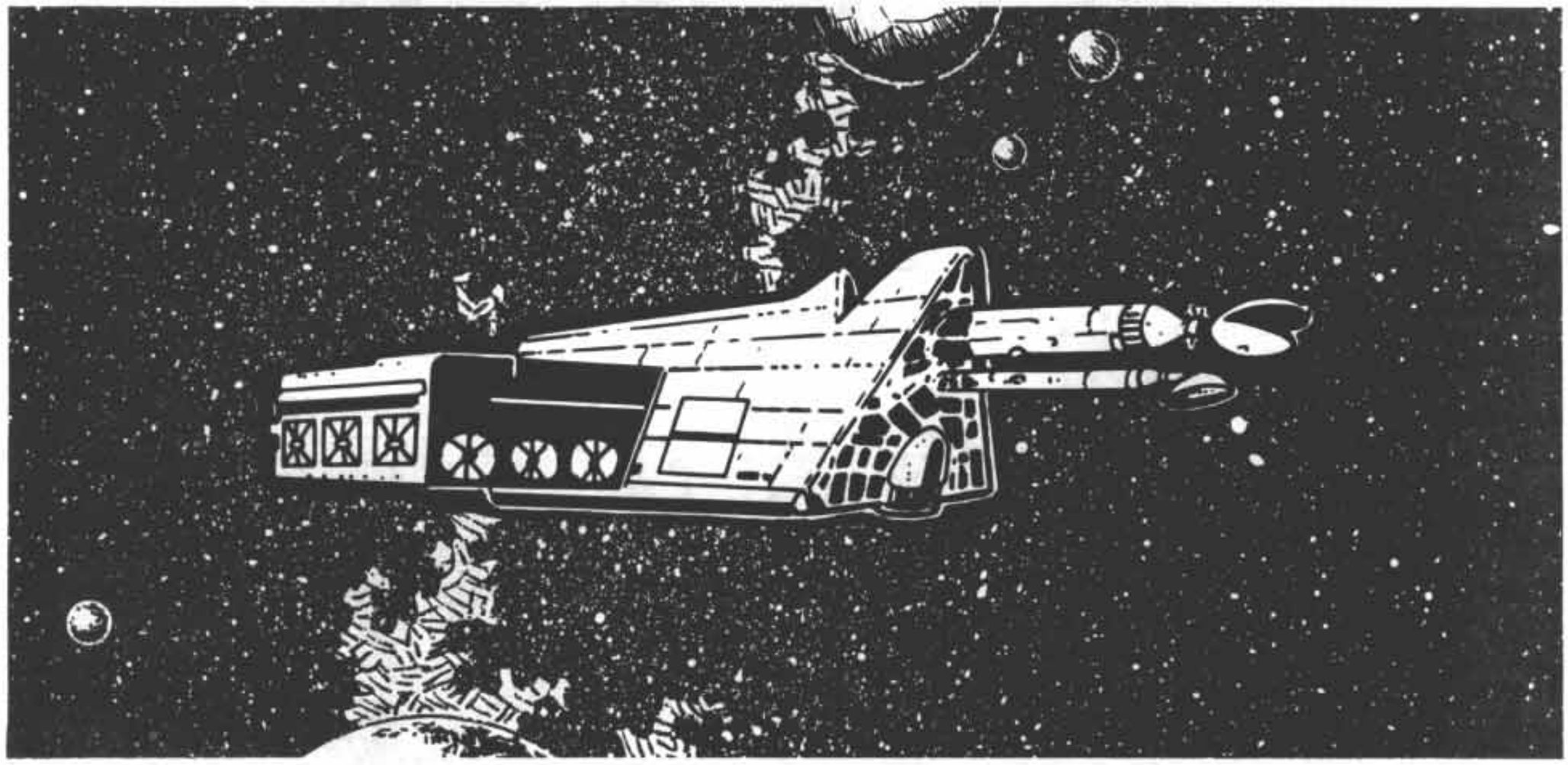
Fuel purification machinery (6.18 MW), 12 hours to refine 2060 m³ (147.14 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-3: Ant	1-6: Elec, 7-20: Qtrs
2-3	1: AL	1-3: TS, 4-17: Qtrs, 18-20: Hold
4-5	1-3: CH	1-3: TS, 4-16: Qtrs, 17-20: Hold
6-13, 16-17		Hold
14		1-9: Eng, 10-20: Hold
15		1-10: Eng, 11-20: Hold
18-19	1-4: CH	1-10: Eng, 11-20: Hold
20		Eng

Systems	
JD-4H	MD-(4h)
PP-6H	SSR-(2h)
CG-1H	FPP-9H
AG-1H	ELS-1H
LSR-1H	All Others-(1h)
LS-2H	
Grapple-1H	

Donosev-Class Survey Ship



General Data

Displacement: 600 tons
Length: 44 meters
Price: MCr306.18
Configuration: Close Structure, USL
Mass (Loaded/Empty): 4076.99/2206.44
Hull Armor: 20
Volume: 8400 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 705 MW Fusion Power Plant (235 MW/hit), 1 year duration (0.0035 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 2G (300 MW/G), no contra-gravity
G-Turns: 104 (148.8 using jump fuel), 37.5 m³ of fuel each
Maint: 112

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×300,000km radio (10 hexes; 10 MW ea.), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: 1×Passive EMS folding array 240,000km (8 hexes; 0.3 MW), 1×Passive EMS folding array 180,000km (6 hexes; 0.2 MW), 2×Active EMS 300,000km (10 hexes; 15 MW ea.), TL-15 Densitometer 0.4 MW), TL-14 Neutrino Sensor (0.01 MW)
Controls: Bridge with 6×Bridge Workstation, plus 4×Crew Workstation

Armament

4 turret hardpoint sockets fitted.

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (6G; 42 MW)
Crew: 15 (2×Maneuver, 2×Electronics, 4×Engineering, 1×Command, 6×Surveyor Specialist)
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW), 7×Large Stateroom (double-occupancy; 0.001 MW ea.)
Cargo: 388 m³, one large cargo hatch
Small Craft and Launch Facilities: 50-ton modular cutter with internal hangar (1 each Fuel Scoop and Lab modules carried), 3×Air Raft with internal hangars, all four with launch ports
Air Locks: 6

Notes

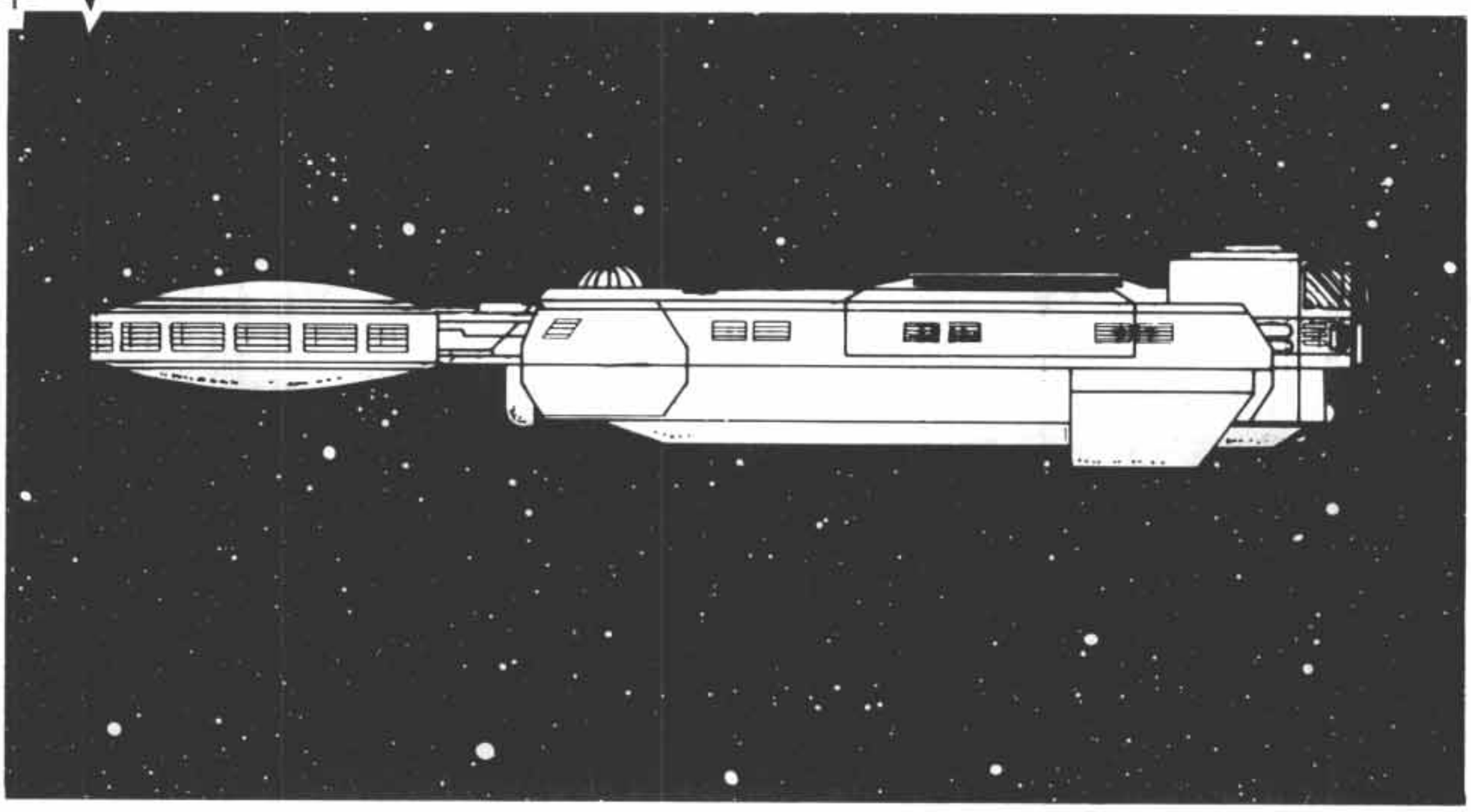
Fuel purification machinery (3.6 MW), 46.5 hours to refine 5580 m³ (398.6 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	1-15: Elec, 16-20: Qtrs
2	1-2: AL, 3-20: Ant	Qtrs
3	Ant	1-10: Qtrs, 11-20: Hold
4-5, 7, 10-12	Ant	Hold
6		Hold
8	1-7: LP, 8-10: CH	1-2: TS, 3-20: Hold
9	Ant	1-2: TS, 3-20: Hold
13-15		Hold
16	1-10: Ant	1-2: TS, 3-20: Hold
17	1-10: Ant	1-2: TS, 3: Eng, 4-20: Hold
18-19	1-9: LP	1-5: Eng, 6-20: Hold
20		Eng

Systems	
JD-7H	Sickbay-1H
PP-3H	All Others-(1h)
SSR-(2h)	
LS-3H	
240K PEMS Ant-2H	
ELS-2H	
LSR-1H	
Hangar-4H	
FPP-3H	
MD-1H	
AG-2H	
Lab-1H	

Bastien-Class Subsidized Liner



General Data

Displacement: 600 tons
Length: 69 meters
Price: MCr169.5
Configuration: Slab SL
Hull Armor: 10
Volume: 8400 m³
Target Size: S
Tech Level: 12
Mass (Loaded/Empty): 4985.02/4154.33

Engineering Data

Power Plant: 426 MW Fusion Power Plant (47 MW/hit), 1 year duration (0.307 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 1G (300 MW/G), Contra-Grav lifters (60 MW)
G-Turns: 76 (120.8 using jump fuel), 37.5 m³ of fuel each
Maint: 249

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.03 MW), Active EMS, 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 4 other workstations

Armament

3 turret hardpoint sockets fitted (Loc: 11; Arcs: All; Loc: 12,13; Arcs: 2,3,4)

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 12 (2×Maneuver, 1×Electronics, 4×Engineering, 1×Maintenance, 2×Stewards [double as Small Craft Pilots], 1×Command, 1×Medical).
Crew Accommodations: 1×Small Stateroom (0.0005 MW ea.), 6×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 21×Small Stateroom (0.0005 MW ea.), 20×Low Berth (0.001 MW ea.)
Cargo: 429.6 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton Launch in Internal Hangar (Minimal), with one launch port
Air Locks: 6

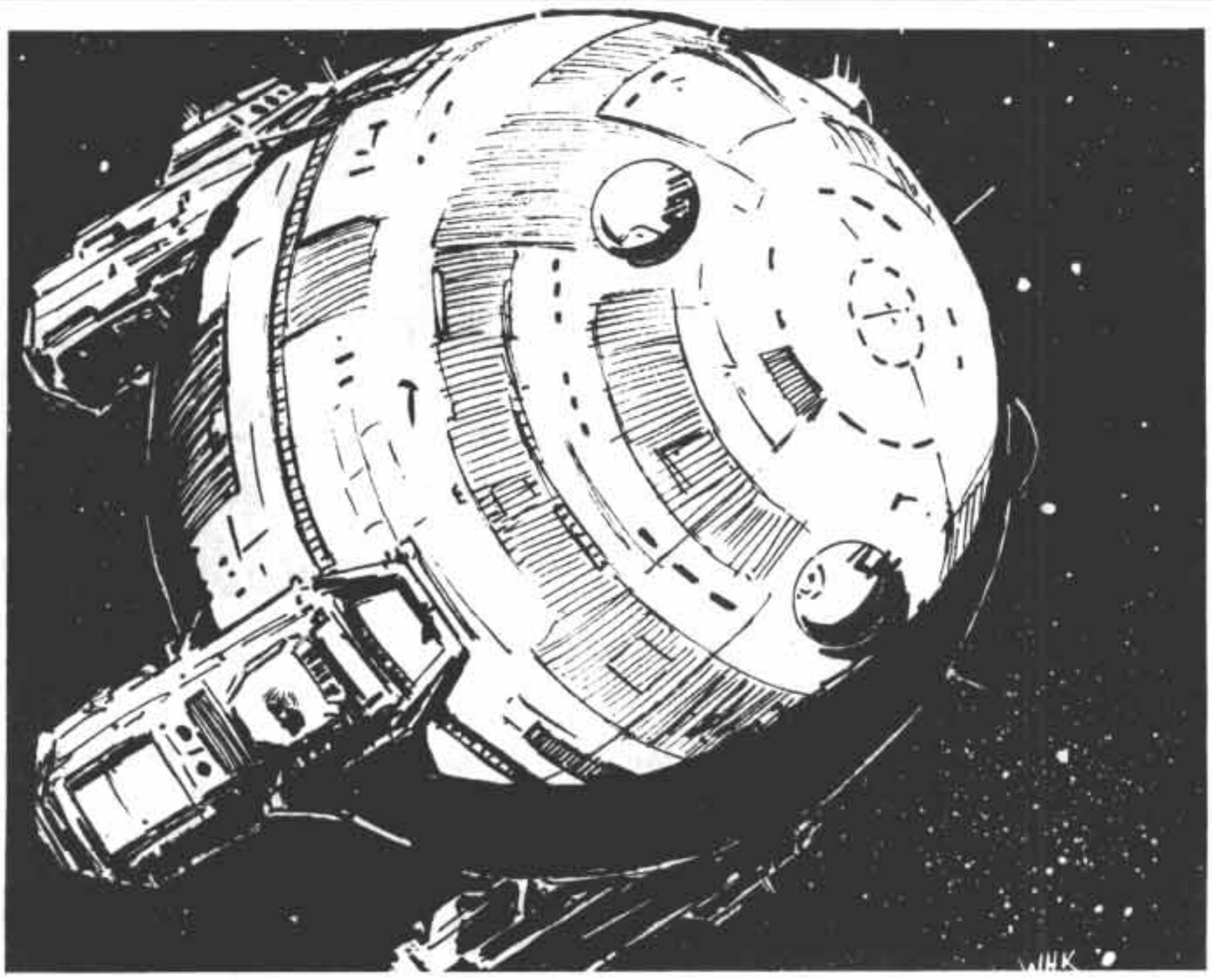
Notes

The *Bastien*-class liner is quite similar to the more well-known Stellar class, but keeps its launch in an internal hangar, rather than in an external grapple, and carries a different arrangement of turret hardpoints.
Fuel purification machinery (10.44 MW), 15.62 hours to refine 4530 m³ (323.6 tons)

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-4: Elec, 5-20: Qtrs	JD-10H
2-3		Qtrs	PP-9H
4	1-2: AL	1-12: Qtrs, 13-20: Hold	CG-1H
5, 8-9, 14-15		Hold	LSR-1H
6-7	1-3: LP	Hold	SSR-(2h)
10	LP	Hold	FPP-14H
11-13		1-2: TS, 3-20: Hold	LS-3H
16-17	1: CH	1-5: Eng, 6-20: Hold	AG-2H
18		1-19: Eng, 20: Hold	ELS-2H
19-20		Eng	MD-1H
			Hangar-3H
			All Others-(1h)

Broadsword-Class Mercenary Cruiser



General Data

Displacement: 800 tons
Length: 28 meters
Price: MCr315.1
Configuration: Sphere SL
Mass (Loaded/Empty): 6491.1/3723.3
Hull Armor: 28
Volume: 11,200 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 1050 MW Fusion Power Plant (262.5 MW/hit), 1 year duration (5.206 MW power shortfall)
Jump Performance: 3 (2240 m³ fuel)
G-Rating: 2 (400 MW/G), Contra-Grav lifters (80 MW)
G-Turns: 48 (92.8 using jump fuel), 50 m³ of fuel each
Maint: 177

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: 300,000km EMS jammer (10 hexes; 30 MW), EM Masking (11.2 MW)
Controls: Bridge with 15×Workstation, plus 7 other workstations

Armament

Offensive: 8×TL-15 150-Mj Laser Turret (Loc:2-5; Arcs: 1,2,3; Loc: 12-15; Arcs: 2,3,4,5; 4.2 MW ea.; 1 Crew ea.)
Master Fire Directors: 2 TL-15 (6 Diff Mod; No Msl; 10 hexes; 1.56 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (2.24 MW), Gravitic Compensators (6G; 56 MW)
Crew: 72 (7×Engineering, 1×Electronics, 2×Maneuver, 10×Gunnery, 2×Maintenance, 31×Ship's Troops, 6×Small Craft Flight Crew, 10×Command, 2×Steward, 1×Medical).
Crew Accommodations: 26×Small Stateroom (single/double-occupancy; 0.0005 MW ea.), 8×Large Stateroom (quadruple-occupancy; 0.001 MW ea.)
Cargo: 555 m³, two large cargo hatches
Small Craft and Launch Facilities: 2×50-ton modular cutters in docking rings, each with its own launch port (each cutter with one fuel scoop module and one ATV module), 2×ATV (in modules), 1×Air Raft with internal hangar (Minimal) and launch port
Air Locks: 8

Notes

This *Broadsword* variant gives up G-hours and internal comfort for improved jump and maneuver performance, plus an ECM/ECCM suite. Because of its power shortfall, the ship's EMS jammer may only be run at the 180,000 km (6 hexes; 22 MW) power level while at full thrust or while the CG lifters are engaged.

The docking ring housings for the two cutters do not allow maintenance or repair work to be done on them while they are docked. The modules may not be swapped while the cutters are docked; this must be done outside of the ship.

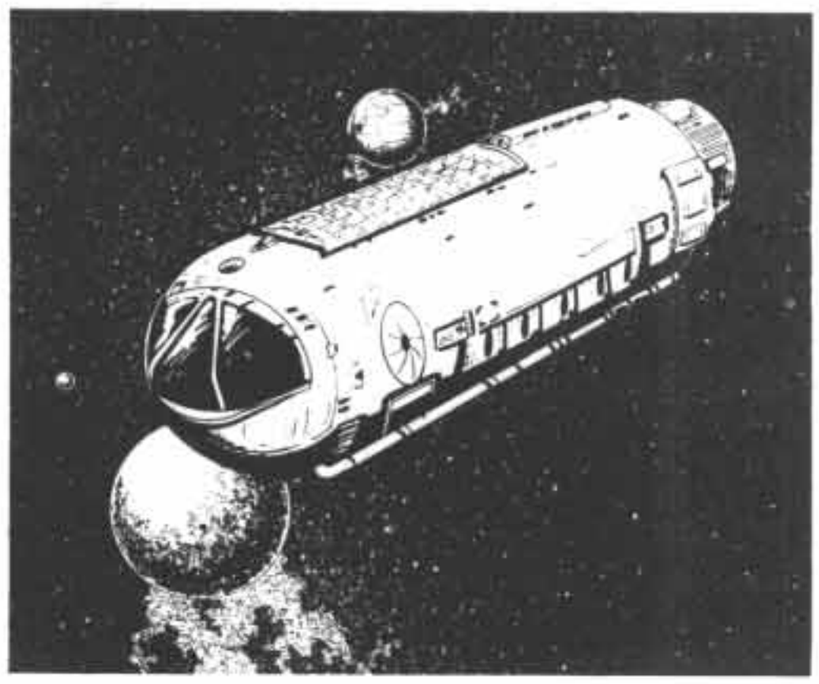
Fuel purification machinery (9.067 MW), 15.35 hours to refine 4640 m³ (331.4 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-2: LT, 3-14: Qtrs, 15-20: Hold
3-5	1: AL	1-2: LT, 3-14: Qtrs, 15-20: Hold
6-9	1-5: EMMR	Hold
10-11		Hold
12		1-2: LT, 3-20: Hold
13	1-3: CH	1-2: LT, 3-20: Hold
14	1-3: LP	1-2: LT, 3-17: Hold, 18-20: Qtrs
15		1-2: LT, 3-17: Hold, 18-20: Eng
16-19	1-10: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems	
JD-9H	MD-1H
PP-4H	FPP-8H
CG-2H	SSR-(2h)
ELS-2H	EMM-1H
LT-1H	EMMR-(11h)
LSR-1H	All Others-(1h)
LS-3H	
AG-3H	
MFD-(2h)	
Hangar-5H	

Launch & Ship's Boat



General Data

Displacement: 10 tons
Length: 14 meters
Price: MCr9.9
Configuration: Cylinder, SL
Mass (Loaded/Empty): 83.99/74.83
Hull Armor: 14
Volume: 140 m³
Target Size: VS
Tech Level: 12

Engineering Data

Power Plant: 14MW Fusion Power Plant (14 MW/hit), 1 year duration (0.255 MW power shortfall)
G-Rating: 1 (5 MW/G), Contra-Grav lifters (1 MW)
G-Turns: 16, 0.625 m³ of fuel each
Maint: 3

Electronics

Computer: 2×TL-12 Model St (0.4 MW each)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation

Armament

None

Accommodations

Life Support: Basic (0.014 MW), Gravitic Compensators (3G; 0.7 MW)
Crew: 2 (1×Maneuver, 1×Electronics)
Crew Accommodations: 2×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 8.46m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 1

Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. st shut down radio or maser when taking off.

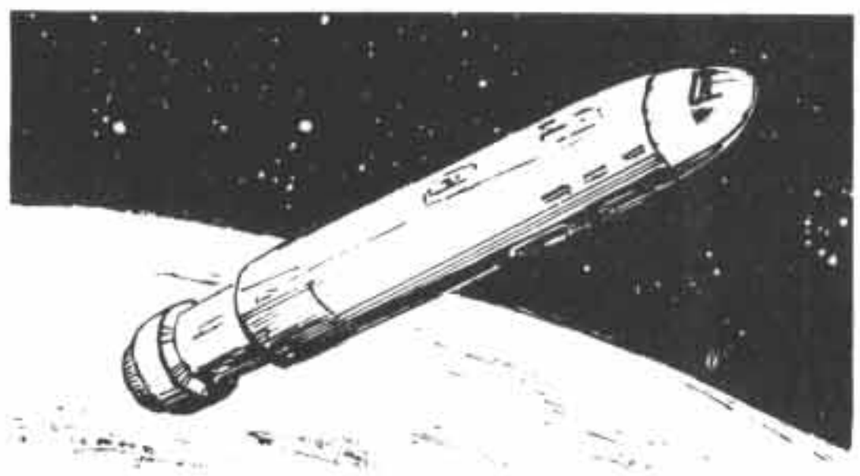
No fuel purification machinery, 10 m³ (0.7 tons) of reaction mass is carried.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Hold	PP-1H
2-3		1-5: Elec, 6-15: Qtrs, 16-20: Hold	LS-1H
4-5, 8-9	1-2: Ant	Elec	ELS-(2h)
6	CH	Hold	All Others-(1h)
7	1-4: AL	Hold	
10-17		Hold	
18-19		1-5: Eng, 6-20: Hold	
20		Eng	

General Data

Displacement: 30 tons
Length: 27.6 meters
Price: MCr17.67
Configuration: Needle SL
Mass (Loaded/Empty): 428.08/378.48
Hull Armor: 40
Volume: 420 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 90MW Fusion Power Plant (45 MW/hit), 1 year duration (17.297 MW excess power)
G-Rating: 4 (15 MW/G), Contra-Grav lifters (3 MW)
G-Turns: 96, 1.875 m³ of fuel each
Maint: 14

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Armament

None

Accommodations

Life Support: Basic (0.042 MW), Gravitic Compensators (3G; 2.1 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 37 m³, one small cargo hatch
Air Locks: 1

Notes

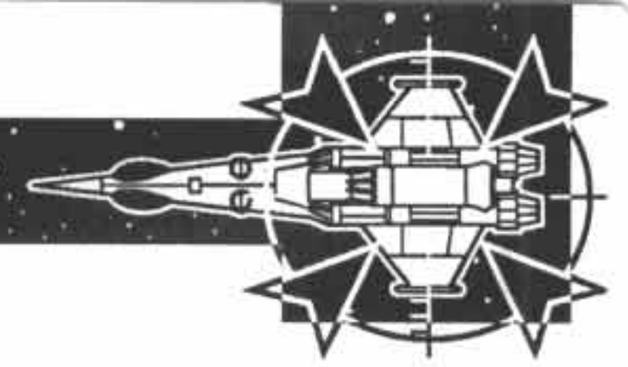
Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery, 180m³ (12.86 tons) of reaction mass is carried.

The Ship's Boat design has 17.3 MW of power left over, which allows the mounting of weapons or more powerful sensors at the expense of cargo space.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Elec	PP-2H
2-3	1-4: Ant	1-3: Elec, 4-8: Qtrs, 9-20: Hold	1-10: Elec, 11-4
4-5	1-4: Ant	1-4: Elec, 5-9: Qtrs, 10-20: Hold	LS-1H
6-7, 10-15		Hold	AG-(2h)
8	1-2: AL	Hold	ELS-1H
9	1-14: CH	Hold	All Others-(1h)
16-17		1-12: Hold, 13-20: Eng	
18-19		1-11: Hold, 12-20: Eng	
20		Eng	

Modular Cutter & Shuttle



General Data

Displacement: 50 tons
Length: 22.4 meters
Price: MCr18.98 (cutter alone)
Configuration: Needle SL
Mass (Loaded/Empty): 353.82/340.72 cutter alone
727.45/684.96 with fuel module
Hull Armor: 30
Volume: 700 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 100 MW Fusion Power Plant (50 MW/hit), 1 year duration (10.9196 MW excess power used to power modules)
G-Rating: 3 (25 MW/G), Contra-Grav lifters (5 MW)
G-Turns: 48, 3.125 m³ of fuel each
Maint: 13, +13 for fuel module

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Accommodations

Life Support: Basic (0.0294 MW), Gravitic Compensators (3G; 1.47 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: Flight Deck
Passenger Accommodations: Varies depending upon module fitted.
Cargo: Varies depending upon module fitted (388 m³ in cargo module), 2.6 m³ in cutter
Air Locks: 1

Notes

Modular Cutter may be fitted with a variety of 29-ton (406m³) modules, including lab module (336.3 tonnes loaded/284.4 empty, MCr14.12), passenger/cargo module (311.59 tonnes loaded/133.59 empty, MCr0.4, carries 30 passengers and 178 m³ cargo—passenger seats, 7 m³ each, can be traded for cargo or for smaller seats, but if cargo mass exceeds 284 tonnes, cutter G-rating will drop to 1G), ATV module (211.84 tonnes loaded/161.84 empty, MCr0.16, includes space for a single ATV of up to 50 tonnes).

Data assumes the fitting of a fuel scoop module (373.63 tonnes loaded/344.24 empty, MCr0.17). The module can scoop and carry 277 m³ (19.8 tons) of fuel and has fuel purification machinery sufficient to refine 277 m³ in 6 hours.

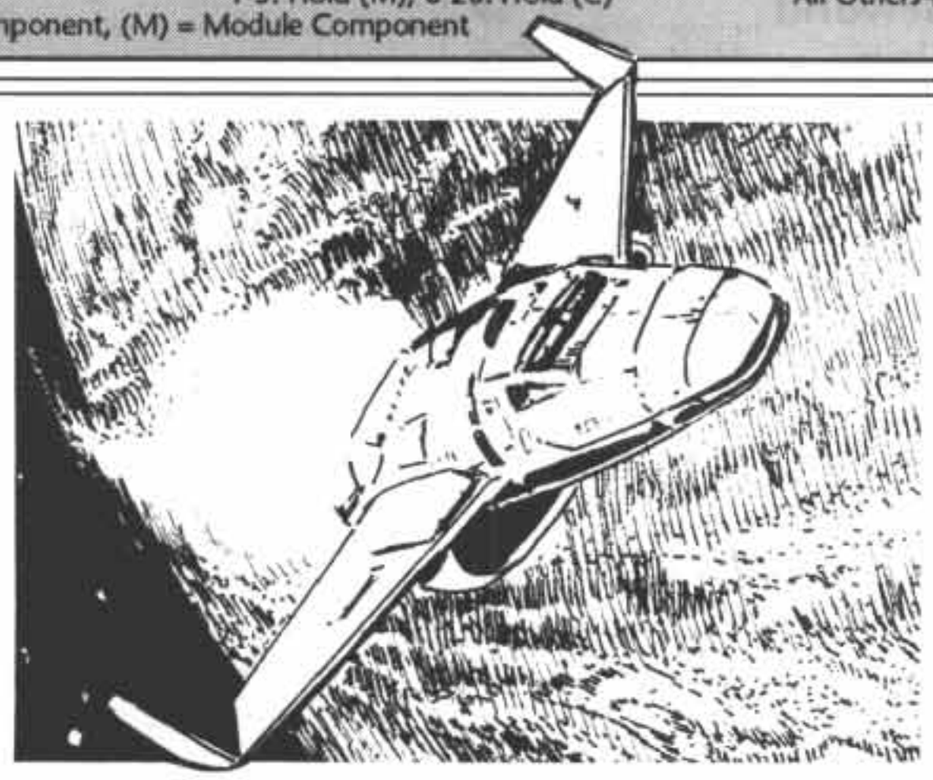
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-10: Elec (C), 11-20: Qtrs (C)	PP-2H
2-3	1-2: AL	1-5 Qtrs (C), 6-10: Elec, 11-15: Hold (C), 16-20: Eng (M)	FPP-3H
			LS-1H
4-5		1-15: Hold (C), 16-20: Hold (M)	MD-(2h)
6-9, 11-15		1: Eng (M), 2-20: Hold (M)	ELS-1H
10, 20		Eng (C)	CG-(2h)
16-19		1-5: Hold (M), 6-20: Hold (C)	All Others-(1h)

(C) = Cutter Component, (M) = Module Component

General Data

Displacement: 95 tons
Length: 27.6 meters
Price: MCr29.04
Configuration: Cylinder AF
Mass (Loaded/Empty): 953.11/711.21
Hull Armor: 31
Volume: 1330 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 170 MW Fusion Power Plant (42.5 MW/hit), 1 year duration (3.591 MW excess power)
G-Rating: 3 (4.75 MW/G), Contra-Grav lifters (9.5 MW)
G-Turns: 96, 5.9375 m³ of fuel each
Maint: 34

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-7: Ant	1-12: Elec, 13-20: Qtrs	PP-4H
2		1-5: Qtrs, 6-20: Hold	LS-2H
3	1: AL	Hold	ELS-1H
4-10, 12-17	Hold		MD-(3h)
11		1-13: TS, 14-20: Hold	AG-1H
18-19	1-5: CH	1-11: Hold, 12-20: Eng	CG-(4h)
20		Eng	All Others-(1h)

Armament

1 turret hardpoint socket fitted (Loc: 11; Arc: 2,3,4)

Accommodations

Life Support: Basic (0.133 MW, Gravitic Compensators (3G; 6.65 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 80×Seat (Adequate)
Cargo: 202m³, one large cargo hatch
Air Locks: 1

Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery is fitted, 570m³ (8.14 tons) of reaction mass carried.

Traveller® Character Generation Worksheet

1. Name _____

2. Race _____

3. Basic Attributes (2D6–1 each, assigned as desired. If attributes total less than 36, you may add points as desired to bring the total up to 36. Aging, homeworlds, and/or activities may raise or lower certain attributes.)

Attribute	*Roll*	*Mods*	*Final*
Strength (STR)	___	___	___
Agility (AGL)	___	___	___
Constitution (CON)	___	___	___
Intelligence (INT)	___	___	___
Education (EDU)	___	___	___
Charisma (CHR)	___	___	___

Additional Attributes

Psionic Strength (PSI)	___	___	___

Psionic strength is only rolled upon examination (see page 246).

Social Level (SOC)	___	___	___

Roll: Roll/allocation; *Mods:* Modifications

4. Homeworld _____ SP___

Sz___ Atm___ Hyd___ Grv___

Pop___ Gov___ Law___ TL___

5. Careers

1st Term _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

2nd Term _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

3rd Term _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

4th Term _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

5thTerm _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

6th Term _____
- Scndry Act _____
- Contact _____
- Spec Assignmt _____
- Promotion _____ Ship DM _____

6. Skills

Skill Name	*Level*
_____	_____
_____	_____
_____	_____

Character

Player

Gender

Homeworld

Age

Universal Personality Profile

STR	AGL	CON	INT	EDU	CHR	PSI	SOC
						-	-

Initiative ____ Rank ____

TRAVELLER: THE NEW ERA

HOME WORLD DATA

Starport ____

Size ____

Atmosphere ____

Hydrographics ____

Gravity ____

Population ____

Government ____

Law Level ____

Tech Level ____

SKILLS & ATTRIBUTES

Strength (STR) ....

Agility (AGL) ....

Constitution (CON) ....

Intelligence (INT) ....

Education (EDU) ....

Charisma (CHR) ....

Psionic Strength (PSI) ....

DERIVED VALUES

Weight ____ Load ____

Throw Range ____ Unarmed Combat Damage ____

HIT CAPACITY

	Current	Scratch	(Base) Slight	Serious	Critical
Head					+
Chest					+
Abdomen					+
Right Arm					+
Left Arm					+
Right Leg					+
Left Leg					+

CONTACTS

#	*Type*

AMMO AND NPC RECORDS

Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
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Magazine 33
Caliber _____
ID _____

Magazine 33
Caliber _____
ID _____

100-Round Belt/ Power Pack
Type/Caliber _____
ID _____

100-Round Belt/ Power Pack
Type/Caliber _____
ID _____

100-Round Belt/ Power Pack
Type/Caliber _____
ID _____

100-Round Belt/ Power Pack
Type/Caliber _____
ID _____

100-Round Belt/ Power Pack
Type/Caliber _____
ID _____

NPC: _____
Experience Level: _____
Physical Attributes: _____
Combat Assets: _____

Other Assets: _____

Initiative: _____ Unarmed Cbt Dmg: _____
Motivation Primary: _____
Secondary: _____
Weapon: _____
Magazines: _____
Special Notes: _____

Wounds

Slight Wound: -1 Initiative

Seriously wounded: -3 Initiative, STR X 1/2

All boxes filled = dead or unconcious (See TNE page 288-289)

NPC: _____
Experience Level: _____
Physical Attributes: _____
Combat Assets: _____

Other Assets: _____

Initiative: _____ Unarmed Cbt Dmg: _____
Motivation Primary: _____
Secondary: _____
Weapon: _____
Magazines: _____
Special Notes: _____

Wounds

Slight Wound: -1 Initiative

Seriously wounded: -3 Initiative, STR X 1/2

All boxes filled = dead or unconcious (See TNE page 288-289)

COMBAT TASKS SUMMARY

Unarmed Melee

Attack Type	*Difficulty*	*Asset*	*Effect*
Hand Strike	Difficult	Unarmed Martial Arts	Damage UCDR*
Kick	Difficult	Unarmed Martial Arts	Damage UCDR*x1.5
Block	Formidable	Unarmed Martial Arts	Avoid Strike/Lose Action
Aimed Strike	Formidable	Unarmed Martial Arts	Damage Chosen Location
Leaping Kick	Difficult	Agility**	Damage 2xAtkr's CON
Avoid Leaping Kick	Difficult	Agility**	Avoid Attack/Lose Action
Grapple	Average	Agility**	Controlling "Hits" UCDR*
Grapple Escape	Average	Agility**	Remove Controlling "Hits" UCDR*
Strangling	Average	Agility**	Damage UCDR*
Strangle Block	Average	Agility**	Avoid Attack/Lose Action
Combat Throw	Formidable	Unarmed Martial Arts	Damage 2xDefender's CON
Limit Throw Damage	Difficult	Agility**	Damagex1/2
Diving Blow	Auto if not avoided		([Atkr's CONx2]+1D6) – (Dfndr's STR+CON)
Avoid Diving Blow	Average	Agility**	Avoid Diving Blow

*UCDR = character's unarmed combat damage rating.
**Plus Acrobatics skill, if any.

Armed Melee

Attack Type	*Difficulty*	*Asset*	*Effect*
Attack	Difficult	Armed Martial Arts*	Damage by Weapon
Block	Formidable	Armed Martial Arts**	Avoid Strike/Lose Action
Aimed Attack	Formidable	Armed Martial Arts*	Damage Chosen Location

*Some weapons have die modifiers.
**Must have object to block with.

Thrown Weapon

Attack Type	*Difficulty*	*Asset*	*Effect*
Throw	Difficult	Thrown Weapon	Damage STR+1D6*
Throw, Long Range	Formidable	Thrown Weapon	Damage STR+1D6*

*For most objects. Throwing knife is always 1D6; grenades do explosive damage.

Direct Fire Combat

Attack Type	*Difficulty*	*Asset*	*Effect*
Aimed Fire, Short Range	Average	Appropriate to Weapon	Damage by Weapon
Aimed Fire, Medium Range	Difficult	Appropriate to Weapon	Damage by Weapon
Aimed Fire, Long Range	Formidable	Appropriate to Weapon	Damage by Weapon
Aimed Fire, Extreme Range	Impossible	Appropriate to Weapon	Damage by Weapon
Quick Fire (any range)*	+1 Level*	Appropriate to Weapon	Damage by Weapon
Fire, Target Obscured	+1 Level	Appropriate to Weapon	Damage by Weapon
Fire, Automatic	**	**	Damage by Weapon

*Modify difficulty level based on Aimed Fire, not possible at extreme range.
**See automatic fire rules (page 276).

Indirect Fire Combat

Attack Type	*Difficulty*	*Asset*	*Effect*
Conventional	Formidable	Forward Observer*	Explosive Damage
Hand-Held	Impossible	Grenade Launcher*	Explosive Damage

*Or appropriate weapon asset of the firing character, whichever is lower. Bonuses for repeated fire.

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Science Fiction Roleplaying Game

TRAVELLER®
The New Era

0303

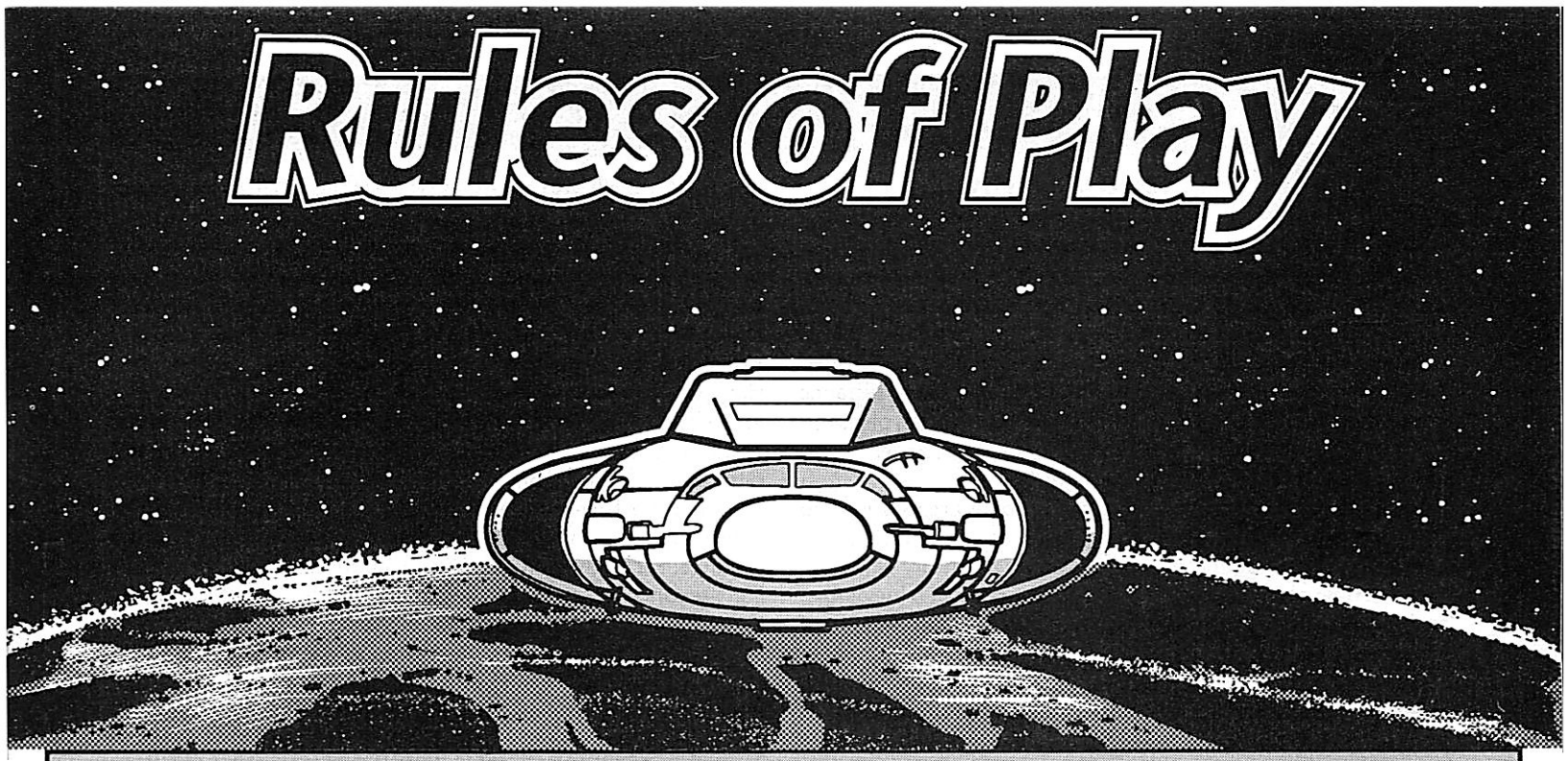
BRILLIANT LANCES™

Traveller Starship Combat



GDW

Rules of Play



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BRILLIANT LANCES

INTRODUCTION

The universe of **Traveller** is known space several thousand years in the future. Humankind has explored and settled over 11,000 worlds, and inhabits a volume of space hundreds of parsecs across. On its journey to the stars, it met dozens of alien races. It befriended some, warred on others, and maintained an uneasy distance from others still. It turned the worlds it owned into safe, pleasant, technological wonderlands. Then, in less than a dozen years, greed and stupidity destroyed everything.

Now, 70 years later, small groups of humans are returning to the stars. The worlds they find, however, are much more dangerous places than they were less than a century earlier. In the uncertain environment of the New Era, conflict is inevitable, and the first place that conflict is joined is in the cold vacuum of space.

However, space is vast, and the distances which must be defended are so large that the passage of light itself is measured in seconds. At these distances, opposing ships are invisible to each other; an entire planet appears only the size of a thumbnail. In order to strike each other at these distances, warships are fitted with sensors and fire control which are accurate to tens of meters, a mere one-30 millionth of the range. Weapons that can take advantage of these precise measurements must travel as fast as physics allows: the speed of light. Many of these bolts will not strike home, so each one that does must hit hard. Like ancient jousting knights, the warships of the 57th century seek to score the crucial first hit that will put the enemy at a decisive disadvantage. To do this, they send powerful bolts of pure energy—relativistic particles and bundles of coherent photons—sizzling into the vast darkness. These bolts, silent but blindingly bright, strike the enemy hulls with mathematically perfect violence, piercing and rending them like brilliant lances.

COMPONENTS

Brilliant Lances contains two rules booklets, three 22"x31" maps, two sheets of die-cut cardboard game markers, two two-sided reference cards, a pad of forms to be used in the game, two six-sided dice, and a 20-sided die. Not included in **Brilliant Lances**, but necessary for play, are several pencils. Players may also find that a calculator is helpful.

Brilliant Lances is one of many games and supplementary products intended for use with the **Traveller: The New Era** science-fiction roleplaying game. However, it is also intended as a stand-alone space combat game, and can be played and enjoyed on its own by players who never intend to play any other **Traveller** product. At many points in the rules below, references are made to concepts detailed elsewhere in the **Traveller** line of materials. While familiarity with these other products may enhance the players' enjoyment of **Brilliant Lances**, none of these are necessary to understand or play this game. When referring to the **Traveller: The New Era** roleplaying game rulebook, the rules below will sometimes use the abbreviation "TNE."

Rules Booklets: These booklets include the 32-page *Rules of Play* booklet that you are reading at this moment, and a 48-page *Technical Booklet*. The *Rules of Play* booklet presents the rules necessary to play **Brilliant Lances**, as well as the scenarios with which the game is played.

The *Technical Booklet* contains rules that players can use to design their own starships. These are the same rules that were used to create the starship designs that are included with **Brilliant Lances**, and in other **Traveller: The New Era** products. Players of **Brilliant Lances** need not use or master these design rules. However, they will need the ship data profiles that are included in the back of the *Technical Booklet*. These data profiles present all of the ships used in **Brilliant Lances** with all of the statistics and ratings needed for play.

Maps: The three maps are all identical, and portray the vastness of open space within a hexagonal grid which is used to measure distance. Each hexagon measures 30,000 kilometers, or 1/10 of a light-second (the distance that light travels in 1/10 of a second). Note the way that the hexagonal pattern runs off of the map edges. These maps may be butted up to each other along their short or long edges to form a continuous hexagonal grid. Players may also order additional maps from GDW to create as large a playing area as desired.

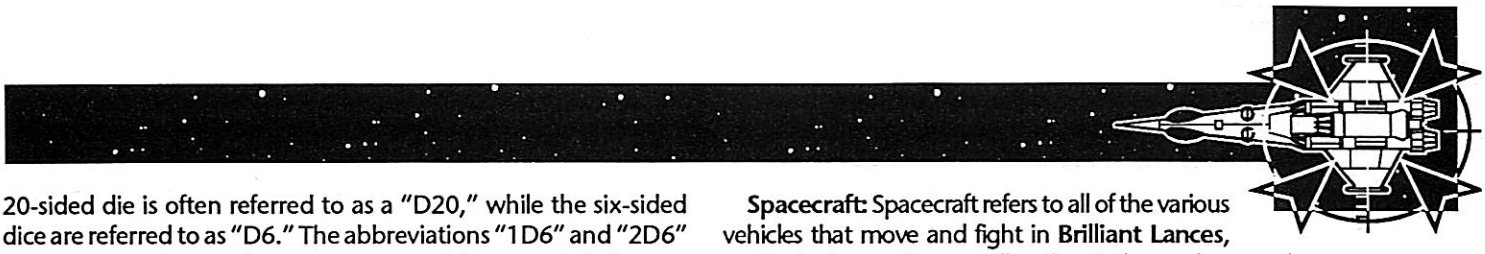
Counters: The two die-cut counter sheets provide a total of 183 cardboard pieces. Thirty of these are large, measuring 1 1/2 inches square, 21 measure 1 inch square, and the remaining 132 pieces measure 1/2 inch square. These pieces are used in two ways, as "counters" and "markers." A piece which represents a spacecraft, sensor drone, missile, planet, or other object in the game is called a "counter." A marker is a piece which is used to represent the status of certain systems (such as Velocity or Heading markers) or conditions on the map (such as Bogey, Active, and Target Lock markers).

Players who are familiar with wargames will notice that the spacecraft counters do not have any statistics or game values printed on them, only an ID number to help players in telling the counters apart. No values are printed on them because **Brilliant Lances** is intended to allow use with starship miniatures. RAFM is producing a line of official **Traveller: The New Era** starships which are intended for use with this game, but players are free to use any miniatures they like, or to simply use the counters provided if they do not wish to purchase miniatures. Either way, the statistics and combat values for each craft are recorded on separate data profiles and control panels. Players must simply note which playing piece in the board is assigned to which data sheets.

Control Panel Pad: The pad contains a number of copies of Spacecraft Control Panels and Spacecraft Log Sheets for use in the game, one on each side of each sheet. The Control Panels are used to each keep track of the operations and circumstances of an individual spacecraft. The Log Sheets are used to keep track of unmanned spacecraft such as missiles and sensor drones. Be sure to save at least one clean sheet in order to make additional copies. GDW grants permission for players to make photocopies of these sheets as needed to provide control panels and log sheets for playing **Brilliant Lances**.

Charts: Two cardstock charts are included, each printed on both sides. These are player aids cards printed with frequently used charts for quick reference. Some of these charts appear in the *Rules of Play* booklet, but keep these cards handy as you read the rules so you can refer to charts that appear only on the cards.

Dice: The three dice included in the game are used to resolve the success of various sensor and combat tasks in the game. The



20-sided die is often referred to as a "D20," while the six-sided dice are referred to as "D6." The abbreviations "1D6" and "2D6" are used to indicate when one or two of the six-sided dice are rolled to determine a result. When 2D6 are rolled, the results of the two dice are added together to yield a result from 2-12. In some cases the rules will refer to "1D10," which requires the use of the 20-sided die. When rolling the D20 for a D10 result, disregard the first (tens place) digit of the result for a result of 1-10. Thus 1 and 11 equal 1, 2 and 12 equal 2, up to 10 and 20 both yielding a result of 10.

GENERAL COURSE OF PLAY

Brilliant Lances is played in scenarios, each of which represents a hostile encounter between two or more spacecraft. A hostile encounter involves detecting the hostile vessel and maneuvering to intercept or avoid it. Combat involves pinpointing targets with fire control sensors, and performing successive attacks (such as missile fire, laser shots, or spinal meson fire) on the located targets.

Die rolls are made at each point in order to obtain sensor locks and hits; the likelihood of the die roll is established and modified by such considerations as range between the attacker and the target, the type of weapon used, the defensive abilities of the target spacecraft, and other factors. If a hit is obtained, the weapon must penetrate the target's screens and active defenses (such as laser fire destroying incoming missiles). The damage inflicted depends on the type of weapon.

The game continues until one side is vanquished, flees, surrenders, or is destroyed.

Definitions

The following terms are used repeatedly in the rules.

Game Turn: The game is played in turns. Each turn represents 30 minutes of elapsed time. Thus, two game turns equal one hour.

Within a single turn, each individual spacecraft is allowed opportunities to maneuver, detect, and attack. Each spacecraft may likewise be detected and attacked by one or more enemy spacecraft as they conduct their turns.

Hex: A hexagonal grid is superimposed over the map to regularize movement and placement of spacecraft. Distance between vessels (used to calculate sensor and weapon range) is measured in hexes, each of which represents an area of space 30,000 kilometers (one-tenth of a light-second) from hexside to hexside.

Velocity: The speed of a vessel or missile expressed in hexes per game turn. For reference purposes, a velocity of 1 hex per turn is equal to a speed of 60,000 kilometers per hour.

G-Turn: An acceleration of 1 G for one game turn (30 minutes). G-turns are cumulative; for example, 6 G-turns yields the same final velocity regardless whether it was generated by accelerating at 1G for six turns, or 6Gs for one turn. Two G-turns equal one G-hour.

Tasks: All combat activities use tasks. Each task involves rolling a die and comparing the result to a target number. If the roll is equal to or less than the target number, the task succeeds; if it is greater than the target number, the task fails. However, regardless of the target number, a roll of 1 always succeeds and a roll of 20 always fails. See the Task Resolution section below for more details.

Spacecraft: Spacecraft refers to all of the various vehicles that move and fight in **Brilliant Lances**, and includes starships, small craft, missiles, and sensor drones.

Starships: Starships are the most commonly used type of spacecraft. These are space vessels with interstellar jump drives that allow them to travel from star system to star system, much faster than light can travel the same distance.

Small Craft: Small craft are vessels that displace less than 100 tons, and have no jump drive, so cannot travel from star to star. They are limited to movement within a single star system unless they are carried by a starship. Many of the small craft in **Brilliant Lances** are carried and launched by starships.

Manned Craft: This term means a spacecraft that has a living crew (as opposed to missiles and unmanned drones) and refers to both starships and small craft.

Missiles: These are weapons fired from spacecraft that maneuver on the map like other spacecraft, but destroy themselves when attacking their targets.

Drones: These are vehicles that are controlled by an operator from another point, usually a starship. Unlike missiles, drones are not built to be used up with each mission, but are intended to be re-used. However, since they have no crew, they can be abandoned or placed at great risk if necessary.

TASK RESOLUTION

Every action attempted in **Brilliant Lances**, whether an evasive maneuver, attempting sensor lock, or firing a weapon, is a *task*. A task is an attempt by the crewmember operating a particular piece of equipment (maneuver controls, sensors, weapons, etc.) to use his or her skills and training to successfully accomplish the action. The success of these tasks is based upon the expertise of the crewmember who is making the attempt, where expertise is a combination of in-born aptitude coupled with accumulated experience and training. This expertise is called the crewmember's *asset* in that particular area.

Success: In order to succeed at a task, the player must make a 1D20 roll that is less than or equal to the crewmember's adjusted asset. The asset is adjusted for factors that increase or decrease the difficulty of the task, called *Difficulty Modifiers* (which will sometimes be abbreviated in charts and tables as "Diff Mods"). Each increase in difficulty level halves the asset, each decrease in difficulty doubles it. There are five levels of difficulty as shown in the Difficulty Levels and Asset Modifiers table, page 4.

Thus, if a crewmember with an asset of 12 is attempting a task, the player must roll a 48 or less if the task is Easy, 24 or less if Average, 12 or less if Difficult, 6 or less if Formidable, and 3 or less if Impossible. Note that Impossible is the name of a difficulty level, and does not mean that a task cannot be attempted.

Tasks can never be reduced to less than Easy. If a task is increased in difficulty above Impossible, it may not be attempted.

Automatic Failure and Success: Regardless of the difficulty level and asset of a task, a roll of 1 always succeeds, and a roll of 20 always fails.

Outstanding Success and Catastrophic Failure: Whenever the roll is 10 or more points lower than the number needed for success (for example, a 3 or less on a roll where 13 or less was needed), the attempt is considered an Outstanding Success. The effects of Outstanding Success are listed in the rules with each type of action. Not all actions have an

additional bonus for Outstanding Success; for these, a normal success is the best result that can be obtained, no matter what the die roll.

If a roll is 10 or more points greater than the number needed for success (for example, a roll of 18 or greater on a roll requiring an 8), there is a chance of Catastrophic Failure. To see if Catastrophic Failure has occurred, roll for the task a second time, at the same difficulty level. If this roll succeeds, there is no Catastrophic Failure, and the attempt is treated as a normal failure. But if this roll also fails (by even the normal amount, not just by 10 points or greater), the attempt has met with Catastrophic Failure.

As with Outstanding Success, these effects are listed with types of action, and not all actions have an additional penalty for Catastrophic Failure.

Assessing Difficulty: The rules below give specific details on the calculations of difficulty in each specific area. In most cases, however, the range at which a task is attempted yields a base difficulty level to which additional Difficulty Modifiers are applied, based on specific circumstances. Each sensor, communicator, and weapon in the game has its performance listed in hexes as short, medium, long, and extreme. Medium range is twice short, long is twice medium (i.e., four times short), and extreme is twice long (i.e., eight times short). Whenever there is only a single range figure listed with a weapon, that range is always its short range. Some tables may go so far as to list the separate short, medium, long, and extreme ranges of equipment—but even if this is not the case, these numbers are easy to compute.

The range at which a piece of equipment is being used modifies the chances of success of the equipment so that the longer the range, the more difficult the task. Difficulties at these ranges is given in the accompanying list.

Difficulty Level by Range

Range		*Difficulty*
Short		Average
Medium	(2×Short)	Difficult
Long	(4×Short)	Formidable
Extreme	(8×Short)	Impossible

Asset Areas and Crew Quality: In the **TNE** roleplaying game, each person (called a character) has many different assets in many different areas of expertise, and not every person will have expertise in a particular area. However, for the purposes of this starship combat game, crewmembers are all assumed to have the proper skills for their assigned roles (gunner, sensor officer, etc.).

Furthermore, rather than each crewmember having a different level of expertise in his or her assigned area, all crewmembers of a ship are treated as having the same expertise in their assigned role. This common level of expertise is called crew quality, and comes in one of four levels: Green, Trained, Line, and Crack. The accompanying table shows the asset that is used for all tasks attempted by the ship, and the success rolls required according to difficulty level. A parenthetical number followed by a "–" sign to the left of the target number indicates the number or less required for Outstanding Success. A parenthetical number followed by a "+" sign to the right of the target number indicates the number or greater that may result in a Catastrophic Failure. Note that the Automatic Failure concept is also incorporated into this table.

Difficulty Levels and Asset Modifiers

Easy	4×asset
Average	2×asset
Difficult	1×asset
Formidable	1/2×asset
Impossible	1/4×asset

Using the chart above, players simply look up the target numbers according to crew quality and difficulty level and roll the die. They never need to know the asset number of a crew, nor calculate the target number required for a certain difficulty level. Asset numbers are listed for completeness, and for integration with the **Traveller** roleplaying game.

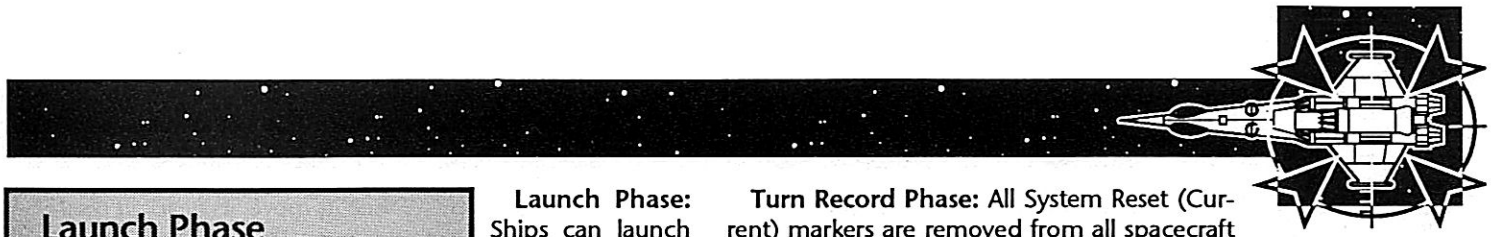
Integration with TNE: The Crew Quality rule does not require specification of particular assets, as crewmembers are presumed to have assets appropriate to their jobs. However, specific assets are sometimes listed parenthetically for use with PC crewmembers who do use their own assets. **Traveller** players will also note that the asset numbers of the four crew quality levels are the same as those of the four NPC experience levels (Novice, Experienced, Veteran, Elite) given in **TNE**, page 59, but the names are different. This is because NPC experience levels in **TNE** are defined as their prowess in ground combat, including their Initiative and damage given by unarmed combat attacks. Crew quality in **Brilliant Lances** does not equal prowess in ground combat; many members of a crack crew may in fact have low Initiative and skills in terms of ground combat. It is only their abilities in the technical areas of space combat that are rated by the crew quality classes below.

SEQUENCE OF PLAY

Each turn of play in **Brilliant Lances** is broken down into several sub-turns, called phases, to organize the number of activities that must be conducted each turn. Phases are always conducted in the same order. If, in a later phase, a player remembers something that he meant to do in an earlier phase, it is too late, as the decisions made in each phase affect the decisions in the phases that come later.

Crew Quality and Task Resolution Rolls

		Rolls				
Crew Quality	*Asset*	*Easy*	*Average*	*Difficult*	*Formidable*	*Impossible*
Green	9	(9–) 19	(8–) 18	9 (19+)	4 (14+)	2 (12+)
Trained	11	(9–) 19	(9–) 19	(1–) 11	5 (15+)	2 (12+)
Line	13	(9–) 19	(9–) 19	(3–) 13	6 (16+)	3 (13+)
Crack	15	(9–) 19	(9–) 19	(5–) 15	7 (17+)	3 (13+)



Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

Launch Phase: Ships can launch small craft that they are carrying, which includes missiles and sensor drones. Place a new marker in the hex they are launched in for each craft which has been launched.

The number of craft that can be launched in a Launch Phase depends on the launch facility type.

Normal Launch Facilities: Small craft which use normal launch facilities may be launched at the rate of one per launch phase per launch facility (unless specified otherwise on the ship data profile, each ship has one normal launch facility).

Launch Tubes: Small craft which are served by a launch tube are launched at the rate of 10 craft per Launch Phase per launch tube.

External Grapples: Small craft (including missiles) carried in external grapples may all be launched in one Launch Phase.

Missile Launchers: All missile launchers, including turrets, barbettes, and bays, may launch up to 10 missiles per Launch Phase.

All newly launched craft have the same vector as the vessel they were launched from.

Plotting Phase: All ships and craft, including those launched in the preceding Launch Phase, plot their maneuvers for the turn. As **Brilliant Lances** uses a realistic vector-based system, this consists of making maneuver "burns" to change the vector heading and velocity, which determines where each craft will move in the Movement Phase. This plotting is done in secret.

Movement Phase: All ships carry out the movement resulting from the vectors created in the Plotting Phase.

Sensor Phase: All players secretly determine the status of their active sensors for the phase, and make their announcements simultaneously. All craft which went active with their sensors have an Active marker placed in their hex. The players then make sensor lock attempts on as many units as there are on the map, including bogeys and already-revealed units. As sensor locks are obtained, Lock markers are placed in the locked craft's hex, indicating that it may be fired on by the craft which holds the lock.

Fire Phase: Missile detonation White Out markers from the previous turn are removed. Vessels may fire on enemy units for which they have a sensor lock. Target vessels may also use various defensive systems to avoid or lessen the effects of successful hits. As hits are obtained, damage is resolved against the target ship. Fire may be resolved in any order desired, as all fire and damage is considered to be simultaneous.

Damage Control Phase: Each craft which has damage control parties may attempt to limit or repair the damage resulting from the current or previous turns. Repairs which are successful are effective at the end of the phase.

For ships which do not have enough power to supply all of their systems (as a result of damage to the power plant), players use this phase to decide which systems will be powered down for the coming turn. Place a Powered Down marker on each such system. Ships which already have powered-down systems from the previous turn may re-allocate their power in this phase, changing the systems which are and are not receiving power.

Turn Record Phase: All System Reset (Current) markers are removed from all spacecraft control panels. Then all System Reset (Next) markers are flipped to their System Reset (Current) side to show that they will be removed in the Turn Record Phase of the coming turn.

Players who wish to keep track of the number of turns played should keep track of them on a piece of scratch paper during this phase. **Brilliant Lances** does not include a turn record track, as it is usually not important to know the number of elapsed turns.

PLOTTING AND MOVEMENT

Brilliant Lances uses a realistic system of vector movement, unlike many games, television programs, and movies, which use fanciful (and unrealistic) analogs of aerodynamic motion. Spacecraft move through space due to thrust and inertia. Once a spacecraft has expended thrust to move it in a certain direction, it will continue to coast in that direction forever, unless another force acts upon it, usually meaning until it expends thrust to change its course or speed. A spacecraft's course and speed are called its vector. On Earth, we rarely see pure examples of vectors, because moving objects are acted on by so many other forces such as friction with the ground or air, aerodynamic lift, and gravity. Our intuitive experience tells us that moving objects tend to slow down and stop, and that it's difficult to keep things moving. However, that is only true in the limited area of our planetary frame of reference. In fact, all objects are in motion and remain that way, coasting along at quite high speeds through empty space. Although it might initially seem strange to players who have not played vector games before, it is that reality which **Brilliant Lances** portrays.

Setting Up: Each manned craft has a control panel sheet and a set of control panel markers which are used to control and keep track of its movement. A set of control panel markers consists of six markers: a Velocity 0 marker, a Velocity 00 marker, a Heading Marker, a Facing marker, a Next Hex marker, and a Heading Change Accumulated G-Turns marker. **Brilliant Lances** contains eight such sets. Each set has its own number in the upper right corner to make it easier to sort out complete sets.

Vectors: A vector is a representation of directional movement. In the game, each ship's vector is represented by its velocity and its heading. Velocity is measured in hexes moved per turn, while heading is the vector's direction of movement with respect to the hex grid. Vessels may have any one of 12 headings, corresponding to the six hexsides and six hex vertices of the hex they currently occupy. Each map sheet has a compass rose printed in the corner which shows the 12 different headings, numbered 1-12. When assembling the maps, make sure they are butted together so that all of the compass roses are oriented in the same direction.

Each spacecraft's current vector is recorded with markers on the craft's control panel. The scenario instructions will tell the players how to determine starting velocities and headings for each spacecraft in the scenario (craft which are launched from larger vessels assume the same vector as the launching vessel). Place one or more Velocity markers in the correct box(es) of the velocity scale and a Heading marker in the correct box of the heading display. For example, if the scenario instructions state that a starship has a heading of 2 and a velocity of 14, the player would place the Heading marker in the 2 box of the heading display, the Velocity 00 marker in the 1 box of the Velocity/Accumulated Gs Track, and

the Velocity 0 marker in the 4 box of the Velocity/ Accumulated Gs Track.

Because players will be sitting around a table with their control panels oriented in different directions, they must remain aware that the heading display on every control panel (labeled 1-12) is oriented according to the compass rose on the maps, not according to the direction that the control panel is laid out.

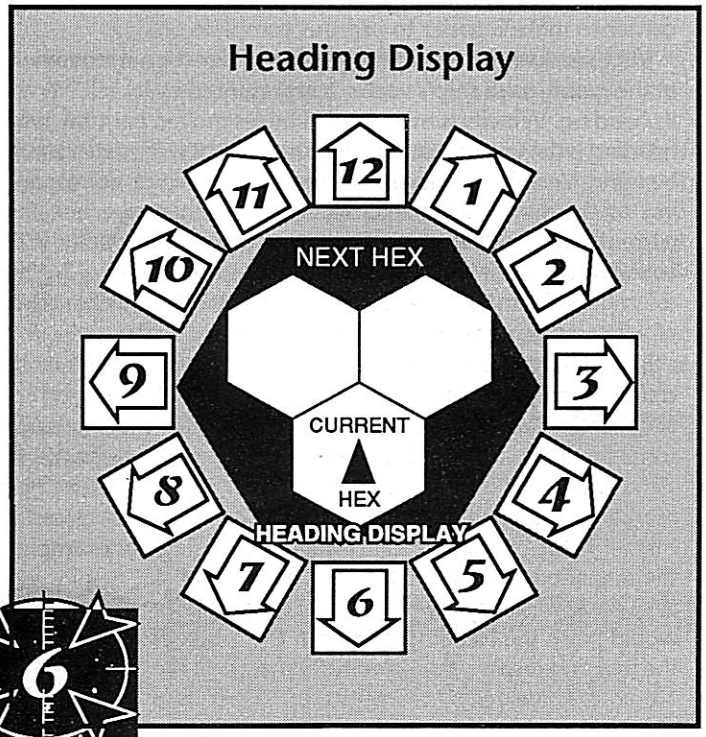
Heading vs. Facing: A craft's *heading* is the direction of its current vector, i.e., the direction it is moving. A craft's *facing* is the direction that the craft's nose is currently pointed. Because a ship can coast through space with its nose pointed in a direction completely different from its direction of motion, or *heading*, its heading and facing need not always be the same direction. However, under certain conditions, such as when thrusting, a craft's facing and heading will be closely related to each other. See the Facing rules on page 16 for more information.

Movement: In each game turn, each spacecraft will move hexes equal to its current velocity in the direction of its current heading. In reality, there are an infinite number of vectors which, for simplicity, **Brilliant Lances** has abstracted into 12.

If the heading direction is a hexside, the craft moves directly down the hexrow.

If the heading is a hex vertex, the ship will move alternately from side to side down the line of the hex vertex. If a ship retains a hex vertex heading from one turn to the next, it can be easy to forget which side of the vertex (left or right) is the next hex to move into. At the center of the heading display is the next hex reminder diagram, showing three adjacent hexes, one of which shows a starship aimed at the common hexside shared by the other two hexes. Use the Next Hex marker to show which hex the ship will enter on its next move. As soon as it finishes its move, alternating along either side of the hexside, place the Next Hex marker in the correct hex to show which will be its first hex when it resumes moving the next turn (assuming that it does not change the direction of its vector, of course).

In the example on the facing page, the starship has a heading of 5 and a velocity of 3. Before its move, its heading display and next hex reminder are as seen on the left. After orienting the starship's heading of 5 with the compass rose as shown on the map fragment, the next hex reminder shows that the ship moves first to the right. The ship then moves its three hexes, alternating left and right across its hex vertex facing. At the end of its move the player notes that, following the alternating pattern, the next hex to be entered is to the left, and so moves the Next Hex marker as seen on the heading display on the right.



Note that in this example, the starship's counter was oriented so that its facing was the same as its heading. This did not need to be the case; so long as the starship is coasting (not expending thrust burns), it can be facing in any direction the player desires.

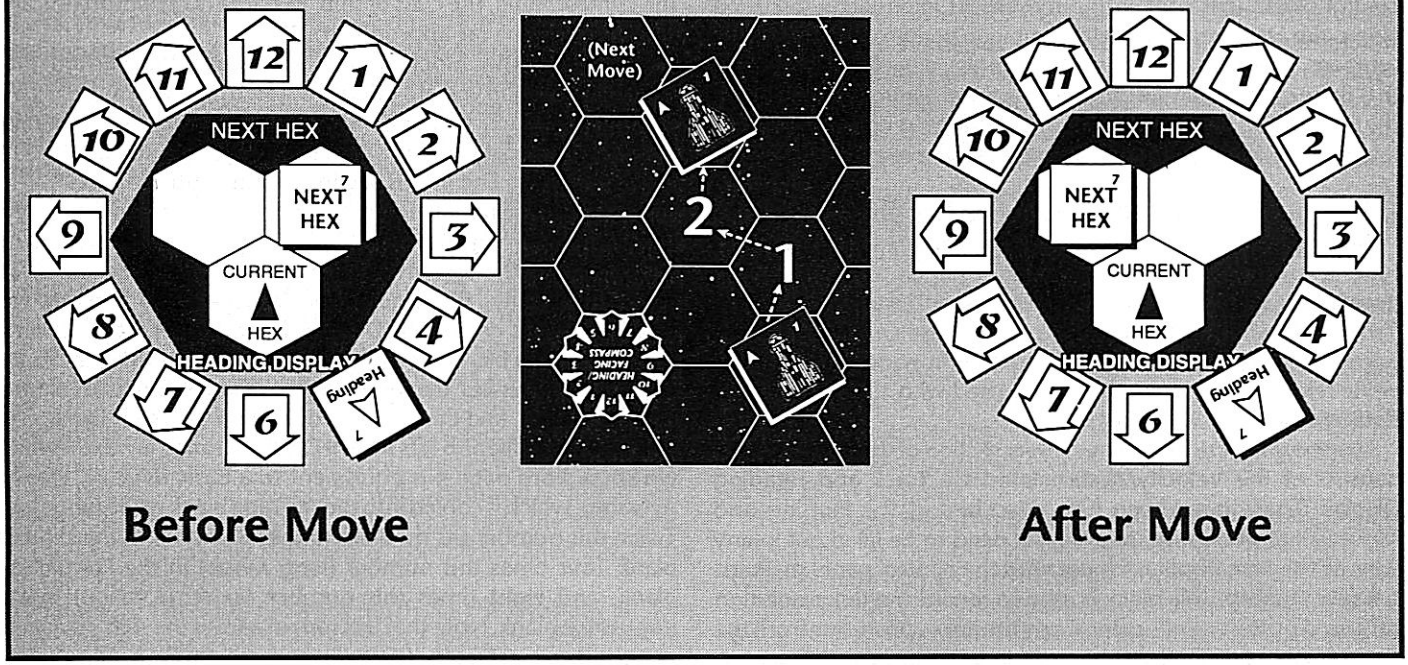
Maneuver: As described above, movement consists of carrying out the vector that is recorded on the heading display. In maneuvering, players use their ships' maneuver drives to change the velocity or direction of the current vector. The new vector is then carried out in the Movement Phase. Any ship that does not use its maneuver drive to change its vector during the Plotting Phase simply continues to execute the same already existing vector each and every Movement Phase until it is acted on by an outside force (such as the gravity of a large body), or until time as we know it comes to an end.

During the Plotting Phase of each turn, all players make decisions concerning the movement of their vessels for the coming Movement Phase. Each vessel maneuvers by firing its maneuver drive thrusters to change its velocity or heading. The power of a craft's thrusters is expressed in G-turns of thrust (each of which represents the force of 1 G acting for a period of 30 minutes, or 1 game turn). Each vessel may spend G-turns up to its G rating on maneuver (to change its vector), evasion (to thwart potential incoming fire), or a combination of the two. The total number of G-turns spent on maneuver and evasion cannot exceed the vessel's G rating. (Note also that a craft spending G-turns for evasion may not have an extended folding sensor array—see "Sensor Lock Procedure," page 12.) Each craft's G rating is listed on its data profile under the heading "Maneuver Gs."

The effects of evasion are explained in the Sensor Lock and Fire Combat rules below. The roll for evasion success is made during the Plotting Phase and is in effect for the rest of the turn. G-turns spent on maneuver may be used to change the craft's vector, by either changing its velocity or its heading. Each G-turn of thrust must be allocated to either velocity or heading change, and cannot be used for both. However, a vessel with a maneuver rating of more than 1 may spend some of its G-turns of thrust on a velocity change and the remainder on a heading change.

Velocity Change: Each G-turn of thrust spent by a ship changes its current velocity by 1. The velocity may be either increased or decreased. As G-turns of thrust are spent, the players must declare whether they are going to increase (accelerate) or decrease (decelerate) the velocity. A small craft with a current velocity of 6 and a G rating of 4 could spend its G-turns to increase its velocity to 10 or decrease it to 2.

Heading Change: The thrust required to change heading is a function of the velocity of the craft. 1/2 G-turn of thrust is required per hex of spacecraft velocity to make a heading change of one position to the port (left) or starboard (right). For example, a ship with a velocity of 6 would require 3 G-turns of thrust per heading change made. If its current heading were 12 and it wanted to change to a heading of 1, it would have to expend 3 G-turns of Starboard thrust.



G-turns may not be spent fractionally. In other words, a ship with a velocity of 3 that was changing its heading by 1 would only require 1 1/2 G-turns to do so. However, the ship would have to spend 2 G-turns to acheive those 1 1/2 G-turns. The left-over 1/2 G-turn could not be counted on the Accumulated G-Turns Track (see below), nor could it be used for evasion. It is simply lost. Note that this same ship, if its G rating were high enough, could spend 3 G-turns to change its heading by 2 all in one turn, and this way would not lose any excess thrust.

Accumulated Thrust: Thrust may be spread over several turns. In other words, a ship may spend 1 G-turn of thrust one turn and another G-turn the next turn. G-turns spent which are not sufficient to achieve an immediate heading change are recorded by placing the Heading Change Accumulated G-Turns marker on the Velocity/Accumulated G-Turns track of the control panel. This marker has a Port arrow on one side to show G-turns spent to change heading to port (counterclockwise—e.g., from 12 to 11 or 4 to 3) and a starboard arrow on the other to show accumulated G-Turns to change the heading to starboard (clockwise—e.g., from 12 to 1 or 7 to 8). As soon as sufficient additional G-turns are added to bring about a heading change, the Heading marker is moved one position in the appropriate direction and accumulated G-turns are reduced to 0. Additional heading change G-turns spent beyond this point are accumulated on the track normally until they reach the point at which they are converted to a heading change, and so on.

For example, a ship with a velocity of 5 and a heading of 8 burns 6 G-turns for a starboard heading change. The first 5 G-turns are sufficient for two heading changes (2 1/2 Gs per heading change at a speed of 5), and the sixth is insufficient for a full heading change. So the ships control panel is adjusted to show a new heading of 10, with one starboard accumulated G-turn on the Velocity/Accumulated G-Turns Track.

A ship which already has an Accumulated G-Turns marker on its Accumulated G-Turns Track must first reduce that marker to 0 before accumulating acceleration for a heading change in the opposite direction. This would mean spending G-turns in the opposite direction to cancel out those already accumulated. For example, if there were already 4 starboard G-turns on a craft's Accumulated G-Turns Track, and the craft now wanted to change its heading to port, it would first have to spend 4 G-turns accelerating to port to counteract the accumulated starboard G-turns before any accumulated G-turns to port would be shown on the Accumulated G-Turns Track.

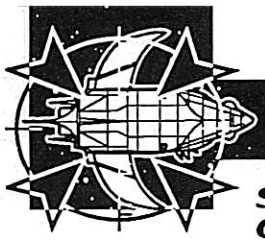
As mentioned above, 1/2 G-turns may never be accumulated on the Accumulated G-Turns track.

Vector Adjustment: Although the thrust decided on in the Plotting Phase is actually applied throughout the entire turn, for simplicity, **Brilliant Lances** treats these changes as taking place immediately. All G-turns spent on velocity change are applied immediately, as are any G-turns sufficient to cause a heading change. Thus these changes are reflected in the movement of the immediately following Movement Phase.

G-turns spent on heading changes that are not sufficient to change the heading this turn are simply recorded on the Accumulated G-Turns Track and do not affect the current turn's movement.

Fuel Use: The control panel lists the amount of fuel used per G-turn (see page 9). Each time G-turns are spent for any purpose, record the fuel use on the "Fuel Use" blank.

Secrecy: The vector adjustments of the Plotting Phase are made in secret so that players cannot adjust their movement to take advantage of another player's plans.



SPACECRAFT CONTROL PANELS AND MOVEMENT LOGS

Most of the remainder of the rules deal with the many issues related to combat: fire control solutions, weapons firing, hit locations, damage description, damage control, etc. The same control panels that contain the movement information discussed above also have areas that detail the range performance of sensors, weapons, defensive systems, and electronics, as well as the damage that these systems can sustain. Because these control panels contain the information that will be used in the following combat rules, it is important to look at the control panels before proceeding further.

Filling out the Spacecraft Control Panels

Each manned craft used in a **Brilliant Lances** scenario should have a control panel filled out. These panels are filled out in accordance with the ship data profiles presented at the end of the *Technical Booklet* and the following rules. There is a sample control panel for a *Gazelle*-class starship printed on page 10 to consult while reading these rules. It is to be used with the *Gazelle*-class data profile in the *Technical Booklet*.

Maneuver Section: The maneuver section of the control panel consists of the Velocity/Accumulated Gs Track and Heading Display. These have been fully described in the Plotting and Movement rules above, and do not need to be filled out in any way, as they are displays for use with the control panel markers.

Crew Quality: This block is used to record the task resolution rolls used by the vessel's crew. Copy the appropriate line from the Crew Quality and Task Resolution Rolls table on page 4. The crew quality of each craft is listed in the scenario instructions, or is decided by the referee or players in home-made scenarios. The control panel contains no column for the asset number, and abbreviates the names of the difficulty levels. Note also that the control panel also lists the ranges at which these difficulty levels apply, in accordance with the Difficulty Level by Range table on page 4.

Constant Difficulty Modifiers vs. Detection and Fire: As will be discussed in more detail under the Sensor Locks rule (page 11), the chance of detecting and hitting a ship varies with its signature, which is based on size and other details. This chart, unique to each ship, is broken down into five categories: signature versus radar (an active sensor), versus active electromagnetic sensors (active EMS, a more advanced radar-type system; this signature is also used versus ladar), versus high-resolution thermal sensors (HRT, a passive sensor), versus passive EMS (a more advanced HRT-type system), and versus enemy fire. For a more detailed discussion of the four sensors, see the Sensor Locks rule.

This chart records two permanent components of this signature, the craft's size, and the effectiveness of its electromagnetic masking (EMM) system, if it has one. To fill this section out, first find the craft's target size on its data profile and consult the Difficulty Modifiers by Target Size chart at right.

Write this number in all five blanks on the "Target Size" line. Note that the Diff Mods are identical versus both sensors and fire, except in the case of Sub-Micro targets.

For ships noted as being equipped with EMM, the four blanks of the EMM line are filled out +2, +1, +2, and +1 from left to right. Note that the column for signature versus fire is already filled out "N/A" for the EMM line. If the craft has no listed EMM system, put a dash, "–", in the blank.



Once the Target Size and EMM blanks are filled in, add the target size and EMM Difficulty Modifiers to get the total modifier which is recorded on the bottom line. For example, a –1 target size modifier and a +1 EMM modifier make a total modifier of 0.

Identification Block: This block is used to record the ID number of the counter or starship miniature that corresponds to the control panel, the class of ship, its name (as appropriate), and its player's name (as appropriate).

Weapons: This block is used to record the performance parameters of the vessel's offensive systems, as well as their state of damage. Each weapon listed in the Offensive Armament section of the data profile and each master fire director (MFD) receives its own line in this section of the control panel.

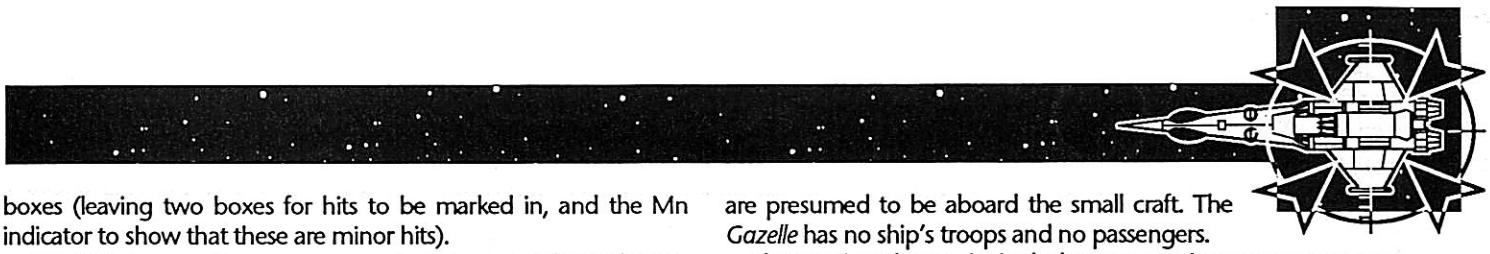
Each MFD line has blanks for the number of Diff Mods ignored, the number of megawatts (MW) of power needed by the system, the ranges of the system (broken down by task difficulty), its missile capability, the amount of damage it ats antenna can sustain, and its crew. The Diff Mod and power information is copied into the blanks from the data profile. If the MFD is capable of controlling missiles, the short range in hexes of its missile communicators is listed, and this range is copied into the "Msl" blank.

The data profile also lists the MFD's short range in hexes (which we know from page 4 is equivalent to a basic difficulty level of Average), which is copied into the Average blank of the range line. Twice this number (its medium range) is written in the Difficult blank, four times this number (long range) in the Formidable blank, and eight times this number (extreme range) in the Impossible blank. Note that this format allows the ship's player to get the basic difficulty level direct from the range in hexes, without having to translate range to difficulty level.

The damage portion consists of a number of hit boxes that can be crossed out to indicate advancing damage, plus the alternative indicators MJ (major) and Mn (minor) to show the type of hits that are being marked. In order to fill out this section, consult the Damage Tables portion of the data profile sheet, on the far right, under "Systems." Here each system is listed with the number of major or minor damage results that it can sustain. Major damage results are listed in the format "NH" where N is the number of major hits that are required to destroy the system, or "(Nh)" where N is the number of minor damage results required to destroy the system. Any system installed in a ship that is not listed separately on the table comes under the "All Others" heading and thus absorbs 1 minor hit. Cross off the MJ or Mn notation so that the appropriate hit type remains, and line out any additional hit boxes beyond those that the system can contain. Thus, a system that was listed as "3H" would be marked by crossing off the Mn notation and two of the hit boxes (leaving three boxes and the MJ notation), and a system that was listed as "(2h)" would be marked by crossing off the MJ indicator and three of the

Difficulty Modifiers by Target Size

Target Size	*Displacement Tons*	*Diff Mods vs. Sensors*	*Diff Mods vs. Fire*
SM (Sub-Micro)	less than 1	+2	+1
MC (Micro)	1-9	+1	+1
VS (Very Small)	10-99	—	—
S (Small)	100-999	–1	–1
M (Medium)	1000-9999	–2	–2
L (Large)	10,000-99,999	–3	–3
VL (Very Large)	100,000-999,999	–4	–4
G (Gigantic)	1,000,000+	–5	–5



boxes (leaving two boxes for hits to be marked in, and the Mn indicator to show that these are minor hits).

All MFDs have only one crewmember, so no additional notations need be made.

Thus, on the sample control panel, we have recorded an MFD that ignores 5 Diff Mods, consumes 1.62 MW, has a short range of 10 hexes, absorbs 4 minor hits before being destroyed, has an antenna that can take 1 minor hit, and has one crew. It is not missile-capable.

Offensive Weapons are filled out in basically the same manner with the following exceptions. Each weapon line has a blank which is used to write in a description of the weapon, and two blanks beneath, one for the hit location which the weapon occupies (see the Facing rules, page 16), and one for the weapon's arc of fire (also see Facing, except that missile launchers have no arcs of fire; fill in this blank with the number of ready missiles). Both of these are listed with each weapon, along with its power consumption and crew size, which may be a number other than 1 (including 0). The weapon's range is given for all four range bands (for each band, the range in hexes is the number to the left of the colon), which are simply copied into the Average, Difficult, Formidable, and Impossible blanks. Some weapons are given additional power to increase their hit chances. These are shown on the data profile by following the power MW with a slash and a –1 or –2 (e.g., "21/–1" or "42/–2"). Copy this notation as is onto the MW blank.

Unused lines may be left blank or completely lined out, at the player's preference.

Defenses: These are filled out much like the weapons section, with certain exceptions. Each defensive system receives one line, and has space for a description of the system, its hit location, arc of fire, power consumption, damage, and crew, as described under Weapons above. In addition, each defensive system must have its tech level (TL) copied from the data profile sheet into the blank provided. If the system is a sandcaster, it must have its Reduction per Hit (Reduc/Hit) copied into the blank provided, as well as the number of sand cannisters carried (Cann). The "Cann Used" blank is not filled out right away, but is used to record the number of sandcaster cannisters used in combat.

If the system is a nuclear damper, it must have its "CV÷" number copied from the data profile into the appropriate blank. Meson screens have their PV value written in the PV blank. Black globes use the PV blank to record their maximum flicker value. Only sandcasters need to fill out the Arc of Fire blank. Other defenses do not use arcs of fire. Meson screens, nuclear dampers, and black globes do not fill out the Reduc/Hit or Cann blanks.

Unused lines may be left blank or completely lined out, at the player's preference.

Crew: Each box in the crew section indicates one crewmember. These numbers are obtained from the crew line under Accommodations on the data profile. Line out all boxes above the correct number of crew for each line. Bridge crew includes all of the Electronics, Maneuver, and Command crew. Engineering crew is one half (round fractions up) of the listed Engineering crew, and Damage Control Parties are the remaining engineering personnel plus all Maintenance personnel. Ship's Troops are listed if present, as are other types of crew (such as stewards) and passengers if applicable.

On our sample control panel, the *Gazelle* has seven bridge crew (1 Electronics + 2 Maneuver + 3 Command—note that the 1 MFD crew is tracked with the MFD, although he/she may be hit on Bridge Crew hits), four engineering crew (7÷2=3.5 rounded up to 4), and four damage control crew (the rest of the 7 engineers plus the one maintenance crew). The three small craft crew are not listed as they are presumed to be aboard the small craft. The *Gazelle* has no ship's troops and no passengers.

Electronics: Electronics includes communicators, sensors, computers, and ECM gear. These are filled out as discussed under Weapons, above, with the following differences.

Communicators and sensors each have two components—the internal control system for the system, and the external sensor. Each of these has its damage listed separately. In most cases, both of these will sustain only 1 minor hit. In a few cases, a communicator will have its short range listed as "∞", which means that its range is infinity for purposes of the **Brilliant Lances** scale. Write "∞" in each of the four difficulty blanks, which means that the basic task difficulty is Easy at these ranges (subject to a "Degraded Performance" damage result, see the Damage rules, below, and environmental Diff Mods, see the Communicator rules).

Some sensors are noted on the data profile sheet as being folding arrays. For each such sensor, place a check mark or "x" in the box marked "folding."

Computers only take 1 minor hit each, so only need to have their type written into the blank provided.

Ships with electromagnetic masking systems mark the hits for the EMM radiators, marked EMMR on the damage tables, as well as the EMM controls.

Target Locks Box: This is not filled out, but is used during play.

Quarters: As indicated on the craft's damage table, each large stateroom takes 1H, and each small stateroom takes (2h). The lines for large and small staterooms are already permanently marked to show major and minor hits for that reason. Line out all excess boxes. The power listing is per individual stateroom or low berth, not the total.

Ships with a specialized sick bay have this noted in the Accommodations section.

Emergency Life Support does not have a power requirement. The Grav Compensator includes a blank to show the maximum Gs compensated.

Hold: These are filled out according to the above guidelines.

Cargo space may not always be filled. The parenthetical blank is used to indicated total cargo space, while the blank "Tons of Cargo" is used to show the amount currently carried. This will vary from scenario to scenario. In most cases, simplicity dictates that cargo will absorb damage at the rate of 1 *damage point* (not hit, see Damage, below) per cubic meter.

Likewise, ships may start with partially empty fuel tanks, with the beginning fuel indicated in the "Starting Fuel, "m^3" blank. Fuel Losses and use are recorded during play. The fuel use per G-turn expended is listed on the G-Hours line of the data profile.

Engineering: In addition to the guidelines already discussed, engineering systems must be rated in two other areas. For the Power Plant, enter its total output in MW in the left-hand blank, then divide this number by the number of hits it can sustain, rounding fractions up. The result is the number of MW of power output lost per hit, which is written into the right-hand blank.

For the Maneuver Drive, copy the MW of power required per G of rated performance from the Maneuver Gs line of the data profile. Then multiply this number by each allowed G rating of performance to show the amount of power needed for each level.

"Other" systems include such things as auxiliary power plants, spare jump drives, etc.

Internal Armor: If a system is noted on the data profile as having internal armor, draw a box around that system on the control panel and note its armor value next to it.

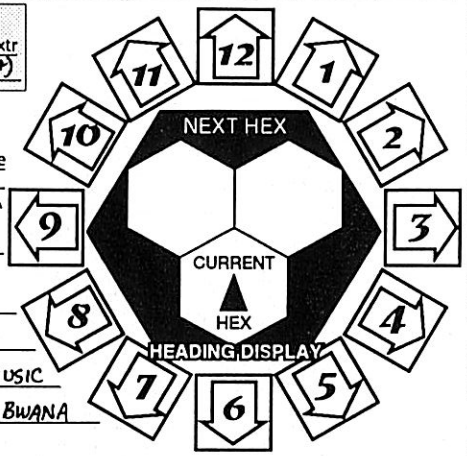
Velocity/ Accumulated Gs Track: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Crew Quality and Target Numbers

Quality	Easy	Ave/Short	Diff/Med	Form/Long	Imp/Extr
LINE	(9-) 19	(9-) 19	(3-) 13	6(16+)	3(13+)

Constant Diff Mods vs. Detection and Fire

	Vs. Active Radar	Vs. Active Act. EMS	Vs. Passive HRT	Vs. Passive Pass. EMS	Fire
Target Size	-1	-1	-1	-1	-1
EMM	+2	+1	+2	+1	N/A
Total	+1	0	+1	0	-1

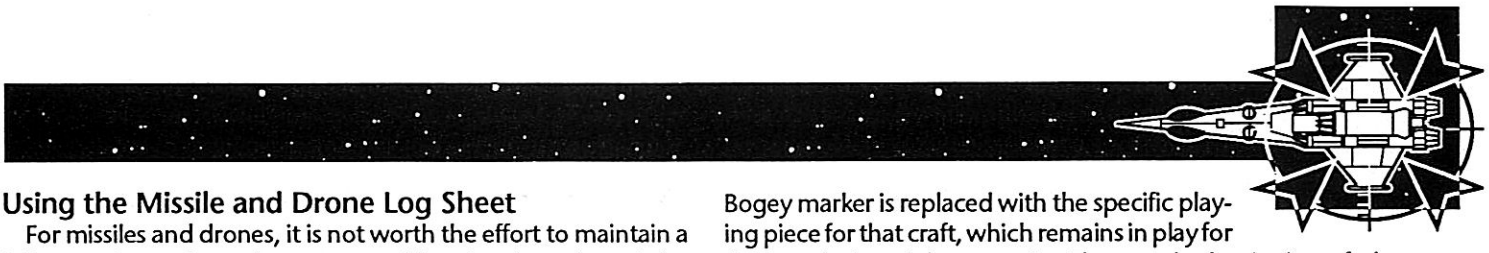


BRILLIANT LANCES™
Traveller® Starship Combat Spacecraft Control Panel

Identification # 001
Class: GAZELLE
Name: U.S.S. ROXY MUSIC
Player: COMMODORE BWANA

Weapons

☐ Master Fire Director Ignore 5 Diff Mods Msl —	1.62	MW	MJ/Mn ☐☐☐☐■	Ranges: Ave (10) Diff (20) Form (40) Imp (80) Crew ☐	Ant: ■/Mn ☐■	
☐ Master Fire Director Ignore ___ Diff Mods Msl ___	___	MW	MJ/Mn ☐☐☐☐☐	Ranges: Ave (___) Diff (___) Form (___) Imp (___) Crew ☐	Ant: MJ/Mn ☐☐☐☐☐



Using the Missile and Drone Log Sheet

For missiles and drones, it is not worth the effort to maintain a full control panel, so they use an abbreviated version of the normal movement rules. Rather than having a control panel and heading display, these unmanned craft simply have their new vector information for the turn noted on the Missile and Drone Log sheet during the Plotting Phase.

Plotting and Movement: Each missile or drone that is brought into play (either at the beginning of the scenario or by launch during play) is assigned a line on the log sheet, where its description and identification number are written in the ID block. Its five signature Difficulty Modifiers are copied into the signatures box provided from the data given on the Missiles Characteristics table (in the *Technical Booklet*). Each subsequent turn it has its movement plotted according to the Plotting and Movement rules. However, rather than having this plotting recorded by markers on a heading display, its vector is recorded in shorthand form in the box for the appropriate turn, using the abbreviations listed at the bottom of the log sheet. For example, a missile which on Turn 2 had a heading of 12, a velocity of 6, and 2 accumulated G-turns to starboard would have "H12, V6, AGS2" written in the Turn 2 box. When each line of turn boxes is used up, use the "Cont" box to note the line number on which the craft has its plotting continued.

Ship Notes: When handling more than one ship at a time, players may wish to use the log sheets to jot down notes about the activities of their ships to assist them in computing Difficulty Modifiers vs. sensor locks or enemy fire, or to remind them of G-turns expended in order to compute fuel expenditures.

Tournament Play: To prevent chances for confusion or concern about cheating, all players participating in **Brilliant Lances** tournament play must use log sheets to note G-turns used for evasion and maneuver, folding and unfolding of passive arrays, and the like. These sheets will also aid in the reconstruction of such battles for later demonstration and analysis.

SENSOR LOCK

Obtaining a sensor lock on an unidentified or known enemy target is the single most crucial step in space combat. Until this sensor lock is obtained, the exact nature of the target is not known. The crew of a starship may be well aware that "something is out there" based on ghost images, thermal hot spots or flashes of returns on active sensors, but a sensor lock is required to identify the target, and more importantly, to do anything about it. At the incredible ranges of interstellar combat, fire control solutions require good, hard data on their targets. The speed of the target, its direction of motion, even its facing, roll, pitch, and yaw, are essential for the fire control to be able to tell where the target will be when the outgoing fire arrives. The most powerful, precise weapons known to violent minds are just so much inert matter without a sensor lock.

Bogeys: Before the first target lock is gained on an unidentified target, that target is an unknown. At the start of play, all spacecraft are unknowns, whether they are large starships, small craft, missiles, or sensor drones. For this reason, no counter (or ship miniature) is placed onto the map until an opponent gains the first sensor lock on that craft. Instead, the position of each craft on the map is indicated by a Bogey marker. The Bogey marker is moved normally using the movement and maneuver rules. This represents the tell-tale indications of something out there that can attract a sensor lock attempt. Once this lock is obtained, the Bogey marker is replaced with the specific playing piece for that craft, which remains in play for the remainder of the scenario. Thus, at the beginning of play, even if they know the overall composition of an enemy force, players do not know what where individual ships are, and which bogeys are only drones or missiles already in flight.

Types of Sensors: There are six main types of sensors used in **Brilliant Lances**, divided into two broad types—active sensors and passive sensors. Active sensors detect targets by sending out pulses of energy, such as radio waves or lasers, which then bounce off their targets and back to the sensor. The time that it takes the pulse to return, the shift in frequency of the pulse, etc., can be used to determine the distance and direction of the target, its motion relative to the sensor, etc. The two major drawbacks of the active sensor are that it broadcasts its own presence by filling space with pulses of energy, and that it requires a lot of power to generate pulses powerful enough to bounce back from very distant targets.

Passive sensors do not betray themselves by emitting energy; rather, they detect targets by sensing the energy given off by those targets. This energy is primarily in the form of heat, but advanced passive sensors also include radar and radio direction finders. Passive sensors are typically less effective than active sensors in terms of absolute range, but are more tactically useful for ships that wish to remain unnoticed.

Radar: This is an active sensor which detects its targets by emitting radio energy across wide angles, and detecting the radio energy which bounces back from distant targets. When a spacecraft is using radar, it suffers the penalties of going active, "lighting up."

Ladar: This is similar to radar, except that it uses laser rather than radio energy, and emits its energy in tight, focused beams, not across wide angles. Ladar may not be used to make an initial sensor lock, as it cannot scan broad areas. However, another sensor which has already locked on the target may hand off its lock to the ladar, which can then maintain the lock. Ladar does not carry the same penalties for going active as do radars, active EMS, and radio broadcasts. However, if its target is using sandcasters, it is one level of difficulty higher to maintain the sensor lock with a ladar set.

Active EMS: Active EMS (electromagnetic spectrum) sensors are advanced versions of radar (appearing at tech level 10), which incorporate the use of wavelengths other than radio, and add in sophisticated computerized image enhancement. Active EMS is an active sensor, and when used, carries the same penalties.

HRT (High Resolution Thermal): This is a passive sensor that detects targets by their infrared radiation. The more heat the target is giving off, the easier it is for the HRT to detect it.

Direction Finders: These specialized passive sensors detect targets by sensing their radar and radio emissions. At tech level 9 and below these are separate stand-alone systems, but by tech level 10 these are incorporated into the passive EMS sensors (immediately below). Note that these sensors are not directly used to roll for sensor locks. Rather, the presence of direction finders assists in the use of other sensors carried by a spacecraft.

Passive EMS: This is an advanced passive sensor (appearing at tech level 10) that combines the capabilities of the HRT with EMS direction finders and computerized image enhancement.

Other: There are several other types of sensors

installed aboard spacecraft, such as densitometers, neutrino sensors, and neural activity sensors, but these do not come into play in normal space combat (see, however, Integration with Traveller: The New Era, below).

Sensor Lock Procedure

Most ships have a number of sensors, each with different ranges of effectiveness. Once the scenario begins, players may begin to attempt sensor locks using any of the sensors available to them. Obtaining a sensor lock on a target is a task using crew quality (or Sensors skill), with the basic difficulty determined by the range of the target from the sensor, using the ranges noted on the craft's control panel. For example, a sensor with listed ranges of Ave 5, Diff 10, Form 20, Imp 40 would have a basic level of Average at 0-5 hexes, Difficult at 6-10 hexes, Formidable at 11-20 hexes, and Impossible at 21-40 hexes. A sensor lock could not be attempted beyond 40 hexes. This basic difficulty level can then be modified up or down by other factors as explained below.

All sensor locks are rolled for during the Sensor Phase. Each ship may use any or all of its sensors, and may attempt as many sensor locks as desired, with the limitation that each sensor may not attempt to gain a lock on the same target more than once in the same Sensor Phase.

Once a lock on a target is successfully rolled, a Target Lock marker is placed in the target's hex. Each Target Lock marker is numbered, and the number of that marker is recorded in the Target Lock box of the control panel belonging to the ship that made the lock. This allows players to keep track of who has seen whom at any given moment. In addition, any Bogey marker is replaced by its counter or starship miniature when it has been "locked up."

Decision Step: Before any sensor lock tasks are rolled, all players must simultaneously decide which sensors they intend to use.

Active/Passive: Players decide for each ship whether it will use active or passive sensors, or both. Each ship has an Active/Passive chit, marked Active on one side, and Passive on the other. If the player decides that the craft will use any active sensors (even in conjunction with passive sensors), the chit is placed, hidden, with its Active side up. Once all players have made their decisions, these chits are simultaneously revealed so that no player may react to any other player's decision. Chits with their Passive side showing are set aside for use on later turns, while chits with their Active sides showing are placed on the map in the hex occupied by the craft using the sensor. Vessels which have gone active are easier to detect by vessels equipped with direction finders or passive EMS sensors.

Folding Sensors: Some vessels are equipped with passive sensors that are noted on the data profiles and control panels as being folding arrays. These sensors have large, synthetic aperture collection areas that must be extended on the ends of pylons and struts in order to be used. The passive sensor must be extended if it is to attempt a lock, as it cannot function when retracted. However, the greater target area presented by a vessel with an extended passive array makes it a better target for enemy *active* sensors. Each ship with a folding array must also make an extend/retract decision during each Decision Step. A chit is also provided for this purpose. On the Extended side, the chit shows a front view schematic of a ship with its array deployed, and the notation "–1 vs. Active." On the Retracted side is the notation that no locks are possible with that sensor. Although this decision is also made during the Decision Step, the chit is not revealed, so as not to disclose information that opposing players would not automatically know. The chit is kept on the player's control panel.

Because of the fragility of the folding struts, no vessel may have an extended folding array in a turn that is burning G-turns for an evasion attempt. If the player chose to burn Gs for evasion in the preceding Plotting Phase, all folding sensors are automatically already retracted in this step.

Integrity: Because of the secret steps included in **Brilliant Lances**, there are many opportunities to change one's mind about a sensor decision after the fact, and reverse that decision after seeing the tactical benefits that might result. Resist the temptation if it ever occurs. That small act of integrity will not only make you a better person, but it will, in a small but very real way, make the world a better place for you and everyone else to live in.

Additional Difficulty Modifiers

The following conditions and circumstances modify the basic difficulty level based on range.

Retaining Sensor Locks: Sensors roll each Sensor Phase for all potential targets on the board, even those which the sensor had a lock on during the previous turn. Thus, an existing sensor lock can potentially be lost on any given turn. However, when rolling to maintain locks from previous turns, apply a –1 Difficulty Modifier to the task (i.e., the task becomes one difficulty level easier).

Handing Off Sensor Locks: Sensor locks may also be "handed off" to other sensors on the same ship or to other friendly ships. When rolling for a handed-off sensor lock, apply a –1 Difficulty Modifier to the task (i.e., the task becomes one difficulty level easier).

Handing a sensor lock off to another sensor on the same ship allows a lock obtained with an active sensor to be transferred to a passive sensor so that the active sensor can be powered down for more stealthy operations. A lock cannot be handed off on the first turn that it is made, but only on a turn following a successful lock. The sensor that first obtained the lock does not need to re-roll the lock for the turn that the lock is handed off. In effect, this task is rolled as if the sensor that is receiving the handoff is rolling to retain a lock from the previous turn.

To hand a sensor lock off to another ship, both ships must make successful communications rolls to make contact with each other (see the Communicators rule, page 15). Again, this handoff can only take place for a target that was successfully locked on the previous turn, and the handing off ship does not need to roll to re-lock it for the current turn.

Going Active: A ship which has gone active for the turn by using either active sensors or radio (see Communicators, below) becomes easier to detect for ships equipped with direction finders or passive EMS sensors. Any ship equipped with functioning direction finders or passive EMS (in the case of a folding passive EMS sensor, the array must be extended) applies a –1 Difficulty Modifier to sensor lock attempts with any of its sensors when rolling to lock onto an active target.

There are two restrictions to this: 1) the direction finder-equipped vessel must be within twice the extreme range (16 times the short range) of the active sensor, and 2) the tech level of the direction finder or passive EMS must be equal to or equivalent to the tech level of the active sensor. If either of these conditions is not met, there is no –1 Difficulty Modifier.

See the procedure section on page 14, for further details.

Target Size: The size of the target is a universally applicable modifier which applies in all sensor and fire tasks. Targets smaller than VS (Very Small) are harder to spot and hit, while larger targets are easier. See the table on page 8. This modifier is included in the Constant Diff Mods table on each spacecraft control panel.

Target Maneuver: The basic sensor lock difficulty levels assume that the target is expending some energy (and hot reaction mass) to maneuver. Thus, a target which has spent any G-turns at all in the turn adds no Difficulty Modifier to the task attempt (except in the case of stern on—see next paragraph). If the target has expended no G-turns for any purpose in the current turn, sensor lock is one difficulty level harder (+1 Diff Mod). If the target is in "cold mode," with its systems off-line and its power plant reduced to only a trickle of power, the sensor task is raised by two difficulty levels (+2 Diff Mod).

On the other hand, if the target is expending G-turns of thrust and is presenting its stern (and therefore its hot exhaust) toward the sensor, the sensor task roll is reduced by three difficulty levels (–3 Diff Mod). "Presenting its stern" is defined as facing so that the sensor is in the stern quarter arc (arc 4) of the target vessel. See the facing rules under the Hit Procedure rules, below.

Target Evasion: Vessels may also expend G-turns on erratic, evasive maneuvers in an attempt to throw off enemy sensor and fire tasks. An evasion attempt is an Impossible task (Ship's Tactics), but the task is reduced one level of difficulty (–1 Diff Mod) for each G-turn that is spent for evasion. For example, a ship with a G-rating of 5 that spent 3 G-turns on maneuver and 2 on evasion would require a Difficult roll against the captain's Ship's Tactics asset in order to successfully evade. The evasion roll is made one time only for the entire turn, in the Maneuver Phase. That result applies to all sensor and hit tasks for the remainder of the turn.

Success on the evasion roll means that the enemy's sensor lock task is one level more difficult (+1 Diff Mod). Outstanding Success on the roll means that the enemy's task is increased by one level for every two G-turns spent on evasion, rounding fractions down, with a minimum of one. Thus, an Outstanding Success would yield a +1 Diff Mod for 1, 2, or 3 G-turns spent on evasion, +2 Diff Mod for 4 or 5 G-turns, and +3 for 6.

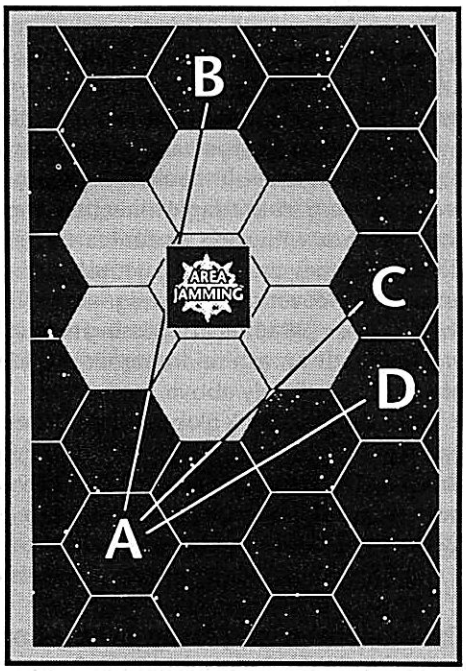
Failure on the roll indicates that there is no increase in difficulty for the enemy's sensor lock attempt. Catastrophic Failure means in addition that the craft's unpredictable and violent gyrations throw off the ship's own sensors and weapons: all of its sensor and firing tasks for the turn are increased by one level in difficulty (+1 Diff Mod).

Electromagnetic Masking (EMM): Ships which are equipped with electromagnetic masking (EMM) packages reduce the effectiveness of active and passive sensors which are used against them. EMM not only disguises a vessel's passive (heat) signature, it also includes the use of stealthy materials to reduce the echo of active sensor energy. A working EMM package increases the difficulty level of sensor locks by radar and HRT sensors by two levels (+2 Diff Mod), and the difficulty of an EMS (active or passive) or ladar sensor lock by one level (+1 Diff Mod). Remember that these Diff Mods are incorporated into each vessel's signature in the Constant Diff Mods vs. Detection on its control panel.

Laser Sensors: Any ship which is equipped with a sandcaster has a laser sensor included as part of the sandcaster installation. A ship equipped with a laser sensor can detect when a ladar set has a sensor lock on it, allowing it to fire sandcasters to increase the sensor task attempt by one difficulty level (+1 Diff Mod) on the current turn. This requires the expenditure of a single sand cannister (see Sandcasters under "Defensive Weapons" below). If the vessel already has sand "in the air," this +1 Diff Mod is already in effect without the need to expend another cannister.

Jamming: Vessels may be equipped with radar or EMS jammers which allow them to attempt to jam enemy *active* sensors. These jammers are deceptive jammers, and are different from the area jammers discussed immediately below. Deceptive jammers do not attempt to blot out enemy sensor energy, but deceive enemy sensors by sending back false echoes that fool the enemy sensor about its target's true location/heading, etc. Jamming tasks, like other tasks, are based on the range in hexes from the jammer to the target of the jamming attempt, as indicated on the control panel. Additional modifiers to this basic difficulty level are based on tech level (TL) differences between the sensor and the jammer. For each TL that the sensor exceeds the jammer, the jamming task is increased one level in difficulty (+ Diff Mod). For each TL by which the jammer exceeds the sensor, the jamming task is decreased one level in difficulty (– Diff Mod). This task is rolled separately for each enemy active sensor that the player wishes to jam. Success in the jamming task indicates that the opposing sensor is jammed, and rolls its sensor task at one difficulty level higher (+1 Diff Mod). Outstanding Success means that it must roll at *two* difficulty levels higher (+2 Diff Mod).

Area Jamming: Some ships may be equipped with jamming drones. These drones are fitted with energy-intensive broadband noise jammers. Area jammers are not finesse devices like the above deceptive jammers. Area jammers attempt to defeat enemy sensors merely by drowning out their signals with more powerful electronic noise. The area of affect of an area jammer is the hex it is in plus the six hexes surrounding it. Any sensor "line of sight" (i.e., the straight line traced from the center of the sensor's hex to the center of the target hex) that passes through this area of effect has its difficulty increased by one level (+1 Diff Mod). In the example at right, a sensor in hex A is attempting locks on targets in hexes B, C, and D. Because the lines of sight A-B and A-C pass through the area jammer's area of effect, those sensor tasks are increased by one difficulty level. The sensor task A-D is unaffected by the area jammer.



If the line of sight passes through the overlapping areas of effect of more than one area jammer, the difficulty is increased by one level per area jammer.

Because area jammers are typically mounted on drones, the areas of effect will move from turn to turn. Area jammers may be turned on and off by the owning player at will. The decision is made during the Decision Step of the Sensor Phase, and remains in effect until the Decision Step of the following turn's Sensor Phase.

Any craft that is carrying an operating area jammer makes itself an easy target for sensor locks. Use the rule above for Going Active, except that there is no tech level requirement, the sensor must be within 80 hexes, and the Difficulty Modifier is *two* levels easier (–2 Diff Mod).

Missile Detonation White Out: When a missile detonates (see the Combat rules below for a fuller description) in a hex, its nuclear explosion creates a temporary white out effect that makes the use of passive sensors more difficult. Any passive sensor lock into that hex (this does not include lock attempts whose "line of sight" merely pass through the hex) is one difficulty level higher (+1 Diff Mod) for each missile detonation in the hex. This is easily represented by flipping over each detonated missile counter to its White Out side, and adding up the difficulty modifers marked on each White Out marker in the hex. These markers are placed at the instant the missile detonates, and are removed at the beginning of the Combat Phase of the turn following their detonation.

"Terrain" Effects: Certain objects in space can also affect the success of a sensor lock. There are two types of interstellar terrain in **Brilliant Lances**: planets and asteroids, which are represented by counters placed on the map. For a complete discussion of the use of planets and asteroids in **Brilliant Lances**, see the Miscellaneous Objects and Issues rule.

Planet: Any craft that is in the same hex as a planet counter is given the benefit of the doubt that it is maneuvering to take advantage of the planet's bulk and passive signature to obscure its own. All sensor tasks rolled against the target are one level more difficult vs. passive and active sensors (+1 Diff Mod).

Asteroid: An asteroid counter represents one or more asteroids travelling in the same direction and speed. Again, ships sharing a hex with such a counter are given the benefit of the doubt that they are advantageously using the presence of the asteroids to cover their own signature. The effects of being in the same hex (whether just passing through or having matched vectors) with an asteroid counter are identical to those of a planet, immediately above.

Black Globes: Black globes are a very sophisticated, very rare, and very expensive defensive device that create a sphere around the defended vessel. Because these screens are so rare, they are not discussed here, but are dealt with in the Miscellaneous Objects and Issues rules.

Multiple Effects: The effects described above are all cumulative.

Procedure for Resolving Sensor Lock Attempts

The procedure for resolving sensor lock attempts divides the task between the sensing player and the target player, where each is responsible for calculating certain Difficulty Modifiers. This not only eases the workload and keeps both players interacting, but also is intended to ensure that information about bogeys is not revealed to an opponent during the course of resolving an unsuccessful sensor task.

As all sensor lock attempts are considered to be simultaneous, they may be resolved in any order desired.

Sensing Player: The player attempting the sensor lock indicates the target of the attempt and announces to the target player the type of sensor being used: radar, active EMS, ladar, HRT, or passive EMS. If using an active sensor, the sensing player must indicate where the scan is coming from, the tech level of the sensor, and point out which opposing units on the map are within twice the extreme range of the sensor (i.e., within direction finding range for purposes of the Going Active Difficulty Modifier). The player does not have to announce the 2xextreme range figure, only which units on the map are within it. Thus, by going active and filling space with pulses of detectable and classifiable energy, a player does offer information about his equipment.

If using a passive sensor, the sensing player does not have to tell the target player where the sensor is located.

When announcing these scans, the sensing player is responsible for calculating the following items which need not be told to the target player.

- Basic difficulty level of the sensor lock attempt based on range (the sensing player must also be careful to not use folding arrays which are in retracted status, or those which cannot function due to damage)
- Difficulty Modifiers based on retained sensor locks (–1 Diff Mod)
- Difficulty Modifiers based on handed off sensor locks (–1 Diff Mod)
- Difficulty Modifiers based on own vessel's Catastrophic Failure at evasion task (+1 Diff Mod)
- Difficulty Modifiers based on sensor line of sight passing through an area jamming area of effect (+1 Diff Mod per area)
- Difficulty Modifiers based on Planet or Asteroid counter in the target hex (+1 Diff Mod)
- Difficulty Modifiers based on White Out markers in the target hex (+1 Diff Mod per marker)
- Difficulty Modifiers based on target having gone active (–1 Diff Mod if sensing ship meets equipment, tech, and range criteria)
- Difficulty Modifiers based on target being a source of area jamming (–2 Diff Mod if sensor meets equipment and range criteria)

The player aids card presents these items in a flowchart style to assist the player in keeping track of them. These items yield one cumulative, net Difficulty Modifier.

Target Player: Once told that his or her ship is the target of a sensor lock attempt, the target player is responsible for reporting to the sensing player the net Difficulty Modifier based on the following criteria.

First, if the sensor attempt is using a radar or active EMS sensor, the target player must decide whether to try to jam the sensor. If so, the target player must announce to the sensing player that the target is jamming. The jamming task roll is made, but the sensing player need not be told if it was successful or not—the target player must merely remember to include the correct jamming Difficulty Modifier in the net Diff Mod reported to the sensing player.

The target player is responsible for the following items:



•Diff Mods from the Constant Diff Mods table on each spacecraft control panel. This table includes modifiers for target size and EMM packages, so the player should not add these items again. The player must also make sure to use the correct column of the table based on the enemy sensor being used, and to delete the EMM modifiers if the EMM has been rendered useless by combat. Use the Active EMS column for ladar.

•Difficulty Modifiers based on a successful jamming attempt vs. the sensor (+1 or +2 Diff Mods)

•Difficulty Modifiers based on the target's maneuver that turn (0, +1, +2, or –3 Diff Mods)

•Difficulty modifiers based on a successful evasion roll that turn (+1 or Evasion Gs ÷2 Diff Mods)

•Difficulty Modifiers based on sandcasters (+1 Diff Mod if equipped with sandcasters or if sand is already "in the air;" this modifier is optional, target player may elect not to use up a sand cannister)

•Difficulty Modifiers based on black globe generators (Diff Mod varies with use)

The player aids card presents these items in a flowchart style to assist the player in keeping track of them.

Resolution: The target player announces the target net Diff Mod to the sensing player, who then combines it with the sensing net Diff Mod to get the final net Diff Mod. The sensing player then applies this modifier to the basic difficulty level based on range. If the difficulty is shifted above Impossible, the attempt may not be made (although the sensing player may roll the dice anyway just to bother the target player and keep him confused about the sensor's real capabilities). If the difficulty is shifted below Easy, it is still rolled as an Easy task.

If the roll is a success, the sensing player places a Lock marker by the target, and records the number printed on the Lock marker in the Target Locks box of the vessel that "owns the lock." This makes it easy for players to keep track of who has seen who.

Outstanding Success and Catastrophic Failure results have no additional effect when rolled as part of a sensor task.

Effects of Sensor Lock: A sensor lock on a target is necessary in order to fire on it. It also allows the player to know the type and class of ship (for example, *Gazelle*-class Close Escort) and therefore any and all information written on the vessel's data profile sheet, such as the craft's G-rating, damage tables, etc. It does not allow the player to know detailed information about the current status of damage the ship has sustained.

In addition, players that currently hold sensor locks on a target may ask for the exact heading, velocity, and accumulated G-turn data of the target in order to help them plan their movement. In the case of multiple players on a side, some of whom might not have a sensor lock on the given target, this information must be passed in secret. There is, however, always the option for players to roll a communications task to share this information with their fellow players (this is not the same as a sensor lock handoff for purposes of the sensor rules, although a communications link opened for this purpose in the Plotting Phase will remain open to be used for a handoff in the Sensor Phase). For purposes of this rule, a sensor lock is held from the Sensor Phase that it is rolled until the Plotting Phase of the following turn (in other words, the lock only gives information on the vector from the turn the lock was rolled, not the new vector the locked target may be plotting).

COMMUNICATORS

Communicators allow craft to pass information back and forth. In game terms, this includes the ability of vessels to hand off sensor locks to each other, the ability of vessels to control drones and missiles, and the ability of players in different ships to discuss tactics with each other.

A communications task is rolled in the same manner as sensor and weapons tasks, with a basic difficulty level based on range modified by other conditions. There are four types of communicators carried by vessels, each of which are subject to different Difficulty Modifiers. These Difficulty Modifiers are all listed and discussed under the Sensor Lock rules. Like any system, communicators are all subject to degraded performance damage results (they are also affected by black globes, as detailed under the special Black Globe rule included in the Miscellaneous Objects and Issues section).

Communications tasks are attempted in the Plotting Phase to control missiles and to allow multiple players to discuss tactics and decisions for the coming turn and in the Sensor Phase to allow ship-to-ship target handoffs.

Radio: Radio communication tasks are affected by "terrain" (planets and asteroids), missile detonation white out, and area jamming. Radio does, however, have the ability to make broad band transmissions that can potentially be picked up by any-receiver in its range, which is useful for purposes of distress calls, warnings, etc. Laser, maser, and meson communicators cannot make such broad-band transmissions; they must all have a specific intended recipient or may not transmit.

Note, however, that any ship that is using its radio communicator during a given turn is treated as having gone active (see the Sensor rules above) for that turn, and is marked with an Active marker.

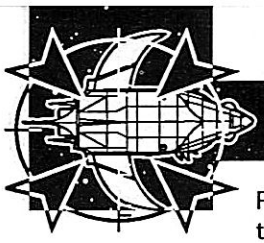
Laser Communicators: Laser communicators are affected by planets and asteroids, missile detonation white out, and sand present around the target (but not around the craft sending the message, as it can create a hole to send the transmission through).

Maser Communicators: Masers are affected by planets, asteroids, and missile detonation white out only.

Meson Communicators: These transmissions are not affected by terrain, white out, or area jamming. They cannot be used to communicate with any vessel with an operating meson screen. Optionally, players can announce that a ship has lowered its meson screen to allow meson communications for a particular turn. However, that meson screen may not be used for any defensive purpose for the entire turn.

Type	*Subject to Conditions*
Radio	Degraded performance, terrain, area jamming, white out
Laser	Degraded performance, sand at target, planet and asteroid hexes
Maser	Degraded performance, planet and asteroid hexes
Meson	Degraded performance, meson screen

Radio Jamming: Vessels equipped with radio or EMS jammers may attempt to jam enemy radio transmissions. This task is based on the range in hexes from the jammer to the target of the jamming attempt, as indicated on the control panel. Additional modifiers to this base difficulty level are based on tech level (TL) differences between the target radio and the jammer.



For each TL that the radio exceeds the jammer, the jamming task is increased one level in difficulty (+ Diff Mod). For each TL by which the jammer exceeds the radio, the jamming task is decreased one level in difficulty (– Diff Mod). This task is rolled separately for each enemy radio that the player wishes to jam. Success in the jamming task indicates that the opposing radio is jammed, and rolls its communications task at one difficulty level higher (+1 Diff Mod). Outstanding Success means that it must roll at *two* difficulty levels higher (+2 Diff Mod).

This use of the EMS jammer requires it to expend energy to blot out the enemy's transmission, so that the craft so doing is treated as having gone active for the turn. The intent to attempt radio jamming is announced during the Plotting Phase, and is in effect for the remainder of the turn. However, the jamming roll and the effect for having gone active does not take place until the target attempts its radio task. Thus, if the target does not attempt a radio communication during the turn until after the Sensor Phase is over, the prospective jammer is not penalized for having gone active, because it had not yet done so. For this reason, a player who intends to attempt a radio transmission during the turn should make sure to announce it by the Sensor Phase so that the jammer is penalized during the Sensor Phase for having gone active.

FACING

The facing of a spacecraft plays an important rule in **Brilliant Lances**. Facing affects sensor tasks, and also controls which weapons can be be brought to bear on the enemy and what portions of any enemy ship can be hit. In general terms, spacecraft must face in the direction that they are *accelerating*. Note, however, that if a spacecraft is not accelerating (i.e., firing its maneuver engines to speed up, slow down, or change direction), its facing has nothing to do with its vector (i.e., the direction and speed at which it is coasting through space). Like a leaf floating down a stream, it may freely spin or point in any direction desired, regardless of its vector.

The facing of a spacecraft is noted in the same way as its heading, by designating one of the 12 directions on the heading display, using the Facing marker provided with each set of control panel markers.

Each spacecraft has five firing arcs as shown in the Arcs of Fire Diagrams on the player aids card. The arcs are defined differently depending upon whether the craft's facing is a hexside (even-numbered facings) or a hex vertex (odd-numbered facings).

The arcs are numbered 1-5 as shown on the diagrams to make them easier to note on the control panels. It is important to understand that there are no port and starboard arcs. All vessels in **Brilliant Lances** are assumed to be constantly rolling about their longitudinal axes in order to bring all of their weapons to bear to all sides. Although split into two pieces, both Broadside arcs (3) are considered to be one arc. The same is true of the Bow Quarter (2) and After Quarter (4) arcs.

These arcs control the way a ship can fire, as well as the way it can be hit. In general, a target located in a particular arc of fire can only be hit by weapons that bear into that arc. Likewise, an enemy ship in a particular arc can only hit parts of the ship that are visible from that direction (a fuller discussion of this topic is presented under "Facing Effects on Combat," page 17).



Players decide the facing of each of their ships during the Sensor Phase, within limits dictated by the type and amount of G-turns used in the previous Plotting and Movement Phases. Within those limits, players may select the most advantageous facing for the current circumstances (this is the players' judgment, based on location of enemy vessels, arcs of fire of their weapons, hit locations that they wish to expose or protect, etc.).

Facing Limits Based on G-Turns Expended

When deciding on a craft's facing, the player must first determine the craft's base facing for the turn, and then determine the amount of allowed deviation from that base facing.

Base Facing: The base facing is controlled by the number of G-turns used that turn, and by how those G-turns were used.

- If G-turns were used to accelerate (increase velocity), the base facing is the same as the craft's *heading*.
- If G-turns were used to decelerate (decrease velocity), the base facing is the craft's heading number +6 (see sidebar).
- If G-turns were used to change heading to starboard, the base facing is the facing number at the beginning of the turn (before the heading change) +3 (see sidebar).
- If G-turns were used to change heading to port, the base facing is the facing number at the beginning of the turn (before the heading change) –3 (see sidebar).
- If G-turns were used for evasion only, there is no base facing, see next step.
- If no G-turns were used for any purpose, there is no base facing, see next step.

If G-turns were used for more than one type of maneuver (e.g. acceleration and heading change), use the base facing resulting from the purpose for which the most G-turns were spent. In case of a tie, the player chooses the base facing from the tied purposes.

If G-turns were used for maneuver and evasion, use the base facing for the maneuver, and proceed to the next step.

Deviation: Once the base facing is established, determine the amount of leeway to either side of that facing that the player has when choosing the craft's facing for the turn.

Deviation is determined by the number of G-turns used for maneuver (not evasion) as a proportion of the craft's *current* G-rating. (Current G-rating includes damage that may have reduced performance from the undamaged G-rating.)

- If G-turns equal to the current G-rating were used, final facing *must* be the base facing.
- If G-turns equal to more than half of the current G-rating but less than the full G-rating were used, final facing must be within base facing ±2 (see sidebar).
- If G-turns greater than zero but less than half of the current G-rating were used, final facing must be within base facing ±4 (see sidebar).

Adding and Subtracting Facings

Look at the control panel heading display and think of it as the face of a clock. Adding a number to a facing direction means to proceed that many positions around the display in a clockwise direction. Subtracting a number from a facing means to proceed that many positions counterclockwise. Thus a facing of 10 plus 5 equals 3, a facing of 3 minus 3 equals 12, and a facing of 6 plus 3 equals 9.

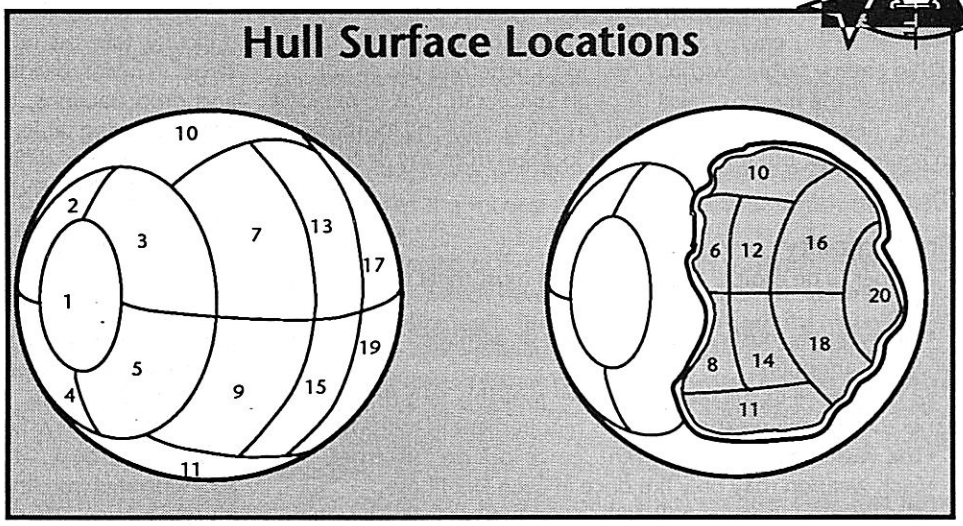
When calculating deviation, the symbol "±" means "plus or minus." The final facing is allowed to be anywhere within this band. Thus a heading of 5 ±2 would allow a final facing of 3, 4, 5, 6, or 7.

No G-Turns Spent: In cases where there is no base facing because no G-turns were spent, the player is not subject to deviation limits and may select any facing for the final facing.

Evasion: In cases where G-turns were spent for evasion (whether the evasion roll was successful or not), the final facing is determined randomly. If all the spent G-turns were used for evasion only, there is no base facing and the final facing is determined by die roll: roll D20 and reroll results of 13-20. The result is the direction of facing.

In cases where maneuver was combined with evasion, the final facing is also rolled randomly, but is rolled randomly from the base facing and deviation limits established by its maneuver actions.

The only exception to random facing determination for evading spacecraft is in the case of Outstanding Success at the evasion task. In this case, the vessel's commander has succeeded in maintaining facing control even while successfully complicating enemy sensor and fire tasks: the player may select any facing for the final facing.



Facing Effects on Combat

The facing of a ship controls which of its weapons can be fired against enemy targets and which portions of the ship can be hit by enemy fire.

Offensive Effects: All weapons except missile launchers have their arcs of fire indicated on the spacecraft control panel (using the numeric abbreviations illustrated on the Arcs of Fire Diagrams). Based on the craft's final facing, determine the fire arc that is occupied by the prospective target. All weapons that have that arc listed on the control panel are eligible to fire into that arc. Weapons that are not listed as able to bear into a particular arc cannot fire in that direction.

Missiles are an exception to this rule, as missiles are not direct fire weapons, as are lasers, particle accelerators, and meson guns. Missiles are small vehicles that are launched in the Launch Phase and maneuver to arrive near their targets. Therefore arcs of fire do not apply to them.

Defensive Effects: Enemy laser and particle accelerator fire coming at a spacecraft from a certain arc can only hit the portions of the craft that are visible from that angle. For example, an enemy firing on a ship from within its Bow On arc (1) should not be able to score a hit on the ship's stern.

Each manned craft has its hull surface and hull interior divided into 20 hit locations. The diagram above shows a spherical craft and its hit locations.

In the case of this spherical example, only hull locations 1-11 can be hit from the Bow On arc (1), 1-15 from the Bow Quarter arc (2), 2-19 from the Broadside arc (3), 6-20 from the After Quarter (4) arc, and 10-20 from the Stern On arc (5). This should make it clear that shrewd use of facing during combat can mask valuable hit locations from enemy fire.

The exact hit locations that can be hit from each arc varies with the hull form of the target, and these are shown on the player aids card.

Although meson guns are direct fire weapons, they are immune to this rule because mesons pass through matter to explode in the interior of their targets. Thus meson guns roll 1-20 for hit location no matter what arc they fire at their targets from.

Facing for Missiles and Drones

In most cases, players should ignore facing for missiles and drones. It is a waste of perfectly good time and energy because missiles and drones have no arc of fire limitations and no hit locations. Determining their facing is justified under special circumstances, such as when a missile or drone might be firing its thrusters directly at a sensor that is attempting to gain a lock on it (and thereby qualifying the sensor for a –3 Diff Mod).

FIRE AND COMBAT

Fire of all weapons takes place during the Fire Phase. All fire and damage resulting from fire is considered to be simultaneous, so that a ship that has just been destroyed by enemy fire is still allowed to conduct its fire for the turn before it is removed from play.

Hits may be negated or reduced in effect by shipboard defenses which include active defenses like lasers, and relatively passive defensive screens.

Weapons Types

There are three main types of weapons used in space combat, each with different hit and damage performance.

Lasers use focused beams of coherent light to impart energy to enemy targets over a very small area. Relative to other long-range beam weapons, lasers have good penetration performance, but generate less explosive force and damage. The main type of missile used in **Brilliant Lances** is a specialized high-performance laser carrier, which powers these lasers by detonating a nuclear explosion, thereby destroying itself. Lasers are direct fire weapons and are limited to hitting enemy hit locations visible from the arc they are firing from.

Particle accelerators accelerate subatomic particles—almost exclusively neutral atoms such as hydrogen—to very high speeds at enemy targets. These have less penetrative ability than do lasers, but generate a much greater explosive force. Like lasers, particle accelerators are limited to only hitting visible hit locations when firing at enemy vessels.

Meson guns also accelerate subatomic particles at enemy targets. But in this case the particle is a meson, which does not interact with matter, and therefore passes through all objects without resistance. However, the meson has only a short life, after which it decays into other more destructive particles. By accelerating the meson to relativistic speeds, its subjective passage of time slows, and its decay is delayed. By timing the decay

to occur as a group of mesons pass through an enemy ship, powerful explosions can be created within enemy targets without having to penetrate the armor.

Because the mesons travel through spacecraft hulls to explode inside, meson guns are not limited to hitting visible hit locations on an enemy ship, but roll 1D20 for hit location from any direction of fire.

Fire Eligibility

In order to be eligible to fire, weapons must meet the following criteria:

- The weapon must not be destroyed or damaged to the point where it cannot fire.
- It must have its full required power available to it (the control panel shows each weapon's power requirement in megawatts).
- The vessel must have a current sensor lock on the target.
- Each weapon may only fire once in each Fire Phase.
- The weapon must be able to bear on the prospective target.

Hit Procedure

As with sensor lock and communications tasks, obtaining a hit on a target is a task whose basic difficulty level is based on the range to the target. Basic difficulty levels by range are listed with each weapon on the control panel. Additional Difficulty Modifiers are applied to this basic level. These are much fewer in number than those that are used in sensor lock attempts, and are based on target size, target evasion, Catastrophic Failure of own evasion attempt, absolute range, and the use of advanced fire control systems called master fire directors (MFDs).

Target Size: The target's size provides a Difficulty Modifier that is used when resolving all fire tasks. This Difficulty Modifier is noted on the control panel in the Fire column of the Constant Diff Mods vs. Detection and Fire table.

Target Evasion: Target evasion works in the hit procedure exactly as it does in the sensor lock procedure, detailed above. Remember that the evasion roll is made in the Maneuver Phase once for the entire turn, with that result applying to all sensor and hit tasks in the turn. (If the firing ship made an evasion attempt and rolled a Catastrophic Failure, all firing tasks for the turn are resolved at +1 Diff Mod.)

Absolute Range: The basic difficulty level listed with each weapon is based on that weapon's own permanent fire control system, called its on-mount fire control system (OMFCS), or beam pointer. This difficulty reflects the beam pointer's ability to accurately direct the weapon's fire at a given point in space over a certain range. However, the range to the target has another affect on hit probability.

When a weapon fires at a target at range R, it is using tracking data that has come from the target (infrared radiation, reflected radar or ladar beams, etc.) over that range R at the speed of light. Assuming the weapon is a laser, it arrives at the target at the speed of light, again passing over the distance R. The time elapsed from when the tracking information left the target and the arrival of the laser fire back at that target is the amount of time that it takes light to travel the distance 2R. If R is a large number, say 300,000 kilometers or one light-second (10 hexes in **Brilliant Lances** scale), the elapsed time would be two seconds. The target can have moved a long way in two seconds, and a tiny degree of error magnified over 300,000 kilometers makes it very easy to miss that target.

To account for this additional difficulty, take the range to the target in hexes, divide by three, and drop fractions, or see the accompanying table. The result is the number of difficulty level increases (+ Diff Mods) applied to the to hit task.

Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14

Overpowered Weapons: Some weapons can be designed to draw five, 10, or more times their normal power requirements to improve their hit probabilities via high rate of fire. These are indicated in the MW blank of the control panel by a "–1" or "–2," etc., separated from the MW rating by a slash. These are the number of + Diff Mods that can be counteracted. These overpower Diff Mods may eliminate + Diff Mods, and cannot be used to reduce the base difficulty level.

Master Fire Directors: Some ships are equipped with one or more master fire directors (MFDs). An MFD allows one gunner to fire a number of separate weapons at a single target, and with an improved chance to hit. All of the weapons under the control of a single MFD are referred to as a battery, and must be equipped with the same type of beam pointer (tech level and range—this can be determined by looking at the ship data profile and seeing if the lasers have the same range bands in hexes, regardless of the damage and penetration at those ranges), and the weapons must all be of the same type (laser, particle accelerator, or meson gun), although they may be of different power. When the MFD and the controlled weapon(s) have different range bands, the lower of the two is used for calculating difficulty levels: the MFD's range performance is thus an upper limit on the range performance of its controlled weapons.

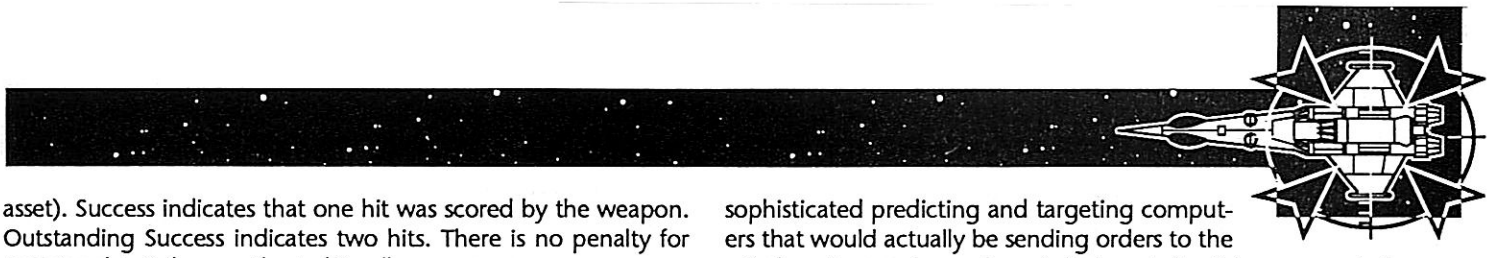
Each MFD may only control one set of weapons per turn, but the weapons assigned to the control of an MFD may be freely changed from turn to turn within the above limits.

For example, using the sample *Gazelle* control panel on page 10, the *Gazelle*'s MFD could be used to control the two laser barbettes or the two laser turrets on a given turn, but not both. When firing the laser turrets, the basic difficulty would be calculated based on the turrets' 2-4-8-16 range bands, so the MFD's superior range would clearly be "wasted." The MFDs installed in *Gazelle*s were obviously designed to match up with the barbettes (both have 10-20-40-80 range bands).

The difficulty level of an MFD-directed fire task is calculated the same as it would be for the individual weapons of its battery. However, when calculating increased difficulty levels due to target range and evasion, the MFD allows the gunner to ignore a certain number of increases in difficulty level as noted on the ship data profile and control panel. The MFD may only *counteract* +Diff Mods that apply; it may not *reduce* a difficulty level.

Although the weapons controlled by the MFD are referred to as a battery, the to-hit rolls are made separately for each weapon controlled by the MFD, so that each has a separate chance to hit or miss.

Resolution: Once the final difficulty level is derived, the task is rolled against the Crew Quality table (Gunnery [Energy Weapons]



asset). Success indicates that one hit was scored by the weapon. Outstanding Success indicates two hits. There is no penalty for Catastrophic Failure on the to-hit roll.

Missiles

Missiles use the rules above, but with slight modifications. All missiles in **Brilliant Lances** are armed with nuclear-pumped X-ray laser warheads. Missiles maneuver to arrive in or near the hex occupied by the target. Once it is close enough to the enemy, the missile makes final targeting adjustments, then deploys a number of laser-generating rods, and detonates its nuclear warhead. The energy of the nuclear explosion creates high-energy (X-ray) photons within the rods, which are focused along the rods' lengths into X-ray beams which travel to the target, and do damage as normal lasers. Mere milliseconds after firing, the rods are themselves consumed by the nuclear explosion.

All missiles are listed in the *Technical Booklet* with their maneuver characteristics in total G-turns, the maximum number of G-turns that can be used per turn, the number and damage values of their lasers, the short range of their communicators (laser or maser), and the characteristics of on-board sensors (if any). Most missiles are controlled by operators aboard the firing ship, but fully independent missiles also exist, and are discussed later.

Each missile launcher may launch up to 10 missiles per Launch Phase, so long as a supply of missiles remains.

Controlling Missiles: Once a missile is launched, it behaves just like any other spacecraft, expending G-turns to maneuver toward its target. Missiles spend their G-turns at any rate desired, within the per-turn limit.

If the missile does not carry its own sensors, the firing vessel must maintain a sensor lock on the missile's target in order for the missile to fire. The controlling ship may lose the lock while the missile is travelling, but the missile requires the firing ship to have a final sensor lock on the turn it detonates to generate a fire control solution. If the missile has its own sensors, it may generate its own lock (using the Sensor asset of the controlling gunner), and have the sensor lock handed off to it from the firing vessel according to normal hand-off rules.

The missile needs telemetry from its controller in order for it to maneuver and fire. So long as the missile remains within its listed communicator short range from its launching vessel, there is no need to roll communications tasks (for simplicity of play they are considered automatic at this range). Beyond this range, a communications task must be rolled during the Plotting Phase for the missile to be controlled (i.e., able to maneuver and/or fire during the turn).

If the missile launching system (turret, barbette, bay, etc.) is manned, that gunner may control one missile at a time. Control of missiles may also be given to master fire directors, which can control more than one missile at a time. The number of missiles that may be simultaneously controlled by an MFD is equal to the number of Difficulty Modifiers it may ignore. Note that a ship can have more missiles in flight at one time than it can control. For example, a ship could launch a large number of missiles a few at a time, and maneuver them to a form a picket line in front of the ship. As it launched more missiles, the missiles that were already in position in the picket line would be allowed to go uncontrolled, and would coast along ahead of the ship, forming a screen until they were needed.

Plotting and Maneuvering Missiles: As stated earlier in the rules, missiles are plotted and maneuvered exactly as any other spacecraft. However, a player does not have access to the sort of sophisticated predicting and targeting computers that would actually be sending orders to the missile as it moved ever closer to its target. For this reason, missiles can be plotted out of the normal sequence of play order to simulate these fire control effects. All manned craft must be plotted normally in the Plotting Phase, but players may leave their missiles unplotted until they see the moves of enemy vessels for which they have sensor locks.

At the beginning of the Movement Phase, players indicate to each other the ships which have target locks on them which are held by missile-controlling craft. Then the players carry out the movement of those vessels one at a time. As each vessel is moved to its destination hex, unplotted missiles which are controlled by vessels holding locks on the moved target have their maneuvers plotted. After all such sensor-locked vessels have been moved, all missiles must have been plotted. Then all other craft and missiles execute their moves.

After movement is carried out, it will become clear that some missiles and locked target vessels will have crossed paths during their movement. Because missiles are commanded to detonate and fire at their point of closest approach, some moves may need to be re-executed to establish that point of closest approach. Starting hexes can be easily established by working in reverse from the heading display or log sheet, and when players know that such backtracking may be required they can easily mark the starting hexes with spare markers or counters.

Movement is then re-executed on a hex-by-hex basis using the Proportional Movement Guide on the player aids card. Each craft or missile that is involved finds its velocity line which shows when it moves during the procedure. Proportional movement steps are counted off from 1 to 10, and each craft or missile moves one or more hexes in each step that an "M" appears on its velocity line—see the guide for details. Players owning missiles may declare that their missiles are detonating at any time during this procedure (but only against vessels for which their controlling ship has a sensor lock). If during any step the range between a missile and a prospective target increases, the player can declare that the detonation took place just before that move, when the range was lower. Immediately upon declaring detonation, the player flips the missile counter over to its White Out side, and makes a note of the range to the target at the moment the missile detonated. The player controlling the missile's target also makes a note of the target's facing at the moment of detonation. This facing does not need to be the same facing that will be chosen for the final facing during the Sensor Phase, but both of these facings must be within the limits allowed by the Facing rule (if the missile detonated in the same hex as the target, do not select a facing, as the missile rolls a straight D20 for hit location).

Firing Missiles: Most missiles have an *absolute range* of 0 and therefore need to detonate in the same hex as their target, but this is not the case for all missiles. However, even missiles with an absolute range of 1 or 2 will find it advantageous to detonate in the same hex, as this will increase their to-hit chances.

Missile fire is resolved in the Fire Phase, but missile detonations and fire can be designated during either the Maneuver or Fire Phases. Designation during the Maneuver Phase was discussed immediately above. Designation during the Fire Phase can take place if the missile ends its turn within firing range of a previously unlocked enemy vessel which is then locked by by the missile's controlling ship during the Sensor Phase.

The missile tables show the fire performance of

each missile's detonation laser. Missiles resolve their laser fire using a modified version of the normal fire procedures. Most missile lasers do not have short, medium, long, and extreme ranges, but rather have an *absolute range* of 0 meaning that they may only fire at targets in the same hex. Rare missiles will have ranges of greater than 0, listed as short/medium/long, for example, 0/1 or 0/1/2. Only listed ranges are available (in the example, the 0/1 laser has short and medium ranges only, no long or extreme). Note that missile lasers with ranges greater than 0 will also have different damage values at these ranges, also noted with the table.

When the missile detonates and fires, its difficulty level is calculated using the normal procedure with the following basic difficulty levels. Basic difficulty level for *all* missiles at 0 hexes is Average, at 1 hex is Difficult (if this range is available), and at 2 hexes is Formidable (if this range is available). It is modified by target size and target evasion as normal. However, unless otherwise indicated, missiles carry no sensors of their own, and rely on sensor updates from the controlling ship. For this reason, the absolute range Diff Mods are calculated based on the range from the controlling ship to the missile's target. (Note that if the missile is firing at a range of greater than 0, the absolute range Diff Mod is calculated on the range from the missile to its target plus the range from the missile to its controlling spacecraft.) If the missile is being controlled by an MFD, the MFD may allow some of these Diff Mods to be ignored according to the normal rules, so long as the range is less than the MFD's listed extreme range band (shown on the control panel as Imp).

If a hit is rolled, roll 1D6 for the total number of hits (each using the listed damage) acheived. The missile is done, consumed by its warhead.

Semi- and Fully Independent Missiles: Missiles which carry their own sensors but which are still controlled by their firing gunner (as discussed above) are referred to as semi-independent missiles (SIMs). SIMs roll every turn for sensor locks like any other craft, except that only one lock may be maintained at a time. If a SIM has a sensor lock on its target when it fires, the absolute range Diff Mod is based only on the range from the SIM to the target. However, a SIM may be commanded to fire by its controller at a target that it does not have a sensor lock on. In this case, absolute range Diff Mods are calculated from the controller to the target just like normal missiles.

Some missiles carry their own targeting and tracking systems and are completely independent of outside input once they are fired. These are called fully independent missiles (FIMs), and are listed with their own Crew Quality/Gunnery asset equivalent which is used when rolling for hits. Once fired, these missiles need no further attention from their gunners, and do not count against the total number of missiles that can be controlled at one time by that gunner. However, these missiles must have a sensor lock on an enemy target in order to maneuver. A FIM which does not have a sensor lock merely coasts on its current vector until it gains a lock. FIMs may also be controlled by their launching ship under such circumstances, but in this case they do count against the total number of missiles that can be controlled.

Fire at Missiles: A missile may be fired upon by enemy vessels at any point in its movement. Most missiles are Micro or Sub-Micro size targets, although larger missiles can be built. Any hit on a Micro or Sub-Micro size missile which can penetrate its armor and has any damage value remaining is sufficient to prevent it from accomplishing its mission, and it is removed from play. (All solid-fueled TL-3+ missiles, i.e., all those listed on page 10 of the *Technical Booklet*, have an Armor Value of 3.)

DEFENSES

Defenses on the target vessel may be used to attack specific "hits" which have been scored. Each defense must be directed against a specific "hit." Although more than one weapon may be directed against a specific hit, if one defensive weapon stops the hit, the others may not then be re-targeted against a different one.

Beam Weapons: Beam weapons can be used in a *de facto* defensive role to destroy missiles before they get close enough to fire. In the Fire Phase, all anti-missile fire is resolved before missile fire. This preemptive defensive fire is an exception to the rule that all fire is simultaneous, and takes place in the short period of time that the missile is deploying its laser rods and making adjustments for its final fire control solution. This fire is resolved as any other beam weapon fire. Naturally, any weapons which were used for anti-missile fire have done their fire for the turn and are not eligible to fire at any other targets.

Sandcasters: Sandcasters fire cannisters of ablative crystals, commonly known as "sand." Each sandcaster contains a generator which creates a field which manipulates the location and shape of the cloud of crystals. At early tech levels, these fields are electromagnetic in nature, and require the use of magnetic sand. More advanced systems are able to supplement and then supplant the magnetic manipulation with gravitic manipulation, which allows the use of more effective non-magnetic crystals.

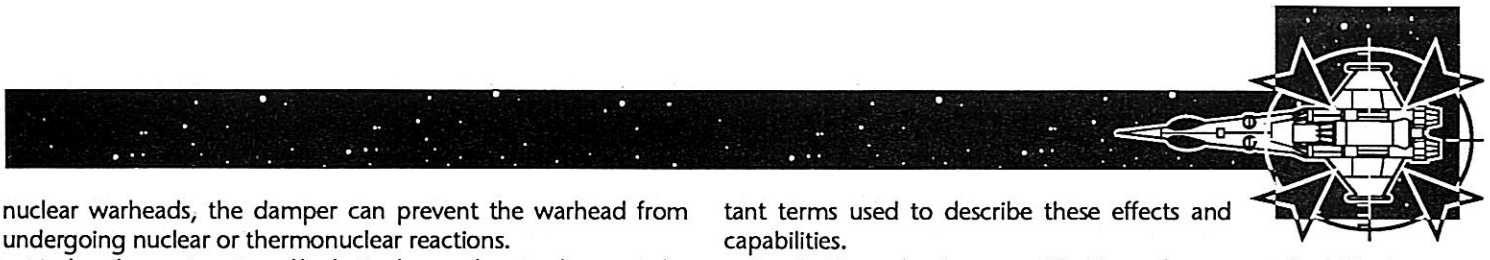
These clouds are placed in the path of incoming beam weapons, and cause the beam weapon to expend its energy burning through the cloud. The sandcaster operator uses laser warning sensors installed in the sandcaster to detect fire control locks and anticipate incoming beam fire. The roll to intercept a beam weapon with a sandcaster is a Difficult test of the Screens (Sandcaster) asset of the operator, and is modified one level up (+1 Diff Mod) for each two tech levels by which the firing beam weapon exceeds the sandcaster, or downward one (–1 Diff Mod) for each two tech levels by which the sandcaster exceeds the beam weapon's tech level. Sandcasters may only fire against weapons coming in through their arc of fire.

A successful sandcaster "hit" on a beam reduces its damage value (for particle accelerators, damage value = penetration value). The amount of this reduction is listed on the ship data profile and control panel. Each such successful sandcaster hit requires that a cannister be used to replace the sand that was burned up by the beam weapon, and this is recorded on the control panel in the "Cann used" blank. On Outstanding Success, double the amount of the beam reduction, but still only one cannister is required to replenish the sand cloud.

In order to function against incoming fire, sand must be out in advance of that fire, which means that each sandcaster which is to function in combat must fire one cannister of sand before combat begins. It is this sand which is then replenished following successful hits. Although sand cannot be recovered, it is not lost except by being burned up by incoming fire. Because it is held in an energy field, sand is held in place around the spacecraft regardless of maneuver or evasion (but it is lost when a ship enters jumpspace, as the jump field does not extend around the sand cloud).

Like offensive weapons, each sandcaster turret can only be used against one hit per turn. However, when a weapon scores two hits by rolling an Outstanding Success, a sandcaster can be used against both these hits, rolling separately for each one, and perhaps using up more than one cannister.

Nuclear Dampers: Nuclear dampers are based on the manipulation of the so-called strong nuclear force which holds atomic nuclei together. By properly projecting this force onto incoming



nuclear warheads, the damper can prevent the warhead from undergoing nuclear or thermonuclear reactions.

Nuclear damper turrets and barbettes have only enough range to be used within the same hex, and are used against the missile during the same moment before it fires at the preemptive beam fire, above.

Larger internal nuclear dampers may have a greater range, which is listed with the damper. This range is an absolute range of effect, and not a short range as with most weapons. These are not limited by arcs of fire when firing out of their own hex.

It is crucial that the damper remain focused on the warhead for long enough to disable it. It is a Difficult task of the operator's Screens (Nuclear Damper) skill to disable a missile's nuclear warhead with a nuclear damper. Modifiers are based on the closing velocity of the missile. This figure varies with the tech level of the damper, and is listed on the ship data profile and control panel as the "CV÷" number, which means that the missile's closing velocity (the velocity of the missile's vector for that turn) is divided by that number and the result (dropping fractions) is the number of + Diff Mods applied to the task. Success indicates that the missile's warhead becomes inert, and cannot detonate and fire.

Nuclear damper turrets, although relatively compact and inexpensive, are limited to firing on only one missile per turn. Larger damper installations may conduct defensive fire against all missiles that fire on the ship during the turn.

Meson Screens: Meson screens project an energy field which interacts with incoming mesons, causing them to decay harmlessly outside of the vessel's hull.

Meson screens come with a listed Protection Value, "PV," on the ship data profile and control panel. The basic difficulty to stop a meson gun hit with a meson screen is Difficult, but this varies with the relative power of the meson gun to the meson screen. Compare the damage value of the firing meson gun by the PV of the meson screen, drop fractions, and consult the table to find the Difficulty Modifier applied.

If the gun's damage value is 4 or more times the PV, difficulty is increased two levels (+2 Diff Mod).

If the gun's damage value is 2 or more times the PV (but less than 4 times), difficulty is increased by one level (+1 Diff Mod).

If the PV of the screen is 2 or more times the gun's damage value (but less than 4 times), difficulty is decreased by one level (–1 Diff Mod).

If the PV of the screen is 4 or more times the gun's damage value, difficulty is decreased by two levels (–2 Diff Mod).

Success indicates that the meson gun "hit" does no damage to the vessel.

Black Globes: These rare defensive devices are not normally encountered, so are discussed in the Miscellaneous Objects and Issues section, page 28.

DAMAGE

Once hits are obtained, and they have successfully made it through the target's defenses, determine what systems were damaged and how much actual damage was sustained.

Weapon Damage Performance

Weapons are listed with penetration and damage figures that are used to calculate the amount of damage they do when they hit a target. These figures vary with range; make sure to use the correct numbers for the range at which the hit was scored.

Terms and Concepts: There are basically two ways for a hit to affect its target: by penetrating (punching holes through) armor, and by explosively damaging equipment. There are several important terms used to describe these effects and capabilities.

Penetration value is a quantification of a weapon's ability to penetrate through heavy structural objects such as starships and their armor and machinery.

Damage value is a quantification of the amount of damage a weapon can inflict on a variety of objects, including heavy machinery.

Penetration rating is a conversion factor used to describe the relationship between a weapon's penetration value and its damage value. The penetration rating is the number of damage value points lost per point of armor value penetrated. For example, a laser with a penetration rating of 1/6 and a damage value of 19 would spend 2 points of damage value to penetrate an armor level of 12, and still have 17 damage points remaining to do interior damage. The penetration rating allows a weapon's performance in terms of damage value to be translated to penetration value (damage value ÷ penetration rating = penetration value), or from penetration value back to damage value (penetration value × penetration rating = damage value—see "Penetration Ratings Conversion" on the player aids card).

Not all weapons have a penetration rating. For some types of weapons, such as particle accelerators (or modern tank-fired kinetic energy rounds), the ability to punch holes in armor and the ability to cause explosive damage to heavy equipment are effectively the same. These weapons do not need a penetration rating, because their penetration value is an accurate assessment of their performance in both cases. On the other hand, some weapons, such as lasers, by their very nature have very different penetration and explosive damage effects. The energy contained in a laser is more efficient at punching holes than it is at causing explosions in machinery. For this reason, lasers use a penetration value for punching holes and a damage value for blowing up equipment, and are also given a penetration rating in order to convert the two values back and forth.

Damage points are the units that are used to describe the amount of damage caused by a hit. Damage points are inflicted on a starship in different ways by different weapons:

- Particle accelerators penetrate armor and inflict damage points with their *penetration value.* They also do additional radiation and EMP damage—see that section under "Damage Effects," below.
- Lasers penetrate armor with their *penetration value,* but inflict damage points with their *damage value.*
- Meson guns do not worry about penetrating armor, and inflict damage points with their *damage value.*

Lasers and particle accelerators hit the surface of a ship first and do explosive damage to any surface fixture they encounter. If they have remaining energy after damaging the surface fixture, or if they hit bare hull surface instead of a fixture, they hit the hull itself and expend energy for penetration. If they penetrate all the way through the hull armor, they cause internal explosions with their remaining energy.

Meson guns do not follow this pattern. Meson gun beams pass through the hull without interacting with or damaging it and simply cause interior explosions. Because they do not penetrate armored hulls *per se,* they do not have a penetration value or penetration rating.

Final Damage Point Value: A weapon's damage and penetration characteristics vary with the range at which the hit was made. Look at the weapons

data on the ship data profile to find the values for the correct range.

Because of intangibles in relative target motion, angle of the hit, "lucky shots," etc., there is some variation in the final force of each hit. To simulate this, roll 2D6 for each hit prior to finding the hit location. For particle accelerators, add the result to its penetration value. For lasers, calculate the penetration value (damage value + penetration rating) and add the result to it. Do not make this roll for meson guns.

Hit Location

When a weapon hits a spacecraft, roll for the hit location. To determine hit location, first determine the arc of fire from which the craft was hit, based on the craft's final facing and the location of the firing weapon. Then consult the Arcs of Fire and Hit Locations by Hull Form table on the player aids card. Find the line for the target's hull form, and intersect that line with the column for the arc of fire that the hit came through. This gives the hit locations that can be hit from that arc. Roll randomly to get the hit location from among those available. Depending upon the number of available locations, this will require a 1D6 or 1D20 roll, with unavailable results rerolled.

Example: If locations 1-5 are available, roll 1D6, rerolling results of 6. If 2-19 are available, roll 1D20, rerolling results of 1 and 20.

Some weapons do not have their hit locations limited based on arcs of fire. A meson gun hit rolls 1D20 for hit location regardless of the target's facing. Likewise, any laser or particle accelerator fire that was fired from a range of 0 (within the same hex as its target—this is typically the case with detonation missiles) also does not concern itself with target facing, and rolls hit location on 1D20.

Once the hit location is determined, find the line for that hit location on the craft's damage table. Each craft has its own unique damage tables, printed on each ship data profile page in the *Technical Booklet*, with the entries determined by the actual placement of systems within the ship and on its surface. During the discussion below, examples will be given using the damage tables of the *Gazelle*-class Close Escort found in the *Technical Booklet*.

Surface Hits: For lasers and particle accelerators, first resolve surface damage. Meson guns skip this step and proceed directly to the internal hits step.

Look in the Surface Hits column of the damage table for the correct hit location. If there is no notation there, the entire surface area of that hit location is considered to be bare hull. Proceed directly to hull penetration.

If there is a notation, this indicates the surface fixture(s) on the surface of that location. In most cases, these notations are abbreviations. A glossary of these abbreviations is printed at the beginning of the data profile section of the *Technical Booklet*. If there is a number before the notation, for example, "1-6: Ant" on the Gazelle's hit location 2, that is the roll on 1D20 to hit the listed fixture. If the fixture is not hit (in the example, on a 7-20), the shot hits bare hull elsewhere on the surface. Proceed directly to hull penetration.

Sometimes there is no number before the notation (the Small Craft at locations 18 and 19). This means that all hits here hit the listed fixture.

In some cases, the notation is not a specific fixture, but a broad category that requires a further roll, as in the case of "Ant," for Antenna. Look at the Damage Type chart on the player aid card. Roll 1D10 (with DMs as indicated beneath the chart if necessary) on the chart to find the specific piece of equipment within the category that was hit. If more than one system fits this criteria, roll randomly among the systems of that type (the roll will vary depending upon number of systems) to see which system was hit. Note that systems that have already been destroyed by previous hits can be hit again by this random roll. However, they absorb no additional damage points when hit again, and the shot passes through them on to the next step. For example, the *Gazelle* took an antenna hit, and a roll of 8 on the Damage Type chart shows that a sensor antenna was hit. As the *Gazelle* has two sensor antennae, one active EMS and one passive EMS, 1D6 is rolled to determine which was hit.

Surface Damage: Once it has been determined which system has been hit, look at the control panel to see how much damage the system can take. Then use the Spacecraft Damage table to find the amount of damage the hit can do based on its number of damage points (for particle accelerators this is its penetration value; for lasers, this is expressed in terms of its damage value).

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than five major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

If the damage is equal to or less than the amount the system can take, apply the damage to it, and the hit is resolved. If the damage is more than the system can take—for example, more hits than the system can take, or major hits when the system takes damage in only minor hits—reduce the number of damage points by the maximum amount required to destroy the system (e.g., 20 damage points would be absorbed by a system that could take 2 minor hits, 40 points by a system which could take 1 major). Note that while a minor hit could be caused by only 1 damage point when the damage was less than or equal to the maximum sustainable damage, that same minor hit would absorb 10 damage points when absorbing energy from a damage quantity greater than it could completely absorb.

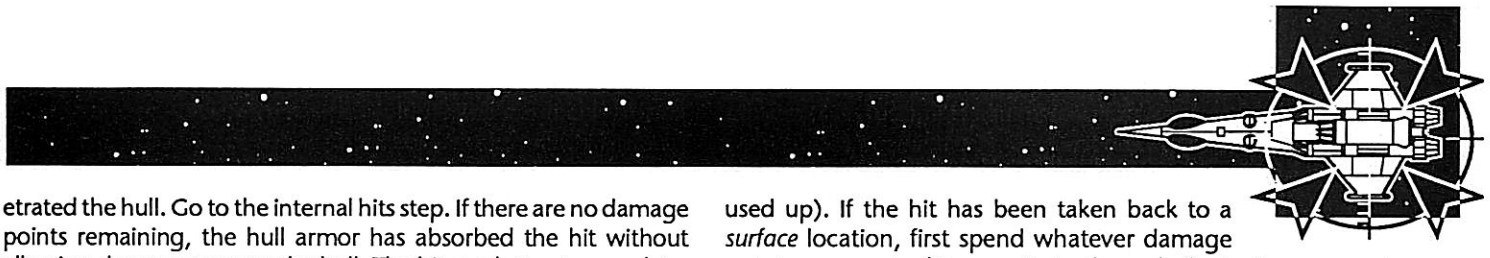
Any leftover damage points are then taken to the hull penetration step.

Hull Penetration: This is only conducted if damage points remain from particle accelerator or laser hits after the surface damage step. Meson guns skip this step.

Find the armor value of the craft's hull on its data profile sheet. (Some craft have different armor values at different hit locations, which is clearly indicated in the "Notes" section. If this is the case, use the armor value for the correct hit location.)

If the hit is by a particle accelerator, whose damage points and penetration value are the same, subtract the hull's armor value from the hit's penetration value to see if the hull was penetrated. For lasers, whose damage points represent their damage value, multiply the armor value by the penetration rating for that range to see how many damage points are used up (round all fractions *up*) in penetration.

If there are damage points remaining, the weapon has pen-



etrated the hull. Go to the internal hits step. If there are no damage points remaining, the hull armor has absorbed the hit without allowing damage to enter the hull. The hit resolution is complete.

Internal Hits: Look in the Internal Explosion column of the hit location to find the system hit there. As with surface hits, there may be a D20 roll to decide which of several types of systems is hit—for example, the *Gazelle*'s hit location 1 where 1-10 means an Electronics hit and 11-20 is a Quarters hit.

Sometimes the result is a specific system, such as Laser Barbette (*Gazelle* locations 10 and 11), and sometimes the result is rolled with 1D10 on the Damage Type chart as described under Surface Hits.

Internal Armor: Some starships have, in addition to the armor of their hull, additional internal armor surrounding one or more systems. These systems and their armor value are indicated on the ship data profiles and control panels. If one of these armored areas is hit, the weapon must first penetrate the additional armor on that area before proceeding to the internal damage step.

Internal Damage: This is conducted in the same basic manner as surface damage.

However, there are additional limits on the amount of damage that can be absorbed by internal systems. There is a maximum amount of damage that can be deposited in one system by one hit. This maximum is 5 major damage results or 120 damage points, even if the system has hit boxes remaining.

There is also a maximum amount of damage that can be absorbed by a crew hit result; this is 1 major hit (40 damage points) for a crew section with more than one crewmember, or 1 minor hit (10 damage points) for a crew section with only one crewmember (such as an MFD or turret).

Excess Damage: After a system has absorbed the maximum possible damage (because it has been destroyed or it has absorbed the maximum levels just described), any remaining damage points are rolled again as excess damage, meaning that the energy goes to damage another system in the same or adjacent hit location.

Roll 1D6 on the Excess Damage Location table to see where the excess damage goes. Use the following notes to interpret the results:

Excess Damage Location

1D6	*Area*
1	–1 internal area
2-3	Same internal area
4	+1 internal area
5	–1 surface area
6	+1 surface area

–1 or +1 internal means that an adjacent internal area has been hit, either 1 place lower or higher on the hit location chart (i.e., hit location 15 becomes 16 on +1, 14 on –1). If this would move the hit location off the chart (by reducing it to 0 or increasing it to 21), the hit instead becomes additional surface damage in the same hit location.

The notation "same internal area" indicates that an additional component in the same area absorbs the excess damage.

The notation –1 or +1 surface area indicates that the additional damage is applied to a surface area adjacent to that original hit, either one higher or one lower on the chart. If this would move the location off of the chart, reverse the sign.

Once the new hit location is determined, determine damage normally using the damage tables. If the excess damage has moved to another internal location and there is still excess damage remaining after the new hit is resolved, roll for excess damage again (and again and again until all damage points are used up). If the hit has been taken back to a *surface* location, first spend whatever damage points are required to penetrate through the hull armor again. Then apply damage to surface fixtures there according to the normal procedure. However, if the hit result at the location is bare hull, all remaining damage points are vented to space with no further damage. If a surface fixture was hit and excess damage remained after destroying it, that remaining excess damage is also vented to space.

Example: Our friend the *Gazelle* is hit by a 300 Mj Laser Barbette at a range of eight hexes (short range—see the barbette listed on the *Gazelle*'s own data profile) through its bow quarter arc (hit locations 1-19 for a wedge hull form). At this range the damage value is 45 and the penetration rating is 1/14. A hit location of 1 is rolled, and a 6 is rolled on 1D20 for the surface hit column, showing that an antenna was hit. A roll of 3 on the Antenna column of the Damage Type chart shows that the antenna hit was for a communicator. The *Gazelle* has two communicators, a radio and a maser. A roll of 2 on 1D6 indicates that the radio antenna was hit.

The radio antenna can take 1 minor hit, so absorbs 10 damage points of the 45 and is destroyed.

35 damage points remain to penetrate the hull, which has an armor value of 62. Multiplying 62 by the penetration rating gives ($62 \times 1/14 = 4.43$ rounded up to) 5 damage points used up in penetration, leaving 30 for internal hits.

Location 1's internal column requires another 1D20 roll to decide between an Electronics and a Quarters hit. The roll is 9, so it is Electronics. Going back to the Damage Type chart, this time using the Electronics column, we roll a 2, again getting a Communicator result. As this is an internal hit, this would be a hit on the communicator's internal controller, rather than its external antenna. Rolling a D6, we get a 3, indicating a hit on the radio controls. The player is lucky; this was essentially a free hit, as the radio was already useless without its antenna. The radio controller takes 1 minor hit, so absorbs 10 damage points and is destroyed, leaving 20 excess damage points.

Rolling on the Excess Damage Table, a roll of 4 indicates that the damage goes to +1 internal area: hit location 2. All internal damage in location 2 is rolled on the Electronics column of the Damage Types chart. A D10 roll of 9 indicates a Bridge Crew hit. The remaining 20 damage points are enough for 2 minor hits against the crew, which indicates that two casualties are taken.

Damage Effects

Damage is taken and recorded in two basic ways: by systems which are divided into the number of minor and major hits they can sustain ("hit box systems"), and systems (such as crew, fuel, and cargo) which are recorded in other terms ("non-hit box systems").

Hit Box Systems: As damage is taken by ship's systems, mark off the proper number of damage boxes on the control panel. It is suggested that this be done in pencil, as successful damage control tasks (page 25) can remove hits. Once all of the boxes are marked off, the system is destroyed and cannot function or be repaired. As long as some damage boxes remain unmarked, the system may still function, although at reduced levels. Note that systems which are defined in terms of minor hits may only take minor hit damage, while systems that are defined in major hits may take either. However, only major hits cause hit boxes to be marked off; minor hits on these systems have

different effects (see "Degraded Performance and System Resets," below).

The specific effects of a system losing hit boxes and being destroyed or out of service due to system resets are as follows:

Weapons, MFDs, Defensive Weapons or Screens, Communicators, Sensors, and ECM: The destroyed system may not be used nor provide its benefits (e.g., EMM), and for weapons and defenses, any listed crewmembers are casualties when the system is destroyed. Non-destroying hits cause system resets and degraded performance (below). Systems which have an antenna are useless if the antenna is destroyed. Degraded performance or system resets on the antenna confer these effects on the entire system.

Missile Launchers: Damage to missile launchers (turrets and barbettes) also destroys their missiles. Each non-destroying hit destroys missiles: one per minor hit and 1D6 per major hit.

Computers: If there is more than one computer, each time a computer is destroyed, the next computer takes over its functions. Once all computers on a ship are destroyed, all tasks become one difficulty level harder (+1 Diff Mod), and the ship may not use its jump drive.

Staterooms and Low Berths: These are "free hits" from a combat standpoint, although passengers or crew with no battle stations occupying the rooms or berths may be killed by such hits, as ruled by the referee in refereed games. Roll randomly to determine specific stateroom.

Life Support and Emergency Life Support: Once both these systems are destroyed, all crew must be in vacuum suits and all tasks become one level more difficult (+1 Diff Mod). See also Critical Hits, below.

Gravitic Compensators: If this system is not functioning, each turn in which the ship expends more than 1 G-turn maneuvering, all tasks are conducted at +1 Diff Mod for each additional G-turn of maneuver. Crewmembers strapped into a workstation ignore 1 additional G-turn of maneuver before Diff Mods set in. Any G-turns spent on evasion increase difficulty by +1 per G-turn, crewmembers in workstations ignore the first +1 Diff Mod. Crewmembers not in workstations (i.e., damage control parties) may not function at all at 2 G-turns or more of evasion.

Sickbay, Labs, Machine, and Electronic Shops: These have no immediate combat effects, but have obvious roleplaying and campaign consequences.

Jump Drive: If destroyed, the ship may not enter jump space. If not destroyed, find the percentage of hit boxes that have been marked off. Multiply the ship's standard jump performance by this number, and round fractions down. This is the current jump performance number. A jump of this or lesser range may be attempted, but with a +1 Diff Mod, in addition to any degraded performance Diff Mod. If the jump performance has rounded down to 0, the ship may attempt a jump 1, but with an *additional* +1 Diff Mod, thus the highest possible Diff Mod is +3.

Power Plant: Each hit on the power plant eliminates the listed portion of the ship's power generation capability. System Reset (below) results only affect one hit box worth of power as well, with only one system reset allowed at a time.

Contra-Gravity: Landings on and take-offs from planetary surfaces are impossible.

Non-Hit Box Systems: These systems have specific instructions regarding the effects of damage, as follows:

Crew: A minor Crew hit causes one casualty, and a major hit causes 1D6. (Note that an MFD operator may become a casualty on either bridge crew hit or an MFD hit where the subsequent D10 roll indicated "crew.")

Fuel: Starship fuel tanks have self-sealing features. A minor hit causes the loss of 1D6 displacement tons of fuel before tanks reseal. A major hit causes the loss of 1D20 displacement tons of fuel before tanks reseal.

Objects: Objects include cargo, vessels carried in the hangar, and other items not actually a part of the ship. If these objects are not being used in the battle, the major damage should be recorded and determined later. However, scenarios will indicate their damage capacity for purposes of destroying the cargo and for absorbing damage which would otherwise be distributed to other areas of the ship. Because ship's cargoes are normally generated by displacement tons rather then metric tonnes, use the following rule of thumb: When not otherwise indicated or able to be determined, assume that each metric tonne of a typical cargo will absorb 1 damage point (being destroyed in the process). Thus, each displacement ton of typical cargo will absorb 14 damage points. For unusually dense or light cargoes (ingots of gold on the one hand, or light bulbs packed in Styrofoam on the other) adjust these figures down or up accordingly.

System Resets and Degraded Performance: Whenever a system suffers damage (major or minor) which does not destroy the system (this includes systems which are defined in terms of major hits and suffer minor or major hits), roll a die and consult the minor damage table. The two results are System Reset and Degraded Performance.

System reset means that the system is off-line for the next combat turn and may not be used, but that it comes back on-line the following turn and may be used normally. If the ship's computer suffers a reset result, and there are no backup computers available, all ship's systems reset. When this result is received, place a System Reset marker by the system with the arrow clearly pointed at the system, and with the Next Turn side up. During the Turn Record Phase of each turn, System Reset markers on their Next Side are switched to their Current side, and all markers on their Current side are removed to indicate that the system will be back up on-line the following turn. Note that a System Reset on a power plant does *not* affect the entire power plant, but only one hit box worth of the plant, as discussed under Hit Box Systems above.

Degraded Performance means that all tasks conducted with that system are conducted with a +1 Diff Mod. This applies principally to sensors, weapons, jammers, jump drives, etc., which have clearly defined tasks associated with their use. However, the following systems experience special effects from DP results:

Computer: All ship tasks are conducted with a +1 Diff Mod. However, if another undamaged computer is available, this computer takes over with no penalty.

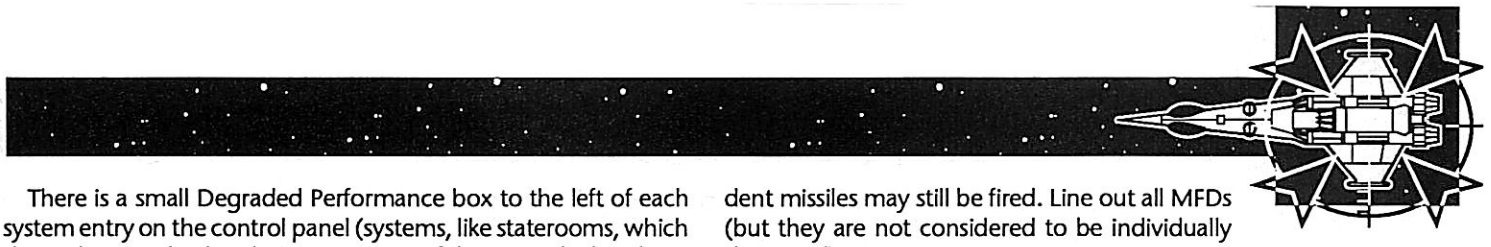
Life Support and Emergency Life Support: Degraded Performance has no game effects; the boxes are included to allow roleplaying effects.

Gravitic Compensators: All damage control tasks are one difficulty level harder (+1 Diff Mod).

Power Plant: All damage control tasks to repair the power plant are performed with a +1 Diff Mod.

Contra-Gravity: Any attempt to land on or take off from a planet becomes a Difficult task (Pilot [Interface/Grav]) instead of automatic. Failure indicates an abort back to the planetary surface or orbit; Catastrophic Failure indicates a crash, and the vessel is destroyed.

Maneuver Drive: The ship may no longer divide its acceleration between maneuver and evasion; it must do one or the other in any given turn.



There is a small Degraded Performance box to the left of each system entry on the control panel (systems, like staterooms, which do not have such a box have no meaningful way in which to have their performance degraded for combat purposes). Mark this box with a check or "x," but use pencil as damage control can remove this result. So long as the Degraded Performance box is already checked, all subsequent minor damage results result in a System Reset.

System Redundancy: Most ships carry more than one computer, and so whenever the computer suffers damage, one of the backup systems will automatically take over without interrupting the function of the other ship systems. For simplicity, all computer hits are assumed to be on the computer currently on-line. This means that if two different weapons scored computer hits in the same turn, and the first hit took the primary computer off-line, then the first backup computer would come on-line and be damaged by the second hit.

Carried Vehicles and Vessels: If damage is taken on a carried vehicle or vessel, it should be treated as a hit on the vehicle or vessel just as if it were in combat (except that, if unmanned, it cannot suffer personnel hits, and these are rerolled).

Radiation and EMP Damage: Any hit by a particle accelerator on any part of a ship will automatically cause all computers, except those with fiber-optic circuits, to suffer a System Reset result (fiber-optic computers suffer no additional ill effects). Also, any particle accelerator damage that rolls a Crew hit does twice the normal number of casualties (2 on a minor, and 2D6 on a major hit).

Critical Hits: Under certain circumstances, a weapon may cause one or more critical hits. This is a function of the damage value of the weapon compared to the size of the target ship. The Critical Damage Level table indicates whether a critical hit is achieved by a weapon and, if so, how many.

If one or more critical hits are achieved, there is a chance that the ship will be vaporized by massive internal explosions. Roll 1D20. If the roll is less than the number of critical hits achieved, the ship is vaporized. If it is equal to or greater than the number of hits achieved, the ship suffers only the actual number of critical hits shown. Roll the appropriate number of critical hits on the Critical Hits table and apply the result immediately.

There are 11 distinct critical hits possible. As critical hits are scored and applied differently than normal hits, keep track of them separately.

Bridge Destroyed: The ship's bridge explodes, destroying all controls located there (including maneuvering, astrogation, sensors, MFDs, and communication equipment) and killing or incapacitating the entire bridge crew. The ship is no longer capable of maneuvering, entering jump, acquiring new sensor fixes, detecting new targets, communicating, or operating screens. Weapons with local fire control stations may continue to engage targets which have already been acquired by the ship's sensors, but do so at one difficulty level higher (+1 Diff Mod). Ships equipped with more than one bridge (main operating, auxiliary operating, fire control, flag, etc.) roll to see which is destroyed. Ships with another crewed operating bridge may shift control functions there beginning the following turn. Mark off all appropriate crew as casualties, and MFDs if they were located on the destroyed bridge.

Fire Control: Destroyed circuitry and power spikes disable the ship's fire control interface between weapons, sensors, and targeting processors. The ship may not fire any energy weapons, nor may it operate missiles (all non-fully independent missiles currently in flight are considered lost). Ship's defenses (sandcasters, nuclear dampers, meson screens) continue to operate, and fully independent missiles may still be fired. Line out all MFDs (but they are not considered to be individually destroyed).

Power Plant: The power plant is seriously damaged and goes off-line. It may not be repaired or restarted for the duration of the scenario. The ship goes on auxiliary power/batteries. The ship may not maneuver, fire energy weapons, nor operate any active sensors or screens. The ship may fire missiles and operate sensors in passive mode at +1 Diff Mod. Line out the power plant.

Sensors: Destroyed circuitry and power spikes disable all sensors. The ship may no longer acquire new sensor locks. All weapons may continue to engage targets which have previously been acquired by the ship's sensors, but do so at +1 Diff Mod. Line out all sensors.

Life Support: The ship's life support has failed and the hull's integrity has been breached, and the crew must rely on their vacuum suits for survival. All tasks are conducted on +1 Diff Mod. This has no additional effect on crews which were at battle stations in their vacuum suits, as these suits have sufficient air and power to keep the crew alive for the remainder of the scenario. However, this result does have potentially dire consequences for the long term. Crews which were for some reason not suited up must spend the entire next turn suiting up and may not conduct any other action. Line out the Life Support and Emergency Life Support systems.

Fuel Explosion: Liquid hydrogen and oxygen escape from shattered storage tanks, combine in the internal spaces of the ship, and explode. Roll for one damage result on the internal explosion table, with the damage value of the explosion determined by the ship size. See the Fuel Explosion Damage Value table.

Artificial Gravity: The ship's artificial gravity and G compensators fail. See the Gravitic Compensators destruction effects above. Line out the Artificial Gravity and G Compensator systems.

Jump Drive: The ship's jump drive is seriously damaged and the ship may not enter jump space until it is repaired. Line out the Jump Drive.

Maneuver Drive: The ship's maneuver drive is seriously damaged and it may not maneuver or evade until it is repaired. Line out the Maneuver Drive.

Spine: The ship suffers serious structural damage that throws the vessel out of alignment. Any spinal mount weapons are rendered inoperative. In addition, the maneuver drive thrust line is no longer centered on the ship's axis of mass, and so any acceleration must be accompanied by constant attitude correction. Each time the ship accelerates, a Difficult task (Pilot [Interface/Grav]) is required to avoid inducing a tumble. For each G less than the full rating of the power plant used, reduce the task difficulty level by 1. Failure results in the ship beginning to tumble, and Catastrophic Failure indicates a severe tumble. In the case of a tumble, the ship may not maneuver or evade in the next combat turn, as it corrects the tumble, and all tasks are conducted at +1 Diff Mod. The same is true of a severe tumble, except that tasks are at +2 Diff Mod.

Computer: Destroyed circuitry and power spikes disable the ship's data bus and information processing systems. The ship may not launch small craft or enter jump. All other tasks are conducted at one higher difficulty level (+1 Diff Mod). Line out all computers.

DAMAGE CONTROL

Players may attempt to repair damage suffered during the current or preceding combat phases during the Damage Control Phase of each turn. These repairs may be attempted using *damage control crew* as listed on the spacecraft control panel.

Damage control crewmembers may be used

singly or in groups to repair one of three kinds of damage: major hits, minor hits, or system resets. Major and minor hits may only be repaired if there are unmarked hit boxes left in the system, because any system with all its boxes marked off is completely destroyed. Critical hits may also not be repaired during the course of a **Brilliant Lances** scenario.

Control panels show the number of crew available for damage control under Damage Control parties. These crewmembers may be assigned individually or in groups to repair damage. The more crew assigned, the lower the task's difficulty. Each crewmember can only be assigned to one damage control task per Damage Control Phase, and a maximum of three crew can be assigned to each task—see the table below.

Damage Control

# Crewmembers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

These crew may only be assigned to repair damage to internal, not hull surface, systems, but these systems may be anywhere in the ship. Engineering crew may also be used to make damage control rolls, but only to systems listed in the engineering section of the control panel. Engineering crew may be combined with damage control crew on such tasks. (Asset used is Ship's Engineering for all systems except those listed in the Electronics block, for which the Electronics asset is used.)

Success indicates that the repair is effective immediately, so a system reset that would have lasted for the entire following turn will not take place at all. Outstanding Success also indicates that a degraded performance result on the system is also removed. Note that without an Outstanding Success, a system can be repaired back to its full level (i.e., all hit boxes unmarked) and still function at its degraded performance level. Catastrophic Failure indicates a system reset in addition to already-existing damage (if the equipment will already be under a system reset the following turn, there is no additional effect).

Energy Allocation and Powering Down Systems: Brilliant Lances does not require players to make decisions each turn on how to assign power. **Traveller** starships are usually designed with sufficient power for all installed systems to function at once. However, as combat damage reduces the power produced by the ship's power plant, players may be required to power down certain systems in order to bring energy consumption into line with production.

During the Damage Control Phase, after the turn's damage control tasks have been attempted, players must cut power to systems so that the total power consumed in megawatts is less than or equal to the amount produced by the power plant. Each system has its MW requirement listed with it, and the maneuver drive has a listing of the amount of power needed for each G of its G rating. To show that a system has been powered down, place a Powered Down marker by the system so that the red arrow in the upper right hand corner of the marker is pointed at the shut down system. On the reverse of these counters are Powered Down markers with the notation 2, 3, 4, 5, and 6. These are used to show how far the maneuver drive has had its power reduced. For example, a maneuver drive with a G rating of 4 would have a Powered Down 2 marker placed on it to show that it was reduced to enough power for only 2 G-turns.

Even systems which are damaged require their full MW input to function at their damaged levels. The one exception is weapons which have been overpowered to increase their hit probabilities. A weapon boosted to –2 Diff Mods could have its power cut in half and would function at –1 Diff Mod (use a Powered Down marker), or have its power divided by 10 and function without its overpower Diff Mod (use a Powered Down 2 marker). A weapon functioning at –1 Diff Mod could have its power divided by 5 to function without its overpower Diff Mod.

BOARDING ACTIONS

Disabled enemy ships may be boarded. Disabled ships have no functioning maneuver drive and no weapons which can fire at the boarding vessels. Unfortunately, there is no way to tell whether an enemy vessel is disabled or playing possum. In **Brilliant Lances**, players will have a general idea of each other's damage because they jointly roll damage results. However, there is no need for either side to tell the other the exact damage status of their ships.

In order to board, the boarding vessel must match vectors with the disabled ship. On the turn following matched vectors, boarding may begin in the Launch Phase, when the boarding player decides how many and what variety of personnel to send over. Reinforcements may be sent each subsequent Launch Phase.

Procedure: Assuming that a vessel is disabled, divide the displacement tonnage of the ship being boarded by 500, and round to the nearest whole number (except that numbers less than 1 always round up to 1). The result is the number of hull sections.

Each game turn, during the Launch Phase, the boarding and boarded player each roll 1D6 and add the following die modifiers (DMs): +1 per Marine (combat armor-equipped combat troop trained in Environment Suit and Zero-G skills), +1 per 2 (non-Marine) troops, and +1 per 10 (non-Marine, non-Troop) crewmembers, and +2 if defending. The player with the higher adjusted die roll captures one hull section, except that a side which took the +2 defending DM does not take any additional hull sections. If both sides choose the defending die roll, no hull sections will change hands. The boarding player must always be attacking (i.e., forego the defending die modifier). Regardless of the winner, each side takes casualties equal to the adjusted die roll of the other side.

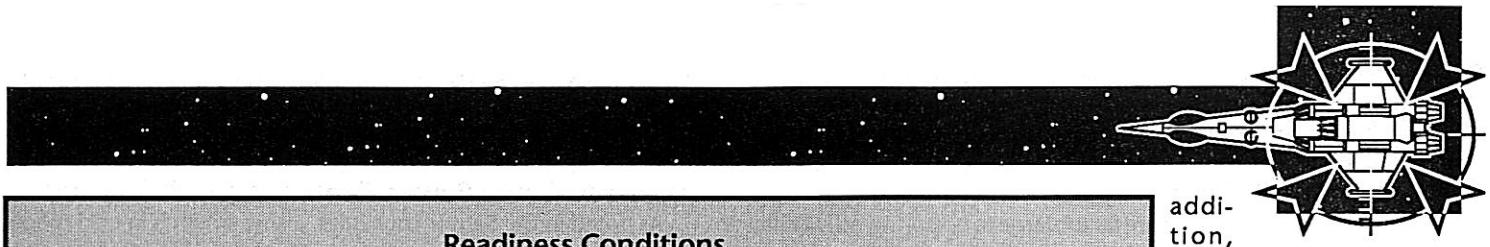
Combat continues until all hull sections belong to one side. If the boarding side loses, the survivors may return to their own vessel. If the boarding side loses, surviving members are captured.

SURPRISE

Surprise is determined only once per scenario. Surprise is possible for either side, and the element of surprise gives an advantage both in attacking and in avoiding the enemy. In some cases surprise is indicated in the scenario instructions, but it can also be determined by the players.

Surprise is a Formidable task (Fleet Tactics). It is rolled by the side which first makes a sensor lock on an enemy (referee's decision, based on the relative sensor and crew qualities of the ships).

Benefits of Surprise: The vessel(s) which was surprised may not maneuver or fire on the first turn it was surprised, unless it is able to man battle stations. Manning battle stations is a Formidable task (Leadership). Battle stations are always manned on the first full turn following surprise.



Readiness Conditions

Name	Description	Effects on Readiness	Max Periods	Side Effects
Condition 0	Normal cruising	Normal	—	None
Condition 1	Alert status	–1 Diff Mod	6	+1 Diff Mod per two periods
Condition 2	Battle stations	Automatic	3	+1 Diff Mod per period

Readiness: Under certain circumstances, players or scenario instructions may stipulate that their vessels are operating at alert status, with some battle stations already manned, or at battle stations. If operating under alert status, the roll to man battle stations is one difficulty level easier (–1 Diff Mod). However, these levels may not be maintained indefinitely. There is a maximum number of consecutive four-hour periods for which these conditions can be maintained, shown on the Readiness Conditions table above. Each additional consecutive four-hour period beyond these limits imposes a +1 Diff Mod on every task attempted by every crewmember. Thus, if Captain Queegulii kept his crew at battle stations for 20 hours, beginning at 12 hours and one minute, all tasks would be one difficulty level higher. Beginning at 16 hours and one minute, all tasks would be two levels higher. These penalties remain in effect until at least three consecutive periods (12 hours) are spent at condition 0. So, in the example, if Queegulii let his crew stand down after 20 hours, but called them back to battle stations after only four hours, they would still perform their tasks at two difficulty levels higher.

In addition, once the crew has returned to normal cruising status, the roll to man battle stations is increased in difficulty if the crew had been standing at alert status or battle stations for a long period of time. For each consecutive period at battle stations or two consecutive periods at alert status, the roll to man battle stations is increased in difficulty by one level (+1 Diff Mod). This penalty is decreased by one level for each subsequent period spent at normal cruising. Thus, a crew which had been at alert status for four consecutive periods (16 hours) would be at +2 difficulty levels to man battle stations during the first period after they stood down, +1 level the period after that, and back to normal after two full periods of normal cruising.

Furthermore, no maintenance or repairs (this applies only to the **Traveller: The New Era** roleplaying rules) can be conducted under either condition 1 or 2, although damage control may be.

MISCELLANEOUS OBJECTS AND ISSUES

Recording Fuel Use: Each ship data profile and control panel lists the amount of fuel (in m^3) use for each G-turn expended by a craft. The Plotting and Movement rules indicate that the amount used is to be recorded each Plotting Phase. In addition, the damage rules show how volumes of fuel may be lost to major and minor hits. These figures are not always relevant, and in many scenarios players can ignore keeping careful track. However, some scenarios portray situations in which ships need to have fuel left over for activities after the end of the scenario. In these cases, players should be careful to track the fuel used through maneuver as well as lost to combat, as fuel use figures in the victory conditions.

Sensor Drones

Drones are basically larger missiles which carry sensors and do not blow up, but return to their owning ship to be used again. In addition, some very large fully independent missiles also use these rules.

A variety of sensors are listed in the *Technical Booklet* along with their characteristics, such as sensors, G rating, armor, size, etc. When firing on a drone, do not use firing arcs or hit locations. If a hit is scored, merely use the Drones column on the Damage Type chart. Each one of the listed systems can absorb 1 minor hit, unless otherwise listed on its characteristics list. If excess damage points remain after inflicting a minor hit, roll again on the table until the damage is used up. Results of Sensor and Communications must be rolled to see if they are antenna (1-3) or internal controller (4-6).

Sensor drones and missiles are also highly susceptible to critical hits—use the separate critical hits table for unmanned craft. Control system indicates that the craft loses all control and goes stupid. Although it will coast through space forever, it is removed from play. Payload indicates that its primary reason for being has been destroyed, whether it was a missile warhead, all of a drone's sensors, or an area jammer. Fuel indicates that the target is destroyed in a massive explosion of its fuel.

Some drones are controlled by an operator aboard the launching ship, and like missiles, are automatically in contact if they remain within the short range of their installed communicator. If communication contact is lost, the drone simply coasts. Other drones are fully independent craft which are controlled by the player but do not need to be controlled by any crewmembers aboard the launching vessel. These drones are given a crew quality rating that is used when it attempts sensor locks and communications tasks with friendly ships to pass sensor lock hand-offs to them, etc.

Gravity

Gravity has very little effect in **Brilliant Lances**. This is because Gs are measured in whole numbers, and no worlds which fit onto **Brilliant Lances** counters extend their 1 G field out of their own hex. Larger bodies such as stars and large gas giants would certainly do so, and sample figures are given below. However, **Brilliant Lances** does not contain templates for such large bodies, but players should feel free to make their own.

Effects: Any craft that is within the 1 G threshold of an astronomical body has 1 G-turn added to its vector each turn in a direction directly at the center of the body. A craft within the 2G threshold as 2 G-turns added to its vector each turn, and so on. These G-turns must be counteracted by the craft's own drives, or else its vector will be bent toward the gravity source.

G thresholds are calculated by using the formula

$$\frac{\sqrt{GM+g}}{3\times10^{7}} = \text{range in hexes}$$

$G = 6.67\times10^{-11}$
M = body's mass in kg
g = 9.8 × G threshold desired

Remember to subtract the body's radius to get the range above its surface to the threshold.

Stars

Stars are far too large to be portrayed in **Brilliant Lances.** In the **Brilliant Lances** scale, our sun would have a diameter of 46.5 hexes. Its 1 G threshold would extend out another 99.5 hexes from its surface (2G threshold at 63.5 hexes, 3Gs at 47.6, 4Gs at 38 hexes, etc.), and there would be tremendous + Diff Mods against sensor tasks within this area and beyond.

Planets

At the scale and distances from the system's primary star represented in **Brilliant Lances,** the orbital paths of planets show no curvature and are treated as perfectly straight lines. Planets may be given a heading and velocity in the scenario instructions, and these will not change during play for any reason.

The planets represented by counters in **Brilliant Lances** are Terra-size worlds, as even small gas giants take up multiple hexes.

Take-Off and Landing: Any ship that wishes to land on a planet must first match vectors with it in the same hex. This means that craft must spend one turn in which their movement from hex to hex is identical to that of the planet. On the first turn following, the craft can announce that it is landing, which takes the entire turn. Craft which are landed on a world have a +2 Diff Mod applied to sensor tasks against them if the world has an atmosphere of Very Thin or less, +3 if the atmosphere is Thin or greater, and +4 if the atmosphere is Exotic, Corrosive, or Insidious. In addition, any craft landed on a planet with a Hydrographic rating of 1 or more may declare that it is underwater, in which case an additional +1 Diff Mod is applied.

Taking off from a Terra-sized planet also takes a full turn. At the end of this turn, the craft has a vector identical to that of the planet.

Sample Planets: To assist players in designing their own scenarios, the following planetary statistics from our own Solar System are presented in **Brilliant Lances** terms as examples. 1 G threshold is given in hexes beyond the planet's surface. Velocity is orbital velocity, and has nothing to do with the rate that our entire Solar System is scorching around the core of the Milky Way (12 hexes per turn, in **BL** scale, is our "local standard of rest" for you trivia freaks).

Planet	*Diameter in hexes*	*1 G Threshold*	*Velocity in hexes per turn*
Mercury	0.16	Below surface	2.87
Venus	0.40	Below surface	2.1
Earth	0.43	Surface	1.787
Mars	0.23	Below surface	1.45
Jupiter	4.76	1.4 hexes	0.78
Saturn	4.00	0.07 hexes	0.58
Uranus	1.86	Below surface	0.41
Neptune	1.62	0.07 hexes	0.33

There are two equally valid ways to handle planetary (and asteroid belt) motion in **Brilliant Lances.** One is to have the maps represent a motionless chunk of space and have the astronomical bodies move across them at their appointed rates. Another is to pick the planet or asteroid belt as the frame of reference so that they remain motionless and drag the visual window represented by the map along with them. Both are perfectly correct, but the latter is usually much easier.

Powered Down Power Plants and Crash Startups

As noted in the Sensor Lock rules, a ship which is in cold mode, with its power plant powered down to minimal levels (assume 1% of maximum power plant output), presents a very difficult target to passive sensors. However, this tactic can backfire if the ship has to start up quickly. To bring the power plant up to full power normally requires a full 30 minutes, leaving the vessel vulnerable for an entire turn. Rather than waiting, the player may attempt a crash startup. This is a Formidable task (of Ship's Engineering). Success indicates that the power plant is brought up to full levels almost immediately, allowing the craft to exercise its full functions in the current turn, including maneuver. Failure indicates that the vessel will not be powered up until the following turn, while Catastrophic Failure means that the power plant has just suffered 1 major damage result, and startup is delayed one additional turn.

Black Globes

Black globes are highly sophisticated and exotic defensive screens. Even at the height of the Third Imperium's technology, only the most basic black globe screens could be reproduced. The best black globes in use were recovered relics from an ancient civilization that pre-dated humanity's starfaring days. Thus black globes are only rarely encountered.

Although these weapons are very advanced from an engineering and scientific standpoint, their use is very simple. Black globe generators create a spherical field around themselves which absorbs all energy that crosses it. This energy is shunted into capacitors within the hull of the protected vessel where it is stored. This screen can be also set to flicker at a set percentage rate in multiples of 10%.

Combat: When set all the way up, the black globe absorbs the energy of all weapons which successfully rolled to hit the target. For example, each hit from a 150 Mj laser would place 150 Mj into the capacitors of the protected ship.

When the weapon is set to flicker, all weapons which successfully rolled "hits" then roll to see if they were absorbed by the globe or passed through to hit the target normally. For each hit, roll 1D10 to get over the flicker rate divided by 10 (i.e., roll 2+ to get through 10% flicker, 3+ to get through 20% flicker, and so on). Hits which do not make this roll are completely absorbed.

Outgoing fire is not affected, as it is synchronized to match the flicker.

Capacitors installed aboard the ship will have a listed capacity in megajoules. If this limit is ever exceeded, the capacitors spontaneously discharge, inflicting 1D20 critical hits on the vessel, two of which must be a power plant and jump drive critical hit. Incoming sensor and communicator energy absorbed by the black globe is considered to be negligible.

Maneuver: When its globe is all the way up, a vessel cannot maneuver to change its vector or attempt to evade. When it is set to flicker, any Gs that are spent for a purpose are reduced in effectiveness by the amount of flicker (e.g., 4 G-turns to accelerate are reduced to 2 G-turns spent on acceleration by a globe set on 50% flicker). The lost amount of G-turns was absorbed by the globe: Use the megawatts per G-turn figure listed on the control panel to find how much power was sent to the capacitors.

Communications: Communications cannot pass through a full-up black globe, but they can be "stuttered" to pass back and forth through a globe that is flickering. Any communicator that attempts to contact a vessel with a flickering black globe does so with a Diff Mod of the flicker level divided by 30 and rounded to the nearest

whole number. However, a ship with a flickering black globe may attempt communication tasks with other non-globed ships at no increase in difficulty because it can synchronize its transmissions to match the flicker. A ship which has already been so contacted may then contact the globed vessel at no increase in difficulty because it has received the proper synchronization data.

Sensors: A vessel with its black globe fully up may not make or maintain any sensor locks.

Sensor lock attempts against a full-up black globe have a +5 Diff Mod vs. active sensors (radar and active EMS) and a +3 Diff Mod vs. passive sensors (HRT and passive EMS) for the black globe, and the only additional Diff Mods that apply are those for Target Size, Retaining Lock, Target Hand-Off, Terrain, Area Jamming, and White Out.

Sensor lock attempts against a flickering black globe or out of one use all of the standard sensor lock Diff Mods, with the addition of the black globe flicker Diff Mods. For both active and passive sensors, divide the flicker rate by 30 and round to the nearest whole number to get + Diff Mods. Thus, 10% is 0 Diff Mod, 20-40% is +1 Diff Mod, 50-70% is +2 Diff Mod, and 80-90% is +3 Diff Mods.

As with normal bogey sensor tasks, the target player is responsible for calculating certain of the Diff Mods for the lock task, but the emissions signatures of a flickering black globe are distinctive enough that anyone who attempts a lock on a flickering black globe should be given that information whether the attempt is successful or not.

Q & A

Q: My ship, with a G-rating of 1G, has a velocity of 4, and I am attempting to make a heading change to port. I have 3 G-turns of thrust accumulated toward the heading change. In the next Plotting Phase, instead of firing the last G-turn of thrust to complete the heading change, I instead expend 1 G-turn of thrust to decelerate. This makes my velocity 3, and I notice that I now have sufficient accumulated G-turns of thrust to make a heading change based on my new velocity. What do I do?

A: Make the heading change. Whenever there is a question of precedence in a vector adjustment, change the velocity first and then check to see if a heading change results.

Q: My ship has a G-rating of 1G and a current velocity of 1. This turn it spent 1/2 G-turn to change its heading one position. For purposes of determining my final facing for the turn, do I use the facing deviation for greater than 1/2 but less than full G-rating, or for full G-rating?

A: Full G-rating. The rules state that fractional G-turns may not be retained, which means that a full 1G was spent in order to receive the 1/2 G effect.

TOURNAMENTS

GDW will periodically sponsor **Brilliant Lances** tournaments for the summer convention season beginning in 1994. These will involve dogfights between two or more players who have equipped themselves on a fixed budget and other technological constraints. Ships and weapons published by GDW will be eligible for these tournaments, as well as those designed using the accompanying ship design sequence and that in **Fire, Fusion, and Steel.** However, all such homemade designs must be submitted to GDW and approved before they can be used, at which time they may be used by any entrant. All details will be presented in issues of ***Challenge,*** The Magazine of Science-Fiction Gaming.

INTEGRATION WITH TRAVELLER: THE NEW ERA

Brilliant Lances is intended to stand alone as a game and not presuppose knowledge of the **Traveller: The New Era** roleplaying game. However, many **Brilliant Lances** players will also be players of the roleplaying game, and will use it to resolve situations that occur in their roleplaying campaigns.

Crew Quality

When a ship manned by PCs is used in **Brilliant Lances,** all tasks should be resolved using the crew's actual assets, rather than the Crew Quality asset levels.

Traveller players will note that the assets assigned to Green, Trained, Line, and Crack crews are the same as those assigned to Novice, Experienced, Veteran, and Elite NPCs. They are given different names because Novice, Experienced, Veteran, and Elite NPCs are so defined because of their Initiative and skill in personal combat, not space combat. A Crack starship crew will not be the equivalent of Elite NPCs in terms of Initiative and unarmed combat. Many of them might even be Novice NPCs, but with very good assets in Sensors, Screens, etc.

Task	*Asset*
Communications	Communications
Control missile/drone	Gunnery (Missile) or RCV Operations
Crash-start power plant	Ship's Engineering
Damage control	Ship's Engineering or Electronics
Defenses	Screens (appropriate cascade)
Evasion	Ship's Tactics
Fire	Gunnery (Energy Weapons)
Jam radio	Sensors
Jam sensor	Sensors
Land/take-off from planet	Pilot (Interface/Grav)
Man battle stations	Leadership
Sensor lock	Sensors
Surprise	Fleet Tactics

Play with a Referee

When **Brilliant Lances** is used as part of a **Traveller: The New Era** roleplaying campaign, there will obviously be a referee present. The presence of a referee allows many interesting variations to be played.

Double Blind Play: In this variation, no Bogey markers are used, and the referee coordinates sensor lock tasks by the players, only placing pieces on the map once they have been locked up. In addition, damage rolls are made by the referee so that the firing player does not know what damage has been done, except by watching the subsequent performance of the vessel.

Scanning for Damage: Getting detailed data on what is going on within an enemy vessel is impossible at ranges of greater than one hex. The referee may allow players to scan enemy vessels in the same hex for life, functioning power plants and weapons, etc. Such tasks will require the integrated use of active and passive sensors, including neural activity sensors or densitometers. These sensor rolls will be uncertain tasks, and the information that the referee reports to the sensing player may or may not be true.

SCENARIOS

The scenarios presented in the game are described using the following format:

Name: The scenario name and number.

Date: The date is given in the standard Imperial dating system, with day of the year followed by the year number itself.

Location: The star system in which the battle takes place is listed in the standard **Traveller** format: system name followed by a slash and then sector name.

Background: This is a brief presentation of the historical events which led up to the battle.

Situation: This describes the actual situation the scenario covers.

Maps: The three maps will always be placed between the players side by side. The outer two maps will be named after one of the two sides (for example, in the first scenario reference is made to the Zhodani map and to the Imperial map), while the map in the center is always called the "neutral map." This naming convention is used to ease set-up and description of victory conditions, but has no effect on the actual course of play.

Forces: Both players have a section where their forces are described with respect to three major considerations.

Ships: The actual ships available in the scenario are listed along with the quality of the ship's crew, its readiness level at the start of the scenario, and any special considerations, such as depleted ammunition, low fuel, battle damage, or other non-functional systems.

Vector: The heading and velocity of each ship. Often the players will be able to decide this themselves, within limits described in this section.

Winning: This section lists the conditions each side must achieve to win. Usually only one side has detailed victory conditions, the other side winning by preventing the achievement of those conditions by their opponent.

SCENARIO GROUP 1
PERFIDIOUS ZHODANE

Scenario 1: Deep Black

Date: 242-1106

Location: Shionthy/Spinward Marches

Background: The Fourth Frontier War, also called the False War, was a short (1082 to 1084), inconclusive war fought between the Third Imperium and the Zhodani Consulate, primarily in the Jewel Subsector. Although it ended in a Zhodani withdrawal due to the Imperial victory at the Battle of Two Suns, the war served mostly to show that both sides were unprepared for war. Over the next two decades, both belligerents built up their heavy battle units while engaging in dangerous, and often violent, intelligence gathering along their borders.

Situation: The Imperial Navy has hidden a secret maintenance depot in the Shionthy asteroid belt intended to service battle-damaged ships on short notice. Zhodani intelligence has found out that there is a depot in the belts, but is anxious to find out its exact location

Maps: The Imperial player will set up anywhere on the Imperial map and the Zhodani player will enter from the outside edge of the Zhodani map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Imperial player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Once all of the asteroids are placed, the Imperial player may examine the backs of each counter. The counter with the starburst is the location of the maintenance depot. All other asteroids are simple rock.

Zhodani Consular Scouts

Ships: 1 *Chatl*-class leader scout, 2 *Ninz*-class scouts. All crews Crack and at battle stations.

Vector: Enter the map with a velocity of at least 1 and any heading desired.

Imperial Navy

Ships: 3 *Gazelle*-class close escorts, all crews Crack. Any one ship at Condition 2, the others at condition 1.

Vector: Set up on the inner map with any vector desired.

Winning: The Zhodani player wins if any Zhodani ship achieves a sensor lock on the maintenance depot and then gets the information back. (Each sensor lock on an Asteroid counter allows the player to look at the other side. All Asteroid counters, including the maintenance depot, are treated as Very Small [VS] targets for purposes of these locks.) To get the information back, the ship must either exit the map at either end (but not the sides) with functional jump drive, or it must communicate the information to another Zhodani ship which then exits the map at either end with functional jump drive.

Failing this, the Imperial player wins.

Scenario 2: Rearguard

Date: 294-1109

Location: Saurus/Spinward Marches

Background: The Fifth Frontier War (1107 to 1110) was the last in a series of continuing wars between the Third Imperium and its spinward neighbors. Following several years of unrest and provocation, Zhodani forces attacked across the Imperial Borders while previously placed guerrillas on selected Imperial worlds began uprisings. Vargr and Sword World forces allied with the Zhodani Consulate and also participated in the attacks.

Situation: As the war began to go against the Outworld Coalition, the Sword Worlds opened peace feelers to the Imperium. A high-ranking Sword World delegation was picked up by the *Lightning*-class cruiser *Bard Refuge* for transport back to Rylanor and direct negotiations with Archduke Norris. However, a local Zhodani commander got wind of the mission and attempted to intercept it. In the ensuing battle, *Bard Refuge* was badly damaged, losing most of her weaponry and having both fighter launch tubes disabled. As *Bard Refuge* now attempts to reach jump point, two of her fighters and a surviving escort must hold off the remaining Zhodani ships long enough for *Bard Refuge* to escape with its all-important diplomatic passengers.

Maps: The Imperial player will set up on either the neutral or Imperial map (and may divide his ships between the two maps), and the Zhodani player will enter from the outer edge of the Zhodani map. *Bard Refuge* has already exited the far edge of the Imperial map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Imperial player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Zhodani Consular Navy

Ships: 1 *Vlezhdatl*-class strike cruiser, 1 *Zhdits*-class destroyer escort, and 2 military boats from the *Vlezhdatl*. Crack crews at battle stations.

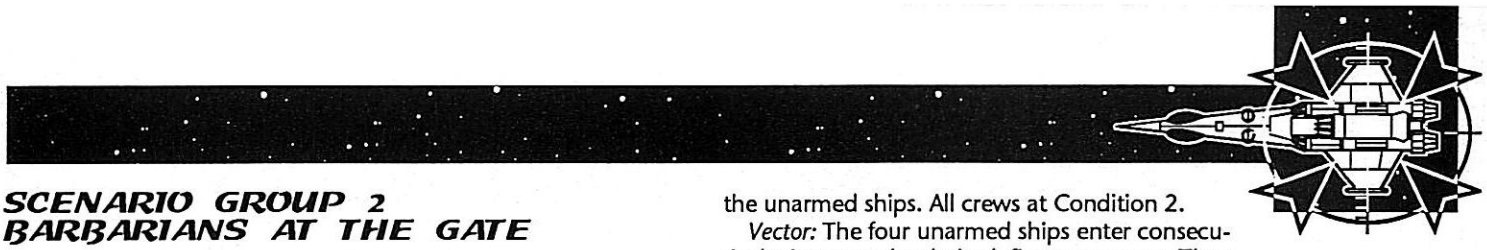
Vector: Maximum initial velocity of 3, any heading.

Imperial Navy

Ships: 1 *Chrysanthemum*-class destroyer escort, 1 *Valor*-class missile corvette, 5 Rampart fighters. Crack crews at battle stations. The *Valor* has expended half its missiles. The *Chrysanthemum* has had its starboard particle accelerator destroyed in the previous fight.

Vector: Any desired vectors.

Winning: The Zhodani player wins if the *Vlezhdatl* exits the far end of the Imperial map still able to maneuver and fire its particle accelerator, or if any two Zhodani ships (no more than one of which may be a boat) exit the far end of the Imperial map able to maneuver and fire at least one laser. In either case, the Zhodani player must do so before the end of the 20th turn, or *Bard Refuge* will have had time to reach its jump point and escape. Failing this, the Imperial player wins.



SCENARIO GROUP 2
BARBARIANS AT THE GATE

Scenario 3: Lackland Sons

Date: 049-1128

Location: Yaggoth/Reaver's Deep

Background: Aslan culture is both territorial and aggressive, and there is powerful pressure on unlanded younger sons (the *Ihatei*) to seek land at the expense of their neighbors. As central order began to break down in the Imperium during the civil war, the waves of Aslan invaders, particularly in the Reaver's Deep Sector, became almost a part of everyday life.

Situation: An Aslan clan transport, with an armed trader in company, move into the Yaggoth system to land an *Ihatei* storm group. With most of the first-line colonial naval vessels drawn away by the civil war, the local forces oppose the Aslan with a scratch force.

Maps: The Imperial player places a Planet counter (representing Yaggoth) anywhere on the Imperial map, but at least four hexes from any map edge.

Aslan *Ihatei* Squadron

Ships: 1 Aslan clan transport, 1 Aslan armed trader. Crews Crack and at battle stations.

Vector: The Aslan enter from the far edge of the Aslan map at any desired velocity and heading. Crews Line.

Colonial Squadron

Ships: 1 armed free trader, 2 system defense boats (SDBs), 1 modular cutter with TL 11 laser gunpack (see page 18, *Technical Booklet*). The SDBs have Line crews, the modular cutter has a Trained crew, the armed free trader a Green crew. All crews at battle stations.

Vector: Any one ship may begin anywhere on the Imperial map with any desired vector. The other ships begin in orbit around Yaggoth.

Winning: The Aslan player wins if at any time the Aslan clan transport is in orbit around Yaggoth, it is still capable of maneuvering, and there are no Colonial vessels capable of firing in orbit around Yaggoth at the same time. Failing this, the Colonial player wins.

Scenario 4: Corsair!

Date: 301-1128

Location: Flire/Vland

Background: Following the withdrawal of the Corridor Fleet to Capital, an avalanche of Vargr raiders swept through Corridor and Vland Sectors. Lacking any central direction, the Vargr moved here and there, bypassing many systems at first, and raiding haphazardly as they went.

Situation: A Vargr raiding group reached Flire in 1127, but found the local defenses too strong to overcome. Instead, the small squadron decided to lay low in one of the system's planetoid belts and jump one of the merchant vessels making the regular run from the colony worlds on the moons of the system's gas giants back to the main world of the system.

Maps: The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the merchant player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

The Vargr player will set up on the neutral map, with each ship in a hex containing an asteroid. More than one ship may be placed in the same hex. The merchant player will enter from the far edge of the merchant map.

Vargr Corsairs

Ships: 2 Vargr corsairs, 1 Vargr trader. Crews Line, at battle stations.

Vector: Any desired vector.

Merchants

Ships: 1 Free Trader (unarmed), 2 Far Traders (unarmed), 1 Yacht (unarmed), 1 Patrol Cruiser, 1 *Gazelle*-class close escort. Crack crew on the patrol cruiser, Line crew on the *Gazelle*, and Green crews on the unarmed ships. All crews at Condition 2.

Vector: The four unarmed ships enter consecutively, in any order desired, five turns apart. They enter with a velocity of 3 and a heading directly down the grain of the map toward the far edge. The merchants may not change their heading or velocity unless and until a friendly ship obtains a sensor lock on a Vargr corsair. The two escorts may enter on any turn desired (or on separate turns) and with any vector desired. Escort crews Line, unarmed merchant crews Trained.

Winning: The Vargr player wins if, at any time, the Vargr trader ship loots an unarmed merchant and then escapes from the map. To loot a merchant, the merchant must be incapable of maneuver and the Vargr trader must spend the entire turn in the same hex and with a matched vector. To escape, it must leave the map by any map edge and still be capable of maneuver and jump.

Scenario 5: The Black War

Date: 111-1129

Location: Vahana/Diaspora

Background: With no resolution of the civil war in sight, Lucan initiated a campaign of terror called the Black War. Utilizing massive planetary bombardments, its aim was to intimidate worlds into surrender and, where that was not possible, leave behind scorched earth incapable of supporting the efforts of his rivals.

The Unity of Promise formed in 1127 in response to the collapse of Imperial authority and the growing anarchy. When it refused to support Lucan's bid for supremacy by sending ships and men, its outer worlds became Black War targets.

Situation: A long-range Black War squadron of Lucan's has been despatched to bombard Vahana into rubble. The Unity of Promise has only a few small vessels available, but they must prevent the bombardment at all costs.

Maps: The Unity player places a Planet marker anywhere on the Unity map, representing Vahana. The Lucan player enters from the far edge of the Lucan map. The Unity player begins in orbit around Vahana.

Lucan's Squadron

Ships: 1 *Kinunir*-class cruiser, 1 *Chrysanthemum*-class destroyer escort, and 1 *Valor*-class missile corvette. The *Valor*-class vessel has been converted to a planetary bombardment platform and carries no anti-ship missiles. The *Valor* has a Trained crew; all others have Crack crews. All crews are at battle stations.

Vector: Lucan's squadron enters with any vector desired.

Promise

Ships: 1 *Gazelle*-class escort, 1 *Fiery*-class escort, 1 system defense boat (SDB) with a full load of TL 11 missiles. Any 1 ship (player's choice) with a Crack crew, others with Line crews. All crews at Condition 2.

Vector: All ships begin with a vector of 0 (in orbit around Vahana).

Winning: Only the *Valor*-class vessel may bombard, and it may only do so while in orbit around Vahana. For each functional missile barbette on the ship, roll 1D20 for delivered planetary bombardment points. If the *Valor* does not have an operational fire director, halve the result. The Lucan player wins by inflicting over 200 cumulative points of planetary bombardment on Vahana.

SCENARIO GROUP 3
THE NEW ERA

Scenario 6: Smash and Grab

Date: 117-1201 (NE 1)

Location: Montezuma/Diaspora

Background: After the release of Virus, the final act in Lucan's Black War, most of explored space was plunged back to barbarism. Seventy years later, the revival of technology in the Old Expanses sector by the Hive Federation, and the resulting growth of the

Reformation Coalition, created an insatiable demand for high-tech equipment. This demand could most easily be met by salvaging pre-Collapse artifacts from The Wilds, the name given to the uncivilized stellar wasteland that comprised most of the territory of the Third Imperium. Sometimes the recovery of these artifacts brought Reformation Coalition ships into direct conflict with local indigenous dictators, and earned them the name Star Vikings.

Situation: Pre-Collapse records unearthed by the Reformation Coalition proved the existence of a large cache of processed lanthanum ore, the vital element required to produce jump drive coils, on the planet Montezuma. A "smash and grab" operation was quickly mounted, but would have to fight its way through the world's cobbled-together space navy.

Maps: The Montezuman player places a Planet counter anywhere on the Montezuman map. The Star Viking player enters from the far edge of the Viking map.

Star Viking

Ships: 1 clipper carrying 2 Rampart fighters. Crack crews at battle stations.

Vector: The Viking player enters the map with any velocity and heading desired.

Montezuman

Ships: 1 *Gazelle*-class close escort, 1 system defense boat (SDB), 1 modular cutter with TL-11 laser gunpack (see page 18, *Technical Booklet*). Crew quality: Trained on the *Gazelle*, Green on the other ships.

Notes: The SDB has a total of only seven Tech Level 8 missiles on board. None of the master fire directors on any of the ships are functional. The EMS arrays on the *Gazelle* and the SDB are not functional and have been replaced by radars (120,000 km close range on the SDB, 150,000 km close range on the *Gazelle*). Because of poor damage control procedures, none of the ships may repair any damage during the scenario. In addition, whenever the ship's life support fails (takes its maximum damage), the ship may conduct no actions for the next turn (may not fire, maneuver, communicate, or make sensor attempts) and it loses all existing sensor locks. (The crew is completely occupied trying to find and put on vacuum suits.) The *Gazelle* is at Condition 2; the other ships are at Condition 1.

Vector: The *Gazelle* is in orbit around the planet. The other two vessels are landed on the planet surface.

Winning: The Star Viking player wins by spending six turns with the long ship in orbit around Montezuma and then exiting the far edge of the Viking map without having any internal systems destroyed beyond repair by battle damage. The Star Viking player wins a marginal victory by spending six turns with the long ship in orbit around Montezuma and then exiting the far edge of the Viking map with its maneuver drive and jump drive still operational.

Balance: To make the scenario more even, give the Star Viking player a single *Gazelle* instead of the clipper and its fighters, and use the marginal victory condition as the Viking player's overall victory condition.

Scenario 7: Cold Recovery

Date: 011-1202 (NE 2)

Location: Beso/Diaspora

Background: Smash-and-grab operations were used only when the prize was particularly valuable. The preferred method of salvage was called a "cold recovery," meaning the machinery or data base recovered was abandoned, undefended, and free for the asking. Cold recoveries sometimes took place on inhabited worlds, but in areas remote from native settlements. More often, however, cold recoveries took place in space.

But even the most remote corner of space could sometimes be dangerous. In addition to the Reformation Coalition, The Wilds were also travelled by free traders, men and women who passed their carefully maintained ships down from generation to generation. Sometimes free traders went "rogue," turning to slavery and piracy for a living, and not above jumping a Coalition salvage crew.

Situation: Coalition-recovered shipping records gave a strong indication that a freighter carrying computer processing units had suffered some sort of accident in the asteroid belts of Beso, but that Virus had then hit the star system before a rescue mission could be mounted.

Maps: The Viking player will enter from the far end of the Viking map and the Rogue player will enter from the far end of the Rogue map.

The 21 Asteroid counters are placed Asteroid side up and mixed up. Each player takes turns (with the Viking player going first) placing an Asteroid counter on the neutral map. No asteroid may be placed adjacent to an already-placed asteroid.

Star Viking

Ships: 1 Seeker (armed scout). Crack crew at Condition 1.

Vector: The ship enters the map with any vector desired.

Rogue Trader

Ships: 1 armed fat trader (subsidized merchant) with 2 TL-12 120-Mj laser turrets, 1 missile turret with 2 TL-11 missiles, and 1 TL 8 sandcaster turret. Trained crew at Condition 2.

Vector: The ship enters the map with any vector desired.

Winning: A player wins by discovering the derelict freighter, spending a turn landed on the asteroid (stationary in the hex) to load the components, and then exiting the map at either end (but not the sides) still capable of conducting a jump. Alternatively, a player can win by destroying the enemy ship.

Discovering the Derelict Freighter: Whenever a ship obtains a successful sensor lock on an asteroid (use target size Very Small [VS] for this purpose), the player may secretly examine the back of the asteroid. The asteroid with the starburst on it is the one containing the derelict freighter.

Scenario 8: Vampire

Date: 217-1202 (NE 2)

Location: Nike Nimbus/Old Expanses

Background: When Virus, the self-aware and self-replicating experimental offensive computer program, was prematurely released near the end of the civil war, it brought down the entire technological base upon which the Third Imperium was built. Not all of the machinery infected with Virus destroyed itself, however. As the unstable virus spread, it also mutated, and some of the strains used the computer systems taken over to actively hunt and kill humans. When ships were taken over by viruses like this, they were called Vampire ships.

Situation: An old *Midu Agashaam*-class destroyer, its computer system infected with the "Doomslayer" strain of Virus, penetrated Reformation Coalition space, jumping into the Nike Nimbus system. The only armed vessels in the system were a new clipper on its shakedown cruise and a system defense boat.

Maps: The Viking player places a Planet counter (representing Nike Nimbus) anywhere on the neutral map. The Viking clipper will enter from the far edge of the Viking map, the Viking SDB begins landed on Nike Nimbus, and the Vampire ship will enter from the far edge of the Vampire map.

Vampire

Ship: 1 *Midu Agashaam*-class destroyer with no missiles. (Treat the virus-controlled computer as a Line crew at battle stations.)

Vector: The vampire ship enters with any vector desired.

Star Viking

Ships: 1 clipper, 1 system defense boat (SDB), two Rampart fighters. The clipper and Ramparts have Line crews, the SDB a Crack crew. All crews at Condition 2.

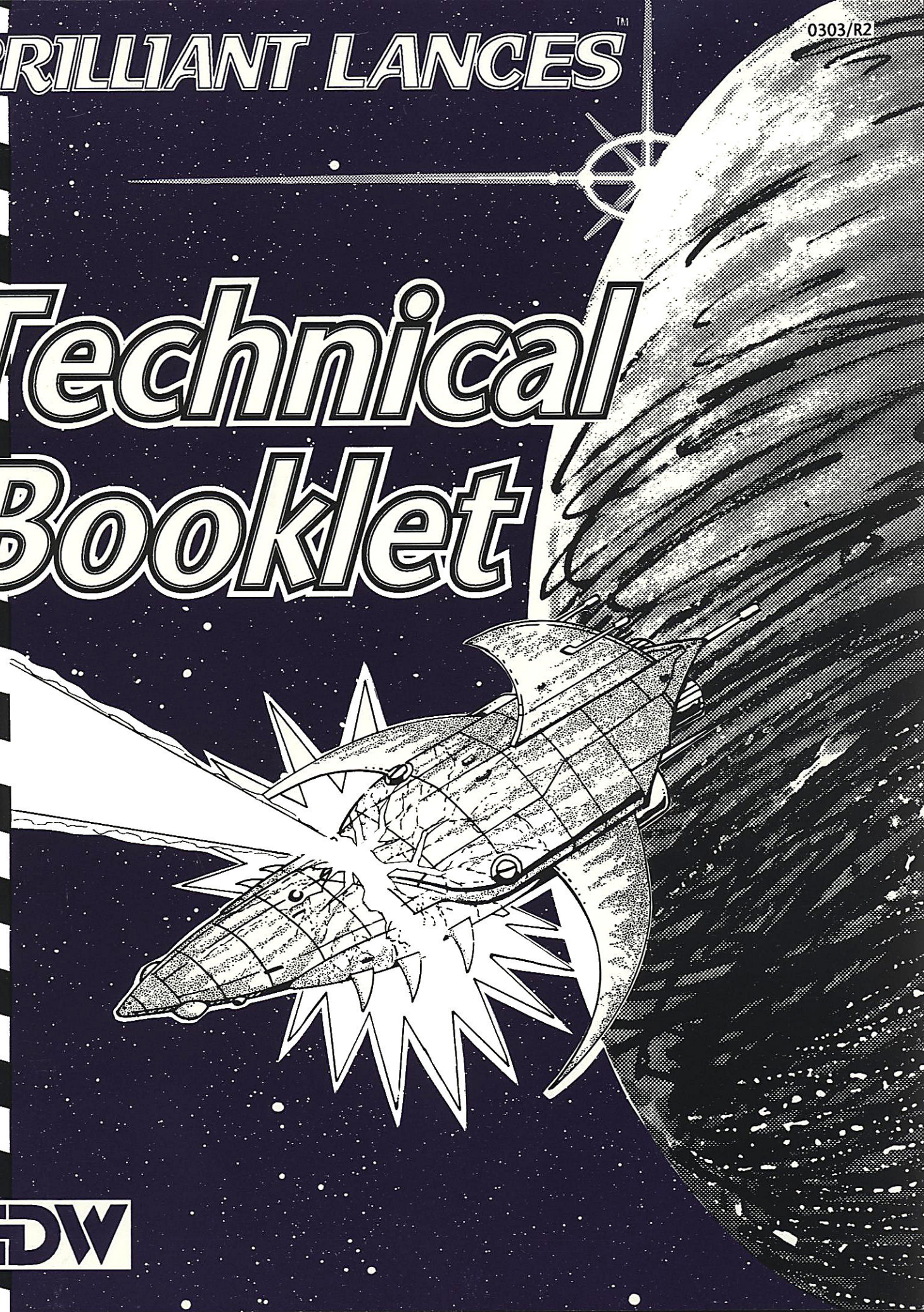
Vector: The clipper enters with any vector desired.

Winning: The player with the last ship capable of firing and maneuvering wins. If both players lose maneuver and/or firing capability from their last surviving ships on the same turn, the game is a draw.

BRILLIANT LANCES™

0303/R2

Technical Booklet



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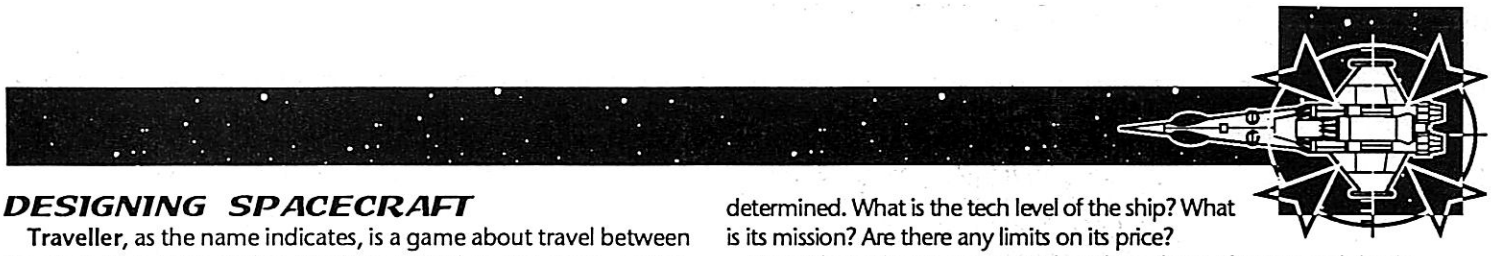
BRILLIANT LANCES™

GDW



DESIGNING SPACECRAFT

Traveller, as the name indicates, is a game about travel between the stars. This focus makes starships central to the game, and so players and referees will want to take a hand at designing ships of their own. It is natural, then, to begin this book with the spacecraft design sequence.

Designing ships serves two functions. First, even if the players never own or use any of the ships designed, the designs can add diversity to the sorts of ships they will encounter. Second, working a design through from hull structure to final additions to the command bridge will give players a much deeper understanding of what starships are like and how they work in the **Traveller** universe.

Before starting the design, there are several items which need to be determined. What is the tech level of the ship? What is its mission? Are there any limits on its price?

Once these decisions are made, take a sheet of paper and divide the right two-thirds of it into five columns, and label them Volume, Mass, Power, Surface Area, and Price. This will be your worksheet as you do your design (pre-made worksheets of this type are available in **Traveller Players' Forms**). Whenever a component uses volume, mass, power, or hull surface area, write the amount in the correct column. Whenever a component contributes volume, surface area, or power (hulls contribute volume and surface area, power plants contribute power) write the amount in the correct column but indicate it with a plus sign or by enclosing it in brackets. This worksheet will make designing your vessel much easier.

STEP 1. HULLS

The first step in designing a space craft is to determine the size, shape, and special configuration of the hull. All other components will then be placed inside the hull or on its surface.

First select a basic hull size from the Hull Size table (page 2). All hulls have a rate (or "tonnage") which is the displacement of the hull in tonnes of liquid hydrogen (the most common starship fuel). Therefore, a ship with a rate of 7 could hold 7 tonnes of liquid hydrogen (provided nothing else was put in the hull). Thus, **Traveller** uses the term "ton" as a unit of volume where 1 ton equals 14 cubic meters (m^3) of internal volume (also measured as 14 kiloliters). The Hull Size table indicates the volume (in cubic meters), the material volume of the shell (assuming a uniform thickness of 1 centimeter) in cubic meters of hull material, and the length of the hull (actually its diameter, as all hull ratings are based on the characteristics of a sphere) in meters.

Next, decide on the hull's form and configuration. Hull form is the basic geometric shape of the hull. As indicated above, the base values for hulls assume a spherical shape. As all hulls of the same rate have the same interior volume, hulls in less space-efficient shapes than spheres will have more surface area, greater length, and require more hull material to achieve an equivalent volume. The Hull Form and Configuration table (page 2) indicates the various hull forms available and the effects on length and material volume.

Once the basic shape is determined, the designer specifies whether the hull has an unstreamlined, streamlined, or an airframe configuration. This decision will affect the cost of the hull (streamlined and airframe configurations are more expensive). In general, airframe hulls may enter any planetary atmosphere to land on the surface or skim fuel; streamlined hulls may skim gas giants but may not land on planetary surfaces with atmospheres of greater than Thin (if contragrav is installed, they may feely land on any world); and unstreamlined hulls may do neither.

Once the basic size and shape is determined, the hull itself is constructed. Hulls consist of hull plating and internal structure.

Hull plating may be thinner or thicker than 1cm, but all hulls must have an armor value of at least 1. Interplanetary and interstellar vessels must have a minimum hull armor value of 10 per G rating of the maneuver drive (to protect against micro-meteors). To determine the armor value of the hull plating, decide on a thickness (in centimeters) and multiply the thickness by the toughness of the material used to construct the hull (round to the nearest whole number).

The Hull Materials table (page 3) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter, and their price per cubic meter. Once the designer has decided on a thickness, multiply the hull's material volume value by the hull thickness (in centimeters) to determine how many cubic meters of material is used for hull plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials table (as modified by hull form and configuration) to determine mass and price.

Internal structure is also a function of the craft's acceleration and its hull material value. Multiply the hull material value from the Hull Size table (as modified by hull form, but not by configuration) by the craft's maximum acceleration in Gs, and divide the result by the hull material toughness value. The result is the volume of internal structure material used; use the Vehicle and Craft Construction Materials table to determine price and mass. The following equations recapitulate these procedures:

Hull Plating

Minimum Hull Thickness = (Gmax×10) ÷ Toughness of hull material from Vehicle and Craft Construction Materials table

Hull Plating Volume (Unstreamlined or Streamlined configuration): HPV = MV×MVM×Ht

Hull Plating Volume (Airframe configuration): HPV= MV×MVM×1.3×Ht

Hull Plating Mass (in tonnes) = HPV×Mass value of hull material from Vehicle and Craft Construction Materials table

Hull Plating Cost (in MCr) = HPV×Sm×Price of hull material from Vehicle and Craft Construction Materials table

Internal Structure

Internal Structure Volume: ISV = (MV×MVM×Gmax) ÷ Toughness from Vehicle and Craft Construction Materials table

Internal Structure Mass: ISV×Mass value of hull material from Vehicle and Craft Construction Materials table

Internal Structure Price: ISV×Price of hull material from Vehicle and Craft Construction Materials table

Gmax: Maximum rated performance in Gs

HPV: Hull plating volume, in cubic meters

Ht: Hull thickness in centimeters, chosen by designer, but at least equal to minimum hull thickness

ISV: Internal structure volume, in cubic meters

MV: Material volume from Hull Size table, in cubic meters

MVM: Material volume multiplier from Hull Form and Configuration table

Sm: Streamlining price modifier according to selected streamlining configuration

Note also that the hull form will affect the surface area of the hull. Note at this time how much surface area is available. Surface area is used for the attachment of weapons, sensors, communicators, launch ports, etc. Keep a running record of how much surface area is used as the ship is designed.



Hull Size Table

Rate	Vol	MV	L
1	14	0.4	3.2
2	28	0.5	4
3	42	0.7	4.6
4	56	0.9	5.2
5	70	1.1	5.6
6	84	1.3	5.8
7	98	1.4	6.2
8	112	1.6	6.6
9	126	1.8	6.8
10	140	1.9	7
15	210	2.1	7.5
20	280	2.3	8.0
25	350	2.5	8.6
30	420	2.7	9.2
35	490	2.9	9.8
40	560	3.1	10.4
45	630	3.4	10.8
50	700	3.8	11.2
55	770	4	11.4
60	840	4.2	11.6
65	910	4.4	12.1
70	980	4.6	12.5
75	1050	4.8	12.9
80	1120	5.1	13.2
85	1190	5.3	13.4
90	1260	5.5	13.6
95	1330	5.8	13.8
100	1400	6	14
200	2800	9	17
300	4200	12	20
400	5600	15	22
500	7000	17	24
600	8400	20	25
700	9800	22	27
800	11200	24	28
900	12600	26	29
1000	14,000	28	30
2000	28,000	43	36
3000	42,000	57	42
4000	56,000	70	47
5000	70,000	80	51
6000	84,000	90	53
7000	98,000	100	57
8000	112,000	110	60
9000	126,000	120	62
10,000	140,000	130	64
20,000	280,000	200	80
30,000	420,000	260	92
40,000	560,000	320	104
50,000	700,000	370	112
60,000	840,000	420	116
70,000	980,000	470	125
80,000	1,120,000	510	132
90,000	1,260,000	550	136
100,000	1,400,000	590	140
200,000	2,800,000	940	170
300,000	4,200,000	1220	200
400,000	5,600,000	1485	220
500,000	7,000,000	1730	240
600,000	8,400,000	1950	250
700,000	9,800,000	2160	270
800,000	11,200,000	2360	280
900,000	12,600,000	2550	290
1,000,000	14,000,000	2740	300

Rate: The hull rating is a standard measure of the volume of the hull expressed in tons of liquid hydrogen. Each ton of liquid hydrogen displaces 14 cubic meters of volume (and is referred to as a "displacement ton").

Vol: The enclosed volume of the hull in cubic meters (m^3). Each cubic meter contains 1000 liters of volume, and so the term kiloliter is sometimes used interchangeably with cubic meter.

MV: Material volume, the volume (in cubic meters) of material required to enclose the hull in a shell one centimeter thick.

L: The length of the hull in meters. For spherical hulls, this is also the diameter.

Surface Area: Surface area in square meters is the hull material volume (after hull form and airframe modifications, but without adjustments for hull thickness) multiplied by 100.

Price: The price of a hull in credits is its material volume multiplied by the price shown on the Hull Material Table.

Configuration: Hulls may be in any of several configurations. The values on the hull table are for a spherical hull. With a different configuration, modify the hull material and price as shown on the Hull Form and Configuration Table.

Hull Form and Configuration Table

		Streamlining Price Modifications			
Hull Form	*MVM*	*Unstrm*	*Stream*	*Airframe*	*LM*
Open Frame	2*	0.3	NA	NA	4
Needle	1.3	0.7	0.8	1.2**	3
Wedge	1.5	0.5	0.7	1.5**	2.5
Cylinder	1.1	0.6	0.8	2**	2
Box	1.2	0.4	0.6	NA	1.25
Sphere	1	0.8	1	NA	1
Dome/Disc	1.2	1.4	1.6	1.2**	1.5
Close Structure	1.4	0.3	NA	NA	1.75
Slab	1.5	0.5	0.7	1.5**	2.75

* Modifies hull material volume only. Surface area remains unchanged.

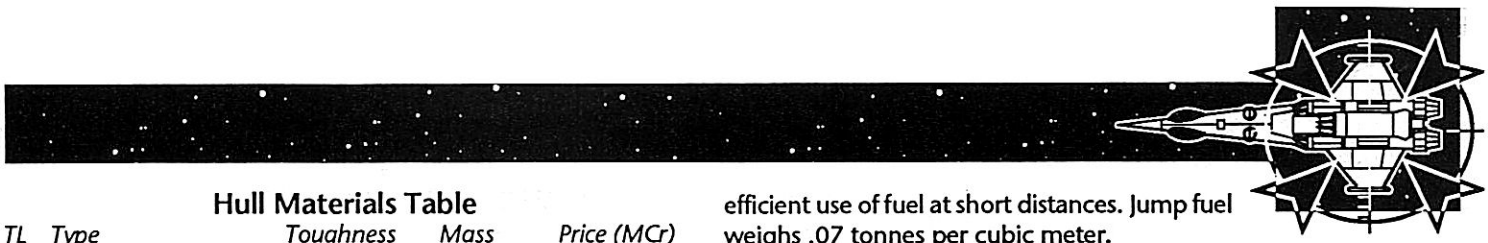
** Airframe configuration increases hull shell material volume (and surface area), but not internal structure. Modify hull shell material volume × 1.3 for airframe configuration hulls.

MVM: Material volume multiplier. Multiply the material volume (MV) from the Hull Size table to get the volume of 1cm-thick hull plating for a hull of the corresponding mass and configuration.

Perform the same calculation, then divide by hull material toughness, to get the volume of that hull's internal structure stressed to 1G.

LM: The length of the hull in meters. For spherical hulls, this is also the diameter.

NA: Not available; that configuration of hull may not be built with that streamlining option.



Hull Materials Table

TL	Type	Toughness	Mass	Price (MCr)
5	Soft Steel	1.7	8	0.0016
6	Hard Steel	2	8	0.002
6	Light Alloy	1.7	6	0.004
7	Composite	4	7	0.007
8	Composite Laminate	6	8	0.008
10	Crystaliron	8	10	0.009
12	Superdense (SD)	14	15	0.014
14	Bonded SD	28	15	0.028
17	Bonded Coherent SD	40	15	0.035

Toughness: Used to determine armor rating.

Mass: Metric tonnes per cubic meter of material volume.

Price: Price in millions of credits per cubic meter of material.

Armor Value: An atmospheric and near orbital craft must have a hull armor value of 1. Interplanetary and interstellar vessels must have a minimum hull armor value of 10 per G rating of the maneuver drive (for protection against micro-meteors).

Armor Value = cm thickness × toughness.

Target Size

Once the hull size has been selected, determine its target size based on the following table.

Tons	Size
<1	Sub-Micro (SM)
1+	Micro (Mc)
10+	Very Small (VS)
100+	Small (S)
1000+	Medium (M)
10,000+	Large (L)
100,000+	Very Large (VL)
1,000,000+	Gigantic (G)

STEP 2. JUMP DRIVE

If a vessel is intended to serve as a starship (i.e., travel between stars), it will need a jump drive.

Jump drive machinery requirements are tied to the volume of the hull and the maximum distance the drive is capable of jumping the ship. There are upper limits on how many parsecs a ship may jump based on the tech level of the drive. The volume of the jump drives, as a percentage of the total volume of the ship, is equal to 1 plus the maximum jump number (in parsecs). So, for example, a ship capable of jump 4 would have jump drives which filled 5% (1 + 4) of the internal volume of the ship. If it were a 100-ton ship (1400 cubic meters of volume), the jump drives would take up 70 cubic meters of volume.

Jump drives also take up hull surface area for radiators, coolant exhaust, etc.

The Jump Drive Table lists the maximum allowed jump number, mass, and price of jump drives at each tech level.

Important Note: The smallest jump drive possible, at any tech level, is 2 cubic meters in volume.

Jump drives require fuel, displacement mass, and coolant, all of which are collectively called jump fuel (liquid hydrogen being used for all three functions). The fuel necessary for a jump of 1 parsec is equal to the total volume of the jump drive machinery multiplied by 5 and divided by the drive's maximum jump number. Thus ships with higher jump performance make more efficient use of fuel at short distances. Jump fuel weighs .07 tonnes per cubic meter.

Fuel tankage itself is under Step 6, Power Supply.

To continue the example of the 100-ton jump-4 ship above, it would require ($70 \times ^5/_4$) 87.5 cubic meters of jump fuel per parsec jumped (up to a maximum of 4 parsecs, the limit of its drive). The ship would normally have at least 350 cubic meters of jump fuel tankage (enough for its 4-parsec maximum jump).

Jump Drive Table

TL	Max Jump	Mass	MCr
9	1	3	.3
11	2	3	.3
12	3	3	.3
13	4	3	.3
14	5	2.5	.3
15	6	2	.3

TL: Tech level of construction.

Max Jump: The longest jump allowed (in parsecs).

Mass: Mass in metric tonnes per cubic meter.

MCr: Price in millions of credits per cubic meter of jump drive.

Surface Area: Surface area in square meters equals cubic meters of jump drive ÷ 3.

STEP 3. ELECTRONICS

Electronics fall into six categories: Controls, Navigational Aids, Communicators, Sensors, Electronic Countermeasures (ECM), and Electronic Counter-Countermeasures (ECCM).

Players should be familiar with the **Brilliant Lances** space combat rules for how communicators, sensors, ECM, and ECCM systems work in order to decide which of these systems to install.

3A. CONTROLS

Control Systems

Control systems include the control consoles and workstations from which the crew of a craft control its systems, as well as the interior circuitry linking the major electrical and mechanical subsystems to the controls. Installed computers must be from the same tech level as the controls, and avionics and navigation aids may not be installed from a higher tech level than that of the controls. The control system chosen also determines the price of workstations installed in step 9.

TL	Type	Power	Price
5	Basic Mechanical	—	.0002
6	Enhanced Mechanical	0.0002	.0003
7	Electronic	0.0005	.0005
8	Enhanced Electronic	0.0005	.00075
9	Computer Linked	0.0005	.001
10-12	Dynamic Linked	0.001	.0015
13-16	Holographic Linked	0.001	.002

Power: MW per displacement ton of the craft.

Price: MCr per displacement ton of the craft, and per bridge or normal workstation (page 17).

All control systems displace 0.014 cubic meters and mass 0.0014 tonnes per displacement ton of the hull.



Computers

If a computer is desired, select one from the list below. Any orbital or deep-space craft must have at least one computer, and jump-capable craft require an additional computer. Space craft may use either standard or fiber-optic models of computers, or a mix of the two.

Spacecraft generally have at least two computers: one is the primary, the other is a dedicated maintenance troubleshooter and safety backup (see Maintenance Points on page 18); starships have three: one primary, one for jump capability/backup, and another for maintenance troubleshooting, which also functions as a backup.

Aircraft with computers may use flight computers (Model Flt). Hypersonic aircraft should have two computers (but are only required to have one); one is a safety backup. Supersonic and slower aircraft are not required to have computers, but may choose to do so to help with long-range sensors and weapons operations.

Important Note: A computer may not be installed which is from a different tech level than the craft's control system. A craft may not have installed sensors or master fire directors from tech levels higher than the installed computer or control system. St or Fb computers are required for any craft fitted with an MFD, or a sensor with a short range greater than 30 kilometers. (Sensors with a short range of 30 kilometers or less do not require a computer.)

Computers Table

TL	Mod	MW	Vol	Mass	MCr	Mult
5	St	0.50	50	10	1.5	1
6	St	0.10	10	2	1.0	0.8
7	St	0.15	5	1	0.5	0.7
8	St	0.20	5	1	0.4	0.6
9	St	0.25	5	1	0.6	0.5
10	St	0.30	6	1.2	1	0.45
11	St	0.35	7	1.4	2	0.4
12	St	0.40	8	1.6	3	0.35
13	St	0.45	9	1.8	4	0.3
14	St	0.50	8	1.6	5	0.25
15	St	0.55	7	1.4	6	0.2
16	St	0.60	6	1.2	10	0.15
17	St	0.60	5	1	11	0.13
18	St	0.60	4	0.8	12	0.11
19	St	0.55	3	0.6	13	0.09
20	St	0.50	2	0.4	14	0.07
21	St	0.45	1	0.2	15	0.05

TL: Tech level of availability.

Mod: Model St = Standard, Fb = Fiber-optic, Flt = flight.

Fiber-optic computers are available from TL 7 on. Multiply MW, volume, mass, and price by 2. Usually one or more of a starship's three computers are fiber-optic.

Flight computers are simplified versions of the above computers optimized to perform a set number of routine flight functions. They may be used in place of standard computers on atmospheric and sub-orbital craft, although full-size computers may be installed as well. Flt computers do not provide maintenance point reduction. Multiply volume, MW, and mass by 0.1 and price by 0.001.

MW: Power requirement in MW

Vol: Displacement in cubic meters

Mass: Mass in metric tonnes

MCr: Price in millions of credits

Mult: Control multiplier

3B. NAVIGATIONAL AIDS

Flight Avionics

TL	MCr	Vol	Mass	MW	Description
5	.01	.0001	.0001	—	Magnetic compass, barometric altimeter
6	.05	.0001	.0001	.01	Radar altimeter, gyrocompass, transponder
7	.10	.001	.001	.1	Weather radar, FLIR, inertial positioning
8	.20	.001	.001	.1	Imaging radar
10	.25	.001	.001	.1	Imaging EMS, inertial/ gravitational positioning

MCr: Price in MCr. If at any tech level higher than level of introduction, price × 0.1

Vol: Displacement in cubic meters.

Mass: Mass in metric tonnes.

MW: Power requirement in MW.

Description: TL 6 or better flight avionics necessary for a starship to land on the surface of a planet. Each level of avionics includes all features shown at lower tech levels as well. FLIR = forward-looking infrared, a focused high-resolution thermal-imaging device.

Terrain-Following Avionics

TL/Type	Vol	Mass	MCr	NOE
None	—	—	—	40
8	0.2	0.05	0.010	120
9	0.02	0.04	0.011	130
10	0.15	0.04	0.012	140
11	0.15	0.03	0.013	150
12	0.1	0.03	0.014	160
13	0.1	0.02	0.015	170
14	0.05	0.02	0.016	180
15	0.05	0.02	0.017	190
16	0.03	0.03	0.018	200

Vol: Volume in cubic meters (kiloliters).

Mass: Mass in metric tonnes.

MCr: Price in millions of credits.

NOE: Safe nape of the earth speed in kilometers per hour.

Power: Power requirement, in MW is equal to Mass .

Antenna: Antenna area, in square meters, is equal to Mass× 10.

3C. COMMUNICATORS

For all electronic systems which do not calculate antenna price separately, antenna price is equal to 0.25 times the total system cost, for purposes of replacing destroyed antennae.

Radio Communicators

			Volume at tech level						
Range	*MCr*	*MW*	*5*	*6*	*7*	*8*	*10*	*12*	*15*
3 km	.000075	.0001	.05	.01	.001	.0001	.0001	.0001	.0001
30 km	.00025	.001	.1	.05	.01	.001	.0001	.0001	.0001
300 km	.0005	.01	.15	.1	.05	.01	.001	.0001	.0001
3000 km	.005	.1	.3	.15	.1	.05	.01	.001	.0001
30,000 km	.030	1	.7	.3	.15	.1	.05	.01	.001
300,000 km	.090	10	—	.7	.3	.15	.1	.05	.01
1000 AU	.150	20	—	—	.7	.3	.15	.1	.05

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: Cubic meters (kiloliters).
MCr: Price in MCr. If TL 5, ×3. If TL 6, ×2.
MW: Power requirement, in megawatts.
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area, in square meters, equals MW × 10.

Laser Communicators

			Volume at tech level				
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*
3 km	.0012	.005	.004	.002	.001	.001	—
30 km	.005	.01	.016	.008	.006	.004	.001
300 km	.011	.02	.020	.010	.008	.005	.002
3000 km	.021	.04	.040	.020	.015	.010	.003
30,000 km	.036	.08	.070	.035	.025	.018	.005
300,000 km	.056	.15	.110	.055	.040	.028	.007
1000 AU	.180	.3	—	.120	.070	.050	.015

Range: Short range in kilometers or Astronomical Units, as indicated

Range Note: Maximum range in an atmosphere coded Thin or greater is 5000 km.

Volume: Cubic meters (kiloliters)
MCr: Price in millions of credits
MW: Power requirement in megawatts
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area equals 1 square meter for all versions.

Maser Communicators

			Volume at tech level				
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*
3 km	.0012	.01	.010	.005	.002	.001	—
30 km	.005	.02	.030	.015	.010	.002	.002
300 km	.011	.04	.040	.020	.015	.010	.004
3000 km	.021	.08	.080	.040	.030	.020	.006
30,000 km	.036	.15	.150	.070	.050	.040	.010
300,000 km	.056	.3	.200	.100	.080	.060	.015
1000 AU	.180	.6	—	.250	.150	.100	.030

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: cubic meters (kiloliters).
MCr: Price in millions of credits.
MW: Power requirement in megawatts
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area equals 1 square meter for all versions.

Radio Receivers

All spacecraft are automatically equipped with radio receivers integral to their hulls at no additional cost. These allow radio reception and are destroyed by electronics hits (1h).

Vehicles of TL-8+ have the same integral radio receivers at no cost. At lower tech levels, vehicles may add radio receivers at no volume at MCr0.0001.

There is no power requirement for any of these receivers.

Finally (in the event that these receivers are destroyed in combat), all passive EMS sensors function as radio receivers, even, in the case of folding arrays, when retracted.

Meson Communicators

			Volume at tech level	
Range	*MCr*	*MW*	*15*	*16*
300 km	0.25	.05	.5	.3
3000 km	1	.2	2	1.5
30,000 km	2.5	1	30	16
300,000 km	5	3	150	80
1000 AU	20	5	500	220

Range: Short range in kilometers or Astronomical Units, as indicated.
Volume: Cubic meters (kiloliters).
MCr: Price in millions of credits.
MW: Power requirement in megawatts.
Mass: Mass, in metric tonnes, equals volume × 2.
Antenna: Antenna area, in square meters, equals MW × 10, with a minimum of 1 square meter.

3D. SENSORS

Radar

A radar requires a processor unit and an antenna

	Processor Volume by TL			
Short Range	*6*	*7*	*8*	*9*
0.3 km	0.3	0.04	0.02	0.01
3 km	3	0.4	0.2	0.1
30 km	30	4	2	1
300 km	300	40	20	10
3,000 km	—	400	30	15
30,000 km	—	—	40	20
60,000 km	—	—	50	30

Volume: Volume in cubic meters (kiloliters) as shown.

MW: Power requirement (in megawatts) equals processor volume in cubic meters × 0.2.

Mass: Mass of the processor, in metric tonnes, equals volume × 2.

MCr: Price of the processor, in MCr, equals volume × 1

Antenna: Antenna area (in square meters) equals volume times the tech level modifier shown below:

TL	*Modifier*
6	10
7	4
8	1
9+	0.5

Antenna Volume (cubic meters): Antenna Area × 0.1.

Antenna Mass (in metric tonnes): Antenna Area × 0.1

Antenna Price (MCr): Antenna Area × 0.05.

EMS Active

	Vol (Kiloliters) by TL				
Short Range	*10*	*11*	*12*	*14*	*16*
3 km	0.2	0.1	0.1	0.1	0.1
30 km	1.0	0.8	0.6	0.5	0.4
300 km	3.0	1.6	1.0	0.8	0.6
3000 km	7.0	3.0	1.6	1.0	0.8
30,000 km	10	5.0	2.2	1.2	1.0
60,000 km	13	6.0	2.5	1.4	1.2
120,000 km	16	8.0	3.3	1.8	1.4
180,000 km	19	10	4.0	2.2	1.6
240,000 km	23	11	4.8	2.6	1.8
300,000 km	26	12	5.5	3.0	2.0
360,000 km	31	15	7.0	3.4	2.2
420,000 km	36	17	8.5	4.2	2.4
480,000 km	42	20	10	5.0	2.6

Volume: Volume in cubic meters (kiloliters) as shown.

Power (MW): Volume × 5.

Price (MCr): Volume × 2.

Mass (metric tonnes): Volume × 2

Antenna (square meters): Volume × 2. Antenna volume, mass, and price are subsumed in the total sensor package above.

Ladar

	Vol (Kiloliters) by TL					
Short Range	*8*	*9*	*11*	*13*	*15*	*16*
3 km	0.1	0.01	0.005	0.001	—	—
30 km	0.4	0.04	0.02	0.004	—	—
300 km	0.8	0.08	0.04	0.008	0.002	—
3000 km	2.0	0.2	0.1	0.02	0.005	0.002
30,000 km	5.0	0.5	0.2	0.04	0.01	0.004
60,000 km	—	1.0	0.5	0.1	0.025	0.01
120,000 km	—	2.4	1.2	0.24	0.06	0.02
180,000 km	—	—	2.5	0.5	0.12	0.05
240,000 km	—	—	—	1.2	0.25	0.1
300,000 km	—	—	—	2.5	0.6	0.2

Power requirement (MW): Volume in cubic meters.

Mass (metric tonnes): Volume × 2.

Price (MCr): Volume × 10

Antenna Area (square meters): Volume × 1. Antenna weight, price, and volume are subsumed in the above figures.

Densitometer (Grav Shielded)

Densitometers are survey instruments which allow determination of celestial object mass and mapping of mineral deposits and gravitic anomalies.

TL	*MW*	*Vol*	*Mass*	*MCr*
11	2.5	30	10	0.75
12	1	15	5	0.9
13	0.9	12	3	0.95
14	0.5	9	2	1
15	0.4	7	1.5	1.5
16	0.3	4	1	1.5

MW: Power requirement in megawatts.

Vol: Volume in cubic meters.

Mass: Mass in metric tonnes.

MCr: Price in millions of credits.

Antenna Area (square meters): MW × 100.

Neutrino Sensor

Neutrino sensors are useful when surveying a star system. They enable a ship to measure the intensity of fusion taking place within a star as well as determine if any of the gas giants are failed stars. Note that the values below apply only to neutrino sensors installed aboard ships or other massive vehicles. These sensors use the mass of the ship itself, especially its hull and fuel tankage, as its antenna. Any stand-alone neutrino sensor would require a massive antenna, usually huge tanks of fuid and/or thick metal plates.

TL	*Vol*	*MCr*
10	100	1
12	10	2
14	5	3

Vol: Volume in cubic meters.

MCr: Price in millions of credits.

MW: All neutrino sensors require 0.01 MW of power for operation.

Mass: All neutrino sensors have a mass in metric tonnes equal to their volume.

Neural Activity Sensor

Neural activity sensors detect and classify life forms according to their level of brain activity.

TL	Range	MW	Vol	Mass	MCr
13	0.005	0.004	0.002	0.005	0.02
14	0.025	0.005	0.002	0.005	0.02
15	0.05	0.006	0.002	0.005	0.02
16	0.5	0.007	0.002	0.005	0.02

Range: Short range in kilometers.
MW: Power requirement in megawatts.
Vol: Volume in cubic meters.
Mass: Mass in metric tonnes.
MCr: Price in millions of credits.
Antenna area (square meters) = MW × 100.

HRT (High Resolution Thermal)

			Volume by TL		
Range	AD	AA	7	8	9
0.3	0.25	0.05	0.006	0.003	0.001
3	.0.5	0.2	0.06	0.03	0.01
30	.1	1	0.3	0.15	0.05
300	2.25	4	0.6	0.3	0.1
3000	3.5	10	1.5	0.6	0.3
30,000	5	20	—	1.5	0.6
60,000	10	80	—	3	1.5
90,000	20	300	—	5	2.5
120,000	40	1200	—	6	3
150,000	90	6000	—	7	3.5
180,000	200	30,000	—	8	4
210,000	400	125,000	—	9	4.5
240,000	800	500,000	—	10	5

Range: Short range (in kilometers)
AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.
AA: Surface area of the antenna is square meters. At tech level 9, multiply antenna area by 0.5.
Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.
MW: Power requirement, in MW, is equal to the processor volume × 0.1.
Processor MCr: The processor price, in millions of credits, is equal to the processor volume × 1.
Antenna MCr: The antenna price, in millions of credits, is equal to the antenna volume × 1.
Processor Mass: The mass of the processor, in metric tonnes, is equal to the processor volume × 2.
Antenna Mass: The mass of the antenna, in metric tonnes, is equal to the antenna volume × 1.

EMS Passive

			Processor Volume by TL				
Range	AD	AA	10	11	12	14	16
3	0.25	0.02	0.03	0.02	0.01	0.005	0.003
30	0.5	0.08	0.1	0.08	0.04	0.02	0.01
300	1	0.4	0.2	0.1	0.08	0.04	0.02
3,000	2.25	1.6	0.3	0.2	0.1	0.08	0.04
30,000	3.5	4	0.6	0.4	0.3	0.2	0.1
60,000	5	8	1.5	1	0.6	0.4	0.3
90,000	10	32	2	1.5	1	0.6	0.4
120,000	20	120	2.5	2	1.5	1	0.6
150,000	40	480	3	2.5	2	1.5	1
180,000	90	2400	3.5	3	2.5	2	1.5
210,000	200	12,000	4	3.5	3	2.5	2
240,000	400	50,000	4.5	4	3.5	3	2.5

Range: Short range (in kilometers).
Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.
AA: Base surface area of the antenna is square meters. The actual surface area of the antenna is this value multiplied by a tech level modifier, as shown below:

TL	Modifier
10	1
11	0.5
12	0.25
13	0.125
14	0.075
15	0.025
16+	0.01

Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.
Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.
MW: Power requirement, in MW, is equal to the processor volume × 0.1.
Processor MCr: The processor price, in millions of credits, is equal to the processor volume × 2.
Antenna MCr: The antenna price, in millions of credits, is equal to the antenna volume × 1.
Processor Mass: The mass of the processor, in metric tonnes, is equal to the processor volume × 2.
Antenna Mass: The mass of the antenna, in metric tonnes, is equal to the antenna volume × 1.

3E. ECM

Radio, Radar, and EMS Jammers

Radio, radar, and EMS jammers have the same characteristics as radios, radars, and active EMS sensors, with three exceptions.

1. Power use and Price are multiplied by 2.
2. Antenna size for the radar jammer is divided by 10.
3. Jammers may not be used as sensors or communicators, only for jamming.

Radio jammers may only be used to jam radios; radar jammers may be used to jam radar or active EMS; and EMS jammers may be used to jam radios, radars, or active EMS.

Area Jammers

Area jammers degrade the effectiveness of sensors and communicators that attempt to function their area of effect.

TL	Vol	Mass	MW	MCr
10	30	30	95	60
11	15	15	50	30
12	8	8	20	16
14	6	6	16	12
16	5	5	12	10

Vol: Volume in m^3.
Mass: Mass in tonnes.
MW: Required power in megawatts.
MCr: Price in millions of credits.

Radio, Radar, and EMS Direction Finder

Direction-finding can be added as an option to any radar or active EMS array. (Passive EMS arrays already incorporate radio and radar DF capabilities.) Price is multiplied by 2 for radar, and by 1.5 for the EMS array. Stand-alone direction finders are also available beginning at TL 6. These have the same mass, volume, and antenna size of a radio of the same tech level, but the price is doubled, and the power requirement in MW is equal to the volume at all ranges and tech levels. All direction finders work equally well versus radio, radar, or EMS emissions.

3F. ECCM

Electromagnetic Masking (EMM)

An electromagnetic masking (EMM) package minimizes a craft's electromagnetic emissions in all bands (radio, IR, visible light, UV, X ray), and uses electromagnetic absorbent material (EMAM) on the hull surface, thus making detection by active and passive sensors (radar, ladar, active EMS, HRT, and passive EMS) more difficult.

EMM packages are available at TL 10 and higher. The following values are per displacement ton (14 cubic meters) of hull.

MW	Vol	Wt	Rad	MCr
0.014	0.28	0.14	0.14	0.07

MW: Power requirement in megawatts.
Vol: Volume in cubic meters (kiloliters).
Wt: Mass in metric tonnes.
Rad: Hull area used by IR radiators (in square meters).
MCr: Price in millions of credits.

STEP 4. WEAPONRY

Ships may be equipped with beam weapons, missiles, defensive screens, and the fire control systems that enable them to function effectively.

Fire Control

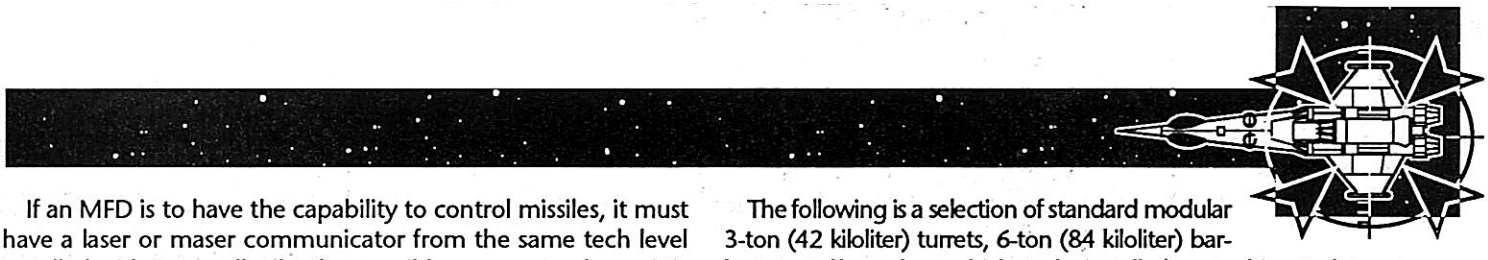
Ships may be equipped with master fire directors (MFDs) which enhance the performance of installed weapons. While many small ships with only one or two turrets rely on local turret control and do not contain MFDs, warships will want several directors. Each MFD must be provided with a pencil-beam active sensor of its own, with a short range equal to the listed range of the fire director. The values for this sensor must be chosen from the Radar table (for TL 8-9 fire directors) or Active EMS table (for TL 10+), except that the power requirement and antenna size listed are multiplied by 0.1 and the cost is multiplied by 0.5. Volume and Mass figures are unchanged. These numbers are added to those of the MFD, as they constitute one piece of equipment. The sensor is not used separately under any circumstances, but is necessary for the normal functioning of the MFD.

Sample Spinal Mounts

TL	Description	Bore	MW	Vol	Ms	Length	Short	Medium	Long	Extreme	Crew	MCr
12	1000 Mj Part Accel	2.14	27.8	792	899	144	10: 158	20: 103	40: 52	80: 27	2	57.844
14	2000 Mj Part Accel	2.14	55.6	736	1048	90	10: 224	20: 224	40: 123	80: 63	1	40.902
15	1000 Mj Part Accel	2.39	27.8	374	495	42	10: 158	20: 158	40: 98	80: 50	1	22.702
15	2000 Mj Part Accel	2.52	55.6	885	1097	105	10: 224	20: 224	40: 224	80: 196	1	59.802
12	1000 Mj Meson Gun	3.6	27.8	1730	1586	144	5: 158	10: 75	20: 38	40: 19	5	147.01
14	2000 Mj Meson Gun	5.05	55.6	2237	1883	90	3: 224	6: 129	12: 67	24: 34	5	185.81
15	1000 Mj Meson Gun	3.6	27.8	602	603	42	1: 158	2: 129	4: 65	8: 33	1	43.782
15	2000 Mj Meson Gun	5.05	55.6	2479	1962	105	4: 224	8: 120	16: 59	32: 29	4	213.628

Spinal mounts are the heaviest of ship-carried weapons. As the name suggests, they are usually carried in the spine of the ship, along its centerline where the weapon can take advantage of the length of the ship to acheive the performance it needs. The weapons above are only a sample of the two major types of spinal weapons, based on the specifications of some of the ships contained later in the book. Spinal mounts are custom-built to the parameters of the ships in which they are installed, and may be designed with the **Fire, Fusion, & Steel: Traveller Technical Architecture** sourcebook.

The two types of weapons are particle accelerators and meson guns. **Bore** is the diameter of the beam tunnel in meters, MW is the required power input in megawatts, volume is the volume of the entire system including crew positions in cubic meters. **Mass** is in metric tonnes, again, for the entire system, and **Length** is the length of the weapon in meters. The **Short, Medium, Long,** and **Extreme** columns give the weapons' performance at these ranges. The number to the left of the colon is the range in hexes, and to the right is the Penetration Value (for particle accelerators) and Damage Value (for meson guns) used at those ranges. **Crew** is the number of crew required (workstations are included in the listed mass, but they need to be provided with stateroom accomodations), and **MCr** is the price of the weapon in millions of credits.



If an MFD is to have the capability to control missiles, it must have a laser or maser communicator from the same tech level installed with it as well. Like the pencil-beam sensor above, it is considered part of the MFD and may not be used for any other purpose, but its full cost, power, and antenna size are used. This communicator should be the same type as installed on the missiles that will be used with the MFD, as the short (automatic contact) range will be limited to that of the MFD or the missile, whichever is shorter. The number of missiles that can be simultaneously controlled by an MFD is equal to the "Diff Mod" listing. When the missile detonates and fires, the missile can only use the MFD's ability to ignore Diff Mods if it is within the MFD's extreme range (8 × the short range shown on the table). Designers should choose the range of their missile control MFDs accordingly.

Note that the task-range performance of weapons that are being fired by an MFD are limited to the range of the MFD if that is shorter than that of the weapon. Therefore, players should take care to install MFDs whose range performance matches that of the installed weapons. A vessel equipped with an MFD must also be equipped with a St or Fb model computer of an equal or higher tech level.

MFD crew are not handled at this step. MFD crew are allocated workstations on the bridge or flight deck and are handled in that step of the design sequence.

Master Fire Directors

	Volume at tech levels					
Range	*8*	*9*	*10*	*12*	*14*	*15*
0.3	0.2	0.1	0.08	0.06	0.04	0.02
3	0.4	0.2	0.16	0.12	0.08	0.04
30	0.8	0.4	0.3	0.24	0.16	0.08
300	1.6	0.8	0.6	0.48	0.3	0.16
3000	3	1.6	1.2	1	0.6	0.3
30,000/1	6	3	2.4	2	1.2	0.6
60,000/2	12	6	4.8	4	2.4	1.2
90,000/3	18	9	7.4	6	3.6	1.8
120,000/4	24	12	10	8	4.8	2.4
150,000/5	30	15	12	10	6	3
180,000/6	36	18	14	12	7.2	3.6
210,000/7	42	21	16	14	8.4	4.2
240,000/8	48	24	18	16	9.6	4.8
270,000/9	54	27	20	18	10.8	5.4
300,000/10	60	30	22	20	12	6
Diff Mod	1	2	3	4	5	6

Range: Short range in kilometers/hexes.

Diff Mod: The number of cumulative adverse difficulty modifiers to hit the fire director ignores, as well as the number of missiles it may control at one time.

Mass: Mass in metric tonnes equals volume × 1.

MCr: Price in millions of credits equals volume × 1.

MW: Power requirement, in megawatts, equals volume × 0.01.

Sockets

If desired, a designer may install turret and/or barbette hardpoint sockets while the ship is being built. This allows easy installation of a standard turret or barbette later. Turret hardpoint sockets consume 3 displacement tons (42 cubic meters) while barbette hardpoint sockets consume 6 displacement tons (84 cubic meters). Both cost .005 MCr if installed during construction and, as they are empty, have negligible mass.

The following is a selection of standard modular 3-ton (42 kiloliter) turrets, 6-ton (84 kiloliter) barbettes, and larger bays which can be installed on starships. Each turret and barbette is designed to fit into a standard turret hardpoint socket or barbette hardpoint socket. The turret or barbette does not add to the displacement of the ship (as the socket itself takes up the full displacement of the mount), but does add weight as shown on the chart on page 10. Sockets may be included in a design even if no weapons are installed until later.

Turret Hardpoint Socket

Displacement: 3 tons
Price: MCr0.005

Barbette Hardpoint Socket

Displacement: 6 tons
Price: MCr0.005

Bays are built in 50-ton and 100-ton versions. There are no standard sockets for bays, and they are instead custom-installed when the ship is built. Bays are designed using the rules in the **Fire, Fusion, & Steel: Traveller Technical Architecture** book.

Weapons Listing

Each weapon includes a fire control workstation for a gunner and may either be fired from the turret/barbette workstation or patched into a master fire director (if the ship has such a device).

TL: This is the tech level of the weapon, and determines the lowest tech level world on which the weapon can routinely be purchased. Turret and barbette weapons and their beam pointers are self-contained systems and so the tech level of the ship's computer does not limit the tech level of mounted turrets. A tech level 15 laser turret, for example, can be mounted in any turret hardpoint socket in any tech level ship.

Description: This indicates power of the laser's pulse (in megajoules) and the mount type: turret (3 displacement tons), barbette (6 displacement tons), or bay (either 50 or 100 displacement tons).

MW: This is the continuous power requirement of the mount to fire each turn. If more power is provided to the weapon it increases the rate of fire (this is called "overpowering"). This does not allow the weapon to make more hit rolls in a turn, but rather allows it to ignore difficulty level increases the same as if it was using a master fire director. For every increase of a factor of 5 of the power input, the laser may ignore one difficulty level increase. Because of engineering limitations, no more than two such increases are possible.

For example, the TL 10 laser turret requires 1.7 MW per turn. If 1.7 MW were allocated to the turret, it would fire normally. If 8.5 MW were allocated, it could ignore 1 difficulty level increase. If 17 MW were provided, it could ignore 2 difficulty level increases.

Ships which are designed from the outset to allocate these higher power levels to their lasers experience no difficulties when firing them. However, if lasers not installed with these higher power levels are fired at these overpower levels (by diverting power from other systems), there is a chance of blowing power couplings, etc., not designed for this strain. Roll a Ship's Engineering task for each shot. If overpowering by one level (–0 Diff Mod to –1 Diff Mod or –1 Diff Mod to –2 Diff Mod), difficulty level is Difficult, level is Formidable if overpowering by two levels (–0 to –2). Failure indicates a System



Reset on the laser, and the laser loses its shot for the current turn. For Catastrophic Failure, roll 1D10: 1-5 indicates a Degraded Performance result plus a System Reset, 6-10 indicates a major hit on the laser. See *Rules Book* for damage descriptions.

Mass: The mass of the weapon in tonnes.

Short: The first number is the short range of the weapon in hexes (tenths of a light-second). The first number following the colon is the penetration rating of the weapon and the second number (following the dash) is the damage value of the weapon.

Medium, Long, Extreme: These show the same values as under "Short," but for the weapon's medium, long, and extreme ranges.

Starship Missiles

Both missile turrets and missile barbettes are equipped with a gunner's workstation and a 300,000-km range communication laser, which is used to control the missile in flight. The only performance difference between turrets and barbettes is the number of missiles carried: a missile turret carries two standard missiles while a barbette carries five.

Additional missiles may be carried in cargo spaces, but it takes an hour (two complete game turns) to reload a turret or barbette once its missiles are expended.

The listing below shows the characteristics of missile turrets and barbettes. Volume is in kiloliters, weight is in tonnes (loaded), Power is in megawatts, and price is in megacredits (without missiles).

Missile Launchers

Type	*TL*	*Missiles*	*Volume*	*Weight*	*Power*	*Price*
Turret	8	2	42	28.4	0.15	0.08
Barbette	8	5	84	70.4	0.15	0.11

All of the missiles listed below are all of the nuclear-detonation variety. The table below gives the type of guidance, warhead yield, mass in metric tonnes, its price in MCr, the number of G-turns of fuel carried (followed by the maximum number of G-turns which can be used in a single turn), the die rolled for number of hits from the laser, the damage value of each laser hit, absolute range in hexes (0 = same hex only), the short range (in hexes) and type of communicator (L= laser, M = maser, R = radio), and its sensor range (in hexes) and type (R = Radar, T = High Resolution Thermal, L = Ladar, A = Active EMS, P = Passive EMS). The Signatures column shows the missile's signature vs. radar, active EMS, HRT, passive EMS, and fire, and is copied into the blanks on the missile log sheet. Note that each of the missiles shown can, if desired, spend all of its G-turns of fuel in a single turn, or spread it out over several turns. This will not always be true of other missiles. All missiles on the Missiles table have a hull armor value of 3. Both semi-independent missiles have a power endurance of 10 hours for their sensors. After this time, they function as normal controlled missiles.

Sandcasters

All sandcaster turrets fit in the standard turret hardpoint socket. Each turret weighs 50 tonnes and requires 1MW of continuous power while in operation.

The table below lists the price of the turret in megacredits, the number of sand cannisters carried in the turret, and the beam reduction made per successful beam interception. Additional sand cannisters may be stored in cargo but it takes one hour to resupply a turret.

TL	*Price*	*Cannisters Carried*	*Beam Reduction*
8	0.6	16	1D6×5
9	0.65	18	1D6×5
10	0.7	20	1D10×5
11	0.75	24	1D10×5
12	0.8	30	1D10×5
13	0.85	35	2D6×5
14	0.9	40	2D6×5
15	1	50	2D10×5

Missiles

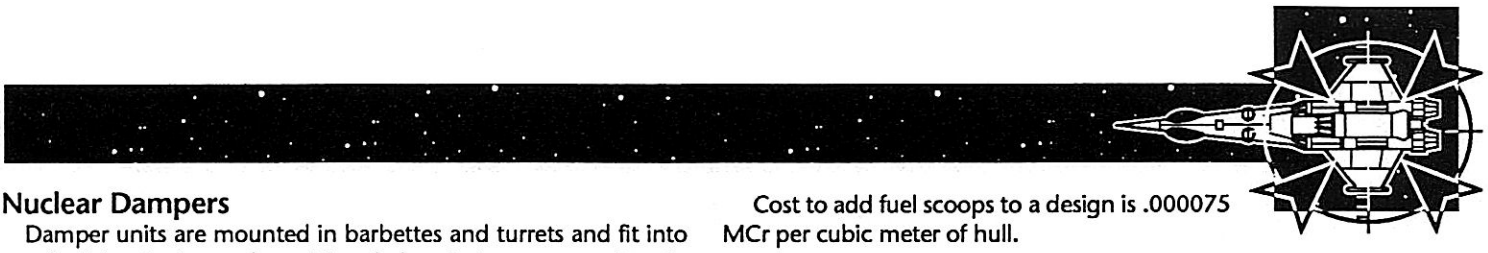
TL	*Guidance*	*Yield*	*Mass*	*MCr*	*G-Turns*	*Hits*	*Damage*	*Range*	*Comm.*	*Sensor*	*Signatures*
9	Controlled	50	7	0.85	12/12	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
11	Controlled	100	7	0.95	12/12	1D6	1/18-56	0	10L	—	+2/+2/+2/+2/+1
12	Semi-Ind.	500	7	2.0	9/9	1D6	1/25-79	0	10L	1P	+4/+3/+4/+3/+1
13	Controlled	200	7	1.15	12/12	1D6	1/21-66	0	10L	—	+2/+2/+2/+2/+1
14	Semi-Ind.	500	7	2.7	7/7	1D6	1/25-79	0	10L	3P	+4/+3/+4/+3/+1
15	Controlled	500	7	1.25	12/12	1D6	1/25-79	0	10L	—	+2/+2/+2/+2/+1
15	Controlled	500	7	2.43	11/11	1D6	1/25-79*	1	10L	—	+2/+2/+2/+2/+1

*Damage listed is at 0 hexes. Damage at 1 hex range is 1/8-25.

Socket Laser Turrets and Barbettes

TL	*Description*	*MW*	*MCr*	*Mass*	*Short*	*Medium*	*Long*	*Extreme*
9	70-Mj laser, 100-ton bay	1.9	267	1402	1:1/7-21	2:1/3-10	4:1/2-5	8:1-3
10	60-Mj laser turret	1.7	1.56	55	1:1/6-19	2:1/6-19	4:1/3-9	8:1/2-5
10	450-Mj laser, 50-ton bay	12.5	104	873	4:1/17-53	8:1/17-53	16:1/9-28	32:1/4-14
11	80-Mj laser turret	2.2	2.08	59	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10
11	150-Mj laser barbette	4.2	6.56	119	10:1/10-31	20:1/5-17	40:1/3-8	80:1-4
12	120-Mj laser turret	3.3	0.94	65	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9
13	150-Mj laser turret	4.2	0.72	68	1:1/10-31	2:1/10-31	4:1/10-31	8:1/10-31
13	106-Mj laser turret	2.9	1.45	59	10:1/8-26	20:1/6-20	40:1/3-10	80:1/2-5
14	150-Mj laser turret	4.2	0.72	63	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
14	300-Mj laser barbette	8.3	2.16	131	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
15	150-Mj laser turret	4.2	0.86	57	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

These weapons are only samples. Additional examples, including higher tech bays, may be designed with the **Fire, Fusion, & Steel: Traveller Technical Architecture** sourcebook.



Nuclear Dampers

Damper units are mounted in barbettes and turrets and fit into standard hardpoint sockets. Mass below is in tonnes, prices in megacredits, and power requirements in megawatts.

TL	Description	Mass (tonnes)	Price (MCr)	Power (MW)
12	Damper Barbette	75.2	1.95	15
13	Damper Barbette	72.2	2.7	9
14	Damper Barbette	60.2	4	6
15	Damper Turret	33.2	4.5	3

Meson Screen

A meson screen is an energy field surrounding the generator which slows and prematurely detonates high-energy mesons. The designer specifies only the power requirement (in MW) of the meson screen; all other values are derived from the power requirement, tech level, and size of the protected ship.

Vol: The meson screen generator's volume, in cubic meters equals MW × 20.

Mass: The meson screen generator's mass, in metric tonnes, equals Vol × 0.75.

AA: The meson screen generator's antenna area, in square meters, equals MW × 10.

MCr: The meson screen generator's price, in millions of credits, equals Vol × 0.1.

Each meson screen requires crew equal to the mass of the screen + 100, times the computer control multiplier (round to the nearest whole number, but must be at least 1). Each crewmember requires one normal workstation installed as part of the screen assembly (i.e., included in the total volume, mass, and price requirements of the screen as a single unit).

Performance

The meson screen generates a Protection Value for the ship which is used against incoming meson guns. The Protection Value is derived by the following formula:

$$PV = TLM \times \sqrt{MW+TSM}$$

PV= Protection Value
TLM = Tech Level Multiplier
TSM = Target Size Modifier

Tech Level Modifiers

TL	TLM
12	50
13	60
14	70
15	80
16	90

Target Size Modifiers

Size	TSM
Small or less	1
Medium	2
Large	4
Very Large	8
Gigantic	16

STEP 5. OPTIONAL FEATURES

Fuel Scoops

Fuel scoops may be added to any design. These allow a vessel to skim the free raw materials for liquid hydrogen (LHYD) fuel from oceans or gas giant atmospheres. They do not consume any volume or add to the mass of the vessel. Fuel scoops do consume surface area. Each 5% of a craft's total surface area given to fuel scoops allows the craft to scoop fuel equal to 20% of its total volume per hour (i.e., a 100-ton ship with fuel scoops covering 10% of its surface can scoop 40 displacement tons of fuel per hour).

Cost to add fuel scoops to a design is .000075 MCr per cubic meter of hull.

Fuel Purification Plant

TL	MW	Vol	Mass	MCr	MinVol
8	0.01	0.7	1.5	0.0002	135
9	0.009	0.6	1.2	0.00019	120
10	0.008	0.55	1.1	0.00018	105
11	0.007	0.45	0.9	0.00017	95
12	0.006	0.4	0.8	0.00016	80
13	0.005	0.35	0.7	0.00015	65
14	0.005	0.25	0.5	0.00014	55
15	0.005	0.2	0.4	0.00015	40
16	0.005	0.15	0.3	0.00016	25
17	0.005	0.1	0.2	0.00017	15

Vol: Cubic meters.
Mass: Metric tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.
All values are per kiloliter of fuel processed per 6 hours.

Socket Extenders

Turrets and barbettes may be mounted on extended mounts to achieve better arcs of fire. These are only practical on larger ships. Bays and spinal mounts may not be mounted on extenders.

When mounted on an extender, a turret or barbette has its arc of fire increased by one arc on each side of its normal arc. For example, a turret mounted in hit location 6 of a box hull form would normally have an arc of fire of 2, 3, and 4. If mounted on an extender, it would cover 1-5. Because of location, many arcs of fire will only be increased by one arc. A turret at hit location 5 on the same box hull, normally arcs 1-3, would only be increase to 1-4.

Each extender is a projection from the hull which requires additional armor and internal structure to support it. Each turret extender requires a basic shell volume of 1.43 cubic meters, which is modified by the hull material and thickness values of the spacecraft's hull as calculated in Step 1. It also requires a basic internal structure volume of 1.43 cubic meters, which is modified by the same maximum G and hull material modifiers as the craft's hull.

Barbette extenders require 2.18 cubic meters of basic shell volume and 2.18 cubic meters of basic internal structure volume, also modified by the same hull thickness, G performance, and hull material values of the craft's hull.

Each such extender has a standard turret or barbette socket on the end of it which can accommodate any standard turret or barbette. The structural requirements of the extender itself are required for the spacecraft; no modifications are required for the weapon fitted in it. A spacecraft may mount no more than two turret extenders or one barbette extender per 500 displacement tons of hull. The minimum hull volume for a single turret extender is 250 tons.

Any spacecraft fitted with a turret or barbette extender becomes unstreamlined, regardless of its original hull configuration. Ships equipped with one or more extender are treated as being one target size larger (i.e., small becomes medium, medium becomes large) when being scanned by active sensors.



Vehicle Service Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Internal Hangar (Minimal)	×2	0.2	.0002	—
Internal Hangar (Spacious)	×4	0.2	.0002	—
Docking Ring	×1	0	.0002	—
Launch Tube	×25	0.5	.00015	.01
External Grapple (USL)	×0.1	1.0	.001	—
External Grapple (SL)	×0.3	1.0	.002	—
External Grapple (AF)	×0.5	1.0	.003	—

Volume: Multiply the craft or vehicle volume by the value shown to determine the facility volume.

Mass: The mass in tonnes per cubic meter of installation.

MCr: The price per cubic meter of installation.

Surface Area: All of these facilities require surface area except for the hangars (which require launch ports, below). The launch tube requires area in m^2 equal to $2 \times L^2$, and the docking ring requires area equal to L2, where L equals the basic length as taken from the Hull Size table, unmodified by hull form, of the largest craft that will use the tube or ring.

Grapples require area equal to the square of the final length of the craft carried by the grapple.

MW: Power requirement per cubic meter of installation.

Hangar Space: Spacious hangars allow all repair and maintenance tasks to be conducted at normal difficulty levels. Minimal hangars increase the difficulty level of all such tasks by one level. This applies to damage or breakdown repair tasks. The expenditure of maintenance hours is unchanged.

Docking Ring: A docking ring may only accommodate craft of one specific displacement (in tons) and one specific hull form and configuration (i.e., 10-ton steamlined cylinder or 30-ton unstreamlined wedge), designated during the design sequence. Airframe configurations may not be accommodated in docking rings. Docking rings allow no maintenance or repair tasks, but does not prevent maintenance hours from being spent.

External Grapple: Types listed are for Unstreamlined (USL), Streamlined (SL), and Airframe (AF) hulls of the carrying ship, not the carried craft. Note that the volume of craft carried in external grapples is not subtracted from the available hull volume of the carrying ship, although the volume of the grapple is. Remember that the volume of the carrying ship plus all externally carried craft is used when calculating the required amount of maneuver drive and jump drive.

By selecting the type of grapple that corresponds to its hull streamlining, the vessel may carry externally mounted craft without compromising its streamlining configuration, so long as the externally mounted craft also meets that configuration. If the grapple or craft's configuration is lower than that of the overall hull, the ship is limited to the lower configuration if it is carrying the craft. If the craft is detached, the hull's configuration may be used.

Special Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Electronics Shop	84	40	1	0.6
Machine Shop	140	120	2	1
Laboratory	112	50	5	0.8
Sickbay	112	50	5	0.8

Vol: Volume in cubic meters (kiloliters).
Mass: Total mass in metric tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.

Internal Armor

Valuable internal systems may have additional armor added around them. Any time a hit is rolled against such a system, the remaining damage value must first penetrate this internal armor before it can damage the system.

Calculate the volume of the system(s) to be protected, and then design the armor as if it were a separate hull, using the same procedure used to calculate the hull shell (or chassis armor material volume, if it is a vehicle) volume, weight, and price of the ship. Select the armor thickness desired, and use the hull form modifier as used by the main hull. Do not, however, use the minimum armor level based on G performance, and do not apply the airframe configuration modifier. There is no internal structure requirement for internal armor.

Access Ports

Description	*Area*	*MCr*
Launch Port	L^2	0.001
Large Cargo Hatch	20 m^2	0.02
Small Cargo Hatch	12 m^2	0.012

Area: Hull surface area required.

L^2: The square of the craft's basic length as taken from the Hull Size table, unmodified by hull form.

MCr: Price in MCr per square meter of launch port, or per each cargo hatch.

Launch Port: At least one launch port is required if craft or vehicles are carried. More launch ports allow craft to be launched more rapidly.

Cargo Hatches: All craft require at least one large cargo hatch per 350 m^3 (25 tons) of cargo capacity. Vessels with under 100 m^3 of cargo space can get by with a single small cargo hatch.

Seats

Short-haul spacecraft will require passenger seats.

Access	*Vol*	*Wt*	*MCr*
Restricted	1.5	.02	.0001
Cramped	2.5	.02	.0001
Adequate	3.5	.02	.0001
Roomy	7	.02	.0001

Vol: Volume in m^3 per position/seat.
Mass: Mass in tonnes per position/seat.
MCr: Price in megacredits per position/seat.

These are simple seats with no controls. Paying passenger seats must be Adequate or better; seats for troops must be Cramped or better. "Restricted" access is the minimum possible accommodation for special purposes only.

Drop Tanks

Ships may be fitted with drop tanks if desired. A drop tank is an additional hull section filled entirely with fuel. Its material volume and mass are calculated just as if it were a separate ship, and it must use the same hull form and configuration modifiers as the ship it will be fitted to, and must be armored and have internal structure bracing sufficient to withstand the ship's rated acceleration.

If a drop tank is fitted to a ship with electromagnetic masking (EMM), the tank(s) must also be so fitted, with the volume and surface area taken out of the tank itself. Power requirements are assumed to be met by the carrying ship, which must allow for them in its own design. If any EMM-fitted ship is carrying non-EMM drop tanks, the ship loses all of its EMM benefits until the tanks are dropped.

A drop tank is designed to be released once it is drained, allowing improved performance by the ship.

STEP 6. POWER SUPPLY

Spacecraft need a source of power to supply their numerous on-board systems. The power supply should be sufficient to run all of a spacecraft's systems at the same time, and many vessels are built with a power excess, allowing other equipment to be installed later, or to allow power to be lost as a result of battle damage.

If a spacecraft's power supply is insufficient to power all of its systems, note the systems that are routinely shut down to allow the others to function (for examples of this, see the spacecraft data pages later in this booklet). These powered-down systems may not include life support (but may include artificial gravity/G-compensation systems, if the designer is willing to accept that risk) or the craft's required number of computers (page 4). A ship that is designed to take-off and land on worlds must be able to operate its contra-grav, maneuver drive (only 1G need be powered if craft is equipped with contra-grav), and at least one each of its communicators and sensors (minimum short range of 300 km for each of these) at the same time.

The plants below include low-tech chemical power plants, fuel cells, nuclear plants, plus some more specialized sources, batteries and photovoltaic ("solar") collector panels.

Fuel cells are like batteries in that they are both electrochemical cells and therefore work on similar principles. However, batteries are closed systems which electrochemically store energy for later withdrawal, while fuel cells are open systems which constantly process fuel and electrochemically convert it to energy.

Fuel: The type of fuel burned. All chemical power plants burn hydrocarbon distillates, but some substitutes are possible. Alcohol distillates may be substituted for hydrocarbon distillates in all power plants listed, but energy output is multiplied by 0.75. All power plants from tech level 7 and higher may be designed to burn liquid hydrogen (LHyd) instead of hydrocarbon distillates at no energy penalty. These plants all require an atmosphere containing oxygen in order to function, thus will not function in vacuum, trace, exotic, corrosive, or insidious atmospheres.

Turbine power plants modified to use LHyd may carry their own on-board supply of liquid oxygen in order to function in vacuum or other environments. The "LOx" is carried in the LHyd fuel tanks, half of the tanks being set aside for this purpose. When operating from on-board oxygen supplies like this, the plant's rate of fuel consumption is *doubled.*

This modification costs Cr50 per cubic meter of tank capacity, and does not prevent the tank from being filled purely with LHyd for standard atmosphere operations.

Chemical Power Plants

TL	Description	MW	Mass	MCr	Min Vol	KL/Hour	Fuel Type
5	Steam Turbine	0.35	2	0.002	1	0.15	Hydrocarbon Distillates
5	Imp. Int. Comb.	0.40	1	0.002	0.01	0.25	Hydrocarbon Distillates
7	Gas Turbine	0.50	1	0.005	0.5	0.3	Hydrocarbon Distillates
8	MHD Turbine	0.60	1	0.01	1	0.2	Hydrocarbon Distillates

Imp. Int. Comb.: Improved Internal Combustion; **MHD Turbine:** Magnetohydrodynamic turbine; **MW:** MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Hour:** Kiloliters (cubic meters) of fuel consumerd per hour per MW output.

Fuel Cells

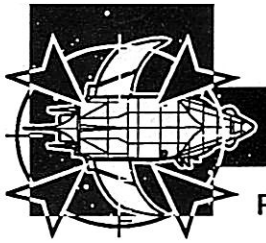
TL	Description	MW	Mass	MCr	Min Vol	KL/Hour	Fuel Type
7	Fuel Cell	0.5	1	0.02	.01	0.3	HG Hydro Dist.
12	Fuel Cell	0.75	1	0.02	.01	0.25	HG Hydro Dist.
14	Fuel Cell	1.5	1	0.02	.01	0.2	HG Hydro Dist.
16	Fuel Cell	1.75	1	0.02	.01	0.2	HG Hydro Dist.

MW: MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Hour:** Kiloliters (cubic meters) of fuel consumed per hour per MW output; **HG Hydro Dist.:** High-grade hydrocarbon distillates.

Nuclear Power Plants

TL	Description	MW	Mass	MCr	Min Vol	KL/Year	Fuel Type
6	Nuclear Fission	0.30	10	0.1	30	0.75	Radioactives
7	Nuclear Fission	0.60	8	0.1	20	0.25	Radioactives
8	Nuclear Fission	1.00	6	0.1	10	0.1	Radioactives
9	Fusion	2.00	4	0.2	100	0.15	Hydrogen
10	Fusion	2.00	4	0.2	50	0.15	Hydrogen
11	Fusion	2.00	4	0.2	20	0.15	Hydrogen
12	Fusion	2.00	4	0.2	10	0.15	Hydrogen
13	Fusion	3.00	3	0.2	1	0.1	Hydrogen
14	Fusion	3.00	3	0.2	0.25	0.1	Hydrogen
15	Fusion	6.00	2	0.2	0.1	0.1	Hydrogen
16	Fusion	7.00	1	0.2	0.075	0.1	Hydrogen

MW: MW output per cubic meter of power plant; **Mass:** Metric tonnes per cubic meter of power plant; **MCr:** Price in MCr per cubic meter of power plant; **Min Vol.:** Smallest possible power plant in cubic meters; **KL/Year:** Kiloliters (cubic meters) of fuel consumed per year per MW output.



Fuel Tankage

Fuel tankage in m^3 must be designated during the design sequence. There is no cost or mass associated with the internal tanks themselves, but the fuel does have mass as indicated on the table.

For nuclear power plants, the power plant fuel (measured by the year) should be thought of as separate from the other fuel.

Almost without exception, starships use liquid hydrogen (LHyd) fuel for all their needs. If, for some reason, a ship has power generated by more than one type of fuel, the tankage for these is calculated separately.

The LHyd tankage should be made sufficient for the ship's jump fuel and reaction mass needs, and this fuel can be used interchangeably for either purpose as needed.

Fuel

Type	*Mass*	*Price*
Hydrocarbon Distillates	1.0	250
HG Hydro Distillates	1.0	1000
Radioactives	12.5	75,000
Liquid Hydrogen (LHyd)	0.07	35

Mass: In tonnes per m^3.
Price: In credits per m^3.

Batteries

TL	*Description*	*MW*	*Mass*	*MCr*
5	Storage Batteries	0.06	2	0.001
6	Storage Batteries	0.08	2	0.0008
7	Storage Batteries	0.1	2	0.0008
8	Storage Batteries	0.2	2	0.001
9	Storage Batteries	0.4	2	0.002
10	Storage Batteries	0.8	2	0.003
11	Storage Batteries	1	2	0.004
12	Storage Batteries	1.5	2	0.005
13	Storage Batteries	2	2.5	0.008
14	Storage Batteries	2.5	2.5	0.01
15	Storage Batteries	3	2.5	0.015
16	Storage Batteries	3.5	2.5	0.02

MW: Maximum output, in megawatts, at the one hour discharge rate, per cubic meter of battery.
Mass: Mass of the battery, in metric tonnes, per cubic meter
MCr: Price in millions of credits per cubic meter

Battery Discharge Rate

The battery's discharge time is the time it takes to drain the battery's charge. The energy output on the table above assumes a discharge time of 1 hour. If the output is lowered, the discharge time is increased, as shown below.

Output	*Time*
×5	0.1 hour
×1	1 hour
×0.1	10 hours
×0.02	100 hours
×0.004	1000 hours

Values may be interpolated. For example, a time of 55 hours (halfway between 10 and 100) yields an input multiplier of ×0.06 (halfway between 0.1 and 0.2).

Solar Arrays

Solar arrays consist of solar collectors, which collect solar radiant energy, and solar cells, which convert radiant energy to electrical energy. Each cubic meter of solar cells requires 10 square meters of solar array if deployed in the inner zone of a star system, 100 square meters of solar collectors if deployed in the habitable zone of a star system, and 10,000 square meters of solar collectors if deployed in the outer zone of a star system.

Solar Collector Panels

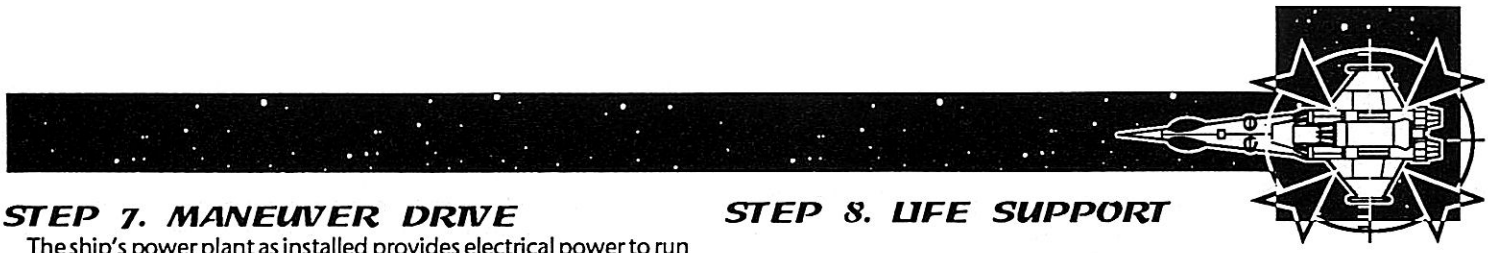
TL	*Vol*	*Mass*	*MCr*
6	0.3	0.008	0.005
7	0.2	0.006	0.004
8	0.15	0.004	0.003
9	0.1	0.003	0.002
10	0.06	0.002	0.001
11+	0.04	0.001	0.001

Vol: Cubic meters of volume required per square meter of installed collector panels, if permanently installed.
Mass: The mass of the collector, in metric tonnes, per square meter of panel.
MCr: The price of the collector, in millions of credits, per square meter of panel.
Retractable Array: The above values are for rigid, permanently installed solar collectors. If the solar collector is designed to be retracted and deployed at various times, double the price, mass, and volume.

Solar Cells

TL	*MW*	*MCr*
6	0.01	0.5
7	0.015	0.4
8	0.02	0.3
9	0.025	0.25
10	0.03	0.2
11	0.035	0.15
12+	0.04	0.1

MW: Output, in megawatts, per cubic meter of solar cell.
MCr: Price, in millions of credits, per cubic meter of solar cell.
Mass: All solar cells mass 2 metric tonnes per cubic meter.
Minimum Volume: The smallest allowed solar cell is 0.01 cubic meters.



STEP 7. MANEUVER DRIVE

The ship's power plant as installed provides electrical power to run the ship's basic systems. The power plant can be (and almost always is) also modified to provide thrust by the addition of a combustion chamber hich burns liquid hydrogen reaction mass in a process called "HEPlaR," or high-efficiency plasma recombustion. Thrust requires both energy and reaction mass, and so additional fuel tankage will be required as well.

Each ship requires 0.5 MW of power output per displacement ton (hull size number) for each G of acceleration. To determine the acceleration rating of the ship, multiply its power devoted to thrust (hereafter called its thrust MW) by 2 and divide the product by its hull number, rounding fractions down.

(This equation works for ships of "typical densities," i.e., those which mass of 15 or fewer metric tonnes per displacement tons. Find the total mass of the spacecraft in tonnes, divide it by its volume in displacement tons, and round to the nearest whole number. If the result is 15 or less, use the system above. If 16 or greater, use the following system for very dense ships. Each MW devoted to thrust produces 20 metric tonnes of thrust. Divide the craft's total mass by tonnes of thrust (thrust MW×20) to find the performance in Gs.)

Each thrust MW requires a heat exchanger/ignition chamber assembly 0.1 cubic meters in size. Mass = 1 tonne per cubic meter, and surface area in square meters is equivalent to the volume in cubic meters. Price is equal to 0.01 MCr per cubic meter of ignition chamber.

Each thrust MW consumes 0.25 cubic meters of reaction mass per hour in addition to the normal fuel cost of the power plant. Liquid hydrogen (LHyd) is used as the reaction mass, and is treated the same as normal LHyd fuel tankage.

Ships with a G rating greater than 1 may only use the acceleration for limited periods of time, unless they have G-compensators or G-tanks installed. (Prolonged periods of high acceleration will otherwise injure the crew.)

Many ships also have contra-grav (CG) lifters as fuel-efficient means of landing and taking off from a planet surface. CG lifters do not provide thrust and so cannot physically lift a ship. Instead, they neutralize most of the gravitational attraction of a world (approximately 99% of gravitational force, beyond which power use becomes prohibitive). This, combined with atmospheric pressure, will provide buoyancy in very dense atmospheres and so allow the craft to float at low altitudes, but usually CG is used only as an adjunct to the ship's thrusters. By neutralizing most of a world's gravitational field, a ship with only 1G of thrust can still escape the world's gravity well.

Note that CG does not reduce the mass of the ship, and so a 1G thruster will still only produce 1G of acceleration; CG merely negates the gravitaional vector of a world.

Contra-Grav Lifters

Type	*TL*	*MW*	*Kl*	*Mass*	*MCr*	*Min Vol*
Standard	9	0.3	0.5	0.4	.02	1
Improved	10	0.2	0.3	0.3	.025	0.3
High Efficiency	12	0.1	0.3	0.2	.03	0.003

TL: Tech level available.

MW: Power requirement per displacement ton (14 kl) of hull.

Kl: Volume in kiloliters (cubic meters) per displacement ton (14 kl) of hull.

Mass: Mass in metric tonnes per displacement ton (14 kl) of hull).

MCr: Price in millions of credits per displacement ton (14 kl) of hull.

Min Vol: Smallest installation volume allowed.

Surface Area: 10% of total hull surface area (used for spacecraft only, not ground vehicles). This includes space for landing gear/skids.

STEP 8. LIFE SUPPORT

Environmental Equipment

TL	*Description*	*MW*	*Vol*	*Mass*	*MCr*
5	Air Lock	0.001	3.000	0.200	.005
5	Basic Life Support	0.0001	0.005	0.005	.0003
6	Extended Life Support	0.0002	0.008	0.008	.0005
10	Artificial Gravity/ G Compensators*	0.005	0.010	0.020	.0005

Values are per air lock for the air lock and per cubic meter of hull volume for all others.

Airlocks required = Hull displacement (in tons)+100, rounded up. Each air lock requires 2 square meters of hull surface area.

Basic life support provides sealed environment, air, and water. Extended ls adds waste disposal/recycling and food, and is required for all craft that are operated for 8+ hours at a time. Ships with extended life support substitute this for basic life support.

*The amount of Gs which can be compensated vary by tech level as follows.

TL	*Compensated Gs*	*Max Accel/ Workstation*	*Max Evade/ Workstation*
10	1G	2G/3G	1G/2G
11	2G	3G/4G	2G/3G
12	3G	4G/5G	3G/4G
13	4G	5G/6G	4G/5G
14	5G	6G/7G	5G/6G
15	6G	7G/8G	6G/7G
16	7G	8G/9G	7G/8G

Compensated Gs is the number of acceleration or evasion Gs negated by the compensator. All crews can automatically withstand 1G, so the maximum acceleration without degrading crew performance is actually 1G above this level, as shown in the Max Accel column to the left of the slash. Evasion Gs, however, are applied erratically, and so cannot be withstood by crews without degrading performance, as shown in the Max Evade column to the left of the slash. Beyond these levels, all tasks are performed at one difficulty level higher (+1 Diff Mod) per G-turn applied.

Starship crewmembers who are strapped into workstations (for **Brilliant Lances** space combat, this is assumed to be everyone except damage control parties, maintenance crew, stewards, medics, and ship's troops) can withstand 1G additional of acceleration or evasion before their performance is degraded. These figures are shown to the right of the slash in the Max Accel and Max Evade columns.

Extended Accommodations

Description	*MW*	*Vol*	*Mass*	*MCr*
Bunk	—	14	0.5	.005
Low Berth	0.001	14	1.0	.05
Emergency Low Berth (for 4)	0.002	28	2.0	.1
Small Stateroom	0.0005	28	2.0	.04
Large Stateroom	0.001	56	4.0	.1

Staterooms are required for paying passengers: one large or small per High Passage passenger, and one large or small per Middle Passage (in the Regency) or one large per *two* Middle Passage in the Wilds.

Civilian crews are usually two per large or one per small stateroom. Military crews are often carried "double occupancy," four per large or two per small stateroom. Officers (except the most senior) may be carried at double occupancy, but enlisted may even be carried in bunks, up to three crew per bunk (by sleeping in shifts: "hot bunking").

Crew Requirements

Engineering: Ce=(P×Cp)÷30

Ce = Engineering crew
P = Power plant peak output in megawatts
Cp = Computer control multiplier

Electronics: Cl = (C+S)×Cp

Cl = Electronics crew
C = Number of installed communicators
S = Number of installed sensors
Cp = Computer control multiplier

Maneuvering: Cm=D

Cm = Maneuvering crew
D = Number of installed drives (maneuver drive = 1, jump drive = 1, maneuver and jump drive = 2)

Gunnery: Cg = FD+Wm

Cg = Gunnery crew
FD = Number of master fire directors
Wm = Sum of the installed weapon mounts which are to be manned in action, times the number of crew each

Maintenance Crew: Cr = Mp÷50

Ct = Maintenance crew
Mp = Maintenance points
= (Jm+Em+Wm+Pm+Mm+Sm)×(0.1×Cp)
Jm = Mass of installed jump drive, in tonnes
Em = Mass of all installed electronics, in tonnes
Wm = Mass of all installed weapons systems, in tonnes
Pm = Mass of all installed power plants, in tonnes
Mm = Mass of heat exchanger/ignition chamber, in tonnes
Sm = Mass of all carried spacecraft, in tonnes
Cp = Computer control multiplier

Ships Troops: Ct as desired.

Ct = Ship's troops

Flight Crew: Cf = Q×R

Cf = Flight crew
Q = Total number of carried craft
R = Crew required of each craft

Command: Cc = Z÷6

Cc = Command crew
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf

Stewards: Cs = [(Cc+Ph)÷8] + {[(Z+Pm)÷50]×Cp}

Cs = Stewards
Cc = Command crew
Ph = High Passengers
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf
Pm = Middle Passengers
Cp = Computer control multiplier

Medical: Cd = [(Z+Cc+Cs+Ph+Pm)÷120] + (Pl÷20)

Cd = Medical crew
Z = Ce+Cl+Cm+Cg+Cr+Ct+Cf
Cc = Command crew
Ph = High Passengers
Pm = Middle Passengers
Pl = Low Passengers

Note: Round all fractions down.

STEP 9. WORKSTATIONS AND BRIDGE

Workstations

Certain crewmembers require the installation of workstations at which they perform their duties of controlling or monitoring certain equipment. One standard workstation (7 m³, see table on next page) must be installed for each engineering, electronics, maneuvering, master fire director, and command crewmember as calculated in the Life Support step above. Workstations for weapons are included in the weapons themselves, and need not be allocated again.

If a ship requires a bridge (see section immediately below), the workstations for the electronics, maneuvering, master fire director, and command crewmembers are installed according to those guidelines, and do not need additional normal workstations. Each engineering crewmember requires one normal workstation, regardless of whether the ship requires a bridge or not.

Even if a ship does not require the specific fitting of bridge workstations as discussed below, the workstations for electronics, maneuvering, master fire director, and command crewmembers are still considered to be grouped together into an area called the "flight deck." This flight deck is treated as a bridge, and its crew as bridge crew for purposes of hits and damage in combat.

Bridge

The ship's bridge is a compartment in the vessel containing crew workstations for command, maneuvering, sensor, communications, and fire direction personnel. It is the ship's nerve center, particularly during combat.

The bridge consists of a number of 1-dispacement-ton (14 cubic meters) workstations. The larger size of the workstations is to allow room for easy movement and communication by command and replacement personnel as well as to allow inspections and conferences on the bridge itself without interfering with the crew's duties.

One workstation is required per electronics, maneuvering, and command crewmember, as determined in the Life Support step, as well as one workstation per master fire director. Each bridge workstation's characteristics are shown on the table on the next page.

Not all ships are large or complex enough to require a bridge. A ship requires a bridge if, during the Crew Requirements step, it is discovered that *two or more* command crew are required. If a ship is of sufficient size/complexity to require a bridge and does not have one installed (i.e., has only a flight deck installed instead), the following penalties apply:

- All sensor tasks are one level more difficult
- No sensor hand-offs are allowed
- Jamming tasks are one level more difficult
- Fire tasks for turrets under local control are one level harder
- MFD-directed fire tasks are one level harder on each turn that the battery composition is changed
- Jump tasks are one level more difficult

Auxiliary Bridge: A designer may wish to install one or more auxiliary bridges with as many or fewer bridge workstations as are installed on the operating bridge (auxiliary flight decks may be installed as well, using normal workstations). Fewer workstations will limit the number of fire directors, sensors, or communicators which can be operated from the site, calculated using the normal crew formulae. If an auxiliary bridge is constructed, additional crewmembers must be carried to man it.

Flag Bridge: If the vessel is to serve as the flagship of a group of ships, it should have a flag bridge. The flag bridge is the facility from which the flag officer commanding (admiral) exercises command and control. The bridge should have bridge workstations for the same number of sensor and communication crew as does the ship's command bridge, plus bridge workstations for additional command crew, depending upon the size of the force being commanded (3+0.25×[Number of ships in the fleet]). Ships which carry large numbers of small craft may have a fighter control bridge containing 3+0.06×(Number of fighters carried) bridge workstations. These bridges allow the application of Fleet Tactics skill to multi-vessel operations. Volume, weight, and price are calculated in the same way as for the ship's bridge.

Fire Control Bridge: On particularly large ships, the designer may wish to designate a number of MFDs that are not located on the main bridge, but are grouped together separately as their own bridge. This decreases the chance of fire control capabilities being lost from hits on the operating bridge.

Crew Workstations

Access	*Vol*	*Wt*	*MCr*
Bridge Workstation	14	0.2	below
Workstation	7	0.2	below

Vol: Volume in m^3 per workstation.

Mass: Mass in tonnes per workstation.

Workstations include control panels, readouts, etc., and are for the use of duty crewmembers. Price for the workstations depend on the type of control system used.

Price: Price of each workstation is determined by the type of control system installed aboard the craft. See Control Systems, page 3.

DESIGN EVALUATION

Once the design is complete, you will need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price, surface area, and mass of all the components. This is your chance to check to make sure that its internal occupied volume and area of surface fixtures are within what is allowed by the size of its hull. This step also provides you with a total price and mass.

Calculate two masses, loaded and empty. Loaded includes a full load of fuel, full load of cargo (assume 1 tonne per m^3), and all carried craft and vehicles on board. Empty is emptied of all jump fuel and reaction mass, all cargo, and all carried craft and vehicles.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as hull form, configuration, armor value, acceleration, jump number, computer type, installed electronics, etc.

If the ship is equipped with drop tanks, it is necessary to record its displacement and determine its G-rating and jump range both with and without the tanks. By the same token, a ship which carries other vessels by means of external grapples must calculate its jump and maneuver performance separately for when the vehicle(s) are attached and detached.

3. Allocate Damage Areas

Divide the volume (cubic meters) of the ship's components into the following categories:

Electronics: All sensors, communicators, ECM, ECCM, control systems, workstations, fire directors, and non-turret, barbette, or bay-mounted defensive screens.

Hold: All fuel, cargo space, hangars, labs, and shops.

Quarters: All life support systems (including the installed artificial gravity/G compensators), hull material volume, accommodations, sick bays and low berths.

Engineering: All power plant, maneuver drive, jump drive, CG lifters, and fuel-processing equipment.

Weapons Mounts: Each individual weapons mount, including turret, barbette, or bay-mounted screens.

Now take the total displacement of the ship and divide by 20. The result is the number of cubic meters of volume available in each of the 20 hit location areas. Allocate the above damage areas to distinct hit locations in proportion to how much of the volume of the ship they consume. Use the ships already rated as a guide.

In general, the bridge (i.e., the largest concentration of electronics) should be in the nose of the vessel to minimize the amount of circuitry between the bridge and the sensor arrays, which are usually mounted forward as well. If the ship has a maneuver thruster, the majority of the engineering space should be aft, but any ship with CG lifters can have engineering space forward on its ventral side as well. If you have a visual image of what the ship looks like, try to make the hit locations correspond with that as much as possible. When allocating the volume of a spinal mount to hit locations, divide it evenly among all 20 hit locations.

4. Place Surface Fixtures

Surface fixtures include all antennae, radiators, external grapples, and hatches. Surface area devoted to maneuver drive thrusters (aft), jump drive (aft), fuel scoops, and contra-grav (ventral surfaces) should also be allocated. These systems do not have surface hit locations listed on the ship's damage table (these have their damage handled by internal damage in the same hit locations), but are allocated in this step to ensure that other systems are not improperly placed where these engineering systems should be. Divide the total hull surface area by 20 to determine the surface area of each hit location and allocate surface fixtures accordingly.

When allocating antenna surface area, use the full unfolded surface area for folding EMS antennae. If the available surface area is too small for this, allocate surface area for all non-antenna surface area consuming systems, and then allocate all remaining surface area to "Antenna." However, this remaining area must be at least equal to 10% of the unfolded surface area of the folding antenna, plus the surface area required by the other antennae installed aboard the craft. If this requirement cannot be met, the systems cannot be accomodated aboard the vessel.

5. Evaluate System Damage

Record the tonnage of each major system in the vessel (each entry on the Damage Type chart, plus each separate weapons mount, plus each antenna on the hull surface) and determine its damage capacity. Systems can take 1 minor hit per 5 metric tonnes of mass (round to the nearest whole number of minor hits, to a maximum of 4), or 1 major hit per 100 metric tonnes of mass (21 or more metric tonnes rounds up to 1 major hit; above multiples of 100 tonnes, 20 tonnes or less round down, 21+ round up). Note that small components (such as laser communicators or active EMS antennae) always take 1 minor hit, even if they have no listed mass or a total mass much smaller than 5 tonnes.

The following specific systems should always be evaluated:

Electronics

Each sensor and its antenna, based on mass.

Each communicator and its antenna, based on mass.

Each master fire director and its antenna, based on its mass.

Each ECM system and its antenna, based on its mass. EMM is a special case. The EMM controller has its hits based on its total mass, using normal procedures. For the radiators, allow 1 minor hit for each whole MW of power allocated to the EMM system (i.e., drop fractional MW). Note that this is an exception to the rule that systems may only have a maximum of 4 minor hits.

Hold

Hangar: The total mass of the hangar spaces divided by 20 equals the number of major hits (round to the nearest whole number).

Labs: Based on the total mass of each lab.

Shops: Based on the total mass of each shop.

Cargo Space (CS): The total mass of the cargo carried is a measure of how much damage is absorbed when the cargo is hit. If cargo space is empty, reroll hits as excess damage.

Quarters

Stateroom (SR): Each large stateroom takes 1 major hit. Each small stateroom takes 2 minor hits.

Life Support: This value is based on the mass of all life support machinery (not including G compensators) plus the total hull material mass (hull shell and internal structure). Two-thirds of the total mass is used to determine the damage level of the main life support system (LS), and the remaining third determines the damage of the emergency life support (ELS) system.

Artificial Gravity (AG): Based on the total volume of the vessel's G compensators.

Low Berth (LBth): The low berths take 1 minor hit per low berth.

Engineering

Jump Drive (JD): Based on the mass of the jump drive itself.

Power Plant (PP): Based on the mass of the power plant.

Maneuver Drive (MD): Based on the mass of the heat exchanger/ignition chamber for the maneuver drive.

Contra-Grav Lifters (CG): The mass of the CG lifters.

Fuel Processing Plant (FPP): Based on the total mass of the plant.

Weapons Mounts

Each individual weapons mount: These may be laser turrets (LT), barbettes (LB), or bays (LBy); missile turrets (MT), barbettes (MB), or bays (MBy); particle accelerators (PA); meson guns (MG); etc. All weapons take hits based on their total mass.

6. Determine Arcs of Fire

The arc of fire of each weapon is determined by the hull location of the weapon and the hull form of the vessel. The following table shows which hull location weapon stations can fire into which arcs on each type of hull form available.

After determining which arcs a weapon can fire into, note the information on the ship's control panel data sheet.

Arcs of Fire by Hull Form

Hull Form	(1) Bow On	(2) Bow Quarter	(3) Broadside	(4) After Quarter	(5) Stern On
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

7. Determine Maintenance Points

Take the loaded mass of the vessel, but subtract the weight of any carried craft and vehicles (their maintenance points are calculated separately), then subtract the mass of its hull shell. Divide the result by the TL modifiers here.

TL	Maint Modifier
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

If the craft has two or more computers (three or more computers for jump-capable ships, St or Fb only, not flight computers) installed, one of these is considered to be a dedicated maintenance troubleshooting computer, which allows the current figure to be divided by 4. If there is only one computer (or two or less for a starship), the figure remains unreduced. This is the number of maintenance points required by the craft. (The loaded figure is used because items such as cargo and fuel do require regular attention to see that they have not shifted, leaked, etc.)

ADDITIONAL EQUIPMENT

The following items are not systems to be installed in a ship design, but are stand-alone pieces of equipment that can be carried and used by already designed vessels.

TL-11 Laser Gunpack

This item is a module designed for use with the 50-ton Modular Cutter, detailed later in this book. The Modular Cutter may be fitted with any of a variety of 29-ton (406 m³) modules. The gunpack is one such type. If carried aboard a vessel, it can be installed aboard a Modular Cutter in about an hour.

The gunpack contains two TL-11 150 Mj Laser Barbettes (see page 10), and an MFD with the same range performance (10-20-40-80). In addition, the pack contains a 180,000 km (6 hex short range) Ladar. Because ladars cannot obtain their own sensor locks, the gunpack-carrying cutter will rely on sensor lock hand offs, but the ladar's range will allow it to retain these locks at a respectable range. The power from an on-board 5.1 MW MHD turbine combined with the 46.27 excess MW from the cutter is more than sufficient for all of the gunpack's systems (includes 1.849 MW excess power), and includes overpowering both laser barbettes to –1 Diff Mod.

The pod is crewed by 2 crewmembers (sensor operator and MFD operator), although 4 may be used if the barbettes are to be capable of local control. Fuel is sufficient for 12 hours, or 24 combat turns.

Mass of the gunpack decreases the cutter's performance to 1G (at 4.95625 m³ of fuel per G-turn), and thereby frees up 35.35 MW, used above. Cutter carries fuel sufficient for 30 G-turns, and the module carries LHyd tankage for another 32 G-turns, for a total of 62 G-turns.

The gunpack masses 439.2 tonnes fully loaded, and costs 57.7 MCr.

Drones

These are carried as cargo, and can be used simply by launching them out of a cargo door. They may be operated via a missile-capable MFD, a missile turret or barbette, or via a normal bridge workstation using a ship's sensor that is compatible with that of the drone (i.e. maser communicators in the case of the two drones listed). When rolling for sensor locks using the drone's sensors, use the Sensor or RCV asset of the controlling crewmember, whichever is lower (or crew quality rating, of course).

Volume is given in displacement tons (14 m³), mass in metric tonnes, and price in millions of credits (MCr). Drones, like missiles, are given maneuver performance in terms of total G-turns available/G-turns which can be used in one turn. Duration is listed in hours (limited by the on-board battery) or "∞", where the drone is fitted with a fusion plant which allows unlimited power for its electronic systems. Communicators are listed in the same way as missiles (L = laser, M = Maser, R = Radio), plus the notation "∞" which indicates a 1000 AU communicator, which has an effectively unlimited range in terms of **Brilliant Lances** starship combat. Sensors are listed with their range in hexes and A for Active EMS and P for Passive EMS. The (F) notation indicates a folding array. Signatures are the drones signatures vs. radar, active EMS, HRT, passive EMS, and fire, respectively, and are copied into the blanks of the log sheet.

TL	Description	Vol	Mass	MCr	G-turns	Duration	Comm	Sensor	Signatures
12	Active/Passive Drone	2	59.1	13.8	56/1	∞	∞M	4A, 5P (F)	+1/+1/+1/+1/+1
14	Passive Drone	4	81.5	7.1	4/1	95	∞M	5P (F)	+1/+1/+1/+1/+1

STARSHIP DATA PROFILES — Scout/Courier

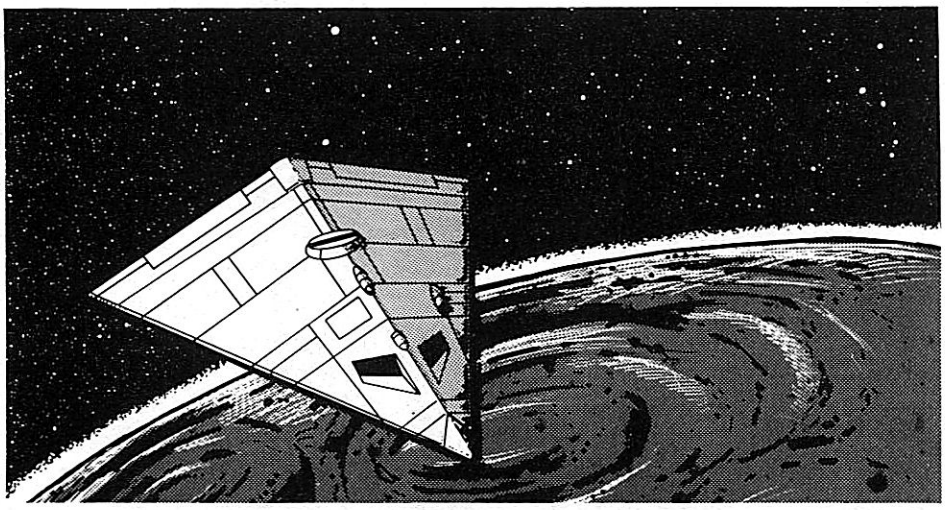
HOW TO READ THE STARSHIP DATA PROFILES

The following abbreviations are used on the starship data profiles on the following pages. See the **Brilliant Lances** rules for guidelines on how to transfer the data profile information onto the control panel pages.

AEMS: Active Electromagnetic Sensor; **AG:** Artificial Gravity (environmental and G-compensating); **AL:** Air Lock; **Ant:** Antenna; **Brb:** Barbette; **BS:** Barbette socket; **CG:** Contra-Gravity Lifters; **CH:** Cargo Hatch; **Elec:** Electronics; **ELS:** Emergency Life Support; **EMM:** Electromagnetic Masking; **EMMR:** Electromagnetic Masking Radiators; **Eng:** Engineering; **FPP:** Fuel Processing Plant; **JD:** Jump Drive; **Las:** Laser; **LB:** Laser Barbette; **LBth:** Low Berth; **LP:** Launch Port; **LS:** Life Support; **LSR:** Large stateroom; **LT:** Laser Turret; **MB:** Missile Barbette; **MD:** Maneuver Drive; **MFD:** Master Fire Director; **MG:** Meson Gun; **MS:** Meson Screen; **MT:** Missile Turret; **ND:** Nuclear Damper; **NDB:** Nuclear Damper Barbette; **NDT:** Nuclear Damper Turret; **PA:** Particle Accelerator; **PEMS:** Passive Electromagnetic Sensor; **PEMS Ant:** Passive Electromagnetic Sensor Antenna; **PP:** Power Plant; **Qtrs:** Quarters; **RC Ant:** Radio Communicator Antenna; **Sand:** Sandcaster Turret; **SSR:** Small Stateroom; **Trt:** Turret; **TS:** Turret Socket, i.e., an empty socket where a turret could be installed. All empty sockets take 1 minor hit (1h). If a turret or barbette is in the socket, it takes damage normally.

Note: Prices for ships do *not* include carried small craft, cutter modules, vehicles, etc., which must be purchased separately.





General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr50.48
Configuration: Wedge SL
Mass (Loaded/Empty): 697.9/477.0
Hull Armor: 28
Volume: 1400m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 147 MW Fusion Power Plant (147 MW/hit), 1 year duration (0.557 MW excess power)
Jump Performance: 2 (210 m³ fuel)
G-Rating: 2G (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 80 (113.6 using jump fuel), 6.25m³ fuel each
Maint: 23

Electronics

Computer: 3×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 300,000km radio (10 hexes, 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 3×Workstation

Armament

1 turret hardpoint socket fitted (Loc: 10; Arc: 1,2,3).

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (0.28 MW), Grav Compensators (6G; 7 MW)
Crew: 3 (2×Maneuver, 1×Electronics). Seeker adds 1×Gunner.
Crew Accommodations: 2×Large Stateroom (0.001 MW ea.), double occupied if necessary.
Passenger Accommodations:
2×Small Stateroom (0.0005 MW ea.)
Cargo: 161.8 m³, one large cargo hatch
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal) and one launch port
Air Locks: 1.

Notes

Standard practice is for one maneuver crewmember to double as the ship's electronics operator. Fuel purification machinery (1.05 MW), 20.28 hours to refine 710 m³ (50.7 tons).

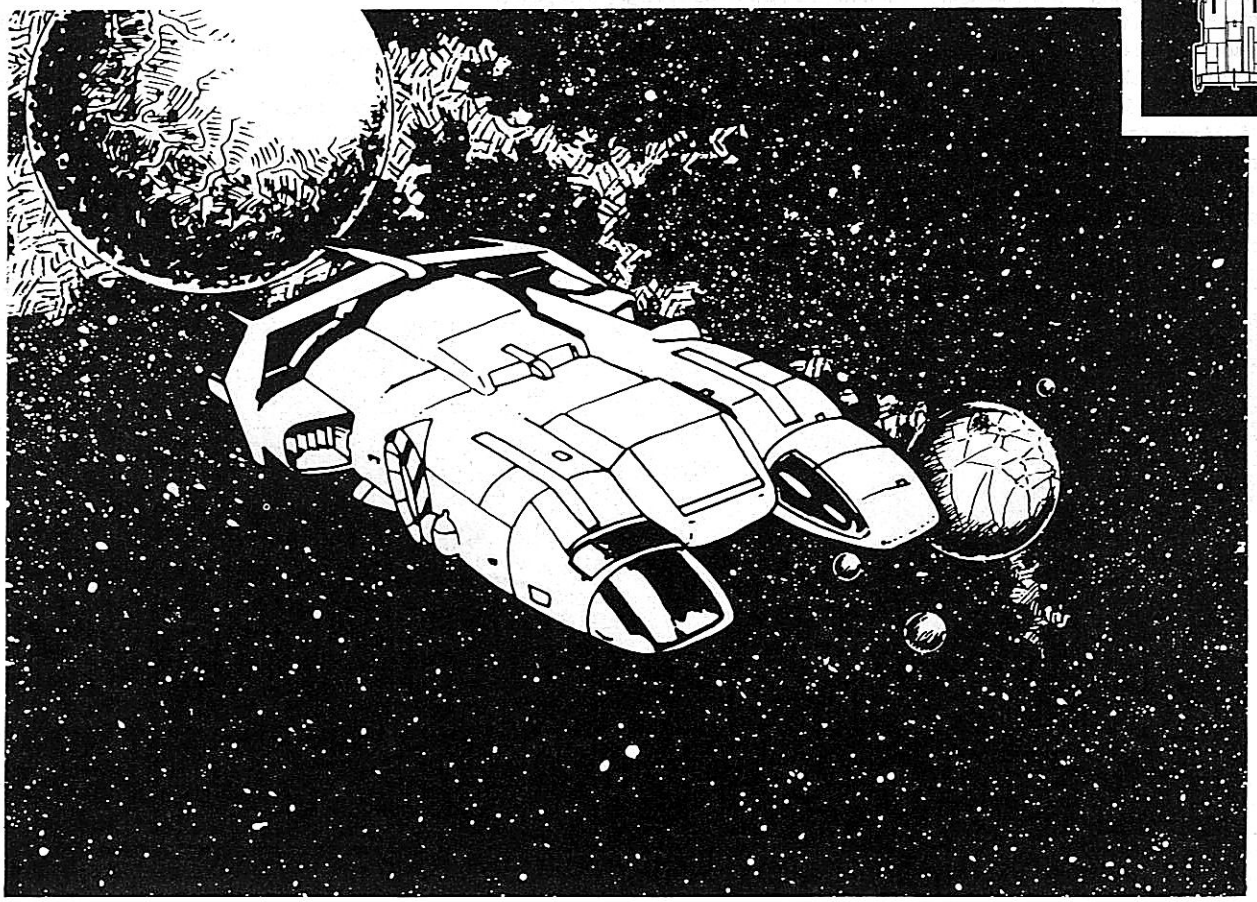
The Seeker is built on the Scout/Courier design, converting the two small staterooms and 116 m³ of the cargo hold into a special 172 m³ ore bay, and the addition of a 150-Mj TL-15 mining laser turret to the socket already installed, adding MCr0.86 to the price and 57 tonnes to its mass. (Turret Loc: 10; Arc: 1,2,3; 4.2 MW, 1 Crew)

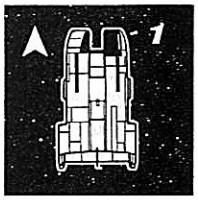
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	1-18: Elec, 19-20: Hold
2-3	Ant	1-12: Qtrs, 13-20: Hold
6-7, 12-13		1-10: Qtrs, 11-20: Hold
4-5, 8-9, 11, 14-15		Hold
10	1: AL	1-12: TS, 13-20: Hold
16-17		1-5: Eng, 6-20: Hold
18-19	1-5: Ant, 6-9: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems	
JD-1H	LS-1H
PP-1H	SSR (2h)
CG-(4h)	Hangar-1H
ELS-1H	All Others-(1h)
MD-(2h)	
FPP-1H	
AG-1H	
LSR-1H	

Jayhawk-Class Far Trader





General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr57.21
Configuration: Wedge SL
Mass (Loaded/Empty): 1918.38/1093.78
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 148 MW Fusion Power Plant (49 MW/hit), 1 year duration (0.7705 MW excess power)
Jump Performance: 2 (420 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (81.6 using jump fuel), 12.5 m³ each
Maint: 89

Electronics

Computer: 3×TL-12 Model St (0.4 MW ea.)
Commo: 30,000 km radio (1 hex, 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex, 0.03 MW), Active EMS 3000 km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 3×Workstation, 1 other workstation

Armament

2 turret hardpoint sockets fitted (Loc: 8,9; Arcs: 1,2,3)

Accommodations

Life Support: Extended (0.56 MW), Grav Compensators (3 G; 14 MW)
Crew: 5 (2×Maneuver, 1×Electronics, 1×Engineering, 1×Steward)
Crew Accommodations: 5×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.)
Cargo: 743.8 m³, 2 large cargo hatches
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal), 1 launch port
Air Locks: 2

Notes

Fuel purification machinery (1.53 MW), 24 hours to refine 1020 m³ (72.86 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*System*
1	1-4: CH, 5-9: LP, 10: Ant	Hold	JD-3H
2, 3	1: Ant	1-2: Elec, 3-20: Qtrs	PP-3H
4-5	1: Ant	1-2: Elec, 3-19: Qtrs, 20: Hold	FPP-2H
6-7, 10-15		Hold	AG-1H
8-9	1-4: CH	1-6: TS, 7-20: Hold	ELS-1H
16-17		1-7: Eng, 8-20: Hold	LS-2H
18-19	1: AL	1-7: Eng, 8-20: Hold	SSR-(2h)
20		Eng	MD-(2h)
			CG-1H
			Hangar-1H
			All Others-(1h)

Moraine-Class Free Trader



General Data

Displacement: 200 tons
Length: 43 meters
Price: MCr46.47
Configuration: Wedge SL
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 10
Mass (Loaded/Empty): 1908.146/1074.746

Engineering Data

Power Plant: 156MW Fusion Power Plant (52 MW/hit), 1 year duration (17.967 MW power shortfall)
Jump Performance: 1 (280 m³ fuel)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 56 (78.4 using jump fuel), 12.5 m³ fuel each
Maint: 89

Electronics

Computer: 3×TL-10 Model St (0.3 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.06 MW), Active EMS 300km (0 hexes; use extreme range for task difficulty in same hex; 15 MW)
Controls: Flight deck with 3×Workstation, plus 2 other workstations

Armament

2 turret hardpoint sockets fitted (Loc: 16/17, 18/19; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (1G; 14 MW)
Crew: 6 (2×Maneuver, 1×Electronics, 2×Engineering, 1×Steward)
Crew Accommodations: 6×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 8×Small Stateroom (0.0005 MW ea.), 8×Low Berth (0.001 MW ea.)
Cargo: 764.8 m³, 2 large cargo hatches
Air Locks: 2

Notes

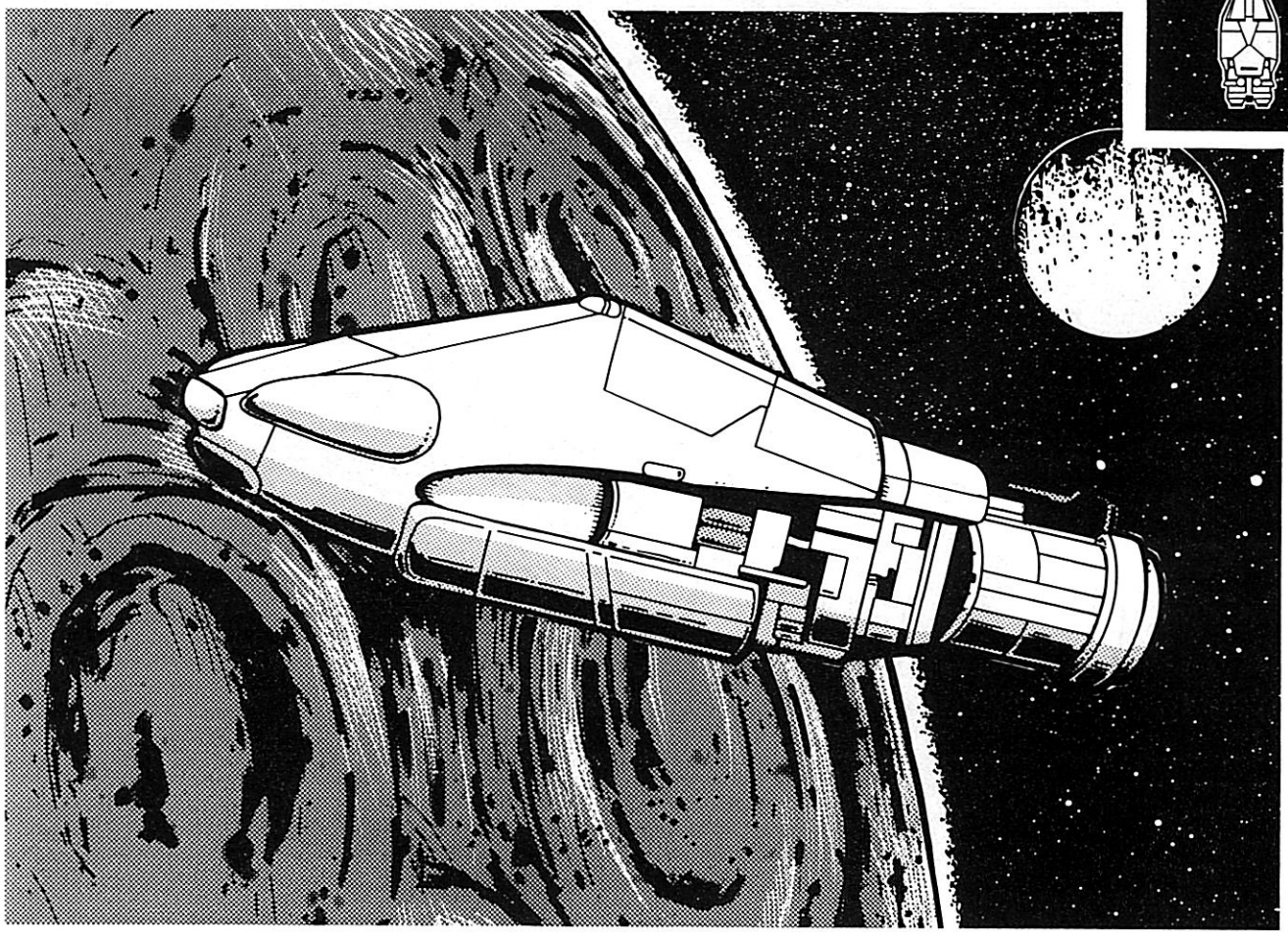
The *Moraine* is the TL-10 version of the more popular and useful *Beowulf*-class. The *Moraine*'s systems consume 174 MW of power, meaning that it cannot operate them all at once with its 156 MW plant. In space, the contra-grav drive is shut down to conserve power. When taking off from a planet, the *Moraine* cannot power its G-compensators, and thus all crew and passengers must be strapped in for this evolution.

Fuel purification machinery (1.53 MW), 30.8 hours to refine 980 m³ (70 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-6: Ant	1-9: Elec, 10-20: Hold	JD-2H
2	1: AL	Qtrs	PP-3H
4		1-3: Eng, 4-20: Hold	FPP-2H
5, 8-9, 11		Hold	CG-1H
12-15	1-3: CH	Hold	SSR-(2h)
3, 6-7		Qtrs	AG-1H
10		1-3: Qtrs, 4-20: Hold,	LS-1H
16-19		1-3: TS, 4-8: Eng, 9-20: Hold	ELS-1H
20		Eng	MD-(2h)
			All Others-(1h)

Lord Baltimore-Class Yacht



General Data

Displacement: 200 tons
Length: 51 meters
Price: MCr84.8
Configuration: Needle USL
Mass (Loaded/Empty): 1502.83/1207.44
Hull Armor: 42
Volume: 2800m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 456MW Fusion Power Plant (228 MW/hit), 1 year duration (0.2275 MW excess power)
Jump Performance: 4 (700 m³ fuel)
G-Rating: 4G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 32 (88 using jump fuel), 12.5 m³ of fuel each
Maint: 48

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Flight deck with 3×Workstation, plus 3 other workstations

Armament

1 turret hardpoint socket fitted. (Loc: 10; Arcs: All)

Accommodations

Life Support: Extended (0.56 MW), Gravitic Compensators (6G; 14 MW)
Crew: 9 (2×Maneuver, 3×Engineering, 3×Small Craft Flight Crew, 1×Command). Air raft pilot doubles as Steward
Crew Accommodations: 9×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.), 1×Large Stateroom (0.001 MW) (owner's suite)
Cargo: 125 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton skiff and internal hangar (Minimal), air raft with internal hangar (Minimal), one launch port each
Air Locks: 2

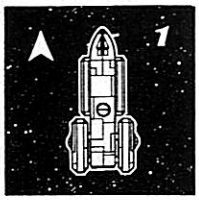
Notes

Fuel purification machinery (2.5 MW), 13.2 hours to refine 1100 m³ (78.57 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-9: Ant	1-10: Elec, 11-20: Qtrs	JD-3H
2, 4		Qtrs	PP-2H
3	1: AL	Qtrs	CG-1H
5-6		1-10: Qtrs, 11-20: Hold	LS-2H
7		1-5: Qtrs, 6-20: Hold	AG-1H
8-9	1: LP	Hold	FPP-2H
12-17		Hold	LSR-1H
10		1-6: TS, 7-20: Hold	ELS-1H
11	LP	Hold	Hangar-3H
18		1-19: Eng, 20: Hold	SSR-(2h)
19-20		Eng	MD-1H
			All Others-(1h)

Gazelle-Class Close Escort



General Data

Displacement: 280/400 tons
Length: 48.5 meters
Price: MCr224.65 (+MCr6.78 tanks)
Configuration: Wedge SL
Mass (Loaded/Empty): 4662.15/4155.53 with tanks
4154.87/3742.43 without tanks
Hull Armor: 62
Volume: 3920 m³/5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 891 MW Fusion Power Plant (99 MW/hit), 1 year duration
Jump Performance: 3 with tanks attached (1120m³), 5 without (1260 m³)
G-Rating: 3G with tanks (200 MW/G), 5G without (150 MW/G), Contra-Grav lifters (30 MW)
G-Turns: 112, 25 m³ fuel each, with tanks attached; 77.6, 18.75 m³ each, without tanks
Maint: 143

Electronics

Computer: 3×TL-14 Model Fb (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EMS jammer (10 hexes; 30 MW), EM masking package (5.6 MW)
Controls: Bridge with 7×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW, 1 crew ea.), 2×TL-14 300-Mj Laser Barbette (Loc: 4/5, 10; Arcs: 1,2,3; 8.3 MW, 1 crew ea.)
Master Fire Directors: 1 TL-14 (5 Diff Mod; Non-Msl; 10 hexes; 1.62 MW, 1 crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
300-Mj Laser Barbette	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (0.784 MW), Grav Compensators (5G; 19.6 MW)
Crew: 22 (7×Engineering, 1×Electronics, 2×Maneuver, 5×Gunnery, 1×Maintenance, 3×Small Craft Flight Crew, 3×Command)
Crew Accommodations: 2×Small Stateroom (0.0005 MW ea.), 8×Large Stateroom (0.001 MW ea.) (multiple-occupancy)
Cargo: 10.8 m³, one small cargo hatch
Small Craft and Launch Facilities: SL external grapple for 20-ton small craft
Air Locks: 3

Notes

As with many other small military designs, the *Gazelle* is very tight. Its 22 crewmembers share accommodations for 18, requiring some "hot bunking."

Without drop tanks, the *Gazelle* consumes 899.465 MW, requiring the contra-grav to be shut down, or the EMS jammer to function with a six-hex short range to make up the difference. With tanks attached, only 749.465 MW are needed.

Although it is streamlined with the drop tanks attached, the *Gazelle* only has contra-grav performance for 300 tons, not 400.

2800 m³ of fuel total (200 tons), 1345 (96 tons) carried in 2 50-ton drop tanks, 1455 (104 tons) internal. 1120 m³ fuel for jump 3 with tanks attached, 1260 m³ for jump 5 without tanks. Fuel purification machinery (7.6 MW), 11.05 hours to refine 2800 m³.

Drop tanks are armored to same level as ship, and equipped with EMM.

Damage tables below assume drop tanks are attached.

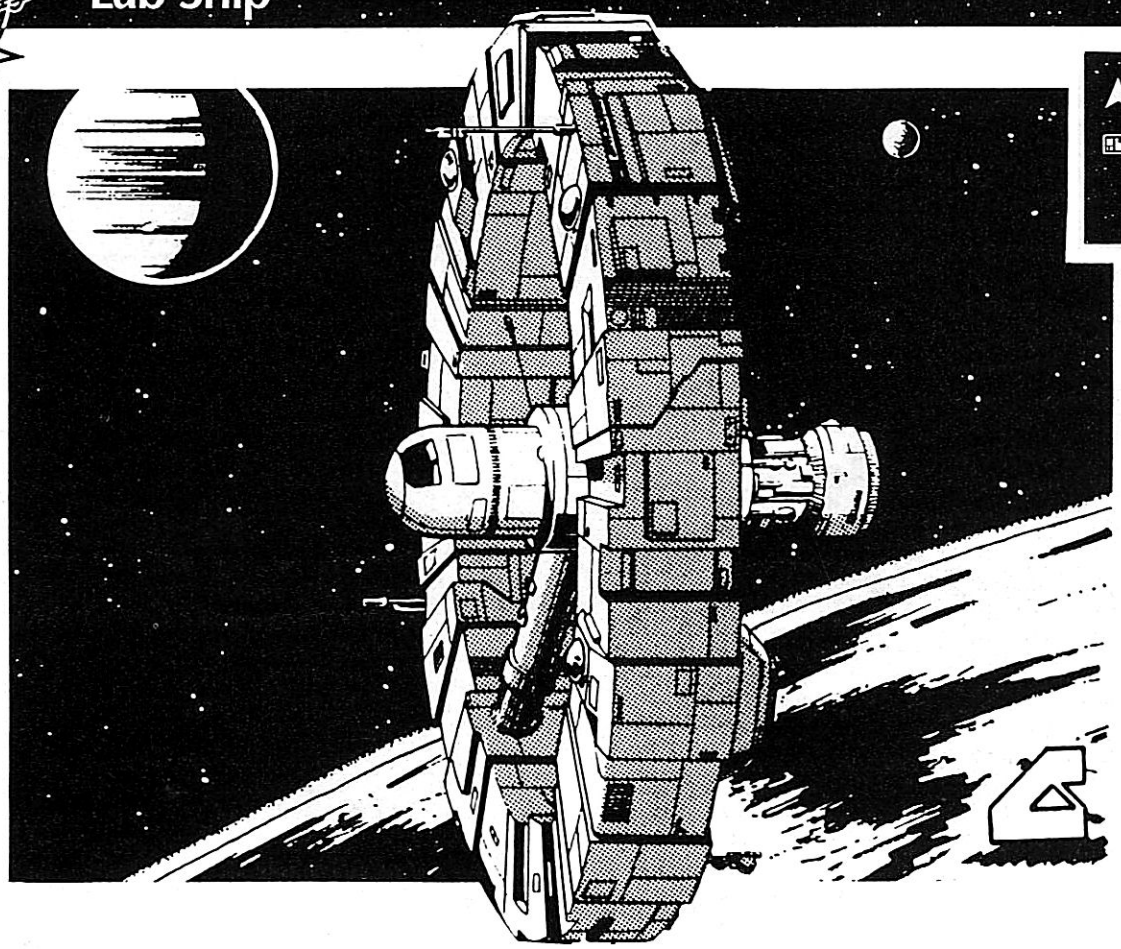
If small craft is not being carried, surface small craft hits are taken by the grapple.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-14: Ant	1-12: Elec, 13-20: Qtrs
2	Ant	Elec
3		Qtrs
4-5	1-10: Small Craft	1-4: LB, 6-20: Qtrs
6-7		Hold
8-9	1: EMMR, 2-14: Small Craft	Hold
10	1-2: EMMR, 3: AL	1-8: LB, 9-20: Hold
11	Small Craft	1-12: Eng, 13-20: Hold
12-13	1-2: EMMR	1-12: Eng, 13-20: Hold
14-15	1: EMMR, 2-14: Small Craft	Hold
16-17	1-2: CH	1-5: LT, 6-7: Hold, 8-20: Eng
18-19	1: Small Craft	1-14: Eng, 15-20: Hold
20		Eng

Systems	
PP-9H	EMMR-(5h)
JD-7H	CG-1H
LS-5H	SSR-(2h)
LB-2H	MD-1H
LT-1H	LSR-1H
FPP-8H	EMM-1H
Grapple-1H	MFD-(4h)
ELS-2H	All Others-(1h)
AG-1H	

Lab Ship





General Data

Displacement: 390/400 tons
Hull Armor: 10
Diameter: 76 meters
Volume: 5460/5600 m³
Price: MCr129.41
Target Size: S
Configuration: Open USL
Tech Level: 15
Mass (Loaded/Empty): 2032.38/1352.49

Engineering Data

Power Plant: 265.2 MW Fusion Power Plant (265.2 MW/hit), 1 year duration (0.355 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1 (200 MW/G), no contra-grav
G-Turns: 96 (129.6 using jump fuel), 25 m³ of fuel each
Maint: 74

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino detector (0.01 MW)
Controls: Flight deck with 4×workstation, plus 11 other workstations

Armament

4 turret hardpoint sockets fitted. (Loc: 12-15; Arcs: All)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (6G; 27.3 MW)
Crew: 17 (2×Maneuver, 1×Engineering, 1×Electronics, 2×Small Craft Flight Crew, 1×Command, 10×Science Personnel)
Crew Accommodations: 17×Small Stateroom (0.0005 MW ea.)
Cargo: 359.7 m³, one large cargo hatch
Small Craft and Launch Facilities: USL External Grapple for 10-ton skiff, Internal Hangar (Minimal) for Air Raft (one of the crew doubles as air raft pilot), one launch port for air raft
Air Locks: 4

Notes

The Lab Ship itself displaces 390 tons, and with its launch attached displaces 400. Its jump, maneuver, contra-grav drives, and controls are configured to work with the 400-ton figure.

Workstations are provided for all 10 scientists.

Fuel purification machinery (3.55 MW), 27.38 hours to refine 3240 m³ (231.4 tons).

4×Laboratory

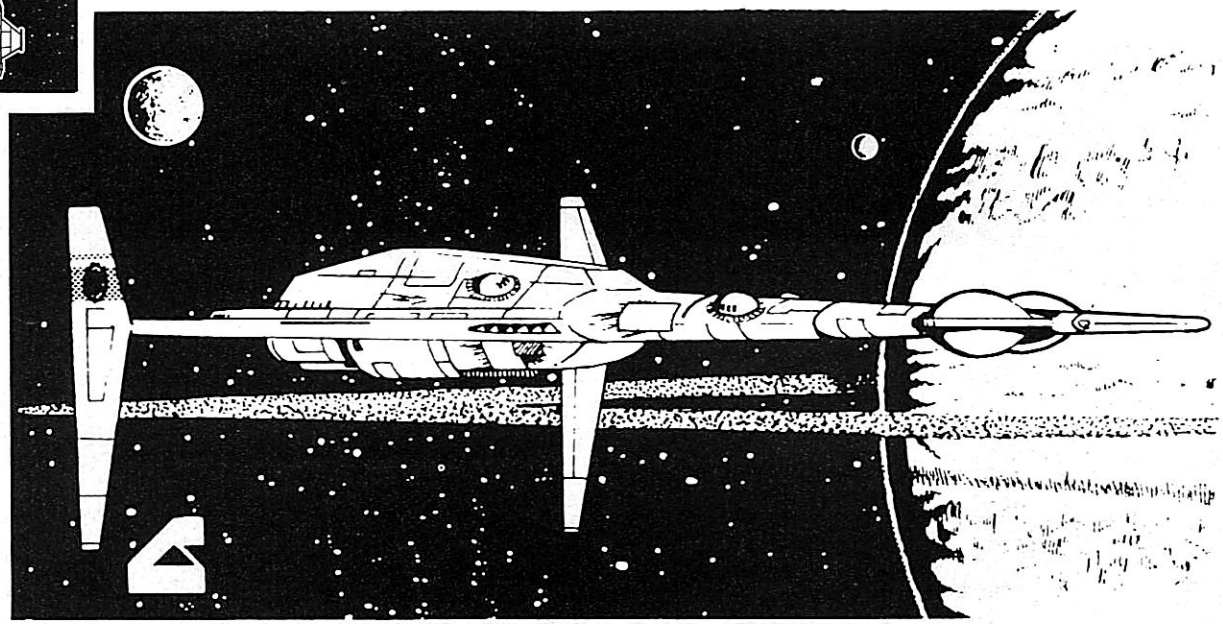
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-4: LP, 5-9: CH	Hold
2-9, 16-20		Hold
10-11		1-13: Eng, 14-20: Hold
12-13	Ant	1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
14		1-3: Elec, 4-6: TS, 7-17: Qtrs, 18-20: Hold
15	1-16: Ant, 17-18: AL	1-4: Elec, 5-7: TS, 8-18: Qtrs, 19-20: Hold

Systems	
JD-4H	Grapple-(3h)
PP-1H	MD-(4h)
LS-2H	FPP- 3H
Lab-1H	SSR-(2h)
AG-1H	All Others (1h)
ELS-1H	
Hangar-1H	

Patrol Cruiser





General Data

Displacement: 400 tons
Length: 66 meters
Price: MCr197.5
Configuration: Needle AF
Mass (Loaded/Empty): 3545.28/2933.8
Hull Armor: 42
Volume: 5600 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 886.5 MW Fusion Power Plant (295.5 MW/hit), 1 year duration (39.65 MW power shortfall)
Jump Performance: 3 (1120 m³)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (104.8 using jump fuel), 25 m³ of fuel each
Maint: 106

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 5 other workstations

Armament

Offensive: 2×TL-15 150-Mj Laser Turret (Loc: 2,3; Arcs: 1,2,3,4; 4.2 MW, 1 crew ea.), 2×Missile Turret (Loc: 12,13; 2 ready Msls ea.; 0.15 MW; 1 crew ea.) (total of 4 ready Msls, plus 8 in cargo).
Master Fire Directors: 2 TL-15 (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW, 1 crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (6 G; 28 MW)
Crew: 19 (2×Maneuver, 1×Electronics, 5×Engineer, 6×Gunnery, 3×Small Craft Flight Crew, 2×Command)
Crew Accommodations: 2×Small Stateroom (command crew; 0.0005 MW ea.), 5×Large Stateroom (multiple-occupancy; 0.001 MW ea.)
Cargo: 0 m³, plus storage for eight missiles, one large cargo hatch
Small Craft and Launch Facilities: 30-ton Ship's Boat with internal hangar (Minimal), and one launch port
Air Locks: 4

Notes

The Patrol Cruiser is a rather tight design. The 19 crewmembers share accommodations for 12, requiring "hot bunking" for the gunnery and engineering crew.

The cruiser's total power requirement is 926 MW, limiting it to only 3G performance when the contra-grav is engaged.

Fuel purification machinery (9.7 MW), 8.1 hours to refine 2620 m³ (187.14 tons).

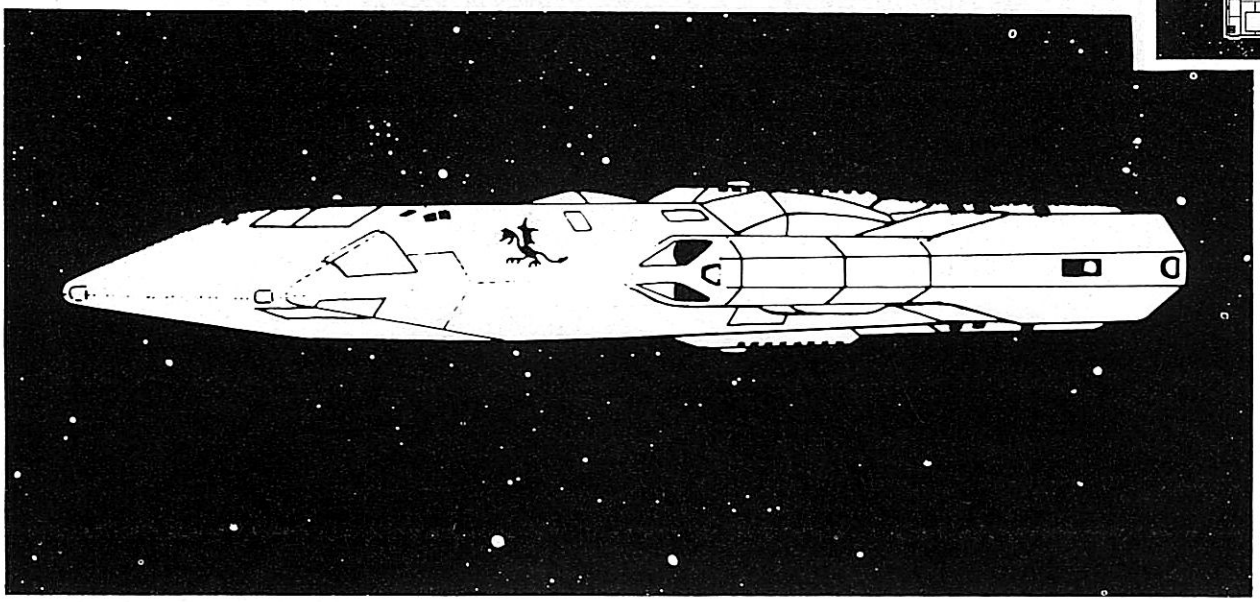
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	1-6: Ant	1-3: LT, 4-17: Hold, 18-20: Elec
3		1-3: LT, 4-20: Hold
4-5, 8-11, 14		Hold
6	1: AL	Qtrs
7		1-15: Qtrs, 16-20: Hold
12-13		1-3: MT, 4-20: Hold
15		1-19: Hold, 20: Eng
16-19	1-2: EMMR	1-12: Eng, 13-20: Hold
20		Eng

Systems	
JD-5H	MD-1H
PP-3H	LSR-1H
CG-1H	LT-1H
LS-5H	MT-1H
AG-1H	FPP-8H
ELS-2H	MFD-1H
SSR-(2h)	Hangar-8H
EMM-1H	All Others-(1h)
EMMR-(5h)	

Shukugan (Dragon)-Class System Defense Boat





General Data

Displacement: 400 tons
Length: 61 meters
Price: MCr166.79
Configuration: Slab SL
Mass (Loaded/Empty): 6075.18/5799.18
Hull Armor: 101
Volume: 5600 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 920 MW Fusion Power Plant (48 MW/hit), 1 year duration (7.64 MW excess power)
G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 112, 25 m³ of fuel each
Maint: 203

Electronics

Computer: 3×TL-12 Mod Fb Computer (0.8 MW ea.)
Commo: 300,000km radio (10 hexes; 10MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), Active EMS 3000km (0 hexes; 8 MW) (use long range for task difficulty in same hex)
ECM/ECCM: EM Masking Package (5.6 MW)
Controls: Bridge with 7×bridge workstation, plus 10 other workstations

Armament

Offensive: 2×TL-11 80-Mj Laser Turret (Loc: 10, 11; Arcs: All; 2.2 MW; 1 Crew ea.), 2×Missile Barbette (Loc: 12, 13; 5 ready Msls ea.; 0.15 MW; 1 Crew ea.; 10 ready Msls total, plus 12 in cargo)
Master Fire Directors: 2 TL-12 (4 Diff Mod; Msl 10 hexes; 2 hexes; 1.44 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-11 80-Mj Laser Turret	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (3G; 28 MW)
Crew: 23 (1×Maneuver, 1×Electronics, 10×Engineering, 6×Gunnery, 2×Maintenance, 3×Command)
Crew Accommodations: 12×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Cargo: 80 m³ (plus storage for 12 missiles), one small cargo hatch
Air Locks: 4

Notes

Fuel purification machinery (8.4 MW), 12 hours to refine 2800 m³ (200 tons).

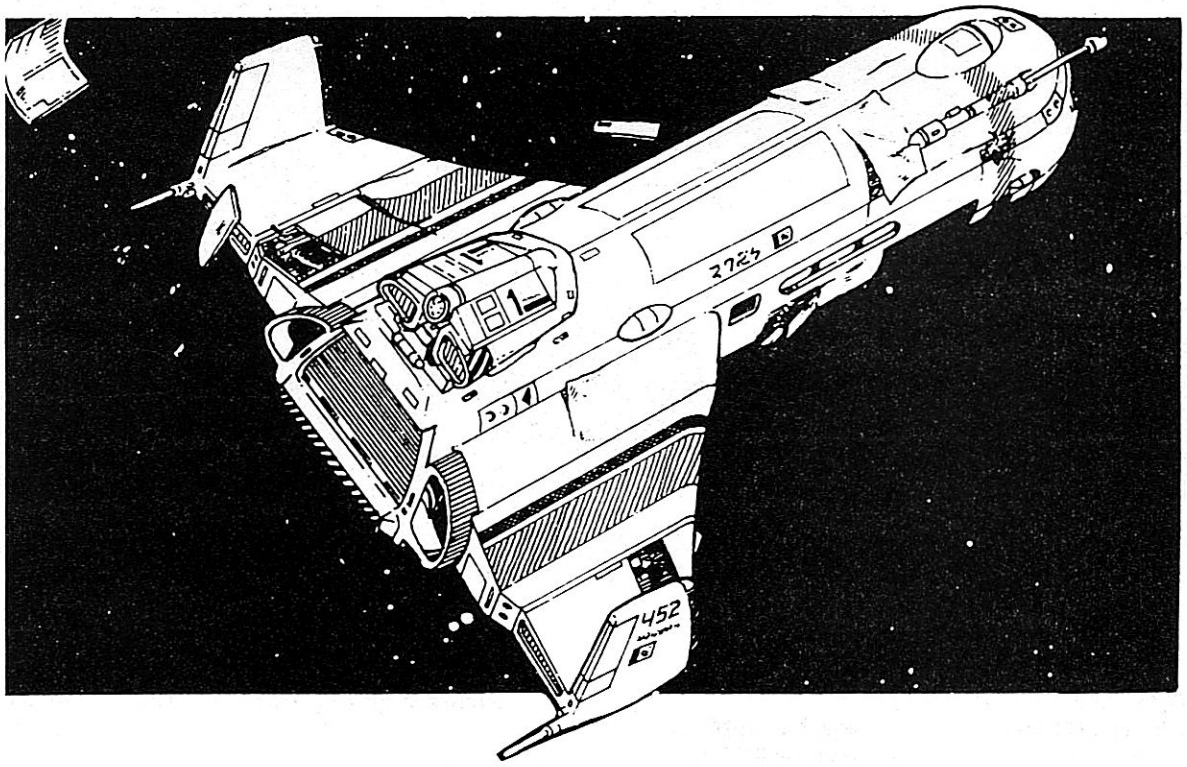
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-10: Eng, 11-20: Qtrs
3	1: AL	Qtrs
4-5, 20	1-2: EMMR	Hold
6-7		1-6: Qtrs, 7-20: Hold
8, 14-15		Hold
9		1-10: Eng, 11-20: Hold
10	1-3: Ant, 6-7: CH	1-3: LT, 4-8: Elec, 9-20: Hold
11		1-3: LT, 4-10: Eng, 11-20: Hold
12		1-6: MB, 7-20: Hold
13		1-6: MB, 7-20: Hold
16-17	1-2: EMMR	Eng
18-19		1-10: Eng, 11-20: Hold

Systems	
PP-19H	EMMR-(5h)
FPP-11H	MFD-(2h)
LS-15H	MD-1H
ELS-8H	SSR-(2h)
CG-1H	All Others-(1h)
LT-1H	
MB-1H	
EMM-1H	
AG-1H	

Petty-Class Subsidized Merchant





General Data

Displacement: 390/400 tons
Length: 44 meters
Price: MCr87.65
Configuration: Cylinder AF
Mass (Loaded/Empty): 3906.28/2371.59
Hull Armor: 10
Volume: 5460/5600 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 286 MW Fusion Power Plant (48 MW/hit), 1 year duration (0.04 MW excess power)
Jump Performance: 1(560 m³ fuel)
G-Rating: 1G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (82.4 using jump fuel), 25 m³ of fuel each
Maint: 180

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.06 MW), Active EMS 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 3 other workstations

Armament

4 turret hardpoint sockets fitted (Loc: 2-5; Arcs: 1,2,3)

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (3G; 27.3 MW)
Crew: 9 (2×Maneuver, 1×Electronics, 3×Engineering, 2×Steward [double as Small Craft Flight Crew], 1×Command).
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW ea.), 4×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.), 13×Low Berth (0.001 MW ea.)
Cargo: 1306.5 m³, four large cargo hatches
Small Craft and Launch Facilities: 10-ton Skiff in AF External Grapple
Air Locks: 4

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-3: Ant	1-6: Elec, 7-20: Qtrs
2-3	1: AL	1-3: TS, 4-17: Qtrs, 18-20: Hold
4-5	1-3: CH	1-3: TS, 4-16: Qtrs, 17-20: Hold
6-13, 16-17		Hold
14		1-9: Eng, 10-20: Hold
15		1-10: Eng, 11-20: Hold
18-19	1-4: CH	1-10: Eng, 11-20: Hold
20		Eng

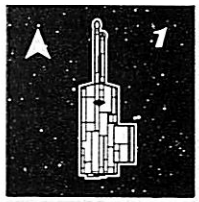
Systems	
JD-4H	MD-(4h)
PP-6H	SSR-(2h)
CG-1H	FPP-9H
AG-1H	ELS-1H
LSR-1H	All Others-(1h)
LS-2H	
Grapple-1H	

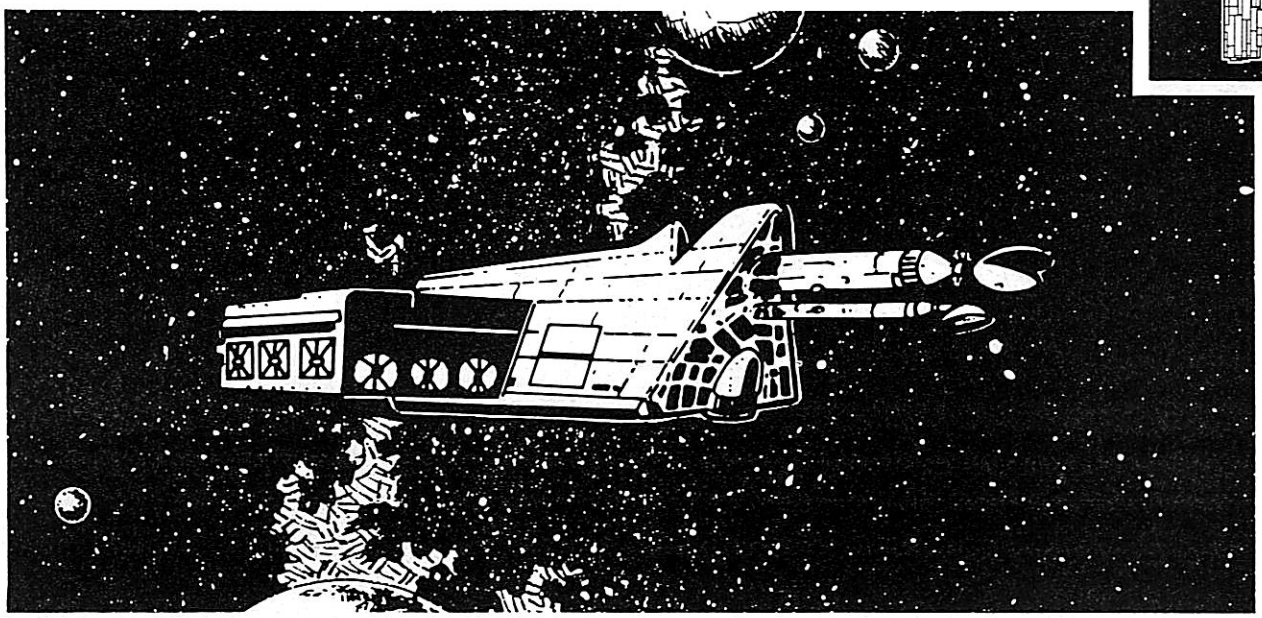
Notes

The ship itself displaces 390 tons; with its launch, it displaces 400. Jump, maneuver, and contra-grav drives are all configured to support the 400-ton figure.

Fuel purification machinery (6.18 MW), 12 hours to refine 2060 m³ (147.14 tons).

Donosev-Class Survey Ship





General Data

Displacement: 600 tons
Length: 44 meters
Price: MCr306.18
Configuration: Close Structure, USL
Mass (Loaded/Empty): 4076.99/2206.44
Hull Armor: 20
Volume: 8400 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 705 MW Fusion Power Plant (235 MW/hit), 1 year duration (0.0035 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 2G (300 MW/G), no contra-gravity
G-Turns: 104 (148.8 using jump fuel), 37.5 m³ of fuel each
Maint: 112

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×300,000km radio (10 hexes; 10 MW ea.), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: 1×Passive EMS folding array 240,000km (8 hexes; 0.3 MW), 1×Passive EMS folding array 180,000km (6 hexes; 0.2 MW), 2×Active EMS 300,000km (10 hexes; 15 MW ea.), TL-15 Densitometer 0.4 MW), TL-14 Neutrino Sensor (0.01 MW)
Controls: Bridge with 6×Bridge Workstation, plus 4×Crew Workstation

Armament

4 turret hardpoint sockets fitted.

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (6G; 42 MW)
Crew: 15 (2×Maneuver, 2×Electronics, 4×Engineering, 1×Command, 6×Surveyor Specialist)
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW), 7×Large Stateroom (double-occupancy; 0.001 MW ea.)
Cargo: 388 m³, one large cargo hatch
Small Craft and Launch Facilities: 50-ton modular cutter with internal hangar (1 each Fuel Scoop and Lab modules carried), 3×Air Raft with internal hangars, all four with launch ports
Air Locks: 6

Notes

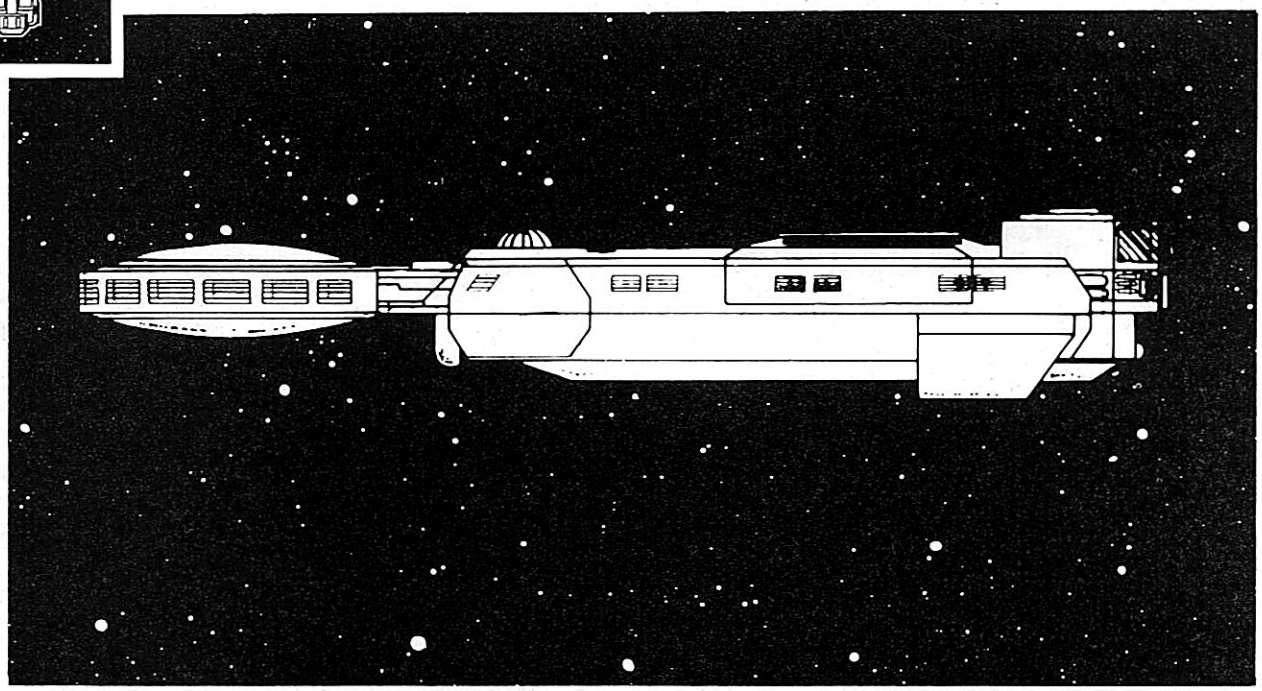
Fuel purification machinery (3.6 MW), 46.5 hours to refine 5580 m³ (398.6 tons)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	Ant	1-15: Elec, 16-20: Qtrs	JD-7H	Sickbay-1H
2	1-2: AL, 3-20: Ant	Qtrs	PP-3H	All Others-(1h)
3	Ant	1-10: Qtrs, 11-20: Hold	SSR-(2h)	
4-5, 7, 10-12	Ant	Hold	LS-3H	
6		Hold	240K PEMS Ant-2H	
8	1-7: LP, 8-10: CH	1-2: TS, 3-20: Hold	ELS-2H	
9	Ant	1-2: TS, 3-20: Hold	LSR-1H	
13-15		Hold	Hangar-4H	
16	1-10: Ant	1-2: TS, 3-20: Hold	FPP-3H	
17	1-10: Ant	1-2: TS, 3: Eng, 4-20: Hold	MD-1H	
18-19	1-9: LP	1-5: Eng, 6-20: Hold	AG-2H	
20		Eng	Lab-1H	

Bastien-Class Subsidized Liner





General Data

Displacement: 600 tons
Length: 69 meters
Price: MCr169.55
Configuration: Slab SL
Mass (Loaded/Empty): 4985.02/4154.33
Hull Armor: 10
Volume: 8400 m³
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 426 MW Fusion Power Plant (47 MW/hit), 1 year duration (0.307 MW excess power)
Jump Performance: 3 (1680 m³ fuel)
G-Rating: 1G (300 MW/G), Contra-Grav lifters (60 MW)
G-Turns: 76 (120.8 using jump fuel), 37.5 m³ of fuel each
Maint: 249

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.03 MW), Active EMS, 3000km (0 hexes; use long range for task difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstation, plus 4 other workstations

Armament

3 turret hardpoint sockets fitted (Loc: 11; Arcs: All; Loc: 12,13; Arcs: 2,3,4)

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 12 (2×Maneuver, 1×Electronics, 4×Engineering, 1×Maintenance, 2×Stewards [double as Small Craft Pilots], 1×Command, 1×Medical).
Crew Accommodations: 1×Small Stateroom (0.0005 MW ea.), 6×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 21×Small Stateroom (0.0005 MW ea.), 20×Low Berth (0.001 MW ea.)
Cargo: 429.6 m³, one large cargo hatch
Small Craft and Launch Facilities: 10-ton Skiff in Internal Hangar (Minimal), with one launch port
Air Locks: 6

DAMAGE TABLES

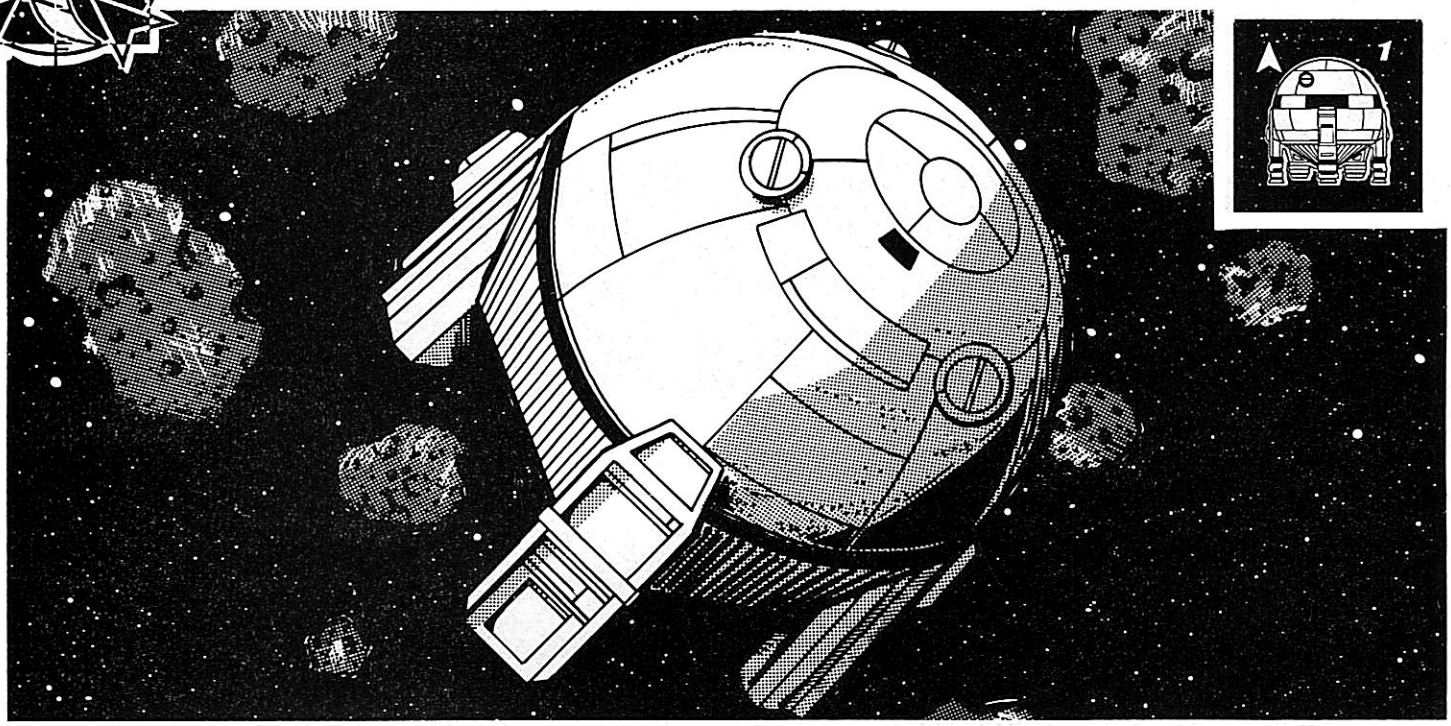
Area	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-4: Elec, 5-20: Qtrs	JD-10H
2-3		Qtrs	PP-9H
4	1-2: AL	1-12: Qtrs, 13-20: Hold	CG-1H
5, 8-9, 14-15		Hold	LSR-1H
6-7	1-3: LP	Hold	SSR-(2h)
10	LP	Hold	FPP-14H
11-13		1-2: TS, 3-20: Hold	LS-3H
16-17	1: CH	1-5: Eng, 6-20: Hold	AG-2H
18		1-19: Eng, 20: Hold	ELS-2H
19-20		Eng	MD-1H
			Hangar-3H
			All Others-(1h)

Notes

The *Bastien*-class liner is quite similar to the more well-known Stellar class, but keeps its launch in an internal hangar, rather than in an external grapple, and carries a different arrangement of turret hardpoints.

Fuel purification machinery (10.44 MW), 15.62 hours to refine 4530 m³ (323.6 tons)

Broadsword-Class Mercenary Cruiser



General Data

Displacement: 800 tons
Length: 28 meters
Price: MCr315.16
Configuration: Sphere SL
Mass (Loaded/Empty): 6404.67/3636.90
Hull Armor: 28
Volume: 11,200 m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 1050 MW Fusion Power Plant (262.5 MW/hit), 1 year duration (5.206 MW power shortfall)
Jump Performance: 3 (2240 m³ fuel)
G-Rating: 2 (400 MW/G), Contra-Grav lifters (80 MW)
G-Turns: 48 (92.8 using jump fuel), 50 m³ of fuel each
Maint: 177

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: 300,000km EMS jammer (10 hexes; 30 MW), EM Masking (11.2 MW)
Controls: Bridge with 15×Workstation, plus 7 other workstations

Armament

Offensive: 8×TL-15 150-Mj Laser Turret (Loc:2-5; Arcs: 1,2,3; Loc: 12-15; Arcs: 2,3,4,5; 4.2 MW ea.; 1 Crew ea.)
Master Fire Directors: 2 TL-15 (6 Diff Mod; No Msl; 10 hexes; 1.56 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (2.24 MW), Gravitic Compensators (6G; 56 MW)
Crew: 72 (7×Engineering, 1×Electronics, 2×Maneuver, 10×Gunnery, 2×Maintenance, 31×Ship's Troops, 6×Small Craft Flight Crew, 10×Command, 2×Steward, 1×Medical).
Crew Accommodations: 26×Small Stateroom (single/double-occupancy; 0.0005 MW ea.), 8×Large Stateroom (quadruple-occupancy; 0.001 MW ea.)
Cargo: 555 m³ (plus 812 m³ for cutter modules), 5 large cargo hatches
Small Craft and Launch Facilities: 2×50-ton modular cutters in docking rings (rings accommodate 50-ton streamlined needle hulls), each with its own launch port (each cutter with one fuel scoop module and one ATV module), 2×ATV (in modules), 1×Air Raft with internal hangar (Minimal) and launch port
Air Locks: 8

Notes

This *Broadsword* variant gives up G-hours and internal comfort for improved jump and maneuver performance, plus an ECM/ECCM suite. Because of its power shortfall, the ship's EMS jammer may only be run at the 180,000 km (6 hexes; 22 MW) power level while at full thrust or while the CG lifters are engaged.

The docking ring housings for the two cutters do not allow maintenance or repair work to be done on them while they are docked. The modules (carried as cargo, 406 m³ each) may not be swapped while the cutters are docked; this must be done outside of the ship.

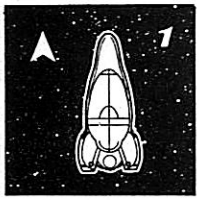
Fuel purification machinery (9.067 MW), 15.35 hours to refine 4640 m³ (331.4 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2		1-2: LT, 3-14: Qtrs, 15-20: Hold
3-5	1: AL	1-2: LT, 3-14: Qtrs, 15-20: Hold
6-9	1-5: EMMR	Hold
10-11		Hold
12		1-2: LT, 3-20: Hold
13	1-17: CH	1-2: LT, 3-20: Hold
14	1-3: LP	1-2: LT, 3-17: Hold, 18-20: Qtrs
15		1-2: LT, 3-17: Hold, 18-20: Eng
16-19	1-10: LP	1-6: Eng, 7-20: Hold
20		Eng

Systems	
JD-9H	MD-1H
PP-4H	FPP-8H
CG-2H	SSR-(2h)
ELS-2H	EMM-1H
LT-1H	EMMR-(11h)
LSR-1H	All Others-(1h)
LS-3H	
AG-3H	
MFD-(2h)	
Hangar-1H	

Eakhau-Class Aslan Trader



General Data

Displacement: 400 tons
Length: 55 meters
Price: MCr99.99
Configuration: Wedge SL
Mass (Loaded/Empty): 4525.05/2069.95
Hull Armor: 42
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 292.5 MW Fusion Power Plant (97.5 MW/hit), 1 year duration (0.4565 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1(200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 30 (63.6 using jump fuel), 25 m³ of fuel each
Maint: 167

Electronics

Computer: 3×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.02 MW), Active EMS 60,000km (2 hexes; 7 MW)
Controls: Flight deck with 4×workstations, plus 2 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea.), plus 2 turret sockets fitted (Loc: 18,19; Arcs: All)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 9: 2×Engineering, 1×Electronics, 2×Maneuvering, 2×Gunners, 1×Command, 1×Medical
Crew Accommodations: 1×Small Stateroom (single-occupancy; 0.0005 MW), 5×Small Stateroom, (double-occupancy; 0.0005 MW ea.), Shrine (0.001 MW), 2×Emergency Low Berth (0.002 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.)

Cargo: 2343.8 m³, with 7 large cargo hatches
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

Fuel scoop, purification machinery (3.975 MW), 12 hours to refine 1590 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1: Ant	1-6: Elec, 7-20: Hold	SSR-(2h)
2-5, 8-9, 16-17		Hold	LS-4H
6, 12-13		1-10 Qtrs, 11-20: Hold	ELS-2H
7	1: AL	1-10 Qtrs, 11-20: Hold	AG-1H
10	1: Ant	1-6: Elec, 7-12: Qtrs, 13-20: Hold	JD-4H
11	CH	1-18: Hold, 19-20: Qtrs	PP-3H
14-15		1-6 Qtrs, 7-20: Hold	MD-(4h)
16		1-18: Hold, 19-20: LT	CG-H
17		1-18: Hold, 19-20: LT	FPP-4H
18		1-10: Eng, 11-18: Hold, 19-20: TS	LT-1H
19		1-10: Eng, 11-18: Hold, 19-20: TS	All Others(1h)
20		Eng	

Khtukhao-Class Aslan Clan Transport



General Data

Displacement: 505/600 tons
Length: 24.05 meters
Price: MCr186.1
Configuration: Sphere SL
Mass (Loaded/Empty): 5301.87/3863.15
Hull Armor: 42
Volume: 7070/8400 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 759 MW Fusion Power Plant (95 MW/hit), 1 year duration
Jump Performance: 2 (1260 m³ fuel)
G-Rating: 2 (300 MW/G), Contra-Grav lifters (60 MW)
G-Turns: 48 (81.6 using jump fuel), 37.5 m³ of fuel each
Maint: 165

Electronics

Computer: 1×TL-14 Mod Fb Computer (1 MW), 2×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Bridge with 7×Bridge Workstation, plus 6 other workstations

Armament

Offensive: 6×TL-14 150-Mj Laser Turret (Loc: 2,5; Arcs: 1,2,3; 4.2 MW ea.; 1 Crew ea.; Loc: 10,11; Arcs: All; 4.2 MW ea.; 1 Crew ea.; Loc: 16,19; Arcs: 3,4,5; 4.2 MW ea.; 1 Crew ea.)
Master Fire Director: 1×TL-14 MFD (5 Diff Mods; No Msl; 10 hexes; 1.62 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (5G; 35.35 MW)
Crew: 26: 6×Engineering, 1×Electronics, 2×Maneuvering, 1×Maintenance, 7×Gunnery, 3×Flight Crew, 3×Command, 1×Stewards, 2×Medical
Crew Accommodations: 2×Small Stateroom (single-occupancy; 0.0005 MW ea.), 12×Small Stateroom, (double-occupancy; 0.0005 MW ea.), Shrine (0.001 MW)
Passenger Accommodations: 23×Small Stateroom (0.0005 MW ea.), 30×Low Berth (0.001 MW ea.)
Cargo: 271.4 m³, 2 large cargo hatches
Small Craft and Launch Facilities: 95-ton shuttle, external grapple (SL).
Air Locks: 6

Notes

Hull is 505 tons, plus shuttle in external grapple equals 600 tons.
Fuel purification machinery (7.65 MW), 12 hours to refine 3060 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-7: Ant	1-5: Elec, 6-10: Eng, 11-20: Hold	LT-1H
2	1-3: AL	1-2: LT, 3-20: Qtrs	MFD-(4h)
3	1-2: Shuttle	Qtrs	Grapple-4H
4	Shuttle	Qtrs	LS-3H
5	1-18: Shuttle	1-2: LT, 3-17 Qtrs, 18-20: Hold	ELS-2H
6		Hold	AG-2H
7	1-9: LCH	Hold	SSR-(2h)
8	Shuttle	Hold	JD-7H
9	Shuttle	1-4: Elec, 5-9: Eng, 10-20: Hold	PP-8H
10	1-2: Ant	1-2: LT, 3-5: Elec, 6-18: Qtr, 19-20: Hold	MD-1H
11		1-2: LT, 3-20: Hold	CG-1H
12-13		1-5: Qtrs, 6-20: Hold	FPP-8H
14-15	Shuttle	Hold	All Others-(1h)
16		1-2: LT, 3-14: Eng, 15-20: Hold	
17	1-2: Shuttle	1-10: Hold, 11-20: Eng	
18	Shuttle	1-10: Hold, 11-20: Eng	
19	1-18 Shuttle	1-2: LT, 3-18: Hold, 19-20: Eng	
20		Eng	

Vargr Trader



General Data

Displacement: 200 tons
Length: 51 meters
Price: MCr55.35
Configuration: Needle SL
Mass (Loaded/Empty): 2088.2/1082.3
Hull Armor: 10
Volume: 2800 m³
Target Size: S
Tech Level: 13

Engineering Data

Power Plant: 150 MW Fusion Power Plant (75 MW/hit), 1 year duration (1.604 MW excess power)
Jump Performance: 2 (420 m³)
G-Rating: 1 (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (81.6 using jump fuel), 12.5 m³ of fuel each
Maint: 81

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-3: Ant	1-5: Elec, 6-7: Qtrs, 8-20 Hold	SSR-(2h)
2	1: Ant	1-5: Elec, 6-20: Hold	LS-2H
3	1: AL, 2: Ant	1-5: Qtrs, 6-20: Hold	ELS-1H
4-5, 8		Hold	AG-1H
6	1: AL, 2-5: CH	1-10: Qtr, 11-20: Hold	JD-3H
7	CH	1-15: Qtrs, 16-20: Hold	PP-2H
9		1-5: Eng, 6-20: Hold	MD-(2h)
10-11		1-9 Hold, 10-14: Qtrs, 15-20: TS	CG-1H
12-13, 16-17		Hold	FPP-4H
14-15		1-15: Eng, 16-20: Hold	All Others-(1h)
18-20		Eng	

Electronics

Computer: 3×TL-13 Mod St Computers (0.45 MW for one)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex; 0.03 MW), Active EMS 3,000km (0 hexes, use long range for difficulty in same hex; 8 MW)
Controls: Flight deck with 4×workstations, plus 1 other workstation

Armament

2 turret sockets fitted (Locs: 10,11; Arcs: All)

Accommodations

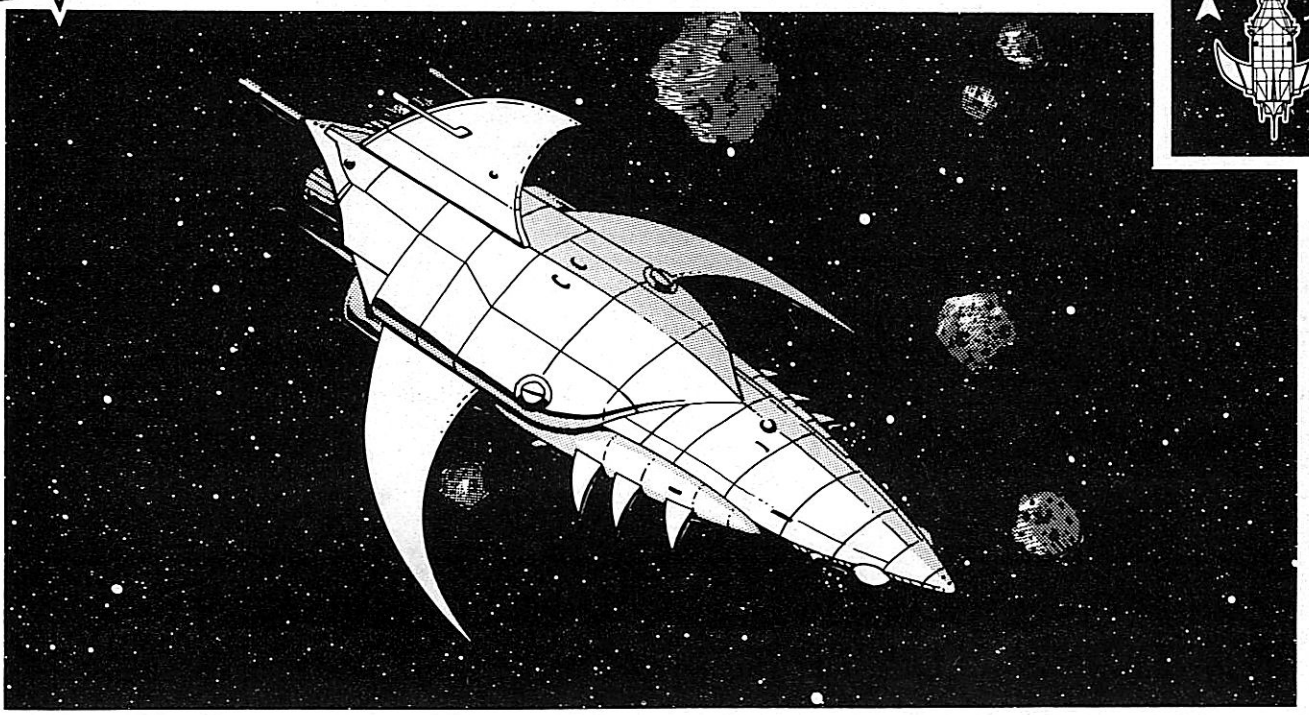
Life Support: Extended (0.56 MW), Gravitic Compensators (4G; 14 MW)
Crew: 5: 1×Engineering, 1×Electronics, 2×Maneuvering, 1×Command.
Crew Accommodations: 1×Small Stateroom (single-occupancy; 0.0005 MW ea.), 2×Small Stateroom, (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: 5×Small Stateroom (0.0005 MW ea.)
Cargo: 934.5 m³, with 3 large cargo hatches
Small Craft and Launch Facilities: None
Air Locks: 2

Notes

Fuel scoop and purification machinery (2.55 MW), 12 hours to refine 1020 m³.

Ship is built with a lower tech crystaliron hull.

Ueknou-Class Vargr Corsair



General Data

Displacement: 400 tons
Length: 55 meters
Price: MCr197.47
Configuration: Wedge SL
Mass (Loaded/Empty): 3980.65/3681.43
Hull Armor: 34
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 746.4 MW Fusion Power Plant (93.3 MW/hit), 1 year duration (0.2245 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 3 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 79.5 (113.1 using jump fuel), 25 m³ of fuel each
Maint: 149

Electronics

Computer: 3×TL-14 Mod Fb Computer (1 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW), 240,000km EMS jammer (8 hexes; 26 MW)
Controls: Bridge with 9×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150-Mj Laser Turret (Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea.), 2×Missile Turrets (Loc: 6,7: 2 ready Msls ea.; 0.15 MW ea.; 1 Crew ea.), total 4 ready Msls plus 4 in cargo
Master Fire Directors: 1×TL-14 MFD (5 Diff Mod; Msl 10 hexes; 10 hexes; 1.77 MW;1 Crew), plus 1×TL-14 MFD (5 Diff Mod; No Msl; 2 hexes;0.71 MW;1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 22: 7×Engineering, 2×Electronics, 2×Maneuvering, 6×Gunnery, 1×Maintenance, 3×Command, 1×Steward.
Crew Accommodations: 3×Small Stateroom (single-occupancy; 0.0005 MW ea.), 17×Small Stateroom, (double-occupancy 0.0005 MW ea.), including allowance for up to 15 ships troops not included in crew total.
Passenger Accommodations: None
Cargo: 101.3 m³, plus 4 missiles, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

Fuel scoop and purification machinery (14.1375 MW), 6 hours to refine 2827.5 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-6: Ant	1-10: Elec, 11-20: Qtrs	MFD-(3h)
2		1-10: Elec, 11-17: Hold, 18-20: LT	EMM-1H
3		1-10: Qtrs, 11-17: Hold, 18-20: LT	SSR-(2h)
4		1-15: Qtrs, 16-20: Hold	LS-4H
5	1: AL	1-10: Qtrs, 11-20: Hold	AG-1H
6		1-5: Qtrs,6-17: Hold, 18-20: MT	JD-5H
7		1-17: Hold, 18-20: MT	PP-8H
8-10		Hold	MD-1H
11		1-6: Elec, 7-9: Eng, 10-20: Hold	CG-1H
12	1-4: CH	Hold	FPP-14H
13-15	1-3: EMM rad	Hold	LT-1H
16-18, 20		Eng	MT-1H
19		1-10: Eng, 11-20: Hold	EMMR-(5h)
			ELS-2H
			All Others-(1h)

Fiery-Class Close Escort



General Data

Displacement: 380/400 tons
Length: 54 meters
Price: MCr239.29
Configuration: Wedge AF
Mass (Loaded/Empty): 4562.87/4102.28
Hull Armor: 56
Volume: 5320/5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 945 MW Fusion Power Plant (94.5 MW/hit), 1 year duration (0.1345 MW excess power)
Jump Performance: 4 (1400 m³ fuel)
G-Rating: 4 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 56 (112 using jump fuel), 25 m³ of fuel each
Maint: 143

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-8+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: 120,000km EMS jammer (4 hexes; 18 MW), EM Masking (5.32 MW)
Controls: 7×Bridge Workstation, plus 7 other workstations

Armament

Offensive: 2×TL-14 150Mj Laser Turret (Loc: 12,13; Arcs: 1,2,3; 4.2 MW ea.; 1 Crew ea.), 1×TL-14 300 Mj Laser Barbette (Loc: 10; Arcs:1,2,3; 8.3 MW; 1 Crew), 1×Missile Turret (Loc: 1; 2 ready Msls; 0.15 MW; 1 Crew) with 2 ready Msls and 4 in cargo
Master Fire Director: 1×TL-14 MFD (5 Diff Mod; Msl 10 hexes; 10 hexes; 1.77 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
TL-14 300-Mj Las Brb	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (1.064 MW), Gravitic Compensators (5G; 26.6 MW)
Crew: 22: 7×Engineering, 1×Electronics, 2×Maneuver, 5×Gunner, 3×Gig Crew, 1×Maintenance, 3×Command
Crew Accommodations: 4×Small Stateroom (single-occupied; 0.0005 MW ea.), 9×Small Stateroom, (double-occupied; 0.0005 MW ea.), 1×Emergency Low Berth (0.002 MW)
Passenger Accommodations: None
Cargo: 26.8 m³, plus four missiles, plus one large cargo hatch
Small Craft and Launch Facilities: External grapple (SL) for 20-ton Military Gig
Air Locks: 4

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-7: Ant	1-3: MT, 4-10: Elec, 11-20: Hold
2-3	1-7: Ant	1-5: Qtrs, 6-10: Elec, 11-20: Hold
4-5		Hold
8-9	1-4: EMMR	Hold
6	1: AL	1-5: Qtrs, 6-10: Elec, 11-20: Hold
7		1-8: Qtrs, 9-11: Elec, 12-20: Hold
10		1-7: LB, 8-20 Hold
11		1-10: Hold, 11-20 Qtr
12		1-3: LT, 4-8: Qtrs, 9-20: Hold
13		1-3: LT, 4-8: Qtrs, 9-18: Hold, 19-20: Eng
14-15		1-15: Eng, 16-20: Hold
16, 18-20		1-10: Hold, 11-20: Eng
17	1-3: CH	1-10: Hold, 11-20: Eng

Systems

MT-1H, EMM-1H, LB-2H, MFD-(4h), LT-1H, Grapple-2H, SSR-(2h), LS-7H, ELS-4H, AG-1H, JD-7H, FPP-6H, PP-10H, MD-1H, CG-1H, EMMR-(5h), All Others-(1h)

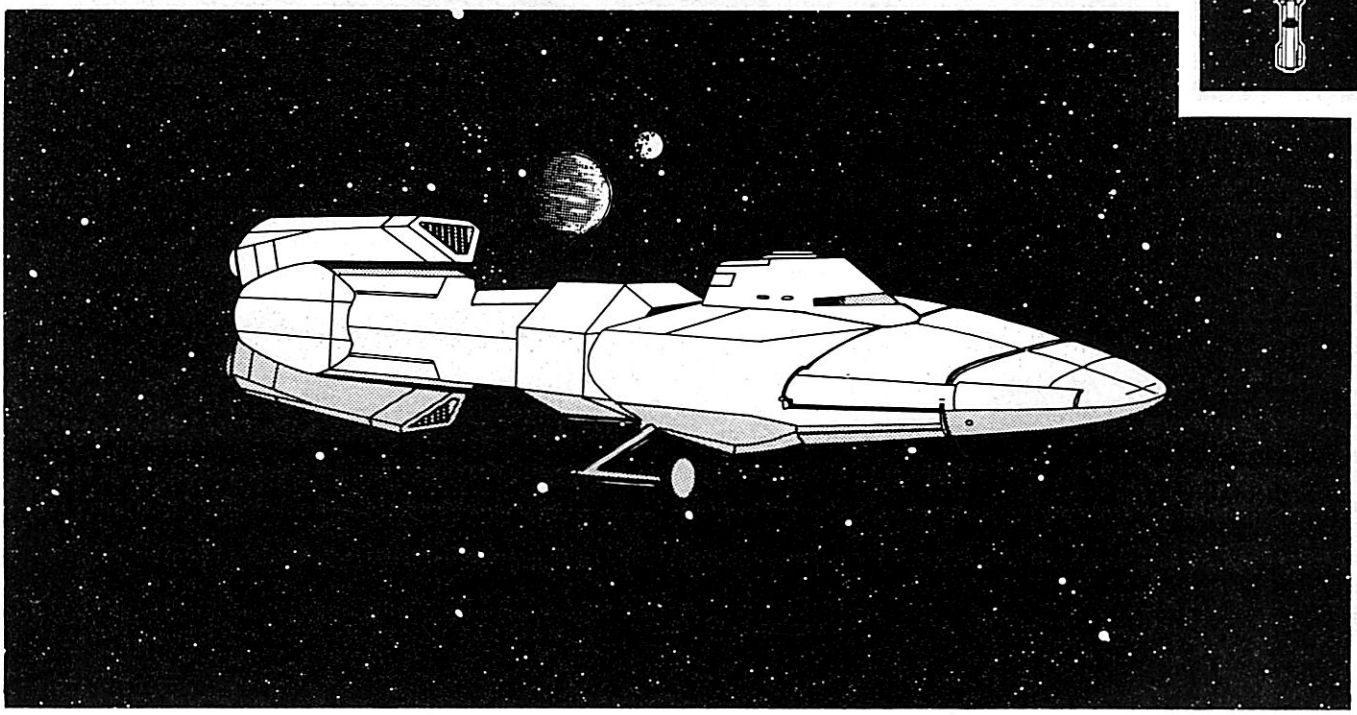
Notes

Steamlined variant of the *Gazelle*-class ship's hull is 380 tons, 400 tons with small craft attached. All drives, etc., are scaled for operations at 400 tons.

Fuel scoops, purification machinery (6 MW), 14 hours to refine 2800 m³.

Valor-Class Missile Corvette





General Data

Displacement: 400 tons
Length: 44 meters
Price: MCr267.45
Configuration: Cylinder SL
Mass (Loaded/Empty): 3363.86/3026.86
Hull Armor: 64
Volume: 5600m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 1324 MW Fusion Power Plant (265 MW/hit), 1 year duration (0.115 MW excess power)
Jump Performance: 4 (1400 m³ fuel)
G-Rating: 6 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 52.8 (108.8 using jump fuel), 25 m³ of fuel each
Maint: 116

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 2×300,000km Laser (10 hexes; 0.15 MW), 1000 AU Maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 180,000km Passive EMS folding array (6 hexes; 0.2 MW), 300,000km Active EMS (with Direction Finder capability, 10 hexes; 15 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: EM Masking Package (5.6 MW)
Controls: Bridge with 11×Bridge Workstation, plus 9 other workstations

Armament

Offensive: 4×Missile Barbette (Loc: 6,7,8,9; 5 ready msls ea.; 0.15 MW ea.; 1 Crew ea.) with a total of 20 ready msls plus 20 in cargo
Master Fire Directors: 4×TL-15 MFDs (6 Diff Mods; 10 hexes Msl; 10 hexes; 2.25 MW ea.; 1 Crew ea.)

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (6G; 28 MW)
Crew: 24: 8×Engineering, 2×Electronics, 2×Maneuvering, 8×Gunnery, 3×Command, 1×Medical
Crew Accommodations: 4×Small Stateroom (single-occupancy; 0.0005 MW ea.), 10×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Cargo: 5.9 m³, plus 20 missiles, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

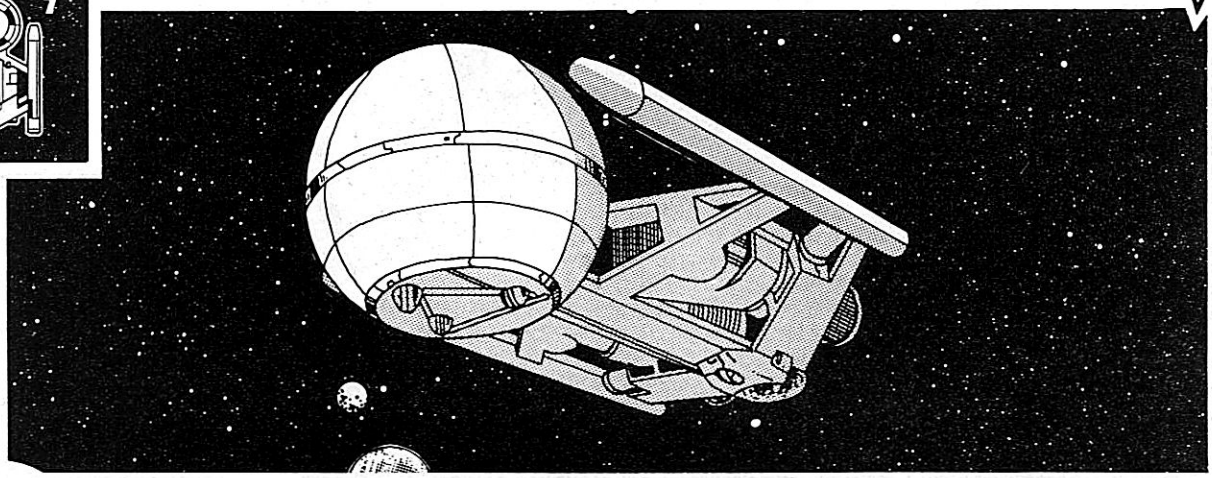
Fuel scoop, purification machinery (7.25 MW), 11.26 hours to refine 2720 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-8: Ant	1-18: Elec, 19-20: Hold	LS-5H
2-3	Ant	1-6: Elec, 7-20: Hold	ELS-3H
4-5	1: AL, 2-8: EMMR	1-11: Qtrs, 12-20: Hold	AG-1H
6-9		1-6 MB, 7-20: Hold	JD-6H
10		1-11: Qtrs, 12-20: Hold	PP-5H
11		1-10: Qtrs, 11-20: Hold	MD-1H
12-15		Hold	CG-1H
16	1-5: CH	Hold	FPP-6H
17-18		1-17: Eng, 18-20: Hold	MB-1H
19-20		Eng	MFD-(2h)
			SSR-(2h)
			EMM-1H
			EMMR-(5h)
			All Others(1h)

Chrysanthemum-Class Destroyer Escort





General Data

Displacement: 950/1000 tons
Length: 51.6 meters
Price: MCr686.52
Configuration: Close USL
Mass (Loaded/Empty): 8341.6/7063.5
Hull Armor: 62
Volume: 13,300 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 3264 MW Fusion Power Plant (297 MW/hit), 1 year duration (2.6105 MW excess power)
Jump Performance: 4 (3500 m³ fuel)
G-Rating: 6 (500 MW/G), no contra-grav
G-Turns: 54 (110 using jump fuel), 62.5 m³ of fuel each
Maint: 265

Electronics

Computer: 3×TL-15 Mod Fib Computers (1.1 MW ea.)
Commo: 2×1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 240,000km folding array (8 hexes; 0.3 MW), Active EMS 480,000km (DF capable; 16 hexes; 25 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: 480,000km EMS jammer (16 hexes; 50 MW), EM Masking (13.3 MW)
Controls: Bridge with 15×Bridge Workstation, plus 21 other workstations

Armament

Offensive: 2×TL-15 1000-Mj Particle Accelerator (Loc: 6-12, 7-13; Arcs: 1; 27.8 MW ea.; 1 Crew ea.), 2×TL-15 150-Mj Laser Turret (Loc: 11—Arcs: 2,3,4; Loc: 20—Arcs: 4,5; 4.2 ME ea.; 1 Crew ea.), 3×Missile Turret (Loc: 4,5,20; 2 Ready Msls ea.; 0.15 MW; 1 Crew ea.), total 6 Ready Msls plus 30 in cargo
Defensive: 3×Sandcaster Turret (Loc: 4,5—Arcs: 1,2,3;Loc: 20—Arcs: 4,5;TL-15; 2D10×5 Reduc/Hit; 50 Cann ea.; 1 MW ea.; 1 Crew ea.), TL-15 Meson Screen Generator (PV=253; 20 MW; 1 Crew)
Master Fire Director: 2×TL-15 Beam MFD (6 Diff Mod; No Msl; 10 hexes; 1.56 MW ea.; 1 Crew ea.), and 2×TL-15 Beam/Msl MFD (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Trt	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31
1000-Mj Part Accel	10:158	20:158	40:98	80:50

Accommodations

Life Support: Extended (2.66 MW), Gravitic Compensators (6G; 66.5 MW)
Crew: 54: 21×Engineering, 2×Electronics, 2×Maneuvering, 15×Gunnery, 2×Maintenance, 3×Flight Crew, 7×Command, 2×Steward
Crew Accommodations: 8×Small Stateroom (single-occupancy; 0.0005 MW ea.), 23×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW)
Cargo: 69.4 m³, plus 30 missiles, one large cargo hatch
Small Craft and Launch Facilities: External Grapple (USL) for 50-ton Cutter
Air Locks: 10

Notes

No fuel purification machinery, 6875 m³ fuel.

Because it is intended to serve as a Fleet unit, the *Chrysanthemum* is dependent on tankers for refueling.

Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

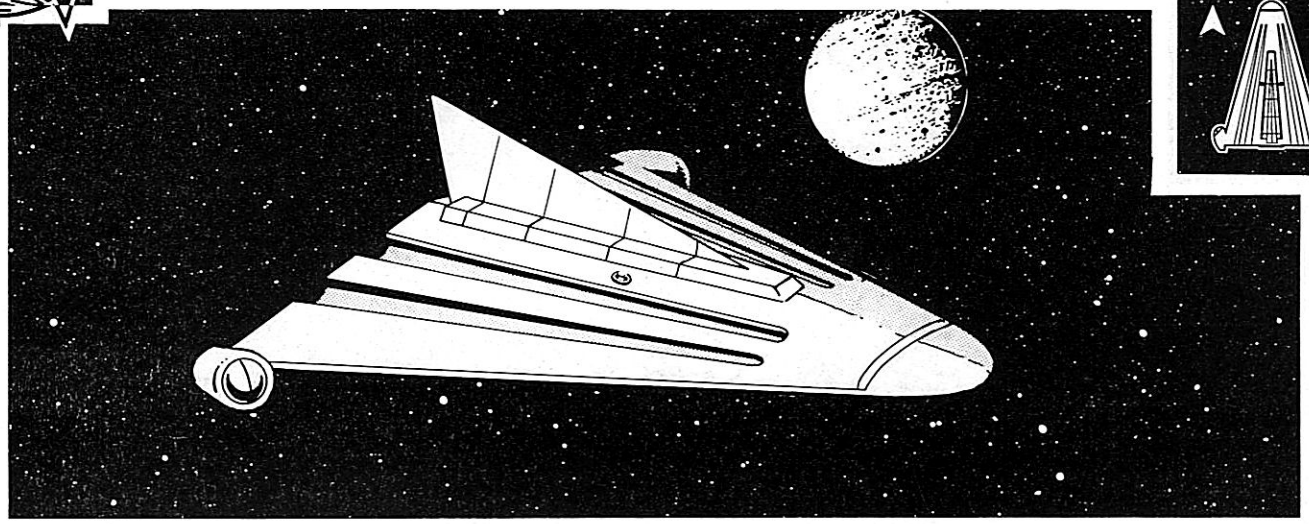
When the cutter is detached, "cutter" surface hits are taken against the grapple.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	Ant	1-5: Elec, 6-9: Eng, 10-20: Hold
3	Ant	1-5: Elec, 6-20: Hold
4-5	1-18: Ant	1: Sand, 2: MT, 3-5: Elec, 6-17: Qtrs, 18-20: Hold
6-7	1-6: EMMR	1-7 PA, 8-20: Hold
8	1: Ant, 2-3: AL, 4-20 Cutter	1-5: Qtrs, 6-20: Hold
9	Ant	1-5: Qtrs, 6-20: Hold
10	Ant	Hold
11	1-19: Cutter	1: LT, 2-20: Hold
12	1-2: EMMR	1-7: PA, 8-20: Hold
13		1-7: PA, 8-20: Hold
14	1-8: Cutter	1-10: Eng, 11-20: Hold
15	1-9: Cutter, 10-11: LCH	1-10: Eng, 11-20: Hold
16-17		1-4: Qtrs, 5-20: Hold
18	Ant	1-5: Eng, 6-20: Hold
19		1-5: Eng, 6-20: Hold
20		1: Sand, 2: MT, 3: LT, 4-13: Eng, 14-20: Hold

Systems	
AEMS-(2h)	PA-5H
EMS Jammer-(2h)	LT-1H
EMM-2H	PEMS Ant-2H
MS-3H	Sand-1H
Grapple-4H	All Others-(1h)
Elec. Shop-1H	
Machine Shop-1H	
SSR-(2h)	
LS-10H	
ELS-5H	
AG-3H	
JD-14H	
PP-11H	
MD-3H	
EMMR-(13h)	
MFD (2h)	
MT-1H	

Kinunir-Class Colonial Cruiser



General Data

Displacement: 1250 tons
Length: 78.75 meters
Price: MCr494.1
Configuration: Wedge SL
Mass (Loaded/Empty): 11,813.50/10,076.64
Hull Armor: 42
Volume: 17,500 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 2856 MW Fusion Power Plant (285.6 MW/hit), 1 year duration (4.797 MW excess power)
Jump Performance: 4 (4375 m³ fuel)
G-Rating: 4 (625 MW/G), Contra-Grav lifters (125 MW)
G-Turns: 44 (100 using jump fuel), 78.125 m³ of fuel each
Maint: 414

Electronics

Computer: 3×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×300,000km radio (ony one powered; 10 hexes; 10 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 180,000km folding array (6 hexes; 0.2 MW), Active EMS 300,000km (DF capable;10 hexes; 15 MW)
ECM/ECCM: None
Controls: Bridge with 13×Bridge Workstation, plus 19 other workstations

Armament

Offensive: 2×TL-15 700-Mj Laser Barbette (Loc: 16,17; Arcs: All; 19.5 MW ea.; 1 Crew ea.), 2×TL-15 Missile Turret (Loc: 4,5; 2 ready msls ea.; 0.15 MW ea.; 1 Crew ea.) total of 4 ready msls plus 38 in cargo, 4×TL-15 150-Mj Laser Turret (Loc: 10,11—Arcs: 1,2,3;Loc: 18,19—Arcs: All; 4.2 MW ea.; 1 Crew ea.)
Master Fire Directors: 2×TL-15 Beam/Missile MFD (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.), and 2× TL-15 Beam MFD (6 Diff Mod; No Msl; 10 hexes; 1.56 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31
700-Mj Laser Barbette	10:1/21-66	20:1/21-66	40:1/21-66	80:1/21-66

Accommodations

Life Support: Extended (3.5 MW), Gravitic Compensators (6G; 87.5 MW)
Crew: 90: 19×Engineering, 1×Electronics, 2×Maneuvering, 12×Gunnery, 2×Maintenance, 35×Ship's Troops, 3×Flight Crew, 12×Command, 2×Steward, 2×Medical
Crew Accommodations: 26×Small Stateroom (single-occupancy; 0.0005 MW ea.), 14×Small Stateroom (double-occupancy; 0.0005 MW ea.), 9×Large Stateroom (ship's troops, quadruple-occupancy; 0.001 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW), Sickbay (0.8 MW), 4 Emergency low berths (0.008 MW ea.)
Cargo: 702.5 m³, plus 38 missiles, 4 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Minimal) for 30-ton Ship's Boat and launch port, Internal Hangar (Minimal) for ATV, & air raft with launch port
Air Locks: 13

Notes

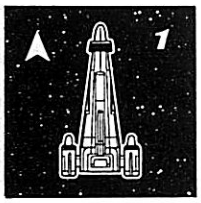
Fuel scoop and purification machinery (39.063 MW), 6 hours to refine 7812.5 m³.

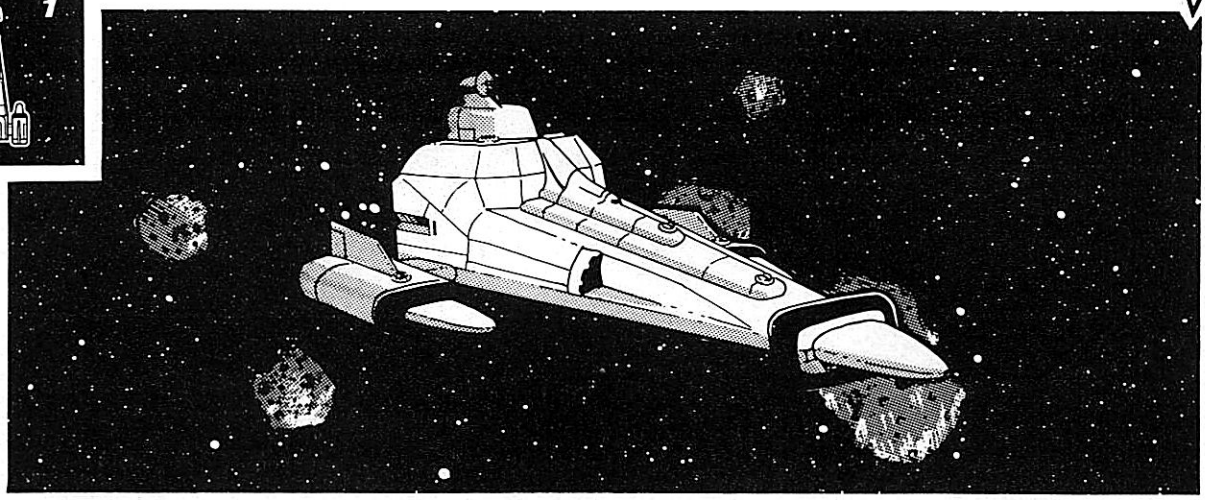
Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-5: Ant	1-5: Elec, 6-20: Hold	LT-1H
2	1-5: Ant, 3: AL	1-2: Elec, 3-7: Eng, 8-12: Qtrs, 13-20: Hold	MFD-(2h)
3	1-5: LP, 6-9: LCH	Hold	Elec. Shop-1H
4-5		1: MT, 2-6: Qtrs, 7-20: Hold	Mach. Shop-1H
6-7		1-10: Qtrs, 11-20: Hold	SSR-(2h)
8		1-5: Qtrs, 6-20: Hold	LSR-1H
9		Hold	LS-11H
10	1-3: Ant	1: LT, 2-4: Elec, 5-20: Hold	ELS-6H
11		1: LT, 2-6: Eng, 7-11: Qtrs, 12-20: Hold	AG-4H
12-13		1-5: Qtrs, 6-20: Hold	JD-18H
14		1-9: Eng, 10-11: Elec, 12-20: Hold	PP-10H
15		1-5: Eng, 6-20: Hold	MD-3H
16-17		1-4: LB, 5-14: Eng, 15-20: Hold	CG-3H
18-19		1: LT, 2-11: Eng, 12-20: Hold	FPP-32H
20		Eng	LB-3H
			MT-1H
			Hangar-11H
			Sickbay-1H
			All Others-(1h)

Midu Agashaam-Class Destroyer





General Data

Displacement: 3000 tons
Length: 105 meters
Price: MCr1549.59
Configuration: Wedge SL
Mass (Loaded/Empty): 28,767.43/25,583.88
Hull Armor: 62
Volume: 42,000 m³
Target Size: M
Tech Level: 15

Engineering Data

Power Plant: 9894 MW Fusion Power Plant (300 MW/hit), 1 year duration (0.7485 MW excess power)
Jump Performance: 4 (10,500 m³ fuel)
G-Rating: 6 (1500 MW/G), Contra-Grav lifters (300 MW)
G-Turns: 51.6 (107.6 using jump fuel), 187.5 m³ of fuel each
Maint: 1020

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 1000 AU radio (∞; 20 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 240,000km folding array (8 hexes; 0.3 MW ea.), Active EMS 480,000km (DF capable; 16 hexes; 25 MW), 4×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: 480,000km EMS jammer (16 hexes; 50 MW), EM Masking (42 MW)
Controls: Bridge with 26×Bridge Workstation, plus 65 other workstations

Armament

Offensive: TL-15 2000-Mj Particle Accelerator (Loc: Spinal; Arcs: 1; 55.6 MW; 1 Crew), 8×TL-15 150 Mj Laser Turret (Loc: 1,3,4,10,11,13,14—Arcs: 1,2,3; Loc: 20—Arcs: 4,5; 4.2 MW ea.; 1 Crew ea.), 6×Missile Turret (Loc: 1,3,4,13,14,20; 2 ready missiles ea.; 0.15 MW ea.; 1 Crew ea.) total of 12 ready missiles plus 36 in cargo
Defensive: 20MW TL-15 Meson Screen Generator (PV=253; 20 MW; 1 Crew), 6×Sandcaster Turret (Loc: 1,3,4,13,14—Arcs: 1,2,3; Loc: 20—Arcs: 5,6; TL-15; 2D10×5 per hit; 50 Cann; 1 MW ea. 1 Crew ea.)
Master Fire Directors: 2×TL-15 Missile/Beam MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.), and 3×TL-15 Beam MFD (6 Diff Mods; No Msl 10 hexes; 1.56 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10: 1/10-31	20: 1/10-31	40: 1/10-31	80: 1/10-31
2000-Mj Part Accel	10: 224	20: 224	40: 224	80: 196

Accommodations

Life Support: Extended (8.4 MW), Gravitic Compensators (6G; 210 MW)
Crew: 129: 65×Engineering, 2×Electronics, 2×Maneuvering, 27×Gunnery, 5×Maintenance, 6×Flight Crew, 17×Command, 3×Stewards, 2×Medical
Crew Accommodations: 17×Small Stateroom (single-occupancy; 0.0005 MW ea.), 56×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW), Sickbay (0.8 MW)
Cargo: 316.4 m³, plus 36 missiles, 2 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Minimal) for 2×50-ton Cutter, two launch ports
Air Locks: 30

Notes

Fuel purification machinery (100.875 MW), 6 hours to refine 20,175 m³.

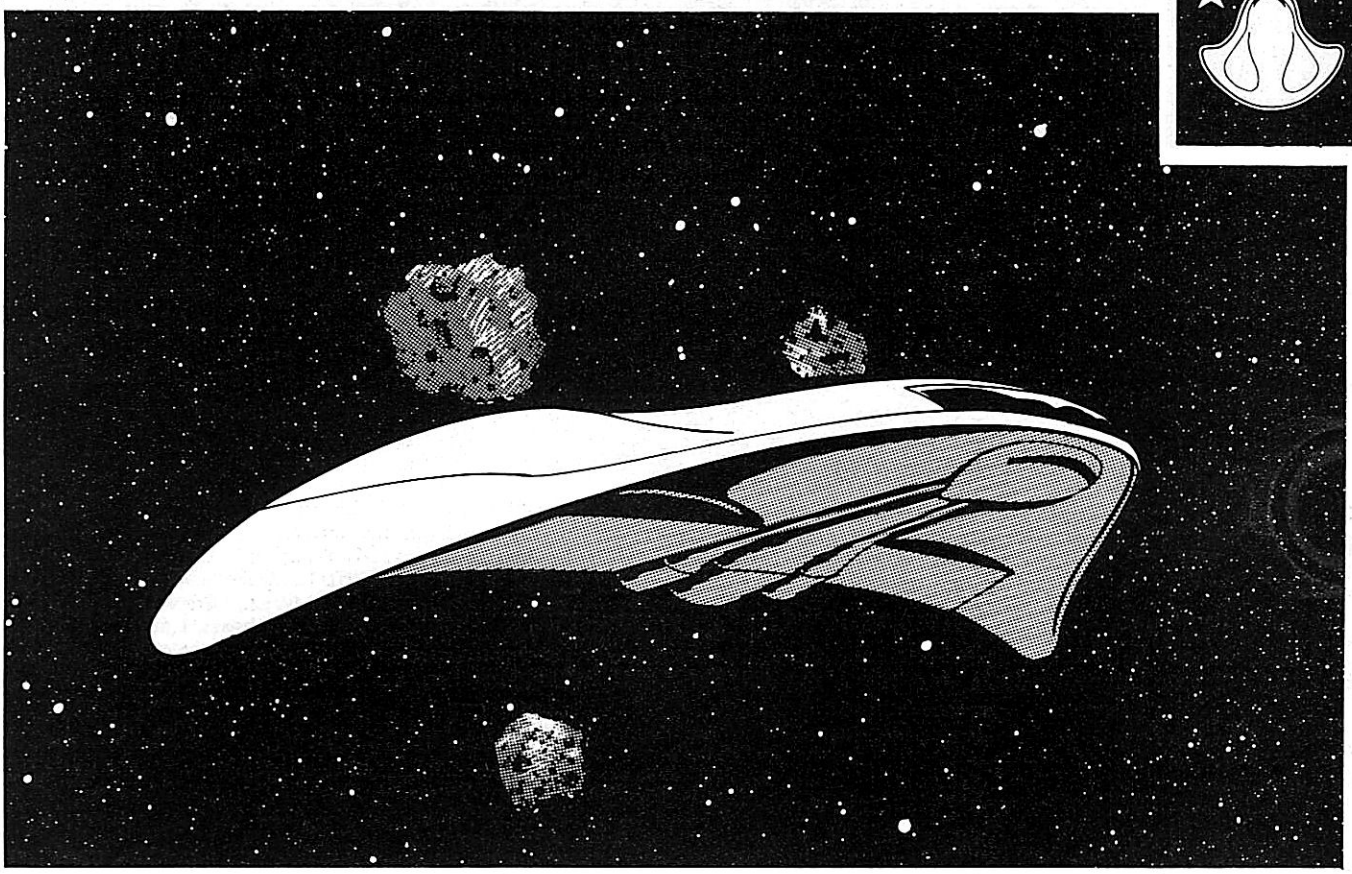
Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-10: Elec, 11-13: Eng, 14-20: Hold
2	Ant	Hold
3		1: Sand, 2: MT, 3: LT, 4-20: Hold
4		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-20: Hold
5		1-2: PA, 3-20: Hold
6-7	Ant	1-5: Elec, 6-10: Qtrs, 11-20: Hold
8	1: AL, 2-11: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
9	1-10: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
10	1-10: Ant	1: LT, 2-6: Elec, 7-11: Eng, 12-16: Qtrs, 17-20: Hold
11		1: LT, 2-6: Eng, 7-11: Qtrs, 12-20: Hold
12	1: AL	1-5: Eng, 6-20: Hold
13	1: AL	1: Sand, 2: MT, 3: LT, 4-20: Hold
14		1: Sand, 2: MT, 3: LT, 4-20: Hold
15	1-12: LPs, 13-14: LCH,	1-15: Eng, 16-20: Hold
16-19		1-10: Eng, 11-20: Hold
20		1: Sand, 2: MT, 3: LT, 4-20: Eng

Systems	
AEMS-(2h)	PP-33H
MD-9H	MFD-(2h)
PEMS Ant-2H	CG-6H
Jammer-(2h)	FPP-81H
PA-11H	Hangar-28H
LT-1H	Sickbay-1H
MT-1H	MS-3H
EMM-4H	All Others-(1h)
Sand-1H	
Elec. Shop-1H	
Mach. Shop-1H	
SSR-(2h)	
LS-23H	
ELS-12H	
AG-9H	
EMMR-(42h)	
JD-42H	

Zhodani *Ninz*-Class Scout



General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr58.41
Configuration: Wedge AF
Mass (Loaded/Empty): 1100.25/957.05
Hull Armor: 56
Volume: 1400 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 153 MW Fusion Power Plant (76.5 MW/hit), 1 year duration (1.2645 MW excess power)
Jump Performance: 2 (210 m³ of fuel)
G-Rating: 2 (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 56 (89.6 using jump fuel), 6.25 m³ of fuel each
Maint: 31

Electronics

Computer: 3×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (1.4 MW)
Controls: Bridge with 4×Bridge Workstation, plus 1 other workstation

Armament

Offensive: 1×TL-14 150-Mj Laser Turret (Loc: 10; Arcs: 1,2,3; 4.2 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (0.28 MW), Gravitic Compensators (5G; 7 MW)
Crew: 5: 1×Engineering, 1×Electronics, 2×Maneuvering, 1×Gunnery
Crew Accommodations: 1×Small Stateroom (single-occupancy, 0.0005 MW ea.) 2×Small Stateroom, (double-occupancy, 0.0005 MW ea.)
Passenger Accommodations: 6×Small Stateroom (0.0005 MW ea.)
Cargo: 94.6 m³, one small cargo hatch
Small Craft and Launch Facilities: Air raft in internal bay (Minimal), one launch port
Air Locks: 1

Notes

Fuel scoop and purification machinery (1.4 MW), 12 hours to refine 560 m³. Bridge has one excess workstation, for use by observer or psionic adept.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2-5		1-10: Hold, 11-20: Qtrs
6-7	Ant	1-5: Elec, 6-10: Hold, 11-20: Qtrs
8		1-10: Qtrs, 11-20: Hold
9		1-17: Qtrs, 18-20: Hold
10	1: AL, 2-5: Ant	1-12: LT, 13-18: Elec, 19-20: Hold
11	1-6: EMMR	Hold
12-16		Hold
17	1-5: CH	Hold
18		1-18 Eng, 19-20: Hold
19-20		Eng

Systems

SSR-(2h)	FPP-2H
LS-3H	LT-1H
ELS-2H	MD-(2h)
AG-1H	EMM-(3h)
JD-1H	Hangar-1H
PP-2H	All Others-(1h)
CG-(4h)	

Zhodani *Chatl*-Class Leader Scout



General Data

Displacement: 150 tons
Length: 46.5 meters
Price: MCr100.073
Configuration: Needle SL
Hull Armor: 31
Volume: 2100 m³
Target Size: S
Tech Level: 14
Mass (Loaded/Empty): 1210.62/1044.02

Engineering Data

Power Plant: 324 MW Fusion Power Plant (102.6 MW/hit), 1 year duration (2.0715 MW excess power)
Jump Performance: 5 (630 m³ fuel)
G-Rating: 3 (75 MW/G), Contra-Grav lifters (15 MW)
G-Turns: 48 (115.2 using jump fuel), 9.375 m³ of fuel each
Maint: 44

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
Controls: Flight deck with 5×workstations, plus 3 other workstations

Armament

Offensive: 1×TL-14 150 Mj Laser Turret (Loc: 10; Arcs: All; 42 MW; Overpowered to –2 Diff Mod; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (0.42 MW), Gravitic Compensators (5G; 10.5 MW)
Crew: 11: 4×Engineering, 1×Electronics, 2×Maneuvering, 1×Gunnery, 1×Maintenance, 1×Command, 1×Steward.
Crew Accommodations: 11×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 2×Small Stateroom (0.0005 MW ea.)
Cargo: 91 m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 2

Notes

No fuel scoop or purification machinery fitted. The steward is present only as a reflection of the *Chatl*-class' main task as a VIP transport and liaison vessel.

Note that flight deck contains one extra workstation for use by VIP passenger or psionic adept.

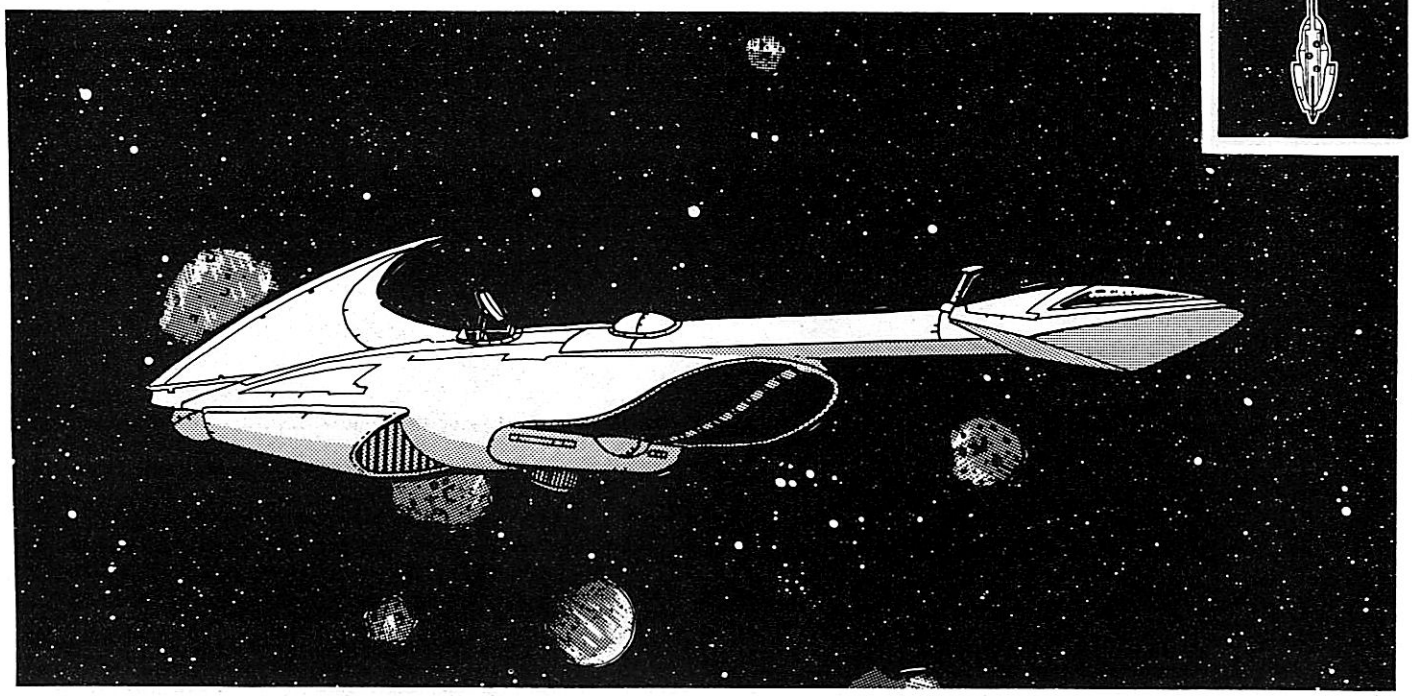
1080 m³ of fuel total.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1-2		1-10: Qtrs, 11-20: Elec
3	1: AL, 2-4: ANT	1-10: Qtrs, 11-12: Elec, 13-20: Hold
4-5, 8-9, 11, 13-17	Hold	
6		1-15: Qtrs, 16-20: Hold
7	1: CH	1-15: Qtrs, 16-20: Hold
10		1-8: LT, 9-18: Qtrs, 19-20: Hold
12		1-10: Qtrs, 11-20: Hold
18		1-17: Eng, 18-20: Hold
19-20		Eng

Systems
AG-1H
CG-1H
ELS-1H
JD-3H
LS-2H
LT-1H
MD-1H
PP-4H
SSR-(2h)
All Others-(1h)

Zhodani *Zhdits*-Class Destroyer Escort



General Data

Displacement: 400 tons
Length: 66 meters
Price: MCr245.84
Configuration: Needle SL
Mass (Loaded/Empty): 5084.96/4780.06
Hull Armor: 62
Volume: 5600 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 1335 MW Fusion Power Plant (103 MW/hit), 1 year duration (0.341 MW excess power)
Jump Performance: 2 (1400 m³ fuel)
G-Rating: 6 (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 48 (104 using jump fuel), 25 m³ of fuel each
Maint: 185

Electronics

Computer: 3×TL-14 Mod Fb Computers (1 MW ea.)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: 150,000km Passive EMS folding array (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (5.6 MW)
Controls: Bridge with 7×Bridge Workstation, plus 11 other workstations

Armament

Offensive: 4×TL-14 150 Mj Laser Turret (Loc: 10,10,10,11; Arcs: All; 4.2 MW ea.; 1 Crew ea.)
Master Fire Director: 1×TL-14 MFD (5 Diff Mod; 10 hexes Msl; 2 hexes; 0.874 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Trt	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (5G; 28 MW)
Crew: 25: 11×Engineering, 1×Electronics, 2×Maneuvering, 5×Gunnery, 1×Maintenance, 3×Command, 1×Steward, 1×Medical
Crew Accommodations: 3×Small Stateroom (single-occupancy; 0.0005 MW ea.), 11×Small Stateroom (double-occupancy; 0.0005 MW ea.)
Passenger Accommodations: None
Cargo: 122.9 m³, one large cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 4

Notes

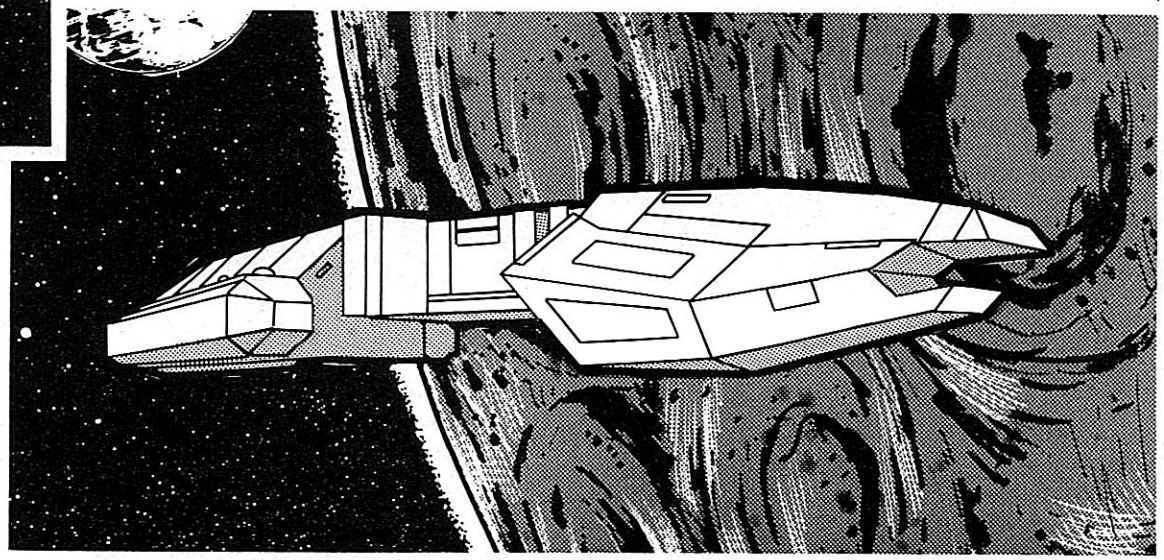
Fuel scoop, purification machinery (13 MW), 6 hours to refine 2600 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-14: Ant	1-15: Elec, 16-20: Qtrs	SSR-(2h)
2-4		1-10: Hold, 11-20: Qtrs	LS-5H
5	1: AL	1-5: Qtrs, 16-20: Hold	ELS-3H
6		1-10: Elec, 11-13: Qtrs, 14-20: Hold	AG-1H
7-9, 12-14		Hold	JD-7H
10		1-3: LT, 4-6: LT, 7-9: LT, 10-20: Hold	PP-14H
11	1-5: EMMR	1-3: LT, 4-20: Hold	CG-1H
15	LCH	1-15: Eng, 16-20: Hold	FPP-13H
16-20		Eng	LT-1H
			MD-1H
			EMM-1H
			EMMR-(5h)
			All Others-(1h)

Zhodani *Vlezhdatl*-Class Strike Cruiser





General Data

Displacement: 2000 tons
Length: 90 meters
Price: MCr974.84
Configuration: Wedge SL
Mass (Loaded/Empty): 23,005.96/20,749.46
Hull Armor: 90
Volume: 28,000 m³
Target Size: M
Tech Level: 14

Engineering Data

Power Plant: 4614 MW Fusion Power Plant (100 MW/hit), 1 year duration (0.4415 MW power shortfall)
Jump Performance: 2 (4200 m³ fuel)
G-Rating: 4 (1000 MW/G), Contra-Grav lifters (200 MW)
G-Turns: 48 (81.6 using jump fuel), 125 m³ of fuel each
Maint: 794

Electronics

Computer: 3×TL-14 Mod Fib Computers (1 MW ea.)
Commo: 3×300,000km radio (10 hexes; only one powered: 10 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (DF capable; 10 hexes; 15 MW), 300,000km Ladar (10 hexes; 2.5 MW)
ECM/ECCM: 180,000km EMS jammer (6 hexes; 22 MW), EM Masking (28 MW)
Controls: Bridge with 21×Bridge Workstation, plus 38 other workstations

Armament

Offensive: 1×TL-14 2000-Mj Particle Accelerator (Loc: Spinal; Arcs: 1; 55.6 MW; 1 Crew), 4×Missile Barbette (Loc: 1,14,15,20; 5 ready Msls ea.; 0.15 MW ea.; 1 Crew ea.) total 20 ready Msls plus 40 in cargo, 4×TL-14 300-Mj Laser Barbette (Loc: 1,14,15—Arcs: 1,2,3; Loc: 20—Arcs: 4,5; 8.3 MW ea.; 1 Crew ea.)
Defensive: TL-14 Meson Screen Generator (PV=232, 20 MW, 1 Crew)
Master Fire Directors: 2×TL-14 Beam/Missile MFDs (5 Diff Mod, Msl 10 hexes; 10 hexes; 1.77 MW; 1 Crew ea.) and 2×TL-14 Beam MFDs (5 Diff Mod, No Msl; 10 hexes; 1.62 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Las Brb	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
2000-Mj Part Accel	10:224	20:224	40:123	80:63

Accommodations

Life Support: Extended (5.6 MW), Gravitic Compensators (5G; 140 MW)
Crew: 141: 38×Engineering, 2×Electronics, 2×Maneuvering, 18×Gunnery, 5×Maintenance, 48×Ship's Troops, 4×Flight Crew, 19×Command, 3×Steward, 2×Medical
Crew Accommodations: 19×Small Stateroom (single-occupancy; 0.0005 MW ea.), 37×Small Stateroom, (double-occupancy; 0.0005 MW ea.), 12×Large Stateroom (ship's troops, quadruple-occupancy; 0.001 MW ea.)
Passenger Accommodations: None
Other Facilities: Electronics Shop (0.6 MW), Sickbay (0.8 MW), Machine Shop (1 MW)
Cargo: 686.5 m³, plus 40 missiles, 4 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Spacious) for 2×30-ton craft, 2 launch ports
Air Locks: 20

Notes

Fuel scoop and purification machinery (51 MW), 6 hours to refine 10,200 m³.

Because the control panels are optimized for smaller ships, some systems on larger ships may require each hit box to record 2 hits (each hit is a slash; two slashes in the form of an "x" fill the box) or the use of additional unused boxes from other lines, such as "other."

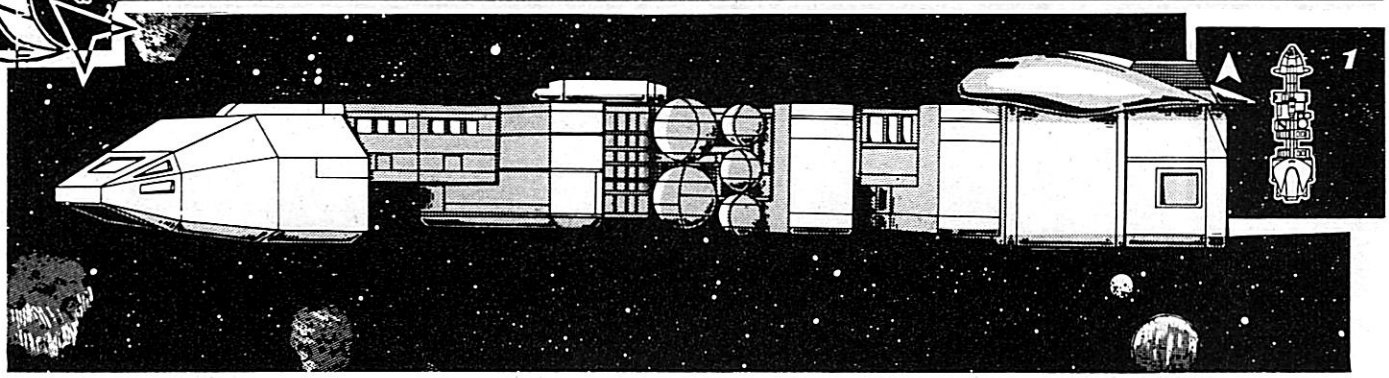
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-15: Ant	1: LB, 2: MB, 3-8: PA, 9-20: Elec
2-3	Ant	1-5: Elec, 16-20: Hold
4-5	1: AL	1-2: PA, 3-15: Qtrs, 16-20: Eng
6		1-19: Hold, 20: NDB
7	1: AL	1-2: PA, 3-20: Hold
8-9		1-11: Qtrs, 12-20: Hold
10-11		Hold
12-13	1-5: EMMR	Hold
14-15		1: LB, 2: MB, 3-9: Eng, 10-20: Hold
16	1-7: EMMR	1-7: Eng, 8-20: Hold
17	1-5: LP, 6-10: CH	1-7: Eng, 8-19: Hold, 20: NDB
18-19		1-15: Eng, 16-20: Hold
20		1: LB, 2: MB, 3-20: Eng

Systems

MS-3H
MFD-(3h)
LSR-1H
SSR-(2h)
MB-1H
LB-2H
Mach. Shop-1H
Elec. Shop-1H
LS-23H
ELS-12H
AG-6H
JD-21H
MD-4H
CG-4H
EMM-3H
EMMR-(28h)
PA-11H
FPP-51H
Hangar-34H
Sickbay-1H
PP-46H
NDB-1H
All Others-(1h)

Reformation Coalition *Aurora*-Class Clipper



General Data

Displacement: 600/1080/2080 tons
Length: 144 meters
Price: MCr749.86
Configuration: Open Frame USL
Mass (Loaded/Empty): 17,404.69/13,311.09
Hull Armor: 20
Volume: 8400/14,000/28,000 m³
Target Size: M (L)
Tech Level: 12

Engineering Data

Power Plant: 2280 MW Fusion Power Plant (50 MW/hit), 1 year duration
Jump Performance: 2 at 2080 tons, 3 at 1560 tons, 4 at 1248 tons (Group III only), 5 at 1040 tons (Group III only) (Fuel used per jump varies with displacement and jump distance, but is always 4368m³ for maximum jump at current displacement.)
G-Rating: 2 at all displacements, limited by hull construction. Divide displacement (in 14 m³ tons) by 2 to get MW needed per G of performance. No contra-grav lifters.
G-Turns: Assuming fuel from fuel skimmer (3500 m³) and 400-ton fuel module (4722 m³), 8222 m3 fuel is available, but fuel use varies with displacement. At 2080 tons, 130 m3 fuel per G-turn. For other configurations, divide MW/G by 8 to get m³ of fuel per G-turn for current displacement.
Maint: 630

Electronics

Computer: 1×TL-12 Mod Fb Computer (0.8 MW), 2×TL-12 Mod St Computer (0.4 MW)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 27.5 MW)
ECM/ECCM: EM Masking (8.4 MW)
Controls: Bridge with 18×Bridge Workstation, plus 26 other workstations

Armament

Offensive: 8×TL-12 120-Mj Laser Turret (Loc: 4,5,5—Arcs: 1,2,3,4; Loc: 10—Arcs: All; Loc: 18,19,20,20—Arcs: 2,3,4,5; 3.3 MW ea.; 1 Crew ea.), TL-12 1000-Mj Meson Gun (Loc: Spinal; Arcs: 1; 27.8 MW; 5 Crew)
Master Fire Directors: 3×TL-12 MFD (4 Diff Mods; No Msl, 10 hexes; 2.95 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Ext*
120-Mj Laser Turret	4:1/5-27	8:1/5-27	16:1/5-20	32:1/5-10
1000-Mj Meson Gun	5:158	10:75	20:38	40:19

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 85: 26×Engineering, 2×Electronics, 2×Maneuvering, 16×Gunnery, 7×Maintenance, 18×Flight Crew, 11×Command, 2×Steward, 1×Medical
Crew Accommodations: 20×Small Stateroom (double-occupancy; 0.0005 MW ea.). Additional accomodations for crew contained in 100-ton auxiliary quarters module.
Passenger Accommodations: None, but additional quarters modules may be added.
Cargo: 149 m³, plus cargo modules, one small cargo hatch
Small Craft and Launch Facilities: External grapples (USL) for 50-ton Cutter, 30-ton craft, 1×400-ton fuel skimmer, and 4×100-ton, 1×200-ton, and 1×400-ton auxiliary modules.
Air Locks: 6

Notes

Clipper carries no fuel of its own. All reaction mass and jump fuel carried in *Manta*-class fueler and fuel modules. Listed price does not include *Manta*, but *Manta*'s loaded mass is included with the clipper's loaded mass, along with loaded mass of one modular cutter and one 30-ton boat (which account for the extra 80 tons of displacement). Price and mass does not include any modules, although clipper is typically fitted at least with one 100-ton auxiliary quarters module and a 400-ton fuel module. The fuel module carries 4722.4 m³ of fuel, plus fuel purification machinery (9.9 MW) sufficient to purify that amount in 17.17 hours.

The Group III clippers are later models with recovered higher technology jump drives.

Fully loaded clipper only has an actual target size of medium (M), but because its laser turrets are all mounted on turret extenders, it is treated as a large (L) target when being scanned by active sensors.

On the damage table, modules A, B, C, and D are 100-ton modules, module E is a 200-ton module, and module F is a 400-ton module, almost always a fuel module.

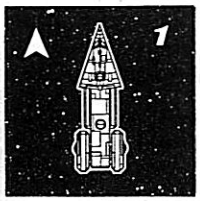
When clipper is empty, treat as Open Frame for purposes of hit location and fire arcs. When loaded with any modules, use Close Structure. When *Manta* is not docked, treat hits on areas 12, 13, 16, and 17 as a surface hit on its 400-ton grapple, then reroll for interior hit location on 1D10+10.

For hits on fuel module, use 1-18: Fuel, 19-20: Fuel Purification, with FP-13H. Hits on a 100-ton quarters module are treated as SSR hits, there are 43 such rooms. Other locations should be handled abstractly as cargo.

DAMAGE TABLES

Area (1D10)	*Surface Hits*	*Internal Explosion*	*Systems*
1	Ant	1-4: MG, 5-11: Elec, 12-20: Hold	AEMS-(2h)
2	30-ton Craft	1-5: MG, 6-10:, Qtrs, 11-20: 100-ton Module B	MG-16H
3	30-ton Craft	1-5: MG, 6-10, Qtrs, 11-20: 100-ton Module A	JD-27H
4	1-10: Ant	1: LT, 2-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module B	EMM-1H PP-46H
5	1: CH, 2: EMMR, 3-12: Ant	1: LT, 2: LT, 3-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module A	AG-2H MFD-1H
6, 8	1-10: Module C, 11-20: Module E	1-10: 100-ton Module C, 11-20: 200-ton Module E	SSR-(2h)
7, 9	1-10: Module D, 11-20: Module E	1-10: 100-ton Module D, 11-20: 200-ton Module E	LS-7H
10	50-ton Craft	1-9 Meson Gun, 10: LT, 11-18: Module Grapple, 19: 30-ton Grapple, 20: 50-ton Grapple	ELS-4H MD-2H
11, 14-15	Module F	Module F	LT-1H
12-13, 16-17	Manta Surface	Manta	All Others-(1h)
18	1-10: Module F	1-10: Fuel Module, 11: LT, 12: 400-ton Grapple, 13-20: Eng	EMMR-(8h) 30-ton Grapple-1H
19	1-10: Module F	1-10: Fuel Module, 11: LT, 12-20: Eng	50-ton Grapple-1H
20		1: LT, 2: LT, 3-20: Eng	100-ton Grapple-2H 200-ton Grapple-2H 400-ton Grapple-6H

Covenanter-Class Scout Cruiser



General Data

Displacement: 500 tons
Length: 75 meters
Price: MCr241.7
Configuration: Wedge SL
Mass (Loaded/Empty): 5340.61/4405.73
Hull Armor: 30/62
Volume: 7000 m³
Target Size: S
Tech Level: 12/15

Engineering Data

Power Plant: 891 MW Fusion Power Plant (99 MW/hit), 1 year duration, plus 38.4 MW auxiliary fusion plant (38.4 MW/hit), 1 year duration
Jump Performance: 2 (1050 m³ fuel)
G-Rating: 3 (250 MW/G), Contra-Grav lifters (50 MW)
G-Turns: 48 (59.2 allowing fuel for jump 1, 81.6 using all jump fuel), 31.25 m³ of fuel each
Maint: 156

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 2×300,000km radio (10 hexes; 10 MW), 2×1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 150,000km (5 hexes; 0.15 MW), Active EMS 300,000km (10 hexes; 15 MW), TL-15 Densitometer (0.4 MW), TL-14 Neutrino Sensor (0.01 MW)
ECM/ECCM: EMS jammer (10 hexes; 30 MW), EM Masking package (6.58 MW)
Controls: Bridge with 7×Bridge Workstation, plus 6 other workstations

Armament

Offensive: 3×TL-14 150-Mj Laser Turret (Loc: 2/3; Arcs: 1,2,3; 4.2 MW; 1 Crew; Loc: 16,17; Arcs: All; 4.2 MW ea.; 1 Crew ea..), 1×300-Mj Laser Barbette (Loc: 10; Arcs: 1,2,3; 8.3 MW; 1 Crew), 1×Missile/RCV Barbette (Loc: 11; 5 ready Msls or recce drones; 0.15 MW; 1 Crew)
Master Fire Directors: 1 TL-14 (5 Diff Mod; Non-Msl; 10 hexes; 1.62 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2:$^{1}/_{10}$-31	4:$^{1}/_{10}$-31	8:$^{1}/_{10}$-31	16:$^{1}/_{10}$-31
300-Mj Laser Barbette	10:$^{1}/_{14}$-43	20:$^{1}/_{14}$-43	40:$^{1}/_{8}$-26	80:$^{1}/_{4}$-13

Accommodations

Life Support: Extended (1.036 MW), Gravitic Compensators (5G; 32.9 MW)
Crew: 35 (6×Engineering, 1×Electronics, 2×Maneuver, 6×Gunnery, 1×Maint, 3×Small Craft, 3×Command, 1×Medic, 6×Scouts, 6×Troops)
Crew Accommodations: 1×Small Stateroom (0.0005 MW), 17×Large Stateroom (0.001 MW)
Small Craft and Launch Facilities: External grapple for 30-ton small craft, Internal hangars for 2 air rafts, 2 tracked ATVs, 1 launch port each
Additional Fittings: 5×Air Lock, 247.5 m³ cargo with 1 large hatch, 8-ton sick bay (0.8 MW), 2×8-ton lab (0.8 MW ea.), 10-ton machine shop (1 MW), 6-ton electronics shop (0.6 MW)

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	1-8: Ant	1-2: Elec, 3-20: Hold
2	1-8: Ant	1-2: Elec, 3: LT, 4-20: Hold
3	1-8: Ant, 9: AL	1-2: Elec, 3: LT, 4-20: Hold
4-5	1-8: Ant	1-2: Elec, 3-4: Eng, 5-12: Qtr, 13-20: Hold
6-7		Qtrs
8-9	1-3: EMMR	Hold
10	1: AL	1-5: LB, 6-20: Hold
11	1: AL	1-5: MB, 6-20: Hold
12-13		1-12: Qtrs, 13-20 Hold
14-15		Hold
16-17	1: AL	1-2: LT, 3-10: Eng, 11-20: Hold
18-19	Small Craft	1-8: Eng, 9-20: Hold
20	1-3: EMMR	Eng

Systems	
JD-6H	SSR-(2h)
PP-9H	MFD-(4h)
Aux PP-1H	Lab-1H
FPP-3H	Sickbay-1H
ELS-3H	Elec. Shop-1H
EMMR-(6h)	Mach. Shop-1H
MB-1H	All Others-(1h)
LB-2H	
LT-1H	
Grapple-2H	
AG-2H	
LS-6H	
CG-1H	
LSR-1H	

Notes

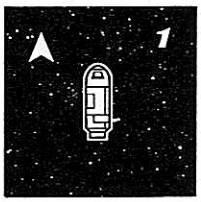
Built by the Covenant of Sufren from cannibalized TL-14 *Gazelle* and TL-15 Scout hulls, with locally manufactured TL-12 components.

Systems consume 929.4 MW. *Gazelle* drop tanks are now permanently attached.

2550 m³ of fuel (not counting 94.86 m³ reactor fuel), 1050 m³ needed for jump 2, 700 m³ for jump 1. Fuel purification machinery (3.1875 MW) sufficient to purify 637.5 m³ in 6 hours (24 hours for entire load).

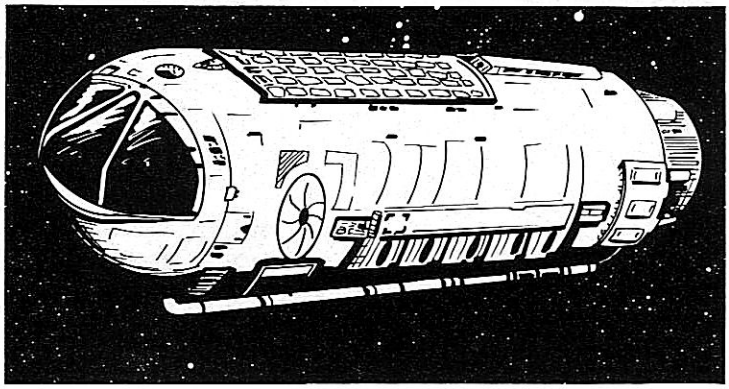
Surface hit locations 1-5 have armor 30, all others have 62.

Skiff & Ship's Boat



General Data

Displacement: 10 tons
Length: 14 meters
Price: MCr9.9
Configuration: Cylinder, SL
Mass (Loaded/Empty): 83.99/74.83
Hull Armor: 14
Volume: 140 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 14MW Fusion Power Plant (14 MW/hit), 1 year duration (0.255 MW power shortfall)
G-Rating: 1 (5 MW/G), Contra-Grav lifters (1 MW)
G-Turns: 16, 0.625 m³ of fuel each
Maint: 3

Electronics

Computer: 2×TL-12 Model St (0.4 MW each)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation

Armament

None

Accommodations

Life Support: Basic (0.014 MW), Gravitic Compensators (3G; 0.7 MW)
Crew: 2 (1×Maneuver, 1×Electronics)
Crew Accommodations: 2×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 8.46m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 1

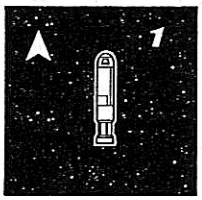
Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. Must shut down radio or maser when taking off.

No fuel purification machinery, 10 m³ (0.7 tons) of reaction mass is carried.

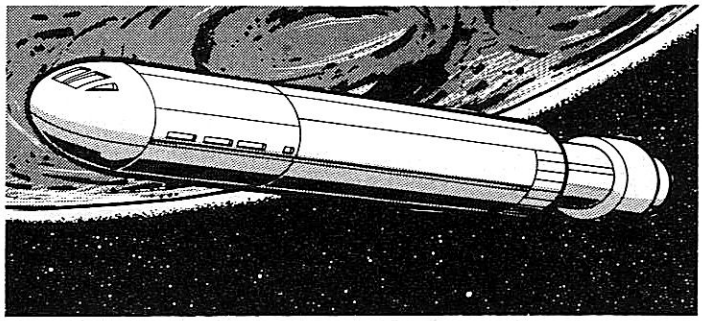
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Hold	PP-1H
2-3		1-5: Elec, 6-15: Qtrs, 16-20: Hold	LS-1H
4-5, 8-9	1-2: Ant	Elec	ELS-(2h)
6	CH	Hold	All Others-(1h)
7	1-4: AL	Hold	
10-17		Hold	
18-19		1-5: Eng, 6-20: Hold	
20		Eng	



General Data

Displacement: 30 tons
Length: 27.6 meters
Price: MCr17.67
Configuration: Needle SL
Mass (Loaded/Empty): 428.08/378.48
Hull Armor: 40
Volume: 420 m³
Target Size: VS
Tech Level: 12



Engineering Data

Power Plant: 90MW Fusion Power Plant (45 MW/hit), 1 year duration (17.297 MW excess power)
G-Rating: 4 (15 MW/G), Contra-Grav lifters (3 MW)
G-Turns: 96, 1.875 m³ of fuel each
Maint: 14

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Armament

None

Accommodations

Life Support: Basic (0.042 MW), Gravitic Compensators (3G; 2.1 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 20×Seat (Adequate)
Cargo: 37 m³, one small cargo hatch
Air Locks: 1

Notes

Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery, 180m³ (12.86 tons) of reaction mass is carried.

The Ship's Boat design has 17.3 MW of power left over, which allows the mounting of weapons or more powerful sensors at the expense of cargo space.

DAMAGE TABLES

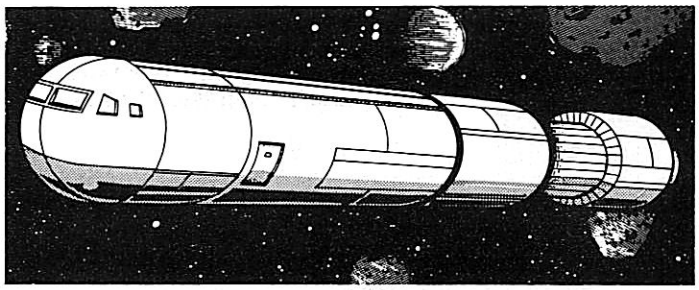
Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		Elec	PP-2H
2-3	1-4: Ant	1-3: Elec, 4-8: Qtrs, 9-20: Hold	1-10: Elec, 11-4
4-5	1-4: Ant	1-4: Elec, 5-9: Qtrs, 10-20: Hold	LS-1H
6-7, 10-15		Hold	AG-(2h)
8	1-2: AL	Hold	ELS-1H
9	1-14: CH	Hold	All Others-(1h)
16-17		1-12: Hold, 13-20: Eng	
18-19		1-11: Hold, 12-20: Eng	
20		Eng	

Modular Cutter & Shuttle



General Data

Displacement: 50 tons **Hull Armor:** 30
Length: 33 meters **Volume:** 700 m³
Price: MCr18.98 (cutter alone) **Target Size:** VS
Configuration: Needle SL **Tech Level:** 12
Mass (Loaded/Empty): 353.82/340.72 cutter alone
727.45/684.96 with fuel module



Air Locks: 1

Engineering Data

Power Plant: 100 MW Fusion Power Plant (50 MW/hit), 1 year duration (10.9196 MW excess power used to power modules)
G-Rating: 3 (25 MW/G), Contra-Grav lifters (5 MW)
G-Turns: 48, 3.125 m³ of fuel each
Maint: 13, +13 for fuel module

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Accommodations

Life Support: Basic (0.0294 MW), Gravitic Compensators (3G; 1.47 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: Flight Deck
Passenger Accommodations: Varies depending upon module fitted.
Cargo: Varies depending upon module fitted (388 m³ in cargo module), 2.6 m³ in cutter

Notes

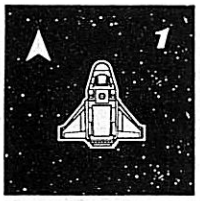
Modular Cutter may be fitted with a variety of 29-ton (406m³) modules, including lab module (336.3 tonnes loaded/284.4 empty, MCr14.12), passenger/cargo module (311.59 tonnes loaded/133.59 empty, MCr0.4, carries 30 passengers and 178 m³ cargo—passenger seats, 7 m³ each, can be traded for cargo or for smaller seats, but if cargo mass exceeds 284 tonnes, cutter G-rating will drop to 1G), ATV module (211.84 tonnes loaded/161.84 empty, MCr0.16, includes space for a single ATV of up to 50 tonnes).

Data assumes the fitting of a fuel scoop module (373.63 tonnes loaded/344.24 empty, MCr0.17). The module can scoop and carry 277 m³ (19.8 tons) of fuel and has fuel purification machinery sufficient to refine 277 m³ in 6 hours.

DAMAGE TABLES

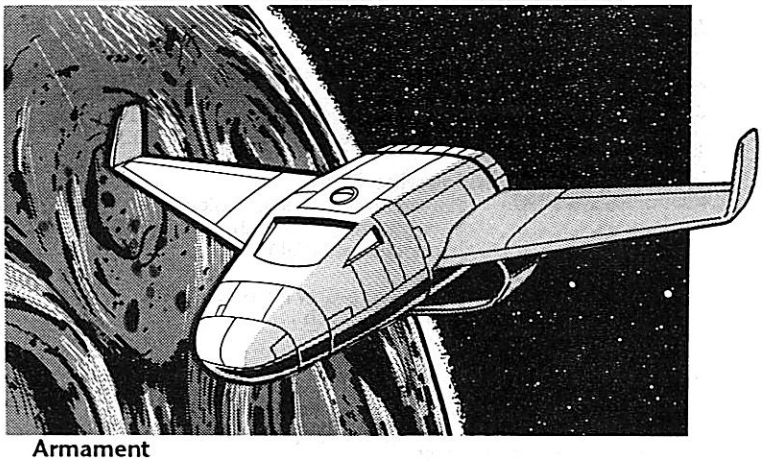
Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-10: Elec (C), 11-20: Qtrs (C)	PP-2H
2-3	1-2: AL	1-5 Qtrs (C), 6-10: Elec, 11-15: Hold (C), 16-20: Eng (M)	FPP-3H
4-5		1-15: Hold (C), 16-20: Hold (M)	LS-1H
6-9, 11-15		1: Eng (M), 2-20: Hold (M)	MD-(2h)
10, 20		Eng (C)	ELS-1H
16-19		1-5: Hold (M), 6-20: Hold (C)	CG-(2h)
			All Others-(1h)

(C) = Cutter Component, (M) = Module Component



General Data

Displacement: 95 tons **Hull Armor:** 31
Length: 27.6 meters **Volume:** 1330 m³
Price: MCr29.04 **Target Size:** VS
Configuration: Cylinder AF **Tech Level:** 12
Mass (Loaded/Empty): 953.11/711.21



Engineering Data

Power Plant: 170 MW Fusion Power Plant (42.5 MW/hit), 1 year duration (3.591 MW excess power)
G-Rating: 3 (4.75 MW/G), Contra-Grav lifters (9.5 MW)
G-Turns: 96, 5.9375 m³ of fuel each
Maint: 34

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-7: Ant	1-12: Elec, 13-20: Qtrs	PP-4H
2		1-5: Qtrs, 6-20: Hold	LS-2H
3	1: AL	Hold	ELS-1H
4-10, 12-17	Hold		MD-(3h)
11		1-13: TS, 14-20: Hold	AG-1H
18-19	1-5: CH	1-11: Hold, 12-20: Eng	CG-(4h)
20		Eng	All Others-(1h)

Armament

1 turret hardpoint socket fitted (Loc: 11; Arc: 2,3,4)

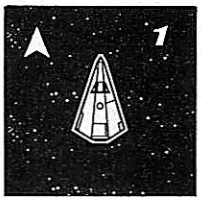
Accommodations

Life Support: Basic (0.133 MW, Gravitic Compensators (3G; 6.65 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: 3×Workstation
Passenger Accommodations: 80×Seat (Adequate)
Cargo: 202m³, one large cargo hatch
Air Locks: 1

Notes

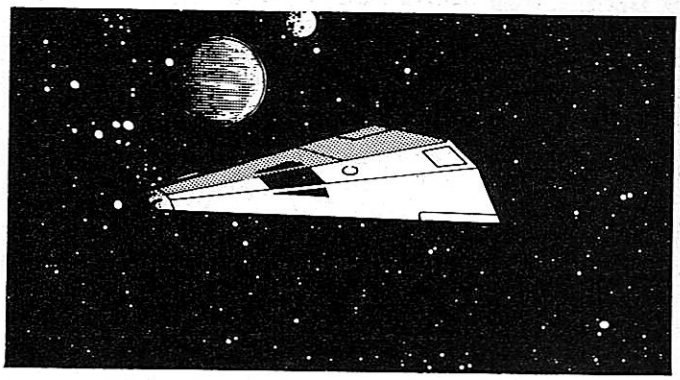
Passenger seats may be removed, each adding 3.5 m³ to the cargo capacity. No fuel purification machinery is fitted, 570m³ (8.14 tons) of reaction mass carried.

Armed Gig/Military Boat & Rampart Fighter



General Data

Displacement: 20 tons **Hull Armor:** 50
Length: 20 meters **Volume:** 280 m³
Price: MCr19.9 **Target Size:** VS
Configuration: Wedge SL **Tech Level:** 14
Mass (Loaded/Empty): 299.79/263.54



Engineering Data

Power Plant: 67.5 MW Fusion Power Plant (6.75 MW/hit), 1 year duration (0.001 MW excess power)
Jump Performance: None
G-Rating: 5 (10 MW/G), Contra-Grav lifters (2 MW)
G-Turns: 60, 1.25 m³ of fuel each
Maint: 9

Electronics

Computer: 2×TL-14 Mod St Computers (0.5 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.04 MW), Active EMS 60,000km (2 hexes; 7 MW)
ECM/ECCM: EM Masking (0.28 MW)
Controls: Flight deck with 3×workstations

Armament

Offensive: 1×TL-14 144Mj Laser Lance (Loc: 1; Arcs: 1; 4 MW; Crew on Flight Deck)

Accommodations

Life Support: Extended (0.056 MW), Gravitic Compensators (5G; 1.4 MW)
Crew: 3: 1×Commander/Pilot, 1×Engineer/Gunner, 1×Electronics
Crew Accommodations: 3×Workstation
Passenger Accommodations: 3×Seat (Adequate), 1×Emergency Low Berth (0.002 MW)
Cargo: 61 m³, one small cargo hatch
Small Craft and Launch Facilities: None
Air Locks: 1

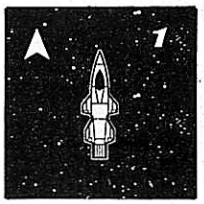
Notes

Laser is a fixed forward-firing mount.
Fuel scoop, but no purification machinery. 75 m³ of fuel carried.

	Short	*Medium*	*Long*	*Extreme*
TL-14 144-Mj Laser	10:1/10-30	20:1/7-21	40:1/3-10	80:1/2-5

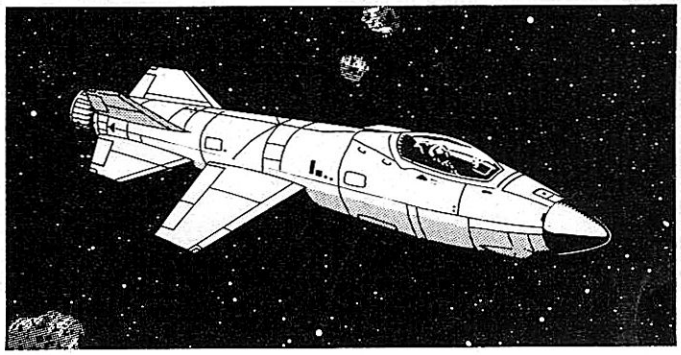
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1		LT	LS-1H
2-5	1-2: Ant	1-10: LT, 11-20: Elec	ELS-1H
6-7	1: EM Rad	1-15: Qtrs, 16-20: Hold	PP-1H
8-9		1-15: Qtrs, 16-20: Hold	LT-1H
10	1-2: AL, 3-4:Ant	Qtrs	All Others-(1h)
11		Qtrs	
12-15		Hold	
16	1: EMM Rad	1-10: Eng, 11-20: Hold	
17		1-10: Eng, 11-20: Hold	
18-19		1-5: Eng, 6-20: Hold	
20		Eng	



General Data

Displacement: 15 tons **Hull Armor:** 62
Length: 15 meters **Volume:** 210 m³
Price: MCr21.84 **Target Size:** VS
Configuration: Cylinder AF **Tech Level:** 15
Mass (Loaded/Empty): 218.8/210.53



Engineering Data

Power Plant: 69 MW Fusion Power Plant (69 MW/hit), 1 month duration (0.656 MW power shortfall)
Jump Performance: None
G-Rating: 6 (7.5 MW/G), Contra-Grav lifters (1.5 MW)
G-Turns: 126, 0.9375 m³ of fuel each
Maint: 5

Electronics

Computer: 2×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.04 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (0.21 MW)
Controls: 1×Workstation

Armament

Offensive: TL-15 144-Mj Laser Lance (Loc: 1/4/5; Arcs: 1; 4 MW; No Crew), USL Grapples for 4 missiles

Accommodations

Life Support: Basic (0.021 MW), Gravitic Compensators (6G; 1.05 MW)
Crew: 1: 1×Pilot/Gunner
Crew Accommodations: 1×Workstation
Passenger Accommodations: None
Cargo: None
Small Craft and Launch Facilities: None

Air Locks: 1 Hatch

Notes

Laser is a fixed, forward-firing mount. No fuel scoop or purification machinery. Power is inadequate to operate maser and radio communicators at the same time. 118.125 m³ of fuel carried.

	Short	*Medium*	*Long*	*Extreme*
TL-15 144-Mj Laser	10:1/10-30	20:1/10-30	40:1/5-15	80:1/2-8

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1, 3		1-10: LT, 11-20: Elec	LS-1H
2	1-3: Ant	1-15: LT, 16-20: Elec	ELS-1H
4-5	1-10: Ant	1-10: LT, 11-20: Elec	PP-1H
6-9, 12-15		Hold	LT-1H
10	1: Hatch	Qtrs	All Others-(1h)
11	1-2: EMMR	1-10: Elec, 16-20: Hold	
16-19		1-5: Eng, 6-20: Hold	
20		Eng	

BRILLIANT LANCES™ Traveller®: The New Era Starship Combat Missile and Drone Log

Identification	Sigs.	1	2	3	4	5	6	7	8	Continues on line#
1	/ / / /									
2	/ / / /									
3	/ / / /									
4	/ / / /									
5	/ / / /									
6	/ / / /									
7	/ / / /									
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10	/ / / /									
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14	/ / / /									
15	/ / / /									
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19	/ / / /									
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21	/ / / /									
22	/ / / /									
23	/ / / /									
24	/ / / /									
25	/ / / /									

ABBREVIATIONS: H: Heading; **V:** Velocity; **NR:** Next Hex Right; **NL:** Next Hex Left; **AGP:** Accumulated G-Turns Port; **AGS:** Accumulated G-Turns Starboard; **E:** Evasion

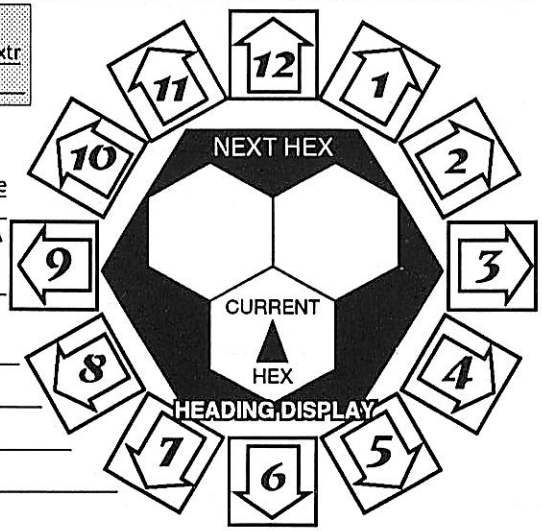
Velocity/ Accumulated Gs Track: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Crew Quality and Target Numbers

Quality	Easy	Ave/Short	Diff/Med	Form/Long	Imp/Extr

Constant Diff Mods vs. Detection and Fire

	Vs. Active Radar	Vs. Active Act. EMS	Vs. Passive HRT	Vs. Passive Pass. EMS	Fire
Target Size					
EMM					N/A
Total					



BRILLIANT LANCES™

Traveller® Starship Combat Spacecraft Control Panel

Identification # _____

Class: _____

Name: _____

Player: _____

Weapons

☐ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore __ Diff Mods Msl __ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐

☐ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore __ Diff Mods Msl __ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐

☐ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore __ Diff Mods Msl __ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐

☐ Master Fire Director — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Ignore __ Diff Mods Msl __ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Ant: MJ/Mn ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

☐ (_____) — Ranges: Ave (__) Diff (__) Form (__) Imp (__)
Loc: ___ Arc/Msls: ___ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐☐☐☐☐ ☐☐☐☐☐

Defenses

☐ (_____) — TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: _____ Arc: _____ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used _____

☐ (_____) — TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: _____ Arc: _____ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used _____

☐ (_____) — TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: _____ Arc: _____ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used _____

☐ (_____) — TL ___ Reduc/Hit ___ CV+ ___ PV ___ Cann ___
Loc: _____ Arc: _____ _____ MW MJ/Mn ☐☐☐☐☐ Crew ☐ Cann used _____

Target Locks

Crew

Bridge Crew	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Engineering Crew	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Damage Control Parties	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Ship's Troops	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Other Crew (_____)	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐
Passengers	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐	☐☐☐☐☐

Electronics

☐ Commo (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Commo (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Commo (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Commo (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Commo (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ Sensor (_____) Folding ☐ ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

Computer (_____) ___ MW Mn ☐
Computer (_____) ___ MW Mn ☐
Computer (_____) ___ MW Mn ☐

Computer (_____) ___ MW Mn ☐
Computer (_____) ___ MW Mn ☐
Computer (_____) ___ MW Mn ☐

☐ ECM (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

☐ ECM (_____) ___ MW — Ranges: Ave (__) Diff (__) Form (__) Imp (__) Ant: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

Electromagnetic Masking ___ MW — Rad: MJ/Mn ☐☐☐☐☐ Cntrl: MJ/Mn ☐☐☐☐☐

Quarters

Large Staterooms	___ MW	MJ	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Small Staterooms	___ MW	Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
Low Berths	___ MW	Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

Hold

Lab	___ MW	MJ/Mn	☐☐☐☐☐
Hangar		MJ/Mn	☐☐☐☐☐
Machine Shop	___ MW	MJ/Mn	☐☐☐☐☐
Electronics Shop	___ MW	MJ/Mn	☐☐☐☐☐

Cargo (_____ m^3) Tons of Cargo _____ Dam. pts. per ton _____ Damage _____
Fuel Tankage (_____ m^3) Starting Fuel, m^3 _____ Fuel Losses _____
Fuel per G-Turn _____ Fuel Use _____

Sick Bay	___ MW	MJ/Mn	☐☐☐☐☐
☐ Life Support	___ MW	MJ/Mn	☐☐☐☐☐
☐ Emergency Life Support	___ MW	MJ/Mn	☐☐☐☐☐
☐ Grav Compensator ___ G	___ MW	MJ/Mn	☐☐☐☐☐

Engineering

☐ Jump Drive		MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Power Plant (___ MW ___ MW ea)		MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Maneuver Drive	(___ MW/G)	MJ/Mn	☐☐☐☐☐ 6G ___ 5G ___ 4G ___ 3G ___ 2G ___ 1G ___
☐ Contra-Gravity	___ MW	MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Fuel Purification Plant	___ MW	MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Other (_____)	___ MW	MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐
☐ Other (_____)	___ MW	MJ/Mn	☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐ ☐☐☐☐☐

+17
+16
+15
+14
+13
+12
+11
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
0
–1
–2
–3
–4
–5
–6
–7
–8
–9

Difficulty Modifier

BRILLIANT LANCES™ Player Aids Card

Traveller® Starship Combat

SENSOR AND FIRE TASKS DIFFICULTY MODIFIER FLOWCHARTS

When calculating the Diff Mods below, use the scale provided on the left margin of this card to help in keeping a running total. Hold the card so that your left thumb and forefinger are free to move up and down the scale, "pinching" the current Diff Mod total.

SENSOR TASK DIFFICULTY MODIFIERS: SENSING PLAYER

The player attempting a Sensor Task computes a total Difficulty Modifier based on the following criteria and combines this cumulative Diff Mod with the cumulative Diff Mod reported by the target player. This final combined Diff Mod is applied to the base difficulty level based on the sensor's range performance when rolling the Sensor Task. No difficulty level may be reduced to less than Easy.

1. If task is an attempt to **retain a lock** from a previous turn, **–1 Diff Mod**. (Cannot be combined with 2.)
2. If task is using a **handed-off sensor lock** from another sensor on the same or a different ship, **–1 Diff Mod.** (Cannot be combined with 1.)
3. If sensing ship suffered a **Catastrophic Failure at an Evasion Task** this turn, **+1 Diff Mod**.
4. If sensor line of sight **passes through an Area Jamming** area of effect, **+1 Diff Mod per area**.
5. If a **Planet or Asteroid** counter is in the target's hex, **+1 Diff Mod.**
6. If there are any **White Out** (missile detonation) markers in the target's hex, **+1 Diff Mod per marker.**
7. If target has **gone active** on the current turn (using active sensors or radio) and the sensing vessel is within twice the active sensor's extreme range, and has a direction finder or passive EMS sensor with a tech level equal to or greater than the active sensor, **–1 Diff Mod.**
8. If target is the **source of Area Jamming**, and the sensing vessel is within 80 hexes of the area jammer, and has any form of functioning direction finder or passive EMS, **–2 Diff Mod.**

SENSOR TASK DIFFICULTY MODIFIERS: TARGET PLAYER

The player controlling the target of a Sensor Task computes a total difficulty modifier based on the following criteria and reports the total to the sensing player.

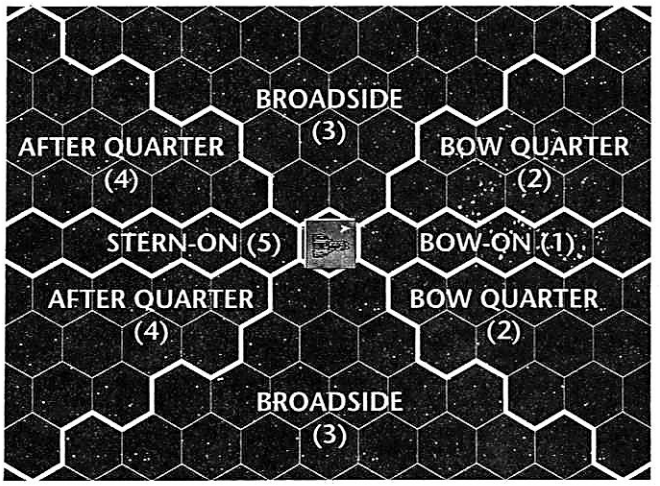
1. The **Constant Diff Mods** value which corresponds to the sensor being used by the sensing player, taken from the table on the Control Panel. Diff Mod ranges from **+4 to –5 Diff Mods**. This combined Diff Mod includes:
   A: Difficulty Modifer for target size (+2 to –5 Diff Mods), and
   B: EMM (Electromagnetic Masking) Difficulty Modifier according to type of sensor, +1 or +2 Diff Mods, or +0 if no EMM is fitted.
   If the EMM suite has been damaged so that it no longer functions, the player should remember to line out the EMM line of the Constant Diff Mods table and use only the target size difficulty modifier.
2. If successful **jamming** attempt was made against the sensor, **+1 Diff Mod** (or **+2 if Outstanding Success** was rolled).
3. Diff Mods **versus passive sensors only** (HRT or passive EMS) based on target's **use of power plant** for maneuver or evasion.
   - If target spent **no G-turns** this turn, **+1 Diff Mod**
   - If target spent **one or more G-turns** this turn, **+0 Diff Mod**
   - If target **powered down** in "cold mode," **+2 Diff Mod**
   - If target spent **one or more G-turns and is facing stern-on** (Arc 5) to the sensing vessel, **–3 Diff Mod**
4. If the target has a **Passive EMS Array Extended, –1 Diff Mod versus Active sensors only.**
5. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
6. If sensor is **ladar** and target has sandcaster and elects to expend a cannister, or already has sand up, **+1 Diff Mod.**
7. If target has a **black globe**, use the following difficulty modifiers:
   - If black globe is **full up**, use **+5 DIff Mod vs. Active Sensors**, and **+3 Diff Mod vs. Passive Sensors.**
   - If black globe is **flickering**, use **+1 Diff Mod per flicker rate ÷30** (round to nearest whole number for both active and passive sensors).

FIRING TASK DIFFICULTY MODIFIERS

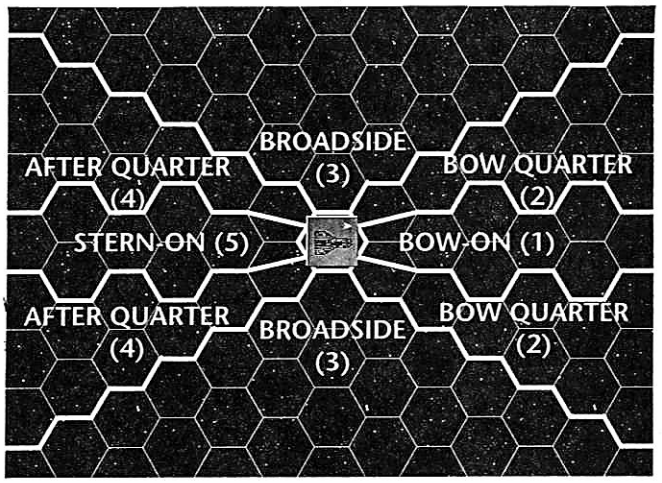
The player attempting a Fire Task computes a total cumulative Difficulty Modifier based on the following criteria. This total combined Diff Mod is applied to the base difficulty level based on the weapon's range performance when rolling the Fire Task. No difficulty level may be reduced to less than Easy.

1. Diff Mod based on **target size, +1 to –5,** take from Constant Diff Mods table on Control Panel.
2. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
3. **Absolute range** to the target in hexes, **divided by 3 (drop fractions) = + Diff Mods**, or see table above right.
   A: For controlled missiles, use range from controlling ship to target
   B: For semi-independent or fully independent missiles (with their own sensor locks), use range from missile to target.
4. If firing ship rolled **Catastrophic Failure on its own Evasion Task** for the current turn, **+1 Diff Mod.**
5. For **overpowered weapons, disregard 1 or 2 + Diff Mods,** based on additional power supplied, as indicated on control panel.
6. Weapons that are being fired with **MFDs** may **disregard 1 to 6 + Diff Mods,** based on TL, as indicated on control panel.

Arcs of Fire: Hexside (Even-Numbered) Facings



Arcs of Fire: Hex Vertex (Odd-Numbered) Facings



Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14
45+	NA*

*Not allowed: 44 hexes is the maximum range of any fire, assuming maximum TL of 15 and maximum target size of Gigantic.

0303/C2

SEQUENCE OF PLAY

(See page 5, Rules Booklet, for details)

Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

DEFENSES

Sandcasters

Base Difficulty: Difficult

Diff Mods: +1 difficulty level per 2 TLs sandcaster is exceeded by firing ship tech level, or -1 level per 2 TLs sandcaster exceeds firing ship's tech level.

Meson Screens

Base Difficulty: Difficult

Diff Mods: Based on meson gun Damage Value compared to screen Protection Value

+2 If meson gun damage value÷meson screen protection value = 4+
+1 If meson gun damage value÷meson screen protection value = 2+
-1 If meson screen protection value÷meson gun damage value = 2+
-2 If meson screen protection value÷meson gun damage value = 4+

Nuclear Dampers

Base Difficulty: Difficult

Diff Mods: Based on Tech Level

TL	*Difficulty Modifier*
12	+1 per closing velocity+2
13	+1 per closing velocity+3
14	+1 per closing velocity+4
15	+1 per closing velocity+5

DAMAGE

Arcs of Fire and Hit Locations by Hull Form

Configuration	*(1) Bow On*	*(2) Bow Quarter*	*(3) Broadside*	*(4) After Quarter*	*(5) Stern On*
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

Table shows the weapon locations that can fire into the listed arcs (e.g., a laser in location 10 on a sphere hull form could fire into arcs 1, 2, 3, 4, and 5, but on a cylinder hull form could only fire into arcs 2, 3, and 4), as well as the hit locations which can be hit from those listed arcs. When rolling for hits from a particular arc, re-roll all hit locations which are not listed in the appropriate column.

Note: Firing meson guns are subject to arc of fire limitations, but always roll 1D20 for hit location, regardless of the facing of the target. Missiles that denonate and fire in the same hex as their targets also roll 1D20 for hit location, rather than worrying about the target's facing.

Damage Type Chart

D10	*Engineering*	*Electronics*	*Quarters*	*Hold*	*Weaponry*	*Antenna*	*Drones*
1	Jump Drive	Def Scrn	Ship's Troops	Lab/Hangar	Mount	Def Scrn	Weapon
2	Jump Drive	ECM	Ship's Troops	Lab/Hngr Crew	Mount	ECM	Weapon
3	FPP	Comm.	Sick Bay/LB	MES	Mount	ECM	Sensor
4	Power Plant	Comm.	Life Support	Cargo	Mount	MFD	Sensor
5	Power Plant	Sensor	Life Support	Cargo	Mount	MFD	Computer
6	Power Plant	Sensor	ELS	Fuel	Crew	Comm	Comm
7	Man Drive	MFD	DCP	Fuel	Crew	Comm	Fuel
8	Eng Crew	Computer	Grav Comp.	Fuel	Crew	Comm	Fuel
9	Eng Crew	Computer	Staterooms	Fuel	Crew	Sensor	Pow Plant
10+	Contra-Grav	Bridge Crew	Staterooms	Fuel	Crew	Sensor	Man Drive

Abbreviations: **DCP:** Damage Control Personnel; **Def Scrn:** Defensive Screen; **ECM:** ECM and ECCM; **ELS:** Emergency Life Support; **FPP:** Fuel Processing Plant; **Grav Comp:** Gravitic Compensators; **Hngr:** Hangar; **LB:** Low Berths; **Man Drive:** Maneuver Drive (heat exchanger/ignition chamber); **MES:** Machine or Electonics Shops; **MFD:** Master Fire Director (roll on Weaponry column for Mount or Crew)

DMs: **Engineering:** If no jump drive, +2; **Electronics:** If no Defensive Screens, +1, If no Def Screens or ECM, +2; **Quarters:** If no Ship's Troops, +2; if no Ship's Troops or Sick Bay, +3; **Hold:** If no Labs or Hangar, +2; if no Labs, Hangars, or Shops, +3; **Antenna:** If no Defensive Screens, +1, If no Defensive Screens or ECM, +2, If no Defensive Screens, ECM, or MFD, +4; **Drones:** If unarmed, +2

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than 5 major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

Excess Damage Location

1D6	*Area*
1	-1 internal area
2-3	same internal area
4	+1 internal area
5	-1 surface area
6	+1 surface area

Minor and Non-Destroying Damage Table

1D6	*Damage*
1-3	System reset, operation interrupted for 1 turn
4-6	Performance degraded: All tasks using system at +1 Diff Mod.

Note: If damage is against the crew, a minor damage is 1 crew casualty. If damage is against fuel, ship loses 1D6 tons of fuel before the tanks re-seal. If damage is against sensors, all locks are lost and must be re-rolled when operations resume.

Major Damage

Major damage to a crew section causes 1D6 casualties. If damage is against fuel, ship loses 1D20 tons of fuel before the tanks re-seal.

Penetration Rating Conversions

Damage Value÷Penetration Rating=Penetration Value
Penetration Value×Penetration Rating=Damage Value

Critical Hit

Vs. Manned Craft

2D6	*Result*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Fuel Explosion*
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

*See Fuel Explosion Damage Value table

Vs. Unmanned Craft and Missiles

1D6	*Result*
1-2	Control system (missile goes inert)
3	Payload (warhead, sensor, or ECM package)
4-6	Fuel (target destroyed)

Fuel Explosion Damage Value

Ship Size	*DV*
SM	Destroyed
Mc	5
VS	10
S	20
M	30
L	40
VL	50
G	60

Critical Hits Table

Weapon Remaining Penetration Value (after penetrating the hull)

Ship Size	*1-20*	*21-40*	*41-60*	*61-80*	*81-100*	*101-120*	*121-140*	*141-160*	*161-180*	*181-200*	*201+*
SM	2	3	4	5	6	7	8	9	10	11	12
Mc	1	2	3	4	5	6	7	8	9	10	11
VS	0	1	2	3	4	5	6	7	8	9	10
S	0	0	0	1	2	3	4	5	6	7	8
M	0	0	0	0	0	1	2	3	4	5	6
L	0	0	0	0	0	0	0	1	2	3	4
VL	0	0	0	0	0	0	0	0	1	1	2
G	0	0	0	0	0	0	0	0	0	0	1

(The number is number of Critical Hits applied to the target.)

Proportional Movement Guide

Velocity	*Step 1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	—	—	—	—	M	—	—	—	—	—
2	—	—	M	—	—	—	—	M	—	—
3	—	—	M	—	—	M	—	—	M	—
4	—	M	—	—	M	—	M	—	—	M
5	—	M	—	M	—	M	—	M	—	M
6	M	—	M	—	M	M	—	M	—	M
7	M	—	M	M	—	M	M	—	M	M
8	M	—	M	M	M	M	—	M	M	M
9	M	M	M	M	—	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M

For craft with a velocity greater than 10, use the line for 10 plus the line for velocity in excess of 10. For example, a vessel with velocity 15 uses the 5 and 10 line. In step 1 it moves one hex, step 2 moves two hexes, and so on. Missiles always detonate at closest approach, so that even if one of the vessels moves two hexes in a step, the missile may detonate before the second hex is moved.

Damage Control

# Pers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult

+17
+16
+15
+14
+13
+12
+11
+10
+9
+8
+7
+6
+5
+4
+3
+2
+1
0
–1
–2
–3
–4
–5
–6
–7
–8
–9

Difficulty Modifier

BRILLIANT LANCES™

Traveller® Starship Combat

Player Aids Card

SENSOR AND FIRE TASKS DIFFICULTY MODIFIER FLOWCHARTS

When calculating the Diff Mods below, use the scale provided on the left margin of this card to help in keeping a running total. Hold the card so that your left thumb and forefinger are free to move up and down the scale, "pinching" the current Diff Mod total.

SENSOR TASK DIFFICULTY MODIFIERS: SENSING PLAYER

The player attempting a Sensor Task computes a total Difficulty Modifier based on the following criteria and combines this cumulative Diff Mod with the cumulative Diff Mod reported by the target player. This final combined Diff Mod is applied to the base difficulty level based on the sensor's range performance when rolling the Sensor Task. No difficulty level may be reduced to less than Easy.

1. If task is an attempt to **retain a lock** from a previous turn, **–1 Diff Mod**. (Cannot be combined with 2.)
2. If task is using a **handed-off sensor lock** from another sensor on the same or a different ship, **–1 Diff Mod.** (Cannot be combined with 1.)
3. If sensing ship suffered a **Catastrophic Failure at an Evasion Task** this turn, **+1 Diff Mod**.
4. If sensor line of sight **passes through an Area Jamming** area of effect, **+1 Diff Mod per area**.
5. If a **Planet or Asteroid** counter is in the target's hex, **+1 Diff Mod.**
6. If there are any **White Out** (missile detonation) markers in the target's hex, **+1 Diff Mod per marker.**
7. If target has **gone active** on the current turn (using active sensors or radio) and the sensing vessel is within twice the active sensor's extreme range, and has a direction finder or passive EMS sensor with a tech level equal to or greater than the active sensor, **–1 Diff Mod.**
8. If target is the **source of Area Jamming,** and the sensing vessel is within 80 hexes of the area jammer, and has any form of functioning direction finder or passive EMS, **–2 Diff Mod.**

SENSOR TASK DIFFICULTY MODIFIERS: TARGET PLAYER

The player controlling the target of a Sensor Task computes a total difficulty modifier based on the following criteria and reports the total to the sensing player.

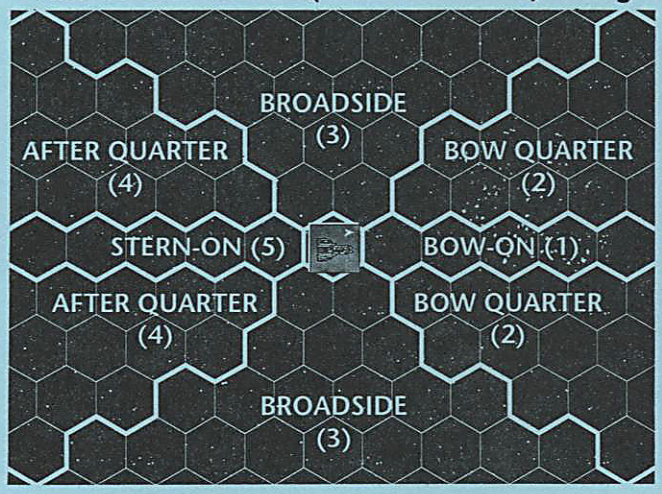
1. The **Constant Diff Mods** value which corresponds to the sensor being used by the sensing player, taken from the table on the Control Panel. Diff Mod ranges from **+4 to –5 Diff Mods**. This combined Diff Mod includes:
   A: Difficulty Modifer for target size (+2 to –5 Diff Mods), and
   B: EMM (Electromagnetic Masking) Difficulty Modifier according to type of sensor, +1 or +2 Diff Mods, or +0 if no EMM is fitted.
   If the EMM suite has been damaged so that it no longer functions, the player should remember to line out the EMM line of the Constant Diff Mods table and use only the target size difficulty modifier.
2. If successful **jamming** attempt was made against the sensor, **+1 Diff Mod** (or **+2 if Outstanding Success** was rolled).
3. Diff Mods **versus passive sensors only** (HRT or passive EMS) based on target's **use of power plant** for maneuver or evasion.
   - If target spent **no G-turns** this turn, **+1 Diff Mod**
   - If target spent **one or more G-turns** this turn, **+0 Diff Mod**
   - If target **powered down** in "cold mode," **+2 Diff Mod**
   - If target spent **one or more G-turns and is facing stern-on** (Arc 5) to the sensing vessel, **–3 Diff Mod**
4. If the target has a **Passive EMS Array Extended, –1 Diff Mod versus Active sensors only.**
5. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
6. If sensor is **ladar** and target has sandcaster and elects to expend a cannister, or already has sand up, **+1 Diff Mod.**
7. If target has a **black globe**, use the following difficulty modifiers:
   - If black globe is **full up**, use **+5 DIff Mod vs. Active Sensors**, and **+3 Diff Mod vs. Passive Sensors.**
   - If black globe is **flickering**, use **+1 Diff Mod per flicker rate ÷30** (round to nearest whole number for both active and passive sensors).

FIRING TASK DIFFICULTY MODIFIERS

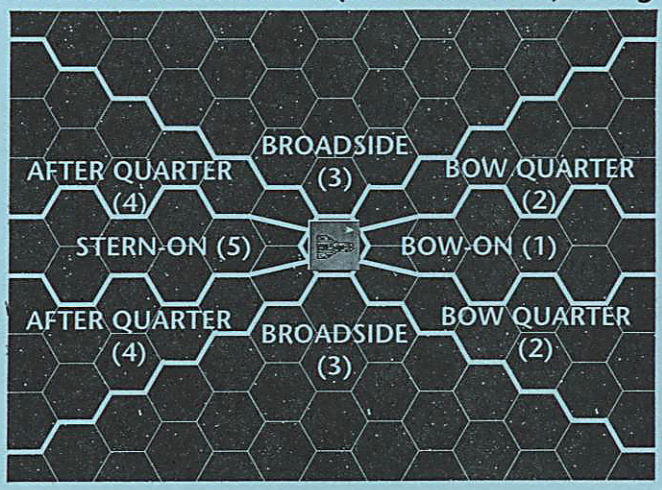
The player attempting a Fire Task computes a total cumulative Difficulty Modifier based on the following criteria. This total combined Diff Mod is applied to the base difficulty level based on the weapon's range performance when rolling the Fire Task. No difficulty level may be reduced to less than Easy.

1. Diff Mod based on **target size, +1 to –5,** take from Constant Diff Mods table on Control Panel.
2. If target made a successful **evasion** attempt, **+1 Diff Mod** (on **Outstanding Success, +1 Diff Mod per G-turns spent on evasion ÷2, drop fractions**).
3. **Absolute range** to the target in hexes, **divided by 3 (drop fractions) = + Diff Mods**, or see table above right.
   A: For controlled missiles, use range from controlling ship to target
   B: For semi-independent or fully independent missiles (with their own sensor locks), use range from missile to target.
4. If firing ship rolled **Catastrophic Failure on its own Evasion Task** for the current turn, **+1 Diff Mod.**
5. For **overpowered weapons, disregard 1 or 2 + Diff Mods,** based on additional power supplied, as indicated on control panel.
6. Weapons that are being fired with **MFDs** may **disregard 1 to 6 + Diff Mods,** based on TL, as indicated on control panel.

Arcs of Fire: Hexside (Even-Numbered) Facings



Arcs of Fire: Hex Vertex (Odd-Numbered) Facings



Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14
45+	NA*

*Not allowed: 44 hexes is the maximum range of any fire, assuming maximum TL of 15 and maximum target size of Gigantic.

0303/C2

SEQUENCE OF PLAY

(See page 5, Rules Booklet, for details)

Launch Phase
Plotting Phase
Movement Phase
Sensor Phase
Fire Phase
Damage Control Phase
Turn Record Phase

DEFENSES

Sandcasters

Base Difficulty: Difficult

Diff Mods: +1 difficulty level per 2 TLs sandcaster is exceeded by firing ship tech level, or -1 level per 2 TLs sandcaster exceeds firing ship's tech level.

Meson Screens

Base Difficulty: Difficult

Diff Mods: Based on meson gun Damage Value compared to screen Protection Value

+2 If meson gun damage value÷meson screen protection value = 4+
+1 If meson gun damage value÷meson screen protection value = 2+
-1 If meson screen protection value÷meson gun damage value = 2+
-2 If meson screen protection value÷meson gun damage value = 4+

Nuclear Dampers

Base Difficulty: Difficult

Diff Mods: Based on Tech Level

TL	*Difficulty Modifier*
12	+1 per closing velocity÷2
13	+1 per closing velocity÷3
14	+1 per closing velocity÷4
15	+1 per closing velocity÷5

DAMAGE

Arcs of Fire and Hit Locations by Hull Form

Configuration	*(1) Bow On*	*(2) Bow Quarter*	*(3) Broadside*	*(4) After Quarter*	*(5) Stern On*
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

Table shows the weapon locations that can fire into the listed arcs (e.g., a laser in location 10 on a sphere hull form could fire into arcs 1, 2, 3, 4, and 5, but on a cylinder hull form could only fire into arcs 2, 3, and 4), as well as the hit locations which can be hit from those listed arcs. When rolling for hits from a particular arc, re-roll all hit locations which are not listed in the appropriate column.

Note: Firing meson guns are subject to arc of fire limitations, but always roll 1D20 for hit location, regardless of the facing of the target. Missiles that denonate and fire in the same hex as their targets also roll 1D20 for hit location, rather than worrying about the target's facing.

Damage Type Chart

D10	*Engineering*	*Electronics*	*Quarters*	*Hold*	*Weaponry*	*Antenna*	*Drones*
1	Jump Drive	Def Scrn	Ship's Troops	Lab/Hangar	Mount	Def Scrn	Weapon
2	Jump Drive	ECM	Ship's Troops	Lab/Hngr Crew	Mount	ECM	Weapon
3	FPP	Comm.	Sick Bay/LB	MES	Mount	ECM	Sensor
4	Power Plant	Comm.	Life Support	Cargo	Mount	MFD	Sensor
5	Power Plant	Sensor	Life Support	Cargo	Mount	MFD	Computer
6	Power Plant	Sensor	ELS	Fuel	Crew	Comm	Comm
7	Man Drive	MFD	DCP	Fuel	Crew	Comm	Fuel
8	Eng Crew	Computer	Grav Comp.	Fuel	Crew	Comm	Fuel
9	Eng Crew	Computer	Staterooms	Fuel	Crew	Sensor	Pow Plant
10+	Contra-Grav	Bridge Crew	Staterooms	Fuel	Crew	Sensor	Man Drive

Abbreviations: **DCP:** Damage Control Personnel; **Def Scrn:** Defensive Screen; **ECM:** ECM and ECCM; **ELS:** Emergency Life Support; **FPP:** Fuel Processing Plant; **Grav Comp:** Gravitic Compensators; **Hngr:** Hangar; **LB:** Low Berths; **Man Drive:** Maneuver Drive (heat exchanger/ignition chamber); **MES:** Machine or Electonics Shops; **MFD:** Master Fire Director (roll on Weaponry column for Mount or Crew)

DMs: **Engineering:** If no jump drive, +2; **Electronics:** If no Defensive Screens, +1, If no Def Screens or ECM, +2; **Quarters:** If no Ship's Troops, +2; if no Ship's Troops or Sick Bay, +3; **Hold:** If no Labs or Hangar, +2; if no Labs, Hangars, or Shops, +3; **Antenna:** If no Defensive Screens, +1, If no Defensive Screens or ECM, +2, If no Defensive Screens, ECM, or MFD, +4; **Drones:** If unarmed, +2

Spacecraft Damage

Damage Points	*Result*
0 or less	No effect
1 to 10	1 minor
11 to 20	2 minor
21 to 40	1 major
41 to 60	2 major
61 to 80	3 major
81 to 100	4 major
101 to 120	5 major

No more than 5 major damage hits can be done in a single location. Remaining damage points beyond 120 are rolled as excess damage in another location.

Excess Damage Location

1D6	*Area*
1	-1 internal area
2-3	same internal area
4	+1 internal area
5	-1 surface area
6	+1 surface area

Minor and Non-Destroying Damage Table

1D6	*Damage*
1-3	System reset, operation interrupted for 1 turn
4-6	Performance degraded: All tasks using system at +1 Diff Mod.

Note: If damage is against the crew, a minor damage is 1 crew casualty. If damage is against fuel, ship loses 1D6 tons of fuel before the tanks re-seal. If damage is against sensors, all locks are lost and must be re-rolled when operations resume.

Major Damage

Major damage to a crew section causes 1D6 casualties. If damage is against fuel, ship loses 1D20 tons of fuel before the tanks re-seal.

Penetration Rating Conversions

Damage Value÷Penetration Rating=Penetration Value
Penetration Value×Penetration Rating=Damage Value

Critical Hit

Vs. Manned Craft

2D6	*Result*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Fuel Explosion*
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

*See Fuel Explosion Damage Value table

Vs. Unmanned Craft and Missiles

1D6	*Result*
1-2	Control system (missile goes inert)
3	Payload (warhead, sensor, or ECM package)
4-6	Fuel (target destroyed)

Fuel Explosion Damage Value

Ship Size	*DV*
SM	Destroyed
Mc	5
VS	10
S	20
M	30
L	40
VL	50
G	60

Critical Hits Table

Weapon Remaining Penetration Value (after penetrating the hull)

Ship Size	*1-20*	*21-40*	*41-60*	*61-80*	*81-100*	*101-120*	*121-140*	*141-160*	*161-180*	*181-200*	*201+*
SM	2	3	4	5	6	7	8	9	10	11	12
Mc	1	2	3	4	5	6	7	8	9	10	11
VS	0	1	2	3	4	5	6	7	8	9	10
S	0	0	0	1	2	3	4	5	6	7	8
M	0	0	0	0	0	1	2	3	4	5	6
L	0	0	0	0	0	0	0	1	2	3	4
VL	0	0	0	0	0	0	0	0	1	1	2
G	0	0	0	0	0	0	0	0	0	0	1

(The number is number of Critical Hits applied to the target.)

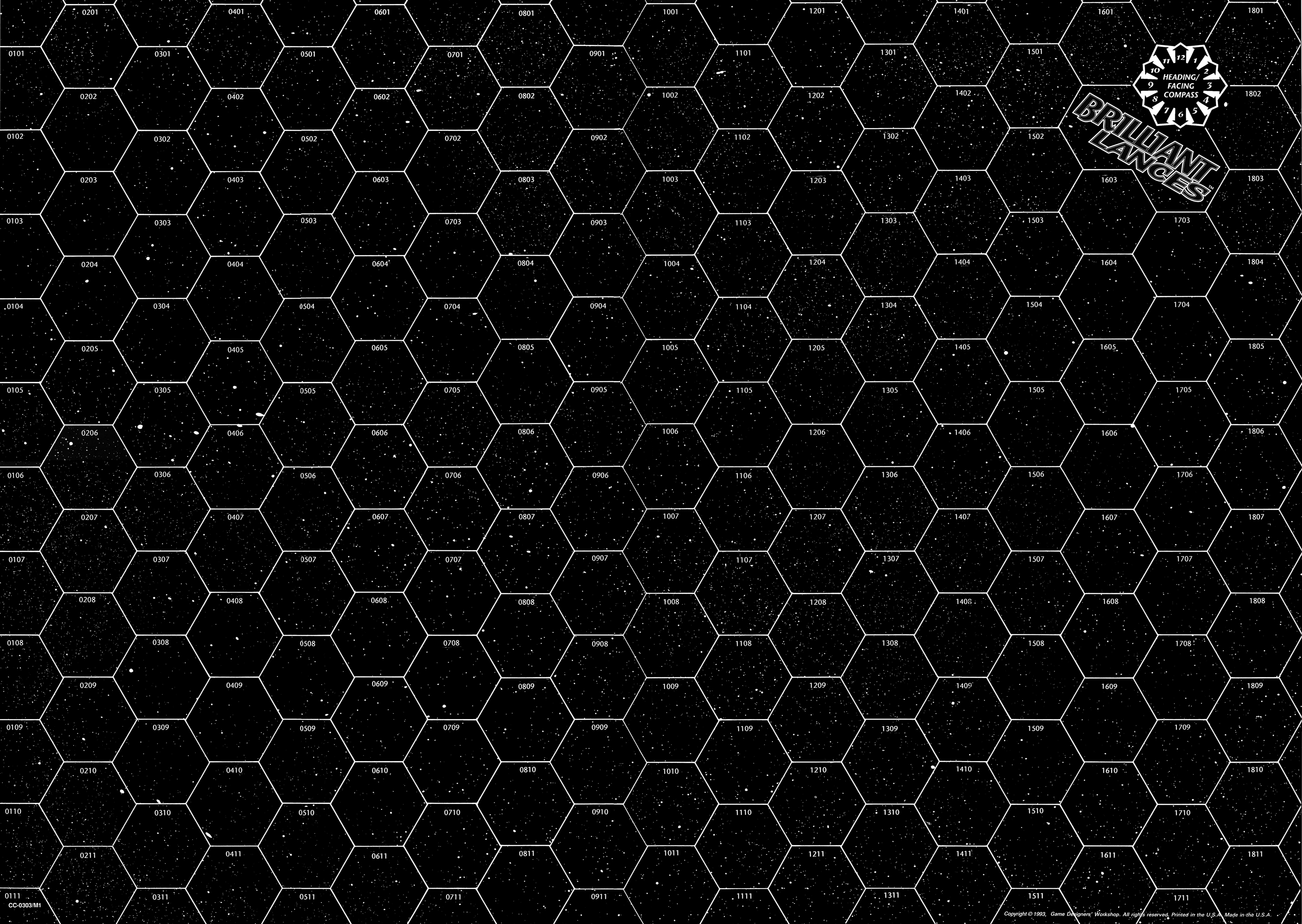
Proportional Movement Guide

Velocity	*Step 1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1	—	—	—	—	M	—	—	—	—	—
2	—	—	M	—	—	—	—	M	—	—
3	—	—	M	—	—	M	—	—	M	—
4	—	M	—	—	M	—	M	—	—	M
5	—	M	—	M	—	M	—	M	—	M
6	M	—	M	—	M	M	—	M	—	M
7	M	—	M	M	—	M	M	—	M	M
8	M	—	M	M	M	M	—	M	M	M
9	M	M	M	M	—	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M

For craft with a velocity greater than 10, use the line for 10 plus the line for velocity in excess of 10. For example, a vessel with velocity 15 uses the 5 and 10 line. In step 1 it moves one hex, step 2 moves two hexes, and so on. Missiles always detonate at closest approach, so that even if one of the vessels moves two hexes in a step, the missile may detonate before the second hex is moved.

Damage Control

# Pers	*System Reset*	*Minor Hit*	*Major Hit*
1	Difficult	Formidable	Impossible
2	Average	Difficult	Formidable
3	Easy	Average	Difficult



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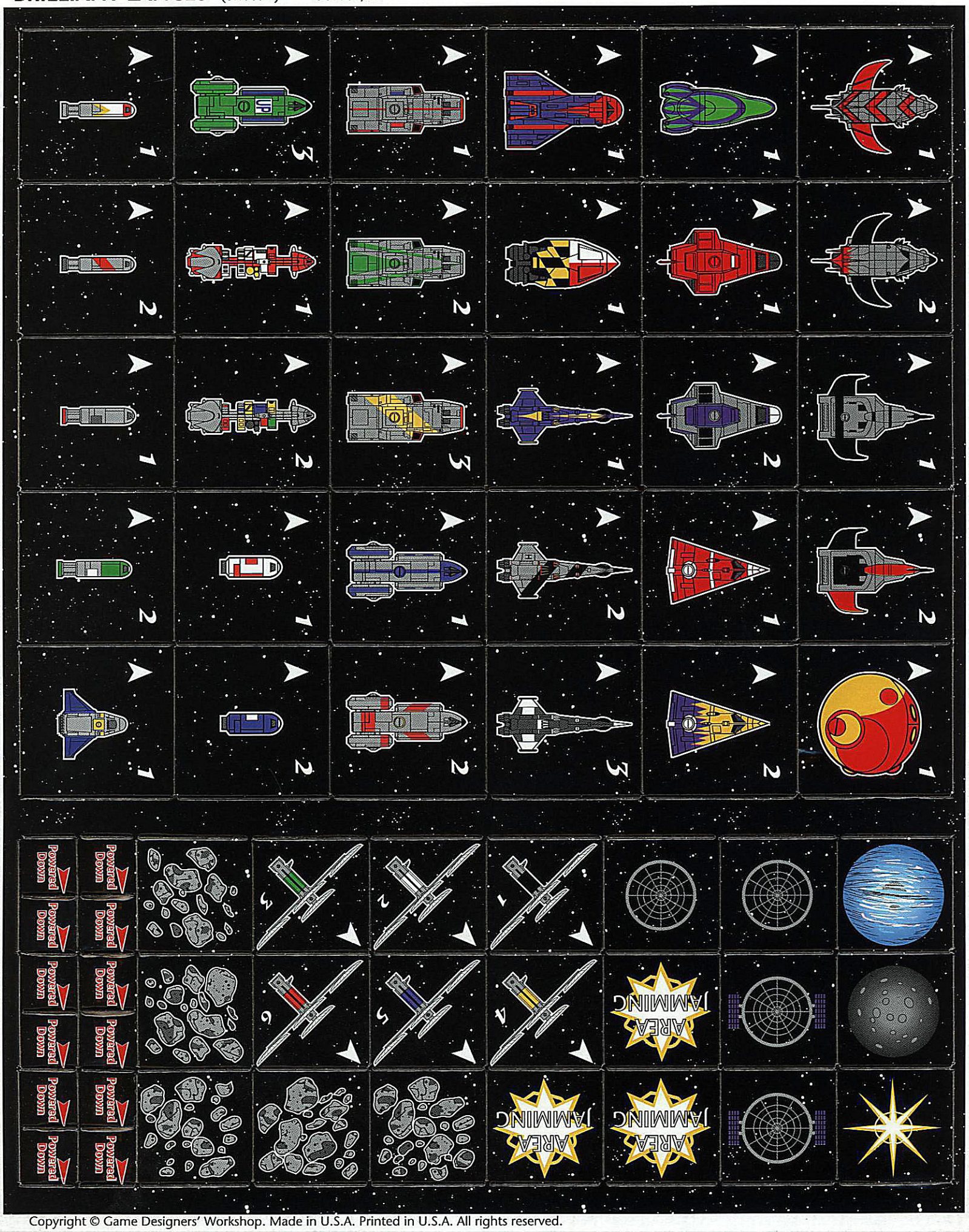

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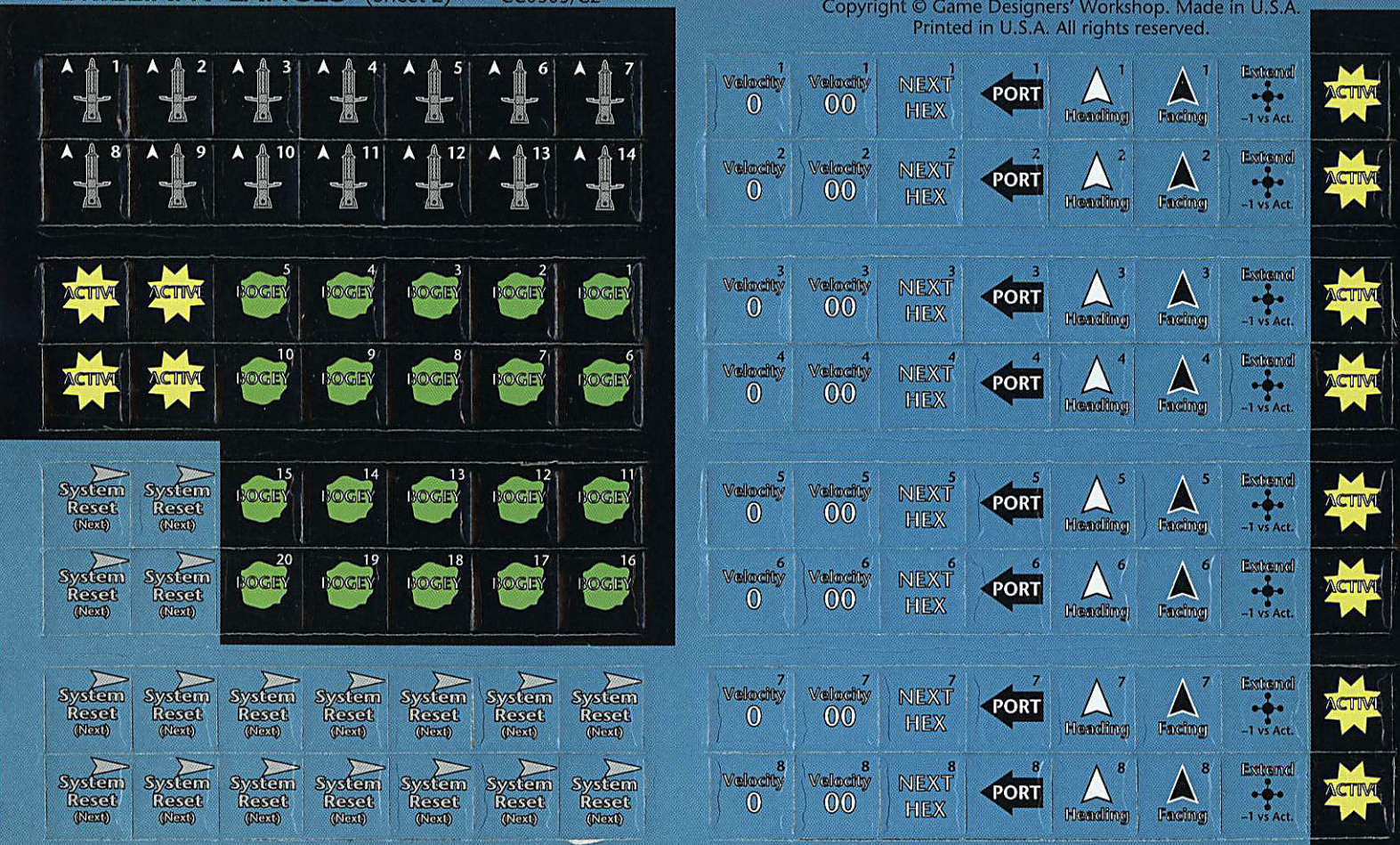

BRILLIANT LANCES (Sheet 2 Back)

PASSIVE	Retract ● No Locks	1 Facing	1 Heading	1 STBD	1 NEXT HEX	1 Velocity 00	1 Velocity 0
PASSIVE	Retract ● No Locks	2 Facing	2 Heading	2 STBD	2 NEXT HEX	2 Velocity 00	2 Velocity 0
PASSIVE	Retract ● No Locks	3 Facing	3 Heading	3 STBD	3 NEXT HEX	3 Velocity 00	3 Velocity 0
PASSIVE	Retract ● No Locks	4 Facing	4 Heading	4 STBD	4 NEXT HEX	4 Velocity 00	4 Velocity 0
PASSIVE	Retract ● No Locks	5 Facing	5 Heading	5 STBD	5 NEXT HEX	5 Velocity 00	5 Velocity 0
PASSIVE	Retract ● No Locks	6 Facing	6 Heading	6 STBD	6 NEXT HEX	6 Velocity 00	6 Velocity 0
PASSIVE	Retract ● No Locks	7 Facing	7 Heading	7 STBD	7 NEXT HEX	7 Velocity 00	7 Velocity 0
PASSIVE	Retract ● No Locks	8 Facing	8 Heading	8 STBD	8 NEXT HEX	8 Velocity 00	8 Velocity 0

WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	
WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	WHITE OUT 1 DIT	
1 LOCK	2 LOCK	3 LOCK	4 LOCK	5 LOCK	PASSIVE	PASSIVE	
6 LOCK	7 LOCK	8 LOCK	9 LOCK	10 LOCK	PASSIVE	PASSIVE	
11 LOCK	12 LOCK	13 LOCK	14 LOCK	15 LOCK	System Reset (Current)	System Reset (Current)	
16 LOCK	17 LOCK	18 LOCK	19 LOCK	20 LOCK	System Reset (Current)	System Reset (Current)	
System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	
System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	System Reset (Current)	

BRILLIANT LANCES™

Deadly beams of pure energy



In space combat, you never see your opponent until it's all over, if even then. With acquisition and tracking ranges measured in tens of thousands of kilometers, to human eyes the people that are trying to kill you are not even a speck. But they can hurt you, even though you can't see them. Precise laser arrays and big particle accelerators, honed by centuries of engineering, can reach out without warning to slit your hull like the belly of a fish, spilling life—oxygen, heat, and fuel—into the hard vacuum.

That's why space combat is a game of cat-and-mouse. Keep yourself wrapped in the mantle of space—cold, dark, silent. Keep your thrust burns to a minimum—they blaze like miniature suns for all to detect. Rig your passive sensors to greedily absorb data, but remain quiet yourself—give nothing away. Keep your weapons ready, in case…There! A faint trace of mid-wavelength infrared betrays a maneuver drive. Bring up the ladar dishes while the big passive array builds up a targeting solution. The moments seem endless while every crewmember shares the same thought: "Have they seen us?" Is the unseen enemy at this moment doing the same thing you are?

You might never know the answer. If you beat him, maybe you'll find out. But what if you hadn't seen him first? Some questions must remain unanswered when death, unbidden, comes scorching toward you as silent, brilliant lances.

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Traveller Starship Combat

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Science Fiction Roleplaying Game

TRAVELLER®
The New Era

0308

BATTLE RIDER™



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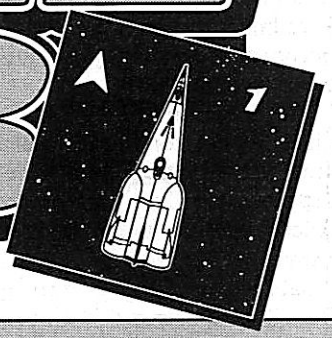
BATTLE RIDER™



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INTRODUCTION

In the 57th century, travel between the stars has long been an accepted fact of life. Starships with powerful jump drives form the basis of interstellar commerce, and the warships that protect that commerce.

But jump drives are bulky and take up volume that could be filled with defensive systems or offensive weaponry. A specialized vessel, optimized for large fleet actions, gained popularity during the Second Imperium and came to completely dominate the fleets of the Third Imperium. These vessels had no jump drives, had nothing in fact not directly related to producing the most effective line-of-battle combatant possible.

They were carried from star to star by huge jump tenders, vessels with little or no combat ability of their own which would release their deadly cargo before the battle started and withdraw to a safe distance. These warships became the very symbol of large fleet actions. Because the warships were carried from star to star, they were called battle riders.

Battle Rider™ is the game of squadron and fleet combat in GDW's **Traveller®** universe. GDW's other space combat boardgame, **Brilliant Lances**, is a detailed and faithful reproduction of individual starship combat, and is very useful for resolving actions between smaller vessels. Because of its level of detail, however, it is unsuited to actions between large groups of vessels. **Battle Rider** undertakes that mission.

COMPONENTS

Battle Rider contains this rules booklet, three 22"x31" maps, three sheets of die-cut cardboard game counters and markers, two reference charts, and several sheets of die-cut game cards. Not included in **Battle Rider**, but necessary for play, are pencils and paper (one each per player).

Battle Rider is one of many games and supplementary products intended for use with the **Traveller: The New Era** science-fiction roleplaying game. However, it is also intended as a stand-alone space combat game, and can be played and enjoyed on its own by players who never intend to play any other **Traveller** products. At many points in the rules below, references are made to concepts detailed elsewhere in the **Traveller** line of materials. While familiarity with these other products may enhance the players' enjoyment of **Battle Rider**, none of these are necessary to understand or play this game. When referring to the **Traveller: The New Era** roleplaying game rulebook, the rules below will sometimes use the abbreviation "TNE."

Rules Booklet: This booklet presents the rules necessary to play **Battle Rider**, as well as the scenarios with which the game is played.

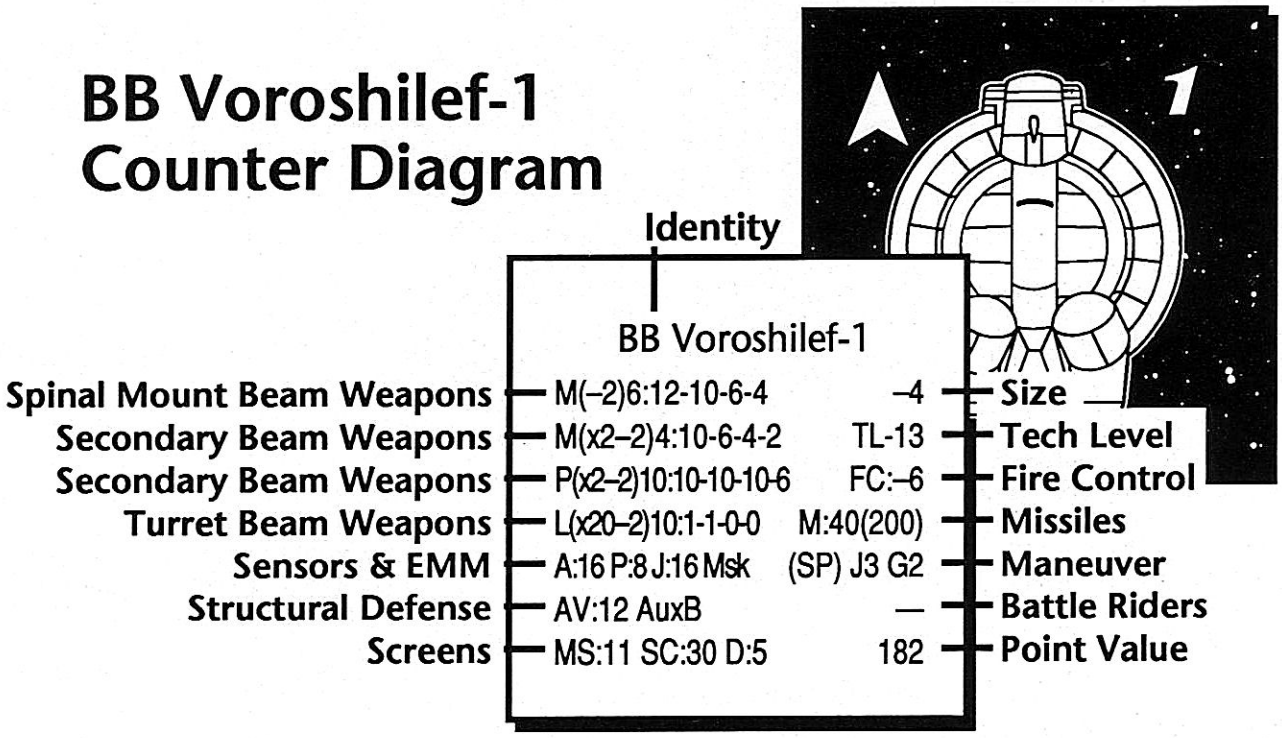
Maps: The three maps are all identical, and portray the vastness of open space within a hexagonal grid which is used to measure distance. Each hexagon measures 30,000 kilometers, or 1/10 of a light-second (the distance that light travels in 1/10 of a second). Note the way that the hexagonal pattern runs off of the map edges.

Unfold the maps and back-fold them against the creases so that they will lie flat. Place the three maps on a table butted up to each other along their short or long edges to form a continuous hexagonal grid.

These maps are duplicates of the maps in the GDW game **Brilliant Lances** and are interchangeable with them. Players who already own **Brilliant Lances** now have a total of six maps to use with either game. Players may also order additional maps from GDW to create as large a playing area as desired.

Counters: The three die-cut counter sheets provide a total of 366 cardboard pieces. Sixty of these are large, measuring 1 1/3 inches square; 42 measure 1 inch square; and the remaining 264 pieces measure 1/2 inch square. These pieces are used in two ways, as "counters" and "markers." A piece which represents a spacecraft, task force, sensor drone, missile, planet, or other object in the game is called a "counter." A marker is a piece which is used to represent the status of certain systems (such as damage or evasion) or conditions on the map (such as Area Jamming and White Out markers).

The ship counters are back-printed with the performance characteristics of the ship. These characteristics are read according to the following diagram:



Identity: Type, class, number.

Beam Weapons: Type (number and/or Diff Mod), close range: damage. Types are lasers (L), particle accelerators (P), and meson guns (M). Numbers of weapons are preceded by an "x" while Diff Mods ignored are preceded by a "–."

Spinal mount beam weapons are long meson guns and particle accelerators mounted along the centerline, or spine, of the ship. If a vessel has two different parallel spinal mount weapons, they are listed in the spinal mount and top secondary beam weapon fields and enclosed in a box. (The *Admiral*-class battle riders, which have both a meson gun and a particle accelerator in the spinal mount position, are examples of this.)

Secondary beam weapons include bay weapons, barbette weapons, and occasionally smaller accelerators mounted radially in a spherical hull ship. (The *Voroshilef*-class battleship is an example of this.)

Turret-mounted beam weapons are lasers usually used as anti-missile weapons.

Sensors: These are listed in the order active sensor (A) and short range, passive sensor (P) and short range, jammer (J) and short range, and electromagnetic masking (Msk). If the passive sensor value is in brackets, the passive sensor array is extendable and retractable.

Structure: The main entry here is the ship's armor value (AV). If the ship has an auxiliary bridge, that is noted here as well.

Screens: These are active defensive systems and are listed in the order meson screen (MS) and value, sandcasters (SC) and number mounted, and nuclear dampers (D) and number mounted.

Size: The number is the size modifier of the vessel. The notation "E" appears on some vessels, but this is used only in the advanced game. (See the Socket Extenders rule, page 19).

Tech Level: The tech level of manufacture.

Fire Control: The number of Diff Mods ignored when firing at a target.

Missiles: If the ship has missiles, the notation "Msl:" will appear here, followed first by the number of missile directors on the ship and then (in parentheses) by the number of ready missiles carried.

Maneuver: This data field covers both interplanetary and interstellar travel capabilities. The first entry (in parentheses) indicates whether the ship can skim (S) and/or process (P) fuel from a gas giant. Next comes the interstellar jump drive (J) capability, if any, and finally the maneuver drive ratings in Gs of acceleration per turn (G). If the G-rating is followed by an asterisk, the vessel has limited maneuver fuel. This has no effect on the basic game, but see the Limited Fuel advanced rule (page 19). The *Gazelle*-class close escort has two jump values separated by a slash, but this has no effect on play of the game.

Battle Riders: This lists the number of battle riders (BR) or light battle riders (BRL) carried by the ship.

Point Value: This is the point value of the ship used for victory determination and and scenario generation. Ships without jump drives have two values separated by a slash. These values differ based on the conditions under which the ship is purchased. See the advanced scenario generation rule (page 19) for a discussion.

Ship Types

BB	Battleship	DD	Destroyer
BR	Battle Rider	DE	Destroyer Escort
BRL	Battle Rider, Light	EC	Escort, Close
BT	Battle Tender	ED	Escort Destroyer
CA	Cruiser, Heavy	LC	Clipper, Combatant
CC	Cruiser, Colonial	LM	Clipper, Multimission
CL	Cruiser, Light	LT	Clipper, Tender
CP	Cruiser, Patrol	MA	Merchant, Armed
CR	Cruiser, Raider	SDB	System Defense Boat
CVM	Corvette, Missile	SM	Sloop, Multimission

Charts: Two identical cardstock charts are included. These are player aids cards printed with frequently used charts for quick reference. Some of these charts appear in the rules booklet, but keep these charts handy as you read the rules.

Cards: The cards included in the game are used to resolve the success of various sensor and combat tasks in the game. Punch out the cards, shuffle them thoroughly, and place the deck face-down by the map.

There are a total of 96 cards in the game. Ninety-five of these have values printed on them and are uniquely numbered from 1 through 95. The remaining card is blank and may be used to create a replacement for a card lost or damaged. A summary of the values printed on all 95 cards is included on page 29 of this book.

BASIC RULES

GENERAL COURSE OF PLAY

Battle Rider is played in scenarios, each of which represents a hostile encounter between two or more spacecraft. A hostile encounter involves detecting the hostile vessel and maneuvering to intercept or avoid it. Combat involves pinpointing targets with fire control sensors, and performing successive attacks (such as missile fire, laser shots, or spinal meson fire) on the located targets.

Task attempts are made at each point in order to obtain sensor locks and hits; the likelihood of success is established and modified by such considerations as range between the attacker and the target, the type of weapon used, the defensive abilities of the target spacecraft, and other factors. If a hit is obtained, the weapon must penetrate the target's screens and active defenses (such as laser fire destroying incoming missiles). Actual success is determined by turning a card and reading its results. The damage inflicted depends on the type of weapon.

The game continues until one side is vanquished, flees, surrenders, or is destroyed.

Definitions

The following terms are used repeatedly in the rules:

Game Turn: The game is played in turns. Each turn represents 30 minutes of elapsed time. Thus, two game turns equal one hour.

Within a single turn, each individual spacecraft is allowed opportunities to maneuver, detect, and attack. Each spacecraft may likewise be detected and attacked by one or more enemy spacecraft as they conduct their turns.

Hex: A hexagonal grid is superimposed over the map to regularize movement and placement of spacecraft. Distance between vessels (used to calculate sensor and weapon range) is measured in hexes, each of which represents an area of space 30,000 kilometers (1/10 of a light-second) from hexside to hexside.

Velocity: The speed of a vessel or missile expressed in hexes per game turn. For reference purposes, a velocity of 1 hex per turn is equal to a speed of 60,000 kilometers per hour.

G: An acceleration of 1G for one game turn (30 minutes). Gs are cumulative; for example, 6 Gs of thrust yields the same final velocity regardless of whether it was generated by accelerating at 1G for six turns, or 6Gs for one turn.

Tasks: All combat activities are resolved as tasks. Each task involves turning a card and comparing the result to a target number. If the card value is equal to or greater than the target number, the task succeeds; if it is less than the target number, the task fails. See the Task Resolution section (page 4) for more details.

Task Force: A group of spacecraft operating together.

Spacecraft: Spacecraft refers to all of the various vehicles that move and fight in **Battle Rider**, and includes starships, small craft, missiles, and sensor drones.

Starships: Starships are the most commonly used type of spacecraft. These are space vessels with interstellar jump drives that allow

them to travel from star system to star system, much faster than light can travel the same distance.

Battle Riders: Large, heavily armed and protected fleet combatants which do not have jump drives fitted.

Manned Craft: This term means a spacecraft that has a living crew (as opposed to missiles and unmanned drones) and refers to both starships and small craft.

Missiles: These are weapons fired from spacecraft that maneuver on the map like other spacecraft, but destroy themselves when attacking their targets.

Drones: These are vehicles that are controlled by an operator from another point, usually a starship. Unlike missiles, drones are not built to be used up with each mission, but are intended to be reused. However, since they have no crew, they can be abandoned or placed at great risk if necessary.

TASK FORCES AND FLEET TACTICS

Combat ships in the game are combined into task forces, and all of the ships in a task force maneuver, evade, and attack together. They are represented on the map by a single Task Force counter until detected. Players may change the composition of task forces during play by detaching or adding ships.

In each scenario, both players will have a specified Fleet Tactics skill level. This skill level is the maximum number of craft which may be placed together in a task force. Players may have fewer craft than this in a task force, but may never have more. There is no limit on the number of task forces in play by either player, except as imposed by the number of ships in play and the level of Fleet Tactics skill.

Dummy Task Forces: Not all task forces need contain ships or sensor drones. Task forces without ships or sensor drones are called "dummy" task forces, and are used to confuse the opposing player. Each side may have dummy task forces in play equal to the Fleet Tactics level of its commander. Note that dummy task forces, once detected and removed from play, can be recreated by splitting them off from another undetected task force. If all task forces are detected, detected dummy task forces cannot be recreated.

TASK RESOLUTION

Every action attempted in **Battle Rider**, whether an evasive maneuver, attempting a sensor lock, or firing a weapon, is a *task*. A task is an attempt by the crewmember operating a particular piece of equipment (maneuver controls, sensors, weapons, etc.) to use his or her skills and training to successfully accomplish the action. The success of these tasks is based upon the difficulty of the task being attempted and the random turn of a card. Success and failure of the task is determined by turning a card and reading the result.

Types of Tasks: Tasks include attempts to detect enemy vessels, obtain sensor locks, jam enemy sensors, fire beam weapons, and defend against enemy fire with defensive screens. Detection, sensor locks, jamming, and fire are range-based tasks, while other tasks are absolute difficulty tasks.

Base Difficulty: The rules below give specific details on the calculations of difficulty in each specific area, but all tasks begin with a base difficulty to which additional difficulty modifiers (often shortened to Diff Mods) are applied, based on specific circumstances. If the task is an absolute difficulty task, its base difficulty is specified in the rules (and repeated on the reference chart). If it is a ranged task, the range at which the task is attempted determines the base difficulty level. Each sensor, jammer, and weapon in the game has a listed range, which is its short range. Medium range is twice short, long is twice medium (i.e., four times short), and extreme is twice long (i.e., eight times short). Base difficulties at these ranges are given in the accompanying table.

Difficulty Level by Range

Range		*Difficulty*
Short		1
Medium	(2×Short)	2
Long	(4×Short)	3
Extreme	(8×Short)	4

Difficulty Modifiers: After the base difficulty level has been determined, difficulty modifiers (Diff Mods) increase or decrease the difficulty of the task. These Diff Mods are explained in the rules covering individual tasks and are summarized on the play aid card. Plus Diff Mods add to the difficulty level, making the task more difficult, while minus Diff Mods subtract from the difficulty level.

Reading the Card: Once the difficulty level of the task has been determined, turn a card and read the result. If the difficulty level is greater than 5, the tasks may not be attempted. Even if the difficulty level of the task is less than 1, a card is still turned. The central field of the card gives the card's success number. If the success number shown is equal to or greater than the task difficulty level, the task succeeds. If it is less than the difficulty level, the task fails.

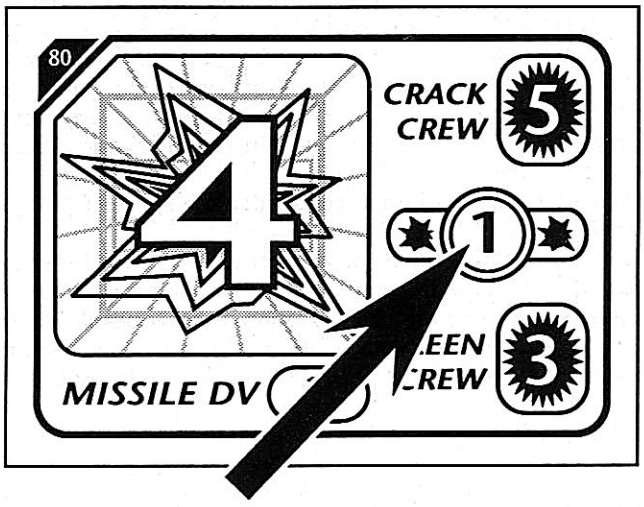
For example, a medium range task with no Diff Mods has a difficulty level of 2. If a 1 is turned the task attempt fails, while if a 2 or higher is turned it succeeds.

Miss: If a "Miss" card is turned, the task attempt fails, even if the difficulty level was less than 1.

Bull's-eye: If a "Bull's-eye" card is turned, the task attempt succeeds.

Outstanding Success: Many tasks have additional beneficial effects from an Outstanding Success result. An Outstanding Success in fire combat, for example, causes double damage.

Two types of cards result in Outstanding Success. First, any "Bull's-eye" card is an Outstanding Success. Second, high-value cards can generate Outstanding Success. Cards with a value of 5 result in an Outstanding Success on tasks with a difficulty level of 2 or less, and cards with a value of 4 result in an Outstanding Success on tasks with a difficulty level of 1. This is noted in the Outstanding Success field of the card (see example below).



Crew Quality: Part of the card deals with success levels when different quality crews man the firing or sensing vessel. These values are used only when playing with the Crew Quality advanced rules (page 18).

Missile Damage: The missile damage field of the card is used to determine the damage levels of missiles. See the Missiles rule (page 12).

SEQUENCE OF PLAY

Each turn of play in **Battle Rider** is broken down into several subturns, called phases, to organize the number of activities that must be conducted each turn. Phases are always conducted in the same order. If, in a later phase, a player remembers something that he meant to do in an earlier phase, it is too late, as the decisions made in each phase affect the decisions in the phases that come later.

Initiative Phase
Operations Phase
Missile Movement Phase
Missile Attack Phase
Turn Record Phase

Initiative Phase

Players turn cards to determine initiative. Each player turns a card and the player whose card has the highest card ID number has the initiative. The player without the initiative launches and/or recovers ordnance, drones, and battle riders (see the Launching rule, below) and reconfigures task forces. After this is done, the player with the initiative does the same.

Reconfiguring task forces means that vessels in a task force may be divided into two or more smaller task forces, and vessels in several different task forces in the same hex may be switched between task forces or combined into fewer larger task forces. However, vessels may only switch from one task force to another, and task forces may only be combined, if both task forces have exactly the same vector (see Movement, below). Also, no task force at the end of the Initiative Phase may have more vessels in it that are allowed by the owning player's Fleet Tactics rating.

Operations Phase

In the Operations Phase, players take turns conducting operation rounds until one player has conducted operations with all of his task forces. The opposing player then conducts operations with all of her remaining task forces.

In each operation round, a player conducts all operations with any one of his task forces. Any task force desired may be used, but each task force may conduct operations only once per game turn.

All ships in the task force conduct all activities, and do so in any order desired. However, all must conduct each activity simultaneously. That is, the task force may fire and then detect, then move, or move and then fire and then detect, but all ships must make the same choice, conducting all fires at the same time, all detection attempts at the same time, and all movement at the same time. The following activities may be conducted in each operation round by each task force, in any order desired:

Move: First, determine whether the ships of the task force will expend Gs on maneuver and/or evasion. If so, place a Thrust marker in the hex with the task force. If the task force is maneuvering, the Projected Endpoint marker of the task force is moved (see the Movement rule, below). If the task force successfully evades, place an Evade marker in the hex.

All ships in a task force must spend the same number of Gs on maneuver and evasion, even if they have different G capabilities.

Detect: First, adjust status of sensors, if desired. (Place or remove Active Sensor marker, place or remove Passive Array marker.) Next, make any detection attempts desired against enemy task forces. See the Detection rule (page 6).

Fire: Ships may only fire at enemy vessels which have been detected (are on the map). First, turn a card to determine if the firing ship has a fire control lock. If so, then turn one card for each firing weapon to see if the weapon hit.

Missile Movement Phase

All missiles move according to the rules of missile movement. Players take turns moving missile spreads, with the player without the initiative moving the first missile spread, until all Missile Spread markers have moved. See the Missiles rule (page 12) for an explanation of the particulars of missile movement.

Missile Attack Phase

All defensive fire against missiles is resolved, and then all surviving missiles attack targets in their hex. All of the defensive fire by one target task force is resolved, and then all of the missile fire at that task force is resolved, before any fire by or at another task force is resolved. Although fire by and at task forces is conducted in order for ease of play, all fire in the Missile Attack Phase is considered to be simultaneous. In other words, ships destroyed or disabled by missile fire early in the phase may still control missile spreads attacking enemy targets later in the phase.

Turn Record Phase

This marks the end of a complete game turn and is a time to take care of certain administrative tasks. All White Out-1, Circuitry Overload-1, and Temporary Damage-1 markers are removed. All White Out-2, Circuitry Overload-2, and Temporary Damage-2 markers flip to the 1 side. All task forces reposition their Projected Endpoint and Previous Position markers as detailed in the Movement rule.

LAUNCHING

Ships can launch and recover battle riders that they are carrying as well as missiles and sensor drones. This takes place during the Initiative Phase of the turn. Battle riders when launched may either become part of the launching ship's task force or form one or more additional task force in the same hex. Missiles are always represented by a Missile Spread marker, placed "undetected" side up. All newly launched battle riders and missiles have the same vector (see Movement rule, below) as the vessel they were launched from.

A ship may (but need not) launch all of its battle riders and/or missiles and/or drones in a single turn.

To recover battle riders, both the tender and the rider must be in the same task force.

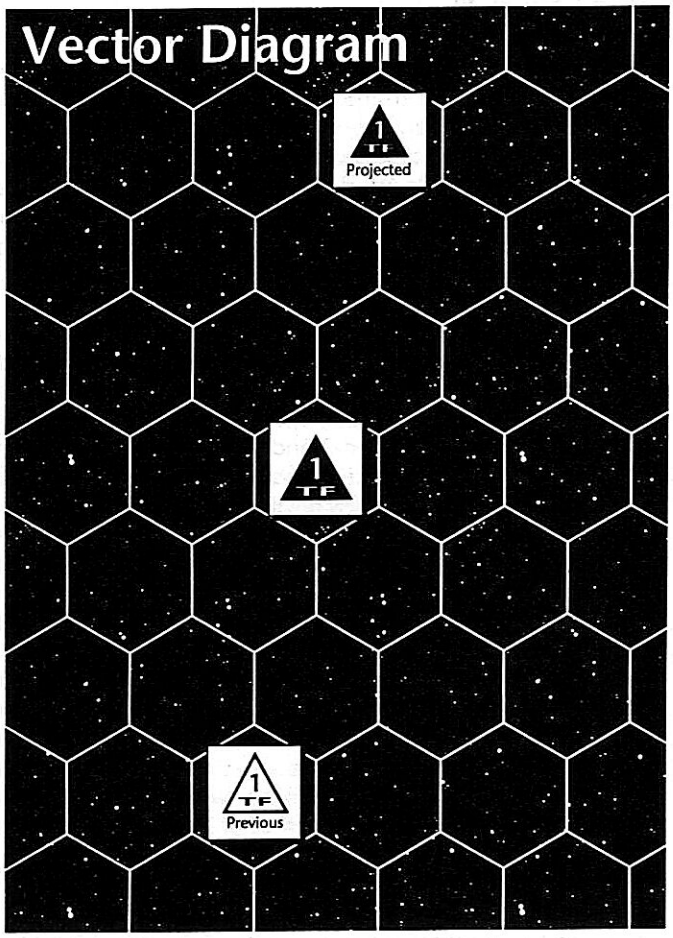
Each tender may only carry the battle riders designed for it. In this game, the following tenders carry the following battle riders:

Tender	*Rider*
Triumph	Gallant
Cleon	Admiral
Maggart	Manticore

MOVEMENT

Battle Rider uses a realistic system of vector movement. Spacecraft move through space due to thrust and inertia. Once a spacecraft has expended thrust to move it in a certain direction, it will continue to coast in that direction forever, unless another force acts upon it, usually meaning until it expends thrust to change its course or speed. A spacecraft's course and speed are called its vector. On Earth, we rarely see pure examples of vectors, because moving objects are acted on by so many other forces such as friction with the ground or air, aerodynamic lift, and gravity. Our intuitive experience tells us that moving objects tend to slow down and stop, and that it's difficult to keep things moving. However, that is only true in the limited area of our planetary frame of reference. In fact, all objects are in motion and remain that way, coasting along at quite high speeds through empty space. Although it might initially seem strange to players who have not played vector games before, it is that reality which **Battle Rider** portrays.

Vectors: A vector is a representation of directional movement. In the game, each ship's vector is represented by its current position and either its former position or Projected Endpoint marker. At the beginning of each turn, a task force's vector is represented by the position of the task force itself and by a task force Projected Endpoint marker. At the end of each turn, a task force's vector is represented by the position of the task force itself and by a task force Previous Position marker.



In the Turn Record Phase of the game turn, the player places the task force's new Projected Endpoint marker on the map and then removes the Previous Position marker. The Projected Endpoint marker will have the same relationship to the Task Force counter as the Task Force counter does to the Previous Position marker. (See illustration above.)

Movement: Each task force begins each game turn (including the first) with a vector as described above. During the Operations Phase, the player will move the task force by replacing the Task Force counter with a Previous Position marker, moving the Task Force counter to the hex containing the Projected Endpoint marker, and then removing the Projected Endpoint marker from the map. Prior to movement, however, the player may alter the position of the projected endpoint by means of maneuver.

Maneuver: During the Operations Phase of each game turn, all players make decisions concerning the movement of their vessels. Each vessel maneuvers by firing its maneuver drive thrusters to change its vector. The power of a craft's thrusters is expressed in Gs of thrust (each of which represents the force of 1 G acting for a period of 30 minutes, or one game turn). Each vessel may spend Gs up to its G-rating on maneuver (to change its vector), evasion (to thwart potential incoming fire), or a combination of the two. Each craft's G-rating is listed on the back of the counter.

Each G of thrust spent on maneuver allows the player to move the projected endpoint of the task force one hex in any direction.

Any ship that does not use its maneuver drive to change its vector during the Operations Phase simply continues to execute the same already existing vector each and every Operations Phase until it is acted on by an outside force (such as the gravity of a large body), or until it exits the map.

Whenever a task force expends 1 or more Gs to maneuver (change its projected endpoint), place a Thrust marker in the map hex with the task force. This Thrust marker is placed on the one hexside which is closest to being in exactly the opposite direction from which the Projected Endpoint marker was moved. If two hexsides are equally close, the opposing player decides which hexside the marker is placed on.

Evasion: Vessels may also expend Gs on erratic, evasive maneuvers in an attempt to throw off enemy sensor and fire tasks, but the total number of Gs spent on maneuver and evasion combined may not exceed the vessel's G-rating. All ships in the task force must spend the same number of Gs on evasion, and one card is turned to determine the success of the entire task force. An evasion attempt has a base difficulty level of 5, but the task is reduced one level of difficulty (–1 Diff Mod) for each G-turn that is spent for evasion. For example, a ship with a G-rating of 5 that spent 3Gs on maneuver and 2 on evasion would have an evasion difficulty level of 3.

One card is turned for evasion during the operation round of the task force. If successful, an Evade +1 marker is placed on the task force. If the card turned indicates an Outstanding Success, the Evade +2 side of the marker is placed on the task force. If the attempt fails, there are no adverse affects (except for the waste of maneuver Gs).

Evasion results apply to all sensor and hit tasks directed against the task force for the rest of that turn and all of the next turn until its next operations round.

Because of the fragility of the structure, no vessel with a folding passive sensor array extended may burn Gs in a turn for evasion. (See Detection, below, for an explanation of folding passive sensor arrays.)

Movement of Dummy Task Forces: Each dummy task force can spend an unlimited number of Gs on maneuver and evasion each turn. (Of course, very large G expenditures will give away the fact that it is a dummy task force and defeat its purpose.)

DETECTION

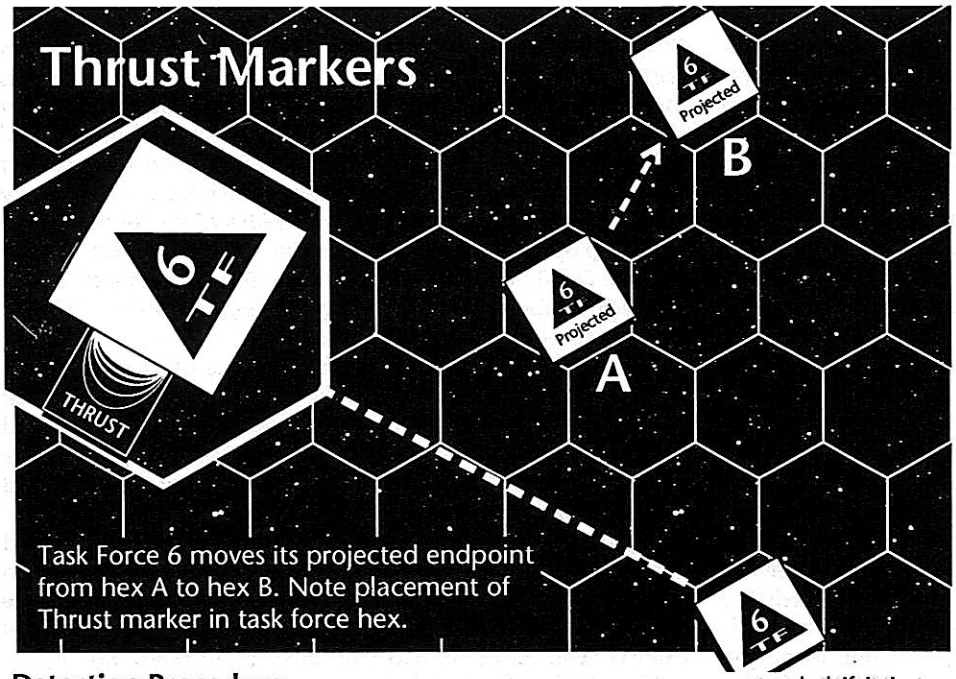
Detecting an unidentified or known enemy target is the single most crucial step in space combat. Until detected, the exact nature of the target is not known. The crew of a starship may be well aware that "something is out there" based on ghost images, thermal hot spots, or flashes of returns on active sensors, but detection is required to identify the target, and more importantly, to do something about it.

At the start of play, all spacecraft are unknowns, whether they are large starships or sensor drones. For this reason, only the Task Force counter is placed on the map until an opponent detects them. The Task Force counter is moved normally using the movement and maneuver rules. This represents the tell-tale indications of something out there that can invite a detection attempt.

Detection attempts are made by spacecraft during the craft's operation round. Once a successful detection attempt is made, the detected spacecraft are placed on the map along with the Task Force counter (which is still required for movement purposes). Once detected, the spacecraft remain on the map for the rest of the scenario.

Types of Sensors: There are two broad types of sensors in the game—active and passive. Active sensors detect targets by sending out pulses of energy, such as radio waves or lasers, which then bounce off their targets and back to the sensor. The time that it takes the pulse to return, the shift in frequency of the pulse, etc., can be used to determine the distance and direction of the target, its motion relative to the sensor, etc. The two major drawbacks of the active sensor are that it broadcasts its own presence by filling space with pulses of energy, and that it requires a lot of power to generate pulses powerful enough to bounce back from very distant targets.

Passive sensors do not betray themselves by emitting energy; rather, they detect targets by sensing the energy given off by those targets. Passive sensors are typically less effective than active sensors in terms of absolute range, but are more tactically useful for ships that wish to remain unnoticed.



Task Force 6 moves its projected endpoint from hex A to hex B. Note placement of Thrust marker in task force hex.

Detection Procedure

Most ships have both an active and a passive sensor, each with different ranges of effectiveness. Once the scenario begins, players may begin to make detection attempts using any of the sensors available to them. Detecting a target is a task with the basic difficulty determined by the range of the target from the sensor, using the sensor range printed on the back of the ship counter. For example, a sensor with listed ranges of 5 would have a basic difficulty of 1 at 0-5 hexes, 2 at 6-10 hexes, 3 at 11-20 hexes, and 4 at 21-40 hexes. Detection could not be attempted beyond 40 hexes. This basic difficulty level can then be modified up or down by other factors as explained below.

All detection attempts are made during the task force's operation round. Each ship may use any or all of its sensors, and may make as many detection attempts as desired, with the limitation that no sensor may attempt to detect the same target (task force) more than once in the same operation round.

Each detection attempt is made against the craft in a task force which is easiest to detect. If successful, the detecting player may attempt to detect the next easiest craft, and so forth, until the player either fails in a detection attempt or determines that there are no additional undetected ships in the task force. This is done by detecting the "sensor shadow" of the task force.

Sensor Shadows: All task forces have a sensor shadow; task forces with no ships in them consist solely of a sensor shadow. The sensor shadow of a task force is treated as a size 0 spacecraft. If a detection attempt against the sensor shadow is successful, the detecting player is told that there are no further ships in the task force; if it is unsuccessful the detecting player is told only that.

A task force with no ships in it (usually a dummy task force, although it could be a task force in which the ships have all been detected and destroyed) is removed from play after its sensor shadow is detected.

Example: The Blue player attempts to detect the ships in Red Task Force 1 (RTF-1). Unknown to the Blue player, RTF-1 consists of only one ship. Blue's first detection attempt is against the easiest target in the TF, which is the ship. It is successful, and so Blue is allowed another detection attempt at the next easiest target. Since the only remaining undetected target is the sensor shadow, the Red player gives the Blue player the Diff Mods for this. The attempt is unsuccessful, and so the Blue player does not know whether there are additional Red ships in the task force. (Had the attempt been successful, the Red player would announce that there are no other ships present.)

In combat, the Red ship is destroyed, but the task force remains in play until the Blue player detects its sensor shadow.

Sensor Status: Before any detection attempts are made, the player decides which sensors each vessel in the task force will use.

Active/Passive: Players decide for each ship whether it will use active or passive sensors, or both. Vessels which have gone active are easier to detect by vessels equipped with direction finders or passive EMS sensors, and so the owning player places an Active marker on each vessel that uses its active sensor. This marker remains in place until the next operation round for that task force.

Folding Sensors: Some vessels are equipped with passive sensors that are noted on the counter back as being folding arrays. Passive sensor ratings printed in brackets are folding arrays. These sensors have large, synthetic aperture collection areas that must be extended on the ends of pylons and struts in order to be used. The passive sensor must be extended if it is to attempt a lock, as it cannot function when retracted. However, the greater target area presented by a vessel with an extended passive array makes it a better target for enemy *active* sensors. Each ship with a folding array must also make an extend/retract decision at the start of each Operations Phase. A marker is also provided for this purpose. On the Extended side, the marker shows a front view schematic of a ship with its array deployed, and the notation "–1 vs. Active." On the Retracted side is the notation that no locks are possible with the passive sensor.

Because of the fragility of the folding struts, no vessel with its folding array extended may burn any Gs in a turn for evasion.

Additional Difficulty Modifiers

The following conditions and circumstances modify the basic difficulty level based on range:

Going Active: A ship which has gone "active" becomes easier to detect for ships equipped with passive sensors. Any ship using passive sensors applies a –1 Diff Mod to detection attempts against an active target.

Target Size: The size of the target is a universally applicable modifier which applies in all sensor and fire tasks. The size modifier for each vessel is printed on the counter back.

Target Maneuver: The basic *passive* detection difficulty levels assume that the target is expending some energy (and hot reaction mass) to maneuver. Thus, a target which has spent any Gs at all in the turn adds no Diff Mod to the passive detection task attempt (except in the case of stern on—see next paragraph). If the target has expended no Gs for any purpose in the current turn, passive detection is one difficulty level harder (+1 Diff Mod). If the target is in "powered down" mode with its systems off-line and its power plant reduced to only a trickle of power, the passive detection is raised by two difficulty levels (+2 Diff Mod).

On the other hand, if the target is expending Gs of thrust and is presenting its stern (and therefore its hot exhaust) toward the sensor, the passive detection is reduced by three difficulty levels (–3 Diff Mod). Trace a line from the detecting ship to the target task force (traced from center of hex to center of hex). If that line crosses the hexside of the target task force which has the Thrust marker on it, the target task force is "presenting its stern."

Target Evasion: If the target task force has an Evasion marker on it, the appropriate addition is made to the difficulty level (+1 or +2, depending on the marker).

Electromagnetic Masking (EMM): Ships which are equipped with electromagnetic masking (EMM) packages reduce the effectiveness of active and passive sensors which are used against them. EMM not only disguises a vessel's passive (heat) signature, it also includes the use of stealthy materials to reduce the echo of active sensor energy, and so EMM on the target provides a +1 Diff Mod for both active and passive detection attempts.

Ships with EMM have the notation "Msk" in the sensor field of the counter back.

Jamming: Vessels may be equipped with jammers which allow them to attempt to jam enemy *active* sensors. These jammers are deceptive jammers, and are different from the area jammers discussed immediately below. Deceptive jammers do not attempt to blot out enemy sensor energy, but deceive enemy sensors by sending back false echoes that fool the enemy sensor about its target's true location/heading, etc.

Jamming tasks, like other ranged tasks, are based on the range in hexes from the jammer to the target of the jamming attempt, as indicated on the ship counter. Additional modifiers to this basic difficulty level are based on tech level (TL) differences between the sensor and the jammer. For each TL that the sensor exceeds the jammer, the jamming task is increased one level in difficulty (+ Diff Mod). For each TL by which the jammer exceeds the sensor, the jamming task is decreased one level in difficulty (– Diff Mod).

A separate task card is turned for each enemy active sensor that the player attempts to jam. The decision to jam is made separately each time an active sensor detection attempt is made, and the jamming card is turned immediately before the detection task card is turned. Success in the jamming task indicates that the opposing sensor is jammed, and attempts its sensor task at one difficulty level higher (+1 Diff Mod). Outstanding Success means that it must attempt at *two* difficulty levels higher (+2 Diff Mod).

A jammer-equipped ship may use deceptive jamming to raise the difficulty level of any detection attempt directed at the task force to which it belongs, including attempts to detect the task force's sensor shadow. If several ships in a task force are equipped with jammers, only one may be used per detection attempt. Ships from one task force may not use their jammers to aid ships from another task force, even if they are both in the same hex.

Area Jamming: Some ships may be equipped with jamming drones. These drones are fitted with energy-intensive broad-band noise jammers. Area jammers are not finesse devices like the above deceptive jammers. Area jammers attempt to defeat enemy sensors merely by drowning out their signals with more powerful electronic noise. The area of affect of an area jammer is the hex it is in plus the six hexes surrounding it. Any sensor "line of sight" (i.e., the straight line traced from the center of the sensor's hex to the center of the target hex) that passes through this area of effect has its difficulty increased by one level (+1 Diff Mod). In the example at right, a sensor in hex A is attempting to detect targets in hexes B, C, and D. Because the lines of sight A-B and A-C pass through the area jammer's area of effect, those sensor tasks are increased by one difficulty level. The sensor task A-D is unaffected by the area jammer.

If the line of sight passes through the overlapping areas of effect of more than one area jammer, the difficulty is increased by one level per area jammer.

Because area jammers are typically mounted on drones, the areas of effect will move from turn to turn. Area jammers may be turned on and off by the owning player at will. The decision is made during the operation round of the task force containing the jammer, and remains in effect until the next operation round of that task force.

Any craft that is carrying an operating area jammer makes itself an easy target for passive detection. Use the rule above for going active, except that the Diff Mod is –2 .

Missile Detonation White Out: When a missile detonates (see the Fire and Combat rules below for a fuller description) in a hex, its nuclear explosion creates a temporary white out effect that makes the use of passive sensors more difficult. Any passive sensor detection attempt into that hex (this does not include attempts whose "line of sight" merely pass through the hex) is one difficulty level higher (+1 Diff Mod) for each missile detonation in the hex. This is easily represented by replacing each detonated missile counter with a White Out marker, and adding up the Diff Mods of the White Out markers in the hex.

White Out-1 and White Out-2 markers have the same effect; the different numbers are merely means of keeping track of when the marker was placed and when to remove it.

"Terrain" Effects: Certain objects in space can also affect the difficulty of a detection attempt. There are two types of interstellar terrain in **Battle Rider:** planets and asteroids, which are represented by counters placed on the map. For a complete discussion of the use of planets and asteroids in **Battle Rider**, see the Advanced Astrographics rule (page 17).

Any craft that is in the same hex as a Planet counter or an Asteroid counter is given the benefit of the doubt that it is maneuvering to take advantage of the object's bulk and passive signature to obscure its own. All sensor tasks attempted against the target are one level more difficult vs. passive and active sensors (+1 Diff Mod).

Black Globes: Black globes are very sophisticated, very rare, and very expensive defensive devices that create a sphere around the defended vessel. Because these screens are so rare, they are not discussed here, but are dealt with in the advanced rules (page 17).

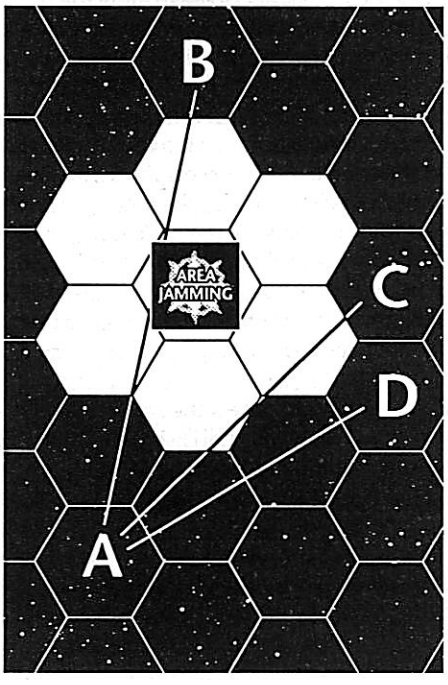
Multiple Effects: The effects described above are all cumulative.

Procedure for Resolving Detection Attempts

The procedure for resolving sensor lock attempts divides the task between the sensing player and the target player, where each is responsible for calculating certain Diff Mods. This not only eases the workload and keeps both players interacting, but also is intended to ensure that information about targets is not revealed to an opponent during the course of resolving an unsuccessful sensor task.

Always start with easiest target in the task force to detect. Then go to harder and harder targets, until a task fails or all targets are detected.

Detecting Player: The player making the detection attempt indicates the target of the attempt and announces to the target player the type of sensor being used: active or passive. If using an active sensor, the detecting player must indicate where the scan is coming from.



When announcing these scans, the detecting player is responsible for calculating the following items which need not be told to the target player.

- Basic difficulty level of the sensor lock attempt based on range (the sensing player must also be careful to not use folding arrays which are in retracted status).

•Diff Mods based on sensor line of sight passing through an area jamming area of effect (+1 Diff Mod per area).

•Diff Mods based on Planet or Asteroid counter in the target hex (+1 Diff Mod).

•Diff Mods based on White Out markers in the target hex (+1 Diff Mod per marker).

•Diff Mods based on target having gone active (–1 Diff Mod for passive detection).

•Diff Mods based on target being a source of area jamming (–2 Diff Mod for passive detection).

•Diff Mods based on the target's maneuver that turn (0, +1, +2, or –3 Diff Mods).

•Diff Mods based on the target's successful evasion attempt that turn (+1 or +2 Diff Mods).

The player aids card recapitulates these items to assist the player in keeping track of them. These items yield one cumulative, net Diff Mod.

Target Player: Once told that his or her ship is the target of a sensor lock attempt, the target player is responsible for reporting to the sensing player the net Diff Mod based on the following criteria.

First, if the sensor attempt is using an active sensor, the target player must decide whether to try to jam the sensor. If so, the target player must announce to the sensing player that the target is jamming and announce the difficulty level of the attempt. The jamming task determination is made by turning a card. The target player then includes the correct jamming Diff Mod in the net Diff Mod reported to the detecting player.

The target player is responsible for the following items:

•Diff Mods based on a successful jamming attempt vs. the sensor (+1 or +2 Diff Mods).

•Diff Mods for spacecraft target size and EM masking packages (printed on the spacecraft counter back) (+1 or +2 Diff Mods for masking).

•Diff Mods for difference in tech levels of the detecting sensor and the target craft. Add the difference in tech levels if the target craft's tech level is higher; subtract the difference if it is lower.

•Diff Mods based on passive array extended (–1 Diff Mod for active detection).

•Diff Mods based on black globe generators (Diff Mod varies with use).

The player aids card presents these items to assist the player in keeping track of them.

Resolution: The target player announces the target net Diff Mod to the detecting player, who then combines it with the sensing net Diff Mod to get the final net Diff Mod. The sensing player then applies this modifier to the basic difficulty level based on range. A card is turned and the the success level compared to the difficulty level.

If the attempt is a success, the target ship is placed on the map in the same hex as the Task Force counter.

Outstanding Success has no additional effect when part of a sensor task.

FIRE AND COMBAT

Fire of virtually all weapons on a vessel takes place during that vessel's operation round. Ships may fire before or after movement, and ships in a task force may split their fire, so that some fire before movement and some after. A ship may itself split its fire, firing some weapons before and some after movement.

Larger ships (those with a size code of –2, –3, –4, or –5) may fire all of their beam weapons in the Operations Phase and then fire all of them again (except for the spinal mount) in the Missile Attack Phase. Smaller ships (those with a code of –1 or more) may fire their weapons in either one phase or the other, but not both. A small vessel may choose to hold fire with its anti-missile lasers to fire later in the Missile Attack Phase. If so, place a Lasers Hold Fire marker on the vessel. If virtually all small vessels of a side are holding fire with their lasers, it may be easier to simply mark those which fired. In this case, use the reverse side of the marker, which is labeled Lasers Fired.

Hits may be negated or reduced in effect by shipboard defenses which include active defenses like sandcasters, and relatively passive defensive screens and armor.

Weapons Types

There are three main types of weapons used in space combat: lasers, particle accelerators, and meson guns. Each of these has differing characteristics.

Lasers use focused beams of coherent light to impart energy to enemy targets over a very small area. Relative to other long-range beam weapons, lasers have good penetration performance, but generate less explosive force and damage. The missiles used in **Battle Rider** are specialized high-performance laser carriers, which power these lasers by detonating a nuclear explosion, thereby destroying itself. All weapons designated L are lasers.

Lasers are little affected by ship armor, but can be blocked by sandcasters and black globes.

Particle accelerators accelerate subatomic particles—almost exclusively neutral atoms such as hydrogen—to very high speeds at enemy targets. These have less penetrative ability than do lasers, but generate a much greater explosive force. Unlike lasers, particle accelerators require long accelerator tunnels, and so most are built as spinal mount weapons, running the entire length of the ship. All weapons designated P are particle accelerators.

Particle accelerators can be blocked by ship armor, sandcasters, and black globes.

Meson guns also accelerate subatomic particles at enemy targets. But in this case the particle is a meson, which does not interact with matter, and therefore passes through all objects without resistance. However, the meson has only a short life, after which it decays into other more destructive particles. By accelerating the meson to relativistic speeds, its subjective passage of time slows, and its decay is delayed. By timing the decay to occur as a group of mesons pass through an enemy ship, powerful explosions can be created within enemy targets without having to penetrate the armor.

Meson guns may only be blocked by meson screens and black globes.

Fire Eligibility

In order to be eligible to fire its weapons at a target, a ship must have a fire control lock on that target. A fire control lock is obtained immediately before firing the ship's first weapon. It is a task performed exactly like detection, using all of the same Diff Mods as detection, but with two additional conditions:

1) Fire control locks may only be attempted against targets which have already been detected (i.e., are physically placed on the map).

2) Fire control locks are conducted with an additional –1 Diff Mod.

If the task is successful, the ship my fire any or all of its weapons at the target. If it fails, no fire at that target is allowed. There is no additional effect from Outstanding Success.

No single weapon may fire more than once in a phase. No weapon rendered inoperative by damage may fire.

Hit Procedure

As with sensor lock and communications tasks, obtaining a hit on a target is a task whose basic difficulty level is based on the range to the target. Basic difficulty levels by range are given on the table at the top of page 10 and are summarized on the reference card.

Difficulty Level by Range

Range		*Difficulty*
Short		1
Medium	(2×Short)	2
Long	(4×Short)	3
Extreme	(8×Short)	4

Additional Diff Mods are applied to this basic level. These are based on target size, target evasion, absolute range, overpowering the weapon, and the use of advanced fire control systems.

Target Size: The target's size provides a Diff Mod that is used when resolving all fire tasks. This Diff Mod is printed on the counter backs.

Target Evasion: Target evasion works in the hit procedure exactly as it does in the sensor lock procedure, detailed above. Remember that the evasion attempt is made in the operation round once for the entire turn, with that result applying to all sensor and hit tasks in the turn.

Absolute Range: The basic difficulty level listed with each weapon is based on that weapon's own fire control system. This difficulty reflects the weapon's ability to accurately direct the weapon's fire at a given point in space over a certain range. However, the range to the target has another affect on hit probability.

When a weapon fires at a target at range R, it is using tracking data that has come from the target (infrared radiation, reflected radar or ladar beams, etc.) over that range R at the speed of light. Assuming the weapon is a laser, it arrives at the target at the speed of light, again passing over the distance R. The time elapsed from when the tracking information left the target and the arrival of the laser fire back at that target is the amount of time that it takes light to travel the distance 2R. If R is a large number, say 300,000 kilometers or one light-second (10 hexes in **Battle Rider** scale), the elapsed time would be two seconds. The target can have moved a long way in two seconds, and a tiny degree of error magnified over 300,000 kilometers makes it very easy to miss that target.

To account for this additional difficulty, take the range to the target in hexes, divide by three, and drop fractions (or see the accompanying table). The result is the number of difficulty level increases (+ Diff Mods) applied to the to hit task.

Diff Mods from Absolute Range

Range in hexes	*Diff Mod*
0-2	—
3-5	+1
6-8	+2
9-11	+3
12-14	+4
15-17	+5
18-20	+6
21-23	+7
24-26	+8
27-29	+9
30-32	+10
33-35	+11
36-38	+12
39-41	+13
42-44	+14

Overpowered Weapons: All weapons can draw more than their normal rated power. Although this does not increase the energy in each shot, it enables the weapon to fire a broader pattern of shots, thus increasing the hit probability.

All weapons can be fired at –1 or –2 Diff Mods by overpowering. Those weapons with overpowering capability designed in, and with sufficient excess power-generating capability, have their overpowering Diff Mods appended in parentheses after the weapon type designator.

For example, a typical meson gun spinal mount might be described as:

M10:6-4-3-2

If designed for routine overpowering to the –2 Diff Mod level, it would be described as:

M(–2)10:6-4-3-2

Weapons designed to be overpowered to the –1 or –2 level may always fire with those Diff Mods without penalty. Weapons not designed with this capability suffer two limitations: power and circuitry.

Power: In order for the ship to fire any weapons at –1 Diff Mod, the ship must forego use of 1G of acceleration that turn. In other words, its total of maneuver and evasion Gs used must be one less than its total G-rating. This allows the ship to fire any and/or all of its weapons at –1 Diff Mod. In order for a ship to fire any weapon at a –2 Diff Mod, the ship must forego use of 2Gs of acceleration that turn, which allows the ship to fire any and/or all of its weapons at a –2 Diff Mod.

Circuitry: Ships not designed to fire at higher power levels may experience firing circuitry overload. A player announces the intention to overpower one or more weapon on a ship before any fire is resolved from that ship and then makes the task attempt to avoid a circuit overload. Avoiding circuitry overload is a task with a fixed difficulty level of 2, and with a +1 Diff Mod applied for every weapon overpowered that turn in excess of the first one. Note that this attempt is made once for the ship, not separately for all weapons on the ship.

If the ship fired at a –1 Diff Mod above its normal capacity, the player turns one card. (This is the case if it fired at a –1 Diff Mod and was not designed for any overpowered fire, or if it fired at a –2 Diff Mod but was designed only for –1 overpowered fire.) If the ship fired at a –2 Diff Mod above its normal capacity, the player turns two cards and must succeed on both attempts for the overall task to succeed. If the task succeeds, the ship fires normally; if it fails, the ship suffers a circuitry overload result. Place a Circuitry Overload-2 marker on the ship.

Ships that suffer a circuitry overload result may not fire any beam weapon for the remainder of that turn and all of the next turn. A ship with overloaded circuits may still launch missiles and use screens.

Fire Control: Most warships are equipped with fire directors. A fire director allows the gunners to fire weapons with an improved chance to hit.

The difficulty level of a fire director-directed fire task is calculated the same as it would be for weapons without fire control. However, when calculating increased difficulty levels due to absolute target range and evasion, the fire director allows the gunner to ignore a certain number of + Diff Mods. The fire control rating of the ship is the number of + Diff Mods it may ignore *on every weapon fired in a turn.* In other words, a ship with a fire control rating of 6 could ignore 6 +Diff Mods on each shot it takes; it does not have to divide the 6 between separate shots.

Fire control may only *counteract* +Diff Mods that apply; it may not *reduce* a base difficulty level.

Resolution: Once the final difficulty level is derived, turn a card and resolve the task. Success indicates that the weapon hit. Outstanding Success indicates that the weapon hit and did double damage. (See Damage, page 11.)

SCREENS

Screens on the target vessel may be used to attack specific "hits" which have been scored. A hit, for purposes of this rule, is the damage caused by one weapon, even if that weapon causes more than one Damage marker to be drawn and placed on the target ship.

Each screen must be directed against a specific "hit," and all weapons firing against a specific hit must be allocated before any are resolved. Although more than one weapon may be directed against a specific hit, if one defensive weapon stops the hit, the others may not then be re-targeted against a different one, nor may additional defenses be allocated against a hit if previous defenses failed.

For each screen directed against a hit, turn a card to make a "screen save." *All screen saves have a base difficulty level of 2.* Diff Mods for different types of screens are detailed below and summarized on the game reference chart.

Sandcasters: Sandcasters fire cannisters of ablative crystals, commonly known as "sand." Each sandcaster contains a generator which creates a field which manipulates the location and shape of the cloud of crystals. At early tech levels, these fields are electromagnetic in nature, and require the use of magnetic sand. More advanced systems are able to supplement and then supplant the magnetic manipulation with gravitic manipulation, which allows the use of more effective non-magnetic crystals.

These clouds are placed in the path of incoming beam weapons, and cause the beam weapon to expend its energy burning through the cloud. The sandcaster operator uses laser warning sensors installed in the sandcaster to detect fire control locks and anticipate incoming beam fire.

Sandcasters may only be used against laser and particle accelerator hits.

Screen save tasks with sandcasters are modified one level up (+1 Diff Mod) for each two tech levels by which the firing beam weapon exceeds the sandcaster, or downward one (–1 Diff Mod) for each two tech levels by which the sandcaster exceeds the beam weapon's tech level.

A successful sandcaster "hit" on a laser or particle accelerator hit reduces its damage value by 1. On an Outstanding Success, its damage value is reduced by 2.

Each sandcaster can only be used against one hit per enemy operation round, but is available to fire again in later operation rounds and in the Missile Attack Phase. Thus it is possible for the coordinated fire of a large enemy task force to overwhelm the defenses of a ship, although several task forces firing at different times have less ability to do so.

Meson Screens: Meson screens project an energy field which interacts with incoming mesons, causing them to decay harmlessly outside of the vessel's hull. Meson screens may only be used against meson gun hits. A meson screen is not directed at a specific meson gun hit; instead, the ship's meson screen automatically protects it against all incoming meson gun hits that turn. As a result, there is no limit to the number of meson gun hits a single screen may protect against.

Screen save tasks with meson screens are modified with +Diff Mods equal to the firing meson gun's damage value (or twice its damage value if it scored an Outstanding Success on its hit task), and with –Diff Mods equal to the meson screens' screen value.

Success indicates that the meson gun "hit" does no damage to the vessel.

Dampers: Nuclear dampers are another form of screen, but are useful solely against missiles, and so are covered in the Missiles rule (see page 12).

Black Globes: These rare defensive screens are not normally encountered, so are discussed in the advanced rules, page 17.

DAMAGE

Once hits are obtained, and they have successfully made it through the target's defenses, determine what systems were damaged and how much actual damage was sustained.

Weapon Damage Performance

Weapons are listed with damage values that are used to calculate the amount of damage they do when they hit a target. These figures vary with range; make sure to use the correct numbers for the range at which the hit was scored.

Calculating Damage Value: The method used to calculate damage inflicted on a target differs depending on the type of weapon being fired. In all cases, if the weapon did double damage (due either to a Bull's-eye card or a Double Damage card), double the damage value before making any of the following calculations.

Lasers: When calculating the damage of a laser (including a missile), subtract the value of any sandcaster hits, subtract the target's armor value divided by 10 (dropping fractions), and add the target's size modifier to the weapon's damage value. (Since most ships have a negative value for a size modifier, adding this will have the effect of reducing the damage value of the weapon.)

Note that lasers have a very high ability to penetrate armor, and this is reflected in the game by dividing armor by 10 and dropping fractions. As no ships in this game have an armor value of 20 or more, as a practical matter it means that ships with an armor value of 10 or more subtract 1 from laser damage while ships with an armor value of 9 or less subtract nothing.

Partide Accelerators: When calculating the damage of a particle accelerator, subtract the value of any sandcaster hits and the target vessel's armor value (AV), and add the target's size modifier to the weapon's damage value.

Meson Guns: When calculating the damage of a meson gun, add the target's size modifier to the weapon's damage value and subtract the value of the defending meson screen.

Note that the meson screen value is only subtracted from the weapon damage value on a *failed* meson screen task attempt. On a successful task, the meson gun shot misses and causes no damage at all.

The meson screen value, when subtracted from the firing weapon's damage value, may never reduce the damage value to less than 0, provided it was greater than 0 after addition/subtraction of target size.

Determining Damage: If the weapon's final damage value is less than 0, it has no effect. If its damage value is exactly 0, draw one Damage marker and treat it as temporary damage (see below). If the damage value is 1 or more, this is the number of permanent damage results the ship suffers.

Temporary Damage: Draw one Damage marker and place it, along with a Temporary Damage-2 marker, on the ship counter. The effects of the damage last for the rest of the turn in which the damage was suffered and throughout the next turn. This represents a less severe version of the damage result in all cases except Ship Explodes results. If a Ship Explodes result is drawn, the target ship is still destroyed and permanently removed from play; replace it with a White Out-2 marker.

Permanent Damage: The weapon's final damage value is the number of permanent damage results the target vessel suffers. Draw this number of Damage markers from the cup and place them on the target vessel. Examine them and return any duplicates to the cup. If a Ship Explodes result is drawn, return all of the markers to the cup, remove the vessel from the map, and replace it with a White Out-2 marker.

In all cases, the Damage markers may be examined by the opposing player.

Damage Results: There are 12 distinct damage results possible.

Bridge Destroyed: The ship's bridge explodes, destroying all controls located there (including maneuvering, astrogation, sensors,

and fire directors) and killing or incapacitating the entire bridge crew. The ship is no longer capable of maneuvering, entering jump, jamming enemy sensors, detecting new targets, or operating screens (meson, damper, or black globe). Weapons may continue to engage targets, but attempt a sensor lock-on at one difficulty level higher (+1 Diff Mod). Ships equipped with an auxiliary bridge may shift control functions there beginning the following turn and so treat the first bridge destroyed result as temporary damage. (The second hit of this type suffered, however, will be permanent.)

Fire Control: Destroyed circuitry and power spikes disable the ship's fire control interface between weapons, sensors, and targeting processors. The ship may not fire any energy weapons, nor may it operate missiles. Ship's screens (sandcasters, nuclear dampers, meson screens) continue to operate.

Power Plant: The power plant is disabled and goes off-line. It may not be repaired or restarted for the duration of the scenario. The ship goes on auxiliary power/batteries. The ship may not maneuver, evade, jam hostile sensors, fire energy weapons, or operate any active sensors or screens (meson, damper, or black globe). The ship may fire missiles and sandcasters and operate passive sensors at +1 Diff Mod.

Sensors: Destroyed circuitry and power spikes disable all sensors. The ship may no longer jam hostile sensors nor make active or passive detection attempts. The ship may still attempt target fire control locks, but does so at +2 Diff Mod.

Life Support: The ship's life support has failed and the hull's integrity has been breached, and the crew must rely on their vacuum suits for survival. All tasks are conducted at +1 Diff Mod.

Ship Explodes: Liquid hydrogen and oxygen escape from shattered storage tanks, combine in the internal spaces of the ship, and explode, setting off a chain reaction with the ship's ordnance and power plant. The vessel is completely destroyed. Replace the ship counter with a White Out-2 marker.

Artificial Gravity: The ship's artificial gravity and G compensators fail. The ship may not spend more than 2Gs to maneuver in the same operation round, and may not evade at all.

Jump Drive: The ship's jump drive is disabled and the ship may not enter jump space.

Maneuver Drive: The ship's maneuver drive is disabled and it may not maneuver or evade.

Spine: The ship suffers serious structural damage that throws the vessel out of alignment. Any spinal mount weapons are rendered inoperative. In addition, the maneuver drive thrust line is no longer centered on the ship's axis of mass, and so any acceleration must be accompanied by constant attitude correction. For each G of maneuver or evasion thrust used, turn a card to test for tumble. Avoiding tumble is a task with a base difficulty of 2, with no Diff Mods. If the task attempt fails, place a Tumble marker on the ship. If 2 or more cards are turned which fail the attempt, place a Severe Tumble marker on the ship.

A ship tumbling (or tumbling severely) immediately becomes a separate task force and continues to tumble until the end of movement in its next operation round. The tumbling ship automatically corrects its tumble at the end of that movement, but may not maneuver or evade in the operation round in which it corrects its tumble.

So long as a ship has a Tumble marker on it, all tasks are performed with a +1 Diff Mod. So long as a ship has a Severe Tumble marker on it, all tasks are performed with a +2 Diff Mod.

Computer: Destroyed circuitry and power spikes disable the ship's data bus and information processing systems. The ship may not launch small craft or enter jump. All other tasks are conducted at one higher difficulty level (+1 Diff Mod).

No Effect: Damage control parties respond rapidly and bring all damaged systems back on line.

MISSILES

All missiles in **Battle Rider** are armed with nuclear-pumped X-ray laser warheads. Missiles maneuver to arrive in or near the hex occupied by the target. Once it is close enough to the enemy, the missile makes final targeting adjustments, then deploys a number of laser-generating rods, and detonates its nuclear warhead. The energy of the nuclear explosion creates high-energy (X-ray) photons within the rods, which are focused along the rods' lengths into X-ray beams which travel to the target, and do damage as normal lasers. Mere milliseconds after firing, the rods are themselves consumed by the nuclear explosion.

Ships which can launch missiles have the necessary game information recorded in the missile field of the counter back. This information always consists of the notation "Msl:" (indicating that the information refers to missiles) followed by two numbers, the second of which is in parentheses. The first number is the number of missile directors the ship has and the second number is the total number of ready missiles carried. The *Voroshilef*, for example, has 40 missile directors and 200 ready missiles.

BB Voroshilef-1
M(–2)6:12-10-6-4 –4
M(x2–2)4:10-6-4-2 TL-13
P(x2–2)10:10-10-10-6 FC:–6
L(x20–2)10:1-1-0-0 M:40(200)
A:16 P:8 J:16 Msk (SP) J3 G2
AV:12 AuxB —
MS:11 SC:30 D:5 182

The missile director value is the number of missiles which may be controlled in a turn. The ready missiles carried is the total number of missiles that the ship may fire throughout a scenario. A ship may launch as many missiles in a turn as the owning player desires (up to the total of ready missiles remaining).



Missiles moving on the map after launch are represented by Missile Spread counters. Each such counter represents all of the missiles fired by a ship in a single turn and with the same vector. If some of the missiles later change vector, a new Missile Spread marker will be placed on the map to represent them.

Missile Spread counters have a detected and an undetected, "Bogey," side. When launched, the undetected side is placed up. Missile spreads are detected as a whole, and have the detection characteristics of a single missile in the spread (target size code of +2). Once a spread is detected, the detected side is turned face up and all missiles in the spread are detected.

Types of Missiles

In the basic game only controlled missiles are used. These are missiles remotely piloted to their target from the launching ship. Semi-independent missiles are covered in the advanced rules (page 18). All controlled missiles have 12Gs of acceleration to expend in movement and have a target size code of +2.

Missile Roster

A missile roster is required to keep track of missile ammunition and the composition of missile spreads on the map. Either photocopy the sheet provided on page 30 of this booklet or use a blank sheet of ruled paper. Record missile spread information on the ruled side of the paper, and on the reverse record missile ammunition information. (This way you only have to deal with one sheet of paper.)

The missile ammunition side of the sheet should have the identity of each ship in play under your command which is equipped with missiles. Write the number of ready missiles after the ship identity (taken from the missile field on the counter or the scenario information, if different from normal availability). Leave room to make hash marks after the ship name to mark of missiles as they are fired.

The missile spread information side should be divided into four columns, labeled "spread," "composition," "G," and "ship."

Launching Missiles

Missiles are launched in the Initiative Phase of the turn. First the player without the initiative launches missiles, then the player with the initiative launches. Launching missiles is done in three steps.

1. Record Missile Spread: On the Missile Spread Sheet, write down the letter code of the Missile Spread counter used (in the "spread" column), the number and type of missiles in the spread (in the "composition" column), and the identity of the ship which fired the spread (in the "ship" column).

Write the number of Gs available to the missiles in the spread in the "G" column. This is the G-rating of a single missile. If missiles of different types are included in a single spread, the lowest G-rating is recorded in the "G" column.

2. Update Missile Ammunition: Mark off the appropriate number of missiles from the firing ship's supply on the missile ammunition side of the Missile Spread Sheet.

3. Place Spread Marker: Place the correct spread marker in the same hex as the task force which contains the firing ship. Place the missile spread's Projected Endpoint marker in the hex containing the task force's Projected Endpoint marker.

Detecting Missiles

Missile Spread counters have a detected and an undetected, "Bogey," side. When initially launched, they are place with their undetected side up, even if launched from a ship which has already been detected.

The opposing player may use sensors to detect missile spreads the same way that they are used to detect task forces. Missile spreads are detected as a whole, and have the detection characteristics of a single missile in the spread. Once a spread is detected, the Missile Spread counter is flipped to its detected side and the owning player must tell the detecting player how many missiles are in the spread (but need not tell what type).

Controlling Missiles

All missile control decisions are made during the Missile Movement Phase. Each player indicates, in turn, which missiles are being controlled and then moves those missiles. A ship controls its own missiles and may not control those launched by a different ship. If a firing ship is destroyed or suffers a fire control hit, remove all of the ship's missile spreads from play. The missile director value of the ship is the number of missiles which it may control in a turn.

Note that a ship can have more missiles in flight at one time than it can control. For example, a ship could launch a large number of missiles a few at a time, and maneuver them to a form a picket line in front of the ship. As it launched more missiles, the missiles that were already in position in the picket line would be allowed to go uncontrolled, and would coast along ahead of the ship, forming a screen until they were needed.

Moving Missiles

Players take turns moving controlled missile spreads in the Missile Movement Phase. All missiles in a spread execute the same move. If player wishes some missiles in a spread to move differently than others, then a new Missile Spread marker is placed in the hex (and a new Missile Endpoint marker) and the missiles of the original spread are divided between the two spreads.

Missiles maneuver by burning Gs of acceleration, just as do ships. The Missile Characteristic chart (on page 18 and on the Player Aid Card) lists the total number of acceleration Gs available to each type of missile, and this should be recorded on the Missile Spread Sheet. As many of these Gs may be expended in a single turn as desired. The number of Gs expended is the number of hexes the controlling player can displace the Projected Endpoint marker of the missile. After the Projected Endpoint marker is displaced, mark of the number of Gs expended on the Missile Spread Sheet, then move the missile spread to its projected endpoint, and then move its Projected Endpoint marker an identical number of hexes to show the new projected endpoint for the next turn. Flip the Projected Endpoint marker over to show that this missile spread has finished its movement for the turn.

If the straight line path of the Missile Spread marker from its starting position to its endpoint ends in or passes through a hex containing a target, the controlling player may declare that the missile spread is attacking that target. Only detected targets may be attacked; undetected missiles and task forces may not. Before moving the missiles, the declaring player must make a fire control lock task attempt from the controlling ship to the target. If this succeeds, the missile spread may attack; if it fails, the spread finishes its projected move without attacking.

If the missile spread will attack the target, place the missile in the hex with the target and then place the missile Projected Endpoint marker as if the target hex were the true final hex of movement. For example, if a missile had a straight-line vector of four hexes but stopped to attack a detected ship after three hexes of movement, the Projected Endpoint marker for the missile would be placed four hexes past the target hex. (This is important for calculating closing velocities, as explained below.)

Once all controlled missile spreads have moved, move all uncontrolled missile spreads. These move exactly like controlled missile spreads, except that they may not burn Gs and may not attack targets they pass or end the move with.

Defensive Fire at Missiles

Detected missiles may be fired at the same as any other detected target in the Operations Phase of the game. However, a special round of last-ditch defensive fire at attacking missiles takes place during the Missile Attack Phase.

All of the defensive fire by one target task force is resolved, and then all of the missile fire at that task force is resolved, before any fire by or at another task force is resolved. Although fire by and at task forces is conducted in order for ease of play, all fire in the Missile Attack Phase is considered to be simultaneous. In other words, ships destroyed or disabled by missile fire early in the phase may still control missile spreads attacking enemy targets later in the phase.

Note that during the Missile Attack Phase ships in a task force may only fire at missiles targeted against it; they may not fire at missiles attacking another task force, even if that task force is in the same hex.

Defensive fire by a task force is resolved in five steps:

1. Target Declaration: The missile-firing player declares the targets of the missiles in each missile spread. The missiles in each spread may be divided among the ships of a task force, but all of the missiles in the spread must attack a single task force. If a large number of missiles are involved, players will find it convenient to make a side note on scratch paper of how many missiles are attacking each ship from each spread.

2. Fire Control Lock: Each ship of the task force must obtain a fire control lock on any missile spread before it can fire at it. If the missile spread has already been detected, this is done normally (and receives the –1 Diff Mod for attempting a fire control lock). If the missiles are undetected, a fire control lock is normally not possible. In this case, however, the ship is allowed a normal detection attempt (without the –1 Diff Mod for the fire control lock attempt) and, if successful, has a fire control lock on the missile spread.

3. Beam Weapon Fire: Beam weapons can be used in a *de facto* defensive role to destroy missiles before they get close enough to fire, and takes place in the short period of time that the missile is deploying its laser rods and making adjustments for its final fire control solution.

Each beam weapon may fire at a single missile (not spread). If more than one beam weapon fires at a single missile, only one firing card is turned. The beam weapon with the best chance of hitting is used, and

each additional beam weapon firing provides a –1 Diff Mod (in addition to any other Diff Mods) to the fire. Any hit on a missile destroys it, and it is removed from play. A missile destroyed by hostile beam fire does not detonate, and so no White Out marker is placed in the hex.

4. Nuclear Damper Fire: Nuclear dampers are based on the manipulation of the so-called strong nuclear force which holds atomic nuclei together. By properly projecting this force onto incoming nuclear warheads, the damper can prevent the warhead from undergoing nuclear or thermonuclear reactions. Nuclear dampers have only enough range to be used within the same hex, and are used against missiles which were not destroyed by beam fire.

It is crucial that the damper remain focused on the warhead long enough to disable it. The base difficulty of the nuclear damper attempt is 2. Diff Mods are based on the closing velocity of the missile. The closing velocity of the missile is the number of hexes from the missile's projected endpoint to the target task force's projected endpoint, including either one (but not both) of the endpoint hexes and using the shortest path between the two markers.

The actual Diff Mods applied vary with the tech level of the damper, and are listed below, and repeated on the game reference chart, as "CV" followed by a number. This means that the missile's closing velocity is divided by that number and the result (dropping fractions) is the number of + Diff Mods applied to the task.

Success indicates that the missile's warhead becomes inert, cannot detonate and fire, and is removed from play. Failure means that the missile is still operational and fires.

Nuclear Damper Diff Mods

Damper TL	+Diff Mod
12	CV/2
13	CV/3
14	CV/4
15	CV/5

5. Sandcaster Fire: The ships of the task force allocate their sandcasters against surviving missiles. Because the target ships can project the incoming path of the missiles with some assurance, no task card is turned; all sandcasters directed against missiles automatically hit and subtract 1 point of damage. Sandcasters may only be used for self-defense by a ship, however; a ship may only direct its sandcasters against missiles targeted against itself, not against other ships in the task force.

Firing Missiles

Once all defensive fire by a task force is completed, surviving missiles fire. Missiles resolve their laser fire using a modified version of the normal fire procedures. Missile lasers do not have short, medium, long, and extreme ranges, but rather have an *absolute range* of 0, meaning that they may only fire at targets in the same hex. This is also considered to be the missile's short range, and so the base difficulty level of missile fire is always 1.

Difficulty is modified by target size and target evasion as normal. However, missiles carry no sensors of their own, and rely on sensor updates from the controlling ship. (For an exception to this, see the advanced rules on semi-independent missiles, page 18). For this reason, the absolute range Diff Mods are calculated based on the range from the controlling ship to the missile's target. As is the case with beam weapon fire, the controlling ship's fire control rating may allow some of these Diff Mods to be ignored.

If a hit is scored, turn another card and read the missile damage value to determine the damage level of the hit. Any damage reduction by sandcasters earlier is now subtracted from the damage value. Whether any missiles hit or not, remove the Missile Spread marker from the map at the end of the phase and replace it with a White Out-2 marker.

SENSOR DRONES

Drones are basically larger missiles which carry sensors and do not blow up, but return to their owning ship to be used again.

Two varieties of drones are covered in this game: tech level 12 dual-mode drones and tech level 14 passive mode drones. Their characteristics are listed below.

Drone Characteristics

TL	*Size*	*G*	*Sensors*	*Points*
12	+1	1	A:4, [P:5]	2
14	+1	1(4)	[P:5]	1

TL: Tech level of availability.

Size: The size Diff Mod and damage modifier for the drone.

G: The allowed Gs of acceleration the drone may expend per turn. The parenthetical notation 4 for the TL-14 drone is the total amount of fuel the drone can expend throughout the scenario. (The TL-12 drone has unlimited fuel.)

Points: These are used for victory determination and scenario generation.

Drones are available in scenarios just as are ships. Each drone is controlled by a single ship of equal or higher tech level, which must be recorded before the start of the scenario. If the controlling ship is destroyed or suffers a bridge hit, the sensor drone is removed from play and lost.

This concludes the basic rules. You are now ready to play **Battle Rider.**

SCENARIOS

Battle Rider is played in scenarios, each of which represents an encounter between two hostile groups of vessels. The scenarios presented in the game are described using the following format:

Name: The scenario number and name.

Description: A short paragraph describing the battle recreated by the game scenario.

Red Fleet: This section lists the ships available to the Red player, gives the Fleet Tactics level of the Red commander, and gives the force's general objective.

Blue Fleet: This gives the same information as above, but for the blue fleet.

Advanced Rules: If any advanced rules are required to play the scenario, they are listed here.

Victory: The specific victory conditions to win the scenarios are given. Victory is often based on points worth of ships destroyed. Note that when calculating victory, a ship is always worth its printed point total. If a ship has two different point totals, it is always worth the lower of the two for victory (even if the scenario required purchase using the higher point total).

Variants: Variants to the scenario usually change the mix of ships available or suggest advanced rules to use. If different ships are available, they are usually purchased with points. When variants (or, in the case of the fourth scenario, the basic scenario itself) rely on points to purchase ships, points will usually be used to purchase Fleet Tactics skill as well. The scenario will assume a Fleet Tactics level of 1 and then will list an additional point cost which must be spent to purchase each additional level of Fleet Tactics (up to a maximum level of 7).

Ships themselves and sensor drones are purchased with the remaining points. Drones are color-coded by side and may be used as any type of drone (provided the correct number of points are paid). Ships must be purchased from the pool of available ships.

Pool of Available Ships: The variant notes may specify the pool of ships available to purchase. If not, all ships are divided into two pools as evenly as possible. First, divide every multi-ship class of vessels in two, dividing them between the two pools. Set aside any single-ship classes and the third ships of any three-ship classes.

Next, divide the remaining ships up. Take the extra *Manticore* and place it with the *Maggart*-class LT and treat them as a single ship. Arrange all remaining ships in descending order of points (counting the *Maggart*-class LT as worth simply its own points). Each player now turns a card and the player who turns the card with the highest card ID number takes the highest point ship (*Sylea*). The opponent takes the next highest ship (*Voroshilef*), and so on until all the ships are in one of the two pools. The two *Maggarts* should be placed together in this sequence so that they end up in different pools.

Other Considerations

A number of general considerations affect all scenarios:

Maps: The three maps will always be placed side by side. Unless otherwise specified, both players will begin the scenario by entering the far opposing map edges.

Task Force Entry: Task forces containing ships and drones enter the map on the first turn and do so with a straight-ahead vector of any value desired by the owning player, so long as it is at least a velocity of 1 and no more than the lowest G-rating in the task force. For example, a task force with a ship with a rating of 3G and another with a rating of 6G could have an initial velocity of 1, 2, or 3. The initial vector must be a straight-ahead course pointed down the grain of the hex grid toward the opposing map edge.

Ships may be divided into task forces in any manner desired, so long as the restrictions of the player's Fleet Tactics skill level are observed. At least one task force must, and all task forces may, enter the map on the first turn of the game. Some task forces may delay their entry, but the owning player must record the turn of entry of each delayed task force, along with its initial velocity, which is subject to the same limitation discussed above.

Exiting the Map: Ships which exit the map are permanently removed from play. If they are capable of entering jump space and if they exit along the map edge that their opponents entered along, they may enter jump space and escape. Ships which exit the sides of the map or which are not capable of entering jump space may not escape and are likely to count toward victory by their opponents (but see the individual scenario victory conditions).

A ship is capable of entering jump space if it has a jump drive, has not suffered a permanent computer, bridge, life support, or jump drive damage result, and has not used any of its jump fuel for maneuver (see the Limited Fuel advanced rule, page 19).

The requirement that escape to jump space must be by means of the opponent's map edge is an abstraction and a necessary artifact of a limited playing area. Players with very large playing areas can instead define a "jump line" beyond which any vessel may enter jump space. Using the Advanced Astrographics rule (page 17), select a planet and then define the 100-diameter distance on the playing surface.

Scenario 1: Skirmish

Light fleet elements often precede the "heavies" into an unknown area to trigger enemy ambushes and secure the area for refueling operations. In the many confused frontier actions toward the end of the Final War, light squadrons of the opposing factions often found themselves thrust into sudden and violent contact.

This scenario is a good one to learn with since both sides are evenly matched and have a wide variety of capabilities.

Red Fleet: Scouting elements, Lucan's 7th Vengeance Fleet

Fleet Tactics: 4

Ships: 1 each of the following classes

CL *Starburst*	DE *Chrysanthemum*
ED *Rapier*	CVM *Valor*
DD *Midu Agashaam*	EC *Fiery*

Objective: Secure the star system by eliminating any enemy resistance encountered.

Blue Fleet: Advanced escort elements, Convoy GX-27 (Margaret's Faction)

Fleet Tactics: 4

Ships: 1 each of the following classes

CL *Starburst*	DE *Chrysanthemum*
ED *Rapier*	CVM *Valor*
DD *Midu Agashaam*	EC *Fiery*

Objective: Secure the star system by eliminating any enemy resistance encountered.

General Information:

Advanced Rules Needed: None

Victory: The last player to have an operational ship on the map is the winner. If both players lose their last operational ship in the same turn, the game is a draw.

Variant: Players secretly purchase their vessels from the available pool of ships. No non-jump-capable ships may be purchased. Both sides have 208 points to spend on vessels and Fleet Tactics. Fleet Tactics level is 1 unless a higher skill is purchased; each increase of 1 (to a maximum of 7) costs 10 points.

Scenario 2: Task Force Dagger

The Reformation Coalition undertook to subdue a extraordinarily large volume of space with very slim resources. Their only hope for success was to use their resources sparingly and always to good effect.

The warlords of the planet Montezuma had been carefully assembling a small fleet of interplanetary combatants designed to protect their world from Star Viking (Reformation Coalition) operations. When word was received on Aubaine that a derelict warship had been recovered from the asteroid belts of Montezuma's star and added to its small fleet, the Assembly decided that it was time to act. A small task force was assembled from whatever vessels could be spared from other duties and sent to Montezuma.

Red Fleet: Task Force Dagger, Reformation Coalition Navy (RCN)

Fleet Tactics: 4

Ships: 1 each of the following classes

LM *Aurora*	SM *Victrix*
LC *Aurora*	2 TL-12 Drones
CR *Ashtabula*	

Objective: Cripple the Montezuman Navy at a minimum cost in friendly vessels.

Blue Fleet: Montezuman High Guard

Fleet Tactics: 1

Ships: 1 each of the following classes

DE *Chrysanthemum*	CP *Patrol Cruiser*
SDB *Shukugan*	EC *Gazelle*
MA *Mary Ellen Carter*	

Objective: Defend the home system and punish any attempt at invasion.

Special Rules: The Montezuman *Chrysanthemum*-class destroyer escort has no missiles loaded and only one of its two spinal mount particle accelerators is operational. Ignore the jump ratings for all Montezuman ships (none are jump-capable) and treat them as having no fire control equipment. In addition, whenever a Montezuman ship suffers a Life Support hit, it may conduct no actions in its next operation round (may not fire, maneuver, or detect) and may not control any missiles in the next Missile Movement and Missile Attack Phases. (The crew is completely occupied trying to find and put on vacuum suits.) Finally, as Montezuman

damage control parties are poorly trained and equipped, return any No Effect damage tokens and keep drawing replacements until a token other than No Effect is drawn.

General Information:

Advanced/Optional Rules Needed: Boarding Actions.

Victory: The scenario ends when one side or the other has no ships remaining on the map capable of attacking with either beam weapons or missiles. To win, the Coalition player must destroy Montezuman ships whose point total is at least 15 *and* is at least twice the point total of Coalition ships lost. A Montezuman ship is destroyed if it suffers a Ship Destroyed result in combat, exits the map, or is successfully boarded and captured by a Coalition ship (see optional Boarding Actions rule, page 25). A Coalition ship is lost if it suffers a Ship Destroyed result or exits the map unable to enter jump space. In addition, any Coalition ship left on the map at the end of the scenario is considered lost unless either it is capable of entering jump space or there are no Montezuman ships left capable of attacking.

Variant 1: The Coalition player places the four ships in a cup, draws one at random, and sets it aside. This ship does not participate in the action. (This variant tips balance toward the Montezuman player.)

Variant 2: Use the advanced rule for Crew Quality (page 18). All Coalition crews are crack and all Montezuman crews are green. (This variant tips balance toward the Coalition player.) Note that variant 1 and 2 can be used together.

Variant 3: Players secretly purchase their vessels from the available pool of ships. The Reformation Coalition pool of available ships includes all those part of Task Force Dagger in the original scenario as well as both *Maggart*-class ships, all three *Manticores*, the *Lancer*, and the *Fusilier*. All other ships worth less than 15 points are in the Montezuman pool.

The Coalition player has 63 points to spend on ships and Fleet Tactics. Fleet Tactics level is 1 unless a higher skill is purchased; each increase of 1 (to a maximum of 7) costs 3 points. If *Manticores* are purchased by the Coalition player, sufficient *Maggarts* must be purchased to transport them.

The Montezuman player automatically has the *Chrysanthemum*-class destroyer escort in the condition described in the basic scenario and has 35 additional points to spend on ships and Fleet Tactics. Fleet Tactics level is 1 unless a higher skill is purchased; each increase of 1 (to a maximum of 7) costs 3 points.

Scenario 3: First Clash

The Reformation Coalition was not alone in its efforts to recover and expand in the vacuum left by the collapse of the Third Imperium. Immediately to coreward, no more than a dozen or so parsecs from the Coalition frontier, lay the fledgling Empire of Solee. Although much smaller than the Coalition in population and worlds controlled, it had the advantage of a large cache of relatively intact Imperial Navy vessels waiting to be repaired and recrewed. Lacking Hiver technical assistance, the process was painstaking and the crews learned by trial and error. But eventually Solee would be able to assemble a nearly irresistible naval presence if left to grow undisturbed. Frontier friction quickly turned to open warfare, and the Coalition's first generation of purpose-built warships received their baptism of fire.

Red Fleet: Task Group 17, Reformation Coalition Navy (RCN)

Fleet Tactics: 4

Ships: 1 each of the following classes

LT *Maggart*	DD *Lancer*
LC *Maggart*	DD *Fusilier*

Plus a total of 3 BRL *Manticores* carried on the *Maggarts* and 2 TL-12 Drones

Objective: Seek out and engage the Soleean Empire's advanced elements and inflict serious damage on them.

Blue Fleet: Cruiser Scouting Detachment 1, Soleean Grand Imperial Fleet

Fleet Tactics: 3

Ships: 1 each of the following classes

CL *Starburst*	DE *Chrysanthemum*
ED *Rapier*	CP Patrol Cruiser
DD *Midu Agashaam*	Plus 2 CVM *Valors*

Objective: Avoid decisive losses from enemy craft while gaining combat experience for the crews.

General Information:

Advanced Rules Needed: Crew Quality. All Coalition crews are crack; all Soleean crews are green.

Victory: The scenario ends when one side or the other has no ships remaining on the map capable of attacking with either beam weapons or missiles.

The Coalition player must destroy Soleean ships whose point total is at least 50 *and* is at least 10 points greater than the point total of all Coalition ships destroyed. A ship is destroyed if it suffers a Ship Destroyed result or exits the map unable to enter jump space. In addition, any ship left on the map at the end of the scenario is considered lost unless either it is capable of entering jump space or there are no enemy ships left capable of attacking.

The Soleean player must avoid the Coalition victory conditions *and* escape with ships whose combined point value is equal to or greater than 25.

Failing a win by either side, the scenario is a draw.

Variant: Players secretly purchase their vessels from the available pool of ships. The Soleean Empire pool of available ships includes all tech level 15 ships except for the CR *Ashtabula*. All remaining ships form the Coalition pool of available ships. Both sides have a total of 167 points to spend on ships and Fleet Tactics. Fleet Tactics level is 1 unless a higher skill is purchased; each increase of 1 (to a maximum of 7) costs 8 points.

If this variant is used, the advanced game scenario purchasing system (including Crew Quality) should be used as well. The Soleean player may only purchase ships with green crews. The Coalition player may purchase ships with crews of any desired quality level.

If *Manticores* are purchased by the Coalition player, sufficient *Maggarts* must be purchased to transport them.

Scenario 4: Battle Royal

When major fleet elements encountered each other with blood on their minds, the resulting battle was usually quick and extraordinarily violent. The following scenario is typical of of a smaller action fought between battle fleets in the closing months of the Final War.

Red and Blue Fleets:

Ships: Both sides purchase their fleets using the point system. Available ships are divided into two pools as described in the scenario main rules above. Both sides have 1200 points with which to purchase ships and Fleet Tactics. Neither side may purchase non-jump-capable ships unless tenders capable of carrying them are also purchased.

Fleet Tactics: Fleet Tactics level is 1 unless a higher skill is purchased; each increase of 1 (to a maximum of 7) costs 60 points.

Objective: Total annihilation of the enemy.

General Information:

Advanced Rules Needed: None, but Crew Quality is recommended. If this advanced rule is used, the advanced rules for fleet purchase should also be used, including costs for crack and green crews.

Victory: The last player to have an operational ship on the map is the winner. If both players lose their last operational ship in the same turn, the game is a draw.

ADVANCED RULES

ADVANCED ASTROGRAPHICS

Gravity

Gravity has very little effect in **Battle Rider.** This is because Gs are measured in whole numbers, and no worlds which fit onto Battle Rider counters extend their 1G field out of their own hex. Larger bodies such as stars and large gas giants would certainly do so, and sample figures are given below. **Battle Rider** does not contain templates for such large bodies, but players should feel free to make their own.

Effects: Any craft that is within the 1G threshold of an astronomical body has 1 G-turn added to its vector each turn in a direction directly at the center of the body. A craft within the 2G threshold has 2 G-turns added to its vector each turn, and so on. These G-turns must be counteracted by the craft's own drives, or else its vector will be bent toward the gravity source.

G thresholds are calculated by using the formula

$$\frac{\sqrt{GM \div g}}{3 \times 10^7} = \text{range in hexes}$$

$G = 6.67 \times 10^{-11}$
M = body's mass in kg
g = 9.8 × G threshold desired

Remember to subtract the body's radius to get the range above its surface to the threshold.

Stars

Stars are far too large to be portrayed in **Battle Rider.** In the **Battle Rider** scale, our sun would have a diameter of 46.5 hexes. Its 1G threshold would extend out another 99.5 hexes from its surface (2G threshold at 63.5 hexes, 3Gs at 47.6, 4Gs at 38 hexes, etc.), and there would be tremendous + Diff Mods against sensor tasks within this area and beyond.

Planets

At the scale and distances from the system's primary star represented in **Battle Rider,** the orbital paths of planets show no curvature and are treated as perfectly straight lines. Planets may be given a heading and velocity in the scenario instructions, and these will not change during play for any reason.

The planets represented by counters in **Battle Rider** are Terra-size worlds, as even small gas giants take up multiple hexes.

Take-Off and Landing: Any ship that wishes to land on a planet must first match vectors with it in the same hex. This means that craft must spend one game turn in which their movement from hex to hex is identical to that of the planet. On the first game turn following, the craft can announce that it is landing, which takes the entire turn. Craft which are landed on a world have a +2 Diff Mod applied to sensor tasks against them if the world has an atmosphere of Very Thin or less, +3 if the atmosphere is Thin or greater, and +4 if the atmosphere is Exotic, Corrosive, or Insidious. In addition, any craft landed on a planet with a Hydrographic rating of 1 or more may declare that it is underwater, in which case an additional +1 Diff Mod is applied.

Taking off from a Terra-sized planet also takes a full turn. At the end of this turn, the craft has a vector identical to that of the planet.

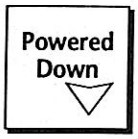
Sample Planets: To assist players in designing their own scenarios, the following planetary statistics from our own Solar System are presented in **Battle Rider** terms as examples. 1G threshold is given in hexes beyond the planet's surface. Velocity is orbital velocity, and has nothing to do with the rate that our entire Solar System is scorching around the core of the Milky Way (12 hexes per turn, in BR scale, is our "local standard of rest").

Planet	*Diameter in hexes*	*1G Threshold*	*Velocity in hexes per turn*
Mercury	0.16	Below surface	2.87
Venus	0.40	Below surface	2.1
Earth	0.43	Surface	1.787
Mars	0.23	Below surface	1.45
Jupiter	4.76	1.4 hexes	0.78
Saturn	4.00	0.07 hexes	0.58
Uranus	1.86	Below surface	0.41
Neptune	1.62	0.07 hexes	0.33

There are two equally valid ways to handle planetary (and asteroid belt) motion in **Battle Rider.** One is to have the maps represent a motionless chunk of space and have the astronomical bodies move across them at their appointed rates. Another is to pick the planet or asteroid belt as the frame of reference so that they remain motionless and drag the visual window represented by the map along with them. Both are perfectly correct, but the latter is usually much easier.

POWERED DOWN

A ship which is in cold mode, with its power plant powered down to minimal levels (assume 1% of maximum power plant output), presents a very difficult target to passive sensors. Ships which are powered down have a +2 Diff Mod applied against attempts to detect them using passive sensors.





Ships which are powered down may not maneuver, jam hostile sensors, fire energy weapons, nor operate any active sensors or screens (meson, damper, or black globe). The ship may fire missiles and sandcasters and operate passive sensors at +1 Diff Mod.

However, this tactic can backfire if the ship has to start up quickly. To bring the power plant up to full power normally requires a full 30 minutes, leaving the vessel vulnerable for an entire turn. To show this, a Powering Up marker is placed on the ship at the start of its operation round, and the marker is removed at the start of its next operation round. While powering up, the ship suffers all of the limitations of being powered down, but does not enjoy the +1 Diff Mod against passive detection attempts.

Rather than waiting, the player may attempt a crash start-up. A crash start-up is a task with a difficulty level of 4. Success indicates that the power plant is immediately on-line, while failure indicates that the ship will have to wait the full turn to power up.

BLACK GLOBES

Black globes are highly sophisticated and exotic defensive screens. Even at the height of the Third Imperium's technology, only the most basic black globe screens could be reproduced. The best black globes in use were recovered relics from an ancient civilization that pre-dated humanity's starfaring days. Thus black globes are only rarely encountered.





Although these weapons are very advanced from an engineering and scientific standpoint, their use is very simple. Black globe generators create a spherical field around themselves which absorbs all energy that crosses it. This energy is shunted into capacitors within the hull of the protected vessel where it is stored. This screen can be also set to flicker at a set percentage rate in multiples of 10%. (The

single ship with a black globe in **Battle Rider,** *Kinunir,* has only one flicker rate for its black globe: 10%.)

The decision to turn the black globe off, turn it on to full, or set it to flicker is made at the start of the vessel's peration round, and is marked with one of the counters provided.

Combat: When set all the way up, the black globe absorbs the energy of all weapons which successfully rolled to hit the target. For example, each hit from a 7 damage value meson gun would place 7 DP into the capacitors of the protected ship.

When the weapon is set to flicker, all weapons which successfully made "hits" then determine if they were absorbed by the globe or passed through to hit the target normally. For each hit, turn a card. If the last digit of the card's identity number is higher than the flicker rate divided by 10 (i.e., turn a 2+ to get through 10% flicker), the hit penetrates the black globe and does full damage. Hits which do not penetrate are completely absorbed.

Outgoing fire is not affected, as it is synchronized to match the flicker.

Capacitors installed aboard the ship will have a listed capacity in damage points. If this limit is ever exceeded, the capacitors spontaneously discharge. Turn two Missile Damage cards, add the results, and inflict that number of damage results on the vessel, plus the vessel automatically suffers both a power plant and jump drive critical hit.

When set to flicker, the only fire which can overpower the capacitors is fire whose damage value exceeds the capacitor's storage level. That is, a ship with a flickering black globe and a size-9 capacitor can take an unlimited number of hits with a damage value of 9 or less during a turn, but a single hit with a damage value of 10 or more will overload the capacitors.

While the screen is completely up, the capacitors can be overloaded in the way described above, or they can be overloaded by cumulative energy. In each operation round in which the globe is completely up and in which the ship is hit by at least one weapon with a damage value of 2 or more, the capacitor value of the shield is reduced by 1. Note that this reduction makes it easier for weapons to overpower the screen in later operation rounds. This reduction is made regardless of how many or how few weapons hit. The reduction is in effect until the vessel turns off its black globe completely. Incoming sensor and communicator energy absorbed by the black globe is considered to be negligible.

Kinunir's capacity is 10 damage points.

Maneuver: When its globe is all the way up, a vessel cannot maneuver to change its vector or attempt to evade. When the black globes available in this game are set to flicker, they allow normal maneuver.

Sensors: A vessel with its black globe fully up may not detect targets or make fire control lock attempts.

Detection and fire control lock attempts against a full-up black globe have a +5 Diff Mod vs. active sensors and a +3 Diff Mod vs. passive sensors for the black globe, and the only additional Diff Mods that apply are those for target size, fire control lock, terrain, area jamming, and white out.

Detection and fire control lock attempts against a flickering black globe (as well detection and fire control lock attempts by ships using flickering black globe) use all of the standard sensor lock Diff Mods, with the addition of the black globe flicker Diff Mods. For both active and passive sensors, divide the flicker rate by 30 and round to the nearest whole number to get + Diff Mods. Thus, 10% is 0 Diff Mod, 20-40% is +1 Diff Mod, 50-70% is +2 Diff Mod, and 80-90% is +3 Diff Mod.

As with normal detection tasks, the target player is responsible for calculating certain of the Diff Mods for the task, but the emissions signatures of a flickering black globe are distinctive enough that anyone who attempts to detect a flickering black globe should be given that information whether the attempt is successful or not.

SEMI-INDEPENDENT MISSILES

Missiles which carry their own sensors but which are still controlled by their firing gunner (as discussed in the basic rules above) are referred to as semi-independent missiles (SIMs). SIMs may attempt to detect targets just like spacecraft, but only controlled SIMs may do so and each SIM may only make one detection attempt per turn. This detection attempt is either before or after the missile moves, at the owning player's option.

When SIMs fire, they may attempt a fire control lock with their own sensor instead of the firing ship's. If successful, the absolute range Diff Mod is based only on the range from the SIM to the target. If unsuccessful, the missile may still fire, but a fire control lock from the controlling ship is necessary and absolute range Diff Mods are calculated from the controller to the target just like normal missiles.

There are two types of semi-independent missiles: tech level 12 and tech level 14. Characteristics of these, plus the basic controlled missiles, are listed below and on the Player Aid Card for ease of use during play. The table below lists their maneuver characteristics in total G-turns, the size modifier of the missile, and the sensor rating of the missile (if any).

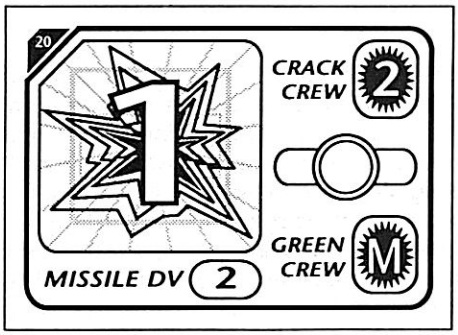
Missile Characteristics Chart

Type	*Gs*	*Size*	*Sensor*
Controlled Missile	G:12	+2	—
TL-12 Semi-Ind	G:9	+2	P:1
TL-14 Semi-Ind	G:7	+2	P:3

CREW QUALITY

All task attempts in the basic game assume an average crew quality. Exceptional crews are capable of much more, while untrained or inexperienced crews tend to fail more often. In the game this difference is expressed by terming a crew "crack" or "green."

Average crews (the majority) use the task cards normally. Crack and green crews do as well, except when a different value appears in the crack or green crew fields. In this case, the value shown there is used instead.



For example, if a player attempts a task with a difficulty level of 2 and draws card with a value of 1, the task fails. If, however, the ship attempting the task had a crack crew *and* the card drawn had a value of 2 in the crack crew data field (see example above), the task would succeed.

By the same token, a task with a difficulty of 1 would normally succeed if the illustrated card were drawn, but would fail if it were drawn by a green crew.

A card with a bull's-eye result in the crack crew data field is treated like a bull's-eye in all respects when drawn by a crack crew, including causing double damage.

MULTIPLE FIRING BATTERIES

Very large ships (those with a size value of –2, –3, –4, or –5) mount more weapons than can be brought to bear in a single direction. The ratings provided on the ship counter for all dampers, sandcasters, and beam weapons (except spinal mounts), are actually the values for a single "battery" of weapons. Each ship has batteries equal to the absolute value of of its size value (except that vessels with a size code of +2 and 0 both have only a single battery.)

A battery is the maximum number of weapons which may fire through a single hexside, or fire at missiles entering the ship's hex across a single hexside. A ship may split the fire of battery between several hexsides, but may not fire more than a battery through a hexside in a phase.

Each ship may fire each battery once per game turn. Some or all batteries may fire during the Operations Phase and then the remainder may fire during the Missile Attack Phase. (This is abstracted in the basic game by allowing ships with one battery to fire in either phase and allowing ships with two or more batteries to fire once in each phase.) Players must keep track of how many batteries fired in the Operations Phase so that they know how many remain to fire in the Missile Attack Phase.

All nuclear dampers from all batteries are assumed to be available for fire in the Missile Attack Phase.

Note that spinal mounts are not part of any battery and are not affected by this rule in any way.

SOCKET EXTENDERS

Some vessels mount their weapons on socket extenders to allow more of them to bear on a target at one time. These vessels have the notation "E" following their size codes. Socket extenders have the following effects:

Batteries: Ships with socket extenders may fire two batteries through each hexside instead of only one.

Detection: Ships with socket extenders subtract 1 from their size rating (–2 becomes –3, for example) when the opposing player makes active detection attempts against them.

LIMITED FUEL

Some ships, marked with an asterisk following their G-rating, have only limited maneuver fuel. At the start of the scenario, draw three cards and add the missile damage values from the cards together. The result is the number of G-turns of maneuver fuel carried in the ship. Repeat this for each ship with limited fuel in the scenario.

Each time that a ship expends a G for thrust or evasion, the owning player marks off a G-turn of maneuver fuel. If, for example, a ship expended 2Gs for maneuver and 3Gs for evasion in an Operations Phase, the owning player would mark off a total of 5 G-turns of maneuver fuel.

Once a ship's maneuver fuel is expended, it may not expend any more maneuver or evasion Gs without consuming the reserve of fuel necessary to make an interstellar jump. In some scenarios this will not matter, but if the ship needs the capability to jump out of system to escape this can be crucial.

CROSSING MOVEMENT

Crossing movement occurs when a task force moves between a ship and its intended target, whether the target is the object of a detection attempt or actual fire combat. A detection or fire attempt is affected by crossing movement when the line from the detecting/firing ship to the target passes through the imaginary line connecting a Task Force counter (friendly or enemy) with either its Projected Endpoint marker or its Previous Position marker, whichever is currently on the map.

Note that movement by the firing/detecting task force and the target are never considered crossing movement.

All tasks affected by crossing movement are subject to a +1 Diff Mod. Tasks which are subject to crossing movement due to more than one task force suffer a cumulative +1 Diff Mod per crossing task force.

ADVANCED TECH LEVEL EFFECTS

Here are two additional tech level effects which add color to the game but were not appropriate to the basic game rules.

Sandcasters: Tech level 15 sandcasters which hit negate 2 points of laser or particle accelerator damage instead of 1. Outstanding Success negates 4 points of damage.

Going Active: In the basic game there is a –1 Diff Mod on attempts to use passive sensors to detect ships which are using their active sensors. In the advanced game, this Diff Mod is applied only if the detecting ship is from a tech level equal to or higher than the active ship.

ADVANCED SCENARIO GENERATION

The advanced scenario generation system is designed to provide a nearly limitless selection of game situations for players, as well as inserting a strong dose of uncertainty in each scenario. The advanced scenarios assume two "pocket empires," comparatively small clusters of worlds in close proximity to each other but surrounded by the "Wilds," the vast, devastated and technologically regressed area of settled space that constitutes the bulk of the ruins of the old Third Imperium.

The two pocket empires have come into contact with each other and are engaged in low-level border fighting, struggling for naval supremacy while also engaged in diplomatic maneuvering with each other and with the few remaining interstellar mercantile interests.

The slowness of communication, the lack of reliable intelligence about the opponent, and the frequent misunderstandings as to motives of enemies and neutrals, makes the situation fraught with uncertainty, especially for the local naval commanders who have to wage an increasingly violent war almost in the dark.

Sides: The two sides, red and blue, divide the ships in the game into two pools of available ships, just as described in the basic game's scenario section, with one exception: All four extra *Gallant*-class battle riders and both *Shukugan*-class system defense boats are automatically assigned to the Blue pool of available ships.

Although the initiative shifts between the two pocket empires, with first one and then the other engaged in offensive acts, for scenario purposes the Red side will always represent the intruder while the Blue side will always represent the native, or defending, player.

Astrographic Bodies: Place the planet and four asteroids on the map at the beginning of each scenario. Place the planet in hex 1010 of the map closest to the blue entry edge. In all scenarios, the Blue player will start with ships on or near the planet, and it will often be the focus of activity in the scenario. The Blue player then places two asteroids in any hex of the central map. Finally, the Red player places the remaining two asteroids in any two hexes of the map containing the planet, but at least four hexes away from it.

Set-Up: The Red player always enters the map with at least one task force on turn 1, and may enter all task forces on that turn or later turns. (The Red player follows the basic game's scenario instructions for entry.) The Blue player may place her task forces landed on the planet, in orbit, stationary in any asteroid hex, or anywhere within five hexes of the planet with an initial vector of one hex per turn in any direction. Some Blue forces may be held off-map for entry later if the mission instructions so specify.

Missions: Each player has 10 numbered Mission markers. To prepare for play, each player draws one Mission marker from the mix and reads the mission statement given below. For ease of scenario preparation, we encourage players to photocopy these mission descriptions so each player has a copy (and hereby give specific permission to do so for this purpose).

Each mission consists of a general description of the player's objectives, a point total to spend on ships and other assets, and a precise statement of victory conditions for the scenario.

The base point values below are for medium-sized scenarios. For larger scenarios, double the points. (For really insane scenarios, triple them.)

Spending Points: Points may be spent for ships and to purchase higher levels of Fleet Tactics skill. The assumed Fleet Tactics level of a side is 1, and each additional level of tactics costs 5% (round fractions to the nearest whole number) of the total points available, up to a maximum Fleet Tactics level of 7.

Ships may be purchased by spending the points printed on the vessel. The Red player may not purchase battle riders without also purchasing tenders sufficient to carry them. The Blue player may purchase battle riders without tenders, but if so must pay the second (higher) price for them. (If purchased with tenders the lower price is paid.)

Ships may be purchased with SIMs instead of regular missiles. A ship carrying SIMs has its price multiplied by 1.05 if half of its missiles are SIMs and by 1.1 if all of its missiles are SIMs. A ship may not carry SIMs from a higher tech level than the ship's own tech level.

Drones may also be purchased for the points listed in the basic rules. Each drone must be assigned to a specific ship, and may not be assigned to a ship of a lower tech level than the drone itself.

Crew Skill: The base purchase price of the ship assumes an average crew. Individual ships may be purchased with crack or green crews at different prices. If purchased with a crack crew, multiply the ship's point value by 1.2. If purchased with a green crew, multiply the ship's point value by 0.8.

Victory and the Turn Record: If only one side fulfills its victory conditions, that side wins and the opposing side loses. If neither side fulfills its victory conditions, both sides lose (the scenario is a draw).

Many scenario victory conditions are dependent on the point level of the opponent, which is not known until after the scenario is over. As a result, it is possible for one side to win and not know it until much later, and it is sometimes possible for both sides to win. As a result, a complete turn record should be kept. At the end of each turn make a check mark after the turn number. If any ships escaped or were destroyed during the turn, record the name and side by the turn number. Likewise, if a successful bombardment was carried out or if a covert team was recovered, record that here as well. If both sides fulfill their victory conditions, the winner is the side which did so first, which can be established by consulting the written turn record.

Intruder (Red) Missions

1. Command of the Spaceways

Mission: Your fleet is to crush all enemy naval opposition in the system as a prelude to further advances on the enemy home system. The planet itself is unimportant and can be bypassed, but all enemy ships must be destroyed. If any enemy vessels escape, you lose.

Points: 500

2. Invade and Secure

Mission: Your fleet is to bombard the planet surface and then land a substantial force of ground troops to seize the key ground installations necessary to control the planet. A total of four turns of bombardment must precede the landing of assault troops, each turn consisting of 10 missiles fired from orbit at the planet surface.

Following bombardment, ground troops may be landed. Only ships with a size code of –3 or –4 may land ground troops. Each size –3 ship in orbit lands one ground troop per turn. Each size –4 ship lands three ground troops per turn. In the Missile Attack Phase of each turn, local ground troops fight back by turning one card and subtracting the missile damage shown from the total number of ground troops landed so far. The invasion succeeds when the cumulative total of landed ground troops (minus casualties) reaches 20. Invasion success is determined during the Initiative Phase of each turn.

Points: 450

3. Probing Attack

Mission: Your fleet is to test the enemy defenses and, if a weak spot is found, press hard. If you have more points than the enemy, you win by controlling the map at the end of the scenario (all enemy ships destroyed, disabled, or escaped). If you have twice as many points as the enemy, you win only by destroying or disabling all ships (and escapes prevent you from winning). If you have three quarters or less as many points as the enemy, you win by disabling or destroying more enemy ships than you lose.

Points: 300

4. Surface Raid

Mission: Intelligence operatives have uncovered evidence of an important technological breakthrough by enemy researchers based on the target world. Your mission is to land a commando team on the world and then extract them 10 turns later (after which they will have secured and neutralized the enemy research facility and made a complete copy of all databases).

The commando force will be landed under cover of a surface bombardment. A total of two turns of bombardment, each turn consisting of 10 missiles fired from orbit at the planet surface, are necessary to cover the landing. Once the second turn of bombardment is complete, the commandos are landed and begin their mission. (You need not, and should not, tell the opposing player that the commando mission is taking place.) Starting 10 turns after the commandos land, they may be extracted. Any ship in orbit over the planet can extract them. Successful extraction is a task with a difficulty level of 1, with crew quality of the extracting ship counting toward success or failure. Each turn after the tenth turn, apply one additional +1 Diff Mod. (+1 Diff Mod on turn 11, +2 Diff Mod on turn 12, etc.) Extraction may be attempted after turn 14, but only a Bull's-eye result will result in successful extraction.

Extraction may only be attempted once. If it fails, the commando team has been captured and the mission is a failure. If it succeeds, the ship containing the commando team must escape from the map. If it is destroyed or disabled, the mission fails.

If the enemy has more points than you do, you win if you successfully complete the bombardment and land the commando team. Extraction and escape are not necessary.

Points: 300

5. Bombardment

Mission: Enemy raids against friendly commercial shipping have been staged out of the target world, and maintenance facilities on the planet surface are key to continuing the raids. Your mission is to destroy those facilities without suffering crippling losses. A total of two turns of bombardment, each turn consisting of 10 missiles fired from orbit at the planet surface, are necessary to destroy the maintenance facilities.

If your point total is equal to or greater than the enemy total, you must carry out the bombardment and suffer no more losses than 1.5 times those suffered by the enemy. If your point total is less than the enemy total, you win simply by successfully carrying out the bombardment, regardless of losses.

Points: 250

6. Hit And Run

Mission: While our forces are still weak in this area, it is necessary to convince the enemy that a major effort is planned here so that enemy naval reserves will be drawn away by our main effort. If you have equal or fewer points than the enemy, your squadron must destroy at least one enemy ship and then escape. If you have more points than the enemy, you must destroy more points of enemy ships than you lose and then escape.

Special Note: In this scenario, you can escape off of either your map entry edge or the hostile map entry edge.

Points: 200

7. Propaganda Raid

Mission: Recent operations by hostile naval elements have been extremely successful, and the enemy has amassed a preponderance of naval forces in this area. Both for diplomatic purposes and to strike a blow at enemy morale, it is necessary to prove that even the largest enemy fleet units are not safe.

Your squadron is directed to engage the enemy and, at whatever cost necessary, destroy or seriously damage a large enemy combatant vessel (size code –3 or –4). If your point total is less than the enemy's, you win if you inflict one hit (other than a no effect) on a size –3 or –4 ship. If your point total is equal to or greater than the enemy's, you win if you destroy a size –3 or –4 ship or, if none are in the scenario, over half of the point total of the enemy fleet.

Special Note: In this scenario, you can escape off of either your map entry edge or the hostile map entry edge.

Points: 150

8. Transit

Mission: Your squadron is needed to reinforce another squadron at a nearby star. In order to make the jump, your ships must take on additional fuel. One of the asteroid clusters on the map (you select which one and record its map and hex number before play begins) is mostly hydrogen gas chunks. To refuel, each of your ships must spend one turn stationary in the same hex as the asteroid. Once refueled, your ships may exit and escape into jump space.

If your points are equal to or greater than the enemy's points, you win if over three quarters of your ships (by point value) escape. If your point total is less than the enemy's, you win if half of your ships escape. If your point total is less than half of your enemy's, you win if any of your ships escape.

Special Note: In this scenario, once refueled you can escape off of either your map entry edge or the hostile map entry edge.

Points: 150

9. Deep Black

Mission: A clandestine intelligence-gathering station has been at work in the enemy system for several months. Your mission is to extract the personnel and collected intelligence data from the secret base. The secret base is located on one of the asteroids (you select which one and record its map and hex number before play begins). To extract the team, one of your ships must spend one turn stationary in the same hex as the asteroid. Once the team is extracted, your ships may exit and escape into jump space. If the team is extracted and the ship carrying the team, or any ship which was part of the same task force as that ship at any time after the extraction (allowing the database to be transferred by tight beam communications), escapes, you win.

Special Note: In this scenario, you can escape off of either your map entry edge or the hostile map entry edge.

Points: 100

10. Snoop 'n' Scoot

Mission: Naval Intelligence suspects an enemy build-up in this area, but needs to have precise information on the size and scope. Your squadron is to detect enemy ships operating in the neighborhood of the star and report back to fleet headquarters. You win if you detect 300 or more points worth of enemy ships or every enemy ship (whichever is less), and escape with at least one ship.

Special Note: In this scenario you can escape off of either your map entry edge or the hostile map entry edge.

Points: 50

Blue (Native) Missions

1. Ambush

Mission: Naval Intelligence has determined that the enemy is planning an operation against this system, although the nature of that operation is unclear. This information gives us an excellent opportunity to inflict a major defeat on our enemy and alter the naval balance of power in this area.

A covering force is in place around the main world while a much larger fleet is hidden in a denser asteroid belt (off-map). The ambush force may enter on your map entry edge anytime on or after turn 6. Your mission is to thwart any enemy plans directed at the system and crush the forces committed here. To win you must prevent the enemy from gaining his victory conditions and you must destroy every enemy ship in the scenario. (If any escape, you lose.)

Points: 500 (up to 150 on the map, up to 350 enter turn 6 or later)

2. Vampire!

Mission: When Virus, the self-aware combatant computer program, swept through the Third Imperium it brought on the Collapse and ended the Final War. Mostly as self-destructive as it was murderous, there remain few examples of functioning Virus in human space, but most survivors, inhabiting the computer brains and control systems of starships, have gathered together for self-defense. These groups are called vampire fleets by humans, and your ships make up such a fleet.

Your objectives are to destroy human ships and, if possible, survive (to destroy more). To win you must destroy more human ships (in terms of point value) than you lose. Human ships which you disable and successfully board (see optional Boarding Action rule) count as double points toward victory (as its computer brain has been infected and taken over by you).

Special Note: Any computer hit on one of your ships destroys it.

Points: 400

3. Naval Supremacy

Mission: Naval command has assembled a powerful squadron of warships under your command to enable you to frustrate any enemy plans in this star system. To win you must prevent the enemy from achieving her victory conditions.

Points: 350

4. Active Defense

Mission: Naval command has assembled a powerful squadron of warships under your command to enable you to maintain control of this star system. If you have equal or greater points than your opponent, you must thwart the enemy victory conditions and have the only operational ships left on the map at the end of the scenario. If you have fewer points than the enemy, you must destroy more enemy ships (in terms of points) than you lose.

Points: 300

5. Fleet In Being

Mission: Your fleet is the only group of major naval combatants we have in this stellar region. It is vital, therefore, that it be preserved intact, even at the price of surrendering this planetary system.

If your point total is equal to or less than that of your enemy, you win if your losses at the end of the scenario are equal to or less than

one-third of the point total of the enemy fleet. If your point total is greater than your enemy's, you must meet the same criteria and in addition must prevent her from achieving her victory conditions.

Points: 300

6. Convoy Run

Mission: While your main body occupies the attention of the enemy, a detached squadron is to escort a critical merchant convoy out of the system. When purchasing vessels, you may purchase as many as desired as "merchant ships." Merchant ships cost half their printed point value, have no offensive weapons except their laser turrets, have no defensive shields except their sandcasters, have no active sensors, jammers, or masking, have no fire control equipment, and have an armor value of 0. They are otherwise identical to the ship purchased. Note which ships are merchants before the scenario begins. All merchant ships must have jump drives.

The merchants and their escorts (up to a total of 100 points worth of ships) enter on or after turn 6, while all other ships begin the scenario on the map. If you have points equal to or greater than your opponent, you win if all of the merchant ships escape. If you have points less than the total enemy points, you win if half or more of your merchants (by point value) escape. If you have points equal to 150 or more less than your opponent, you win if one merchant ship escapes.

Points: 250 (up to 150 on the map, up to 100, including all merchants, enter turn 6 or later)

7. Economy of Force

Mission: The naval command has limited fleet resources in this area and expects you to make optimal use of those assigned to you. To win you must destroy more enemy ships (by point value) than you lose. If you have total points equal to or greater than the enemy, you must also prevent the enemy from achieving her victory conditions.

Points: 250

8. Delaying Action

Mission: No enemy naval operations were expected against this system and your forces are inadequate for defense. Your mission is to conduct a skillful delaying action. If your point total is less than the enemy, you win if you can delay the enemy victory conditions for 20 turns and then escape with at least one ship. If your point total is equal to or greater than the enemy, you win by frustrating his victory conditions.

Points: 200

9. Desperate Defense

Mission: No enemy naval operations were expected against this system and your forces are inadequate for defense. It is vital for the honor of the fleet, however, that you inflict some telling damage on the enemy before being overwhelmed.

You must engage the enemy and, at whatever cost is necessary, destroy or seriously damage a large enemy combatant vessel (size code –3 or –4). If your point total is less than the enemy's, you win if you inflict one hit (other than a no effect) on a size –3 or –4 ship. If your point total is equal to or greater than the enemy's, you win if you destroy a size –3 or size –4 ship or, if none are in the scenario, over three-quarters of the point total of the enemy fleet.

Points: 150

10. Escape

Mission: No enemy naval operations were expected against this system and so your forces are inadequate for defense. It is vital that at least one ship escape to carry news to the high command of this enemy offensive.

You win if one of your ships escapes into jump space, unless the enemy has points equal to or less than yours, in which case you win by thwarting her victory conditions.

Points: 100

OPTIONAL RULES

MULTIPLE PLAYERS

If multiple players are present on each side, the available ships are divided among them in any manner acceptable to all of them, and the player with ships having the greatest total point value is designated the fleet commander. The fleet commander has the Fleet Tactics skill level specified for that side in the scenario description. Every other player turns a card and consults the missile damage value. The result is the player's Fleet Tactics skill, except that a result of 6 is treated as a 4 and a result of 1 is treated as a 3.

HIDDEN DAMAGE

In the basic game, the Damage marker is placed on the vessel and both players can see the result. Hidden damage puts considerably more suspense into the game, but requires a higher level of honesty by both players.

When a damage result is drawn, the player examines it and then places it on the affected ship counter result side down, so that only the explosion graphic is visible. The results of the damage are implemented normally, but the opposing player is not told the result.

Duplicate Damage markers are still returned to the draw pile or cup (face-down), and Ship Explode results are still immediately obvious to all players (as the affected ship is removed from play and replaced with a White Out-2 marker).

REFEREE

When **Battle Rider** is used as part of a **Traveller: The New Era** roleplaying campaign, there will obviously be a referee present. The presence of a referee allows many interesting variations to be played.

Double Blind Play: In this variation, only the referee is allowed to look at the map, and the referee coordinates all detection tasks by the players, only telling players what ships have been detected and their course and vector. (A piece of blank hex paper is very useful for this.) In addition, damage and hit cards are turned by the referee so that the firing player does not know whether a shot hit or what damage has been done, except by watching the subsequent performance of the vessel.

Scanning for Damage: Getting detailed data on what is going on within an enemy vessel is impossible at ranges of greater than one hex. The referee may allow players to scan enemy vessels in the same hex for life, functioning power plants and weapons, etc. Such tasks will require the integrated use of active and passive sensors. These sensor rolls will be uncertain tasks, and the information that the referee reports to the sensing player may or may not be true.

LARGE SCENARIOS

Battle Rider is designed to allow multiple-ship and squadron-sized actions, but it is still possible to bog it down with numbers, particularly in the area of missile fire and damage. The following optional rules will assist play in larger scenarios.

Missile Barrages: When large numbers of missiles are fired at a particularly well-defended ship, the resolution of anti-missile fire and then the fire of the missiles can take a long time. To speed play, divide the missiles up into a series of "barrages." The number of missiles in each barrage need not be great (two missiles per barrage will cut the amount of card turning in half, for example), but should be mutually agreeable to both players.

Each missile in a given barrage must be attacked with exactly the same defenses (such as three lasers per missile) and one card turn determines the effect of all fires against the barrage (that is, all hit or all miss). After laser fire, the surviving barrages are attacked by dampers (using the same rule), and then the surviving barrages are hit by sandcasters. One card is then turned per barrage to determine if it hit, and then one card is turned per barrage for damage, with that damage card applying to each missile in the barrage. If there are relatively few missiles surviving after the damper fire round, individual damage card may be turned for each missile which hits.

Damage Results: In a large scenario it is fairly easy to exhaust the supply of Damage markers, or at least deplete them sufficiently to make certain results much higher probability than normal (particularly No Effect and Ship Explodes). While additional marker sheets are available from GDW (and we will cheerfully sell you as many as you would like), a less expensive alternative is to substitute a die roll or card turn for damage instead of a random marker draw.

Roll two 6-sided dice, add the result, and consult the following table. (If no dice are available, turn two cards and add the missile damage values shown together.)

No.	*Result*
2	Bridge Destroyed
3	Fire Control
4	Power Plant
5	Sensors
6	Life Support
7	Roll Again
8	Artificial Gravity
9	Jump Drive
10	Maneuver Drive
11	Spine
12	Computer

Roll Again: Roll one 6-sided die (or turn one card and consult the missile damage value). On a result of 1-5, there is no effect; on a result of 6, the ship explodes.

Task Force Composition Chart: With large numbers of ships in a task force, and with several Damage markers on one or more ship, the stacks of counters can become fairly precarious. If this becomes a problem, photocopy the next page and use it as a play aid. Place the ships of a large task force in the box once they are detected and begin to take damage.

FACING

The facing of spacecraft plays a limited role in **Battle Rider.** In general terms, spacecraft must face in the direction that they are *accelerating.* Note, however, that if a spacecraft is not accelerating (i.e., firing its maneuver engines to speed up, slow down, or change direction), its facing has nothing to do with its vector (i.e., the direction and speed at which it is coasting through space). Like a leaf floating down a stream, it may freely spin or point in any direction desired, regardless of its vector.

Facing Limits Based on G-Turns Expended

When deciding on a craft's facing, the player must first determine the craft's base facing for the turn, and then determine the amount of allowed deviation from that base facing.

Base Facing: If G-turns were used for thrust, the base facing is the hexside opposite that containing the ship's Thrust marker. If G-turns were used for maneuver and evasion, use the base facing for the maneuver, and proceed to the next step.

If G-turns were used for evasion only, or if no G-turns were used for any purpose, there is no base facing—see next step.

Deviation: Once the base facing is established, determine the amount of leeway to either side of that facing that the player has when choosing the craft's facing for the turn.

Deviation is determined by the number of G-turns used for maneuver (not evasion) as a proportion of the craft's G-rating.

- If G-turns equal to the G-rating were used, final facing *must* be the base facing.
- If G-turns equal to more than half of the G-rating but less than the full G-rating were used, final facing must be the base facing or either of the adjacent hexsides.
- If G-turns greater than 0 but less than half of the G-rating were used, final facing may be any hexside *except* the one containing the Thrust marker.

No G-Turns Spent: In cases where there is no base facing because no G-turns were spent, the player may select any facing for the final facing.

Evasion: In cases where G-turns were spent for evasion (whether the evasion roll was successful or not), the base facing is determined randomly. Turn a card and multiply the missile damage value shown by 2. Consult the Heading/Facing Compass on the map. The result is the direction of facing. For every maneuver G not spent for either maneuver or evasion, the player may adjust the final facing one hexside from that determined by the die roll.

The only exception to random facing determination for evading spacecraft is in the case of Outstanding Success at the evasion task. In this case, the vessel's commander has succeeded in maintaining facing control even while successfully complicating enemy sensor and fire tasks: The player may select any facing for the final facing.

Facing Effects on Combat: Spinal mount weapons may only fire across the facing hexside. Trace a line from center of firing hex to center of target hex to determine if the target is in the spinal mount's arc of fire.

Task Force Composition Chart

BOARDING ACTIONS

Disabled enemy ships may be boarded. Disabled ships have no functioning power plant or maneuver drive. Unfortunately, there is no way to tell whether an enemy vessel is disabled or playing possum.

In order to board, the boarding vessel must match vectors with the disabled ship. On the turn following matched vectors, boarding may begin in the Initiative Phase. Once a boarding party is sent to a disabled ship, the boarding ship conducts all tasks with a +1 Diff Mod due to crewmembers away from their stations.

Procedure: Assuming that a vessel is disabled, the boarding action takes place. The ship size modifier multiplied by –1 (i.e., the modifier with the value of the sign reversed) is the number of hull sections on the boarding and boarded ship. (Ships with a size of –1, 0, +1, and +2 all have a single hull section, but the reversed sign of their size value is still used as a modifier below.)

Each game turn, during the Initiative Phase, the boarding and boarded player each turn a card, consult the missile damage value, and add the following modifiers (Mods):

± hull size (with sign reversed)
+1 first turn of attack
+1 if defending
+1 if lost the previous turn

The player with the higher adjusted value captures one hull section, except that a side which took the +1 defending Mod does not take any additional hull sections. If the values are tied, neither side captures a hull section. The boarding player may never take the +1 defending Mod. The boarded player may forego the defending Mod for the purpose of recapturing a previously captured hull section. Note that whichever side *loses* in a turn receives a +1 Mod the next turn.

Combat continues until all hull sections belong to one side or the other. (Note that the boarding player must win the first turn of battle or the boarding action fails.) If the boarding side wins or loses, the survivors may return to their own vessel (and the +1 Diff Mod is ignored). If the boarded side loses, the crew is captured. The boarding crew may remain on board the captured ship to secure it or repair it, or they may return to the boarding ship and re-man their stations, at the player's option.

SURPRISE

Surprise is determined only once per scenario. Surprise is possible for either side, and the element of surprise gives an advantage both in attacking and in avoiding the enemy. In some cases, surprise is indicated in the scenario instructions, but it can also be determined by the players.

Surprise is a task with a base difficulty level of 5 and –Diff Mods equal to the player's Fleet Tactics skill. It is attempted by the side which first detects an enemy vessel.

Benefits of Surprise: The side which was surprised may not maneuver or fire on the first turn it was surprised, unless it is able to man battle stations. Manning battle stations is a task with a base difficulty level of 4 and no Diff Mods (but using Crew Quality, if applicable). Battle stations are always manned on the first full turn following surprise.

Readiness: Under certain circumstances, players or scenario instructions may stipulate that their vessels are operating at alert status, with some battle stations already manned, or at battle stations. If operating under alert status, the task to man battle stations is one difficulty level easier (–1 Diff Mod). However, these levels may not be maintained indefinitely without fatiguing the crew. Alert status can be maintained for only three consecutive four-hour (eight-turn) periods (a total of 24 turns) before crew fatigue degrades performance. Each additional consecutive four-hour (eight-turn) period beyond these limits imposes a +1 Diff Mod on every task attempted by every crewmember.

Thus, if Captain Queegulii kept his crew at battle stations for 20 hours, beginning at 12 hours and one minute (or turn 25), all tasks would be one difficulty level higher. Beginning at 16 hours and one minute (or turn 33), all tasks would be two levels higher. These penalties remain in effect until at least three consecutive periods (12 hours, or 24 turns) are spent at condition 0. So, in the example, if Queegulii let his crew stand down after 20 hours, but called them back to battle stations after only four hours, they would still perform their tasks at two difficulty levels higher.

In addition, once the crew has returned to normal cruising status, the task attempt to man battle stations is increased in difficulty if the crew had been standing at alert status or battle stations for a long period of time. For each consecutive period at battle stations or two consecutive periods at alert status, the roll to man battle stations is increased in difficulty by one level (+1 Diff Mod). This penalty is decreased by one level for each subsequent period spent at normal cruising. Thus, a crew which had been at alert status for four consecutive periods (16 hours) would be at +2 difficulty levels to man battle stations during the first period after they stood down, +1 level the period after that, and back to normal after two full periods of normal cruising.

RESTRICTED FIRE CONTROL

Some vessels have sophisticated fire directors but do not have enough to guarantee that all weapons will have access to them in the heat of battle. All ships are assumed to have a fire director for their spinal mount (if any), but may have only limited number of other directors. The number listed below for vessels in the game is the number of fire directors available for each battery in each phase. Each fire director can engage one target with one or more weapons of the same type and printed range and allow those weapons to ignore the standard fire control Diff Mods. Once all of the available fire directors have been used, additional fire is conducted without benefit of the ship's fire control rating.

The following vessels in the game have limited fire directors if this optional rule is used:

Vessel	*Directors*
Ashtabula	2
Aurora	1
Chrysanthemum	1
Fiery	1
Gazelle	1
Kinunir	1
Maggart	1
Mary Ellen Carter	1
Midu Agashaam	1
Patrol Cruiser	1
Shukugan	1

INTEGRATION WITH TRAVELLER: THE NEW ERA

Battle Rider is intended to stand alone as a game and not presuppose knowledge of the **Traveller: The New Era** roleplaying game. However, many **Battle Rider** players will also be players of the roleplaying game, and will use it to resolve situations that occur in their roleplaying campaigns.

Fleet Tactics: A player character's **Battle Rider** Fleet Tactics rating is his or her Fleet Tactics asset divided by 3, rounding fractions down.

Crew Quality: When a ship manned by player characters is used in **Battle Rider**, all tasks should be resolved using the crew's actual assets and using the standard D20 die roll for task resolution. Task difficulty numbers in **Battle Rider** (BR) correspond to the following difficulty levels in the roleplaying game (RPG).

BR	*RPG*
1	Easy
2	Average
3	Difficult
4	Formidable
5	Impossible

The following **Traveller** assets are used for defined tasks in **Battle Rider.**

Task	*Asset*
Control missile/drone	Gunnery (Missile) or RCV Operations
Crash-start power plant	Ship's Engineering
Damage control	Ship's Engineering or Electronics
Defenses	Screens (appropriate cascade)
Evasion	Ship's Tactics
Fire	Gunnery (Energy Weapons)
Jam sensor	Sensors
Land/take-off from planet	Pilot (Interface/Grav)
Man battle stations	Leadership
Detect/fire control lock	Sensors
Surprise	Fleet Tactics

Evaluating Ships

Ships designed using **Fire, Fusion, & Steel** or published in other **Traveller** products may be converted easily to **Battle Rider** ships. Use any counter or appropriate miniature to represent the ship on the map and make a separate data card for the ship in the same format as the back of a counter. 3"x5" index cards cut in half are useful and about the right size for this.

Identity: The name, class, and type of ship are entered here. This information is provided by the published design or made up by the designer.

Size: The size modifier of the craft is based on its total displacement. Consult the following chart and record the appropriate value. If the vessel is equipped with socket extenders, add the notation "E" after the size value.

Tons	*Size*	*BR Size*
less than 1	Sub-Micro (SM)	+2
1+	Micro (Mc)	+1
10+	Very Small (VS)	0
100+	Small (S)	–1
1000+	Medium (M)	–2
10,000+	Large (L)	–3
100,000+	Very Large (VL)	–4
1,000,000+	Gigantic (G)	–5

Tech Level: The tech level of manufacture.

Beam Weapons: Beam weapon values are recorded in the appropriate data fields. Type is noted by a standard letter code (L for laser, M for meson gun, P for particle accelerator) in parentheses following the type record the number of guns firing (if more than one) and what Diff Mods they ignore based on overpowering. Numbers of weapons are preceded by an "x" while Diff Mods ignored are preceded by a "–."

In the case of spinal mounts, the number firing is the total number (usually, but not always, 1) installed to fire along the main axis of the vessel. In the case of all other batteries, the number firing is the total number installed on the vessel divided by the absolute value of the ship size modifier (with size value of 0, +1, and +2 all treated as 1), rounding all fractions to the nearest whole number. In other words, the larger the vessel, the fewer guns per battery, but the more total batteries.

In the case of overpowering, values are written here only if the ship has sufficient excess power to run all systems and overpower the weapons simultaneously. If five times the power necessary to fire the weapon is available, record a –1 in this space; if 10 times the power necessary is available, record a –2.

After the number and Diff Mod codes, write down the short range in hexes, a colon, and then the damage at each of the four ranges of the weapon. Separate each range with a dash. If the weapon has the same damage at all ranges, simply write the number once.

Standard **Traveller** damage is converted to **Battle Rider** damage using the following Damage Conversion table.

Damage Conversion

Traveller	*Battle Rider*
1+	0
20+	1
40+	2
80+	3
120+	4
160+	5
200+	6
250+	7
300+	8
400+	9
500+	10
750+	11
1000+	12
1250+	13
1500+	14
1750+	15
2000+	16
2500+	17
3000+	18
3500+	19
4000+	20
4500+	21
5000+	22
6000+	23
7000+	24
8000+	25
9000+	26
10,000+	27

Fire Control: The number of Diff Mods ignored when firing at a target. This is determined by the tech level of the installed master fire directors and is the same value as in conventional **Traveller** ships.

It is assumed for purposes of the game that all ships have sufficient master fire directors to engage multiple targets. This is the case if the ship has (in addition to any missile fire directors) one fire director for every meson gun and particle accelerator and one for every two lasers mounted.

If it has fewer than that, total the number of non-missile fire directors, subtract the number of spinal mount weapons available, and divide the remainder by the number of batteries on the vessel (as determined by the ship's size code). Record this number in parentheses after the ship's fire control Diff Mod value. This is the number of fire directors available to service the weapons of a single battery in a single phase.

If there are fire directors for missiles and/or spinal mounts but none extra for beam weapons, the ship still has a fire director rating of 1, as it is assumed that a director can be "borrowed" to direct fire from a battery.

Each fire director may engage one target with one or more weapons of the same type and printed range and allow those weapons to ignore the standard fire control Diff Mods. Once all of the available fire directors have been used, additional fire is conducted without benefit of the ship's fire control rating.

Sensors: These are listed in the order active sensor (A), passive sensor (P), and jammer (J). Use the best sensor of the type available to determine the ship's rating. (Jammers are sensor jammers, not communication jammers.) After the sensor type, make a colon and then record the sensor's short range. If the ship has an EMM package, just write "Msk" at the end of this line.

Structure: The main entry here is the ship's armor value (AV). Armor value for **Battle Rider** is calculated using the standard **Traveller** armor value and consulting the Damage Conversion table at left. If, for example, a ship had a **Traveller** armor value of 143, it would have a **Battle Rider** rating of 4.

If the ship has an auxiliary bridge, that is noted here as well.

Screens: These are active defensive systems and are listed in the order meson screen (MS) and value, sandcasters (SC) and number mounted, and nuclear dampers (D) and number mounted.

The value of the meson screen is calculated by taking its **Traveller** protection value and consulting the Damage Conversion table at left. If, for example, the screen had a protection value of 2200, it would have a **Battle Rider** rating of 16.

Sandcasters and nuclear dampers are divided into batteries, using the same procedure as for beam weapons, and the number in a single battery is recorded here.

Missiles: If the ship has missiles, write "Msl:" in this field, followed first by the number of missile directors on the ship and then (in parentheses) by the number of ready missiles carried. The number of ready missiles is the sum of all missiles carried in turrets, barbettes, and bays, but not counting any reloads carried as cargo.

Maneuver: This data field covers both interplanetary and interstellar travel capabilities. The first entry (in parentheses) indicates whether the ship can skim (S) and/or process (P) fuel from a gas giant. Next comes the interstellar jump drive (J) capability, if any, and finally the maneuver drive ratings in Gs of acceleration per turn (G).

A ship must have at least 20 G-hours of fuel if it has a maneuver drive. Ships with less than 50 G-turns of fuel have limited maneuver fuel. Note this by placement of an asterisk after the G-rating.

Battle Riders: This lists the number of battle riders (BR) or light battle riders (BRL) carried by the ship.

Point Value: This is the point value of the ship used for victory determination and and scenario generation. To determine the point value of a ship, divide its gross tonnage by 1000, extract the square root, and multiply the result by the tech level of construction. The result is the ship's point value.

Battle riders have two values separated by a slash. The first value is the value calculated above (based on simple tonnage and tech level). The second value is the first one multiplied by 1.5, and is used if the vessel is purchased without a tender.

Tournaments

GDW will periodically sponsor **Battle Rider** tournaments for the summer convention season beginning in 1995. These will involve dogfights between two or more players who have equipped themselves on a fixed-point budget and other technological constraints. Ships and weapons published by GDW will be eligible for these tournaments, as well as those designed using the ship design sequence in **Fire, Fusion, & Steel.** However, all such homemade designs must be submitted to GDW and approved before they can be used, at which time they may be used by any entrant. All details will be presented in issues of **Challenge,** The Magazine of Science-Fiction Gaming.

DESIGNER'S NOTES

These notes should properly begin where the thinking for the design began, and that is with the damage system. **Battle Rider** is clearly intended to be a simplified and streamlined alternative to **Brilliant Lances**. Because **Brilliant Lances** is designed to provide the detailed combat and damage resolution the ship-to-ship combat requires when player characters are manning the key battle stations, it obviously covers a level of detail that is inappropriate to fleet actions, and the more successful **Brilliant Lances** is at its design goal (and we think that it's very successful), the less suited it is to larger actions. Much of the fine-grained detail of **Brilliant Lances** is contained in the damage system, and so that's where I started to look when I began work on **Battle Rider.**

My first instinct was to simply do away with hit locations, subsystems, and minor damage. All damage would be expressed in terms of major damage hits and divided randomly among the major ship systems (engineering, life support, etc.). After a fairly short time, I became dissatisfied with this because it seemed to have the worst of both worlds; it lost most of the detailed feel of damage in **Brilliant Lances** but still required lots of paperwork to keep track of damage on big ships (which can take a huge number of major damage hits to some systems).

Fairly quickly my attention turned to critical hits, and I began looking at what killed most ships (especially big ships) in most scenarios. Not surprisingly, it was critical hits. As a result, I keyed the damage levels of weapons to what was necessary to cause a critical hit and just ignored everything else. Because of the variety of critical hit possibilities, this actually keeps a nice mix of damage types while greatly streamlining play.

My next step was to keep paperwork to an absolute minimum. (My original goal was to eliminate it altogether, but that proved impossible. More on why later.) The first target for paperwork reduction was the vector movement system. We had decided with **Brilliant Lances** to go with a heading plus velocity vector system, for reasons which aren't important here. That kept markers off the map but meant that each ship needed a written record of its vector. For large fleet actions that just wasn't practical, so I went with the marker system we originally used in the old **Triplanetary** and **Mayday** boardgames. This puts some markers back on the map, but eliminated part of the paperwork. The simplified damage system, once I went to markers in place of a die roll and had players just place the marker on the ship, enabled a lot more paperwork to be dumped. Printing all of the key game statistics of each ship on the back of the counter eliminated almost all of the rest.

The last remaining piece of paper in the game is the Missile Spread Sheet, and that proved nearly impossible (and certainly impractical) to dispense with. All of the functions of the Missile Spread Sheet could be done with counters, but it would require at least one additional counter sheet and would clutter up the playing surface a lot more than one little piece of paper. As a result, I decided to stick with the Missile Spread Sheet.

While we're on the subject of missiles, some word about their treatment in the game is in order, as it differs from the way they function in **Brilliant Lances** and the core **Traveller** rules. In those rules, each missile causes 1D6 separate hits, each with a damage value of about 2 (in **Battle Rider** terms). While I was willing to ignore cumulative damage that is less destructive than a critical hit in most cases, to do so for missiles would render them impotent against any ship with a size modifier of –3 or –4, and against any size –2 ship with an armor value (in **Battle Rider** terms) of 10 or more. Not only was that not an accurate portrayal of their effects, it also wasn't very much fun from a game point of view.

As a result, I made the die roll (or card turn in this case) determine the cumulative level of damage of all the shots combined, but to avoid overstating the level of critical damage, I reduced it to a 1-6 range (instead of a 2-12 range, which it would have been simply adding the number of DV-2 hits generated). The result is a compromise that I think adds a lot to the enjoyment of the game.

My next priority was to come up with a game system which, while remaining faithful to the physics involved, was decision-driven and tactics-driven rather than simply science-driven. To that end, Dave Nilsen and I bounced a lot of ideas back and forth and finally came up with the current mix of game elements incorporated in **Battle Rider.** The back-and-forth nature of the operation rounds keep the players alternating actions and reacting to each other throughout the game turn, which was a high priority. Since fire isn't simultaneous, players are continually making tactical decisions throughout the game turn that affect the outcome of the battle, and influence the decision both players make later in the turn.

I also wanted the much-ignored Fleet Tactics skill to be a force in the game, but at first had trouble visualizing what affect it had on play. Our traditional view of it is some sort of intuitive ability to second-guess your opponent, which is tough to write a rule about since that's what both players in a game try to do by their playing styles. Finally, I began thinking of this intuitive style of play as an *innate talent,* and began exploring what Fleet Tactics might be if it were treated solely as an *acquired skill.*

What we came up with was the ability to command a task force (or several task forces) of vessels and have them operate as a coordinated single entity without ramming or shooting each other. That was easy to incorporate into the game by making it the maximum number of ships in a task force. That maximum number of ships has an important, if subtle, effect on game balance once combat begins. Given two equal-sized fleets, one commanded by an admiral with a Fleet Tactics level of 2 and the other with a Fleet Tactics level of 3, the second fleet can fire all of its vessels before the first fleet can fire two thirds of its own. Given that fire is not simultaneous, that can be an important edge.

Of course we then built in a little of the innate talent side of Fleet Tactics as well by tying the number of dummy task forces to the Fleet Tactics skill level.

Finally, a word about the advanced scenario generation system. Those of you who played **Seastrike** many years ago will probably recognize the inspiration for this system. The main thing that most naval encounter battles in game formats lack (and space combat games are usually naval games at heart—this one certainly is) is the sense of fear and confusion that comes with facing a largely unknown force. This scenario design system is designed to put that fear and confusion, that edge, back into the battle. You will never know what you're up against, and often won't know what you have to do to win, until it's too late. Sometimes you won't even know whether you've won or lost until it's all over. It's almost impossible to just play the victory conditions, and so players will have to do something they aren't very often called on to do—they will have to rely on their instincts and intuition, and will have to do everything they can to confuse and mislead their opponent.

While the victory goals of one player usually change as the opposition increases or decreases, we make no claim that all of the situations generated by this system are "balanced," nor do we offer any apologies on that score. Life is not always balanced, and the knowledge that it necessarily will be is another luxury no naval commander enjoys. Sometimes you're just stuck in a lousy situation and you have to do the best you can. Unlike your real-world counterparts, however, you have the advantage of knowing that there will always be another battle, and next time the shoe may be on the other foot.

BATTLE RIDER CARDS

The following list provides the actual values in each data field on each card in the game. If a card is lost, use the blank card to make a replacement.

No.	Hit	Crack	Double	Green	Missile
1	1				1
2	1				2
3	1				3
4	1				4
5	1				5
6	1				6
7	1				1
8	1				2
9	1				3
10	1				4
11	1				5
12	1				6
13	1				1
14	1				2
15	1				3
16	1				4
17	1				5
18	1				6
19	1				1
20	1	2		Miss	2
21	1	2		Miss	3
22	1	2		Miss	4
23	1	2		Miss	5
24	1	2		Miss	6
25	1	2		Miss	1
26	1	2		Miss	2
27	1	2		Miss	3
28	1	2		Miss	4
29	2				5
30	2				6
31	2				1
32	2				2
33	2				3
34	2				4
35	2				5
36	2				6
37	2				1
38	2				2
39	2				3
40	2				4
41	2				5
42	2				6
43	2				1
44	2				2
45	2				3
46	2				4
47	2				5
48	2	3		1	6
49	2	3		1	1
50	2	3		1	2
51	2	3		1	3
52	2	3		1	4
53	2	3		1	5
54	2	3		1	6
55	2	3		1	1
56	2	3		1	2
57	3				3
58	3				4
59	3				5
60	3				6
61	3				1
62	3				2
63	3				3
64	3				4
65	3				5
66	3	4		2	6
67	3	4		2	1
68	3	4		2	2
69	3	4		2	3
70	3	4		2	4
71	4		*1*		5
72	4		*1*		6
73	4		*1*		1
74	4		*1*		2
75	4		*1*		3
76	4		*1*		4
77	4		*1*		5
78	4	5	*1*	3	6
79	4	5	*1*	3	1
80	4	5	*1*	3	2
81	5		*2*		3
82	5		*2*		4
83	5	Bull's-eye	*2*	4	5
84	5	Bull's-eye	*2*	4	6
85	5	Bull's-eye	*2*	4	1
86	Bull's-eye		*5*		2
87	Bull's-eye		*5*		3
88	Bull's-eye		*5*		4
89	Bull's-eye		*5*		5
90	Bull's-eye		*5*		6
91	Miss				1
92	Miss				2
93	Miss				3
94	Miss				4
95	Miss				5

The 96th card is a blank, with basic control panel printed on it but no values or card number, to use to replace a lost or damaged card.

Missile Spread Sheet

Spread	Composition	G	Ship

Battle Rider™

Errata & Clarifications — June 22, 1994

Counter Values

Several counters have incorrect numbers of weapons listed on their reverse side.
LT Maggart-1: The correct total for lasers is 4 (not 8). The correct total for sandcasters is 2 (not 4).
LC Maggart-2: The correct total for lasers is 5 (not 10). The correct total for sandcasters is 3 (not 6).
LM Aurora-1: The correct total for lasers is 4 (not 10). The correct total for sandcasters is 2 (not 4).
LC Aurora 2: The correct total for lasers is 5 (not 10). The correct total for sandcasters is 3 (not 6).

Note that in all cases except the LM Aurora-1, the value listed is the total number of lasers and casters on the vessel and the number which can fire into any one hexside (because of the socket extenders used on these vessels).

Battle Rider™ Player Aid Card

SENSOR TASK DIFFICULTY MODIFIERS
Base difficulty level = range

Target Condition	*Active*	*Passive*
Detecting Player Determines:		
Evading	+1 (+2)	+1 (+2)
Same hex as planet/asteroid	+1	+1
No thrust	—	+1
Thrusting away	—	–3
Active	—	–1
Area jamming emitter	—	–2
Fire control lock attempt	–1	–1
Sensor LOS passes through white out/area jamming	+1	+1
Target Player Determines:		
Passive array extended	–1	—
Ship size	+/– size	+/– size
Higher tech level	+1	+1
Lower tech level	–1	–1
Masked	—	+1
Jamming	+1 (+2)	—
Powered down	—	+2
Black globe up	+5	+3
Black globe flickering	+2	+2

JAMMING TASK DIFFICULTY MODIFIERS
Base difficulty level = range

Condition	*Modifier*
Jammer	– Tech Level
Detector	+ Tech Level

FIRING TASK DIFFICULTY MODIFIERS
Base difficulty level = range

Condition	*Modifier*
Target Size	+/– size
Evading	+1 (+2)
Range 0-2	—
Range 3-5	+1
Range 6-8	+2
Range 9-11	+3
Range 12-14	+4
Range 15-17	+5
Range 18-20	+6
Range 21-23	+7
Range 24-26	+8
Range 27-29	+9
Range 30-32	+10
Range 33-35	+11
Range 36-38	+12
Range 39-41	+13
Range 42-44	+14
Fire Control	reduces + mods = FC rating
Overpowering	reduces 1 or 2 + mods

CIRCUITRY OVERLOAD TASK DIFFICULTY
Base difficulty level = 2

No Diff Mods.

SCREEN TASK DIFFICULTY MODIFIERS
Base difficulty level = 2

Condition	*Modifier*
Meson screen	+ DV–MS
Damper (TL-12)	+ CV+2
Damper (TL-13)	+ CV+3
Damper (TL-14)	+ CV+4
Damper (TL-15)	+ CV+5
Sandcaster	+ (ATL–DTL)+2 (round down)
Black globe	Missile DV 1-3 blocks, 4-6 does not block

EVASION TASK DIFFICULTY MODIFIERS
Base difficulty level = 5

Condition	*Modifier*
Each G spent:	–1

SEQUENCE OF PLAY
Initiative Phase
Operations Phase
(players alternate operations by task forces)
Missile Movement Phase
(alternating between players)
Missile Attack Phase (simultaneous)
Turn Record Phase

MISSILE CHARACTERISTIC CHART

Type	*Gs*	*Size*	*Sensor*
Controlled Missile	G:12	+2	—
TL-12 Semi-Ind	G:9	+2	P:1
TL-14 Semi-Ind	G:7	+2	P:3

CALCULATING DAMAGE VALUES
Laser DV = weapon DV, +/– target size, – sandcaster hits, –target armor value+10*
Particle Accelerator DV = weapon DV, +/– target size, – sandcaster hits, – target armor value
Meson Gun DV = weapon DV, +/– target size, – meson screen value**

* When calculating laser damage, divide target armor value by 10, dropping all fractions.
** The meson screen value is only subtracted from the weapon damage value on a failed meson screen task attempt. On a successful task, the meson gun shot misses and causes no damage at all. The meson screen value, when subtracted from the firing weapon's damage value, may never reduce the damage value to less than 0, provided it was greater than 0 after addition/subtraction of target size.

DAMAGE SUMMARY
Bridge: May not maneuver or evade, enter jump space, attempt detection, jam, operate screens, or use fire control to negate Diff Mods. Fire control locks allowed at +2 Diff Mod against already detected targets. If auxiliary bridge is available, effects of hit are temporary. (A second Bridge hit in the same scenario is permanent.)

Fire Control: May not fire energy weapons or missiles.

Power Plant: May not maneuver, evade, jam, attempt detection using active sensors, use screens (meson or black globe), or fire energy weapons. (Missiles and sandcasters may be fired and passive sensors used at +1 Diff Mod.)

Sensors: May not jam or attempt detection. Fire control locks allowed at +2 Diff Mod against already detected targets.

Life Support: All future tasks performed at +1 Diff Mod.

Ship Explodes: Remove ship from play.

Artificial Gravity: May not spend more than 2 Gs to maneuver, may not evade at all.

Jump Drive: May not enter jump space.

Maneuver Drive: May not maneuver or evade.

Spine: May not fire spinal weapon. For each G of maneuver or evasion thrust used, turn a card to test for tumble. Avoid tumble on a base difficulty of 2. (Crew quality counts.) If 2 or more tumble cards are turned, severe tumble results. If tumbling, +1 Diff Mod on all tasks. If severe tumble, +2 Diff Mod on all tasks. Next Operations Phase is spent correcting the tumble. No maneuver or evasion allowed, and Diff Mods still in effect until end of Operations Phase.

Computer: May not launch small craft or enter jump space. All other tasks performed at +1 Diff Mod.

No Effect: Damage has no effect on ship performance.

Battle Rider™ Player Aid Card

SENSOR TASK DIFFICULTY MODIFIERS
Base difficulty level = range

Target Condition	*Active*	*Passive*
Detecting Player Determines:		
Evading	+1 (+2)	+1 (+2)
Same hex as planet/asteroid	+1	+1
No thrust	—	+1
Thrusting away	—	–3
Active	—	–1
Area jamming emitter	—	–2
Fire control lock attempt	–1	–1
Sensor LOS passes through white out/area jamming	+1	+1
Target Player Determines:		
Passive array extended	–1	—
Ship size	+/– size	+/– size
Higher tech level	+1	+1
Lower tech level	–1	–1
Masked	—	+1
Jamming	+1 (+2)	—
Powered down	—	+2
Black globe up	+5	+3
Black globe flickering	+2	+2

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Condition	*Modifier*
Jammer	– Tech Level
Detector	+ Tech Level

FIRING TASK DIFFICULTY MODIFIERS
Base difficulty level = range

Condition	*Modifier*
Target Size	+/– size
Evading	+1 (+2)
Range 0-2	—
Range 3-5	+1
Range 6-8	+2
Range 9-11	+3
Range 12-14	+4
Range 15-17	+5
Range 18-20	+6
Range 21-23	+7
Range 24-26	+8
Range 27-29	+9
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Damper (TL-12)	+ CV+2
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Damper (TL-15)	+ CV+5
Sandcaster	+ (ATL–DTL)+2 (round down)
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EVASION TASK DIFFICULTY MODIFIERS
Base difficulty level = 5

Condition	*Modifier*
Each G spent:	–1

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* When calculating laser damage, divide target armor value by 10, dropping all fractions.
** The meson screen value is only subtracted from the weapon damage value on a failed meson screen task attempt. On a successful task, the meson gun shot misses and causes no damage at all. The meson screen value, when subtracted from the firing weapon's damage value, may never reduce the damage value to less than 0, provided it was greater than 0 after addition/subtraction of target size.

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Life Support: All future tasks performed at +1 Diff Mod.

Ship Explodes: Remove ship from play.

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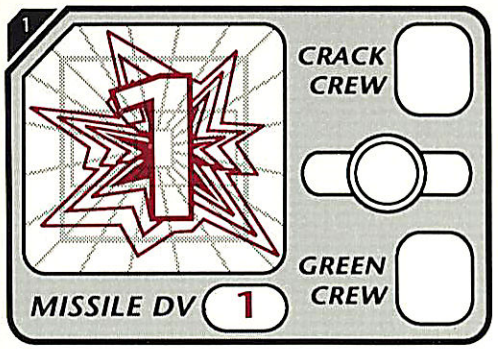
Jump Drive: May not enter jump space.

Maneuver Drive: May not maneuver or evade.

Spine: May not fire spinal weapon. For each G of maneuver or evasion thrust used, turn a card to test for tumble. Avoid tumble on a base difficulty of 2. (Crew quality counts.) If 2 or more tumble cards are turned, severe tumble results. If tumbling, +1 Diff Mod on all tasks. If severe tumble, +2 Diff Mod on all tasks. Next Operations Phase is spent correcting the tumble. No maneuver or evasion allowed, and Diff Mods still in effect until end of Operations Phase.

Computer: May not launch small craft or enter jump space. All other tasks performed at +1 Diff Mod.

No Effect: Damage has no effect on ship performance.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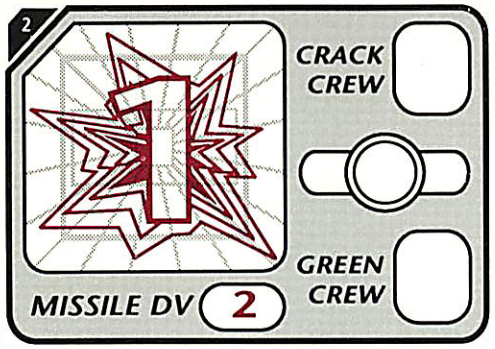
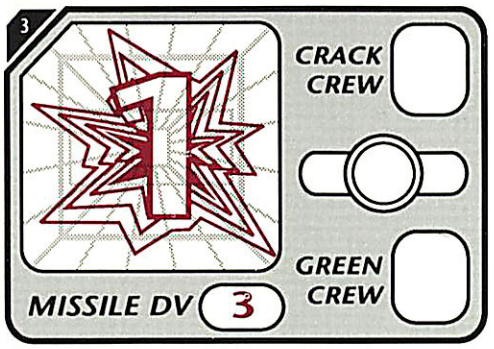
GREEN CREW
MISSILE DV 1


2
CRACK CREW
GREEN CREW
MISSILE DV 2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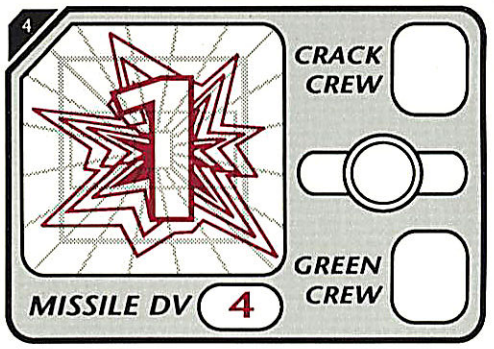
CRACK CREW
GREEN CREW
MISSILE DV 3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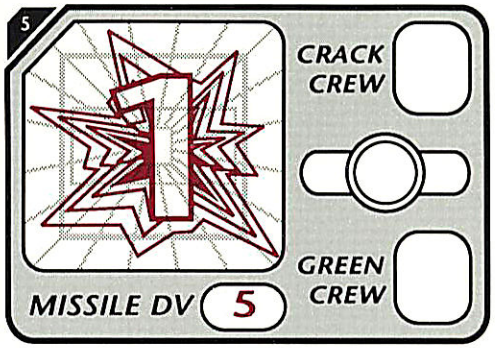
GREEN CREW
MISSILE DV 4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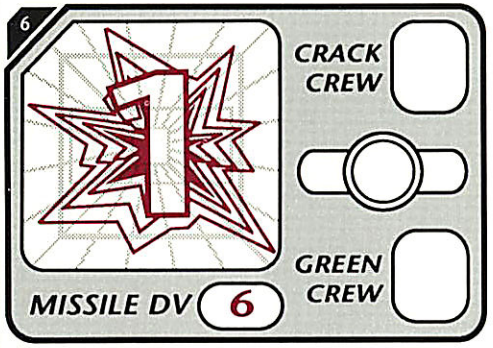
GREEN CREW
MISSILE DV 5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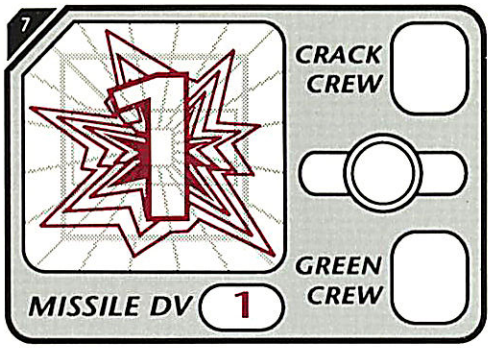
GREEN CREW
MISSILE DV 6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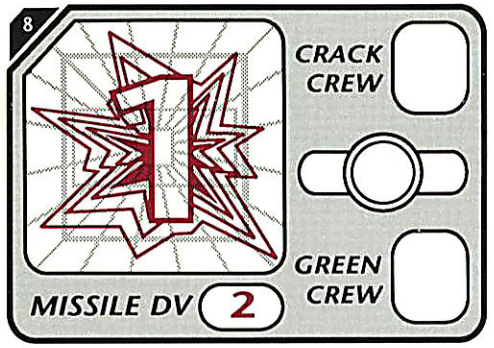
GREEN CREW
MISSILE DV 1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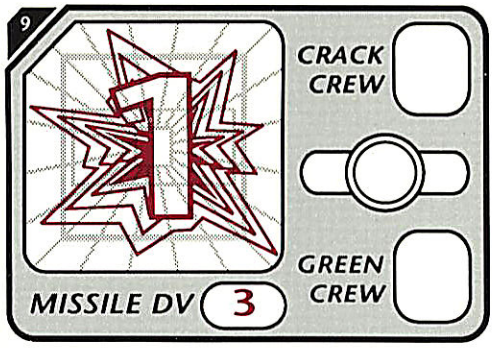
GREEN CREW
MISSILE DV 2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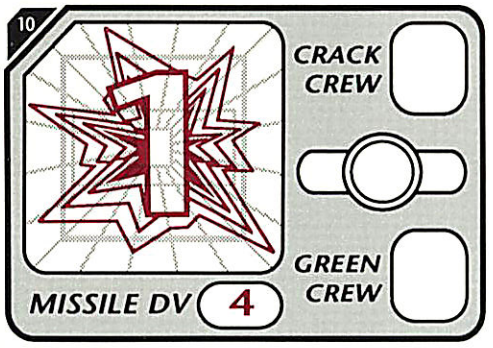
GREEN CREW
MISSILE DV 3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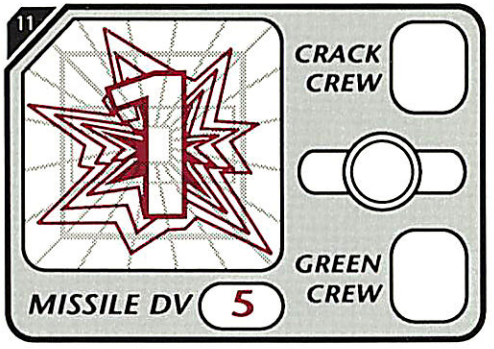
GREEN CREW
MISSILE DV 4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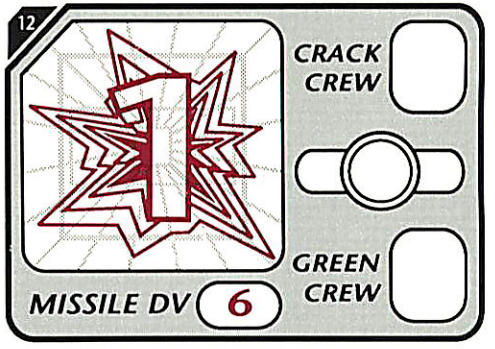
GREEN CREW
MISSILE DV 5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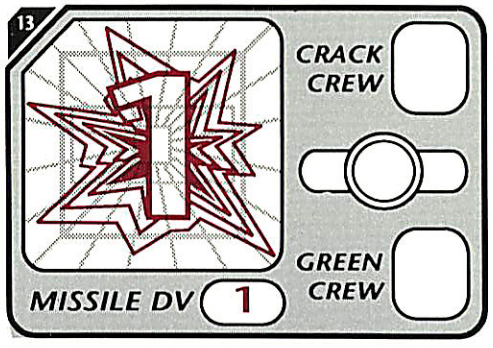
GREEN CREW
MISSILE DV 6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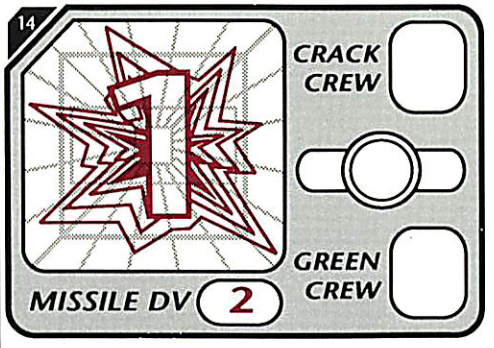
GREEN CREW
MISSILE DV 1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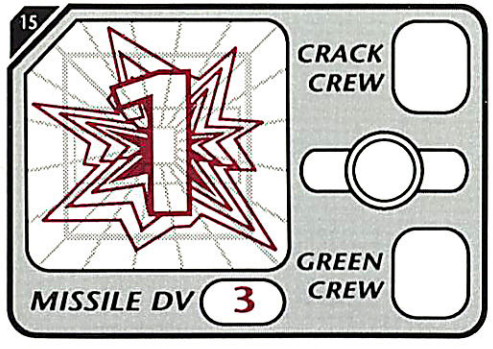
GREEN CREW
MISSILE DV 2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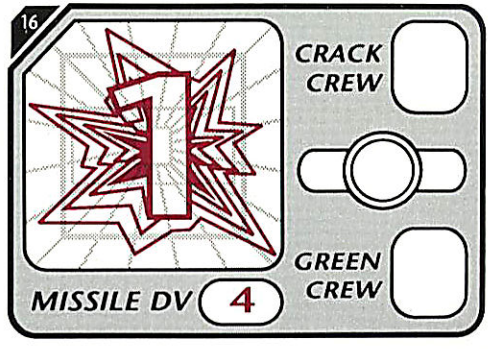
GREEN CREW
MISSILE DV 3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GREEN CREW
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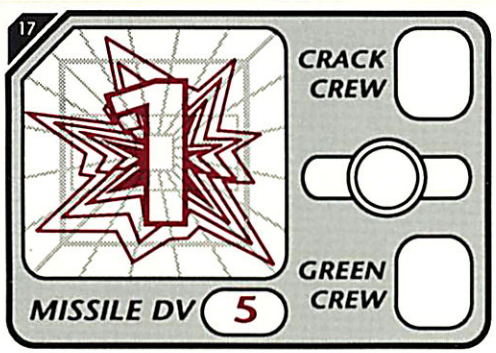
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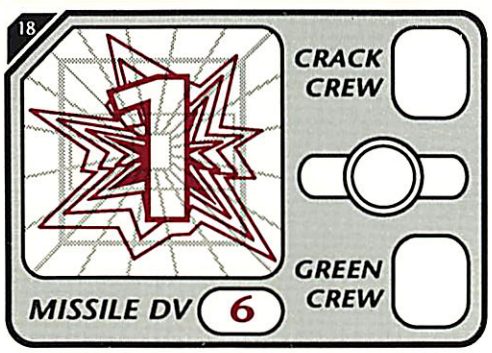
CRACK CREW
GREEN CREW
MISSILE DV 5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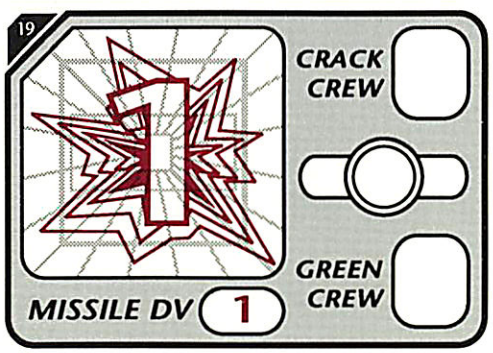
GREEN CREW
MISSILE DV 6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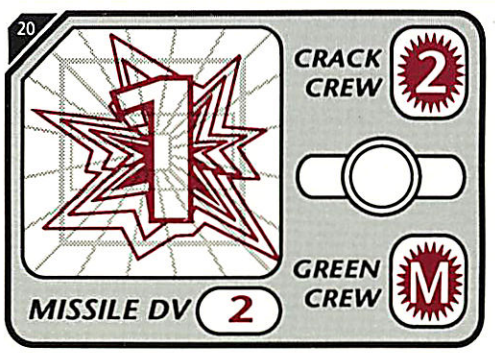
GREEN CREW
MISSILE DV 1


20
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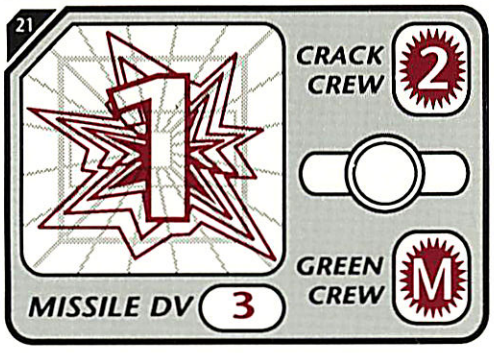
CRACK CREW
2
GREEN CREW
M
MISSILE DV 2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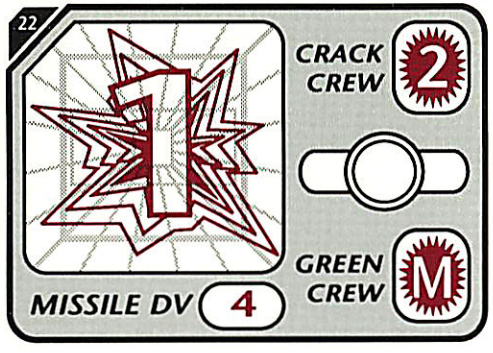
CRACK CREW
2
GREEN CREW
M
MISSILE DV 3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2
GREEN CREW
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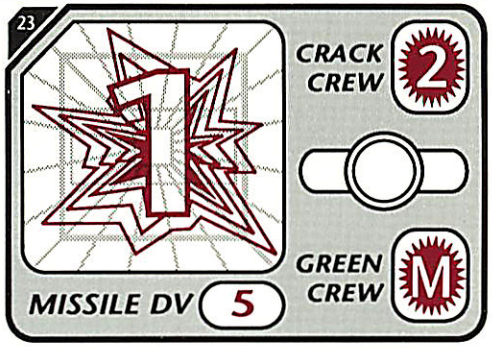
MISSILE DV 4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CRACK CREW
2
GREEN CREW
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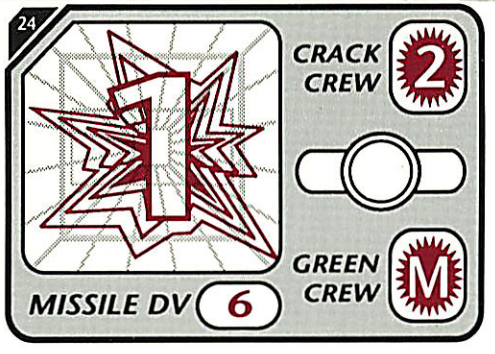
MISSILE DV 5


24
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CRACK CREW
2
GREEN CREW
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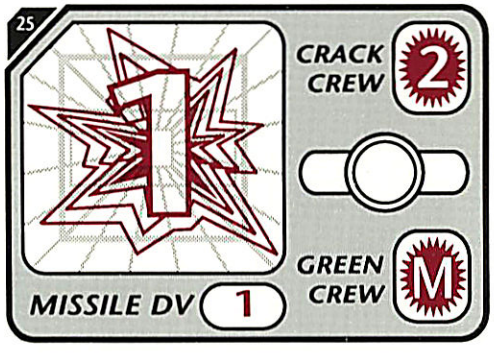
MISSILE DV 6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GREEN CREW
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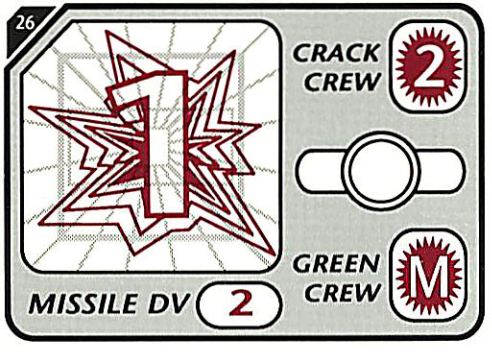
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GREEN CREW
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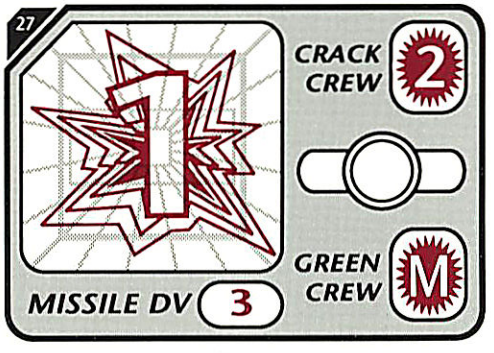
MISSILE DV 2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GREEN CREW
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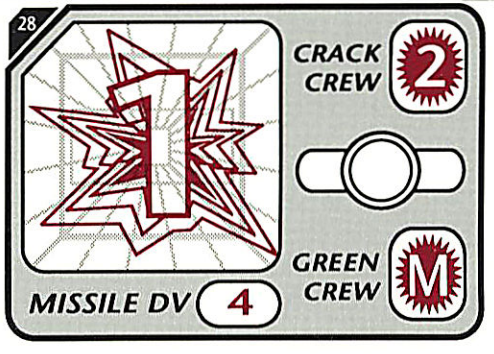
MISSILE DV 3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2
GREEN CREW
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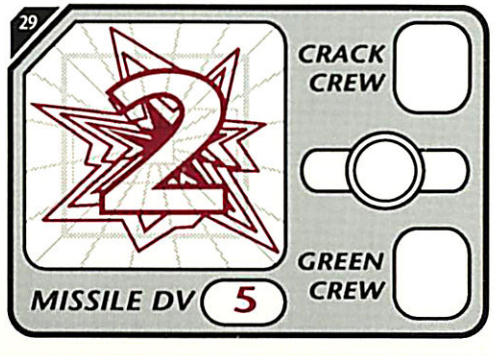
MISSILE DV 4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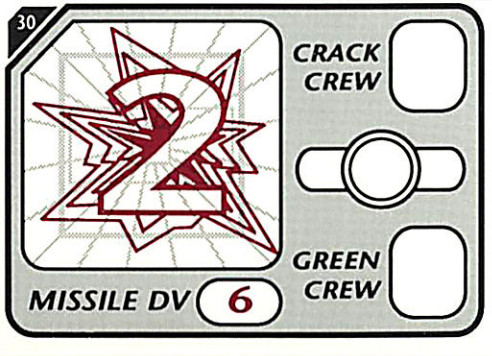
GREEN CREW
MISSILE DV 5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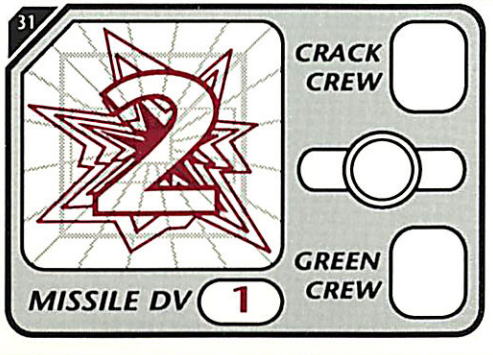
GREEN CREW
MISSILE DV 6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GREEN CREW
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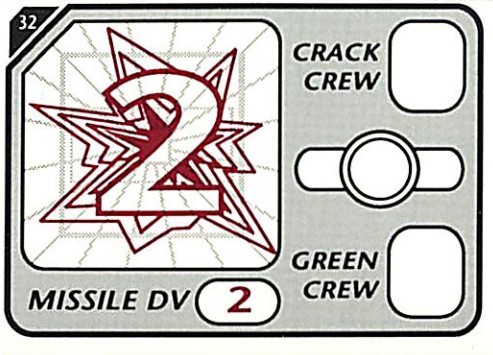
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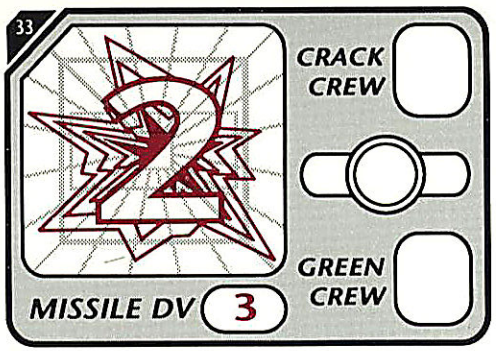
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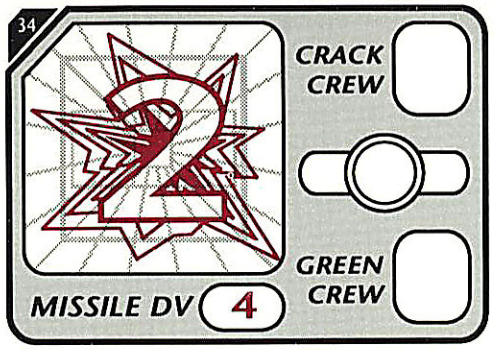
GREEN CREW
MISSILE DV 3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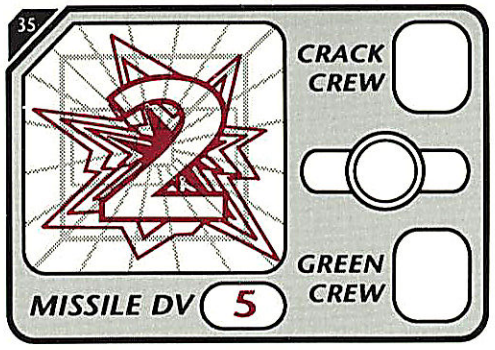
GREEN CREW
MISSILE DV 4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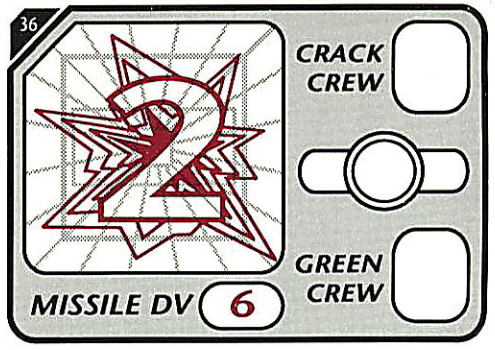
GREEN CREW
MISSILE DV 5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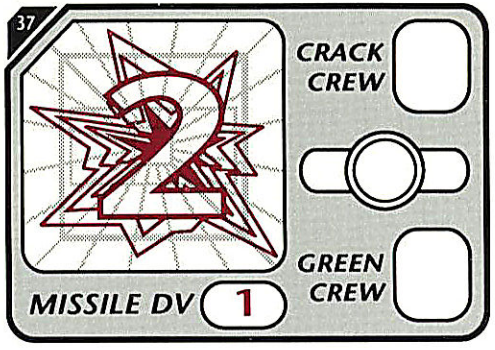
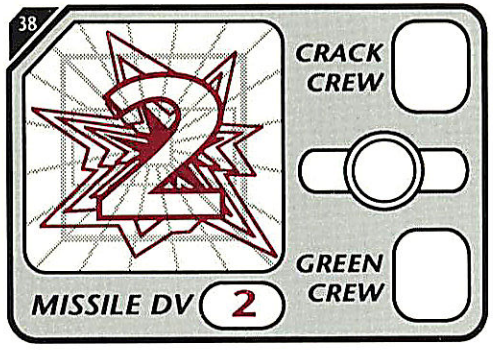
GREEN CREW
MISSILE DV 6


37
CRACK CREW
GREEN CREW
MISSILE DV 1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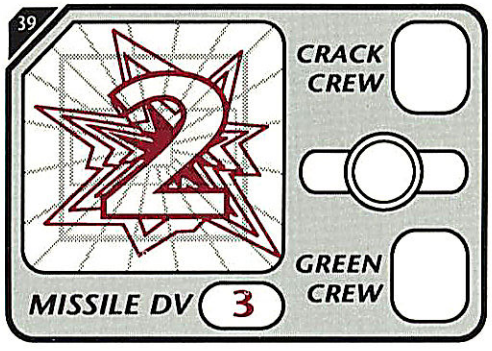
GREEN CREW
MISSILE DV 2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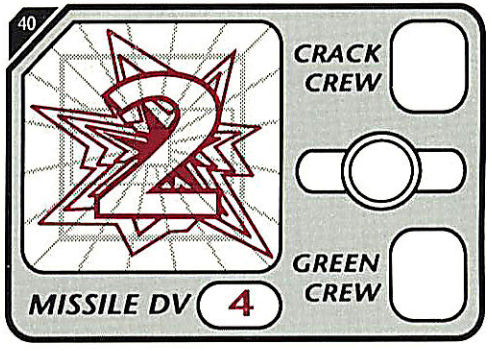
GREEN CREW
MISSILE DV 3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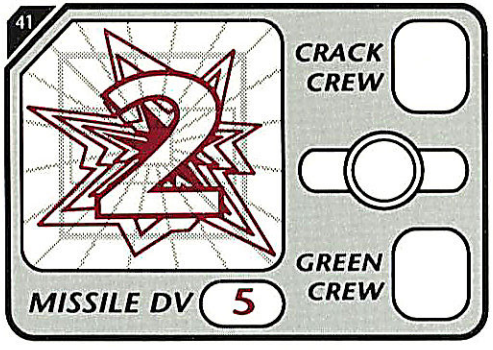
GREEN CREW
MISSILE DV 4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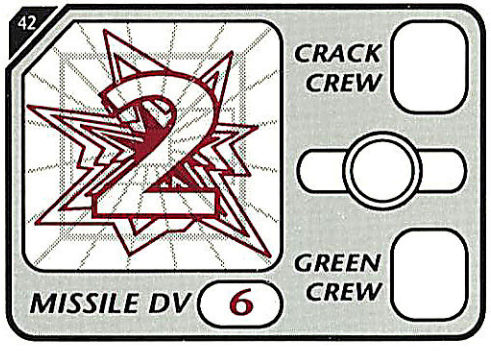
GREEN CREW
MISSILE DV 5


42
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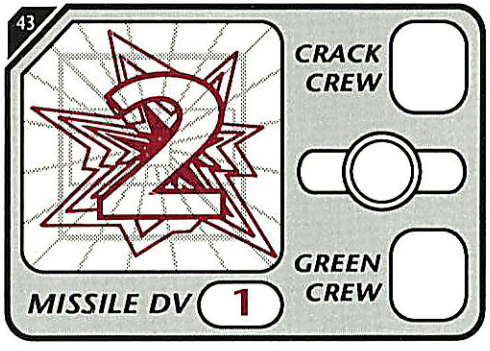
GREEN CREW
MISSILE DV 6


43
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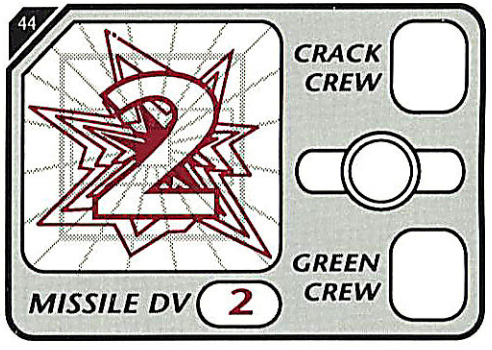
GREEN CREW
MISSILE DV 1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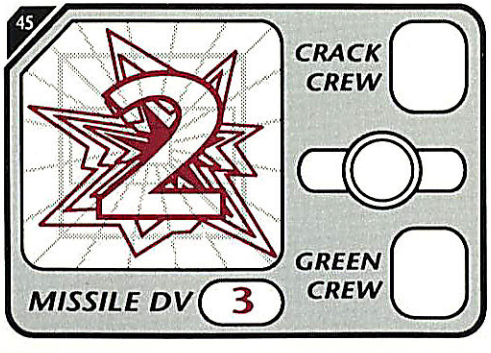
GREEN CREW
MISSILE DV 2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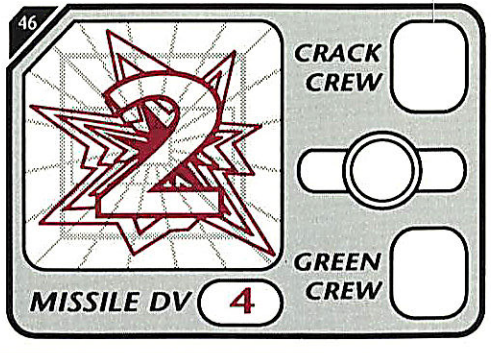
GREEN CREW
MISSILE DV 3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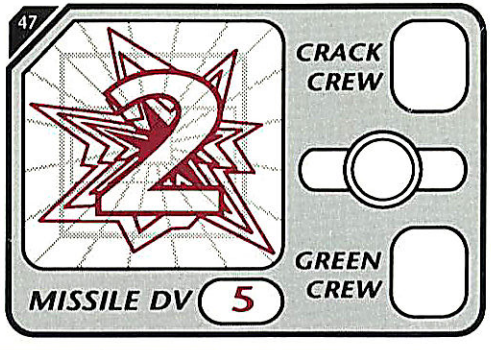
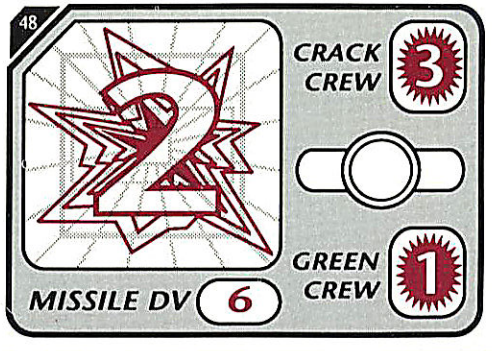
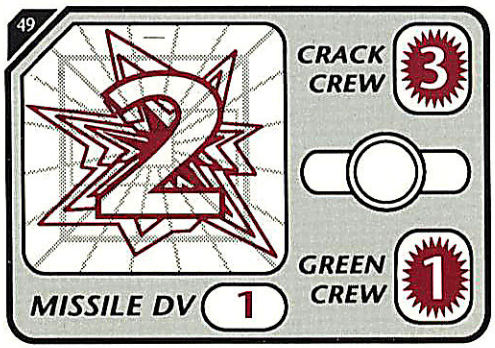
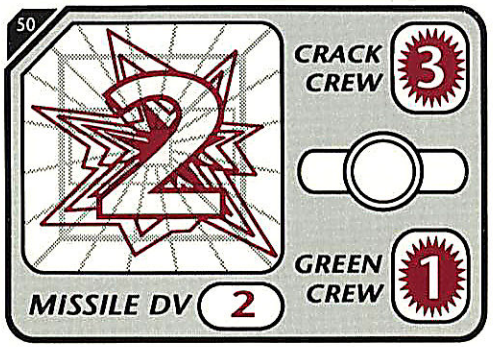
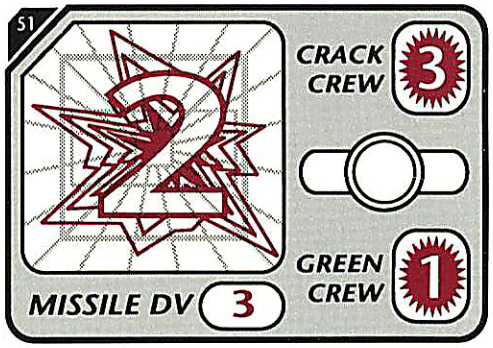
GREEN CREW
MISSILE DV 4


47
CRACK CREW
GREEN CREW
MISSILE DV 5


48
CRACK CREW
3
GREEN CREW
1
MISSILE DV 6


49
2
CRACK CREW
3
GREEN CREW
1
MISSILE DV
1


50
2
CRACK CREW
3
GREEN CREW
1
MISSILE DV
2


51
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3
GREEN CREW
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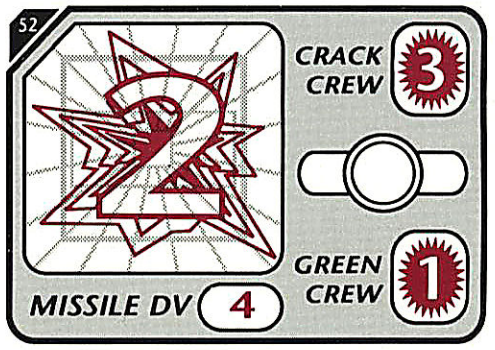
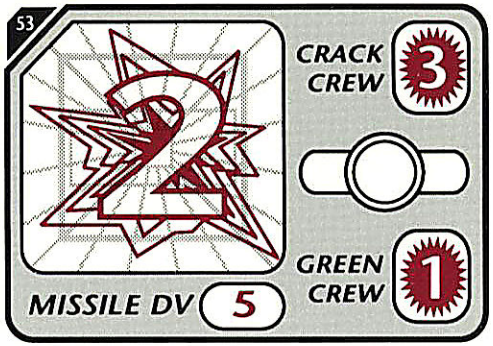
MISSILE DV
3


52
2
CRACK CREW
3
GREEN CREW
1
MISSILE DV
4


53
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3
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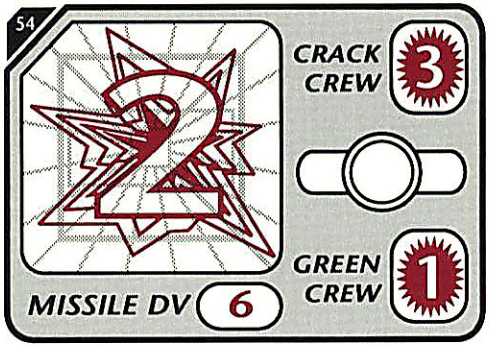
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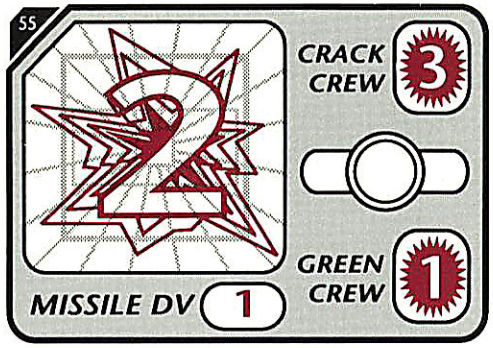
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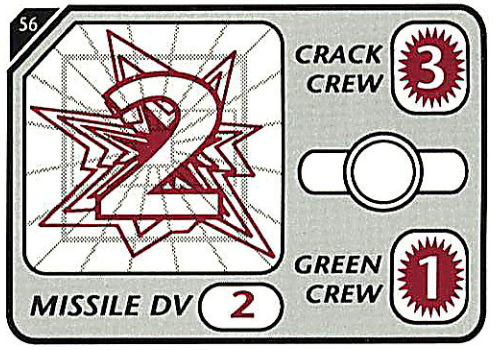
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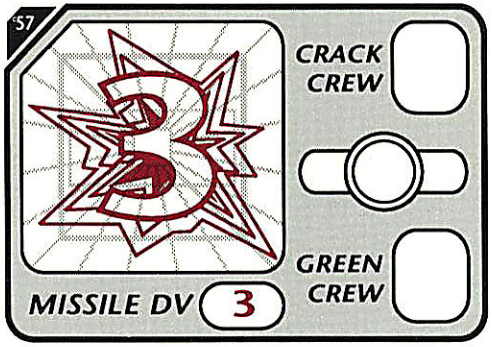
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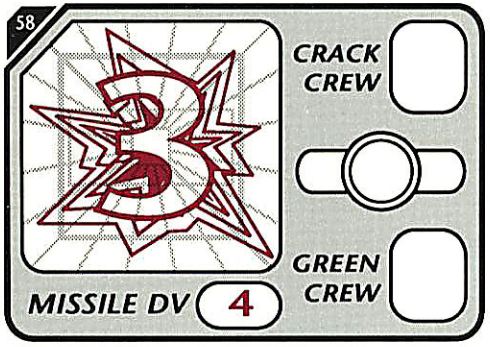
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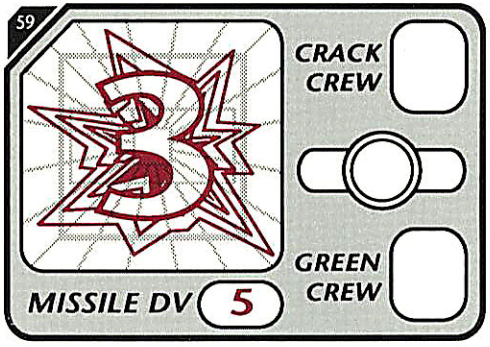
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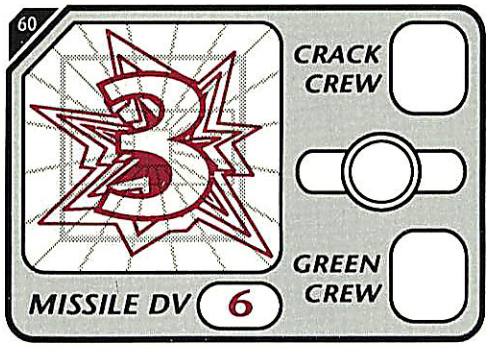
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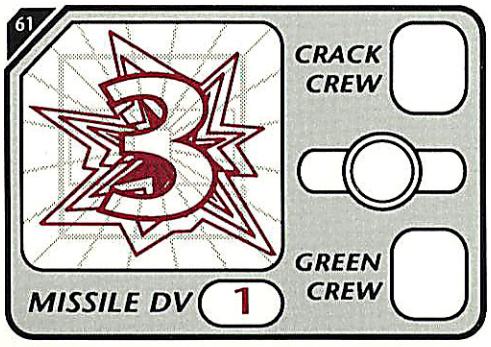
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GREEN CREW
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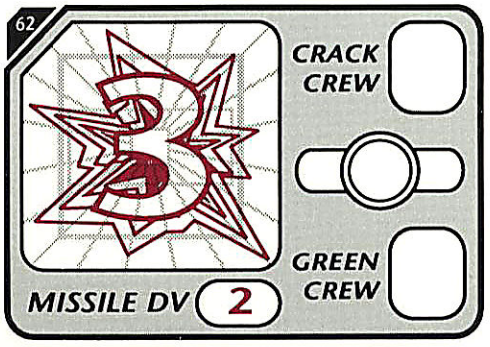
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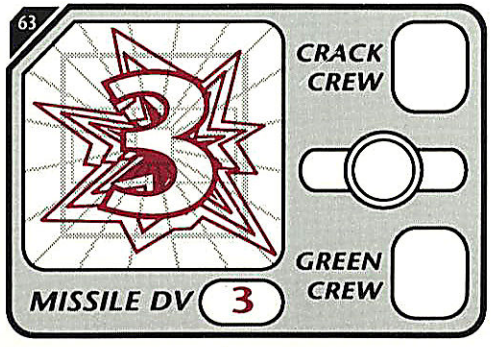
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GREEN CREW
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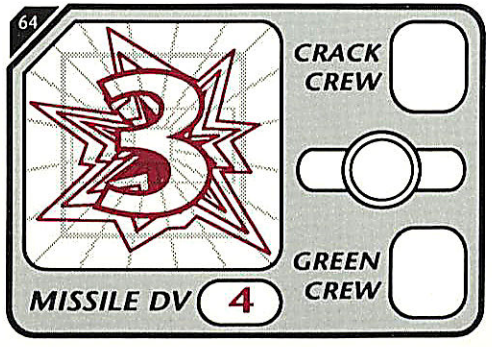
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GREEN CREW
MISSILE DV
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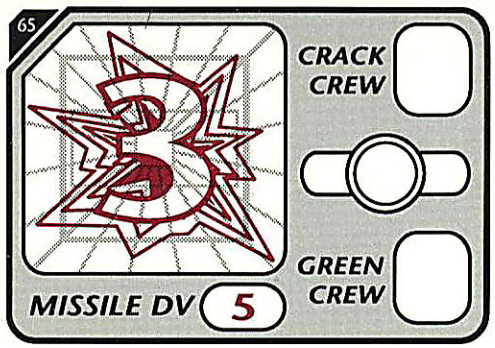
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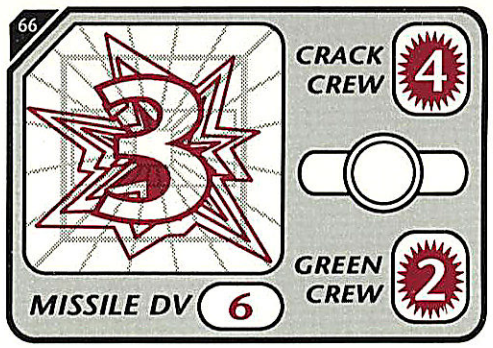
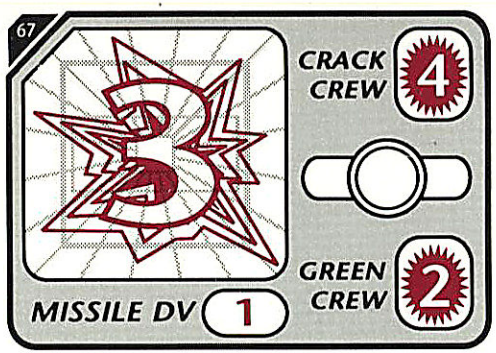
GREEN CREW
MISSILE DV 5


66
3
CRACK CREW 4
GREEN CREW 2
MISSILE DV 6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GREEN CREW 2
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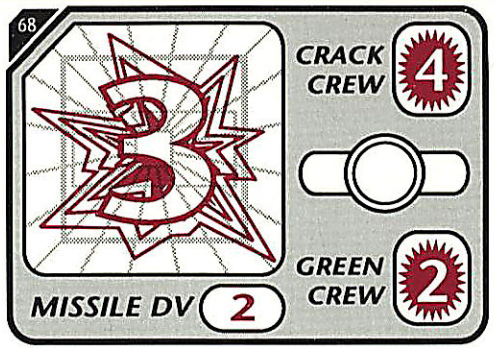
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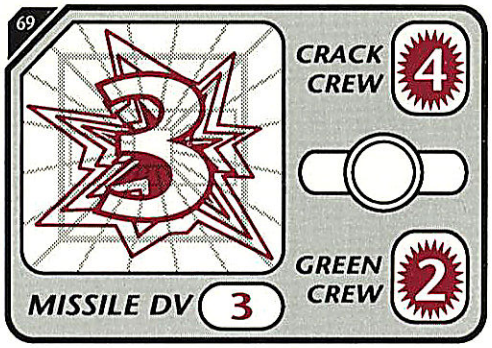
CRACK CREW 4
GREEN CREW 2
MISSILE DV 2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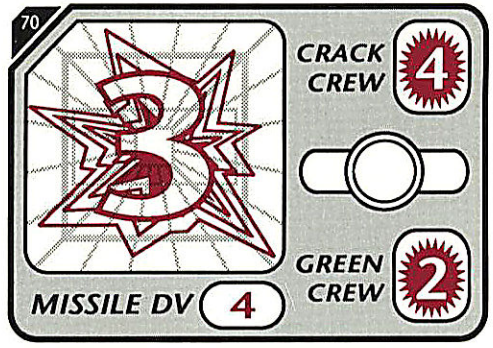
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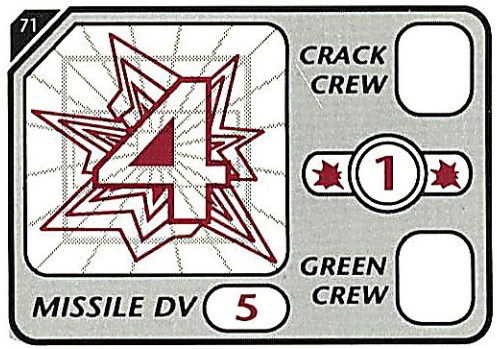
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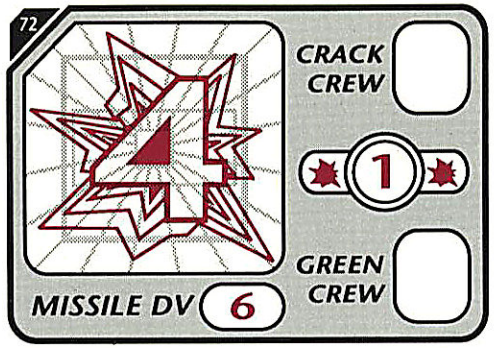
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GREEN CREW
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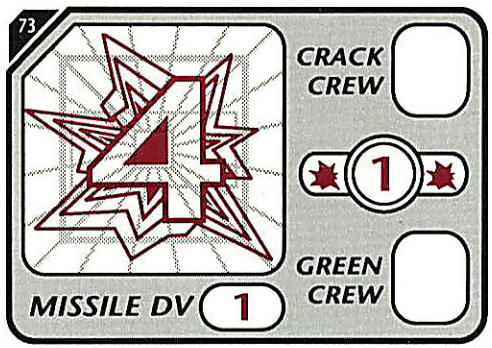
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4
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1
GREEN CREW
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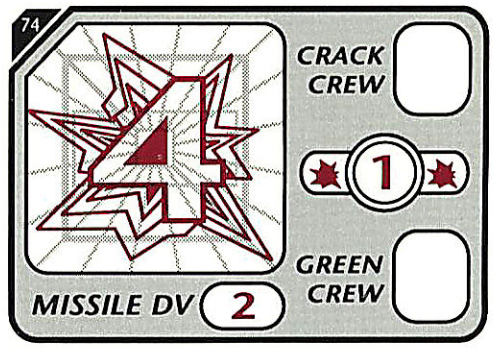
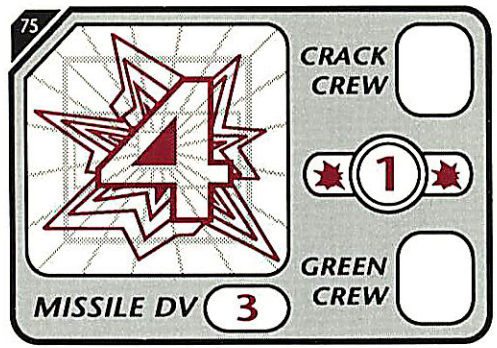

74
4
CRACK CREW
1
GREEN CREW
MISSILE DV 2


75
4
CRACK CREW
1
GREEN CREW
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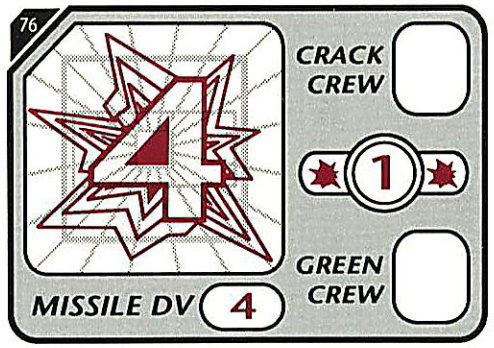
76
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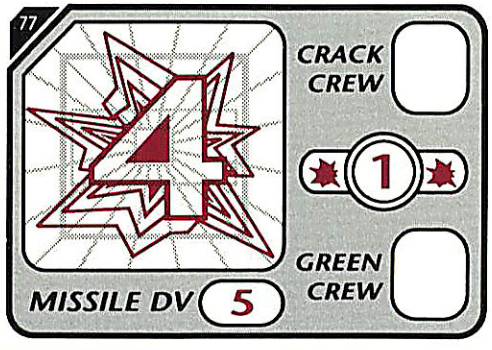
CRACK CREW
1
GREEN CREW
MISSILE DV 4


77
4
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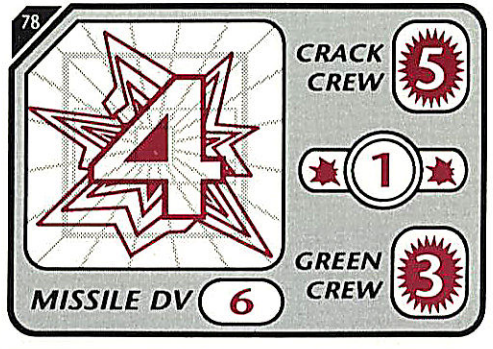
1
GREEN CREW
MISSILE DV 5


78
4
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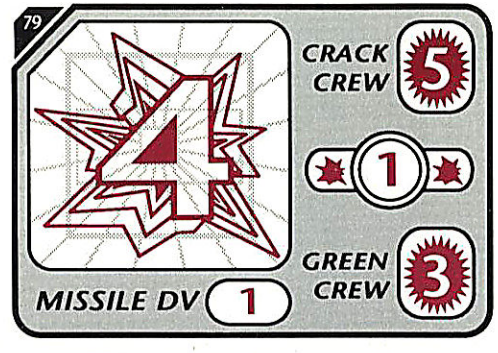
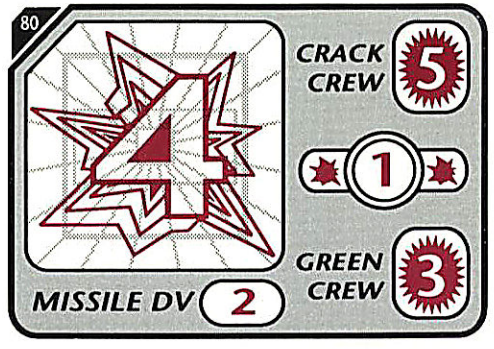
1
GREEN CREW 3
MISSILE DV 6


79
4
CRACK CREW 5
1
GREEN CREW 3
MISSILE DV 1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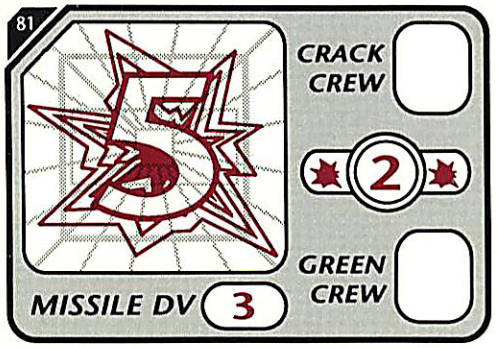
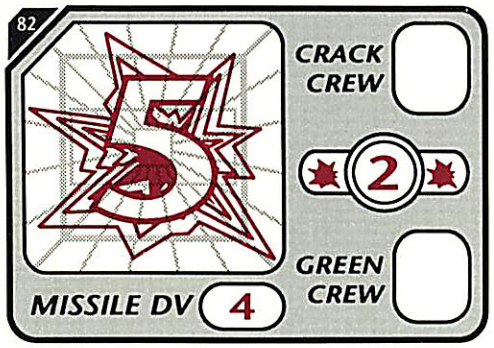
CRACK CREW 5
1
GREEN CREW 3
MISSILE DV 2


81
5
CRACK CREW
2
GREEN CREW
MISSILE DV 3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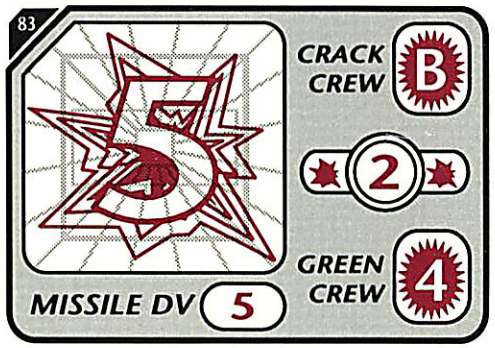
5
CRACK CREW
2
GREEN CREW
MISSILE DV 4


83
5
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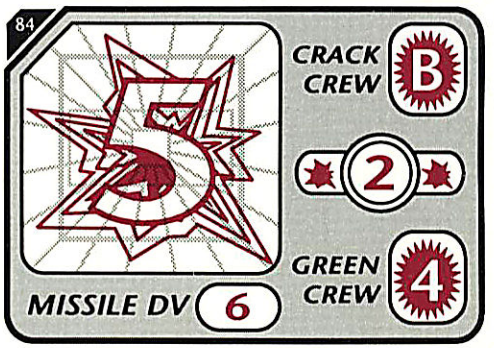
B
2
GREEN CREW
4
MISSILE DV 5


84
5
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B
2
GREEN CREW
4
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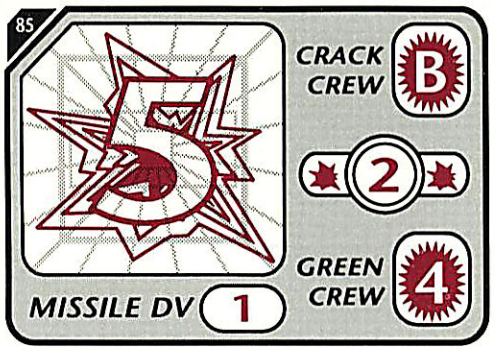
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5
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B
2
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4
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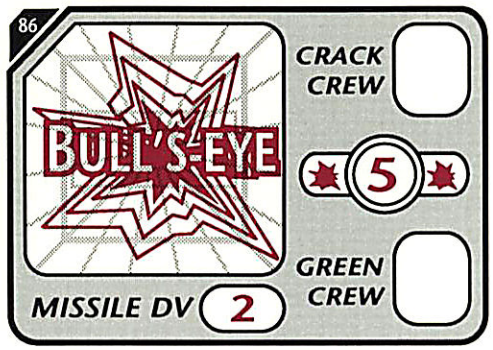
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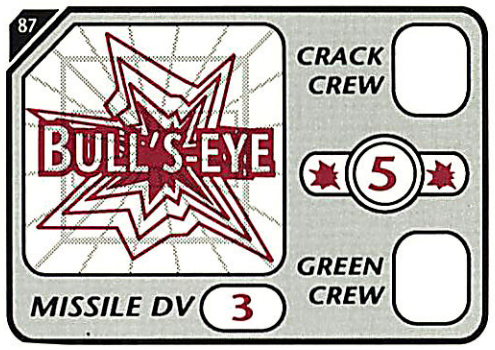
BULL'S-EYE
CRACK CREW
5
GREEN CREW
MISSILE DV 2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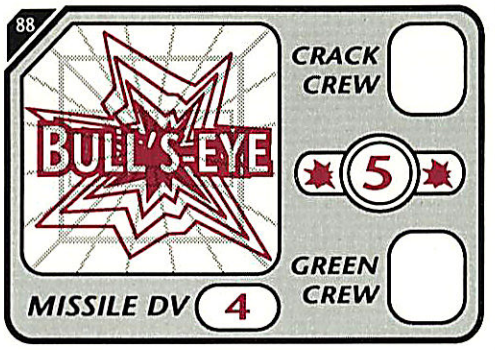
BULL'S-EYE
CRACK CREW
5
GREEN CREW
MISSILE DV 3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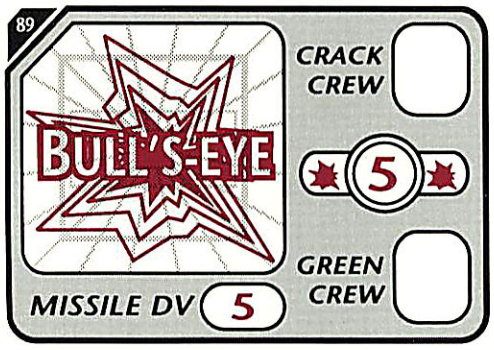
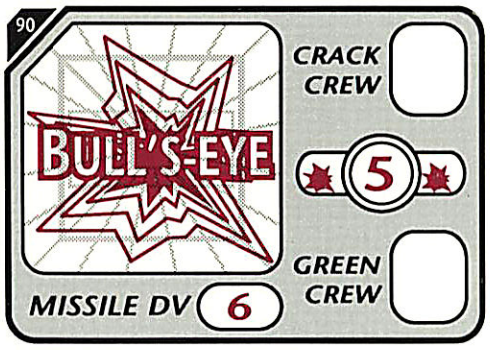
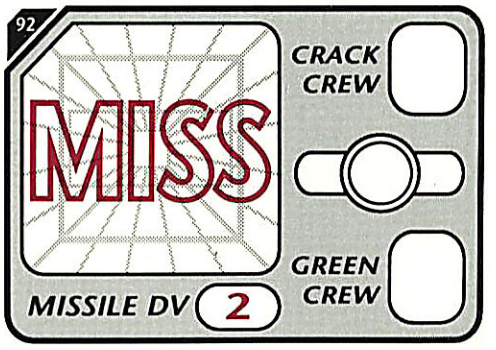
BULL'S-EYE
CRACK CREW
5
GREEN CREW
MISSILE DV 4


89
BULL'S-EYE
CRACK CREW
5
GREEN CREW
MISSILE DV 5


90
BULL'S-EYE
CRACK CREW
5
GREEN CREW
MISSILE DV 6


91
MISS
CRACK CREW
GREEN CREW
MISSILE DV 1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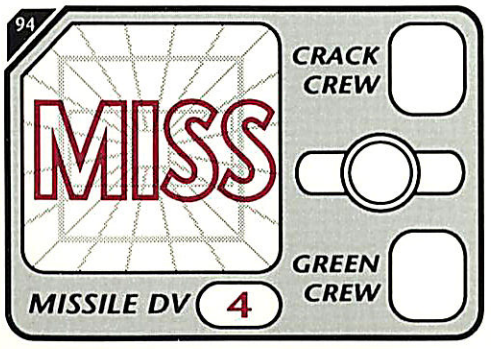
MISS
CRACK CREW
GREEN CREW
MISSILE DV 2


93
MISS
CRACK CREW
GREEN CREW
MISSILE DV 3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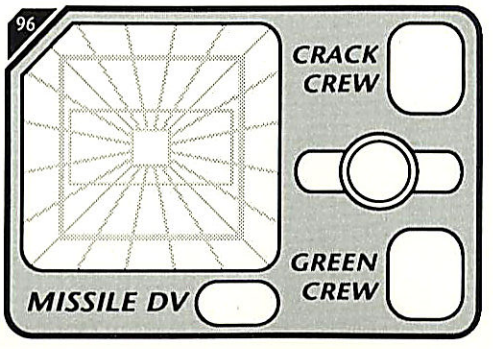
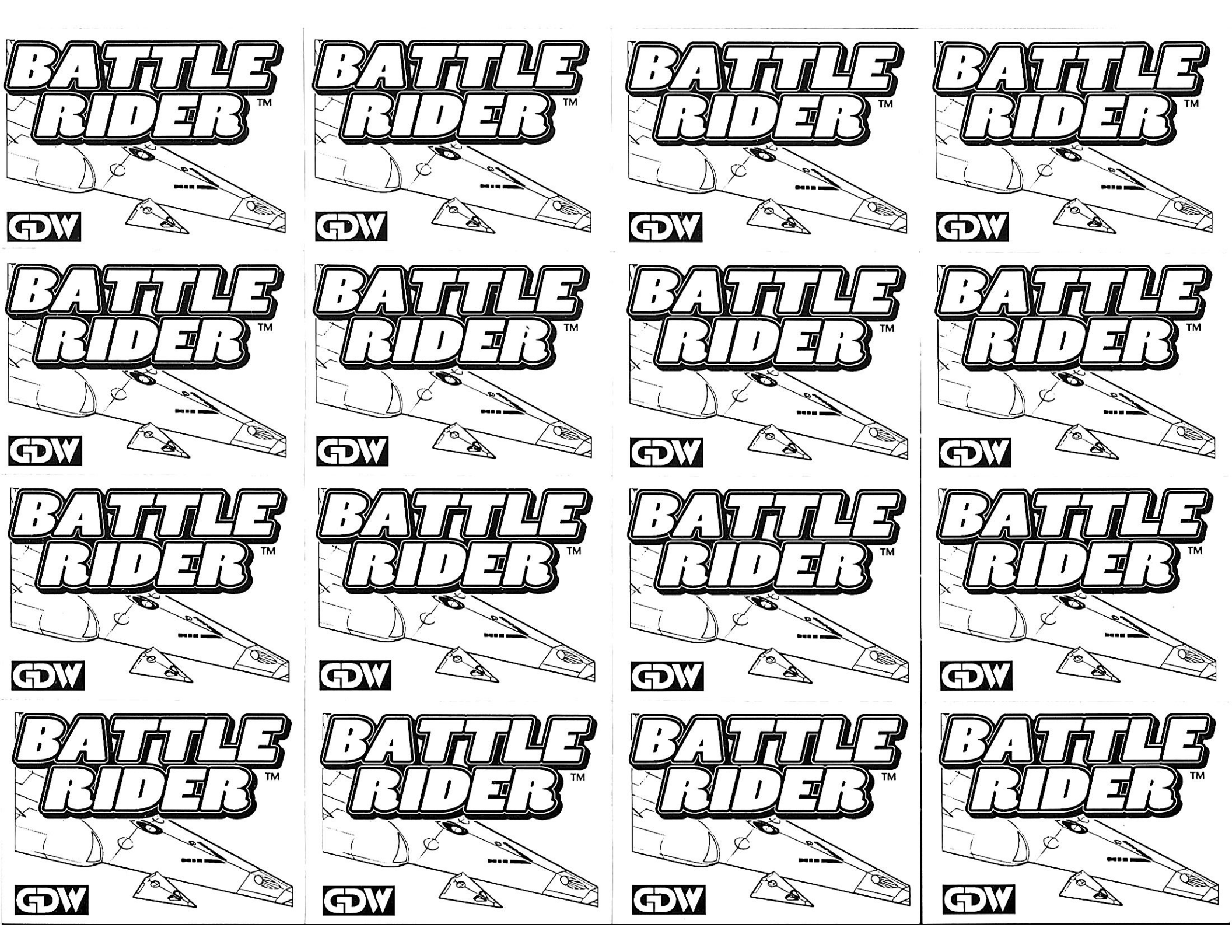
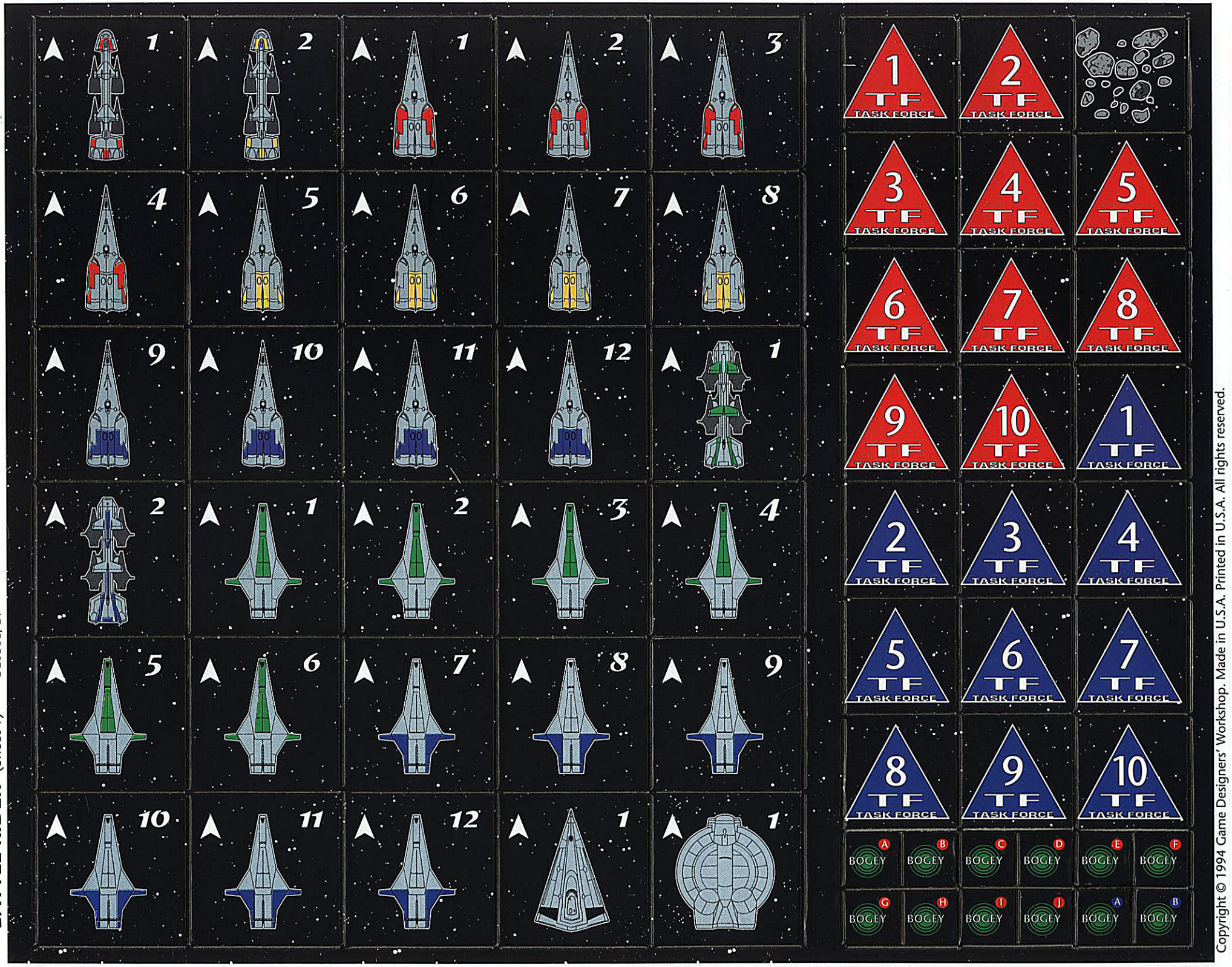
MISS
CRACK CREW
GREEN CREW
MISSILE DV 4


95
MISS
CRACK CREW
GREEN CREW
MISSILE DV 5


96
CRACK CREW
GREEN CREW
MISSILE DV


BATTLE RIDER™
GDW



BATTLE RIDER (Sheet 1) CC0308/C1

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BR Gallant-3

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-2

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-1

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BT Triumph-2

M[–2]10:9-9-8-5	–4
—	TL-15
—	FC:–6
L[10–2]10:1	M:6(30)
A:16 P:8 J:16 Msk	(P) J:3 G:2
AV:0 Aux B	4xBR
MS:13 SC:20 D:5	225

BT Triumph-1

M[–2]10:9-9-8-5	–4
—	TL-15
—	FC:–6
L[10–2]10:1	M:6(30)
A:16 P:8 J:16 Msk	(P) J:3 G:2
AV:0 Aux B	4xBR
MS:13 SC:20 D:5	225

BR Gallant-8

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-7

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-6

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-5

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-4

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BT Cleon-1

M[–2]10:8-8-7-4	–4
—	TL-14
—	FC:–5
L[10–2]2:1	M:4(20)
A:16 P:8 J:16 Msk	(P) J:3 G:2
AV:0 AuxB	6xBR
MS:13 SC:15 D:1	238

BR Gallant-12

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-11

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-10

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Gallant-9

M(–2)10:14-11-8-5	3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G6
AV:12 Aux B	—
MS:14 SC:40 D:10	90/135

BR Admiral-4

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-3

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-2

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-1

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BT Cleon-2

M[–2]10:8-8-7-4	–4
—	TL-14
—	FC:–5
L[10–2]2:1	M:4(20)
A:16 P:8 J:16 Msk	(P) J:3 G:2
AV:0 AuxB	6xBR
MS:13 SC:15 D:1	238

BR Admiral-9

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-8

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-7

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-6

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-5

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BB Voroshilef-1

M(–2)6:12-10-6-4	–4
M(x2–2)4:10-6-4-2	TL-13
P(x2–2)10:10-10-10-6	FC:–6
L(x20–2)10:1-1-0-0	M:40(200)
A:16 P:8 J:16 Msk	(SP) J3 G2
AV:12 AuxB	—
MS:11 SC:30 D:5	182

BB Sylea-1

M(–2)10:16-14-11-8	–4
—	TL-15
—	FC:–6
L(x30–2)10:1	M:40(200)
A:16 P:8 J:16 Msk	(SP) J3 G6
AV:16 AuxB	—
MS:16 SC:40 D:15	210

BR Admiral-12

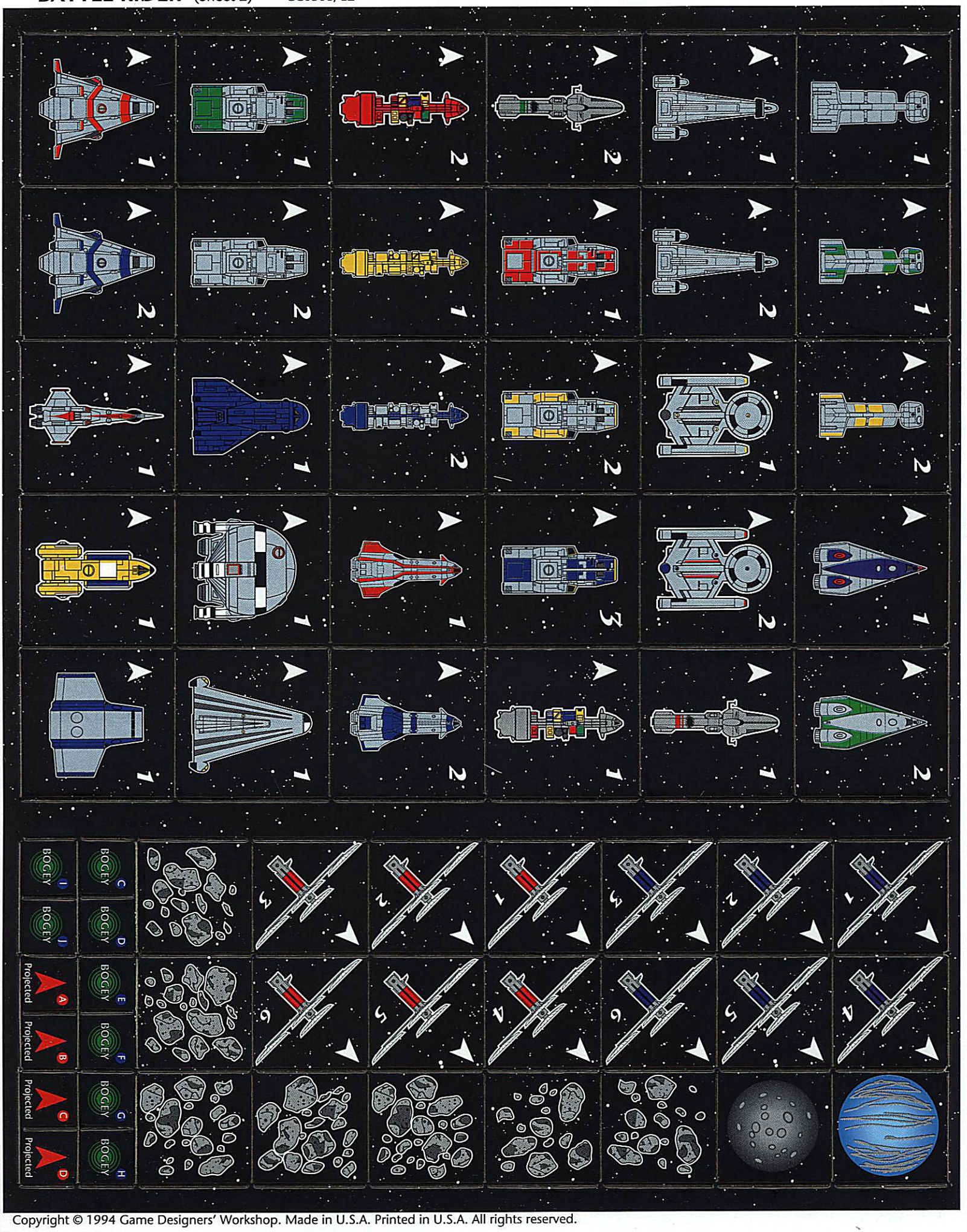
M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-11

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105

BR Admiral-10

M[–2]8:11-9-6-3	–3
P[–2]10:12	TL-14
L[x10–2]10:2-2-1-0	FC:–5
L(x30–2)2:1	M:20(100)
A:16 P:8 J:16 Msk	(S) G5
AV:12 Aux B	—
MS:16 SC:30 D:5	70/105



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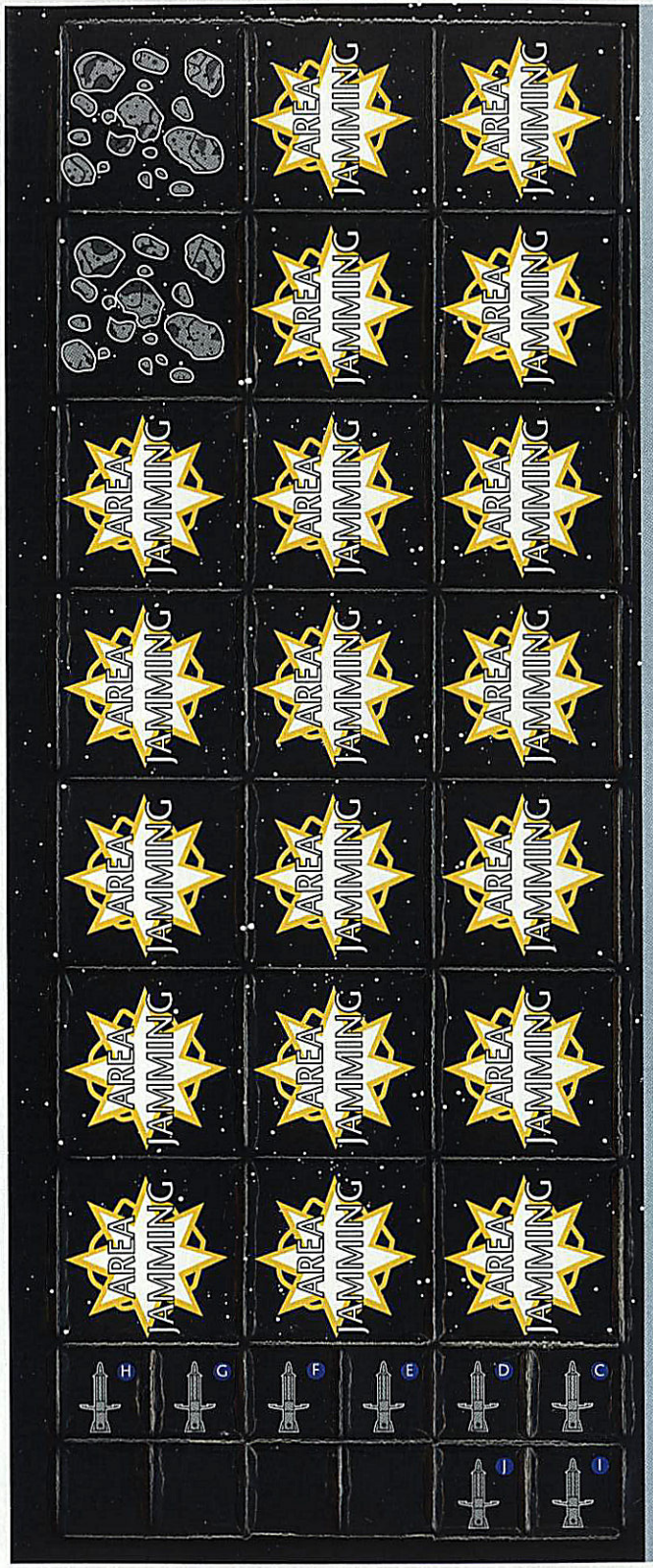

ED Rapier-2

M(–2)6:10-8-7-5	–3
—	TL-15
L(x5–2)10:2	FC:–6
L(x10–2)10:1	M:10(50)
A:16 P:8 J:16 Msk	(SP) J4 G4
AV:10	—
MS:11 SC:7	45

ED Rapier-1

M(–2)6:10-8-7-5	–3
—	TL-15
L(x5–2)10:2	FC:–6
L(x10–2)10:1	M:10(50)
A:16 P:8 J:16 Msk	(SP) J4 G4
AV:10	—
MS:11 SC:7	45

CL Starburst-2

M(–2)10:11-9-6-3	–3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(SP) J3 G6
AV:10	—
MS:14 SC:20 D:10	75

CL Starburst-1

M(–2)10:11-9-6-3	–3
—	TL-15
—	FC:–6
L(x20–2)10:1	M:20(100)
A:16 P:8 J:16 Msk	(SP) J3 G6
AV:10	—
MS:14 SC:20 D:10	75

CA Mercury-1

M(–2)10:12-10-7-4	–3
—	TL-15
—	FC:–6
L(x25–2)10:1	M:30(150)
A:16 P:8 J:16 Msk	(SP) J5 G4
AV:10 Aux B	—
MS:16 SC:25 D:5	105

CVM Valor-1

—	–1
—	TL-15
—	FC:–6
—	M:20(40)
A:10 [P:6] Msk	(SP) J4 G6
AV:2	—
—	9

DE Chrysanthemum-2

P[x2]10:4-4-3-2	–2
—	TL-15
—	FC:–6
L [x2]10:1	M:4(20)
A:10 [P:8] J:16, Msk	J4 G6
AV:2	—
MS:7 SC:2	15

DE Chrysanthemum-1

P[x2]10:4-4-3-2	–2
—	TL-15
—	FC:–6
L [x2]10:1	M:4(20)
A:10 [P:8] J:16, Msk	J4 G6
AV:2	—
MS:7 SC:2	15

DD Midu Agashaam-2

P10:6-6-6-5	–2
—	TL-15
—	FC:–6
L [x4]10:1	M:6(12)
A:10 [P:8] J:16 Msk	(SP) J4 G6
AV:2	—
MS:7 SC:3	25

DD Midu Agashaam-1

P10:6-6-6-5	–2
—	TL-15
—	FC:–6
L [x4]10:1	M:6(12)
A:10 [P:8] J:16 Msk	(SP) J4 G6
AV:2	—
MS:7 SC:3	25

LM Aurora-1

M5:4-2-1-0	–2E
—	TL-12
—	FC:–4
L(x10)4:1-1-0-0	M:2(4)
A:10 P:4 Msk	(P) J2 G2
AV:1	—
SC:4	15

BRL Manticore-3

M(–2)2:6-3-2-1	–1
—	TL-12
—	FC:–4
L [x2]2:1-1-0-0	—
P:4 Msk	(S) G4
AV:3	—
—	7/11

BRL Manticore-2

M(–2)2:6-3-2-1	–1
—	TL-12
—	FC:–4
L [x2]2:1-1-0-0	—
P:4 Msk	(S) G4
AV:3	—
—	7/11

BRL Manticore-1

M(–2)2:6-3-2-1	–1
—	TL-12
—	FC:–4
L [x2]2:1-1-0-0	—
P:4 Msk	(S) G4
AV:3	—
—	7/11

CVM Valor-2

—	–1
—	TL-15
—	FC:–6
—	M:20(40)
A:10 [P:6] Msk	(SP) J4 G6
AV:2	—
—	9

DD Fusilier-1

P[–1]10:11	–2
—	TL-12
—	FC:–4
L(x10–2)4:1-1-1-0	M:5(25)
A:16 P:8 J:16 Msk	(SP) J2 G2*
AV:10	—
MS:10 SC:10	30

DD Lancer-1

M(–2)6:9-6-3-X	–2
—	TL-12
—	FC:–4
L(x10–2)4:1-1-1-0	M:5(25)
A:16 P:8 J:16 Msk	(SP) J2 G2*
AV:10	—
MS:10 SC:10	30

LC Maggart-2

M(–2)6:6-3-2-X	–2E
—	TL-12
—	FC:–4
L(x10)4:1-1-0-0	M:12(24)
A:16 P:6 J:10 Msk	(P) J2 G2
AV:1	1xBRL
SC:6	18

LT Maggart-1

M(–2)6:6-3-2-X	–2E
—	TL-12
—	FC:–4
L(x8)4:1-1-0-0	M:4(8)
A:16 P:6 J:2 Msk	(P) J2 G2*
AV:1	2xBRL
SC:4	17

LC Aurora-2

M5:4-2-1-0	–2E
—	TL-12
—	FC:–4
L(x10)4:1-1-0-0	M:12(24)
A:10 P:4 J:10 Msk	(P) J2 G2
AV:1	—
SC:6	17

CC Kinunir-1

—	–2
—	TL-15
L(x2) 10:2	FC:–6
L(x4)10:1	M:2(4)
A:10 [P:8]	(SP) J4 G4
AV:2	—
BG	17

CR Ashtabula-1

—	–1
—	TL-15
—	FC:–6
L(x4)10:1	M:2(4)
A:10 [P:5] J:10 Msk	(SP) J3 G2
AV:1	—
SC:2	12

MA Mary Ellen Carter-1

—	–1
—	TL-12
—	FC:–4
L(x2)4:1-1-0-0	M:2(4)
A:10 [P:6]	(SP) J2 G1
AV:0	—
—	6

SDB Shukugan-2

—	–1
—	TL-12
—	FC-4
L(x2)2:1-1-0-0	M:2(10)
P:4 Msk	(SP) 4G
AV:3	—
—	11

SDB Shukugan-1

—	–1
—	TL-12
—	FC-4
L(x2)2:1-1-0-0	M:2(10)
P:4 Msk	(SP) 4G
AV:3	—
—	11

SM Victrix-1

—	–1
—	TL-12
—	FC:–4
L(x2)4:1-1-0-0	M:1(2)
A:10 P:5 J:4 Msk	(SP) J2 G4
AV:2	—
SC:1	6

EC Gazelle-1

—	–1
—	TL-14
L(x2)10:2-2-1-0	FC:–5
L(x2)2:1	—
A:10 [P:5] J:10 Msk	(SP) J3/5 G3
AV:2	—
—	8

CP Patrol Cruiser-1

—	–1
—	TL-15
—	FC:–6
L(x2)10:1	M:2(4)
A:10 [P:6] Msk	(SP) J3 G4
AV:2	—
—	9

EC Fiery-2

—	–1
—	TL-14
L10:2-2-1-0	FC:–5
L(x2)2:1	M:1(2)
A:10 [P:5] J:4 Msk	(SP) J4 G4
AV:2	—
—	8

EC Fiery-1

—	–1
—	TL-14
L10:2-2-1-0	FC:–5
L(x2)2:1	M:1(2)
A:10 [P:5] J:4 Msk	(SP) J4 G4
AV:2	—
—	8

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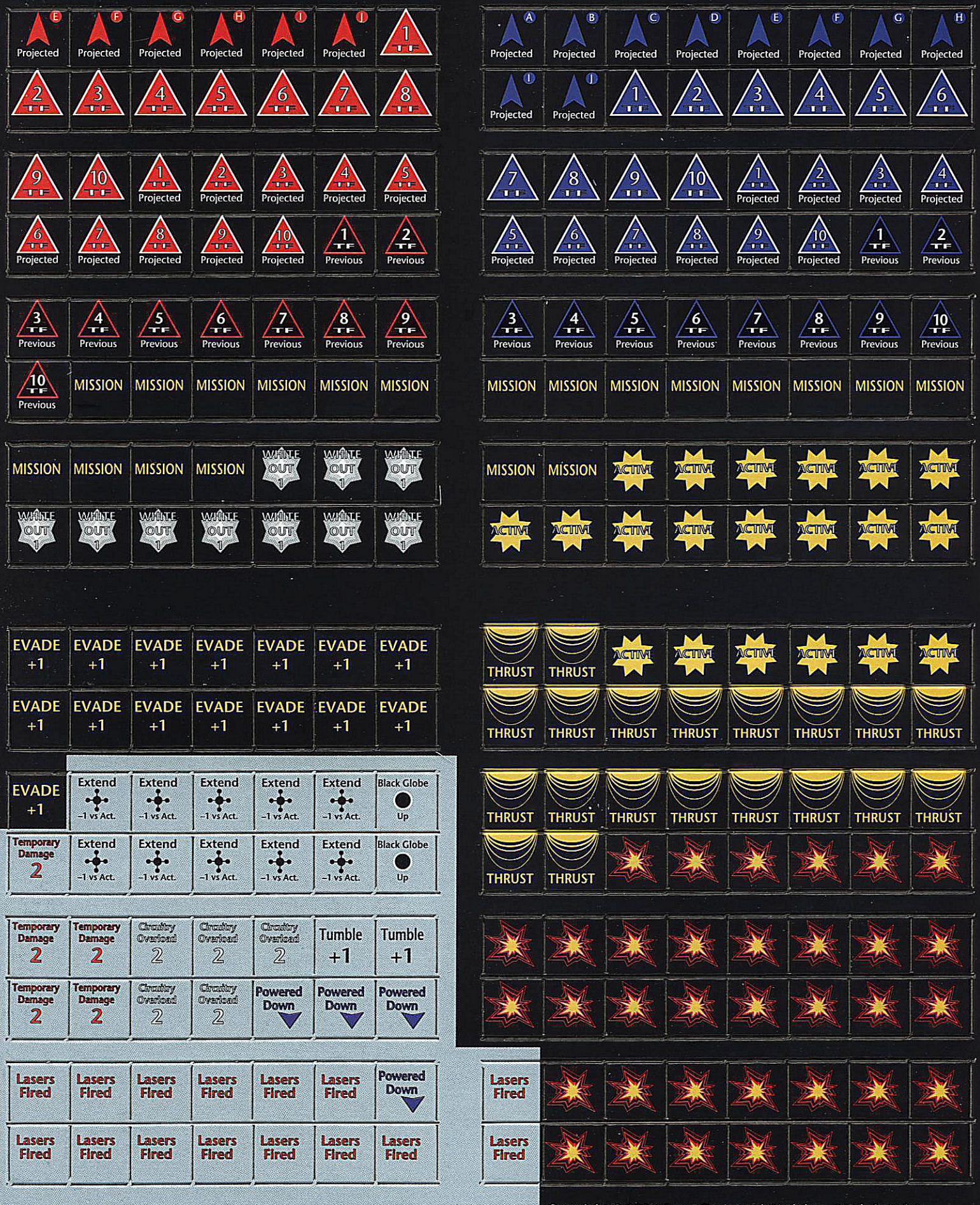

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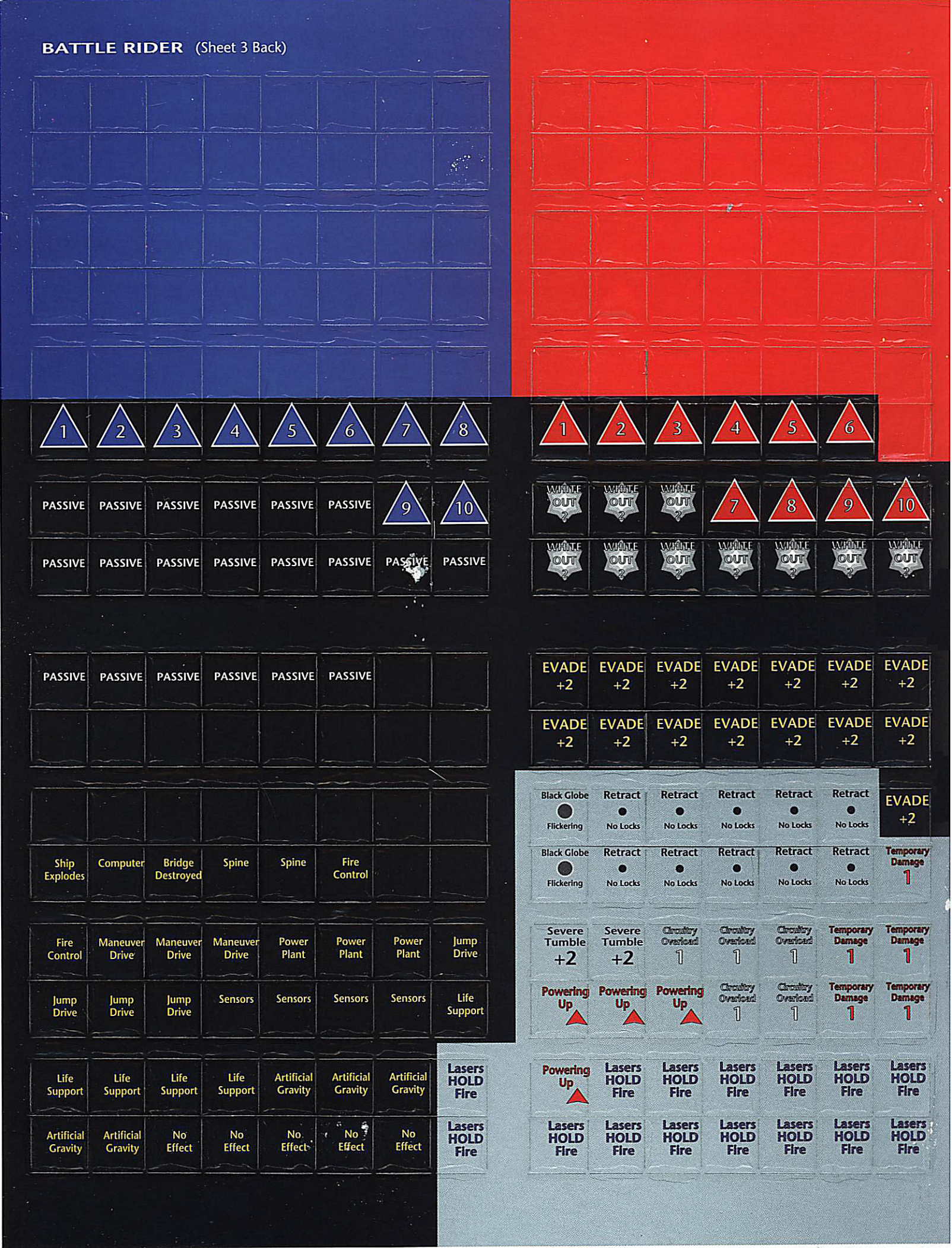

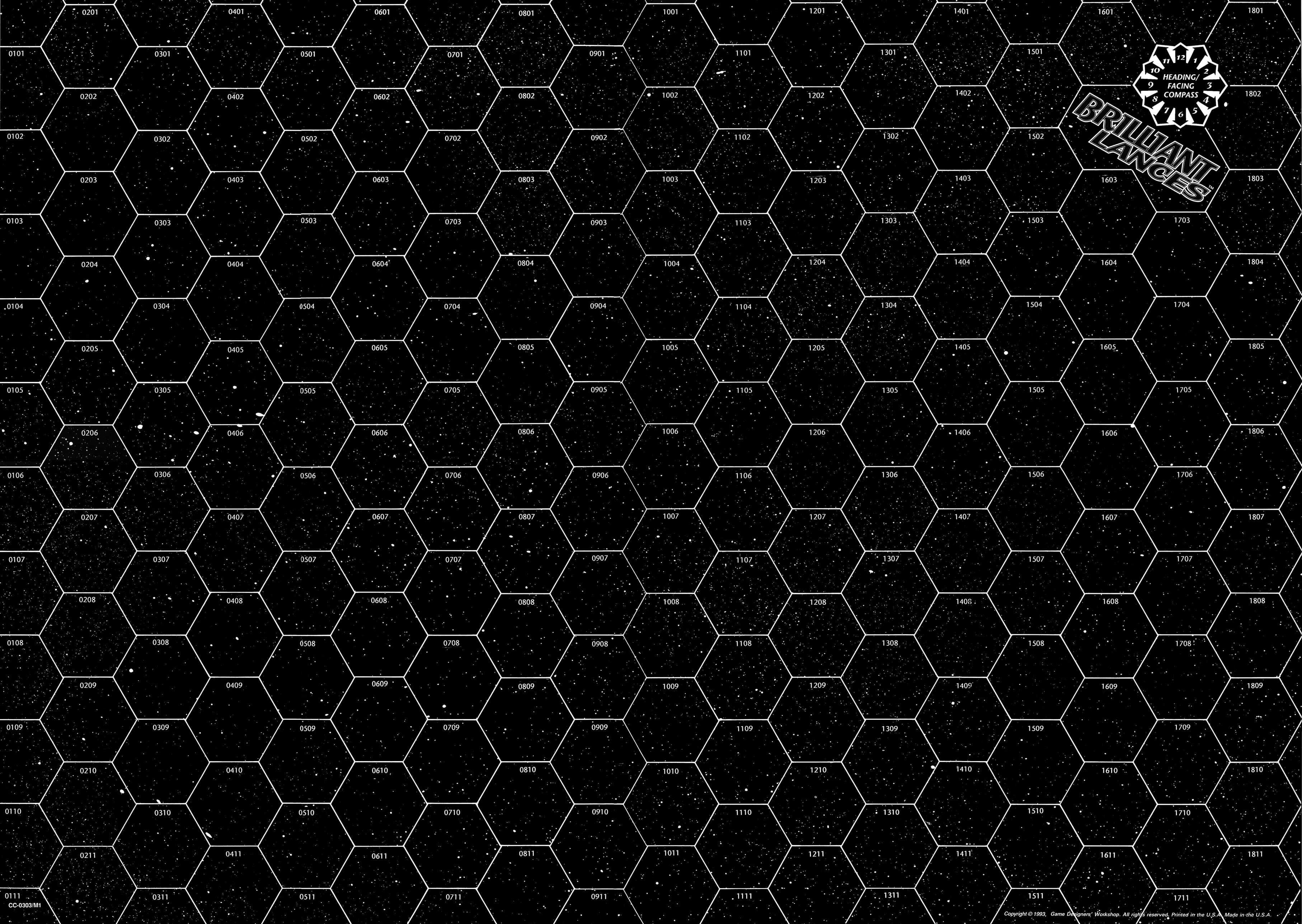

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Science Fiction Roleplaying Game

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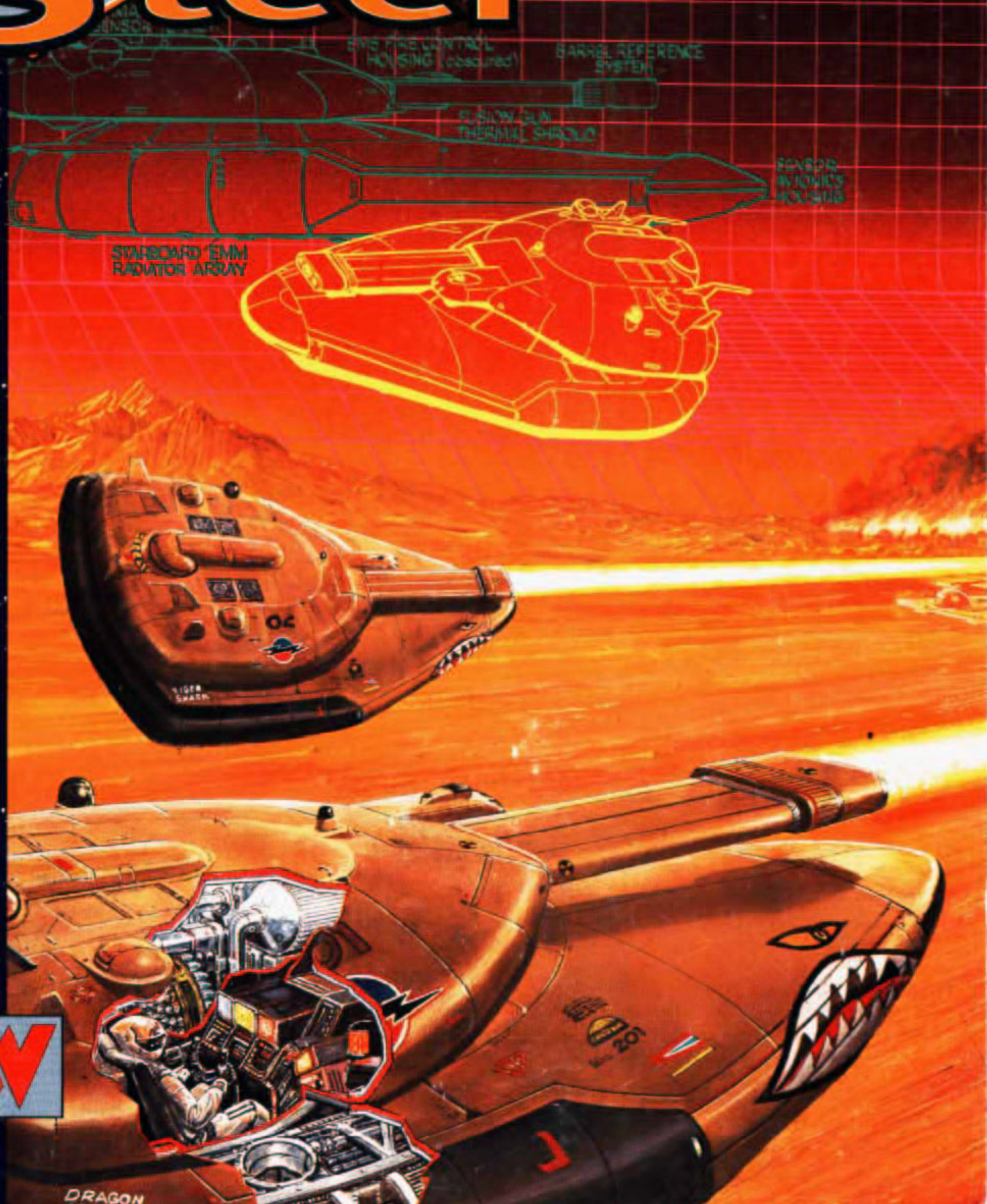
Technical Architecture



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Science Fiction Roleplaying Game

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The New Era

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Technical Architecture

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Not Dedicated To: Robert J. Lippert

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FIRE, FUSION, & STEEL

Fire, Fusion, & Steel (FF&S) is the technical architecture manual for **Traveller.** It enables referees and players to design major items of equipment to meet the specific needs of their games. It is also meant to explain the genuine scientific basis of the equipment in the game, where such basis exists, and provide the fictional rationale for other technical items. We do this because we believe that, to the extent possible, a science fiction game ought to be grounded in real science. Of course, the game isn't just science, it is science *fiction*, and so the technology used in the game departs from reality in a number of significant areas. But it only does so where required by the necessities of high adventure. We believe firmly that a grounding in solid science for much of the game's technology adds to the sense of realism, the "willing suspension of disbelief," so important to enjoyable roleplaying.

Beyond those goals, this manual also enables referees to tailor the **Traveller** rules to fit a variety of other possible science fiction universes with different departures from scientific reality. While this gives unprecedented control of the game environment to the referee and players, it poses some problems for the organization of this book.

For purposes of clarity, the environment in which **Traveller: The New Era** is played is called *Imperial Space* throughout this book. It represents not a specific astrographic area, but rather the specific future history detailed in the game, along with the technological reality of that future history. The assumption of this book is that the vast majority of users will, at least initially, be using it to design Imperial Space technical equipment. As a result, each chapter of the manual is organized with all Imperial Space technologies first, and incorporated directly into the various design sequences. Then a section covering alternate technologies is provided at the end of most chapters which details alternative technological approaches to the issue addressed by the chapter.

The manual itself is divided into three broad areas, or "books": Major Systems, Subsystems, and Weaponry. By major systems we mean vehicles and craft of various sorts which incorporate a large number of subsystems in their design. The design sequences for these major systems include tables and subsystems unique to the major system (such as tracked suspensions in the Ground Vehicle chapter), but will refer you to subsystem chapters (such as Life Support or Electronics) for material common to a number of different major systems. Weaponry could be included in subsystems but constitutes such a large body of material as to justify its own section of the book.

We hope that this organization proves to be the most useful in the long run.

Special Note: It was our original aim to make this manual complete under one cover. In the course of preparing the book, however, it became clear that that simply was not possible. A science-fiction game should always be open to additional technological treatments, and no one book should ever impose absolute limits on what the game can cover. We've covered the most important subjects in this manual, but look for treatments of additional subjects ("wet" ships, robots, disintegrators, neural weapons, primitive transport, genetic engineering, jump projectors, etc.) in future products. When a sufficient number of these have been published, they will be gathered into a single follow-on volume.



The Metric System of Measure

The **Traveller** game exclusively uses the metric system of measure. Those players from countries (such as our own) which still cling to the archaic English system of measure have our sympathy. For you we present the following summary of the major metric units commonly used in the game, an explanation of what they mean, and an approximate conversion system.

The conversion system is by no means precise, but is instead intended to provide a rough feel for equivalencies.

The metric system is a decimal system. Each area of measurement (distance, volume, power, energy, etc.) has a base unit of measure (meter, liter, watt, joule) and all other units are either decimal multiples or fractions of that base measurement. Whether it is a fraction or multiple, and by how much, is indicated by a prefix attached to the base unit of measure. These prefixes are:

micro-	1/1,000,000
milli-	1/1000
centi-	1/100
deci-	1/10
deka-	×10
kilo-	×1000
mega-	×1,000,000

Distance

millimeter	about 1/25 of an inch
centimeter	about 2/5 of an inch
meter	about 1 yard (and 3 inches)
kilometer	about 3/5 of a statute mile, 5/9 of a nautical mile

Volume

liter	(1000 cubic centimeters) about 1 quart
kiloliter	(1 cubic meter) about 1 ton of water

Weight

gram	(weight of 1 cubic centimeter of water) about 1/30 of an ounce.
kilogram	2.2 pounds
tonne	(1000 kilograms, also called a metric ton) about 2200 pounds

Energy

joule	work done by a current of 1 amp flowing at a potential of 1 volt
megajoule	power produced by the explosion of between 6 and 7 ounces of TNT

Power

watt	1 joule per second
kilowatt	about 1 1/3 horsepower

Important Note: *Throughout this book, the word "tonne" always means a metric ton. A "ton" in its meaning of 14 cubic meters of volume will always be specified in the text as "displacement ton."*

Interpolation

The design rules will often allow you to design a component which falls somewhere between two entries on a table and direct you to interpolate the correct value. Interpolation is a method of determining a value which falls between two known values. As an example, look at the CPR Gun table on page 109, and assume we want to know the weight of a 7.62 cm gun. We know the weights for a 7cm gun (.54 tonnes) and for an 8cm gun (.66 tonnes).

To interpolate, first find out how far between the the two reference points your intermediate data point falls. This is done in three steps.

Step 1: Subtract the lower reference point from the higher reference point. 8cm–7cm=1cm.

Step 2: Subtract the lower reference point from the intermediate reference point. 7.62cm–7cm=0.62cm.

Step 3: Divide the result of step 2 by the result of step 1. The result will be a decimal value. 0.62÷1=0.62.

In the case of our example, the result will be 0.62.

Second, find out the the differences in values between the two reference points, by subtracting the lower value from the higher. In our example, the difference in weight is 0.12 tonnes.

Third, multiply the decimal value of the difference in data points times the difference in values and add the result to the lower of the two reference point values. In our example, we multiply 0.62 times 0.12 (product of .0744) and add it to the lowest data point value (.54) for a result of 0.6144. The 7.62cm gun weighs 0.6144 tonnes (614.4 kilograms).



TECHNOLOGY ASSUMPTIONS

Traveller: The New Era is intended to not be limited to a single campaign background or to a single set of future science assumptions. Its rules are intended as a framework that will allow the play of a wide variety of science-fiction visions. Such different visions have distinctive technologies that separate them from speculative universes without such technologies. Matter teleportation, stardrives, and antigravity are all forms of technology whose presence in or absence from a setting have a major influence on the overall feel of that science fiction setting, and are all directions that can be explored in **Fire, Fusion & Steel: Traveller Technical Architecture.**

However, like any roleplaying game, **Traveller** must have a basic set of assumptions which drive a basic campaign setting. Not all referees wish to design their own unique universes. Many would rather start playing in a standard campaign setting that they know will be supported by future products and source material. For **Traveller**, this standard campaign is the Imperial campaign that was started with the first **Traveller** edition. This campaign will continue to be supported as the standard default campaign of **Traveller: The New Era.**

The purpose of this chapter is to explain to referees and players how the technological assumptions of this standard Imperial campaign fit into the variable technology schemes presented in **Technical Architecture.** Players and referees who have no desire to use a campaign other than the Imperial campaign may still find this information interesting.

Different Universes

The approach taken by **Traveller: The New Era** is that each of these different technological visions are actually different universes. The different technologies seen in these universes are the result of differing physical laws. These physical laws will make certain technological breakthroughs more or less difficult, perhaps even impossible. The more a universe's physics resist a certain development, the longer it will take to make the initial breakthrough, and the more time will pass between successive improvements. Likewise, the physics of a universe will allow one form of stardrive to be developed, but not another—say the use of naturally occurring warp points instead of **Traveller**'s standard jump drive.

Traveller divides the technology of the future into two types: baseline technology and projected technology.

Baseline Technology: Baseline technology is technology based on physical laws that we understand and can effectively manipulate in the 20th century. This includes such things as firearms, internal combustion engines, nuclear fission, ballistic computers, etc. Baseline technology also includes one important set of extrapolated technologies: advanced power generation. The ability to create power of a certain quantity using a certain amount of fuel is the most important consideration for the use of any other technology, and hence is included in **Traveller**'s baseline technology. This particularly refers to the harnessing of fusion technology at ever increasing levels of efficiency. It is this baseline technology that defines the **Traveller** technology, or tech, level.

Tech Level: Tech level is a shorthand scale to show the level of baseline technology available. See the table for examples.

In different universes, different projected technologies may be added at different tech levels, indicating the point on the baseline scale at which they initially become possible. But not all projected technologies will be possible in a given universe, nor will they become possible at the same time as in other universes.

Note that baseline technology levels have fuzzy borders. Certain technologies become available as experimental systems before they are routinely useful and economically practical. Furthermore, the model of Earth history can be misleading when applied to an interstellar community, because worlds do not need to individually discover basic scientific principles. The best example is the discovery in Earth's history of microbes and the medical revolution that this brought about. A low-tech world would not have to develop its own microscopes to learn about these facts. Such a world would only have to be told about certain principles of infection and sanitation in order to realize the great health benefits that come from boiling water, maintaining standards of cleanliness, etc.

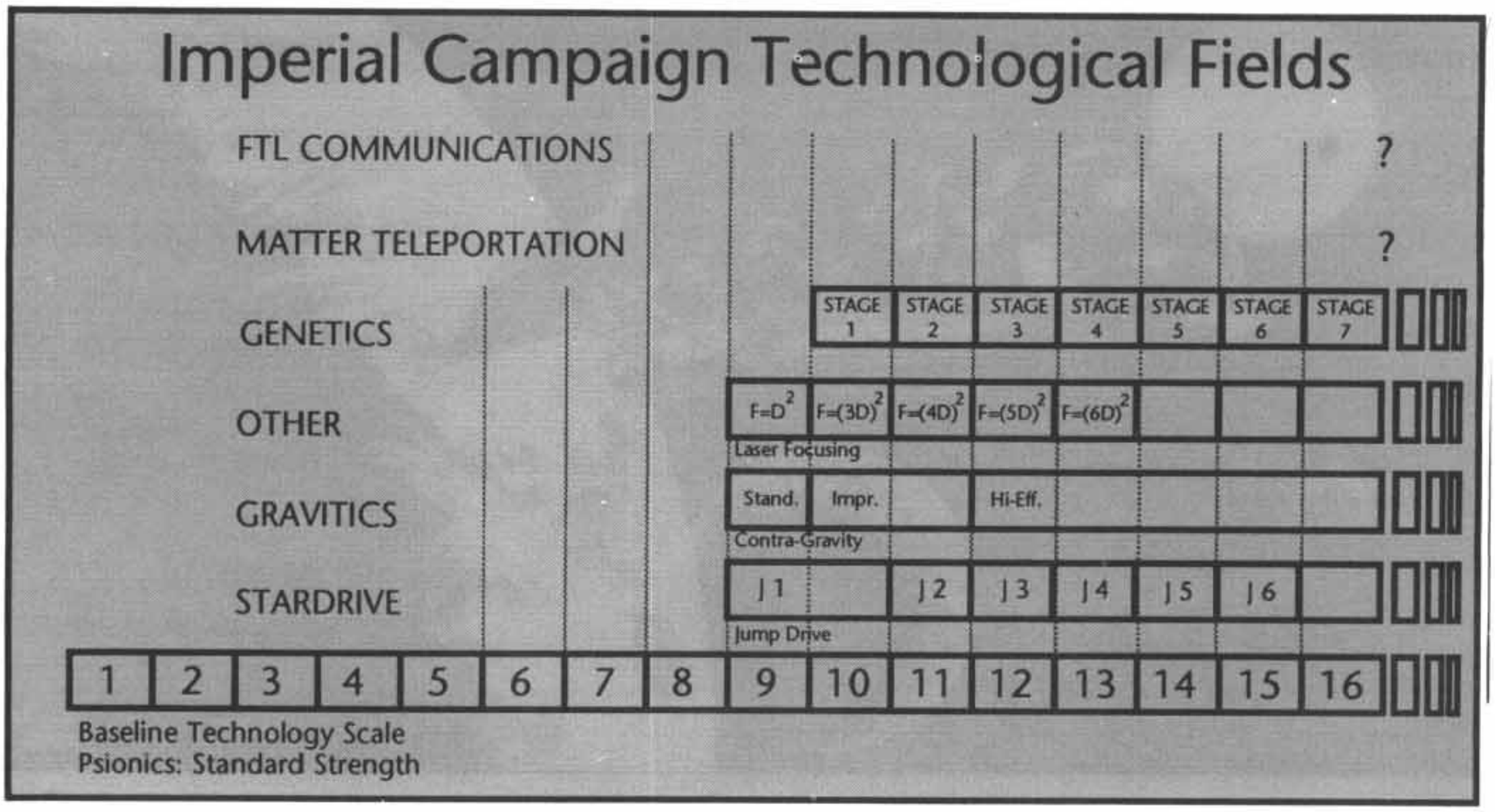
Also note that baseline technology allows unusual technical breakthroughs under specific local conditions. For example, on a world with a dense atmosphere and low gravity (an unlikely combination to be sure), practical aircraft will become available before they were on Earth, as it would be easier to generate sufficient power to keep an aircraft in the air.

Available Baseline Technology

Baseline Tech Level	*Period in Earth's History*	*Available Technology*
0	Stone Age	Fire, stone tools
1	Middle Ages	Wind power
2	c. 1600	Early firearms
3	c. 1800	Steam power
4	c. 1900	Internal combustion engines, electricity
5	c. 1930	Radio, radar, rocketry
6	c. 1950	Jet engines, nuclear fission
7	c. 1970	Low-power lasers, printed circuits
8	c. 1990	Fiber-optics, microchips
9	Beyond 2000	Fusion power
10+	Farther beyond	Increasingly efficient fusion power

Projected Technology: Projected technology refers to breakthroughs using physical laws not currently known (for example, stardrives and antigravity), or physical laws that we do know and understand to some extent, but which we do not yet understand how to completely manipulate (the cloning of higher animals is an example of this). Because projected technology deals with the ability to do certain things in a universe because the physical laws there allow it, projected technology also refers to things not normally thought of as technology, like psionics. Psionics is not a technology *per se*, but rather a natural phenomenon which can be exploited.





The Imperial Campaign as Example

In order to clearly explain these concepts, we will examine the technological underpinnings of the standard Imperial campaign. This campaign is a variant universe like any other described above. It has its own set of technological assumptions which reveal the background physics of the universe.

A universe can be thought of as having "settings" which dictate the sort of things that can and cannot be done in that universe, and how difficult these things are. The harder a certain technology is to perfect, the later it will be introduced on the baseline technology scale.

Looking at the technology chart above for the Imperial campaign, we see that, like any **Traveller** universe, it begins with the baseline tech level scale. To this baseline are added the projected technology fields.

Projected technology is divided into several different fields. Each field represents a solution to a problem or goal. For example, the stardrive field answers the problem of how people get from star to star. Some of these fields present alternative approaches to those goals. In the case of the stardrive field, a universe's projected technology can be jump drive, stutterwarp, natural warp points, star gates, hyperspace, or psionic shifting (as a rule of thumb, only one type of stardrive should be included in a universe). Other fields have just one approach and effect (matter teleportation, for example).

When a field is selected to use in a universe, it must be given an initial availability point in relation to the baseline tech level scale. For example, in the Imperial campaign, the stardrive type chosen, jump drive, becomes available at tech level 9.

After setting the tech level of initial availability, the field's "slope" must be set. Most fields will have scales of improvement within them (for example, jump drive availability starts out with jump 1, then advances to jump 2, jump 3, and so on). The slope determines how rapidly these improvements are made with respect to the baseline tech level. The standard 1:1 slope allows one of these improvements per baseline tech level. A shallow slope reflects the fact that each incremental improvement takes longer. A shallow slope could be designated by the referee as requiring two (a 1:2 slope) or even three (a 1:3 slope) tech levels per improvement. For example, if jump drive technology were placed on a 1:2 slope, jump 1 would become available at tech level (TL) 9, jump 2 at TL 11, jump 3 at TL 13, and so on. A universe might also have a steep slope, showing that once a certain breakthrough was made, further development proceeded rapidly. At a 2:1 slope, jump 1 and 2 would appear at TL 9, jump 3 and 4 at TL 10, and so on. In the Imperial campaign, there is an initial flat spot immediately following introduction at TL 9 and 10, but once TL 11 is reached, jump performance increases at the 1:1 rate.

Note the other fields used in the Imperial campaign. There is contra-gravity technology appearing at TL 9. This is one of the subset approaches to the gravitics field. Contra-gravity means the negation of gravitational attraction. Another gravitic approach is thruster plate technology, in which gravitic force is transformed into directional thrust. Both these also allow the generation of artificial gravity fields aboard spaceships.



Laser focusing technology is another field included in the Imperial campaign, also appearing at TL 9. This allows laser beams to hit targets beyond a mere few thousand kilometers.

Psionics is given at the standard strength level. Some universes may not allow psionics at all, while some might use weaker or stronger variations. Note that psionics has no introduction TL, as it is not limited by technology, but only by human awareness of its existence. Because psionics is not a technology as such, and this book is specifically about technical issues, **FF&S** does not include alternative psionics rules.

Some fields are not included here, as they do not appear by TL 16, which is the current limit of the **Traveller: The New Era** Imperial campaign. Whether such fields as FTL (faster-than-light) communications or matter teleportation become available after TL 16 or are altogether impossible in this universe cannot be known to characters in the universe, as everything is impossible until the first time it is done.

The Representative Fields and Effects table shows certain representative fields and their general effects. All universes should have at least a stardrive and a defined TL for the beginning of genetic manipulation techniques. All of the other fields are optional, although most campaigns will have a gravitics approach and some form of psionics.

Some of these fields are linked to each other. For example, if using the psionic shifting approach to stardrive technology, not only would the psionic shifting capability have to be assigned to the tech level at which it becomes available, the universe would also require psionic abilities to use with the drives.

Referees who plan to create their own technological backgrounds should see Appendix II for more details.

Note on Use

The following sections are organized into three books: Major Systems, Subsystems, and Weaponry. Each of these books is further subdivided into specific chapters.

Major systems include spacecraft and vehicles, and subsystems are things like power plants, electronics, controls, etc., that are installed in the major systems. Weaponry includes those weapons installed aboard major subsystems, as well as those used on their own.

Both Book 1 and Book 3 will require the use of the subsystems book to complete their design. For this reason, **FF&S** is thumb-indexed to allow easy access to the chapters of Book 2. When a reference to a "section" of Book 2 appears in Books 1 and 3, place your thumb on the corresponding number in the column on the page's outer margin. By flipping through the book until the number appears reversed white out of a black band, you can move directly to the required section.

Representative Fields and Effects

Representative Fields	*Effects*
Stardrive	Several styles of approach (jump drive, star gates, etc.)
Gravitics	Several styles of approach (antigrav, thruster plates, etc.)
Psionics	Levels of approach (weak, standard, powerful, etc.)
Laser focusing	Yes or no, plus initial TL and slope
Matter teleportation	Yes or no, plus initial TL and slope
FTL communications	Yes or no, with styles of approach, TL, and slope

Book 1: Major Systems





CHAPTER 1
Designing Spacecraft

Traveller, as the name indicates, is a game about travel between the stars. This focus makes starships central to the game, and so players and referees will want to take a hand at designing ships of their own. It is natural, then, to begin this book with the spacecraft design sequence.

Designing ships serves two functions. First, even if the players never own or use any of the ships designed, the designs can add diversity to the sorts of ships they will encounter. Second, working a design through from hull structure to final additions to the command bridge will give players a much deeper understanding of what starships are like and how they work in the **Traveller** universe.

Before starting the design, there are several items which need to be determined. What is the tech level of the ship? What is its mission? Are there any limits on its price?

Once these decisions are made, take a sheet of paper and divide the right two-thirds of it into five columns, and label them Volume, Mass, Power, Surface Area, and Price. This will be your worksheet as you do your design (pre-made worksheets of this type are available in **Traveller Players' Forms**). Whenever a component uses volume, mass, power, or hull surface area, write the amount in the correct column. Whenever a component contributes volume, surface area, or power (hulls contribute volume and surface area, power plants contribute power) write the amount in the correct column but indicate it with a plus sign or by enclosing it in brackets. This worksheet will make designing your vessel much easier.

1. HULLS

The first step in designing a space craft is to determine the size, shape, and special configuration of the hull. All other components will then be placed inside the hull or on its surface.

First select a basic hull size from the Hull Size table (page 11). All hulls have a rate (or "tonnage") which is the displacement of the hull in tonnes of liquid hydrogen (the most common starship fuel). Therefore, a ship with a rate of 7 could hold 7 tonnes of liquid hydrogen (provided nothing else was put in the hull). Thus, **Traveller** uses the term "ton" as a unit of volume where 1 ton equals 14 cubic meters (m^3) of internal volume (also measured as 14 kiloliters). The Hull Size table indicates the volume (in cubic meters), the material volume of the shell (assuming a uniform thickness of 1 centimeter) in cubic meters of hull material, and the length of the hull (actually its diameter, as all hull ratings are based on the characteristics of a sphere) in meters.

Next, decide on the hull's form and configuration. Hull form is the basic geometric shape of the hull. As indicated above, the base values for hulls assume a spherical shape. As all hulls of the same rate have the same interior volume, hulls in less space-efficient shapes than spheres will have more surface area, greater length, and require more hull material to achieve an equivalent volume. The Hull Form and Configuration table (page 12) indicates the various hull forms available and the effects on length and material volume.

Once the basic shape is determined, the designer specifies whether the hull has an unstreamlined, streamlined, or an airframe configuration. This decision will affect the cost of the hull (streamlined and airframe configurations are more expensive). In general, airframe hulls may enter any planetary atmosphere to land on the surface or skim fuel; streamlined hulls may skim gas giants but may not land on planetary surfaces with atmospheres of greater than Thin; and unstreamlined hulls may do neither. These capabilities may be modified if the vessel is equipped with some form of weight compensating drive, such as contra-grav—see the Sublight (Maneuver) Drives chapter (Section 9).

Once the basic size and shape is determined, the hull itself is constructed. Hulls consist of hull plating and internal structure.

Hull plating may be thinner or thicker than 1 cm, but all hulls must have an armor value of at least 1. Interplanetary and interstellar vessels must have a minimum hull armor value of 10 per G rating of the maneuver drive (to protect against micro-meteors). To determine the armor value of the hull plating, decide on a thickness (in centimeters) and multiply the thickness by the toughness of the material used to construct the hull (round to the nearest whole number).

The Vehicle and Craft Construction Materials table (page 38) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter, and their price per cubic meter. Once the designer has decided on a thickness, multiply the hull's material volume value by the hull thickness (in centimeters) to determine how many cubic meters of material is used for hull plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials table (as modified by hull form and configuration) to determine mass and price.

Interior structure is also a function of the craft's acceleration and its hull material value. Multiply the hull material value from the Hull Size table (as modified by hull form, but not by configuration) by the craft's maximum acceleration in Gs, and divide the result by the hull material toughness value. The result is the volume of internal structure material used; use the Vehicle and Craft Construction Materials table to determine price and mass. The following equations recapitulate these procedures:

Hull Plating

Minimum Hull Thickness = (Gmax×10) ÷ Toughness of hull material from Vehicle and Craft Construction Materials table

Hull Plating Volume (Unstreamlined or Streamlined configuration): HPV = MV×MVM×Ht

Hull Plating Volume (Airframe configuration): HPV= MV×MVM×1.3×Ht

Hull Plating Mass (in tonnes) = HPV×Mass value of hull material from Vehicle and Craft Construction Materials table

Hull Plating Cost (in MCr) = HPV×Sm×Price of hull material from Vehicle and Craft Construction Materials table



Interior Structure

Internal Structure Volume: ISV = (MV×MVM×Gmax) + Toughness from Vehicle and Craft Construction Materials table

Internal Structure Mass: ISV×Mass value of hull material from Vehicle and Craft Construction Materials table

Internal Structure Price: ISV×Price of hull material from Vehicle and Craft Construction Materials table

Gmax: Maximum rated performance in Gs

HPV: Hull plating volume, in cubic meters

Ht: Hull thickness in centimeters, chosen by designer, but at least equal to minimum hull thickness

ISV: Internal structure volume, in cubic meters

MV: Material volume from Hull Size table, in cubic meters

MVM: Material volume multiplier from Hull Form and Configuration table

Sm: Streamlining price modifier according to selected streamlining configuration

Note also that the hull form will affect the surface area of the hull. Note at this time how much surface area is available. Surface area is used for the attachment of weapons, sensors, communicators, launch ports, etc. Keep a running record of how much surface area is used as the ship is designed.

Hull Size

Rate	*Vol*	*MV*	*L*
1	14	0.4	3.2
2	28	0.5	4
3	42	0.7	4.6
4	56	0.9	5.2
5	70	1.1	5.6
6	84	1.3	5.8
7	98	1.4	6.2
8	112	1.6	6.6
9	126	1.8	6.8
10	140	1.9	7
15	210	2.1	7.5
20	280	2.3	8.0
25	350	2.5	8.6
30	420	2.7	9.2
35	490	2.9	9.8
40	560	3.1	10.4
45	630	3.4	10.8
50	700	3.8	11.2
55	770	4	11.4
60	840	4.2	11.6
65	910	4.4	12.1
70	980	4.6	12.5
75	1050	4.8	12.9
80	1120	5.1	13.2
85	1190	5.3	13.4
90	1260	5.5	13.6
95	1330	5.8	13.8
100	1400	6	14
200	2800	9	17
300	4200	12	20
400	5600	15	22
500	7000	17	24
600	8400	20	25
700	9800	22	27
800	11,200	24	28
900	12,600	26	29
1000	14,000	28	30
2000	28,000	43	36
3000	42,000	57	42
4000	56,000	70	47
5000	70,000	80	51
6000	84,000	90	53
7000	98,000	100	57
8000	112,000	110	60
9000	126,000	120	62
10,000	140,000	130	64
20,000	280,000	200	80
30,000	420,000	260	92
40,000	560,000	320	104
50,000	700,000	370	112
60,000	840,000	420	116
70,000	980,000	470	125
80,000	1,120,000	510	132
90,000	1,260,000	550	136
100,000	1,400,000	590	140
200,000	2,800,000	940	170
300,000	4,200,000	1220	200
400,000	5,600,000	1485	220
500,000	7,000,000	1730	240
600,000	8,400,000	1950	250
700,000	9,800,000	2160	270
800,000	11,200,000	2360	280
900,000	12,600,000	2550	290
1,000,000	14,000,000	2740	300

Rate: The hull rating is a standard measure of the volume of the hull expressed in tonnes of liquid hydrogen. Each tonne of liquid hydrogen displaces 14 cubic meters of volume (and is referred to as a "displacement ton").

Vol: The enclosed volume of the hull in cubic meters (m^3). Each cubic meter contains 1000 liters of volume, and so the term kiloliter is sometimes used interchangeably with cubic meter.

MV: Material volume, the volume (in cubic meters) of material required to enclose the hull in a shell 1 centimeter thick.

L: The length of the hull in meters. For spherical hulls, this is also the diameter.

Surface Area: Surface area in square meters is the hull material volume multiplied by 100.

Price: The price of a hull in credits is its material volume multiplied by the price shown on the Vehicle and Craft Construction Materials table.

Configuration: Hulls may be in any of several configurations. The values on the Hull Size table are for a spherical hull. With a different configuration, modify the hull material and price as shown on the Hull Form and Configuration table.



Hull Form and Configuration

Hull Form	MVM	Streamlining Price Modifier: Unstrm	Stream	Airframe	LM
Open Frame	2*	0.3	N/A	N/A	3.5
Needle	1.3	0.7	0.8	1.2**	3
Wedge	1.5	0.5	0.7	1.5**	2.5
Cylinder	1.1	0.6	0.8	2**	2
Box	1.2	0.4	0.6	N/A	1.25
Sphere	1	0.8	1	N/A	1
Dome/Disc	1.2	1.4	1.6	1.2**	1.5
Close Structure	1.4	0.3	N/A	N/A	1.75
Slab	1.5	0.5	0.7	1.5**	2.75

* Modifies hull material volume only. Surface area remains unchanged.

** Airframe configuration increases hull shell material volume (and surface area), but not internal structure. Modify hull shell material volume ×1.3 for airframe configuration hulls.

MVM: Material volume multiplier. Multiply the material volume (MV) from the Hull Size table to get the volume of 1 cm-thick hull plating for a hull of the corresponding mass and configuration.

Perform the same calculation to get the volume of that hull's internal structure stressed to 1G.

LM: Length Multiplier. Multiply the length L obtained from the Hull Size table by LM to get the length of the hull for a particular hull form.

N/A: Not available; that configuration of hull may not be built with that streamlining option.

Target Size

Once the hull size has been selected, determine its target size based on the following table.

Tons	Size
less than 1	Sub-Micro (SM)
1+	Micro (Mc)
10+	Very Small (VS)
100+	Small (S)
1000+	Medium (M)
10,000+	Large (L)
100,000+	Very Large (VL)
1,000,000+	Gigantic (G)

STEP 2. FASTER-THAN-LIGHT DRIVE

If a vessel is intended to serve as a starship (i.e., travel between stars), it will need an FTL drive. In the Imperial Space setting of **Traveller**, this will be a jump drive, but other types of drives are available in different science-fiction settings. Faster-than-light drives are covered in detail in the chapter of that name (Section 3).

STEP 3. CONTROL SYSTEMS

Control systems fall into three categories: the actual spacecraft controls, computers, and navigational aids. These are covered in detail in the Control Systems chapter (Section 4).

STEP 4. ELECTRONICS

Electronics fall into four categories: communicators, sensors, electronic countermeasures (ECM), and electronic counter-countermeasures (ECCM).

Players should be familiar with the **Traveller** space combat rules for how communicators, sensors, ECM, and ECCM systems work in order to decide which of these systems to install. All of these systems are covered in the Electronics chapter (Section 5).

STEP 5. WEAPONRY

Ships may be equipped with beam weapons, missiles, defensive screens, and the fire control systems that enable them to function effectively. All of these are covered in the Weaponry book (page 91) except for defensive screens, which are covered in the Defenses chapter (Section 6).

Sockets

If desired, a designer may install turret and/or barbette hardpoint sockets while the ship is being built. This allows easy installation of a standard turret or barbette weapon. Turret hardpoint sockets consume 3 displacement tons (42 cubic meters) while barbette hardpoint sockets consume 6 displacement tons (84 cubic meters). Both cost MCr.005 if installed during construction and, as they are empty, have negligible mass.

See Appendix 1 (page 153) for a selection of standard modular 3-ton (42 kiloliter) turrets, 6-ton (84 kiloliter) barbettes, and larger bays which can be installed on starships. Each turret and barbette is designed to fit into a standard turret hardpoint socket or barbette hardpoint socket. The turret or barbette does not add to the displacement of the ship (as the socket itself takes up the full displacement of the mount), but does add weight as shown on the chart. Sockets may be included in a design even if no weapons are installed until later.

Turret Hardpoint Socket

Displacement: 3 tons
Price: MCr0.005

Barbette Hardpoint Socket

Displacement: 6 tons
Price: MCr0.005

Type	Displacement	Volume	Diameter	Height	Surface Area
Turret	3 tons	42 m^3	3.6 m	4.2 m	10m^2
Barbette	6 tons	84 m^3	4.5 m	5.25 m	16m^2

Bays are built in 50-ton and 100-ton versions. There are no standard sockets for bays, and they are instead custom-installed when the ship is built.



OPTIONAL FEATURES

A variety of optional features are possible, such as fuel scoops, laboratories, machine shops, vehicle launch facilities, etc. Consult the Optional Features chapter (Section 7) for a complete discussion.

STEP 7. POWER SUPPLY

The ship needs a power plant to provide electric energy to various subsystems as well as to power the maneuver drive (assuming one is installed). A variety of power plants are available and are detailed in the Power Production chapter (Section 8).

STEP 8. SUBLIGHT DRIVE

The ship's power plant as installed provides electrical power to run the ship's basic systems. The power plant can be (and almost always is) also modified to provide thrust by the addition of a combustion chamber, or to power a more exotic maneuver drive. The variety of maneuver drives available are detailed in the Sublight (Maneuver) Drives chapter (Section 9).

Also included under this heading is the addition of lifter technology as required for movement on or near a planet. This is particularly the case for spacecraft in the Imperial Space campaign, which use contra-grav lifters. See the Lifters chapter (Section 10).

STEP 9. CREW AND LIFE SUPPORT

Determine the crew requirements of the ship and then fit life support to accommodate them. A variety of options for life support are covered in the Life Support chapter (Section 11).

Crew Requirements

Engineering: Ce=(P×Cp)+30
- **Ce** = Engineering crew
- **P** = Power plant peak output in megawatts
- **Cp** = Computer control multiplier

Electronics: Cl = (C+S)×Cp
- **Cl** = Electronics crew
- **C** = Number of installed communicators
- **S** = Number of installed sensors
- **Cp** = Computer control multiplier

Maneuvering: Cm=D
- **Cm** = Maneuvering crew
- **D** = Number of installed drives (maneuver drive = 1, jump drive = 1, maneuver and jump drive = 2)

Gunnery: Cg = FD+Wm
- **Cg** = Gunnery crew
- **FD** = Number of master fire directors
- **Wm** = Sum of the installed weapon mounts which are to be manned in action, times the number of crew each

Maintenance Crew: Cr = Mp+50
- **Ct** = Maintenance crew
- **Mp** = Maintenance points
  = (Jm+Em+Wm+Pm+Mm+Sm)×(0.1×Cp)
- **Jm** = Mass of installed jump drive, in tonnes
- **Em** = Mass of all installed electronics, in tonnes
- **Wm** = Mass of all installed weapons systems, in tonnes
- **Pm** = Mass of all installed power plants, in tonnes
- **Mm** = Mass of heat exchanger/ignition chamber, in tonnes
- **Sm** = Mass of all carried spacecraft, in tonnes
- **Cp** = Computer control multiplier

Ships Troops: Ct as desired.
- **Ct** = Ship's troops

Flight Crew: Cf = Q×R
- **Cf** = Flight crew
- **Q** = Total number of carried craft
- **R** = Crew required of each craft

Command: Cc = Z÷6
- **Cc** = Command crew
- **Z** = Ce+Cl+Cm+Cg+Cr+Ct+Cf

Stewards: Cs = [(Cc+Ph)÷8] + {[(Z+Pm)÷50]×Cp}
- **Cs** = Stewards
- **Cc** = Command crew
- **Ph** = High Passengers
- **Z** = Ce+Cl+Cm+Cg+Cr+Ct+Cf
- **Pm** = Middle Passengers
- **Cp** = Computer control multiplier

Medical: Cd = [(Z+Cc+Cs+Ph+Pm)÷120] + (Pl÷20)
- **Cd** = Medical crew
- **Z** = Ce+Cl+Cm+Cg+Cr+Ct+Cf
- **Cc** = Command crew
- **Ph** = High Passengers
- **Pm** = Middle Passengers
- **Pl** = Low Passengers

Note: Retain fractions during multiple-step calculations; round all fractions in the final result down.



STEP 10. WORKSTATIONS AND BRIDGE

Workstations

Certain crewmembers require the installation of workstations at which they perform their duties of controlling or monitoring certain equipment. One standard workstation (7 m³, see the Controls chapter, Section 4) must be installed for each engineering, electronics, maneuvering, master fire director, and command crewmember as calculated in the Life Support step above. Workstations for weapons are included in the weapons themselves, and need not be allocated again.

If a ship requires a bridge (see section immediately below), the workstations for the electronics, maneuvering, master fire director, and command crewmembers are installed according to those guidelines, and do not need additional normal workstations. Each engineering crewmember requires one normal workstation, regardless of whether the ship requires a bridge or not.

Even if a ship does not require the specific fitting of bridge workstations as discussed below, the workstations for electronics, maneuvering, master fire director, and command crewmembers are still considered to be grouped together into an area called the "flight deck." This flight deck is treated as a bridge, and its crew as bridge crew for purposes of hits and damage in combat.

Bridge

The ship's bridge is a compartment in the vessel containing crew workstations for command, maneuvering, sensor, communications, and fire direction personnel. It is the ship's nerve center, particularly during combat. The basic parameters of the bridge are laid down at this time, but its dimensions are not finalized until all electronics and fire control equipment is installed.

The bridge consists of a number of 1-dispacement-ton (14 cubic meters) workstations. The larger size of the workstations is to allow room for easy movement and communication by command and replacement personnel as well as to allow inspections and conferences on the bridge itself without interfering with the crew's duties.

One workstation is required per electronics, maneuvering, and command crewmember, as determined in the Life Support step, as well as one workstation per master fire director. Each bridge workstation uses 14 cubic meters of volume, masses 0.2 tonnes total, and costs an amount as shown on the Workstations table found in the Controls chapter (Section 4)

Not all ships are large or complex enough to require a bridge. A ship requires a bridge if, during the Crew Requirements step (page 13), it is discovered that *two or more* command crew are required. If a ship is of sufficient size/complexity to require a bridge and does not have one installed (i.e., has only a flight deck installed instead), the following penalties apply:

- All sensor tasks are one level more difficult
- No sensor hand-offs are allowed
- Jamming tasks are one level more difficult
- Fire tasks for turrets under local control are one level harder
- MFD-directed fire tasks are one level harder on each turn that the battery composition is changed
- Jump tasks are one level more difficult

Auxiliary Bridge: A designer may wish to install one or more auxiliary bridges with as many or fewer bridge workstations as are installed on the operating bridge (auxiliary flight decks may be installed as well, using normal workstations). Fewer workstations will limit the number of fire directors, sensors, or communicators which can be operated from the site, calculated using the normal crew formulae. If an auxiliary bridge is constructed, additional crewmembers must be carried to man it.

Flag Bridge: If the vessel is to serve as the flagship of a group of ships, it should have a flag bridge. The flag bridge is the facility from which the flag officer commanding (admiral) exercises command and control. The bridge should have bridge workstations for the same number of sensor and communication crew as does the ship's command bridge, plus bridge workstations for additional command crew, depending upon the size of the force being commanded (3+0.25×[Number of ships in the fleet]). Ships which carry large numbers of small craft may have a fighter control bridge containing 3+0.06×(Number of fighters carried) bridge workstations. These bridges allow the application of Fleet Tactics skill to multi-vessel operations. Volume, weight, and price are calculated in the same way as for the ship's bridge.

Fire Control Bridge: On particularly large ships, the designer may wish to designate a number of MFDs that are not located on the main bridge, but are grouped together separately as their own bridge. This decreases the chance of fire control capabilities being lost from hits on the operating bridge.

DESIGN EVALUATION

Once the design is complete, you will need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price, surface area, and mass of all the components. This is your chance to check to make sure that its internal occupied volume and area of surface fixtures are within what is allowed by the size of its hull. This step also provides you with a total price and mass.

Calculate two masses, loaded and empty. Loaded includes a full load of fuel, full load of cargo (assume 1 tonne per m³), and all carried craft and vehicles on board. Empty is emptied of all jump fuel and reaction mass, all cargo, and all carried craft and vehicles.



2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as hull form, configuration, armor value, acceleration, jump number, computer type, installed electronics, etc.

If the ship is equipped with drop tanks, it is necessary to record its displacement and determine its G-rating and jump range both with and without the tanks (this can be complicated by the fact that sometimes the higher jump performance possible with the lower displacement cannot be achieved with the fuel remaining). By the same token, a ship which carries other vessels by means of external grapples may need to calculate its jump and maneuver performance separately for when the vehicle(s) are attached and detached. In most cases these figures will be the same, as the vessel is equipped with drives large enough to operate with the small craft attached, and the craft is a small enough percentage of the mother ship that jump and maneuver do not increase appreciably when the craft is detached.

3. Allocate Damage Areas

Divide the volume (cubic meters) of the ship's components into the following categories:

Electronics: All sensors, communicators, ECM, ECCM, control systems, workstations, flight deck/bridge spaces, fire directors, and internal screens (i.e., those not mounted in bays, barbettes, or turrets).

Hold: All fuel, cargo space, hangars, labs, and shops.

Quarters: All life support systems (including the installed artificial gravity/G-compensators), hull material volume, accommodations, sick bays, and low berths.

Engineering: All power plant, FTL drives, sublight (maneuver) drives (including CG lifters), and fuel-processing equipment.

Weapons Mounts: Each individual weapons mount, including bay-, barbette-, or turret-mounted defensive screens.

Now take the total displacement of the ship and divide by 20. The result is the number of cubic meters of volume available in each of the 20 hit location areas. Allocate the above damage areas to distinct hit locations in proportion to how much of the volume of the ship they consume. Use the ships already rated as a guide.

In general, the bridge (i.e., the largest concentration of electronics) should be in the nose of the vessel to minimize the amount of circuitry between the bridge and the sensor arrays, which are usually mounted forward as well. If the ship has a maneuver thruster, the majority of the engineering space should be aft, but any ship with CG lifters can have engineering space forward on its ventral side as well. If you have a visual image of what the ship looks like, try to make the hit locations correspond with that as much as possible. When allocating the volume of a spinal mount to hit locations, divide it evenly among all 20 hit locations.

4. Place Surface Fixtures

Surface fixtures include all antennae, radiators, external grapples, and hatches. Surface area devoted to slower-than-light maneuver drive (aft), jump drive (aft), and lifters (ventral surfaces) should also be allocated. These systems do not have surface hit locations listed on the ship's damage table (these have their damage handled by internal damage in the same hit locations), but are allocated in this step to ensure that other systems are not improperly placed where these engineering systems should be. Divide the total hull surface area by 20 to determine the surface area of each hit location and allocate surface fixtures accordingly.

5. Evaluate System Damage

Record the tonnage of each major system in the vessel (each entry on the Damage Type chart, plus each separate weapons mount, plus each antenna on the hull surface) and determine its damage capacity. Systems can take 1 minor hit per 5 metric tonnes of mass (to a maximum of 4), or 1 major hit per 100 metric tonnes of mass (21 or more metric tonnes rounds up to 1 major hit; above multiples of 100 tonnes, 20 tonnes or less round down, 21+ round up). Note that small components (such as laser communicators or active EMS antennae) always take 1 minor hit, even if they have no listed mass or a total mass much smaller than 5 tonnes.

The following specific systems should always be evaluated:

Electronics

Each sensor and its antenna, based on mass.

Each communicator and its antenna, based on mass.

Each master fire director and its antenna, based on its mass.

Each ECM system and its antenna, based on its mass. EMM is a special case. The EMM controller has its hits based on its total mass, using normal procedures. For the radiators, allow 1 minor hit for each MW of power allocated to the EMM system. Note that this is an exception to the rule that systems may only have a maximum of 4 minor hits.

Hold

Hangar: The total mass of the hangar spaces divided by 20 equals the number of major hits (round to the nearest whole number).

Labs: Based on the total mass of each lab.

Shops: Based on the total mass of each shop.

Cargo Space (CS): The total mass of the cargo carried is a measure of how much damage is absorbed when the cargo is hit by a weapon. This varies with cargo type. If cargo space is empty, cargo space hits are re-rolled as excess damage.

Quarters

Stateroom (SR): Each large stateroom takes 1 major hit. Each small stateroom takes 2 minor hits.

Life Support: This value is based on the mass of all life support machinery (not including G-compensators) plus the total hull material mass (hull shell and internal structure). Two-thirds of the total mass is used to determine the damage level of the main life support system (LS), and the remaining third determines the damage of the emergency life support (ELS) system.

Artificial Gravity (AG): Based on the total volume of the vessel's G-compensators.

Low Berth (LBth): The low berths take 1 minor hit per low berth.



Engineering

When using alternate technology fields for FTL and/or sublight drives, the names and number of these systems will change. For example, a ship with stutterwarp uses this for FTL and sublight drive, while a ship with thruster plates uses these for sublight drive and lifters. The systems listed below are for the Imperial Space campaign, which uses three systems (JD, MD, CG). Designers using other systems must make adjustments accordingly.

Jump Drive (JD): Based on the mass of the jump drive itself.

Power Plant (PP): Based on the mass of the power plant.

Maneuver Drive (MD): Based on the mass of the heat exchanger/ignition chamber for the maneuver drive.

Contra-Grav Lifters (CG): The mass of the CG lifters.

Fuel-Processing Plant (FPP): Based on the total mass of the plant.

Weapons Mounts

Each individual weapons mount: These may be laser turrets (LT), barbettes (LB), or bays (LBy); missile turrets (MT), barbettes (MB), or bays (MBy); particle accelerators (PA); meson guns (MG); etc. All weapons take hits based on their total mass.

6. Determine Arcs of Fire

The arc of fire of each weapon is determined by the hull location of the weapon and the hull form of the vessel. The following table shows which hull location weapon stations can fire into which arcs on each type of hull form available.

After determining which arcs a weapon can fire into, note the information on the ship's control panel data sheet.

ARCS OF FIRE BY HULL FORM

Hull Form	(1) Bow On	(2) Bow Quarter	(3) Broadside	(4) After Quarter	(5) Stern On
Open Frame	1-20	1-20	1-20	1-20	1-20
Needle	1-15	1-19	1-20	2-20	6-20
Wedge	1-19	1-19	2-19	16-20	16-20
Cylinder	1-5	1-15	2-19	6-20	16-20
Box	1-5	1-15	2-19	6-20	16-20
Sphere	1-11	1-15	2-19	6-20	10-20
Dome/Disc	1-11	1-15	2-19	6-20	10-20
Close Structure	1-9	1-15	2-19	6-20	12-20
Slab	1-5, 10-11	1-15	2-19	6-20	10-11, 16-20

7. Determine Maintenance Points

Take the loaded mass of the vessel, but subtract the weight of any carried craft and vehicles (their maintenance points are calculated separately), then subtract the mass of its hull shell. Divide the result by the TL modifiers here.

TL	Maint Modifier
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16-18	8
19-21	10
22+	12

If the craft has two or more computers installed (three or more computers for jump-capable ships, St or Fb only, not flight computers), one of these is considered to be a dedicated maintenance troubleshooting computer, which allows the current figure to be divided by 4. If there is only one computer (or two or less for a starship), the figure remains unreduced. This is the number of maintenance points required by the craft. (The loaded figure is used because items such as cargo and fuel do require regular attention to see that they have not shifted, leaked, etc.)

8. Atmospheric Speed

Any spacecraft which is streamlined can hurtle through the atmosphere at hypersonic speeds (and will have to in order to reach orbit), but it cannot necessarily maneuver at those speeds. The maximum atmospheric maneuver speed of a streamlined spacecraft, regardless of its G rating, is 1100 kph. The maximum atmospheric maneuver speed of an airframe spacecraft is determined by the G rating, as shown below

G	Speed (kph)
1	3500
2	4700
3	5300
4	5600
5	5800
6	5900

Maximum atmospheric maneuver speed is used to determine the difficulty modifier for hitting a flying spacecraft in an atmosphere (**Traveller**, page 294). The maximum atmospheric maneuver speed multiplied by 0.75 is the spacecraft's atmospheric cruising speed, which is used to determine travel times in the atmosphere when the spacecraft is used as an aircraft.

Spacecraft with lifters (contra-gravity, thruster plates, etc.) may fly NOE (nap-of-the-earth). Spacecraft have a safe NOE speed equal to their maximum atmospheric speed multiplied by 0.25, but never more than allowed by their installed terrain-following avionics (or 40 kph if no avionics are installed).

Combat Move: The high mode combat movement (in 10-meter grid squares per combat turn) is equal to the spacecraft's maximum atmospheric flight speed (in kilometers per hour) multiplied by 0.139. The safe NOE combat movement (in 10-meter grid squares per combat turn) is equal to the spacecraft's maximum NOE speed (in kilometers per hour) multiplied by 0.139, rounded to the nearest whole number.

Travel Move: The high mode travel movement rate (in kilometers per 4-hour period) is equal to the cruising speed (in kilometers per hour) multiplied by 4. The NOE mode travel movement rate (in kilometers per 4-hour period) is equal to the safe NOE speed (in kilometers per hour) multiplied by 6.



CHAPTER 2
Ground Vehicle Design

A ground vehicle, for purposes of these rules, is defined as any conveyance which operates in physical contact with the ground. This includes wheeled vehicles, tracked vehicles, and legged vehicles. Ground vehicles are produced by adding components to a basic structure. The vehicle's volume is determined first and specific components are then added until the volume is filled. Components have a weight and price; the vehicle's weight and price are determined by adding together the weights and prices of its components.

Before starting the design, there are several items which need to be determined. What is the tech level of the vehicle? What is its mission? Are there any limits on its price?

Once these decisions are made, take a sheet of paper and divide the right two-thirds of it into five columns, and label them Volume, Mass, Power, Surface Area, and Price. This will be your worksheet as you do your design. Whenever a component uses volume, mass, power, or chassis surface area, write the amount in the correct column. Whenever a component contributes volume, surface area, or power (hulls contribute volume and surface area, power plants contribute power) write the amount in the correct column but distinguish it with brackets or a "+" sign. This worksheet will make designing your vehicle much easier.

STEP 1. CHASSIS

The first step is to determine the size and general configuration of the chassis. Select a chassis size from the Chassis Size table below. All chassis have a rate which is the displacement of the hull in tonnes of liquid hydrogen (a common measure as it is the most common fuel). Therefore, a vehicle with a rate of 1 could hold 1 tonne of liquid hydrogen (provided nothing else was put in the chassis). Each "ton" of displacement consists of 14 cubic meters (m^3) of internal space (or 14 kl). The Chassis Size table indicates the volume (in m^3), and the material volume of the shell (assuming a uniform thickness of 1 cm) in cubic meters of material.

Note that this table is identical to that found in the starship design section of the rules, with two exceptions. First, the vehicle chassis listed are all assumed to be laid out as elongated six-sided blocks, and so have already had their material volumes modified accordingly. Second, the "hull length" column is omitted as being irrelevant to vehicle design.

Vehicles may be designed using chassis which fall between two listed values on the table by means of interpolation. Larger vehicle chassis may be used by using the spacecraft Hull Size table (page 11). Use 1.4 for the material volume multiplier (MVM) for a vehicle chassis.

CHASSIS SIZE

Rate	*Vol*	*MV*
1	14	0.6
2	28	0.7
3	42	1.0
4	56	1.3
5	70	1.5
6	84	1.8
7	98	2.0
8	112	2.2
9	126	2.5
10	140	2.7

Once the chassis size is determined, determine its configuration. There are three general vehicle configurations: standard, turret, and small turret. Most vehicles, such as cars, trucks, air rafts, etc., are standard configuration. Turret vehicles, like tanks, have a turret which holds a large gun and one or more crewmembers. Small turret vehicles have a single small turret which holds a light weapon and sometimes a gunner (although it is often remotely controlled).

A turret vehicle has considerable waste volume representing the free area around the turret to enable it to traverse and fire in all directions. At higher tech levels, advances in engineering allow larger and larger turrets on chassis of a given size, reducing this inefficiency. To represent this feature in the design, all components mounted in the turret consume more than their *actual* volume. To determine the exact increase in volume, consult the Turret Efficiency table, below.

TURRET EFFICIENCY

TL	*Volume*
4	×6
5	×5
6	×4
7	×3
8+	×2

The volume of turret components after multiplying them by these turret efficiency values is referred to as their *effective volume.*

All components in a small turret (see below, in Weaponry) have an effective volume equal to 10 times their actual volume.

Next, the chassis itself is constructed by enclosing the chassis space with hull material, called hull plating.

The Vehicle and Craft Construction Materials table (Section 1, page 38) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter, and their price per cubic meter. Once the designer has decided on a thickness, multiply the hull's material volume value by the hull thickness (in centimeters) to determine how many cubic meters of material is used for hull plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials table (as modified by hull form and configuration) to determine mass and price.

Hull plating may be thinner or thicker than 1 cm, but all chassis must have an armor value of at least 1. To determine the armor value of the hull plating, decide on a thickness (in centimeters) and multiply the thickness by the toughness of the material used to construct the hull.

Once the base armor value (that enjoyed by all surfaces) is determined, the designer may decide to put additional armor on one or more surfaces of the vehicle. This is done by adding material weight and cost to the vehicle, but it adds additional thickness (and thus protection) to that face. Each additional centimeter of material adds to the material volume as shown on the following table.

Face	*Increase per cm*
Front or rear (each)	10%
Sides (both)	15%
Top or bottom (each)	25%

For example, a vehicle built around a 3-ton hull (42 kiloliters) has a material volume of 1 (meaning each centimeter of hull thickness all the



way around the hull requires 1 cubic meter of actual hull material). The designer decided to increase the thickness of the front armor of the vehicle. For each extra centimeter of front armor, add 0.1 (10% of1) cubic meters to the total hull material.

Once all armor is installed, the designer may further increase its effectiveness by sloping it. The top and bottom may not be sloped, but the front, rear, and sides may be. Armor may be installed at a moderate slope (about 30°) or a radical slope (about 60°). A moderate slope increases the effective armor value of a face by 50%. A radical slope increases the effective armor value of a face by 100%.

Sloping armor does not add to either the weight or price of the vehicle, but does subtract from its volume. The volume cost of sloping an armored face is expressed as a multiple of the entire enclosed volume of the chassis and is noted on the table below.

Armor Slope

Face	*Moderate*	*Radical*
Front or rear	10%	20%
Sides (both)	20%	40%

For example, a vehicle with a size 6 hull (84 kiloliters) has a radical slope to its frontal armor. This uses up 20% of the original volume, or 16.8 cubic meters.

Vehicles may be designed as *open* vehicles, meaning they are open-topped and partially open-sided. These vehicles sometimes have a glass or plastic transparent windscreen or roof added later. Open vehicles multiply their hull material volume by 0.7. They have no armor against overhead attacks, and attacks from the side and rear are rolled for to determine if they strike armor or glass (using the open vehicle rule).

STEP 2. SUSPENSION

The suspension is the mechanism in contact with the ground. There are five specific suspension types: restricted wheel, wheel, cross-country wheel, track, and walker. Different suspension types are available at different tech levels. Each suspension takes up a fixed percentage of the chassis volume. The Suspension Table lists those values as well as the weight and price per cubic meter of installed suspension.

Suspension

Type	*TL*	*Vol*	*Mass*	*SA*	*Price*
Restricted Wheel	4	2.1	0.42	70	.000525
Restricted Wheel	5	1.4	0.28	70	.00035
Wheel	5	2.1	0.42	70	.000525
Cross Country Wheel	5	2.8	0.56	60	.0007
Track	5	2.8	4.2	50	.0014
Walker	8	2.8	2.8	80	.0028

TL: Tech level available.

Kl: Volume in kiloliters (cubic meters) per displacement ton (14 kl) of hull.

Mass: Mass in tonnes per displacement ton (14 kl) of hull.

SA: Useful surface area in square meters is equal to the chassis material volume (from the Chassis Size table) times this number. This computation shows the surface area left after allowing for the surface area of the suspension itself plus such standard features as hatches, vision devices, etc. Useful surface area is used for the installation of sensor and communications antennae, and other surface area consuming items.

MCr: Price in millions of credits per displacement ton (14 kl) of hull.

STEP 3. CONTROL SYSTEMS

Vehicles require only basic mechanical controls to drive, but may have more sophisticated controls if a computer is installed. These are covered in detail in the Control Systems chapter (Section 4).

STEP 4. LIFE SUPPORT

The type of life support required by a vehicle depends largely on its intended mission. A variety of options for life support are covered in the Life Support chapter (Section 11). If any extended accommodations are to be fitted (such as staterooms or bunks), they are installed at this time. Only vehicles intended for very long trips, days or weeks, are fitted with bunks or staterooms, and even then they are usually intended for use by several crewpersons in rotation.

STEP 5. ELECTRONICS

Electronics fall into four categories: communicators, sensors, electronic countermeasures (ECM), and electronic counter-countermeasures (ECCM).

Players should be familiar with the **Traveller** combat rules for how communicators, sensors, ECM, and ECCM systems work in order to decide which of these systems to install. All of these systems are covered in the Electronics chapter (section 5).

STEP 6. WEAPONRY

Vehicles may be equipped with weapons, missiles, defensive systems, and the fire control systems that enable them to function effectively. All of these are covered in the Weaponry book (beginning on page 91) except for defensive systems, which are covered in the Defenses chapter (Section 6), and fire control, which is in Section 14. A number of special considerations apply to vehicle-mounted weapons, however.

Weapon Mounts: Vehicle-mounted guns do not require carriages, tripods, or other such mounts, as the vehicle itself serves as the mount. However, the type of vehicle mount and its location must be specified. There are five main types of vehicle mounts: chassis, turret, small turret, pintel, and open. As a sixth option, tac missiles may be mounted on the outside of the vehicle on launch rails.

Weapons in chassis mounts emerge from one of the six faces of the chassis. Although fine adjustments to their bearing and elevation is possible, gross weapon pointing is achieved by repositioning the vehicle itself.

A turret is a fully rotating armored compartment set onto the top of the chassis. The advantage of a turret is that it allows fire in any direction without without requiring the vehicle to be pointing or travelling in that direction. A turret (as opposed to a small turret) is one whose effective volume is more than 10% of the total chassis volume. Indirect fire weapons must be in either turrets or open mounts (see below). Although referred to simply as "turrets" in the basic rules, these will sometimes be referred to as "main turrets" in the rules below to distinguish them from small turrets.



A small turret is usually on top of a turret, or in the case of a turretless vehicle, on top of the chassis itself, but it could be mounted on any face of the vehicle. Small turrets may have an effective volume of no more than 10% of the total vehicle volume. If a small turret is to be manned, it must allocate volume for the crewmember equal to one-half the volume of the member's crewstation. Manned small turrets are also called cupolas, unmanned small turrets are referred to as *remote mounts*. Remote mounts are controlled from crewstations within the hull. The equipment necessary to remotely control the mount (periscopes, repeaters, etc.) is subsumed within the mass and price of the remote turret and crewstation (but see Step 8, Crew, below for fire control requirements).

Both types of turret have front, side, top (or in the case of a belly turret, bottom), and rear armor equal to those values calculated for the entire vehicle.

A pintel mount is a simple post or curved rail on which is mounted a light weapon, such as a machinegun or autocannon. It is usually mounted on top of the chassis or turret.

An open weapon is a large weapon mounted in the chassis of an open-topped vehicle. Many early self-propelled artillery pieces were of this configuration. Indirect fire weapons must either be in open mounts or turrets.

Weapon Stabilization: Stabilization gear enables a vehicle to fire its weapons while moving; the Stabilization table (see the Fire Control chapter, Section 14) lists the characteristics of stabilization gear at various tech levels.

Mechanical Loading Assistance: A gun may reduce its requirement for loaders by having mechanical loading assistance for the gun. Mechanical loading assistance is covered in the actual weapon design sequences. Loading assisters have a volume of 1 cubic meter per ton and must be located with the weapons mount and the ammunition. (Note that with mechanical loading assistance, the ammunition must be stored in the same part of the vehicle as the gun mount; i.e., in the turret for a turret-mounted weapon, or in the hull for a chassis or open-mount weapon.)

Autoloader: CPR guns require one or more crew as loaders in addition to the gunner. All of the weapon's loaders may be replaced by an autoloader; weapons in remote mounts *must* have autoloaders. Autoloader characteristics are calculated during the weapon design sequence. Half of the autoloader's volume is in the part of the vehicle with the weapon mount and the rest is in the part of the vehicle where the ammunition is stored.

STEP 7. POWER PLANT

The vehicle needs a power plant to provide electric energy to various subsystems as well as to power the suspension. A variety of power plants are available and are detailed in the Power Production chapter (section 8).

Fuel: Fuel tankage for the power plant is also calculated at this time.

Auxiliary Water Propulsion: Amphibious tracked vehicles do not require auxiliary water propulsion, as their tracks act as paddles and can drive them forward slowly. Wheeled amphibious vehicles (and tracked amphibious vehicles looking for more speed than their tracks will give them) may have auxiliary water propulsion. Auxiliary water propulsion occupies volume equal to 0.05 of the power plant volume. It masses 1 tonne per cubic meter and costs MCr0.001 per cubic meter.

STEP 8. TRANSMISSION

Ground vehicles must have a transmission. The size of the transmission depends on the tech level of the vehicle and the output of the power plant.

Wheel and Tracked Transmissions

TL	*Vol/T*	*Vol/W*	*Price*
4-5	5	3	1000
6	2	1	1250
7+	.5	.3	1500

Walker Transmissions

TL	*Vol/L*	*Price*
8	8	10,000
9	2	2500
10	.4	675

TL: Tech level of availability

Vol/T: Volume (in cubic meters) of a tracked vehicle suspension per MW of power output.

Vol/W: Volume (in cubic meters) of a wheeled vehicle suspension per MW of power output.

Vol/L: Volume (in cubic meters) of a legged (walker) vehicle suspension per MW of power output.

Price: Price (in MCr) per cubic meter of installed transmission.

Mass: The mass (in tonnes) of the transmission is equal to its volume (in cubic meters)

STEP 9. CREW

Each vehicle crewmember requires a crewstation, and each passenger requires a seat.

Crewstations: Two types of crewstations are possible: cramped and open. Open vehicles may have cramped crewstations while enclosed vehicles must have open crewstations. Both types are listed in the Controls chapter (Section 4). The crewstations must be from the same tech level as the controls installed in Step 3.

Seats: Passenger seats are found in the Optional Features chapter (Section 7).

Each vehicle requires a driver. A vehicle commander is optional but recommended on enclosed armored fighting vehicles. If the vehicle has a main turret, the commander's station must be in the turret.

If one or more weapons are installed, a gunner is required, and a loader may be necessary as well. A gunner may fire more than one weapon, but he may only fire weapons controlled from his station (called a *weapon station*). One station may control all weapons mounted on the same side of the chassis or in any part of a turret. One station is required for each small turret unless it is remotely controlled. One station may control any number of remote turrets, but a gunner may never operate more than one weapon in a single turn. A weapon station must be in the same part of the vehicle as the weapons controlled, except that a turret-mounted weapon may be controlled from the chassis and remote-mounted weapons may be controlled from anywhere.

Fire Control: During the weapon design sequence, fire control systems are specified for various weapons. However, the designer should note that for vehicle-mounted weapons, fire control systems must be provided for each weapon station, not just for



each weapon. For a vehicle with only one weapon and only one gunner, this distinction is immaterial, but if that same vehicle were designed to allow the gun to be fired from two separate weapon stations, each would require a separate fire control system.

If the weapon station controlling a weapon is in a different part of the vehicle from the weapon itself, the volume of the fire control equipment is divided evenly between the two locations.

Weapon stations that only control small arms or tac missiles do not require fire control systems. However, tac missile weapon stations are equipped with tac missile control units (see page 149).

STEP 11. CARGO

All remaining volume may be allocated to ammunition stowage, cargo space, or declared waste volume. Waste volume has no effect on the design.

Ammunition stowage has no cost but adds the weight of the ammunition to the loaded weight of the vehicle.

Cargo volume has no cost but adds to the loaded weight of the vehicle. Multiply the cargo volume, in cubic meters, by 0.25 to determine the addition, in metric tonnes, to the vehicle's loaded weight.

DESIGN EVALUATION

Once the design is complete, you will need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price, surface area, and mass of all the components. This is your chance to check to make sure that its internal occupied volume and area of surface fixtures are within what is allowed by the size of its hull. This step also provides you with a total price and mass.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as armor values, weapon statistics, installed electronics, crew, passengers, etc. Note the volume of the original chassis as its transport volume (the space it takes up in the hold of a starship or transport vehicle).

At the same time, total the price of the vehicle and its empty and loaded weights. Empty weight is the vehicle without any ammunition, fuel, cargo, crew, or passengers. This is essentially the weight of the vehicle as it comes off the assembly line, and is also what it weighs when being transported by another vehicle or starship.

Loaded weight includes a full load of ammunition, full cargo (0.25 tonnes per cubic meter), and a weight allowance of 100 kilograms per passenger and crew. This is its typical weight when in operation.

Flotation: Determine enclosed volume. To do so, first add up actual turret volume, then add up the effective turret volume. Subtract the effective turret volume from the vehicle's transport volume (the volume of its nominal chassis size) and add the actual turret volume. The result is the vehicle's enclosed volume. Divide the enclosed volume by the vehicle's loaded weight in metric tonnes. If the result is greater than 1, the vehicle floats; if it is 1 or less, the vehicle will not float.

Suspension Damage Resistance: Compute suspension damage resistance (SDR): for tracked vehicles, this is the suspension's armor value; for wheeled and walker vehicles, its critical damage level (see **TNE** page 300). These are based on the vehicle's chassis size *in displacement tons* as chosen in Step 1.

Tracked SDR = 2 × chassis size, Wheeled SDR = 1 + chassis size, Walker SDR = chassis size.

3. Determine Movement

Movement of ground vehicles is based on top road speeds and cross-country speeds, both of which are determined by the vehicle's loaded power-to-weight ratio as well as its suspension. For purposes of the power-to-weight calculations, the vehicle's motive power is the total output of its power plant minus energy used to run other systems (such as life support, electronics, weapons, etc.).

Road Speed:

Base road speed in kilometers per hour = 5 + ([MW÷ LW]×2500)

MW: Vehicle motive power in megawatts

LW: Loaded weight of the vehicle in tonnes

Tracked and wheeled vehicle modifiers

Each tech level above 5	+1 kph
If wheeled	+10 kph
If light wheeled*	+15 kph
If legged	×0.25 kph

*To qualify for the light wheeled bonus, vehicle must be equal to or less than the listed weight (in tonnes) for its tech level on the following table:

LIGHT WHEELED VEHICLES

TL	*Weight*
5	5–
6	10–
7	15–
8	20–
9	25–
10	30–
11	35–
12	40–

TL: Tech level at which vehicle appears.

Weight: Maximum weight of a light vehicle at that tech level.

Cross-Country Speed:

Legged vehicles have the same speed cross-country as they have on a road.

Wheeled vehicle cross-country speed depends on the type of suspension used.

Type	*Cross-Country*
Restricted Wheel	0.1
Wheel	0.2
Cross-Country Wheel	0.4

Type: Suspension type installed on vehicle.

Cross-Country: Cross-country speed in kph equals road speed times this multiplier.





Tracked vehicle cross-country mobility depends on the power-to-weight ratio of the vehicle.

P/W	*T*
.001-.0039	0.4
.004-.0079	0.5
.008-.0119	0.6
.012-.0159	0.7
.016+	0.8

P/W: Power-to-weight ratio. Divide vehicle's motive power in megawatts by its loaded weight in tonnes. Use the line that corresponds to the result.

T: Tracked multiplier. Cross-country speed in kph equals road speed times this multiplier.

Water Speed: Tracked vehicles without auxiliary water propulsion and wheeled vehicles with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.1. Tracked vehicles with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.2.

Combat Move: The safe combat movement (in meters per turn) is the vehicle's maximum speed, in kilometers per hour, multiplied by 0.463, rounding the result to the nearest increment of 5. This calculation is made separately for road, off-road, and water movement based on the maximum road, off-road, and water speeds.

Travel Move: The vehicle's travel movement rate (in kilometers per 4-hour period) is equal to its safe combat move (in meters per turn) multiplied by 4.32, rounded to the nearest increment of 5.

4. Firing Characteristics

Records the firing characteristics of each mounted weapon as well as the effects of installed stabilization and fire control.

5. Determine Maintenance Points

Divide the loaded mass of the vehicle by the maintenance modifier appropriate to tech level as shown below.

TL	*Maintenance Modifier*
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

Any ground vehicle which has two full-size computers (model St or Fb) installed should divide this result by 4 to get final maintenance points.



CHAPTER 3
Lift Vehicle Design

A lift vehicle is a transition between ground vehicles and aircraft, and has some of the characteristics of each. Lift vehicles are those which are, literally, lifted or levitated off the ground by some means other than wings. In the basic design rules there are two means of lifting a vehicle: contra-gravity and air cushion.

Lift vehicles are produced by adding components to a basic structure. The vehicle's volume is determined first, and specific components are then added until the volume is filled. Components have a mass and price; the vehicle's mass and price are determined by adding together the masses and prices of its components.

Before starting the design, there are several items which need to be determined. What is the tech level of the grav vehicle? What is its mission? Are there any limits on its price?

Once these decisions are made, take a sheet of paper and divide the right two-thirds of it into five columns, and label them Volume, Mass, Power, Surface Area, and Price. This will be your worksheet as you do your design. Whenever a component uses volume, mass, power, or chassis surface area, write the amount in the correct column. Whenever a component contributes volume, surface area, or power (chassis contribute volume and surface area, power plants contribute power) write the amount in the correct column, but distinguish it with brackets or a "+" sign. This worksheet will make designing your vehicle much easier.

STEP 1. CHASSIS

The first step is to determine the size and general configuration of the chassis. Select a chassis size from the Chassis Size table below. All chassis have a rate which is the displacement of the hull in tonnes of liquid hydrogen (a common measure as it is the most common fuel). Therefore, a vehicle with a rate of 1 could hold 1 tonne of liquid hydrogen (provided nothing else was put in the chassis). Each "ton" of displacement consists of 14 cubic meters (m^3) of internal space (or 14 kiloliters). The Chassis Size table indicates the volume (in cubic meters), and the material volume of the shell (assuming a uniform thickness of 1 centimeter) in cubic meters of material.

Note that this table is identical to that found in the starship design section of the rules, with two exceptions. First, the vehicle chassis listed are all assumed to be laid out as elongated six-sided blocks, and so have already had their material volumes modified accordingly. Second, the "hull length" column is omitted as being irrelevant to vehicle design.

Lift vehicles may be designed using chassis which fall between two listed values on the table by means of interpolation. Larger vehicle chassis may be used by using the spacecraft Hull Size table on page 11. Use 1.4 for the material volume multiplier (MVM) for a vehicle chassis.

Chassis Size

Rate	*Vol*	*MV*
1	14	0.6
2	28	0.7
3	42	1.0
4	56	1.3
5	70	1.5
6	84	1.8
7	98	2.0
8	112	2.2
9	126	2.5
10	140	2.7

Once the chassis size is determined, determine its configuration. There are five general chassis configurations: Simple, Fast Subsonic, Transonic, Supersonic, and Hypersonic. Each of these represents progressively more streamlined chassis which can reach higher and higher speeds. Air cushion vehicles may only use simple chassis; grav vehicles may use any chassis shown.

Each chassis size has a volume cost, which is the waste volume consumed by streamlining, as well as a variety of other values used in later calculations.

Lift Vehicle Chassis Configurations

Type	*Vol*	*SA*	*Price*	*Max*	*Eff*
Simple	0.00	70	1.00	400	0.85
Fast Subsonic	0.05	70	1.02	800	0.90
Transonic	0.10	65	1.03	1200	0.95
Supersonic	0.20	60	1.04	2800	1.00
Hypersonic	0.30	55	1.1	5000	1.00

Vol: Waste volume consumed by streamlining is equal to the total volume of the chassis multiplied by this value.

SA: Useful surface area in square meters is equal to the chassis material volume (from the Chassis Size table) times this number. This computation shows the surface area left after allowing for standard features such as hatches, vision devices, intakes, exhausts, lifter plates, landing skids, etc. Useful surface is used for the installation of sensor and communications antennae, and other surface area consuming items.

Price: The price of the hull plating is its normal material cost times the value shown on the chart.

Max: The maximum atmospheric speed of the chassis in kilometers per hour.

Eff: The efficiency of the chassis, used to calculate maximum speed.

Once the chassis configuration is chosen, the chassis itself is constructed by enclosing the chassis space with hull material, called hull plating.

The Vehicle and Craft Construction Materials table (Section 1, page 38) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter, and their price per cubic meter. Once the designer has decided on a thickness, multiply the hull's material volume value by the hull



thickness (in centimeters) to determine how many cubic meters of material is used for hull plating. Multiply this by the correct mass value on the Vehicle and Craft Construction Materials table to determine mass. Price in millions of credits is determined by multiplying material volume by hull thickness in centimeters, the correct price multiplier from the Vehicle and Craft Construction Materials table, and the price modifier from the Lift Vehicle Chassis Configuration table.

Hull plating may be thinner or thicker than 1 centimeter, but all chassis must have an armor value of at least 1. To determine the armor value of the hull plating, decide on a thickness (in centimeters) and multiply the thickness by the toughness of the material used to construct the hull.

Once the base armor value (that enjoyed by all surfaces) is determined, the designer may decide to put additional armor on one or more surfaces of the vehicle. This is done by adding material weight and cost to the vehicle, but it adds additional thickness (and thus protection) to that face. Each additional centimeter of material adds to the material volume as shown on the following table.

Face	*Increase per cm*
Front or rear (each)	10%
Sides (both)	15%
Top or bottom (each)	25%

For example, a vehicle built around a 3-ton hull (42 kiloliters) has a material volume of 1 (meaning each centimeter of hull thickness all the way around the hull requires 1 cubic meter of actual hull material). The designer decided to increase the thickness of the front armor of the vehicle. For each extra centimeter of front armor, add 0.1 (10% of 1) cubic meters to the total hull material.

Once all armor is installed, the designer may further increase its effectiveness by sloping it. The top and bottom may not be sloped, but the front, rear, and sides may be. Armor may be installed at a moderate slope (about 30°) or a radical slope (about 60°). A moderate slope increases the effective armor value of a face by 50%. A radical slope increases the effective armor value of a face by 100%.

Sloping armor does not add to either the weight or price of the vehicle, but does subtract from its volume. The volume cost of sloping an armored face is expressed as a multiple of the entire enclosed volume of the chassis and is noted on the table below:

ARMOR SLOPE

Face	*Moderate*	*Radical*
Front or Rear	10%	20%
Sides (both)	20%	40%

For example, a vehicle with a size 6 hull (84 kiloliters) has a radical slope to its frontal armor. This uses up 20% of the original volume, or 16.8 cubic meters.

Simple chassis must have at least a moderate frontal slope. Fast subsonic chassis must have a radical frontal slope.

Vehicles may be designed as *open* vehicles, meaning that they are open-topped and partially open-sided. These vehicles sometimes have a glass or plastic transparent windscreen or roof added later. Open vehicles multiply their hull material volume by 0.7. They have no armor against overhead attacks and attacks from the side and rear are diced for to determine if they strike armor or glass (using the open vehicle rule).

Turrets: Any vehicle may be built as a turreted vehicle. A turreted vehicle has a large main turret mounting a powerful weapon. There is considerable waste volume representing the free area around the turret to enable it to traverse and fire in all directions. All components mounted in a large main turret consume more than their *actual* volume. To determine the exact increase in volume, consult the Turret Efficiency table, below.

TURRET EFFICIENCY

TL	*Volume*
6	×4
7	×3
8+	×2

The volume of turret components after multiplying them by these turret efficiency values is referred to as their *effective volume*.

All components in a small turret (see below, in Weaponry) have an effective volume equal to 10 times their actual volume.

In addition, turreted vehicles are less aerodynamic than non-turreted vehicles. For each 1% of the total chassis volume (after reductions for hull slope) that is devoted to *effective* turret volume, the maximum speed of the chassis will be reduced by 1% (see page 26, "Determine Movement").

Main turrets (see Step 6, Weaponry, below) must be locked in the forward position during high-speed flight or the vehicle will become unstable and risk crashing. The maximum safe speed of any lift vehicle while slewing its turret is 300 kilometers per hour. (Lift vehicles may fly at higher speeds while slewing their turrets, but the drivers must make skill rolls to avoid a mishap according to the normal overdriving rules.) Small and airborne type turrets (see Step 6, Weaponry, below) have no such penalty.

STEP 2. SUSPENSION

The suspension is the mechanism in contact with the ground. There are four specific suspension types: air cushion, standard contra-grav, improved contra-grav, and high-effeciency contra-grav. Different suspension types are available at different tech levels. Each suspension takes up a fixed percentage of the chassis volume. The suspension table lists those values as well as the weight and price per cubic meter of installed suspension.

Contra-grav negates the gravitational force of over 99% of the vehicle's weight. This allows light lift vehicles to actually be buoyant on worlds with sufficiently dense atmospheres. However, all contra-grav vehicles are assumed to have vectored thrust agencies to hold up the remaining fraction of their weight, allowing them to hover.

If air cushion suspension is installed, usable surface area must be multiplied by 0.6 to allow for the tremendous space taken up by this suspension type.



Suspension

Type	*TL*	*Vol*	*Mass*	*Price*	*MW*	*Min Vol*
Air Cushion	6	4.2	0.84	.0042	0.1	1
Standard CG	9	0.5	0.4	.02	0.3	1
Improved CG	10	0.3	0.3	.025	0.2	0.3
High-Efficiency CG	12	0.3	0.2	.03	0.1	0.03

TL: Tech level available.

MW: Power requirement per displacement ton (14 kl) of hull.

Kl: Volume in kiloliters (cubic meters) per displacement ton (14 kl) of hull.

Mass: Mass in tonnes per displacement ton (14 kl) of hull.

MCr: Price in megacredits per displacement ton (14 kl) of hull.

Min Vol: Smallest installation volume allowed.

STEP 3. CONTROL SYSTEMS

Control systems fall into three categories: the actual vehicle controls, computers, and navigational aids. These are covered in detail in the Controls chapter (Section 4). Note that some control systems may not be installed on high-speed chassis.

The tech level of the control system must be equal to or greater than the tech level of the installed suspension.

CG-equipped vehicles require flight avionics and flight computers; air cushion vehicles do not.

STEP 4. LIFE SUPPORT

The type of life support required by a vehicle depends largely on its intended mission. A variety of options for life support are covered in the Life Support chapter (Section 11). If any extended accommodations are to be fitted (such as staterooms or bunks) they are installed at this time. Only vehicles intended for very long trips, days or weeks, are fitted with bunks or staterooms, and even then they are usually intended for use by several crewpersons in rotation.

STEP 5. ELECTRONICS

Electronics fall into four categories: communicators, sensors, electronic countermeasures (ECM), and electronic counter-countermeasures (ECCM).

Players should be familiar with the **Traveller** combat rules for how communicators, sensors, ECM, and ECCM systems work in order to decide which of these systems to install. All of these systems are covered in the Electronics chapter (Section 5).

STEP 6. WEAPONRY

Vehicles may be equipped with a wide variety of weapons. All of these are covered in the Weaponry section, beginning on page 91, except for defensive screens, which are covered in the Defenses chapter (Section 6). A number of special considerations apply to vehicle-mounted weapons, however.

Weapon Mounts: Vehicle-mounted guns do not require carriages, tripods, or other such mounts, as the vehicle itself serves as the mount. However, the type of vehicle mount and its location must be specified. There are five main types of vehicle mounts: chassis, turret, small turret, pintel, and open. As a sixth option, tac missiles may be mounted on the outside of the vehicle on launch rails.

Weapons in chassis mounts emerge from one of the six faces of the chassis. Although fine adjustments to their bearing and elevation is possible, gross weapon pointing is achieved by repositioning the vehicle itself.

A turret is a fully rotating armored compartment set onto the main vehicle chassis (it is usually on top of the chassis, but in the case of contra-grav vehicles, a turret could as easily be on the belly to allow the vehicle to fire at ground targets as it flies over them). The advantage of a turret is that it allows fire in any direction without without requiring the vehicle to be pointing or travelling in that direction. A turret (as opposed to a small turret) is one whose effective volume is more than 10% of the total chassis volume. Indirect fire weapons must be in either turrets or open mounts (see below). Although referred to simply as "turrets" in the basic rules, these will sometimes be referred to as "main turrets" in the rules below to distinguish them from small turrets, and from the aircraft-style turrets discussed below.

A small turret is usually on top of a turret, or in the case of a turretless vehicle, on top of the chassis itself, but it could be mounted on any face of the vehicle. Small turrets may have an effective volume of no more than 10% of the total vehicle volume. If a small turret is to be manned,





it must allocate volume for the crewmember equal to one-half the volume of the member's crewstation. Manned small turrets are also called cupolas, unmanned small turrets are referred to as *remote mounts*. Remote mounts are controlled from crewstations within the hull. The equipment necessary to remotely control the mount (periscopes, repeaters, etc.) is subsumed within the mass and price of the remote turret and crewstation (but see Step 8, Crew, below for fire control requirements).

Both types of turret have front, side, top (or in the case of a belly turret, bottom), and rear armor equal to those values calculated for the entire vehicle.

A pintel mount is a simple post or curved rail on which is mounted a light weapon, such as a machinegun or autocannon. It is usually mounted on top of the chassis or turret, and are particularly popular for open vehicles.

An open weapon is a large weapon mounted in the chassis of an open vehicle. Indirect fire weapons must be in either open mounts or turrets.

Lift vehicles may also mount weapons in any of the mounts listed in the Airborne Weapons Mounts chapter (page 152).

Fixed airborne mounts have no weight or drag. Main turrets have no drag points (as the drag of the turret is already calculated into the lower maximum speed of this chassis configuration). Hardpoints only have drag when ordnance or a bomb rack is mounted. Drag disappears when the weapons are dropped or launched. Airborne turrets from page 152 always incur a drag penalty.

Ordnance hardpoints are generally located on the top and sides of the chassis. Normally, a lift vehicle has room for up to four hardpoints on the hull top, although this is reduced to two hardpoints on turreted vehicles. All hull hardpoints count as inboard hardpoints from the Airborne Weapons Mounts chapter (page 152). Additional hardpoints can be mounted on stub wings, one attached to each of the vehicle's sides. Each stub wing can have one inboard hardpoint, one outboard hardpoint, and one wingtip launch rail.

Inboard wing hardpoints (and vehicle hull hardpoints) can carry up to 1500 kilograms of ordnance, or 7.5% of the total weight of the vehicle, whichever is greater, while outboard hardpoints can carry up to 500 kilograms of ordnance, or 2.5% of the vehicle's loaded weight, whichever is greater.

Multiple bomb/missile racks may be attached to each hardpoint, as well as single weapons.

Fuel drop tanks may be attached to inboard stub wing hardpoints if they have fuel-intake plumbing. Note that the Airborne Weapons Mounts chapter includes different values for plumbed and "dry" hardpoints.

Launch rails for missiles weighing no more than 100 kilograms may be installed on stub wingtips.

Stabilization: Stabilization gear enables a vehicle to fire its weapons while moving; see the Weapon Stabilization rules in the Fire Control chapter (Section 14) for characteristics.

Fixed forward-firing weapons do not require stabilization to fire while moving.

Mechanical Loading Assistance: A gun may reduce its requirement for loaders by having mechanical loading assistance for the gun. Mechanical loading assistance is covered in the actual weapon design sequences. Loading assisters have a volume of 1 cubic meter per ton and must be located with the weapons mount and the ammunition. (Note that with mechanical loading assistance the ammunition must be stored in the same part of the vehicle as the gun mount.)

Autoloader: Guns require one or more crew as loaders in addition to the gunner. All of the weapon's loaders may be replaced by an autoloader; weapons in remote mounts *must* have autoloaders. Autoloader characteristics are calculated during the weapon design sequence. Half of the autoloader's volume is in the part of the vehicle with the weapon mount and the rest is in the part of the vehicle where the ammunition is stored.

STEP 7. POWER PLANT

The vehicle needs a power plant to provide electrical energy to various subsystems, as well as to power the lifting agency. A variety of power plants are available and are detailed in the Power Production chapter (Section 8).

Grav and air cushion vehicles also require thrust, as their suspensions serve only to hold them up, not move them forward. The power plant on these vehicles is modified to provide thrust by the addition of propellers, a combustion chamber, or to power a more exotic maneuver drive. The variety of thrusters available is detailed in the Sub-Light (Maneuver) Drive chapter (Section 9).

Fuel tankage for the power plant and thruster are also calculated at this time.

STEP 8. CREW

Each vehicle crewmember requires a crewstation, and each passenger requires a seat.

Crewstations: Two types of crewstations are possible: cramped and open. Open vehicles may have cramped crewstations while enclosed vehicles must have open crewstations. Both types are listed in the Controls chapter (Section 4). The crewstations must be from the same tech level as the controls installed in Step 3.

Seats: Passenger seats are found in the Optional Features chapter (Section 7).

Each vehicle requires a driver. A vehicle commander is optional, but recommended on enclosed armored fighting vehicles. If the vehicle has a turret, the commander's station must be in the turret.

If one or more weapons are installed, a gunner is required, and one or more loaders may be necessary as well, as specified in the weapon design sequence. A gunner may fire more than one weapon, but may only fire weapons controlled from his station (called a *weapon station*). One station may control all weapons mounted on the same side of the chassis or in any part of a turret. One station is required for each small turret unless it is remotely controlled. One station may control any number of remote turrets, but one gunner may only fire one weapon per combat turn. A weapon station must be in the same part of the vehicle as the weapons controlled, except that a turret-mounted weapon may be controlled from the chassis, and remote-mounted weapons may be controlled from anywhere.



Fire Control: During the weapon design sequence, fire control systems are specified for various weapons. However, the designer should note that for vehicle-mounted weapons, fire control systems must be provided for each weapon station, not just for each weapon. For a vehicle with only one weapon and only one gunner, this distinction is immaterial, but if that same vehicle were designed to allow the gun to be fired from two separate weapon stations, each would require a separate fire control system.

If the weapon station controlling a weapon is in a different part of the vehicle from the weapon itself, the volume of the fire control equipment is divided evenly between the two locations.

Weapon stations that only control small arms or tac missiles do not require fire control systems. However, tac missile weapon stations are equipped with tac missile control units (see page 149).

STEP 9. CARGO

All remaining volume may be allocated to ammunition stowage, cargo space, or declared waste volume. Waste volume has no effect on the design.

Ammunition stowage has no cost, but adds the weight of the ammunition to the loaded weight of the vehicle.

Cargo volume has no cost, but adds to the loaded weight of the vehicle. Multiply the cargo volume, in cubic meters, by 0.25 to determine the addition, in tonnes, to the vehicle's loaded weight.

DESIGN EVALUATION

Once the design is complete, you will need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price, surface area, and mass of all the components. This is your chance to check to make sure that its internal occupied volume and area of surface fixtures are within what is allowed by the size of its hull. This step also provides you with a total price and mass.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as armor values, weapon statistics, installed electronics, crew, passengers, etc. Note the volume of the original chassis as its transport volume (the space it takes up in the hold of a starship or transport vehicle).

At the same time, total the price of the vehicle and its empty and loaded weights. Empty weight is the vehicle without any ammunition, fuel, cargo, crew, or passengers. This is essentially the weight of the vehicle as it comes off the assembly line, and is also what it weighs when being transported by another vehicle or starship.

Loaded weight includes a full load of ammunition, full cargo (assume 0.25 tonnes per cubic meter), and a weight allowance of 100 kilograms per passenger and crew. This is its typical operating weight.

Suspension Critical Damage Level: Only air cushion suspensions have a critical damage level (CDL, see **TNE** page 300); contra-grav vehicles simply use their hull armor.

CDL is equal to the air cushion vehicle's chassis volume (selected in Step 1) in displacement tons.

3. Determine Movement

Movement of lift vehicles is based on their thrust. The G rating of a lift vehicle is its total thrust in tonnes divided by 10 times its hull displacement (in displacement tons). Its maximum speed (in kilometers per hour) in an atmosphere is determined as follows:

If G = 1 or less, speed = (G × 3500) × Eff

If G = 2 or less, but more than 1, speed = {3500 + [1200(G–1)]} × Eff

If G = more than 2, speed = {4700 + [600(G–2)]} × Eff

Eff = chassis configuration efficiency (from Step 1)

Maximum speed cannot be greater than the maximum design speed of the chassis type. Maximum speed is reduced by drag and size of main turrets. Note the total number of drag points from the weapons mounts installed, again both with and without external stores and add the percent of chassis volume taken up by effective turret volume (see page 23). Reduce the maximum speed by 1% for each point.

Cruising Speed: A lift vehicle's cruising speed is 75% of its maximum speed.

Minimum Speed: Lift vehicles have no minimum speed. Contra-grav vehicles are assumed to have vectored thrust capabilities which allow them to hover.

NOE Speed: Only grav vehicles have an NOE speed. Grav vehicles have a safe NOE speed equal to the maximum allowed by their terrain-following avionics (40 kilometers per hour if no avionics are installed) or one-quarter of their maximum speed, whichever is less.

Combat Move: The safe NOE combat movement (in 10-meter grid squares per combat turn) is equal to the vehicle's maximum NOE speed (in kilometers per hour) multiplied by 0.139, rounded to the nearest whole number. The high mode combat movement (in 10-meter grid squares per combat turn) is equal to the vehicle's maximum flight speed (in kilometers per hour) multiplied by 0.139.

Travel Move: The high mode travel movement rate (in kilometers per 4-hour period) is equal to the cruising speed (in kilometers per hour) multiplied by 4. The NOE mode travel movement rate (in kilometers per 4-hour period) is equal to the safe NOE speed (in kilometers per hour) multiplied by 6.

4. Firing Characteristics

Record the firing characteristics of each mounted weapon as well as the effects of installed stabilization and fire control.

5. Determine Maintenance Points

Divide the loaded mass of the vehicle by the maintenance modifier appropriate to tech level as shown below:

TL	*Maintenance Modifier*
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

Any lift vehicle which has two full-size computers (model St or Fb) installed should divide this result by 4 to get final maintenance points.



CHAPTER 4
Aircraft Design

There are three general types of aircraft: fixed-wing, rotary-wing, and lighter-than-air.

Fixed-wing aircraft depend on their airframes and their associated wings to produce the lift that enables them to fly. Fixed-wing aircraft may be propelled by any power source that produces thrust; unpowered fixed-wing aircraft are called gliders.

Rotary-wing aircraft rely on lift generated by rapidly rotating airfoils—rotor blades—in order to fly. The principal type of rotary-wing aircraft is the helicopter, which uses a power plant to spin its rotor and thus generate lift.

Autogyros are rotary-wing aircraft but with an unpowered rotor. Like fixed-wing aircraft, they generate lift by accelerating laterally and causing air to pass over their airfoil (which in this case happens to be a free-rotating rotor instead of a conventional fixed wing). As their configuration and operation are very similar to a fixed-wing aircraft, they are treated as a special case of fixed-wing design.

Lighter-than-air aircraft, called airships hereafter in this rule, include a range of craft from unpowered balloons to giant airships used as scheduled passenger liners or military reconnaissance and bombardment platforms.

All aircraft follow the same general design sequence outline, although the details differ depending on the type of aircraft being designed.

Step 1: Weight

Weight is the limiting factor in designing all aircraft. Weight is expressed in metric tonnes in one standard gravity (1G).

Fixed-Wing Aircraft: The weight selected by the designer for a fixed-wing aircraft is the aircraft's maximum weight without external stores. This includes the weight of the empty aircraft, a full internal fuel load, the crew, passengers, cargo, weapons, and ammunition.

Externally carried stores may increase the weight and add drag, affecting top speed. Up to 35% of the aircraft's maximum internal weight may be carried as external stores, depending on available *hardpoints*. The maximum internal weight plus its maximum external stores weight equals the aircraft's maximum takeoff weight.

Rotary Aircraft: The weight selected by the designer for a rotary-wing aircraft is its maximum takeoff weight.

Airships: The weight selected by the designer of an airship is its useful lift weight.

Step 1A: Envelope (Airships Only)

Lift generated by lighter-than-air gases and the volume needed to hold the lifting gases are the two constraints on the useful lift of an airship. Once the useful lift has been determined, calculate the envelope needed to produce that lift.

There are two types of envelopes possible, rigid and non-rigid, and three common types of lifting gasses, hydrogen, helium, and heated air.

A rigid envelope is constructed of a metal framework with a fabric (or, at higher tech levels, thin metal) covering. A non-rigid envelope is constructed of fabric without the metal frame. The table below shows the weight of both envelope types per displacement ton (14 cubic meters) of envelope according to tech level.

Hydrogen provides 15 kilograms of lift per displacement ton (14 cubic meters) in a lift envelope. Helium provides 14 kilograms per displacement ton and heated air provides 12 kilograms.

By subtracting the weight of the envelope per displacement ton from the lift of the gas in the envelope, the useful lift per displacement ton is derived. To determine the total volume of the envelope in displacement tons, divide the designed useful lift of the airship by the useful lift per ton of the envelope. The result is the total volume of the envelope in displacement tons.

These values, along with the prices of the envelopes, are summarized on the following table:

				Useful Lift (Atmosphere 6, 7)			
Type	*TL*	*Wt*	*MCr*	*H*	*He*	*HA*	*SM*
Non-Rigid	3	.007	.00014	.008	.007	.005	0.3
	4	.006	.00010	.009	.008	.006	0.5
	6	.005	.00015	.010	.09	.007	0.7
	8	.004	.00020	.011	.010	.008	0.8
	9	.003	.00025	.012	.011	.009	0.9
Rigid	4	.010	.00070	.005	.004	.002	0.6
	5	.009	.00080	.006	.005	.003	0.7
	7	.008	.00100	.007	.006	.004	1.0
	9	.006	.00200	.009	.008	.006	1.1

Wt: Weight, in tonnes, per displacement ton of envelope.

MCr: Price, in millions of credits, per displacement ton of envelope.

H: Useful lift, in tonnes, per displacement ton of hydrogen envelope.

He: Useful lift, in tonnes, per displacement ton of helium envelope.

HA: Useful lift, in tonnes, per displacement ton of heated atmosphere envelope.

SM: Speed multiplier. Multiply this value by the maximum speed on the Envelope Configuration table on page 28 to find the maximum speed at that tech level.

The lift values on the previous table are for an atmosphere with standard pressure (Type 6 or 7). Total lift is increased 20% in Atmosphere Types 8 and 9, which changes the useful lift to that shown on the table below. Lift is insufficient to produce a working airship in Atmosphere 5 or less.

				Useful Lift (Atmosphere 6, 7)			
Type	*TL*	*Wt*	*MCr*	*H*	*He*	*HA*	*SM*
Non-Rigid	3	.007	.00014	.011	.0098	.0074	0.2
	4	.006	.00010	.012	.0108	.0084	0.4
	6	.005	.00015	.013	.0118	.0094	0.6
	8	.004	.00020	.014	.0128	.0104	0.7
	9	.003	.00025	.015	.0138	.0114	0.8
Rigid	4	.010	.00070	.008	.0068	.0044	0.5
	5	.009	.00080	.009	.0078	.0054	0.6
	7	.008	.00100	.010	.0088	.0064	0.9
	9	.006	.00200	.012	.0108	.0084	1.0



Gaseous hydrogen costs Cr10 per displacement ton. Gaseous helium costs Cr30 per displacement ton on worlds where it is available. (Gaseous helium is available on about 50% of the worlds in the game.)

Once the type of envelope is selected, the configuration is chosen from the Envelope Configuration table on page 29. Five configurations are available.

Balloon: Balloon configuration is a non-rigid spherical gas bag from which a passenger or cargo compartment is suspended. Many balloons are tethered to the ground and are raised to provide elevated observation platforms. Non-tethered balloons are almost exclusively wind-driven and free-floating. Propulsion is difficult due to their bulky and unstable nature, but thrusters can move the balloon at low speeds.

Cigar: Elongated cigar-shaped envelopes are available in both rigid and non-rigid configurations. Cigar envelopes are equipped with fins for stability and steering, and so are much better suited to powered flight.

Cyclo-Crane: The cyclo-crane is a complex airship configuration in which the cigar-shaped envelope is pierced from front to back by a central shaft. Four (or more) pylons radiate from the central shaft and mount airfoils and engines on their ends (well outside of the envelope itself). These airfoils and engines can be turned to different angles to maneuver the craft or cause the bag to spin around its central axis, thus generating lift from the airfoils. The cabins and payload are suspended from cables attached to the ends of the central shaft.

Magnus Sphere: The Magnus sphere configuration consists of a spherical gas bag pierced through its center from side to side by a central shaft. The engines are mounted on the ends of the shaft and the cabin and payload are carried by conformal arms attached to the shaft. The engines can be rotated to give additional lift for takeoff, but the main lift augmentation comes from powered rotation of the Magnus sphere during flight (from the "Magnus effect," which provides lift to a spinning ball). Due to its compact nature, the Magnus sphere does not tend to weather vane in high winds and so is much safer in bad weather than conventional airships.

Airfoil: An airfoil airship is a rigid envelope constructed in the shape of an aerodynamic lifting body. The airfoil has a minimum speed necessary to gain its lift multiplier. This usually means that airfoil ships take off using conventional runways, but some cargo ships take off vertically without their cargo and then, when they have achieved their minimum speed for aerodynamic lift, snag their cargo from the ground using hook and line retrieval, carrying the cargo as an underslung load.

Note that the maximum speed by envelope configuration type is modified by tech level speed multipliers (and these vary between standard and dense atmospheres).

ENVELOPE CONFIGURATION

TL	Config	Type	Lift Mult	Wt Mult	Speed	MCr
3	Balloon	Non-Rigid	1	0.8	0/50	×0.8
4	Cigar	Both	1	1	0/200	×1
8	Cyclo-Crane	Non-Rigid	1.3	1.2	0/300	×2
9	Magnus Sphere	Non-Rigid	1.5	1.1	0/300	×1.5
9	Airfoil	Rigid	1.8	1.3	40/300	×1.3

TL: Tech level of first availability.

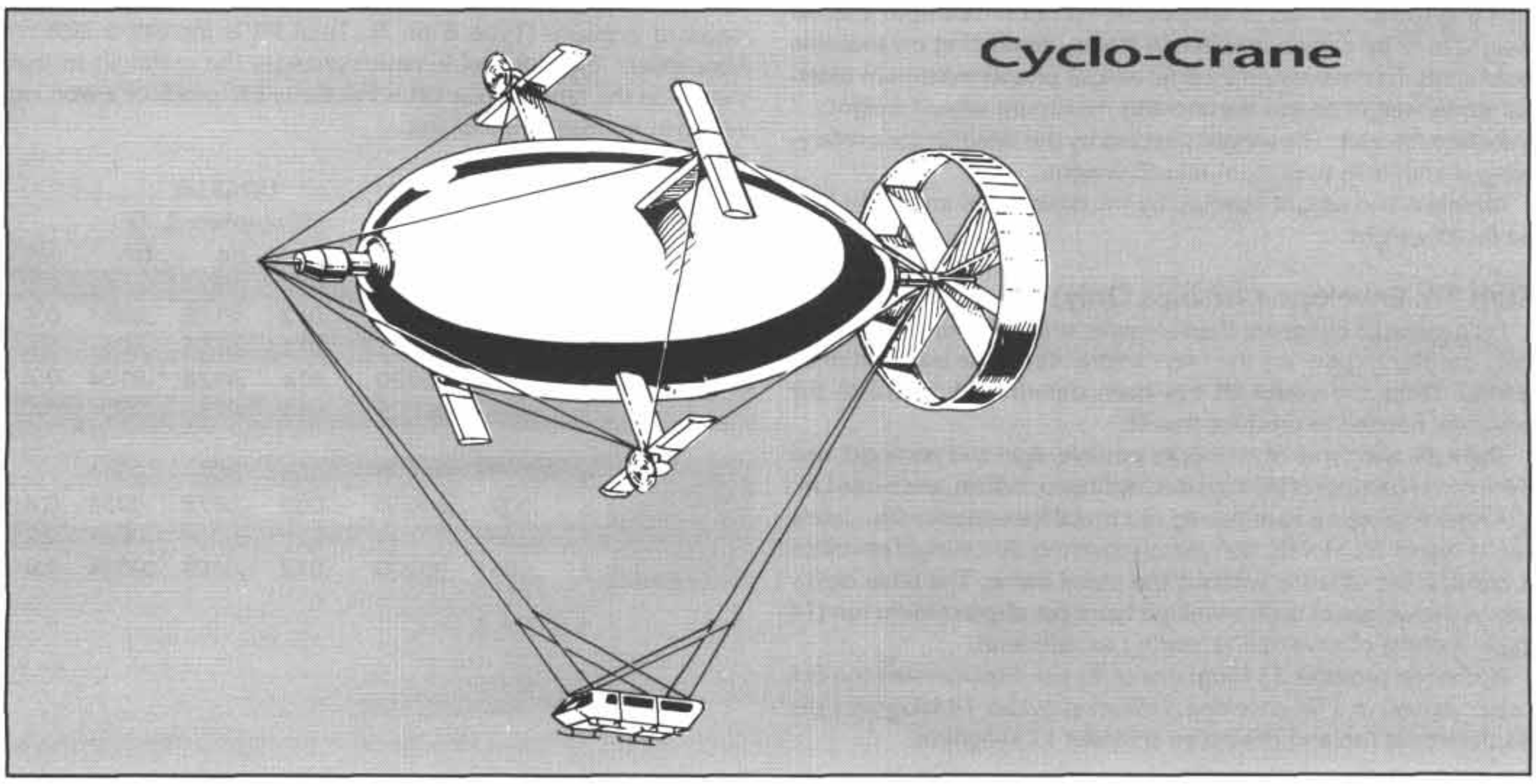
Config: Envelope configuration.

Type: Rigid, non-rigid, or both, indicating the type of envelope which can use this configuration.

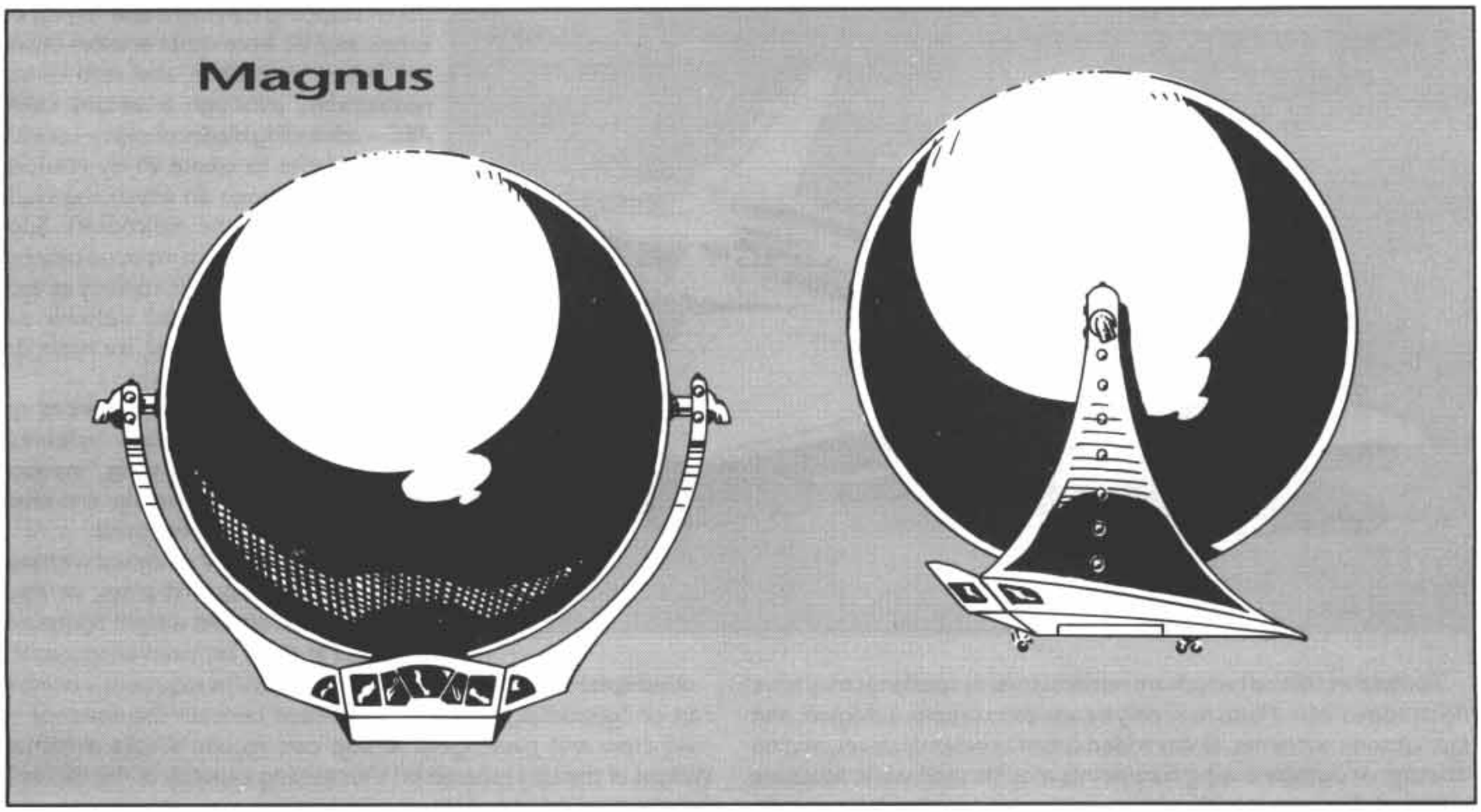
Lift Mult: The total normal lift of the envelope is multiplied by this value to determine the maximum takeoff weight of the airship. The multiplier represents additional aerodynamic lift gained by the configuration.

Wt Mult: The total normal envelope weight is multiplied by this value to determine the actual envelope weight. Additions here represent additional internal structure necessary to achieve the indicated configuration. Note that changes in lift and envelope weight will necessitate recalculation of useful lift.

Speed: The minimum speed and maximum speed of the envelope







configuration. Note that maximum speed is adjusted by tech level speed multipliers found on the tables on page 27. Most airships have no minimum speed. The airfoil's minimum speed is that necessary to gain its aerodynamic lift multiplier.

MCr: The price of the envelope is its normal price multiplied by the value shown on the table.

Step 2: Airframe

Once the designer decides upon the aircraft's weight, he must select an airframe from the Airframes table (page 30). Each type of airframe has its own price per metric tonne of aircraft, minimum and maximum flight speeds, and efficiency factor (used in determining the aircraft's cruising and maximum speeds).

Fixed-Wing Aircraft: There is a wide variety of airframes, as there is a great spread in performance between different fixed-wing aircraft.

Autogyros: Autogyros are designed as if they were a special form of fixed-wing aircraft, using a unique airframe type. They are treated as fixed-wing aircraft in all other respects. Autogyro airframes may not incorporate STOL or VTOL capability, although they may incorporate seaplane capability.

Wing-in-Ground: Wing-in-ground (WIG) airframes are unusual airframes which allow truly immense loads to be carried. Wing-in-ground is a contraction of "wing in ground effect." Ground effect refers to the increase in performance experienced by all aircraft when flying within approximately half a wingspan of the ground. For conventional aircraft, long duration cruise in ground effect is not practical, but for specialized WIG craft, using the PAR (Power Augmented Ram) effect, it is, and creates dramatic increases in performance. The WIG airframes here are considered to be PARWIGs (WIG for short). These craft, also called "wingships," blow high-pressure air beneath their wings and use the increased lift resulting from the build-up of this high-pressure air between the ground and their lifting surfaces. This high-pressure air is essentially recycled back to the aircraft by the ground, rather than being dissipated through the air column beneath an aircraft flying at altitude. (Air cushion vehicles trap this air within their sidewalls or "skirts," while WIG aircraft create a rapidly dissipating bubble of high pressure beneath them as they move along.) Although they are able to generate enough speed that they can fly out of ground effect for short periods of time (in effect "hopping"), a WIG craft is distinguished by the fact that it cannot fly for any great distance out of ground effect (multiply fuel use by 5 during these short periods). As this effect can only be maintained over surfaces such as water, icecaps, or level ground, WIG vehicles are of rather specialized utility.

WIG craft may not be combined with STOL capabilities, but may be combined with VTOL and seaplane capabilities.

Gliders: Gliders are unpowered fixed-wing aircraft. Gliders always use simple airframes with STOL capability.

Fixed-Wing Options: Airframes may be modified for VTOL (Vertical Take-Off/Landing), STOL (Short Take-Off/Landing), or seaplane configuration.

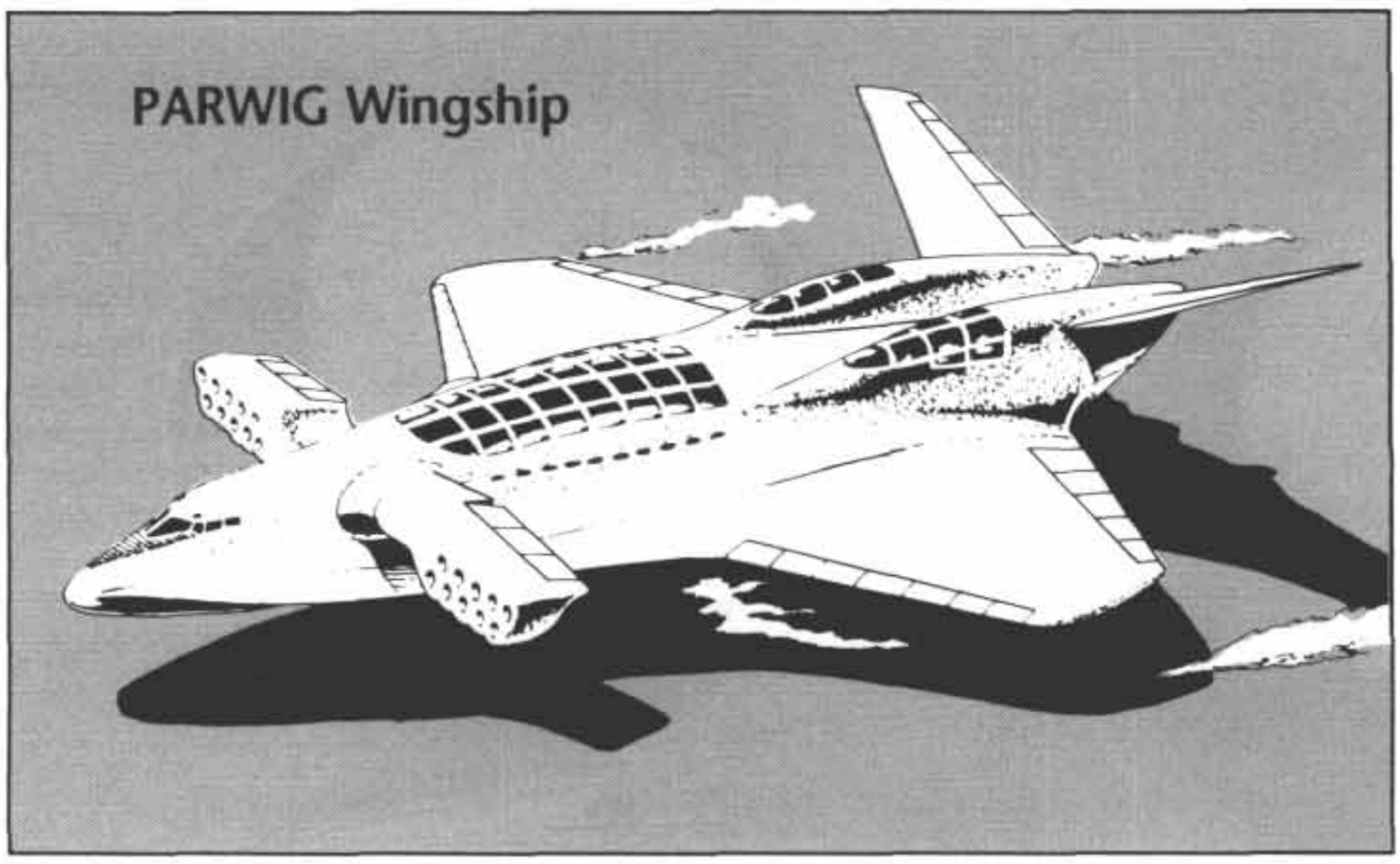
VTOL: VTOL airframes incorporate either thrust vectoring gear for jets or tilt engine/tilt wings to allow the aircraft to take off directly upward then switch to normal flight. Add 10% to the weight and 50% to the cost of the airframe.

STOL: STOL airframes have longer, broader wings for greater lift, allowing shorter takeoffs and landings. Add 5% to the weight and 30% to the cost of the airframe. Add 10 drag points to the aircraft.

Seaplanes: Seaplane airframes add 5% to weight and 25% to the cost of the airframe. Seaplanes may only land on water.

Amphibians: Amphibian airframes (which may land on water or land) are built identically to seaplanes up to 350 tonnes aircraft weight. Between 350 and 400 tonnes, add no weight, but add 25% to cost. Above 400 tonnes, subtract 5% from airframe weight and add 25% to cost.





Floatplanes: Aircraft which are not designed as seaplanes may have floats added later. Floats may only be added to simple, autogyro, and fast subsonic airframes. Floats added count as external stores, and no fuselage or outboard wing hardpoints may be used while floats are attached. Floats weigh 5% of the total loaded weight of the aircraft, cost MCr0.01 per tonne of float, and add 20 drag points.

VTOL and STOL airframes are mutually exclusive. Seaplane capability may be added to either VTOL or STOL capability.

Carrier Aircraft: Aircraft may have the capability to fold their wings to allow them to be stored at a smaller volume. Add 5% to airframe weight and cost.

Beefing up airframe for aircraft carrier arrested landings costs a percentage of aircraft equal to 8.5% minus the aircraft's agility rating with a minimum percentage increase of 0.5%.

Adding corrosion resistance to aircraft adds nothing to weight and 5% to the cost of the airframe and power plant. Normal aircraft carried aboard ship or operating in a corrosive atmosphere require 5 times their normal MP to remain functional. Corrosion-resistant aircraft only require 2 times their normal MP.

Rotary-Wing Aircraft: Conventional helicopters require only a simple airframe, and indeed, can gain no performance benefits from faster airframes, as they cannot achieve speeds beyond the maximum allowed for a simple airframe. This is because of the particular problems created by the helo's rotor blades, of which two are significant: advancing blade tip speed and retreating blade stall.

Recognizing that the tip of each rotor blade is moving at a very high speed, it is not hard to imagine that a fast helicopter will soon run into the sound barrier with the tips of its forward-moving (advancing) rotor blades, which is an absolute limit on helicopter performance. The flip side of this is that as these same rotor blade tips spin a little farther and begin to move toward the rear of the helicopter (retreating), they begin to stall, losing lift at the same time that the blade tips on the opposite side of the helicopter are reaching the speed of sound.

Thus conventional helicopters are limited to 320 kph, which is the top speed of the simple airframe (even if it were to use a fast subsonic airframe, a conventional helicopter would still be limited to 320 kph). The key to higher performance is "unloading" the rotor, slowing down stopping it in flight and relying on thrust and lift from other sources (auxiliary jets or propellers, and stub wings, respectively, although a variant called ABC—advancing blade concept—uses stiff coaxial blades to create lift by ensuring that there is always an advancing blade on each side of the helicopter). Such helicopters are called compound helicopters. These can be built starting at tech level 6, and may use fast subsonic airframes. See Step 3, Thrust, for more details.

At higher tech levels, an advanced application of the compound helicopter becomes possible, the "X-wing," in which the stopped blades are heavier and more robust, and allow higher speed.

Helicopters may be designed with seaplane or amphibian airframes, or have floats added. Cost and weight figures are the same as those for fixed-wing aircraft.

Airships: In addition to the envelope, airships require one or more cars or "gondolas," inside or suspended beneath the envelope to hold crew and passengers. Airship cars require simple airframes. Weight of the cars is based on the carrying capacity of the car itself, not the total weight of the airship.

AIRFRAMES

TL	*Type*	*Aircraft*	*Wt*	*MCr*	*Min*	*Max*	*Eff*
4	Simple	Any	0.01	0.01	150/75	320	0.85
5	Autogyro	Fixed	0.005	0.02	40/—	200	0.65
5	Fast Subsonic	Fixed, Rotary	0.05	0.02	160/80	800	0.90
6	Transonic	Fixed, Rotary	0.10	0.03	180/90	1100	0.95
6	Supersonic	Fixed	0.20	0.04	280/140	2800	1.00
7	Hypersonic	Fixed	0.30	0.1	350/175	5000	2.75
7	Wing-in-Ground	Fixed	0.05	0.02	75/—	400	0.90

TL: Tech level of first availability.

Wt: Airframe weight, in metric tonnes, per tonne of aircraft.

MCr: Price, in millions of credits, per tonne of aircraft.

Min: Minimum speed, in kilometers per hour, of a conventional airframe/STOL airframe. Wing-in-ground and autogyro airframes have a single speed, as they may not be combined with STOL capabilities.

Max: Maximum design speed, in kilometers per hour, of the airframe.

Eff: Airframe efficiency, used in determining maximum and cruising speeds.

Surface Area: Each airframe has one square meter of useful surface area (for electronics and other similar surface installations) per metric tonne of aircraft. This is not true surface area, but is only the portion not already allocated to control surfaces, intakes, landing gear, etc., and therefore not suitable for surface installations.



Step 3: Thrust

Thrust propels an aircraft through the atmosphere. The mechanism by which an aircraft generates thrust is called its thrust agency. There are two general categories of common thrust agencies: propellers and jets.

Propeller-driven aircraft use the output from any power source to turn a propeller (sometimes called an air screw), which either pulls or pushes the aircraft through the atmosphere. Propellers require an atmosphere to function.

Jet-driven aircraft use the actual expanding gas of the combustion of fuel, sometimes combined with high-speed turbines, to create direct thrust. Provided a separate (and sufficient!) source of compressed oxygen is available, a jet thruster will work as well in vacuum as in an atmosphere.

A variety of thrust agencies are discussed in detail in the Sub-Light (Maneuver) Drive chapter (Section 9). Notice that many thrust agents have a limited number of airframe types on which they can be used.

Unpowered fixed-wing aircraft are called gliders. They are usually pulled aloft by another aircraft (of at least twice their weight; these are called *tugs*) and then released to glide to the earth. However, there are other methods, including catapult or even self-powered launch.

Rotary-Wing Aircraft: Helicopters are unique in that they rely on overhead rotors for lift as well as thrust. Helicopters need gearboxes, transmission assemblies, and rotors (all collectively referred to as the *rotor assembly*) to convert engine power to lift. Gearboxes reduce engine speed to rotor speed with reduction ratios of up to 90:1. Transmission assemblies link the power plant to the rotors, and rotors provide lift.

A rotor provides lift for the aircraft in addition to forward thrust. The total lift provided (determined by the size of power plant installed) must be equal to, or in excess of, the maximum take-off weight. The helicopter's thrust, in tonnes, is equal to its lift in tonnes multiplied by 0.1. If additional thrust is desired, an additional thruster (usually a turbojet or turbofan) may be added.

On a conventional helicopter, this added thrust plus the thrust from the rotor blades is limited to the top speed of 320 kph when speed is calculated in the design rating section, below.

Compound helicopters must have an added thrust agency, as their speed is calculated using this added thrust only. This added thrust must yield a speed at least equal to the minimum speed of the airframe. Compound helicopters at tech levels 6 and 7 may only use the MTR rotor configuration. At TL 8 they may use the CMR (depicting ABC technology) and MTR configurations.

TL 9+ compound helicopters use the X-wing rotor configuration.

Rotors come in several configurations, which in turn affect the number of rotor assemblies needed in a helicopter design. All of these configurations are designed to prevent torque from rotating the helicopter in the opposite direction of the rotor's rotation. The most common rotor configurations include the following:

Main and Tail Rotor (MTR): This assembly is a large, single main rotor and a much smaller anti-torque rotor which is mounted vertically to provide lateral thrust near the end of the tail boom. At higher tech levels, advanced versions of configuration are known as NOTAR, for NO TAil Rotor, in which vectored turbine exhaust takes the place of the anti-torque rotor.

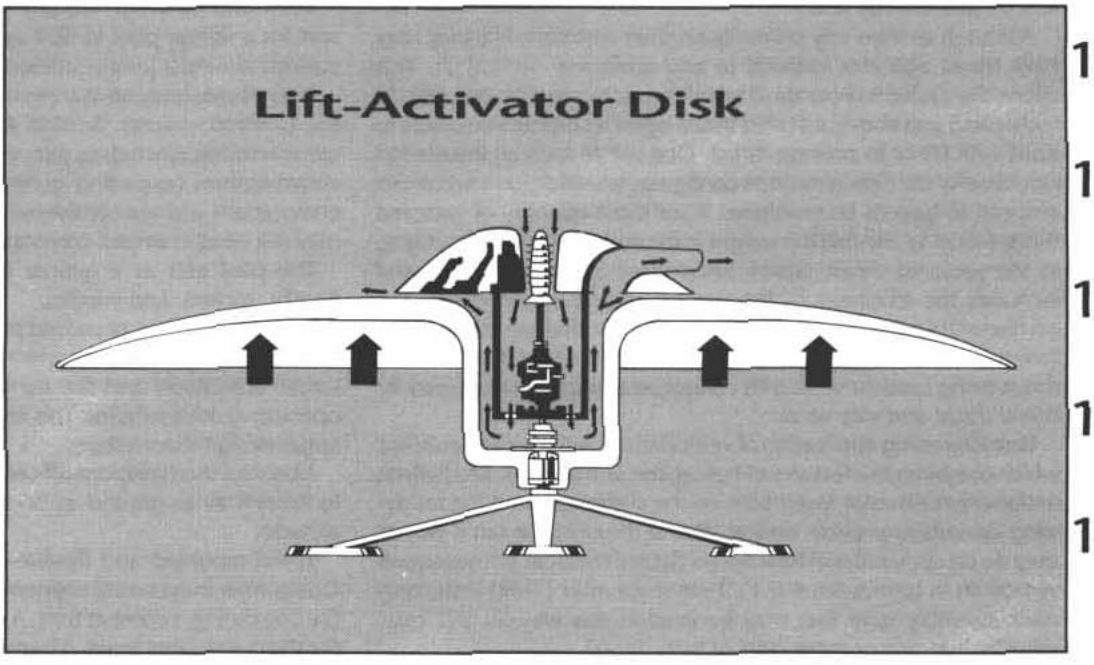
Light MTR rotor assemblies are available for helicopters weighing two tons or less.

Twin Main Rotors (TMR): Two main rotors (or several pairs of main rotors in the case of really immense helicopters) on separate shafts that spin in opposite directions are mounted in such a way that their rotor blades do not interfere with each other. In some designs, the rotors are at the front and rear of the fuselage, with one rotor set higher than the other. In other designs, the rotors are mounted side-by-side at the ends of long outriggers, or are synchronized to mesh like eggbeaters.

Coaxial Main Rotors (CMR): Two main rotors spinning in opposite directions are mounted on the same vertical axis. This combines the advantages of twin counter-rotating rotors in a more compact configuration.

Lift Activator Disk (LAD): The "wing" consists of a revolving disk which spins around a fixed central cylindrical hub (which contains the crew, passengers, and power plant). The power plant draws air in from above the craft and then blows it across the top of the disk at high speed, generating lift. The spin of the disk (at about 1000 revolutions per minute) accelerates the air flow, further increasing lift. Part of the air flow is vented to the rear as thrust.

X-Wing: The X-wing helicopter is the ultimate expression of the compound helicopter. Going beyond merely unloading the rotors in flight, advanced materials technology allows a four-bladed rotor to be locked in flight so that its blades—two of them swept forward—now function as fixed lifting surfaces, allowing the aircraft to fly at high speeds, and then transition back to rotary flight for vertical





landings. X-wing configurations use the NOTAR system (see MTR, above) to counteract torque when in helicopter mode. X-wing helicopters use transonic airframes.

Ornithopter(ORN): Ornithopters are not rotary-wing aircraft, but their function is best described here. Ornithopters have mechanically articulated wings that flap like a bird's, providing both lift and forward thrust. Constructed of advanced light-weight materials, the ornithopter is still less efficient than a helicopter in rising to altitude, but can then lock its wings and function as a glider, conserving fuel and also allowing silent, stealthy approaches to a target.

Rotor Assemblies

TL	*Type*	*Wt*	*MCr*	*Lift*	*Max Wt*
5	Lt MTR	0.2	0.02	4	2
6	MTR	0.25	0.01	4	60
6	TMR	0.35	0.015	5	—
6	CMR	0.25	0.02	5	60
9	LAD	2.00	0.01	9	—
9	X-Wing	0.25	0.05	5	40
10	ORN	0.15	0.05	2.5	1
12	ORN	0.1	0.03	3	2

Wt: Weight, in tonnes, per tonne of power plant.

Reduce rotor assembly weight by 10% per tech level above its tech level of introduction (i.e., 90% of listed weight at one tech level higher, 80% at two tech levels higher, etc.), but never below 50% of the value shown on the table.

MCr: Price, in millions of credits, per installed tonne of rotor assembly.

Lift: Lift, in tonnes, per MW output of power plant.

Max Wt: Maximum take-off weight of a craft using that type of rotor assembly. This value increases by 10% each tech level above the original tech level of adoption.

Folding Rotors: Any helicopter may be given the capability to fold its rotor blades to reduce its storage volume by doubling the price of its rotor assembly.

Airships: Airships are typically powered by propellers, but may also be powered by jets.

Although airships rely primarily on their aerostatic lift, they may have thrust agencies installed to add additional vertical lift. This allows the airship to operate at weights greater than its useful lift. At tech level 5 and above, installed thrust agencies can be vectorable to assist with lift or to provide thrust. One use of such an installation would be for the airfoil envelope configuration which has a minimum airspeed to gain its lift multiplier. A sufficient quantity of vectored thrust (equal to *one-half* the weight in excess of the useful lift weight, as the vectored thrust takeoff takes place in ground effect, and increases the efficiency of the vertical thrust) would enable the airship to lift vertically off of the ground and transition to its minimum forward airspeed to gain its lift multiplier. Remember that vectored thrust being used for vertical lift cannot be at the same time used for lateral thrust and vice versa.

One interesting application of vertical thrust is the *helistat* concept which combines the features of helicopters and airships. The helistat designer installs rotor assemblies on the airship car, and the rotary-wing assemblies provide vertical lift and thrust in the same way as they do on conventional helicopters (lateral thrust in tonnes equals vertical lift in tonnes times 0.1). Twin main rotor (TMR) is the only rotor assembly type that may be used in this way (in this case, visualize it as one or more pairs of twin rotors).

If additional lateral thrust is desired, propellers or jets may be added in addition. Maximum speed is limited by the airship envelope configuration.

An airship with added vertical lift must have its weight re-defined. It now has a *maximum take-off weight* equal to its useful lift weight plus the value in tonnes of the added vertical lift.

Step 4: Power Plant

Propellers, rotors, and High Efficiency Plasma Recombustion (HEPlaR) thrusters require a separate power plant. Select the power plant or plants to power the aircraft. Available power plants are listed in the Power Production chapter (Section 8).

Certain types of jet thrusters (turbojets, turbofans, ramjets, scramjets, and rockets) are self-contained and do not require a separate power plant. Aircraft with self-contained thrusters will usually require some additional electric power. Each such power plant includes (without additional weight or cost) an electrical generator which will produce MW equal to the thruster's thrust in tonnes times 0.02. If additional power is needed, a small power plant will have to be installed.

Step 5: Controls

Select controls for the aircraft from those listed in the Control Systems chapter (Section 4). The tech level of controls installed must be equal to or greater than the listed tech level of the airframe and any installed thrust agencies, power plant, sensors, or avionics. If a computer is installed, it must have the same tech level as the controls.

Fixed-Wing Aircraft: Certain controls may not be used on certain airframe types, as noted on the Controls table in the Controls chapter (Section 4).

Rotary-Wing Aircraft: Helicopters larger than 10 tonnes require enhanced mechanical controls. All others require only basic mechanical controls, with all the above guidelines.

Airships: Unpowered airships (balloons) do not have controls. Powered airships require simple controls.

Step 6: Crew and Passengers

Crew and passenger accommodations can range from a single seat for a fighter pilot to 500 seats for passengers and four crew-stations aboard a jumbo jetliner.

Aircraft crew may be at crewstations, called cockpits for pilots (see the Controls chapter, Section 4). Aircraft with more than three crewmembers (excluding gunners) must have a flight deck, and all crewmembers (excluding gunners) must be provided with open crewstations and are considered to be grouped together. Gunners may still be at cramped crewstations.

The pilot acts as a gunner for fixed forward-firing weapons, bombs, rockets, and missiles.

A sensor operator, or second pilot who can act as sensor operator, is often included on aircraft which employ terrain-following radar, or target acquisition and fire control radar and high-performance, operator-guided missiles. This crewperson may also operate a laser target-designation system.

A bombardier/weapons officer is required if the aircraft is intended to launch air-to-ground attacks from higher than 2000 meters altitude.

Turret-mounted and flexible-mounted guns require a gunner. One gunner may control any number of remote turrets, but may only fire one during a combat turn. A gunner in a simple turret may only fire the guns in that turret. A gunner firing guns attached to a flexible



mount may fire only those guns during a combat turn, but may move to a second flexible mount to fire its guns, taking a full combat turn to move there.

A navigator is required if the aircraft's normal mission duration is six hours or longer. Navigators are not required in aircraft with tech level 7 or higher navigational aids and a flight computer.

A flight engineer is required in aircraft with three or more engines, or more than 3.5 MW devoted to propeller thrust, unless a flight computer is installed.

A copilot is required if the aircraft's normal mission duration is four hours or longer. A copilot is required on all commercial aircraft. A copilot is required for any aircraft weighing more than 25 metric tonnes unless a flight computer is installed.

All crew except pilot, copilots, and sensor operators may double as gunners. Passengers are provided with seats as found in the Optional Features chapter (Section 7).

Armor and escape devices listed in the Crew/Passenger Position Additions table may be added to any cockpit or crewstation. Transonic aircraft require ejection seats; advanced ejection seats are required aboard supersonic combat aircraft; and rocket-powered escape capsules are required aboard hypersonic aircraft.

Cockpit armor may negate the minor hit result of "1 crewmember." Check the penetration value of the weapon that hit. If it is less than the armor value, the minor hit becomes no effect.

CREW/PASSENGERS POSITIONS ADDITIONS

TL	Type	Mass	MCr
6	Ejection Seat	0.1	0.005
7	Adv. Ejection Seat	0.25	0.010
7	Rocket Escape Pod	0.50	0.015
4	Cockpit Armor (AV 2)	0.1	0.005
7	Adv. Cockpit Armor (AV 4)	0.15	0.010

Mass: Mass in tonnes.

Escape Systems: The mass and price of the ejection seat, advanced ejection seat, and rocket escape pod are the cost to add this feature to each crew and/or passenger station.

Step 7: Life Support

Aircraft flying above 3000 meters in a Standard atmosphere (5000 meters in Dense, 1500 meters in Thin) require life support systems. These range from oxygen tanks and masks to sealed cockpits and full pressure suits aboard combat aircraft to sealed cabins and basic life support (with emergency backup oxygen masks) for civilian airliners.

A variety of life support options are available and are discussed in detail in the Life Support chapter (Section 11).

Step 8: Weapons Mounts

The number of weapon mounts should be determined and the type selected from the Airborne Weapons Mounts chapter on page 152. Fixed mounts have no weight or drag. Hardpoints only have drag when ordnance or a bomb rack is mounted. Drag disappears when the weapons are dropped or launched. Turrets always incur a drag penalty.

Hardpoints are generally located beneath the fuselage and wings. Normally, an aircraft only has room for one fuselage hardpoint—usually the strongest of the hardpoints. Fuselage hardpoints can carry up to 2000 kilograms of ordnance or 10% of the loaded weight of the aircraft, whichever is greater. For large aircraft, assign one 2000kg hardpoint per *complete* 20 tonnes clean weight of aircraft. Hardpoints mounted farther outboard can carry less and less weight. Inboard wing hardpoints can carry up to 1500 kilograms of ordnance, or 7.5% of the loaded weight of the aircraft, whichever is greater, while outboard hardpoints can carry up to 500 kilograms of ordnance, of 2.5% of the aircraft's loaded weight, whichever is greater.

Bomb racks, each carrying up to six bombs, three rocket pods, or three launch rails with their missiles, may be attached to each hardpoint, as well as single weapons.

Fuel drop tanks may be attached to the centerline hardpoint or the inboard wing hardpoints if they have fuel intake plumbing. Note that the Airborne Weapons Mounts table includes different values for plumbed and "dry" hardpoints.

Launch rails for missiles weighing up to 100 kilograms may be installed on each wingtip.

Internal bomb and weapon bays hold one tonne of ordnance for each tonne of capacity.

Fixed-Wing Aircraft: Up to two inboard and two outboard hardpoints may be fitted to each wing.

Rotary-Wing Aircraft: As combat helicopters are intended for agile operations close to the surface of the ground, fuselage hardpoints are not used. Instead, standard wing hardpoints are mounted on stub wings. Each helicopter stub wing can have one inboard hardpoint, two outboard hardpoints, and sufficient wingtip launch rails to carry 100 kg of missiles. Weight and price of the stub wings is subsumed under the airframe.

Airships: As with helicopters, airships do not use fuselage hardpoints and instead mount their wing hardpoints on short stub wings, each with one inboard hardpoint, one outboard hardpoint, and one wingtip launch rail. Unlike helicopters, airships may have multiple stub wings along their length, allowing them to mount as much ordnance on hardpoints as they can lift. Stub wing weight and cost is subsumed under the gondola airframe.

Rigid airships may also have internal bomb bays: non-rigid airships may only have bomb bays *internal to their cars.*

Step 9: Weapons

A variety of weapons may be installed aboard aircraft. Machine-guns and CPR guns may be installed either in fixed, forward-firing mounts, or in flexible or turret mounts. Lasers and energy weapons may also be installed in fixed, forward-firing mounts.

Bombs may be installed in internal bomb bays. One tonne of bombs may be carried for each tonne allocated for internal bomb bays. They may also be attached to hardpoints either singly or in multiple racks. Rocket pods, gun pods, ECM pods, sensor pods, flare dispensor pods, napalm tanks, and fuel tanks may also be carried by the hardpoints. Missiles and larger free-flying rockets may be carried on missile launch rails that are mounted separately or are attached to hardpoints, and at tech level 7 and beyond they may be carried in retractable internal missile bays.

Ammunition for internally mounted guns is included in the overall aircraft weight. Ammunition for gun pods is included in the pods and counts as part of the external load.

Step 10: Electronics

Electronic systems of any sort may be installed on the aircraft, as detailed in the Electronics chapter (Section 5). Internally mounted systems count toward the total aircraft weight and the antennae must fit within the available surface area of the airframe.

External, pod-mounted systems incur a drag penalty and count toward the aircraft's loaded weight.



Step 11: Cargo

Aircraft may have weight allocated to cargo. Each tonne of cargo capacity allows the aircraft to carry one tonne of cargo.

Step 12: Fuel

Fuel capacity is measured in cubic meters. Each cubic meter of fuel masses one metric tonne except for liquid hydrogen (used in HEPlaR thrusters), which masses 0.07 tonnes per cubic meter.

An air-to-air refueling probe may be included in an aircraft's design. This allows the aircraft to refuel in flight from a tanker aircraft or another aircraft carrying a refueling pod as an external store.

Refueling probes cost Cr1000 and weigh 0.1 tonne. Refueling pods include a wind-powered transfer pump attached to an extendable hose and drogue, and a tank holding fuel for transfer. Refueling pods cost Cr5000 and weigh one tonne loaded per 1000 kg of fuel, with a 500 kg fuel minimum.

Step 13: Maneuver Enhancement (Fixed-Wing and Rotary-Wing Aircraft Only)

Designers may allocate any percentage of a fixed-wing or rotary-wing aircraft's weight to maneuver enhancement. There is no cost. The higher the percentage of weight devoted to maneuver enhancement, the more agile the aircraft.

Aircraft with more than 20% of their aircraft weight devoted to maneuver enhancement are assumed to be variable geometry aircraft of some sort. Variable geometry aircraft automatically count as having folding wings for purposes of storage and do not need to devote any additional airframe weight to that feature.

RATING YOUR DESIGN

Once you have designed your aircraft, you need to determine and record its ratings. These include weight, thrust, speed, agility, fuel use, endurance, range, price, and volume.

Weight: A fixed-wing aircraft's full internal weight, a rotary-wing aircraft's maximum take-off weight, and an airship's useful lift weight are the weights determined at the beginning of the design sequence (for helistats and airships with added vertical lift, use the maximum take-off weight discussed in Step 3). Be sure that total weights of all components, including fuel, cargo, ammunition, and ordnance in internal bays, do not exceed the specified weight. This is the aircraft's "clean" weight.

Fixed-wing aircraft also have a maximum gross take-off weight equal to its maximum internal weight multiplied by 1.35. This includes the full internal loaded weight plus externally carried stores attached to hardpoints.

Rotary-wing aircraft and airships may also carry ordnance on external hardpoints, but this does not add to their maximum take-off weight. That is, the weight of these weapons must have been anticipated from the beginning of the design.

Thrust: An aircraft's thrust is determined by its thrust agency and its installed power plant. Remember that a rotary-wing aircraft's thrust in tonnes is equal to its lift in tonnes times 0.1, plus any additional thrust agency incorporated.

Wing-in-Ground Aircraft: Multiply the effective thrust of wing-in-ground aircraft by 5.

Airships: Use thrust in tonnes divided by useful lift weight.

Glide Ratio: Fixed-wing aircraft, including autogyros, and ornithopters have glide ratios. The glide ratio is the number of meters forward an aircraft will glide for every meter it drops. All fixed-wing aircraft start with a glide ratio of 5 and add 1 to the ratio for every 5% of airframe weight devoted to maneuverability. STOL aircraft double their glide ratio. Once the final calculations are complete, subtract 1 from the glide ratio for every drag point (excluding the drag points for a STOL airframe).

All ornithopters have a glide ratio of 20.

Powerless helicopters attempt to "autorotate" to a soft landing, trading altitude for rotor speed, and have no meaningful glide distance. MTR and X-wing configuration compound helicopters calculate their glide ratios as fixed-wing aircraft. They are *not* STOL.

G Rating: An aircraft's G rating helps determine its top speed and agility. Calculate the G rating by dividing the aircraft's total thrust by its total weight (maximum take-off weight or useful lift weight for airships) and multiplying the result by the airframe efficiency factor (listed on the Airframes table, page 30). Airships do not have efficiency factors. For fixed-wing aircraft, calculate the G rating using both the aircraft's clean and maximum take-off weights (for two different G ratings).

VTOL aircraft must have a G rating of 0.5 or greater or they are instead treated as STOL aircraft. VTOL aircraft which have a maximum take-off weight G rating of less than 0.5 but a clean G rating of 0.5 or more are usually called STOVL (Short Take-Off Vertical Landing) aircraft, as they require a short take-off roll but can land vertically once they have released ordnance.

Speed: Maximum speed (in kilometers per hour) in an atmosphere is determined by the vehicle's G rating. Calculate maximum speed (for fixed-wing aircraft, calculate for each of the two G ratings).

If G = 1 or less, speed = G×3500

If G = 2 or less, but more than 1, speed = 3500 + (1200×[G–1])

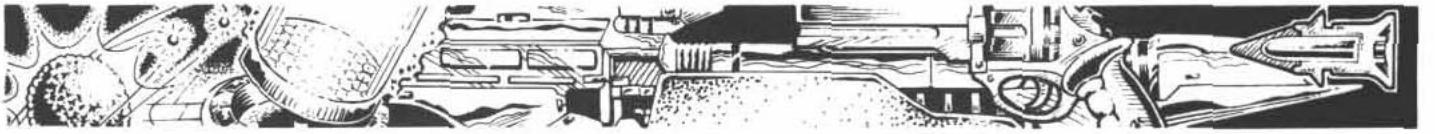
If G = more than 2, speed = 4700 + (600×[G–2])

Maximum speed cannot be greater than the maximum design speed of the airframe type. Maximum speed is reduced by drag. Note the total number of drag points from the weapons mounts installed, and from use of a STOL airframe, again both with and without external stores. Reduce the maximum speed by 1% for each drag point.

As an example, an attack aircraft carrying four loaded, multiple-bomb racks under its wings and a drop tank under its fuselage would have 17 drag points. This would reduce its maximum speed while carrying these external stores by 17%. Once the bombs and tanks are dropped, the aircraft's maximum speed would increase to its full "clean" loaded speed or maximum airframe design speed, whichever is lower.

Airships: Given the low maximum speeds of airship envelopes, it is easy to overpower an airship. However, this power is not wasted. Airships are very susceptible to wind, and can get into a great deal of trouble in high winds, especially close to the ground. Such operations will require task rolls by the airship's pilot to not lose control of the airship and crash. Excess thrust beyond the airframe's maximum speed can be used by the pilot to reduce the difficulty level of such tests. Compute airship speed normally, and if the result is greater than the maximum speed, take the excess speed and divide it by the maximum speed, dropping fractions. The result is the number of –Diff Mods that can be used by the pilot to maintain control in bad weather.

For example, a tech level 7 non-rigid cigar envelope (standard atmosphere) has a maximum speed of 140 kph, and a useful lift of 10 tonnes. It is fitted with propellers generating 1.2 tonnes of thrust. This yields a G rating of 0.12 and a maximum speed of 420 kph. Maximum speed is limited to 140, so there is excess speed of 280 kph. Dividing this by 140, the result is 2, meaning that the design



gives the pilot 2 –Diff Mods for use in difficult weather or maneuvers. Add 1 to this result for cyclo-cranes and Magnus spheres, even if the result was 0.

Cruising Speed: An aircraft's cruising speed is 75% of its maximum speed.

Minimum Speed: An aircraft's minimum speed depends on the airframe type. Note its minimum speed on the airframe table. STOL aircraft have a minimum speed of half this. VTOL aircraft, most airships, and rotary-wing aircraft have no minimum speed. Minimum speed is reduced by 1% for each percent of a fixed-wing aircraft's weight used for maneuver enhancement.

NOE Speed: Only rotary-wing and VTOL fixed-wing aircraft fly the contours of the ground at nap-of-the-earth (NOE) speeds. NOE is defined as flying *around* ground obstacles, not over them, and must have the ability to hover. Airships, which may hover, are not responsive enough for NOE flight, and are too susceptible to wind effects. Aircraft have a safe NOE speed equal to the maximum allowed by their terrain -following avionics (40 kilometers if no avionics are installed) or one-quarter of their maximum speed, whichever is less.

Take-Off and Landing Rolls: All aircraft except for VTOL, helicopters and airships have take-off and landing rolls. These are the distances an aircraft must roll before taking off or after touching down.

To calculate take-off roll, multiply the square root of the actual take-off weight by the aircraft's minimum speed, then multiply the result by .25 and divide the result by the G rating of the aircraft. (However, if the actual take-off weight is less than 1 tonne, use it instead of its square root.) The result is the minimum safe take-off roll of the aircraft in meters.

To calculate landing roll, multiply the square root of the landing weight of the aircraft by the aircraft's minimum speed, then multiply the result by 0.6. (However, if the actual landing weight is less than 1 tonne, use it instead of its square root.) The result is the minimum landing roll of the aircraft in meters, but may never be less (in meters) than the aircraft's minimum speed (in kilometers per hour).

Combat Move: *The high mode combat movement (in 10-meter* grid squares per combat turn) is equal to the aircraft's maximum flight speed (in kilometers per hour) multiplied by 0.139. For VTOL aircraft, the safe NOE combat movement (in 10-meter grid squares per combat turn) is equal to the aircraft's safe NOE speed (in kilometers per hour) multiplied by 0.139, rounded to the nearest whole number.

Travel Move: The high mode travel movement rate (in kilometers per four-hour period) is equal to the cruising speed (in kilometers per hour) multiplied by 4. The NOE mode travel movement rate for VTOL aircraft (in kilometers per 4-hour period) is equal to the safe NOE speed (in kilometers per hour) multiplied by 6.

Agility: Agility is principally determined by speed.

Speed (kph)	*Agility*
22-42	1
43-85	2
86-171	3
172-343	4
344-687	5
688-1375	6
1376-2751	7
2752-5503	8
5504+	9

Add 1 to agility for every 10% of airframe weight devoted to maneuverability enhancement.

Calculate agility separately for NOE speed, maximum clean speed, and maximum loaded speed (where they are different). Aircraft flying NOE have their agilities doubled.

Agility serves as an increase difficulty modifier for fire against aircraft. An aircraft firing at another aircraft subtracts its agility from the target aircraft's to determine the difficulty modifier used.

Volume: A fixed-wing or rotary-wing aircraft's storage volume, in cubic meters, is equal to its weight in tonnes multiplied by 60. A fixed-wing aircraft with wing-folding capability has a storage volume of its weight in tonnes times 30, and a rotary-wing aircraft with its rotor folded or removed for transport has a volume equal to its weight in tonnes multiplied by 20. An airship has a volume equal to its envelope volume. Non-rigid, non-helistat airships can be disassembled for transport at a volume equal to 3 times its car/gondola mass in tonnes.

Volume determines target size difficulty modifiers, as shown on the table at the bottom of the page.

Fuel Use: The fuel use of each engine and power plant is obtained from the appropriate table in cubic meters per hour. If more than one engine or power plant is installed, multiply fuel use per engine by the number of engines installed to determine total fuel consumption.

Endurance: Endurance is the number of hours an aircraft can remain aloft at cruising speed. Divide the total volume of fuel carried by the fuel use per hour to determine the endurance, in hours, of the aircraft.

Range: Range is the distance an aircraft can fly at cruising speed. Calculate range by multiplying endurance by cruising speed. Do this for both clean cruising speed and loaded cruising speed, when they are different.

Price: Total the price of the aircraft's components to determine its total price.

Size	*Displacement Tons*	*Kiloliters/Cubic Meters*	*Diff Mod*
Sub-Micro (SM)	0-1	0-13	—
Micro (Mc)	1-9	14-139	—
Very Small (VS)	10-99	140-1399	–1
Small (S)	199-999	1400-13,999	–2
Medium (M)	1000-9999	14,000-139,999	–3
Large (L)	10,000-99,999	140,000-1,399,999	–4
Very Large (VL)	100,000-999,999	1,400,000-13,999,999	–5
Gigantic (G)	1,000,000+	14,000,000+	–6

Book 2: Subsystems





CHAPTER 1
Material Technology

Material technology deals with the progressive refinement of materials used in the fabrication of artificial structures. For game purposes, this relates primarily to vehicle, aircraft, and spacecraft hulls, but material technology has a hidden effect on the whole range of subsystem technologies covered in later chapters.

For example, metals with better resistance to fatigue allow the construction of high-speed propellers and fan blades, which simultaneously lead to more powerful aircraft propellers and high-performance turbines. Progressively harder metals form the basis of progressively more effective kinetic energy penetrators in tank gun ammunition.

The earliest metals appear at tech level 1, and consist of bronze (an alloy of copper and tin) and iron. Early iron is hand-forged and of low quality. By tech level 2, foundries are capable of making large solid-iron castings, but are still not capable of fabricating large vehicles or structures from iron subcomponents.

The placement of iron on the Vehicle and Craft Construction Materials table (page 38) at tech level 3 represents the first availability of industrially mass-produced iron from large foundries, along with early steel from the Bessemer process, and the ability to construct large vehicles with it. The first iron-hulled ships, as well as the first armored ships, are built at tech level 3. While steel is used for a number of subcomponents, it is still extremely difficult to use it in large constructions. (Steel is iron with carbon, and sometimes other metals, such as nickel, added for greater toughness and hardness.)

At tech level 4, steel becomes widely used as a replacement for iron in ship hulls, and the first primitive armored land vehicles appear. The first experiments with hardened steel are made, and by tech level 5, hardening techniques become reliable enough that face-hardened armor becomes widespread.

Face-hardened armor is an illustration of two competing values in armor plate which, for purposes of simplicity, we gloss over in **Traveller**, those values being hardness and toughness. Hardness is the ability of armor to resist any deformation at all, and it is usually associated with a certain brittleness. Toughness is the ability of the armor to absorb energy without shattering, and usually is associated with a certain elastic character. By way of illustration, glass is extremely hard but not very tough. Rubber is very tough but not extremely hard.

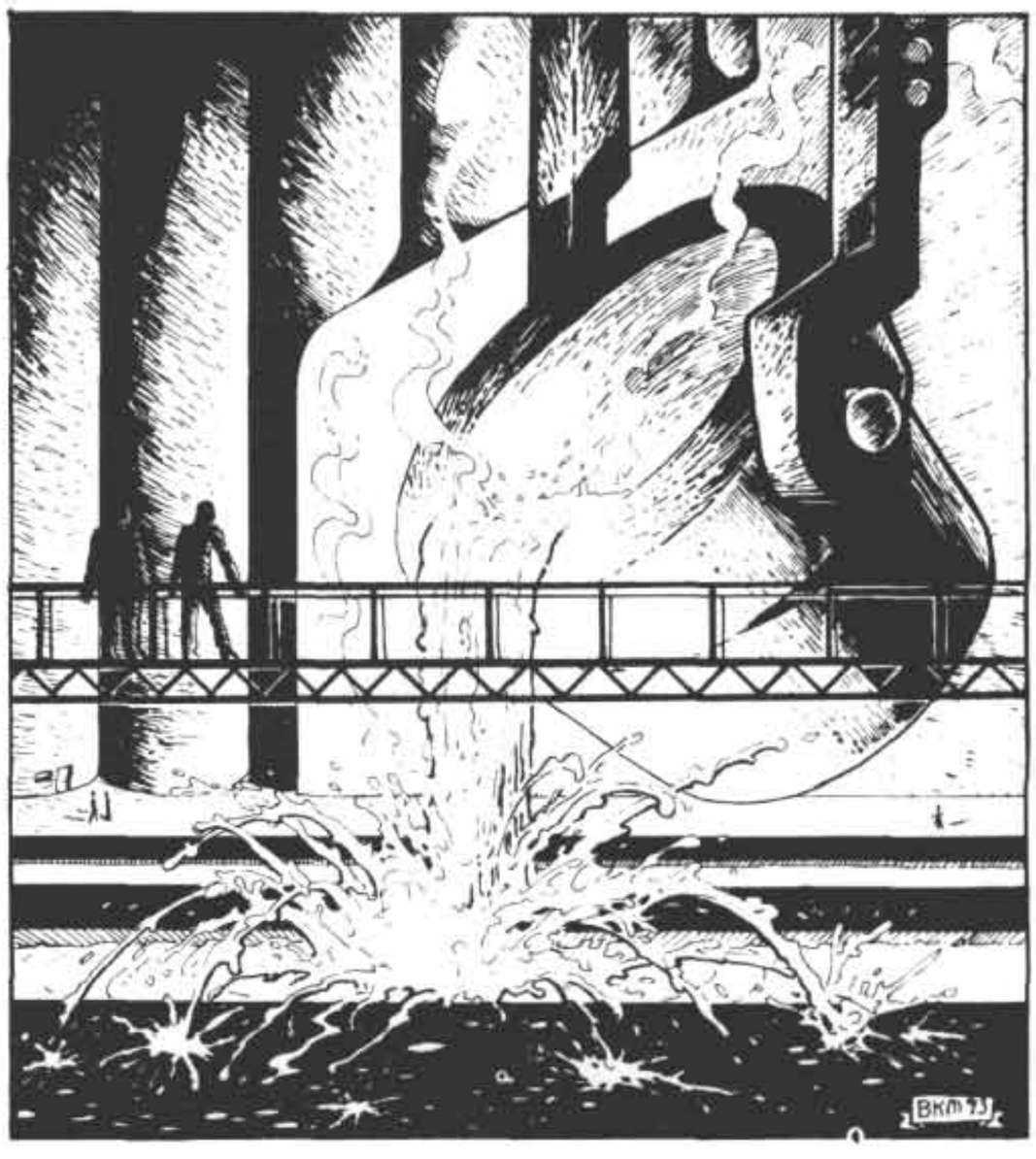
Armor which is very hard will cause small shells to shatter when they hit it and cause no damage, but larger shells will shatter the armor and pass completely through it. Tough armor can often be gouged or damaged by smaller shells, but does not suffer the massive shattering that hard armor does. Face-hardened armor combines both characteristics in one plate by taking a plate of very tough armor and hardening only the face of it. Small shots shatter against it while larger shots crack only the outer surface and are stopped by the more elastic part of the plate.

Although this is an interesting subject with some interesting effects on armor and protection, we have decided for purposes of game simplicity, to lump both characteristics into a generalized "toughness" rating, which represents the ability of armor to resist penetration by all projectiles.

At tech level 6, a number of alloys appear, which are different approaches to toughness and weight issues, as well as fiberglass, the first of the nonmetallic materials strong enough to consider for structural use. Light composites at tech level 7 represent a variety of additional nonmetallic structural materials, such as graphite, boron-carbide, etc. Early chobham armor is an example of light composite armor on vehicles.

Composite laminates at tech level 8 are matrices of different metallic and nonmetallic materials arranged to make the most of each material's strengths. The current version of armor used by US main battle tanks, which incorporates a mesh of depleted uranium in the composite armor, is similar to the level of protection shown on the table.

Crystaliron is a ferrous metal with perfect crystal structure and carefully controlled impurities in order to gain maximum hardness and toughness. Superdense is metal which has had its molecular structure partially collapsed in a massive artificial gravity field (such as might be encountered in a white dwarf star), which increases its density and strength. Bonded superdense has had its electron bonds artificially strengthened, by means of a field similar to that used in damper technology (see the Defenses chapter, Section 6). Bonded coherent superdense armor is dynamically manipulated by input from sensors and the computer so as to polarize the subatomic forces in the hull molecules, thereby presenting maximum penetration resistance to the specific striking weapon.





1. Vehicle and Craft Construction Materials

TL	Type	Toughness	Mass	Price (MCr)
3	Iron	1.5	8	0.0016
4	Soft Steel	1.7	8	0.0016
5	Hard Steel	2	8	0.002
6	Light Alloy	1.7	6	0.004
6	Fiberglass	0.25	1	0.001
6	Titanium Alloy	3	8	0.010
7	Light Composite	4	7	0.007
8	Composite Laminate	6	8	0.008
10	Crystaliron	8	10	0.009
12	Superdense (SD)	14	15	0.014
14	Bonded SD	28	15	0.028
17	Coherent SD	40	15	0.035

The previous materials are those commonly used to build vehicles of various sorts and personal armor. For completeness, we offer the following list of common construction materials used to make buildings and fortifications. Price and weight are omitted as these vary considerably, and in any event are not relevant to the design sequences in this book. They are included so that referees may accurately judge the armor value and resistance to penetration of various field fortifications and civilian structures.

The table following this table lists, for convenience, the armor values of some commonly encountered forms of cover.

Toughness: A measure of the material's resistance to damage. A material's toughness times its thickness in centimeters equals its armor value.

Mass: Tonnes per cubic meter of the material.

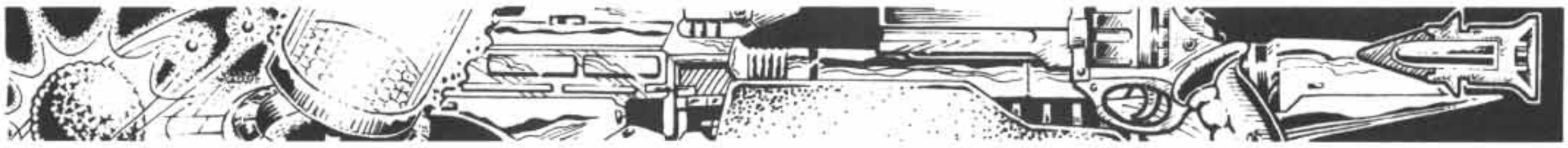
Price: Price in millions of credits per cubic meter of material.

2. Construction Materials

TL	Type	Toughness
1	Loose Dirt	0.04
1	Stone, Packed Dirt	0.2
1	Wood	0.2
2	Masonry	0.3
4	Reinforced Concrete	0.4

3. Common Forms of Cover

Type	Thickness	Armor Value
Sandbag	25cm	1
2" Wooden Plank	5cm	1
Timber House Wall	20cm	4
Cinder Block Wall	30cm	9
Stone Wall	30cm	6
Thick Stone Wall	60cm	12
Reinforced Concrete	25cm	10
Tree Trunk	60cm	12
Brick Wall	10cm	3
Thick Brick Wall	30cm	9



CHAPTER 2
Personal Armor

Personal armor consists of solid or woven protection worn over various body parts. The design sequence deals with three types of armor: rigid, non-rigid, and powered. Rigid armor covers metallic and hard ceramic armors, while non-rigid covers leather, ballistic cloth, and ballistic weave. Powered armor is also called battle dress and consists of rigid all-body armor and a powered exoskeleton.

Rigid Body Armor: The designer will need to specify material, body parts covered, and thickness of protection. The first centimeter of armor can be made particularly tough through the use of surface-hardening, angling of the plates, and other techniques which serve to lower the effective weight of the first layer of armor proportional to its protection. This is reflected in the personal armor tables beginning on page 40, which apply only to the first centimeter of armor thickness.

The Rigid Body Armor table indicates the weight, in kilograms, per armor level of a particular armor type. For example, a soft steel piece of armor covering the chest weighs 7.8 kilograms per armor level. However, these weights apply only to the first centimeter of armor. The extra-tough first centimeter has been reached when the armor value equals the toughness rating of the armor type used. After that, additional armor value additions cost double the weight shown on the table.

In the case of fractional toughness values (such as with iron, soft steel, and light alloy), all armor weighs double after an armor value of 1 is reached.

Due to the need for fine-fitting work, rigid personal armor is fairly expensive. The price column on the table is the price, in credits, per kilogram of armor.

Armor Values: Armor value is determined by the thickness chosen by the designer. Although the armors shown provide information for an armor value of 1, values less than 1 may be selected by opting for thinner (lighter) armor than what is shown on the table.

Armor values of less than 1 but equal to or greater than 0.5 are treated as an armor value of 0. All armor with an AV of 0 has a parenthetical (melee only) value of 2. All armor with an AV of less than 0.5 has no value versus projectiles or energy weapons and has a parenthetical (melee only) value equal to its calculated AV multiplied by 4. Parenthetical melee values are rounded to their nearest increment of 0.5. (Since armor absorbs melee damage equal to twice its armor value, each AV of 0.5 absorbs one hit.) Armor with a parenthetical AV of less than 0.5 provides no protection.

Flexible Body Armor: Flexible body armor imposes fewer agility penalties than does rigid armor, but it is limited in the degree of protection it affords. (If too thick, it ceases to be flexible.) As a result, the flexible body armor lists the absolute armor value offered by that type of armor and the design decision involves selection of body parts to be covered. Price is, as with rigid armor, determined by multiplying the total weight (in kilograms) by the price listed on the Flexible Body Armor table on page 40.

Insert Plates: The Flexible Body Armor table also includes values for insert plates. These plates are inserted in pockets in ballistic cloth and ballistic weave jackets and vests. Plates may only be inserted over the chest and abdomen. When plates are inserted in these vests or jackets, the armor value of the plate is added to the protection of the vest or jacket.

Flak jackets already contain insert plates and their armor values take them into account.

Agility Penalties: Any armor covering the arms and/or legs causes an Agility reduction of 1. Any rigid armor (including flexible armor with plate inserts, which includes all flak jackets) covering part or all of the torso causes an Agility reduction of 1. These two effects are cumulative. Battle dress (see below) is excepted from this rule.

Initiative Penalties: Visored helmets cause an Initiative reduction of 1.

Storage Volume: Storage volume is the space taken up by armor when it is not being worn. This is generally used when a large amount of armor is being carried as cargo. Different pieces of armor have different storage volumes depending on what parts of the body are covered and whether the armor is rigid or flexible. The table below lists storage volumes in liters for different types of armor. Rigid armor consists of solid pieces of armor, usually metallic, although sometimes ceramic, articulated at the joints. Typical rigid armor is plate at lower tech levels and combat armor at higher tech levels. Semi-rigid includes armor which is made up of a large number of connected rigid pieces, and so is somewhat flexible. It includes chain mail, flak jackets, and ballistic jackets and vests with rigid armor inserts. Fabric includes leather, ballistic cloth, and ballistic weave. Note, however, that a ballistic weave helmet is rigid, and so has the same storage volume as listed for rigid helmets.

ARMOR STORAGE VOLUME (IN LITERS)

Type	*Rigid*	*Semi-Rigid*	*Fabric*
Helmet	1	0.5	0.5
Visored Helmet	2	—	—
Arms	5	0.5	0.5
Chest	10	1	0.5
Abdomen	10	1	0.5
Legs	15	0.5	1

Optional Features: Several optional features are possible.

Environmental Control: At tech level 9, environmental control may be added as an option. The environment control option includes an air-tight liner which gives complete protection against most chemical agents, tainted atmospheres, biological agents, and a moderate defense against radiation. A suit equipped with this liner is generally worn open at the neck and wrists, and can be sealed by donning gauntlets and a clear, flexible headpiece. Heat buildup in the suit is handled by a simple solid-state cooling system that is woven into the liner and which eliminates all infrared signature except on the exposed face, hands, and heat exhaust. The heat exhaust is a very pronounced IR source, but this can be dampened by



inserting a chemical chill can into the cooling system. The chill can completely eliminates the signature from 45 minutes to two hours, depending on the background temperature. At the end of that time, the can is used up and discarded.

When combined with a whole-body protective suit, the complete garment is usually called a combat environment suit. The environmental control option also results in a much more comfortable suit, with lower heat fatigue over time. Incorporation of environmental control reduces any agility penalty suffered by the armor by 1. (Armor with an Agility penalty of –2 becomes –1; armor with an Agility penalty of –1 loses its Agility penalty.)

The environmental control option costs Cr6000.

Helmet Sensor Suite: At tech level 10, compact sensor suites become available with sufficient resolution to negate the Initiative penalty associated with a visored helmet. These suites cost Cr750.

Chameleon Option: At tech level 12, a chameleon surface becomes available for any full-body armor. The chameleon option selectively bleeds heat to match background IR levels and effectively renders the wearer invisible to IR sensors. The chameleon option costs Cr1000.

Looking Glass Option: At tech level 15, a looking glass surface becomes available for any full-body armor. The looking glass surface changes color to match background colors and patterns, rendering the wearer nearly invisible when stationary. The suit adjusts gradually to its background (taking 1D20 combat turns to fully adjust), so while moving the suit has no more effect than camouflage fatigues.

The looking glass option costs Cr50,000.

Psionic Shield Option: At tech level 12, a psionic shield option is available as an addition to helmets. The option costs Cr4000 and adds negligible volume to the armor. At tech level 12, it adds 1 kilogram to the mass of the helmet, but at tech level 13 and beyond, the additional mass is negligible.

In-Helmet Communicators: Communicators may be added to helmets and armor packages by selecting a communicator from the Electronics chapter and adding its mass and price to the cost of the helmet or armor.

Advanced Sensors: Sensor suites may be added to armor by selecting a sensor from the Electronics chapter and adding its mass and price to the cost of the armor. The sensor data is displayed on the inside of the helmet visor or, if the helmet is not equipped with an armored visor, on the inside of a clear plastic faceplate.

ARMOR DESIGN TABLES

I. Rigid Body Armor Table

		Hit Location Covered								
TL	*Material*	*Tough*	*Chest*	*Abdmn.*	*Full Torso*	*Arms*	*Legs*	*Helmet*	*Visored Helmet*	*Price (Cr per kg)*
1	Iron	1.5	8.8	8.8	17.6	5.9	17.6	1.6	2.9	20
2	Soft steel	1.7	7.8	7.8	15.6	5.2	15.6	1.3	2.6	20
5	Hard steel	2	6.6	6.6	13.2	4.4	13.2	1.1	2.2	25
6	Light alloy	1.7	6	6	12	4	12	1.0	2	65
6	Titanium	3	4.4	4.4	8.8	2.9	8.8	0.7	1.5	125
7	Light comp.	4	3	3	6	2	6	0.5	1	100
8	Comp. lam.	6	2.4	2.4	4.8	1.6	4.8	0.4	0.8	100
10	Crystaliron	8	2.1	2.1	4.2	1.4	4.2	0.35	0.7	90
12	Super-dense	14	1.8	1.8	3.6	1.2	3.6	0.3	0.6	95
14	BSD	28	0.9	0.9	1.8	0.6	1.8	0.15	0.3	185
17	BCSD	40	0.6	0.6	1.2	0.4	1.2	0.1	0.2	235

Note: Although iron cannot be mass-produced until tech level 3 and the same is true for soft steel at tech level 4, both can be hand-forged in quantities sufficient for armor at two tech levels sooner.

II. Flexible Body Armor

			Hit Location Covered						
TL	*Material*	*AV*	*Chest*	*Abdmn.*	*Full Torso*	*Arms*	*Legs*	*Helmet*	*Price (Cr per kg)*
0	Leather	(1/2)	1	1	2	1	2	.5	10
1	Iron mail	(1)	5	5	10	3.3	10	1	20
2	Steel mail	(1)	4.5	4.5	9	3	9	.8	20
5	Flak jacket	1	6	6	12	—	—	—	15
7	Flak jacket	1	4	4	8	—	—	—	25
7	Ballistic cloth	1*	2	2	4	1.3	4	—	80
7	Plate insert	+1	2	2	—	—	—	—	25
8	Ballistic weave	1	2	2	4	1.3	4	.5	100

* Ballistic cloth is treated as no armor vs. edged melee weapons.



Battle Dress: Battle dress incorporates a powered exoskeleton which, in addition to allowing heavier armor, also doubles the effective strength of a human and moves at regular human speeds. The table below shows a variety of basic exoskeletons available at different tech levels. After selecting an exoskeleton, armor, batteries, and other equipment (e.g., integral weapons, oxygen tanks, etc.) are added up to the maximum allowed mass the exoskeleton can carry.

Each exoskeleton has a listed reduction in Initiative and Agility (except for the light TL-17 exoskeleton).

Designers may overload an exoskeleton if desired, but each additional 10% of mass reduces Agility and Initiative by an additional 1 and reduces movement by 10%. The exoskeleton may not be overloaded by more than 30%.

The rules on pages 39-40 on Agility penalties and benefits of environmental control do not apply to battle dress. Agility penalties and bonuses for environmental control are subsumed into the AGL penalties listed with the exoskeletons. All battle dress exoskeletons automatically include environmental control, as well as filter/respirator fittings which allow the wearer to function in thin and tainted atmospheres, as well as under chemical/biological warfare conditions.

However, battle dress does require an outside source of oxygen. For use in vacuum, portable life support systems must be worn (see **TNE**, page 337).

Powered Exoskeletons

TL	*SM*	*MM*	*MCr*	*SV*	*AGL*	*INIT*
10	0.25	0.56	0.077	100	–3	–2
12	0.1	0.23	0.111	100	–2	–1
12	0.2	0.4	0.152	120	–3	–2
14	0.05	0.21	0.153	100	–1	–1
14	0.1	0.4	0.255	120	–2	–2
17	0.05	0.3	0.2	80	—	—
17	0.1	0.6	0.3	100	–1	–1

TL: Lowest tech level of availability.

SM: Skeletal mass, the mass in tonnes of the rigid exoskeleton (including its power servos and supporting electronics).

MM: Maximum mass of the suit, in tonnes, including the skeletal mass, armor mass, and power supply mass.

MCr: Price (in millions of credits) of the exoskeleton. Total price of the battle dress unit will also include batteries and armor.

SV: Storage volume in liters of the empty armor. This includes space for power packs and armor.

AGL: The Agility penalty of the unit, assuming it is not overloaded.

INIT: The Initiative penalty of the unit, assuming it is not overloaded.

MW: Power requirement, in megawatts, equals the total mass of the unit (including power source and armor) times 0.014.

SAMPLE BATTLE DRESS DESIGNS

Tech Level 10 Battle Dress (AGL –3, INIT –2)

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.25	4	.042	.13	.26	.552	.008	10	.077	.0378	.0004	.1202

Tech Level 12 Light Battle Dress (AGL –2, INIT –1)

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.1	6	.042	.0375	.075	.229	.00375	10	.111	.0392	.0002	.1504

Tech Level 12 Heavy Battle Dress (AGL –3, INIT –2)

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.2	12	.084	.056	.112	.396	.0056	10	.152	.0784	.0003	.2307

Tech Level 14 Light Battle Dress (AGL –1, INIT –1)

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.05	8	.036	.06	.12	.206	.003	100	.153	.0672	.0006	.2208

Tech Level 14 Heavy Battle Dress (AGL –2, INIT –2)

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.1	16	.072	.112	.224	.396	.0056	100	.255	.1344	.001	.3904

None of these designs have been fitted with integral weapons, oxygen tanks, or sensors.

AV: Armor value.
AM: Armor mass (tonnes).
BV: Battery volume (cubic meters).
BM: Battery mass (tonnes).
TM: Total mass (tonnes).
End: Endurance of suit battery (hours).
SMCr: Skeleton price in MCr.
AMCr: Armor price in MCr.
BMCr: Battery price in MCr.
TMCr: Total price in MCr.



CHAPTER 3
Faster Than Light (FTL) Drives

Interstellar drives which allow avoidance of the limits of light speed form the basis of much science fiction. As there is no known way to avoid the light speed barrier, science-fiction authors (including game designers) must find ways to get characters from one star system to another expeditiously and using means which *seem* plausible given current scientific knowledge. After all, we do not yet know everything about the natural universe. Assuming that what we know is reasonably correct, what additional knowledge might enable FTL (faster-than-light) travel?

JUMP DRIVES

"Jump" drives enable starships to bypass the normal laws of time and distance by travelling from star to star through another form of space. The drives push a ship into a tunnel through jump space, or "J-space," a conceptual universe with more elastic dimensions than normal space (N-space). Due to the unique topology of J-space, the fall through the tunnel takes about one week (150 hours), regardless of the distance travelled in N-space. This time spent in the J-space tunnel is referred to as time "in the hole" by experienced travellers.

As gravitational fields interfere with the alignment of the jump drive (and may cause a jump mishap), ships do not usually jump until they are at least 100 planetary diameters away from the nearest world.

Jump drive machinery requirements are tied to the volume of the hull and the maximum distance the drive is capable of jumping the ship. There are upper limits on how many parsecs a ship may jump based on the tech level of the drive. The volume of the jump drives, as a percentage of the total volume of the ship, is equal to 1 plus the maximum jump number (in parsecs). So, for example, a ship capable of jump 4 would have jump drives which filled 5% (1+4) of the internal volume of the ship. If it were a 100-ton ship (1400 cubic meters of volume), the jump drives would take up 70 cubic meters of volume.

The Jump Drive table in the right-hand column lists the maximum allowed jump number, mass, and price of jump drives at each tech level.

Important Note: The smallest jump drive possible, at any tech level, is 2 cubic meters in volume.

Jump drives require fuel, displacement mass, and coolant, all of which are collectively called jump fuel (liquid hydrogen being used for all three functions). The fuel necessary for a jump of 1 parsec is equal to the total volume of the jump drive machinery multiplied by 5 and divided by the drive's maximum jump number. Thus, ships with higher jump performance make more efficient use of fuel at short distances. Jump fuel weighs .07 tonnes per cubic meter.

Fuel tankage itself is under Section 8, Power Production.

To continue the example of the 100-ton jump-4 ship above, it would require ($70 \times 5/4 =$) 87.5 cubic meters of jump fuel per parsec jumped (up to a maximum of 4 parsecs, the limit of its drive). The ship would normally have at least 350 cubic meters of jump fuel tankage (enough for its 4-parsec maximum jump).

JUMP DRIVE

TL	*Max Jump*	*Mass*	*MCr*
9	1	3	0.3
11	2	3	0.3
12	3	3	0.3
13	4	3	0.3
14	5	2.5	0.3
15	6	2	0.3

TL: Tech level of construction
Max Jump: The longest allowed jump in parsecs.
Mass: Mass in metric tonnes per cubic meter.
MCr: Price in millions of credits per cubic meter of jump drive.
Surface Area: Surface area in square meters equals cubic meters of jump drive ÷ 3.

ALTERNATIVE TECHNOLOGIES

The means by which FTL travel is accomplished is an important element, perhaps the single most important element, in defining a feel of a science-fiction campaign. The following FTL drives are not available in the Imperial Space campaign of **Traveller**, but instead are presented as alternative means of cracking the C-barrier.

Because the purpose of these alternative technologies is to allow referees to customize the background of their campaigns, the rules below should be seen as guidelines. Referees should feel free to change details to create the proper "look" for their campaigns.

Stutterwarp

Of all the possible forms of FTL travel, stutterwarp comes closest to physical travel though space at trans-light velocities. Stutterwarp is an implementation on the macro scale of the tunneling phenomenon common to electrons. The proper introduction of energy in a field around the ship allows it to move instantaneously from one location to another without passing through the intervening space.

The distances that the stutterwarp can travel in one warp, however, are very small. One cycle of the drive moves the ship less than a few hundred meters. But by cycling the drive very rapidly, the ship can travel vast distances in very short times, even faster than light.

Speed/Efficiency: Actual speed of a stutterwarp ship depends on the output of the power plant, the displacement of the craft that is being moved, and the amount of gravity through which it is being moved. In deep space, where gravity is less than



0.0001G, the warp efficiency is equal to parsecs per day. A warp efficiency 1 ship, for example, would require one week to travel between stars seven parsecs apart.

In the inner system of a star where the gravity becomes greater than 0.0001 G, the efficiency of the stutterwarp drops off enormously (by a factor of proximately 10,000). Ships with stutterwarp in the inner system are still moving at enormous speeds, but no longer at multi-light speeds. Stutterwarp-powered ships travelling between worlds in the inner system can expect travel times ranging from hours to, at most a few days.

Finally, when gravitation reaches about 0.1G, the efficiency of the stutterwarp drives drops off once again. At 0.1G, the stutterwarp has just enough efficiency to maintain orbit; above 0.1G, it cannot overcome the gravitational attraction and some other means of propulsion must be used. The major effect of this is that a stutterwarp drive cannot lift a vessel off of a world's surface or even out of its atmosphere. Some other type of engine is required, or the vessel may carry landing craft.

It is easy for a referee to determine at what distance from a planet or star these cut-off points are. Simply divide the body's surface gravity by 0.1G or 0.0001G (depending on which distance you wish to know), take the square root of that value, and multiply it by the radius of the body in kilometers. The result will be the distance in kilometers from the body's core at which the cut-off points are located.

For Sol, stutterwarp drives will not operate above light speed much beyond the asteroid belt, and they cannot overcome Sol's attraction at all if they are within 11.6 million kilometers of Sol's core (or about 10.9 million kilometers from Sol's surface). For Terra, the cut-off points are at approximately 638,000 kilometers and 20,000 kilometers.

Designing Stutterwarp Ships: Stutterwarps are available at tech level 10 and beyond. Stutterwarps require a separate power plant.

Volume: The volume of a ship's stutterwarp drive in cubic meters is equal to 2 plus the product of five times the square root of the output (in megawatts) from the power plant devoted to the drive.

$$V = 2 + (5\sqrt{MW})$$

Price: The price of the stutterwarp, in millions of credits, is equal to its volume multiplied by 0.3.

Performance: The efficiency of the stutterwarp is equal to the product of the tech level efficiency multiplier times the cube root of the quantity: megawatts (devoted to the drive) divided by 10 times the ship's displacement in displacement tons. The tech level efficiency multiplier of the stutterwarp is equal to the tech level of construction plus 4.

$$E = Tlm \times \sqrt[3]{MW \div 10D}$$

E: Efficiency
Tlm: Tech level multiplier (tech level + 4)
MW: Power input to the drive.
Surface Area: Surface area in m^2 equals volume in $m^3 \div 3$.

Stutterwarp Vessels in Combat: The stutterwarp is so much faster than conventional ships that it can literally "fly rings around" a G-maneuvering vessel. The craft's stutterwarp efficiency multiplied by 4 (rounding fractions to the nearest whole number) is the number of range bands (hexes if playing **Brilliant Lances**) it can move in *one minute*. Since a combat turn is *30 minutes* long, multiply the speed (in hexes per minute) by 30 to find out how many hexes it can move per turn. (This will range from 120 to as much as 500.)

To make the game manageable, divide the turn into several segments. If a stutterwarp ship is facing a conventional vector movement ship, divide the turn into as many segments as the current velocity of the vector-movement ship (or the fastest vector-movement ship if there are several). Divide the stutterwarp ship's movement by the number of segments in the turn. Each segment the stutterwarp ship moves that many hexes (or range bands) and the hostile ship moves 1 (or the fastest hostile ship moves 1 and the slower ones either move or pass, making sure they move the correct total number of hexes in the complete turn).

Ships may fire some or all of their weapons in any segment, but may fire each of their weapons only once per turn. Ships which have increased rates of fire (due to increased power to energy weapons) may use this to make extra shots instead of a blanket lowered difficulty level. This may allow an energy weapon to fire five or even 10 times in turn, but it may fire no more often than once per segment.

Regardless of how many hexes a ship moves in a segment, it may fire or be fired on at any point in its movement. As it moves each hex, the owning player should pause briefly to let any opposing player declare attacks.

If only stutterwarp ships are involved in the combat, divide the turn into 10 segments.

Charge Buildup Limitation (Optional): Stutterwarp as described above is a tremendously versatile drive system. Often the dictates of a game require some limitation on the versatility of a drive, particularly if a military situation is being gamed. The following limitation has been used by us in the GDW **2300 AD**™ future history. Its advantage is that it allows stars with planets to provide important way stations and choke points to travel. Without this option, it is very difficult to have a "frontier" between two powers. The first evidence of an invasion expedition would be the appearance of a hostile fleet in your capital's star system. Therefore, the following is highly recommended.

The structure of the stutterwarp drive imposes some limitations on distances travelled. As a stutterwarp drive tunnels, an energy charge builds up in its components. This charge is related to the total distance tunneled, rather than to the time the drive is in operation. When this charge reaches a critical threshold level, a rapid deterioration of the drive components begins, stalling the drive and releasing lethal radiation. The energy charge is removed by discharging it in a gravity well. If the discharge is not made by the time the ship has travelled its range value in parsecs, the ship will be completely irradiated and the crew killed. The discharge must take place in a significant gravity well of at least 0.1G, and it requires 40 hours to complete.

Note that in order to discharge into 0.1G, a vessel must be orbiting a body while discharging. Although 0.1G is also the limit at which stutterwarp drives drop below the efficiency of conven-



tional drives, stutterwarp drives are sufficient to make any velocity changes necessary to maneuver a ship that is in orbit, as long as the vessel does not drop below the 0.1G distance. Stutterwarp vessels can also leave orbit without using conventional drives.

Also, a stutterwarp vessel can use a planet to change its vector. To do so, the craft begins a shallow drop toward the planet. The velocity it picks up in this drop is sufficient to slingshot it past the planet and beyond the 0.1G limit, where its stutterwarp can be used to maneuver it away.

Wormholes

Wormholes are permanent or semi-permanent naturally occurring tunnels through space. They allow travel from one end of the wormhole to the other, and the hole may conceivably be of any length. Entry and exit points tend to be near large masses, such as stars or black holes. The fact that the wormholes can only be discovered, not created, lends a completely different topology to the universe. Wormholes are defined by two different characteristics: opening and length.

Opening: Wormholes may be open or closed, indicating the degree of difficulty encountered when trying to enter them. Whether all wormholes are open, all closed, or there are a mix of the two types is entirely up to the referee. Open wormholes can be entered without any unusual expenditure of energy, and in fact, are often discovered by accident. Closed wormholes can be entered only by great expenditures of energy and are more difficult to detect. (They are detected using densitometers.)

Ships enter closed wormholes by means of "keyhole" drives.

KEYHOLE DRIVE TABLE

TL	Mj	Vol
9	3	2
11	2.5	1.75
12	2	1.5
13	1.5	1.25
14	1.25	1
15	1	0.75
16	0.9	0.5
18	0.8	0.25
20	0.7	0.15

Mj: Power, in megajoules, required per displacement ton of craft.

Vol: Volume of drive, in cubic meters, per displacement ton of craft.

Price: All keyhole drives cost MCr0.3 per cubic meter of drive.

Mass: All keyhole drives mass 1 tonne per cubic meter.

Surface Area: Surface area in m^2 is equal to volume in $m^3 \div 3$.

In addition to the keyhole drive itself, the ship will usually have banks of capacitors to store energy from the power plant prior to the jump. Consult the Power Production chapter (Section 8) for a discussion of capacitors.

Length: There are two aspects of wormhole length which are important: endpoint length and apparent length. Endpoint length is the distance between the two endpoints (openings) of the wormhole, and determines the practical real-universe distance travelled through the wormhole. Endpoint length can either be determined randomly or deliberately set by the referee.

Apparent length is the time actually spent in the wormhole while travelling, and is up to the referee. Several options should be considered. One is a constant apparent length. That is, no matter how great or short the endpoint length, a constant amount of time is spent in the wormhole. (This is similar to the time spent in J-space when using a jump drive.) A second is a scaled apparent time, where the time spent in the wormhole is proportional to the endpoint length of the wormhole. A ratio of time to parsecs should be established, and it can be as little as one hour per parsec to a week or more per parsec. A third option is no apparent length: travel is instantaneous. A final option is random apparent length, the assumption being that wormholes are not necessarily straight mathematical constructs and may meander. Wormholes with short endpoint lengths may have very long apparent lengths, and vice versa. This option is perhaps the most interesting as it adds greater variety to the topography of your universe.

Stargates

There are two possibilities for including stargates in a game. One is the tightly closed-door wormhole opening and the other is the artificial (or "drilled") wormhole. Within these general classes there are a number of sub-varieties. When establishing a universe using wormholes as transportation routes, remember that it is not necessary that every variety discussed below be included. Some of the most interesting science-fiction universes are the most restrictive with respect to travel.

Closed Door: This really represents one more type of opening for a wormhole, and assumes that ships cannot easily carry equipment powerful enough to breach the wormhole opening. In this case, large gates are built at the wormhole openings which allow ships to pass through freely.

Drilled Wormholes: These stargates are nothing more than artificially created (rather than naturally occurring) wormhole openings. In some cases, stargates may be relics of long-vanished civilizations. There are two varieties of drilled wormholes: semi-permanent and transitory.

In the case of semi-permanent drilled wormholes, the builders determine entry and exit points, and a gate has to be built at both ends before the wormhole can be activated.

In the case of transitory wormholes, the gate serves as a very large directional-matter transporter which can teleport any object (including a ship) from the gate to any point within its maximum range. It essentially re-drills its wormhole every time it transfers volume. With that exception, all of the below considerations of stargate design must be addressed.

Characteristics: Stargates are usually huge and require tremendous power. If near a star, power is usually supplied by solar collectors, while fusion reactors provide power in other cases. Unlike most forms of technology, we offer few hard guidelines here and instead leave the details up to the referee. However, we will outline what sorts of requirements need to be defined.

Power requirements will be based on the displacement of objects passing though the gate, and will be expressed as Mj per displacement ton. The megajoules, rather than megawatt, nota-



tion is used as the gate is not continuously powered, instead only requiring a burst of energy when an object enters the wormhole through the gate. As a result, gates often have capacitor or homopolar generator banks (see Section 8, Power Production) banks which require recharging between ship entries.

Drilled wormholes are somewhat different, as both gates need to be continuously powered to maintain the wormhole between them. This power requirement is in MW per parsec of endpoint length.

The actual gate structure is heavy with complex electronic components, and has a volume equal to one displacement ton (14 cubic meters) per displacement ton capacity. That is, 1000 tons of machinery are required for a gate large enough for a 1000-ton ship to pass through. Gate structure costs between MCr0.001 and MCr1 per displacement ton (at the referee's discretion) and masses 1 tonne per cubic meter (14 tonnes per displacement ton).

Stargate Characteristics Summary

Gate Opening Energy: Mj per displacement ton
Gate Sustaining Power: MW÷parsec endpoint length
Gate Capacity: In displacement tons
Gate Volume: Gate capacity × 1.
Gate Mass: Gate capacity (in displacement tons) × 14.
Gate Price: Gate volume multiplied by the cost constant.

Gate performance is affected by tech level. Tech level can provide both progressive increases in efficiencies and can also impose upper limits on endpoint length. It may also reduce the gate volume to a decimal multiplier of the gate capacity, such as 0.8 or 0.1.

The table below is a sample description of what gate technology might be in a science-fiction universe.

Stargates

TL	*EPL*	*GOE*	*GSP*	*Vol*
10	6	20	100	1
11	7	18	100	1
12	8	16	100	1
13	9	14	100	1
14	10	12	100	0.9
15	12	10	100	0.8
16	15	9	100	0.7
18	20	8	100	0.6
20	25	7	100	0.5
21	30	6	100	0.4

TL: Tech level of availability.
EPL: Maximum endpoint length in parsecs.
GOE: Gate opening energy in megajoules per displacement ton of transferred volume.
GSP: Gate sustaining power in megawatts per parsec of endpoint length.
Vol: Volume of gate machinery, in displacement tons, per displacement ton of transfer capacity.
Gate Mass: The mass of the gate, in tonnes, is equal to the volume of its machinery in displacement tons multiplied by 14.
Gate Price: The price of the gate, in millions of credits, is equal to the volume of its machinery in displacement tons multiplied by 28.

Subspace

Subspace is a duplicate of our physical universe in smaller scale. Ships which enter subspace can move from point to point at sublight speed, but arrive at their destination sooner than in normal space because the distance travelled is less. In this respect, subspace bears some similarities to J-space (see the discussion of jump drives above), but with some very important differences.

Subspace does not resemble a vacuum, but instead resembles a fluid medium. Continuous energy is required to sustain forward motion through the resisting medium. In addition, each point in subspace has an analogous point in normal space (N-space) and a ship whose subspace drives fail will immediately reappear in N-space at the point corresponding to its previous subspace location. This also means that, although power is usually consumed in relation to speed, a certain amount of energy is consumed simply remaining in subspace, even if absolutely stationary, and this is called the "station-keeping" power level.

Subspace drives require separate power plants. The amount of energy channeled to the subspace drive, coupled with the efficiency of the drive, determines the speed of the craft.

A variable volume of subspace drives may be installed, the volume of the drives limiting the total power that can be used in the drive. The drive's speed is determined by dividing the power (in megawatts) by the displacement (in displacement tons) and multiplying by the tech level efficiency modifier.

$$V = (MW \div D) \times Eff$$

V: Velocity
MW: Power input in megawatts
D: Displacement in tons
Eff: Tech level efficiency multiplier

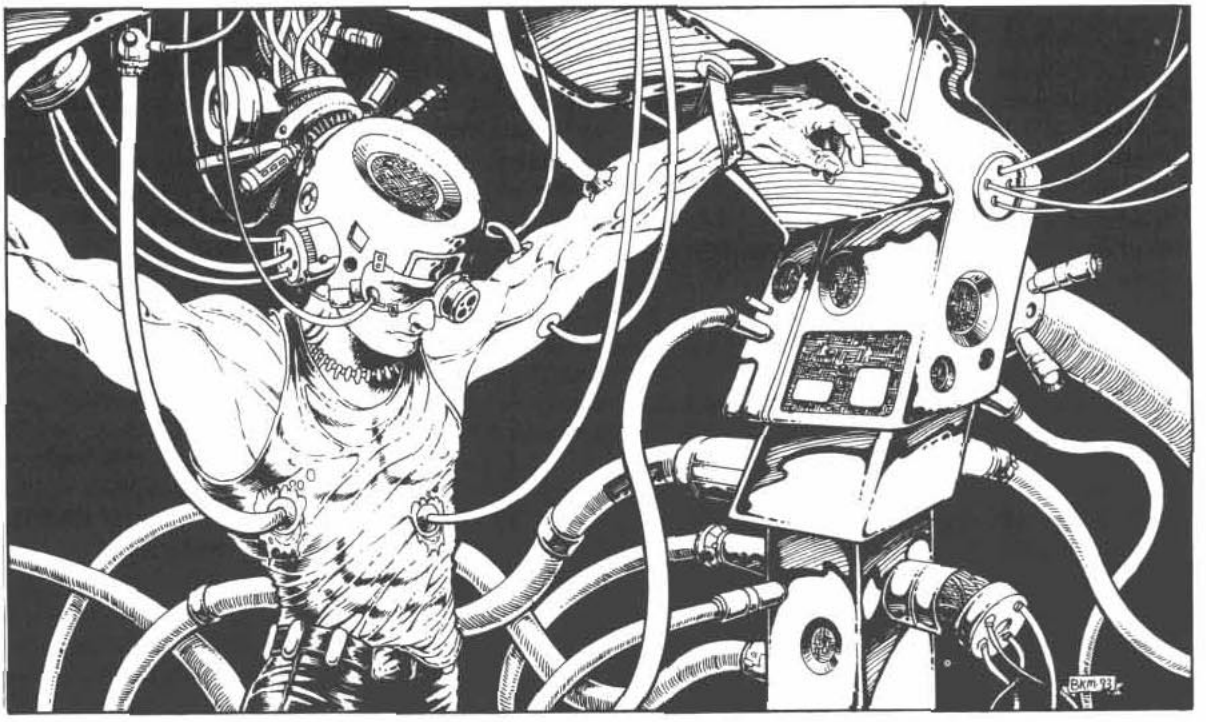
The volume requirements, prices, and efficiency levels should be determined by the referee. As with the case of stargates, we present the following table as one example of subspace drives, but remind referees that they are free to change these values as much as desired.

Subspace Drives

TL	*Vol*	*Eff*
9	0.50	0.60
10	0.40	0.65
11	0.30	0.70
12	0.25	0.75
13	0.20	0.80
14	0.15	0.85
15	0.10	0.90
16	0.08	0.95
18	0.06	1.00
20+	0.04	1.10

TL: Tech level of construction
Vol: Cubic meters of drive per MW of power input.
Eff: Drive efficiency multiplier.
Mass: The mass of the drive, in tonnes, is equal to its volume in cubic meters.
Price: The price of the drive, in millions of credits, is equal to its volume, in cubic meters, multiplied by 0.25.
Surface Area: Surface Area in m^2 equals volume in cubic meters ÷ 3.





Subspace Drive and Combat: Normal Traveller starship sensors and communicators are useless in subspace. Consult the Electronics chapter (Section 5) for alternate equipment which is used in subspace. Missiles (unless built with subspace drives), sancasters, and force fields are likewise useless. Lasers, meson guns, and particle accelerators may be used normally. With the exception that different weapons, sensors, and communicators are used, the only other difference is that each range band (hex in **Brilliant Lances**) is 0.01 parsec (0.0326 light-years), approximately 1 million light-seconds. Spacecraft combat speed in range bands (hexes) per turn is equal to their subspace travel velocity multiplied by 200 (rounding fractional results to the nearest whole number).

Psionic Transfer Drive

Psionic transfer (PT) drive uses a conventional power plant to artificially augment the psionic teleportation skill of a psion. This technology normally assumes a cybernetic man-machine interface (usually by neural jack), but it can also be accomplished with computer empathy. Although machinery cannot duplicate the subtlety of a psionic field, it can amplify and strengthen it, which is what the psionic transfer drive does.

The normal requirement that the psion have foreknowledge of the destination is still in effect, which limits the number of psions capable of running a PT drive significantly. Usually both Teleportation and Clairvoyance skills are required. At tech levels 16 and above, the astrogation computer can store direct neural images of the location with sufficient clarity that psions can use them in place of normal sensory input to orient themselves for the transfer.

No one burst of energy characterizes the PT drive, but it must run for a number of hours prior to the transfer equal to the planned transfer *distance (in parsecs)*, and a like number of hours are spent in transfer.

Range is determined by psionic power. The maximum psionic teleportation transfer range, in parsecs, is equal to the square root of the psionic power rolled for the task. Psions may attempt to transfer for distances greater than can be guaranteed (the square root of the psion's Psionic Strength and Teleportation skill level), but if the additional D10 roll is insufficient to reach the destination, a misjump occurs. Consult the **Traveller** main rules for the rules concerning misjumps.

Note that psions often use Psi Booter when conducting PT operations.

The volume requirements, prices, and efficiency levels should be determined by the referee. As with the case of stargates, we *present* the following table as one example of PT drives, but remind referees that they are free to change these values as much as desired.

PT Drives

TL	*Vol*
9	0.10
10	0.09
11	0.08
12	0.07
13	0.065
14	0.06
15	0.055
16	0.05
18	0.045
20+	0.04

TL: Tech level of construction

Vol: The volume of the PT drive is equal to the volume of the craft multiplied by the value shown on the table.

Mass: The mass of the drive, in tonnes, is equal to its volume in cubic meters.

Price: The price of the drive, in millions of credits, is equal to its volume, in cubic meters, multiplied by 0.25.

MW: The power required for the drive, in megawatts, is equal to its volume in cubic meters.



CHAPTER 4
Controls

Controls, for the purposes of these rules, include control systems proper, navigational aids, computers, and workstations.

CONTROL SYSTEMS

Control systems include control consoles from which the crew of a craft control its systems, and the interior circuitry linking the craft's electrical and mechanical systems to those controls. Installed computers must be from the same tech level as the controls, and avionics and navigation aids may not be installed from a tech level higher than that of the controls.

CONTROLS

TL	*Type*	*Power*	*Price*	*Airframe*
4	Primitive Mechanical	—	.0001	Simple
5	Basic Mechanical	—	.0002	Fast Subsonic
6	Enhanced Mechanical	0.0002	.0003	Transonic
7	Electronic	0.0005	.0005	Hypersonic
8	Enhanced Electronic	0.0005	.00075	Hypersonic
9	Computer Linked	0.0005	.001	Hypersonic
10-12	Dynamic Linked	0.001	.0015	Hypersonic
13-16	Holographic Linked	0.001	.002	Hypersonic
17-20	Synaptic Linked	0.001	.0025	Hypersonic
21+	Synaptic Fluidic	0.001	.003	Hypersonic

Power: MW per displacement ton of the craft.

Price: MCr per displacement ton of the craft.

Airframe: Maximum airframe type that can be equipped with these controls (for use with aircraft design).

Volume and Mass: Control systems used in vehicles and spacecraft displace 0.014 cubic meters and mass 0.0014 tonnes per displacement ton of the hull.

Aircraft Controls: The values on the Controls table are for spacecraft and vehicles, whose size are calculated in terms of volume. As aircraft calculate size in terms of weight, some modification is necessary. All controls mass 0.014 tonnes per tonne of overall weight of the aircraft. Multiply the power and prices above by 10, and apply them per tonne of overall aircraft weight.

RCV Controls: Vehicles and spacecraft may be designed to function without on-board crews. Such craft require controls, avionics, and sensors, but do not require life support or computers. Vehicles intended specifically for RCV operations are typically reconnaissance vehicles or military vehicles used in very high-threat environments.

Remotely commanded vehicle (RCV) controls may be installed on any aircraft, vehicle, or spacecraft. In the case of aircraft and spacecraft, the RCV option adds 10% to the mass, volume, and price of the controls. In the case of a vehicle, it adds 1% to the mass, volume, and price of the suspension.

RCV controls require a sensor (usually a video camera) in the vehicle and a communication link between the vehicle and the operator. A simple video camera (available at tech level 6 and beyond) masses 2 kilograms, displaces 3 liters (allowing for traverse) and costs Cr100. Communicators are selected from those available in the Electronics chapter.

A number of RCV operators are required equal to the number that the RCV would require if it were manned. (A simple spaceborne sensor drone only requires one operator, as coasting through space does not require the attention of a pilot the way an atmospheric craft does.) Each operator requires a workstation or crewstation (according to where the operators are located, i.e., in a vehicle, aircraft, or spacecraft; ground stations, which have lots of space, are treated as spacecraft and therefore use workstations) of a tech level equal to that of the RCV.

For truly ambitious RCV operations, in which a large, normally manned vehicle or spacecraft is converted to RCV operations, each workstation or crewstation that is to function in the remote operations must additionally have its mass, volume, and price increased by 10%. A number of RCV controllers equal to the normal crew are required to operate it. Each RCV operator requires a workstation or crewstation identical to the one on the vehicle that it is remotely controlling.

In addition, any RCV that would normally (i.e., if it were manned) require one or more computers must have the appropriate number and type of computers installed with the workstations of its operators.

For spaceborne RCV operations, the time lag inherent when RCV and operators are separated by a light-second or more create difficulties (increase the difficulty of all tasks by one level for each light-second apart). Operators of spaceborne sensor drones are therefore often equipped with MFDs to assist with these difficulties. In order to use the MFD's ability to ignore Diff Mods, the RCV must be within the MFD's extreme range (8×short range listed on the MFD table), so the designer must choose the range of such an MFD accordingly.

WORKSTATIONS AND CREWSTATIONS

Vehicles, aircraft, spacecraft, and many weapons require the allocation of workstations or crewstations to allow crewmembers to control important equipment or machinery. Workstations are used on spacecraft and very large vehicles which perform missions lasting days or more. Crewstations are used on aircraft and vehicles which are typically operated for 24 hours or less at a time.

These are each of two types: normal workstations and roomier bridge workstations, and cramped crewstations and roomier open crewstations. The only difference between these is their volumes. Guidelines for the use of the different types of stations are provided in the vehicle design sequences.

The tech level of workstations/crewstations installed must be the same as the installed controls.

WORKSTATIONS AND CREWSTATIONS

TL	*Bridge W/S Vol*	*Normal W/S Vol*	*Crewstation Crmp/Open*	*Mass*	*MCr*
4	—	—	2.5/3.5	0.1	0.0001
5	—	—	2.5/3.5	0.1	0.0002
6	—	—	2.5/3.5	0.2	0.0003
7	14	7	2.5/3.5	0.2	0.0005
8	14	7	2.5/3.5	0.2	0.00075
9	14	7	2.5/3.5	0.2	0.001
10-12	14	7	2.5/3.5	0.2	0.0015
13-16	14	7	2.5/3.5	0.2	0.002
17-20	14	7	2.5/3.5	0.2	0.0025
21+	14	7	2.5/3.5	0.2	0.003

Volume: In cubic meters. Under Crewstation, Crmp indicates the volume of a cramped crewstation, Open indicates the volume for an open crewstation.

Mass: In tonnes

MCr: Price in megacredits (millions of credits)

W/S: Workstation



NAVIGATIONAL AIDS

Flight avionics assist spacecraft and aircraft in maneuvering over the ground and making takeoffs and landings, particularly in difficult circumstances (such as night or inclement weather). Terrain following avionics assist lift vehicles, large lift craft (such as spacecraft with G-lifters), helicopters, and VTOL aircraft to fly at high speeds at nap-of-the-earth altitude. Navigation aids assist vehicles in navigating across the surface of world.

Flight Avionics

TL	*MCr*	*Vol*	*Mass*	*MW*	*Description*
4	.001	.0001	.0001	—	Magnetic compass
5	.01	.0001	.0001	—	Gyrocompass, barometric altimeter
6	.05	.0001	.0001	.01	Radar altimeter, transponder
7	.10	.001	.001	.1	Weather radar, FLIR, inertial positioning
8	.20	.001	.001	.1	Imaging radar
10	.25	.001	.001	.1	Imaging EMS, inertial/gravitational positioning

MCr: Price in MCr. If at any tech level higher than the level of introduction, price × 0.1; **Vol:** Displacement in cubic meters; **Mass:** Mass in metric tonnes; **MW:** Power requirement in MW; **Description:** TL 6 or better flight avionics necessary for a starship to land on the surface of a planet. Each level of avionics includes all features shown at lower tech levels as well. FLIR = forward-looking infrared, a focused high-resolution thermal-imaging device.

Terrain-Following Avionics

TL/Type	*Vol*	*Mass*	*MCr*	*NOE*
None	—	—	—	40
8	0.2	0.05	0.010	120
9	0.02	0.04	0.011	130
10	0.15	0.04	0.012	140
11	0.15	0.03	0.013	150
12	0.1	0.03	0.014	160
13	0.1	0.02	0.015	170
14	0.05	0.02	0.016	180
15	0.05	0.02	0.017	190
16	0.03	0.03	0.018	200
17	0.03	0.03	0.019	250
18	0.02	0.04	0.020	300
19	0.02	0.04	0.022	350
20	0.01	0.05	0.024	400
21	0.01	0.05	0.028	450

Vol: Volume in cubic meters (kiloliters); **Mass:** Mass in metric tonnes; **MCr:** Price in millions of credits; **NOE:** Safe nape of the earth (NOE) speed in kilometers per hour; **Power:** Power requirement, in MW is equal to Wt; **Antenna:** Antenna area, in square meters, is equal to Wt × 10.

Navigation Aids

TL	*MCr*	*Vol*	*Mass*	*MW*	*Description*
2	.001	.0001	.0001	—	Magnetic compass
5	.001	.0001	.0001	—	Gyrocompass
6	.001	.0001	.0001	.01	Transponder
7	.010	.001	.001	.01	Inertial positioning
8	.020	.001	.001	.01	Satellite positioning
10	.025	.001	.001	.01	Integrates IGS positioning

MCr: Price in MCr. If at any tech level higher than level of introduction, price × 0.1; **Vol:** Displacement in cubic meters; **Mass:** Mass in metric tonnes; **MW:** Power requirement in MW; **IGS:** Inertial gravitational satellite

COMPUTERS

If a computer is desired, select one from the list below. Any orbital or deep-space craft must have at least one computer, and jump-capable craft require an additional computer. Space craft may use either standard or fiber-optic models of computers, or a mix of the two.

Spacecraft generally have at least two computers: one is the primary, the other is a dedicated maintenance troubleshooter and safety backup; starships have three: one primary, one for jump capability/backup, and another for maintenance troubleshooting, which also functions as a backup.

Aircraft with computers may use flight computers (Model Flt). Hypersonic aircraft should have two computers (but are only required to have one); one is a safety backup. Supersonic and slower aircraft are not required to have computers, but may choose to do so to help with long-range sensors and weapons operations.

Important Note: A computer may not be installed which is from a different tech level than the craft's control system. A craft may not have installed sensors or master fire directors from tech levels higher than the installed computer or control system. St or Fb computers are required for any craft fitted with an MFD, or a sensor with a short range greater than 30 kilometers. (Sensors with a short range of 30 kilometers or less do not require a computer.)

Computers Table

TL	*Mod*	*MW*	*Vol*	*Mass*	*MCr*	*Mult*
5	St	0.50	50	10	1.5	1
6	St	0.10	10	2	1.0	0.8
7	St	0.15	5	1	0.5	0.7
8	St	0.20	5	1	0.4	0.6
9	St	0.25	5	1	0.6	0.5
10	St	0.30	6	1.2	1	0.45
11	St	0.35	7	1.4	2	0.4
12	St	0.40	8	1.6	3	0.35
13	St	0.45	9	1.8	4	0.3
14	St	0.50	8	1.6	5	0.25
15	St	0.55	7	1.4	6	0.2
16	St	0.60	6	1.2	10	0.15
17	St	0.60	5	1	11	0.13
18	St	0.60	4	0.8	12	0.11
19	St	0.55	3	0.6	13	0.09
20	St	0.50	2	0.4	14	0.07
21	St	0.45	1	0.2	15	0.05

TL: Tech level of availability.

Mod: Model St = Standard, Fb = Fiber-optic, Flt = flight.

Fiber-optic computers are available from TL 7 on. Multiply MW, volume, mass, and price by 2. Usually one or more of a starship's three computers are fiber-optic.

Flight computers are simplified versions of the above computers optimized to perform a set number of routine flight functions. They may be used in place of standard computers on atmospheric and sub-orbital craft, although full-size computers may be installed as well. Flt computers do not provide maintenance point reduction. Multiply volume, MW, and mass by 0.1 and price by 0.001.

MW: Power requirement in MW

Vol: Displacement in cubic meters

Mass: Mass in metric tonnes

MCr: Price in millions of credits

Mult: Control multiplier



CHAPTER 5
Electronics

Electronics fall into three categories: communicators, sensors, and electronic countermeasures (ECM). The technologies discussed below in each of these categories are those available in the Imperial Space campaign universe. The fourth section in this chapter deals with alternative technologies, most of which are used in conjunction with alternative FTL drives.

Electronics Pods: Any of the electronic systems listed below may be placed in streamlined pods for mounting on hardpoints on aircraft and lift vehicles. Each pod has a shell weight equal to 10% of its final weight. Each pod can mount an antenna with an antenna area equal to 1 square meter per 1000 kilograms (1 metric tonne) of total pod weight.

For all electronic systems which do not calculate antenna price separately, antenna price is equal to 0.25 times the total system cost, for purposes of replacing destroyed antennae.

A. COMMUNICATORS

Communicators can be either broadcast or tight beam. Radio is the principal form of broadcast communications while laser, maser, and meson communicators are tight beam. Tight beam communicators are much more difficult to intercept or jam, but are also somewhat more complex and require that the transmitter know the precise location of the receiver.

Laser Communicators

			Volume at Tech Level						
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*	*18*	*20*
3	.0012	.005	.004	.002	.001	.001	—	—	—
30	.005	.01	.016	.008	.006	.004	.001	—	—
300	.011	.02	.020	.010	.008	.005	.002	—	—
3000	.021	.04	.040	.020	.015	.010	.003	.001	—
30,000	.036	.08	.070	.035	.025	.018	.005	.002	.001
300,000	.056	.15	.110	.055	.040	.028	.007	.003	.002
1000 AU	.180	.3	—	.120	.070	.050	.015	.007	.005

Range: Short range in kilometers (or Astronomical Units, as indicated by the abbreviation AU)

Range Note: Maximum range in an atmosphere coded Thin or greater is 5000 km

Volume: Cubic meters (kiloliters)

MCr: Price in millions of credits

MW: Power requirement in megawatts

Mass: Mass, in metric tonnes, equals volume × 2

Antenna: Antenna area equals 1 square meter for all versions

Radio Receivers

All spacecraft are automatically equipped with radio receivers integral to their hulls at no additional cost. These allow radio reception and are destroyed by electronics hits (1h).

Vehicles of TL 8+ have the same integral radio receivers at no cost. At lower tech levels, vehicles may add radio receivers at no volume at MCr0.0001.

There is no power requirement for any of these receivers.

Finally (in the event that these receivers are destroyed in combat), all passive EMS sensors function as radio receivers, even, in the case of folding arrays, when retracted.

Maser Communicators

			Volume at Tech Level						
Range	*MCr*	*MW*	*8*	*9*	*10*	*12*	*15*	*18*	*20*
3	.0012	.01	.010	.005	.002	.001	—	—	—
30	.005	.02	.030	.015	.010	.002	.002	—	—
300	.011	.04	.040	.020	.015	.010	.004	—	—
3000	.021	.08	.080	.040	.030	.020	.006	.002	—
30,000	.036	.15	.150	.070	.050	.040	.010	.004	.002
300,000	.056	.3	.200	.100	.080	.060	.015	.006	.004
1000 AU	.180	.6	—	.250	.150	.100	.030	.015	.010

Range: Short range in kilometers (or Astronomical Units, as indicated by the abbreviation AU)

Volume: Cubic meters (kiloliters)

MCr: Price in millions of credits

MW: Power requirement in megawatts

Mass: Mass, in metric tonnes, equals volume ×2

Antenna: Antenna area equals 1 square meter for all versions

Meson Communicators

			Volume at Tech Level			
Range	*MCr*	*MW*	*15*	*16*	*18*	*20*
300	0.25	.05	.5	.3	.01	—
3000	1	.2	2	1.5	.5	.1
30,000	2.5	1	30	16	5	.2
300,000	5	3	150	80	25	15
1000 AU	20	5	500	220	85	50

Range: Short range in kilometers (or Astronomical Units, as indicated by the abbreviation AU)

Volume: Cubic meters (kiloliters)

MCr: Price in millions of credits.

MW: Power requirement in megawatts.

Mass: Mass, in metric tonnes, equals volume × 2

Antenna: Antenna area, in square meters, equals MW × 10, with a minimum of 1 square meter

Radio Communicators

			Volume at Tech Level								
Range	*MCr*	*MW*	*5*	*6*	*7*	*8*	*10*	*12*	*15*	*18*	*20*
3	.000075	.0001	.05	.01	.001	.0001	.0001	.0001	.0001	.0001	.0001
30	.00025	.001	.1	.05	.01	.001	.0001	.0001	.0001	.0001	.0001
300	.0005	.01	.15	.1	.05	.01	.001	.0001	.0001	.0001	.0001
3000	.005	.1	.3	.15	.1	.05	.01	.001	.0001	.0001	.0001
30,000	.030	1	.7	.3	.15	.1	.05	.01	.001	.0001	.0001
300,000	.090	10	—	.7	.3	.15	.1	.05	.01	.001	.0001
1000 AU	.150	20	—	—	.7	.3	.15	.1	.05	.01	.001

Range: Short range in kilometers (or Astronomical Units, as indicated by the abbreviation AU); **Volume:** Cubic meters (kiloliters); **Price:** Price in MCr. If TL 5, ×3. If TL 6, ×2; **MW:** Power requirement, in megawatts; **Mass:** Mass, in metric tonnes, equals volume × 2; **Antenna:** Antenna area, in square meters, equals MW × 10.



B. SENSORS

Sensors detect the presence of targets either by detecting energy emitted by the target or by reflecting energy off of them and detecting the reflection. The first type of sensor is known as a passive sensor, since it does not emit energy of its own. The second type is called an active sensor, since it projects energy and bounces it off the target. Radar, ladar, and active EMS are all active sensors, while passive EMS, high-resolution thermal, densitometers, neutrino sensors, and neural activity sensors are passive.

Aside from signal power, there are two critical issues in sensor design: antenna size and detector element size.

Antenna size is important for two reasons.

First, the absolute size (surface area) of an antenna determines the amount of energy it can collect. The larger a sensor, the more energy that can be collected from a faint target, thus the more sensitive the sensor is. At higher tech levels, the detection elements on the sensor's surface become more sensitive, allowing the absolute size of the sensor to decline with no diminution of sensitivity.

Second, the diameter of a sensor determines its *resolution*, or ability to see detail by separating closely spaced objects into discrete images. Resolution is expressed as the linear dimension that can be resolved, and varies with the wavelength of radiation coming from the target (i.e., short wavelengths allow finer resolution, hence greater detail), but varies inversely with sensor diameter. Thus, very high diameters are required to get good resolution in the infrared wavelengths that are so useful in space combat. This is limited by physics, not technology.

Because most ships cannot carry around huge 800-meter diameter dishes, some way must be found to decouple surface area from diameter. This method is called *aperture synthesis*, in which the effect of a large diameter dish is created by the use of one or more smaller dishes. The way that this is done for spacecraft is to reduce the single large dish (or telescope, or whatever) into an array of several smaller dishes whose signals are processed and combined by a computer to create the effect of one single large dish. The resolution of a synthetic aperture array with a distance X between the outermost edges of its outermost dishes is identical to a single large dish with a diameter of X (although its potential sensitivity is greatly reduced). On starships, these dishes are mounted on folding struts that allow them to be extended out to the required distance. They can also be retracted for atmospheric entry, docking, etc., but cannot be used when retracted.

There is a slightly different use of the synthetic aperture concept that is used for active sensors on planetary vehicles, typically aircraft. Computerized processing allows a fast-moving vehicle to use its own speed to stretch its effective sensor diameter along its flight path. The radar emits pulses at a fixed angle from its flight path (called "staring," as opposed to "scanning" back and forth), and the computer electronically combines the sensor pulses returned during a period of flight time and integrates them into an image as detailed as if the sensor diameter was equal to the aircraft's speed times the period over which the pulses were built up. Naturally, flight must be straight and level to allow accurate computations, and this only works for targets away from the sensor platform's flight path, i.e., it cannot look directly ahead. A variation of this, *inverse synthetic aperture*, uses the target's relative motion, and allows the sensor to look straight ahead, although this has inherently less resolution than normal synthetic aperture systems.

However, this is only practical because of the relatively short ranges between planetary targets compared to the tremendous distances between space targets. In space, the relative speeds of sensor to target are insignificant compared to the distances involved. Only an absolute increase in effective array diameter can address these issues.

These antenna size issues affect all sensors, but are particularly important for passive sensors which must use the energy that is coming off the target. Active sensors pump energy at the target and listen for the echo, so they can make up for lack of antenna size by increasing radiated power, and by decreasing the wavelength of this power.

The second critical issue is detector element size. Each detector element in the receiver represents a fixed proportion of the total area scanned by the sensor. If the signal received from an object is a smaller proportion of the "picture" drawn by the sensor than one detector element, resolution is reduced to a blob with no detail.

Radar

Radar is an active sensor which bounces radio waves off of targets and then detects the returning echoes. A radar requires a processor unit and an antenna.

	Processor Volume by Tech Level				
Short Range	*5*	*6*	*7*	*8*	*9*
0.3 km	0.3	0.1	0.04	0.02	0.01
3 km	3	1	0.4	0.2	0.1
30 km	30	10	4	2	1
300 km	300	100	40	20	10
3,000 km	—	—	400	30	15
30,000 km	—	—	—	40	20
60,000 km	—	—	—	50	30

Volume: Volume in cubic meters (kiloliters) as shown

MW: Power requirement (in megawatts) equals processor volume in cubic meters × 0.2

Mass: Mass of the processor, in tonnes, equals volume × 2

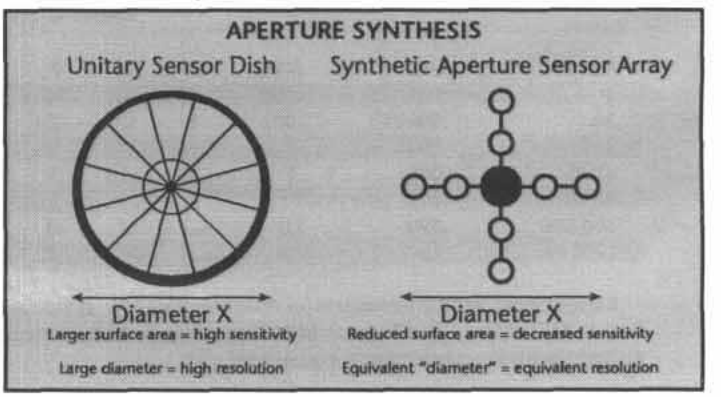
MCr: Price of the processor, in MCr, equals volume × 1

Antenna: Antenna area (in square meters) equals volume times the tech level modifier shown in the following table:

TL	*Modifier*
5	10
6	6
7	4
8	1
9+	0.5

Antenna Volume (cubic meters): Antenna area × 0.1

Antenna Mass (in metric tonnes): Antenna area × 0.1





Active EMS

Active EMS incorporates a variety of active emitters and passive detectors covering most of the electromagnetic spectrum (EMS), making it a much more sophisticated version of radar.

	Volume (kl) by Tech Level						
Short Range	*10*	*11*	*12*	*14*	*16*	*18*	*20*
3 km	0.2	0.1	0.1	0.1	0.1	0.1	0.1
30 km	1.0	0.8	0.6	0.5	0.4	0.3	0.2
300 km	3.0	1.6	1.0	0.8	0.6	0.4	0.3
3000 km	7.0	3.0	1.6	1.0	0.8	0.6	0.4
30,000 km	10	5.0	2.2	1.2	1.0	0.8	0.5
60,000 km	13	6.0	2.5	1.4	1.2	0.9	0.6
120,000 km	16	8.0	3.3	1.8	1.4	1.1	0.7
180,000 km	19	10	4.0	2.2	1.6	1.2	0.8
240,000 km	23	11	4.8	2.6	1.8	1.4	0.9
300,000 km	26	12	5.5	3.0	2.0	1.5	1.0
360,000 km	31	15	7.0	3.4	2.2	1.7	1.1
420,000 km	36	17	8.5	4.2	2.4	1.8	1.2
480,000 km	42	20	10	5.0	2.6	1.9	1.3

Volume: Volume in cubic meters (kiloliters) as shown.
Power (MW): Volume × 5
Price (MCr): Volume × 2
Mass (tonnes): Volume × 2
Antenna (square meters): Volume × 2. Antenna volume, mass, and price are subsumed in the total sensor package above.

Ladar

Ladar is a tight beam active sensor that bounces laser light off of the target and detects the reflection. As the laser can scan a very small area, it is used exclusively to lock onto a target after some other search sensor has detected it.

	Volume (kl) by TL							
Range	*8*	*9*	*11*	*13*	*15*	*16*	*18*	*20*
3	0.1	0.01	0.005	0.001	—	—	—	—
30	0.4	0.04	0.02	0.004	—	—	—	—
300	0.8	0.08	0.04	0.008	0.002	—	—	—
3000	2.0	0.2	0.1	0.02	0.005	0.002	—	—
30,000	5.0	0.5	0.2	0.04	0.01	0.004	0.002	—
60,000	—	1.0	0.5	0.1	0.025	0.01	0.004	0.002
120,000	—	2.4	1.2	0.24	0.06	0.02	0.005	0.003
180,000	—	—	2.5	0.5	0.12	0.05	0.01	0.005
240,000	—	—	—	1.2	0.25	0.1	0.025	0.006
300,000	—	—	—	2.5	0.6	0.2	0.04	0.01

Range: Short range in kilometers
Power Requirement (MW): Volume in cubic meters
Mass (metric tonnes): Volume × 2
Price (MCr): Volume × 10
Antenna Area (square meters): Volume × 1. Antenna weight, price, and volume are subsumed in the above figures.

Densitometer (Grav Shielded)

Densitometers are survey instruments which allow determination of celestial object mass and mapping of mineral deposits and gravitic anomalies.

TL	*MW*	*Vol*	*Mass*	*MCr*
11	2.5	30	10	0.75
12	1	15	5	0.9
13	0.9	12	3	0.95
14	0.5	9	2	1
15	0.4	7	1.5	1.5
16	0.3	4	1	1.5
18	0.2	2	0.8	1.5
20	0.1	1	0.7	1.5

MW: Power requirement in megawatts.
Vol: Volume in cubic meters.
Mass: Mass in tonnes.
MCr: Price in millions of credits.
Antenna Area (square meters): MW × 100.

Neutrino Sensor

Neutrino sensors are useful when surveying a star system. They enable a ship to measure the intensity of fusion taking place within a star as well as determine if any of the gas giants are failed stars.

TL	*Vol*	*MCr*
10	100	1
12	10	2
14	5	3
16	2	4
18	1	5

Vol: Volume in cubic meters.
MCr: Price in millions of credits.
MW: All neutrino sensors require 0.01 MW of power for operation.
Mass: All neutrino sensors have a mass in tonnes equal to their volume.
Neutrino sensors have no antennae.

Neural Activity Sensor

Neural activity sensors detect and classify life forms according to their level of brain activity.

TL	*Range*	*MW*	*Vol*	*Mass*	*MCr*
13	0.005	0.004	0.002	0.005	0.02
14	0.025	0.005	0.002	0.005	0.02
15	0.05	0.006	0.002	0.005	0.02
16	0.5	0.007	0.002	0.005	0.02
18	5	0.009	0.002	0.004	0.025
20	50	0.01	0.002	0.003	0.03

Range: Short range in kilometers.
MW: Power requirement in megawatts.
Vol: Volume in cubic meters.
Mass: Mass in tonnes.
MCr: Price in millions of credits.
Antenna Area (square meters) = MW × 100.



High-Resolution Thermal (HRT)

HRT sensors are sophisticated visual sensors sensitive to infrared radiation.

			Volume by Tech Level		
Range	*AD*	*AA*	*7*	*8*	*9*
0.3	0.25	0.05	0.006	0.003	0.001
3	.0.5	0.2	0.06	0.03	0.01
30	.1	1	0.3	0.15	0.05
300	2.25	4	0.6	0.3	0.1
3000	3.5	10	1.5	0.6	0.3
30,000	5	20	—	1.5	0.6
60,000	10	80	—	3	1.5
90,000	20	300	—	5	2.5
120,000	40	1200	—	6	3
150,000	90	6000	—	7	3.5
180,000	200	30,000	—	8	4
210,000	400	125,000	—	9	4.5
240,000	800	500,000	—	10	5

Range: Short range (in kilometers)

AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.

AA: Surface area of the antenna is square meters. At tech level 9, multiply antenna area by 0.5.

Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.

Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.

MW: Power requirement, in megawatts, is equal to the processor volume × 0.1.

Processor Price: The processor price, in millions of credits, is equal to the processor volume × 1.

Antenna Price: The antenna price, in millions of credits, is equal to the antenna volume × 1.

Processor Mass: The mass of the processor, in tonnes, is equal to the processor volume × 2.

Antenna Mass: The mass of the antenna, in tonnes, is equal to the antenna volume × 1.

Visible and Infrared Light Sensors

These sensors use visible or infrared light to detect an object, either relying on background light (passive) or illuminating it with a beam of light (active). Due to the short range of these sensors, they are usually used on vehicles rather than spacecraft. (AIR = active infrared; PIR = passive infrared; LA = light amplification; IE = image enhancement; WSV = wide-spectrum visual)

SENSORS

TL	*Description*	*MW*	*Vol*	*Mass*	*MCr*	*Range*
4	Headlight	.0001	.002	.001	.00005	.03
4	Searchlight	.001	.01	.01	.00010	.25
5	AIR Searchlight	.001	.01	.01	.00200	.12
6	AIR Scope	.0001	.001	.001	.00100	.06
6	PIR Viewer	.0001	.001	.001	.00100	.03
7	AIR Goggles	.0001	—	.0001	.00030	.06
7	LA Scope	.001	.001	.005	.00500	.06
8	PIR Goggles	.0001	—	.0001	.00050	.06
8	LA Scope	.0005	.001	.001	.00100	.12
8	IE Viewer	.001	.001	.005	.00300	.25
9	IE Scope	.0005	.001	.001	.00100	.25
9	Imaging Radar	.003	.01	.02	.02000	.3
10	WSV Viewer	.003	.01	.02	.02000	.5
11	WSV Scope	.001	.001	.005	.01000	.5
12	WSV Goggles	.0001	—	.0001	.00500	.3

Volume in cubic meters, Mass in tonnes, Range indicates short range in kilometers. Asset is Observation for goggles, scopes, and head/searchlight, Sensors for viewers and radar.

Passive EMS

Passive EMS uses large antenna arrays to detect any electromagnetic emanations from a potential target, such as heat or radio waves, or naturally reflected light waves. It is an extremely sophisticated and precise sensor.

			Volume by Tech Level						
Range	*AD*	*AA*	*10*	*11*	*12*	*14*	*16*	*18*	*20*
3	.25	.02	.03	.02	.01	.005	.003	.002	.001
30	.5	.08	.1	.08	.04	.02	.01	.005	.002
300	1	.4	.2	.1	.08	.04	.02	.01	.005
3,000	2.25	1.6	.3	.2	.1	.08	.04	.02	.01
30,000	3.5	4	.6	.4	.3	.2	.1	.08	.04
60,000	5	8	1.5	1	.6	.4	.3	.2	.1
90,000	10	32	2	1.5	1	.6	.4	.3	.2
120,000	20	120	2.5	2	1.5	1	.6	.4	.3
150,000	40	480	3	2.5	2	1.5	1	.6	.4
180,000	90	2400	3.5	3	2.5	2	1.5	1	.6
210,000	200	12,000	4	3.5	3	2.5	2	1.5	1
240,000	400	50,000	4.5	4	3.5	3	2.5	2	1.5

Range: Short range (in kilometers).

Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.

AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.

AA: Base surface area of the antenna in square meters. The actual surface area of the antenna is this value multiplied by a tech level modifier, as shown below:

TL	*Modifier*
10	1
11	0.5
12	0.25
13	0.125
14	0.075
15	0.025
16+	0.01

Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.

MW: Power requirement, in MW, is equal to the processor volume × 0.1.

Processor Price: The processor price, in millions of credits, is equal to the processor volume × 2.

Antenna Price: The antenna price, in millions of credits, is equal to the antenna volume × 1.

Processor Mass: The mass of the processor, in tonnes, is equal to the processor volume × 2.

Antenna Mass: The mass of the antenna, in tonnes, is equal to the antenna volume × 1.



C. ELECTRONIC COUNTERMEASURES (ECM)

Also known as electronic warfare (EW) equipment, ECM is designed to combat enemy sensors and communicators by either disrupting their operation or locating them with an eye toward their destruction.

Radio, Radar, and EMS Jammers

Radio, radar, and EMS jammers have the same characteristics as radios, radars, and active EMS sensors, with three exceptions.

1. Power use and price are multiplied by 2.
2. Antenna size for the radar jammer is divided by 10.
3. Jammers may not be used as sensors or communicators, only for jamming.

Radio jammers may only be used to jam radios; radar jammers may be used to jam radar or active EMS; and EMS jammers may be used to jam radios, radars, or active EMS.

Area Jammers

Area jammers degrade the effectiveness of sensors and communicators that attempt to function in their area of effect. The principal design decision, therefore, is the area of effect of the jammer, all other values being derived from that. The area of effect is defined as the radius of effect in kilometers. (Note that space-based area jammers routinely have an effect radius of 45,000 kilometers.)

TL	*MW*	*Vol*
10	.002	.32
11	.001	.30
12	.00045	.40
14	.00036	.375
16	.00027	.42
18	.00018	.375
20	.00009	.40

TL: Tech level of first availability.

MW: Power requirement, in megawatts, per kilometer of effect radius.

Vol: Volume, in cubic meters, per megawatt of power.

Mass: The mass of an area jammer, in tonnes, is equal to its volume in cubic meters.

Price: The price of an area jammer, in millions of credits, is equal to its volume in cubic meters multiplied by 2.

Sensor Decoys

These require no power and instead are dispensors for decoy material, consisting of flares intended to duplicate the heat signature of the craft, metallic strips, sometimes self-inflating, which mimic the reflected signature of the craft, or anti-laser aerosols to disperse the laser light and prevent it from providing a precise reflection.

Decoys work on ladar (anti-laser aerosols), active radar or EMS (metallic chaff), or passive infrared such as HRT or passive EMS (heat flares). Designers may include different types of decoys on a craft, but each type only works on the specified sensor. A decoy increases the difficulty of a target lock by 1 if of an equal tech level with respect to the sensor and increases it by 2 if from a higher tech level.

The required size of a decoy is 0.002 cubic meters for Sub-Micro size craft. This increases by 0.001 cubic meters per increase in target size, so that a Very Small target requires 0.004 cubic meters per decoy.

All decoys mass 0.5 metric tonnes per cubic meter and cost MCr5 per m^3.

Decoys are usually carried in internal automatic dispensers, but aircraft may also carry them using the electronic pods rule at the beginning of this chapter (page 49). They are dispensed one at a time, but a dispenser may launch one decoy per second. More than one decoy does not further decrease the chance of sensor locks.

When used with planetary combat, each decoy lasts one combat turn, and affects all sensor attempts against the owning vehicle, regardless of direction.

When used with **Brilliant Lances**, decoys are "popped" at the end of the Movement Phase, after all movement has been completed. In order to cover the ship as it moves throughout the turn, one decoy must be popped per G-turn expended that turn (0 G-turns expended still requires one decoy) for maneuver, and two per G-turn spent for evasion. This full amount constitutes one "salvo." Each decoy salvo only affects sensors coming in through a single hexside (this includes sensor attempts which are traced across either adjoining hex vertex), but affects all sensor scans made from that direction for the entire turn. Thus, a ship which expended 4 G-turns for maneuver must pop 4 decoys to get protection across one hexside for a turn, 24 decoys to get 360° protection for that turn, or 48 decoys for 360° coverage if it spent 4 G-turns on evasion.

Decoy dispensers are hit by surface hits. They have a surface area of 1 m^2 and have their hit capacities calculated on their loaded mass. Dispenser volume is equal to 2 times the volume of the decoys it holds, mass is 1 tonne per cubic meter, and cost is MCr0.001 per cubic meter.

Radio, Radar, and EMS Direction Finder

Direction-finding can be added as an option to any radar or active EMS array. (Passive EMS arrays already incorporate radio and radar DF capabilities.) Price is multiplied by 2 for radar, and by 1.5 for the EMS array. Stand-alone direction finders are also available beginning at TL 6. These have the same mass, volume, and antenna size of a radio of the same tech level, but the price is doubled, and the power requirement in MW is equal to the volume at all ranges and tech levels. All direction finders work equally well versus radio, radar, or EMS emissions.

Stealth

Stealth design minimizes a craft's electromagnetic emissions in the most common bands (radio and IR), and uses electromagnetic absorbent material (EMAM) on the hull surface, thus making detection by active and passive sensors (radar and HRT) more difficult.

Stealth design increases the difficulty of an HRT or radar lock on it by one difficulty level (two if from a higher tech level than the sensor), but has no effect on other types of sensors.

Stealth aircraft may not have turrets, hardpoints, or any other feature which produces a drag point. Hypersonic airframes may not incorporate stealth design.

Stealth design is available at TL 8 and higher. The following values are per displacement ton (14 cubic meters) of hull. When applying stealth to aircraft, multiply aircraft mass by 5 to determine effective displacement for purposes of EMM. (Note that this is *not* the same displacement used to calculate the storage volume of the craft.)

Volume (m^3)	*Mass (tonnes)*	*Price (MCr)*
0.5	0.1	0.05

Electromagnetic Masking (EMM)

Electromagnetic masking is an advanced form of stealth design, and includes radiators to dissipate immense IR signatures as well as more advanced electromagnetic absorbing material. EMM packages may not be installed in addition to stealth, but rather are used in place of it. EMM effects are +2 Diff Mods vs. HRT or radar, and +1 Diff Mods vs. passive or active EMS sensors.

Unlike stealth design, EMM may be used on hypersonic airframes, and aircraft may carry hardpoint ordnance or other drag-producing features. However, EMM's effect on detection difficulty is reduced by one level if a hypersonic airframe is used, by one level if any drag-producing features are incorporated in the design, and thus is reduced by two levels if both effects are present. (Note, however, that an aircraft whose only drag-producing feature was hardpoint stores could gain back its +1 modifier by dropping its stores.)

EMM packages are available at TL 10 and higher. The following values are per displacement ton (14 cubic meters) of hull. When applying EMM to aircraft, multiply aircraft mass by 5 to determine effective displacement for purposes of EMM. (Note that this is *not* the same displacement used to calculate the storage volume of the craft.)

Power (MW)	*Vol (m^3)*	*Mass (tonnes)*	*Rad*	*Price (MCr)*
0.014	0.28	0.14	0.14	0.07

Rad: Hull area used by IR radiators (in square meters).



D. ALTERNATE TECHNOLOGY

The following electronic devices rely on FTL drive technologies other than the J-space rationale of the Imperial Space campaign.

Subspace Radio

Subspace is explained in the alternate technology section of the FTL Drive chapter (Section 3). Since subspace consists of a resisting medium, it is possible to propagate waves through it and thus achieve FTL communication. Waves travel through the subspace medium at a constant velocity of 1 (N-space) parsec per hour, which imposes a time lag on subspace radio communication.

Subspace radios consist of separate transmitters and receivers. While transmitters are often quite bulky and their power requirements are based on their range, receivers are comparatively simple and can pick up a signal at any range (provided it is from a transmitter capable of sending at that range).

SUBSPACE TRANSMITTER

			Volume at Tech Level							
Range	*MCr*	*MW*	*9*	*10*	*11*	*12*	*14*	*16*	*18*	*20+*
1	0.075	1	5	1	.1	.01	.01	.01	.001	.001
2	0.25	2	10	5	1	.1	.01	.01	.01	.001
3	0.5	3	15	10	5	1	.1	.01	.01	.01
4	1	4	30	15	10	5	1	.1	.01	.01
5	3	5	70	30	15	10	5	1	.1	.01
10	9	10	—	70	30	15	10	5	1	.1
20	15	20	—	—	70	30	15	10	5	5

Range: Short range in parsecs.
Volume: Cubic meters (kiloliters).
MCr: Price in MCr.
MW: Power requirement, in megawatts.
Mass: Mass, in tonnes, equals volume × 2.
Antenna: Antenna area, in square meters, equals volume in cubic meters × 10.

SUBSPACE RECEIVER

TL	*Volume*
9	2
10	1.5
11	1
12	0.8
13	0.6
14	0.4
15	0.2
16	0.1
17	0.05
18	0.01
19	0.005
20+	0.001

TL: Tech level of availability.
Volume: Cubic meters (kiloliters), including antenna.
Price: Price for a subspace receiver is MCr0.05 at tech level 9 and MCr0.01 at all higher tech levels.
MW: Power requirement is 0.001 megawatts at all tech levels.
Mass: Mass, in tonnes, equals volume in cubic meters.

Subspace Active Sensor (SAS)

Just as waves propagated through subspace can be used to communicate, wave echoes can be used to detect objects in subspace in the same manner as radar or sonar. An active subspace sensor array requires a processor unit and an antenna.

	Processor Volume by Tech Level								
Range	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*18+*
0.01	10	5	2	1	.5	.4	.3	.2	.1
0.02	30	10	4	2	1	.5	.4	.3	.2
0.03	300	100	40	20	10	4	2	1	.5
0.04	—	—	200	30	15	8	4	2	1
0.05	—	—	—	40	20	15	8	4	2
0.06	—	—	—	50	30	20	15	8	4

Range: Short range in parsecs.
Volume: Volume in cubic meters (kiloliters) as shown.
MW: Power requirement (in megawatts) equals processor volume in cubic meters × 0.2.
Mass: Mass of the processor, in tonnes, equals volume × 2.
MCr: Price of the processor, in MCr, equals volume × 1
Antenna: Antenna area (in square meters) equals volume times the tech level modifier shown below:

TL	*Modifier*
9	8
10	6
11	4
12	2
14	1
16+	0.5

Antenna Volume (cubic meters): Antenna area × 0.1
Antenna Mass (in tonnes): Antenna area × 0.1
Antenna Price (MCr): Antenna area × 0.05



Passive Subspace Sensor (PASS)

Subspace radio and active sensor waves may be detected by passive sensors, as may the subspace *"wake" of a starship.* PASS arrays do not require a great deal of power, but do require extremely sensitive antennae and sophisticated processor units.

PASS arrays can locate the sources of subspace radio or active sensors emissions well enough to provide target solutions, and so are useful combat sensors. Subspace wake sensing cannot detect the approach of a vessel, and so is not useful in combat. Instead the wake-sensing capability of PASS arrays is used as a means of tracking ships through subspace.

PASS arrays consist of a processor and an antenna.

PASS Processor Volume by Tech Level

Range	*AD*	*AA*	*9*	*10*	*12*	*14*	*16*	*18*	*20+*
0.01	0.5	0.08	1	0.8	0.4	0.2	0.1	0.06	0.04
0.02	1	0.4	2	1	0.8	0.4	0.2	0.1	0.06
0.03	2.25	1.6	3	2	1	0.8	0.4	0.2	0.1
0.04	3.5	4	6	4	3	2	1	0.8	0.4
0.05	5	8	15	10	6	4	3	2	1
0.06	10	32	20	15	10	6	4	3	2
0.07	20	120	25	20	15	10	6	4	3
0.08	40	480	30	25	20	15	10	6	4
0.1	90	2400	35	30	25	20	15	10	6
0.2	200	12,000	40	35	30	25	20	15	10
0.4	400	50,000	45	40	35	30	25	20	15

Range: Short range (in parsecs).

Processor Volume: The volume of the processor in cubic meters (kiloliters) as shown on the table.

AD: Antenna diameter, in meters. If the antenna diameter is greater than the hull length (unmodified by configuration), the antenna must be a folding array.

AA: Base surface area of the antenna in square meters. The actual surface area of the antenna is this value multiplied by a tech level modifier, as shown below:

TL	*Modifier*
9	1
10	0.5
12	0.25
14	0.125
16	0.075
18	0.025
20+	0.01

Antenna Volume: The volume of the antenna in cubic meters (kiloliters) is equal to the antenna area × 0.05 for a fixed array or × 0.1 for a folding array.

MW: Power requirement, in MW, is equal to the processor volume × 0.1.

Processor Price: The processor price, in millions of credits, is equal to the processor volume × 2.

Antenna Price: The antenna price, in millions of credits, is equal to the antenna volume × 1.

Processor Mass: *The mass of the processor, in metric* tonnes, is equal to the processor volume × 2.

Antenna Mass: The mass of the antenna, in metric tonnes, is equal to the antenna volume × 1.

Subspace Direction Finders

Direction-finding can be added as an option to any subspace active sensor (SAS) array. (PASS arrays already incorporate DF capabilities.) Price is multiplied by 1.5 for the SAS array.

Stand-alone direction finders are also available beginning at TL 10. These have the same mass and volume of a subspace radio receiver of the same tech level, but the price is doubled, and the power requirement in MW is equal to 0.01 for all versions. All direction finders work equally well versus subspace radio and SAS emissions.

Subspace Jammers

Subspace radio and subspace sensor jammers have the same characteristics as subspace radios and SAS arrays, with three exceptions.

1. Power use and price are multiplied by 2.
2. Antenna size for the sensor jammer is divided by 10.
3. Jammers may not be used as sensors or communicators, only for jamming.

Radio jammers may only be used to jam radios; sensor jammers may be used to jam SAS and PASS arrays.

Tachyons

Tachyons are conceptual particles which travel faster than the speed of light. The term "conceptual" is used advisedly. Tachyons were conceived of, not discovered, as an interesting thought exercise in theoretical physics. What would the properties be, it was queried, of a particle which existed only while travelling faster than light?

Although there is no evidence that such a particle could actually exist (and overwhelming evidence that it does not), it has nevertheless found its way into science-fiction literature, and the same thought exercise leads authors to ask, "what if?" Nevertheless, tachyons should be approached with extreme caution if a hard science game is being played. They, like the Dean Drive (see the Lifters chapter, Section 10) are more at home with science fantasy than science fiction.

Tachyons allow FTL radio and active sensors, generally called "T-band" electronics. The same tables are used as for subspace radio, SAS arrays, ECM, and jammers, but the T-band waves move through N-space, not subspace.

Note that T-band communicators and sensors, alone among the alternate electronics technologies, do not have an associated FTL drive.



CHAPTER 6
Defensive Systems

Defensive systems refer to advanced technology methods of defeating attacks, methods which go beyond simply making armor thicker and harder.

EXPLOSIVE REACTIVE ARMOR (ERA)

Reactive armor is available at tech level 7 and beyond, and is a cheap alternative to composite and composite laminate armor. Reactive armor consists of a series of blocks of explosive material sandwiched between two metal plates. When a hollow charge (HEAP) warhead penetrates the outer metallic plate and contacts the explosive block behind it, the explosive detonates and blows the front metallic plate away from the vehicle. As the blocks are placed at an angle off of vertical, the plate blows off at an angle as well, removing part of the penetrator stream from the HEAP round. (See the Munitions chapter, beginning on page 135, for a discussion of how HEAP rounds penetrate armor.) This reduces the penetration of the HEAP penetrator jet considerably.

However, reactive armor has no effect on conventional solid penetrators, as the force of the explosion is insufficient to break up the penetrator rod, and so does not reduce either the mass or the velocity of the penetrator. Likewise, reactive armor has no effect on lasers, particle accelerators, or meson guns, but does affect plasma and fusion guns in the same way as it affects HEAP rounds.

Detonation: If the explosive reactive armor (ERA) array of a vehicle is hit by any round with a penetration of 10 or greater, the array detonates. From then on, one-twentieth of the ERA on that vehicle face is missing (having been exploded). Each time a round hits that vehicle side after that, roll 1D20. If the number rolled is equal to or less than the number of times the armor has detonated on that face, the round hits bare armor; if it is greater than that number, the round hits an intact part of the ERA.

For example, a tank is hit in the front by a round capable of detonating its ERA, and so one-twentieth of its ERA detonates. A second round hits and the player owning the vehicle rolls a D20. If a 1 is rolled, the round hits bare armor, but a 7 is rolled, and so the round hits intact ERA and detonates another section. When the next round hits the front of the tank it will hit bare armor on a roll of 2 or less.

Armor Value: ERA never adds its AV unless it detonates, and it never adds its AV against anything other than a HEAP round or a plasma or fusion bolt. If the round is HEAP or a plasma or fusion bolt and the array detonates, the array adds its AV to that of the AV of the structural armor of the vehicle.

Multiple Detonations: Whenever an ERA block explodes there is a chance that there will be a chain reaction of additional multiple detonations. Each type of ERA has a detonation number listed on the chart below. Whenever an ERA detonates, roll 1D20. If the roll is equal to or less than the detonation number of the armor, there is a multiple detonation. If there is a multiple detonation, roll the D20 again and that number rolled is the number of additional hit locations cleared of armor.

For example, a tank with improved ERA (detonation number of 3) is hit for the first time by a plasma bolt on a face protected by ERA. The ERA detonates and adds its armor to the base armor for purposes of stopping penetration by the plasma bolt. However, the owner of the tank rolls a 2 for multiple detonations, and since this is less than the detonation number of 3, there is a chain reaction multiple detonation. The player rolls a D20 again and this time rolls a 12. Twelve additional hit locations are stripped of ERA by the blast, which means that the next time that face is hit by a round, it will hit bare armor on a roll of 13 or less and ERA on a roll of 14 or higher.

Multiple Layers: Up to three layers of ERA may be added to the outside of a vehicle, but each layer after the first adds only half of its AV to the vehicle. The multiple detonation value of the ERA is sum of the detonation values of all the layers.

For example, a vehicle with three layers of Improved ERA would have an AV of (16+8+8=) 32 in addition to its normal armor value, and would have a multiple detonation number of (3+3+3=) 9.

Volume: ERA is seldom applied to the entire surface of a vehicle, and instead is usually applies to only one or two faces. First decide which faces of the vehicle will be covered. Next determine the volume of adding 1 additional centimeter of armor on that face (from the Ground or Lift Vehicle Design chapters). The volume of a single layer of ERA in cubic meters is equal to the volume of 1 additional centimeter of armor on that vehicle face multiplied by 20.

Mass: ERA masses 4 tonnes per cubic meter of volume.

Price: The price of ERA, in millions of credits, is equal to the volume of the array in cubic meters multiplied by 0.007.

Replacement Blocks: ERA is usually custom-designed for each vehicle to fit the vehicle's unique configuration. Replacement blocks may be purchased, but are unique to each vehicle, and in fact each face of each vehicle. Each replacement block has volume, mass, and price equal to that of one complete layer for that face divided by 20, and can replace one layer from a single detonation on that face. Twenty replacement blocks are required to replace one full layer on that face after a complete detonation.

EXPLOSIVE REACTIVE ARMOR

TL	*Description*	*Det*	*AV*
7	Basic ERA	5	12
8	Improved ERA	3	16
9	Advanced ERA	1	20

TL: Tech level of first availability.
Det: Detonation number (per layer) of the ERA.
AV: Armor value added by the ERA when it detonates.

DAMPERS, SCREENS, AND THE STRONG AND WEAK FORCES

In ancient times, people often explained the physical world in terms of four universal elements: earth, air, fire, and water. Our modern understanding of physics revolves around four universal forces: electromagnetism, gravity, the strong, or nuclear, force, and the weak force (although it would now appear that the electromagnetic and weak forces are merely manifestations of the *electroweak* force, and that there is a *color* force underlying the strong—but **Traveller**'s mandate does not take us that far). The strong force is the force that holds the sub-atomic particles (protons and neutrons) of the atom's nucleus together, and the weak force is related to the decay of subatomic particles.



Manipulation of electromagnetism became possible at tech level 3, but control and manipulation of the other forces has proven more difficult to master. Much of the advances in technology postulated in **Traveller** result from an ability to manipulate the strong and weak forces, and this ability is most directly used in the design of nuclear dampers and meson screens.

Nuclear Dampers

The creation of nuclear dampers is allowed by the understanding and manipulation of the strong and weak forces which control the stability of atomic nuclei. Nuclear damper units create interference fields in these forces, resulting in strong positive and negative nodes where the wave patterns intersect and interact. At negative nodes the forces are reduced, and at positive nodes they are reinforced. By selectively projecting these nodes onto a material, the atomic nuclei can be made more or less stable, depending upon the needs of the user. For example, by projecting a strong force negative node, the nucleons (particles of the nucleus: protons and neutrons) are held together less powerfully, allowing nucleons to escape (at early tech levels this use is imprecise, creating random transmutations, at higher tech levels it allows more reliable transmutation, albeit very expensively) at low energy levels. On the other hand, nodes can be projected that "freeze" a radioactive nucleus by preventing its decay and eliminating dangerous radiation.

The latter effect allows the manufacture of damper boxes that permit the transport of radioactive material without the need for heavy shielding.

Nuclear damper screens are created by projecting these fields at a distance to inhibit the function of nuclear warheads. By sufficiently strengthening the strong force with a positive node, a nuclear damper can prevent fission chain reactions from beginning by eliminating the spontaneous fission in a supercritical mass that begins the chain reaction. The projection of negative nodes, causing the shed of nucleons, can be dangerous at early tech levels, as the release of low-energy neutrons initiates the fission of common nuclear warhead materials. However, at higher tech levels, the effect can cause large numbers of nuclei to dissociate so rapidly into non-fissile elements that there are insufficient nuclei to maintain a chain reaction. This is fortunate because it is also this effect of the screen that is necessary to inhibit fusion warheads. While early dampers inhibit fusion warheads by disabling their fission triggers, pure fusion can only be prevented by reducing the strong force that permits the fusion to occur.

Nuclear Damper Screens: Unlike most weapons, damper screens only have a single range. Targets within that range may be attacked and targets outside of that range may not. All attacks by nuclear dampers are Difficult tests for success, a successful attack rendering the warhead inert.

When designing a nuclear damper, the designer specifies the range of the weapon in kilometers. All other values are derived from the Nuclear Damper Design table below. Space-based nuclear dampers must have a range of 30,000 kilometers in order to successfully intercept in-coming missiles.

Nuclear dampers require a beam pointer with a short range equal to the damper's absolute range. They also require a normal workstation for local control (or they may be controlled by an MFD which may control a number of dampers equal to its Diff Mod rating—this rating only allows the MFD to control multiple dampers, but does not allow it to apply its Diff Mod negations to damper tasks). Dampers may also be fitted with sensors which allow them to make their own target locks if the vehicle's main sensors are knocked out.

Nuclear Damper Design

TL	*MW*	*Vol*	*MCr*
12	.00050	5	0.13
13	.00030	8	0.3
14	.00020	10	0.67
15	.00010	11	1.5
16	.00008	13	2
18	.00006	16	4
20	.00003	18	6

TL: Tech level of construction.

MW: Power, in megawatts, equals the range in kilometers multiplied by the value shown on the table.

Vol: The volume of the damper, in cubic meters, is equal to its power in megawatts multiplied by the value on the table.

MCr: The price of the damper, in millions of credits, is equal to the power in megawatts multiplied by the value on the table.

Mass: The mass of the damper, in metric tonnes, is equal to its volume in cubic meters.

Antenna Area: The antenna area of the damper, in square meters, is equal to its volume multiplied by 0.1.

Nuclear Damper Boxes: Nuclear damper boxes are used to transport radioactive materials safely. Damper boxes are available at tech levels 11 and higher. Damper box design depends on the capacity of the box, which is expressed in tonnes of fissionable material. All other values are derived from the capacity of the box, as indicated below.

Mass: The mass of the box, in metric tonnes, is equal to its capacity multiplied by 0.3.

Volume: The volume of the box is equal to its capacity multiplied by 1.2.

Price: The price of the box, in millions of credits, is equal to its capacity multiplied by 0.33 unless the capacity of the box is 1 tonne or greater, in which case the price is equal to the sum of 0.9 plus the product of the capacity of the box multiplied by 0.03. (MCr = 0.9 + [0.03×Cap])

Power: The power requirement of the box, in megawatts, is equal to its capacity in tonnes multiplied by 0.001.

Meson Screens

A meson screen is another application of the ability to manipulate the strong force, which is transmitted by mesons. A meson screen projects an energy field surrounding the screen generator which slows and prematurely detonates high-energy mesons. The designer specifies only the power requirement (in MW) of the meson screen; all other values are derived from the power requirement, tech level, and volume of protected space.

Vol: The meson screen generator's volume, in cubic meters equals MW × 20.

Mass: The meson screen generator's mass, in metric tonnes, equals Vol × 0.75.

AA: The meson screen generator's antenna area, in square meters, equals MW × 10.

MCr: The meson screen generator's price, in millions of credits, equals Vol × 0.1.



Performance: The meson screen generates a Protection Value for the target which is used against incoming meson guns. The Protection Value is derived by the following formula:

$$PV = TLM \times \sqrt{MW+TSM}$$

PV= Protection value
TLM = Tech level multiplier
TSM = Target size modifier

Tech Level Modifiers

TL	TLM
12	50
13	60
14	70
15	80
16	90
17	100
18	105
19	110
20	115
21	120

Target Size Modifiers

Size	TSM
Small or less	1
Medium	2
Large	4
Very Large	8
Gigantic	16

Each meson screen requires crew equal to the mass of the screen (in tonnes + 100, times the computer control multiplier (round to the nearest whole number, but must be at least 1). Each crewmember requires one normal workstation installed as part of the screen installation.

SANDCASTERS

All sandcaster turrets fit in the standard turret hardpoint socket. Each turret weighs 50 tonnes and requires 1MW of continuous power while in operation.

The table below lists the price of the turret in megacredits, the number of sand cannisters carried in the turret, and the beam reduction made per successful beam interception. Additional sand cannisters may be stored in cargo, but it takes one hour to resupply a turret. Individual sand cannisters have a volume of 0.5m³, mass 0.5 tonnes, and have a cost in credits as indicated on the table.

TL	MCr	Cannisters Carried	Beam Reduction	Cann Cr
8	0.6	16	1D6×5	400
9	0.65	18	1D6×5	400
10	0.7	20	1D10×5	600
11	0.75	24	1D10×5	600
12	0.8	30	1D10×5	600
13	0.85	35	2D6×5	800
14	0.9	40	2D6×5	800
15-16	1	50	2D10×5	1000
17-18	1.2	54	2D20×5	1500
19-20	1.4	58	2D20×5	1500
21	1.6	62	3D20×5	2000

Sandcasters fire cannisters of ablative crystals, commonly called "sand." Each sandcaster also contains a generator which creates a field used to manipulate the location and shape of the cloud of crystals. At early tech levels, these fields are electromagnetic, and require magnetic sand. More advanced systems supplement, then supplant, the magnetic manipulation with gravitic manipulation, which allows the use of more effective nonmagnetic crystals.

These clouds are placed in the path of incoming beam weapons, and the beams expend their energy burning through the cloud. The sandcaster operator uses integral laser warning sensors to detect fire control locks and anticipate incoming beam fire. Each successful sandcaster hit reduces the beam by the indicated amount, and requires that another cannister be expended to replace the burned sand.

ELECTROSTATIC ARMOR (ESA)

Electrostatic armor is, until the development of the meson screen, the closest realistic analog to the classic "force field" of science fiction. The protected target (usually a vehicle or aircraft) is surrounded by a low-power static field linked to a fully charged high-energy capacitor. When an object enters the field (and provided it falls within fairly narrowly defined parameters for mass and velocity) the capacitor discharges its energy which vaporizes the foreign object.

The massive power discharge is triggered by entry of detectable mass in the field, and so it has no effect on lasers and no significant effect on particle accelerator weapon systems (PAWS). It was originally designed as a counter to hyper-velocity tank rounds, but it is difficult to generate sufficient power to completely vaporize the dense penetrators of most large-caliber CPR guns and mass drivers. As a result, electrostatic armor is usually used as an adjunct to, rather than a replacement for, a conventional armored envelope. Due to the low mass of the penetrator stream of a HEAP round or a plasma bolt, however, electrostatic armor is extremely effective against HEAP rounds and both plasma and fusion guns.

ESA systems will have an armor value which is usually added to the base armor value of the protected target. The full AV is added versus HE, HEAP, plasma bolt, and fusion bolt attacks. Half the AV is added versus KEAP attacks. No AV is added versus laser and PAWS attacks.

ESA Design: The ESA system itself consists of a field generator and a homopolar generator. The designer specifies the discharge power, in megajoules, of the field generator. All other values are derived from the field generator's discharge power. The homopolar generator must have a discharge capacity equal to the discharge power of the field generator.

Field Generator

TL	Vol	MCr	AV
9	0.4	1	4
10	0.3	0.8	5
11	0.2	0.6	5.5
12	0.15	0.5	6
14	0.1	0.4	7
16	0.075	0.3	8
18	0.05	0.25	9
20	0.025	0.2	10

TL: Tech level of construction.

Vol: The volume of the field generator, in m³, is equal to its discharge power in megajoules multiplied by the value shown on the table.

MCr: The price of the field generator, in MCr, is equal to its discharge power in megajoules multiplied by the value shown on the table.

AV: The armor value of the system is equal to the discharge power (in megajoules) multiplied by the value shown on the table, multiplied by the target size AV multiplier (see table below). This value is used versus HEAP rounds and both plasma and fusion guns. Half this value is used against KEAP rounds.



Target Size AV Multiplier

Size	*Multiplier*
Small or less	1
Medium	.5
Large	.25
Very Large	.12
Gigantic	.06

Mass: Generator mass, in tonnes, is equal to volume in $m^3 \times 2$

Homopolar Generator: Direct electrical power requires the installation of a homopolar generator (HPG), see the Power Production chapter (Section 8). The HPG must be of sufficient size to store the ESA's one-shot energy output as defined immediately above. Calculate the volume of HPG needed by multiplying the ESA's discharge energy (DE) in MJ by the value on the HPG table.

Rate of Fire: Define the ESA's rate of fire (ROF). As ESAs have no effect on lasers and PAWS, they are used almost exclusively in planetary combat and so ROF is calculated on the basis of a five-second combat turn. The rate of fire is equal to the continuous power input from the power plant, in megawatts, multiplied by 5 and divided by the discharge power in megajoules. The result is the number of times per five-second combat turn that the ESA will add its value to the vehicle's basic armor.

Note that in many cases the ROF value will be less than 1. In this case, the ESA homopolar generator requires one or more turns to recharge before it can be used again. Divide 1 by the ROF result, rounding all fractional results up, to determine how many turns the homopolar generator must recharge before it can fire again.

Explosive Power Generation: Some ESA systems are not tied to a continuously running power plant, and instead rely upon explosive generation of power to recharge the homopolar generator. See the Power Production chapter (Section 8) for details of explosive power generators.

TRACTORS AND REPULSORS

Both tractors and repulsors are advanced devices based on artificial gravity technology. Tractors are large, focused artificial gravity attractors. When directed at other craft, they draw them in or restrict their agility. Repulsors are large, focused but negatively polarized artificial gravity projectors available at very high tech levels. When directed at incoming missiles or other foreign objects, they deflect them away from their target.

The performance of both tractors and repulsors is expressed in terms of tonnes of thrust per cubic meter of projector. If a tractor or repulsor operator makes a successful task roll, the power of the weapon may be applied to the target, either as acceleration toward (tractor) or away from (repulsor) the projector.

The manipulator is a combination tractor/repulsor which allows fine control over the object being targeted. Because a tractor can only pull objects toward itself, it cannot stop them once they are close aboard. A manipulator can apply tractor and repulsor thrust to an object to place it beside the projector at a relative net vector of zero. Manipulators are often installed in large, otherwise empty bays which they load with large, unwieldy cargoes, and then unload at the destination.

The table in the next column shows the tonnes of thrust generated per kiloliter (cubic meter) of tractor or repulsor projector installed.

			Tonnes per kiloliter of projector at tech level				
Type	*Price*	*Power*	*12*	*14*	*16*	*18*	*20*
Tractor	.1	.01	3	30	300	600	1500
Repulsor	.2	.02	—	—	200	400	800
Manipulator	.3	.02	—	—	200	400	800
Range Modifier			.1	.01	.001	.0001	.00001

Price: Millions of credits per cubic meter of projector.

Power: Power requirements are in megawatts per tonne of applied thrust.

Mass: Mass in tonnes of any gravitic projector is equal to its volume in cubic meters.

The system requires a workstation and a beam pointer to function. The beam pointer determines the range of the weapon for purposes of achieving a hit. However, power drops dramatically with range. Divide power by the the product of the range in kilometers multiplied by the tech level range modifier, shown on the bottom line of the table. However, any product of range times modifier less than 1 is rounded up to 1.

FORCE FIELDS

True force fields are a result of an increased ability to manipulate subatomic particles as well as a deeper understanding of the sensitivity of those to electromagnetic radiation. The earliest force fields are called black globes, due to the fact that they are effectively opaque to all forms of matter and electromagnetic energy encountering the field from both the inside and outside. Since they absorb all light, from both the inside and outside they look completely black.

The field itself is a cloud of free electrons held in place by an electromagnetic field. Free electrons are those which are not bonded to an atomic nucleus, and are therefore capable of absorbing and emitting electromagnetic energy of any wavelength. Early descriptions of black globes as "free electron lasers in reverse" are not entirely accurate, but it is true that the same characteristics of free electrons which make FELs possible are utilized in the force field.

Since early versions of the field were omnidirectional, ships with the field up were unable to sense targets, fire, or maneuver. At short range, this presented tremendous tactical problems, since the lack of maneuverability made the target solution by hostiles trivial and allowed an enemy to simply pump energy into the globe (by means of any and all directed energy weapons) until the field collapsed. The solution was to "flicker" the black globe, allowing the ship to maneuver, sense, and fire while absorbing a portion of the incoming energy of weapons. While maneuver was limited, firing by energy weapons was at full effectiveness: The pulses of the ship's energy weapons were timed to the flicker of the shield much as with the interruptor gears on primitive propeller-driven fighter aircraft. Higher tech levels allowed a more rapid flicker rate.

The next step beyond the black globe, however, was the white globe, a unidirectional force field that allowed a ship to maneuver and fire while completely shielded from enemy fire. Because the field is unidirectional, energy can pass freely out through the barrier, but this still poses difficulties for incoming communications and sensor data. As a result, white globes are tuned to allow certain narrow wavelengths of energy through. These are usually wavelengths which are not particularly useful for weaponry, particularly space-based weaponry. White globe-equipped ships thus tend to rely heavily on infrared wavelength radiation for sensors and make extensive use of masers for tight beam communication.



A critical concern in force field architecture is what to do with the energy the field absorbs. Black globe-equipped ships store it in HPG banks and in combat often shut down their power plants, substituting energy from the HPG banks to power critical ship systems. Some vessels mount additional large lasers or particle weapons which are not normally powered by the ship's power plant, and instead are fed solely by intercepted incoming energy from hostile fire.

White globes have less problem with radiating energy, as the electron globe of the field can radiate energy outward as easily as it can absorb it (which is why it glows white while in use). The energy is first cycled through the system's HPG bank, however, and is then discharged back to an unengaged part of the electron cloud for transmission outward. As a result, white globes are not limited in the total amount of energy they can absorb, but only in the volume of energy they can process in a given amount of time. This is determined by the size of the HPG banks and engineers refer to this limit as the "traffic flow ceiling."

Important Note: If an erected force field comes into contact with large quantities of matter (a vehicle of 50 displacement tons or greater, a large asteroid, planet, etc.), the generator is immediately overloaded and destroyed, and its HPG sink immediately suffers a catastrophic detonation, causing 1D20 critical hits. As the field attempts to drain all of the kinetic energy of the large mass, cooling it to absolute zero, energy is drawn from the entire mass to be drained by the globe, rapidly overloading the generator, as it cannot possibly contain all of the energy in a system that large.

DESIGNING FORCE FIELDS

Force field defensive systems consist of two subcomponents: the force field generator and the homopolar generator/energy sink. Force field generators are described on the following table.

Force Field Generators

TL	Type	Flicker	Power	Vol	MCr
15	Black	10%	15	135	400
15	Black	20%	20	200	600
15	Black	30%	25	270	800
15	Black	40%	30	350	1000
16	Black	50%	35	300	500
16	Black	60%	40	400	700
17	Black	70%	45	450	900
18	Black	80%	45	250	500
19	Black	90%	45	250	500
20	White	—	50	300	900
21	White	—	50	400	910

TL: Tech level of first availability.
Type: Black globe or white globe.
Flicker: Operational flicker rate.
Power: Megawatts of power input required for operation of the generator.
Vol: Volume in cubic meters of the generator.
MCr: Price in millions of credits of the generator.
Mass: All generators mass 1 tonne per cubic meter.

Protected Volume: Power requirements increase as the volume of the protected target increases. Multiply those values by the ship's target size multipliers shown in the Target Size Multiplier table:

Target Size Multipliers

Size	*Multipliers*
VS and smaller	×1
S	×2
M	×3
L	×4
VL	×5
G	×6

Note that deployed folding HRT or Passive EMS arrays increase the effective target size of a ship for purposes of force field protected volume. On the following chart, use the diameter of the deployed sensor to find the minimum protected volume required, which reads out in target size as used on the Target Size Multipliers table above. This will require a greater amount of power to run the force field. If insufficient power is provided to run the field at the larger volume required for the extended array, the sensor must be retracted, and may not be used while the force field is on.

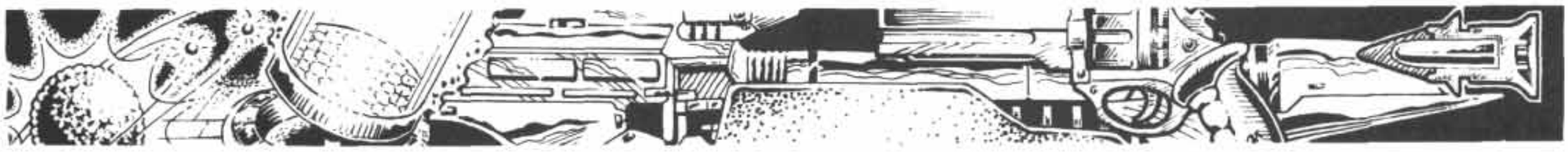
Sensor Array Minimum Volume

Antenna Diameter	*Min Vol (Target Size)*
10 or less	SM
20	Mc
40	VS
90	S
200	M
400	L
800	VL
1200+	G

HPG Bank: Any size homopolar generator may be selected for the system. The storage capacity of the HPG subcomponent (or HPG bank) is the maximum power which may be stored by a black globe before catastrophic discharge. White globes are continuously discharging, so there is considerably less danger of an overload. However, incoming power is still cycled through the system and the peak power per 30-minute starship combat turn which can be processed by the field is equal to the power of the installed HPG system. The peak power per five-second planetary combat turn which can be processed by the field is equal to the above value divided by 360.

Note that 35% of the volume of a jump drive consists of capacitor/HPG banks. The jump drive capacitors may be used to store energy along with/in lieu of specifically installed HPGs. Multiply the jump drive volume by 0.35, and divide the result by the correct TL entry on the Homopolar Generator Energy Capacity table. This is the capacity of the jump drive HPG/capacitors in megajoules. Add this to the capacity of the specially installed HPGs to get the total traffic flow ceiling.

Solar Array: Black globes function as excellent solar arrays for ships with power plant damage. Look on the Sensor Array Minimum Volume table, and find the number in the "Antenna Diameter" column corresponding to the chosen protected volume. A full-up black globe in the habitable zone of a star produces power in megawatts equal to 0.1 times the Antenna Diameter figure squared (multiply this value by 10 in the inner zone, and by 0.01 in the outer zone). If the globe is set to flicker, multiply this result by the flicker rate.



CHAPTER 7
Optional Features

These items are used almost exclusively on spacecraft, and constitute an assortment of features which do not fall into any other major category.

Fuel Scoops

Fuel scoops may be added to any design. These allow a vessel to skim the free raw materials for liquid hydrogen (LHyd) fuel from oceans or gas giant atmospheres. They do not consume any volume or add to the mass of the vessel. Fuel scoops do consume surface area. Each 5% of a craft's total surface area given to fuel scoops allows the craft to scoop fuel equal to 20% of its total volume per hour (i.e., a 100-ton ship with fuel scoops covering 10% of its surface can scoop 40 displacement tons of fuel per hour). Cost to add fuel scoops to a design is MCr0.000075 per cubic meter of hull.

Fuel Purification Plant

TL	*MW*	*Vol*	*Mass*	*MCr*	*MinVol*
8	0.01	0.7	1.5	0.0002	135
9	0.009	0.6	1.2	0.00019	120
10	0.008	0.55	1.1	0.00018	105
11	0.007	0.45	0.9	0.00017	95
12	0.006	0.4	0.8	0.00016	80
13	0.005	0.35	0.7	0.00015	65
14	0.005	0.25	0.5	0.00014	55
15	0.005	0.2	0.4	0.00015	40
16	0.005	0.15	0.3	0.00016	25
17	0.005	0.1	0.2	0.00017	15
18+	0.005	0.05	0.1	0.00018	5

Vol: Volume in cubic meters.
Mass: Mass in tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.
All values are per kiloliter of fuel processed per 6 hours.

Special Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Electronics Shop	84	40	1	0.6
Machine Shop	140	120	2	1
Laboratory	112	50	5	0.8
Sick Bay	112	50	5	0.8

Vol: Volume in cubic meters (kiloliters).
Mass: Total mass in tonnes.
MCr: Price in millions of credits.
MW: Power requirement in megawatts.

Vehicle Service Facilities

Description	*Vol*	*Mass*	*MCr*	*MW*
Internal Hangar (Minimal)	×2	0.2	.0002	—
Internal Hangar (Spacious)	×4	0.2	.0002	—
Docking Ring	×1	0	.0002	—
Launch Tube	×25	0.5	.00015	.01
External Grapple (USL)	×0.1	1.0	.001	—
External Grapple (SL)	×0.3	1.0	.002	—
External Grapple (AF)	×0.5	1.0	.003	—

Volume: Multiply the craft or vehicle volume by the value shown to determine the facility volume.

Mass: The mass in tonnes per cubic meter of installation.

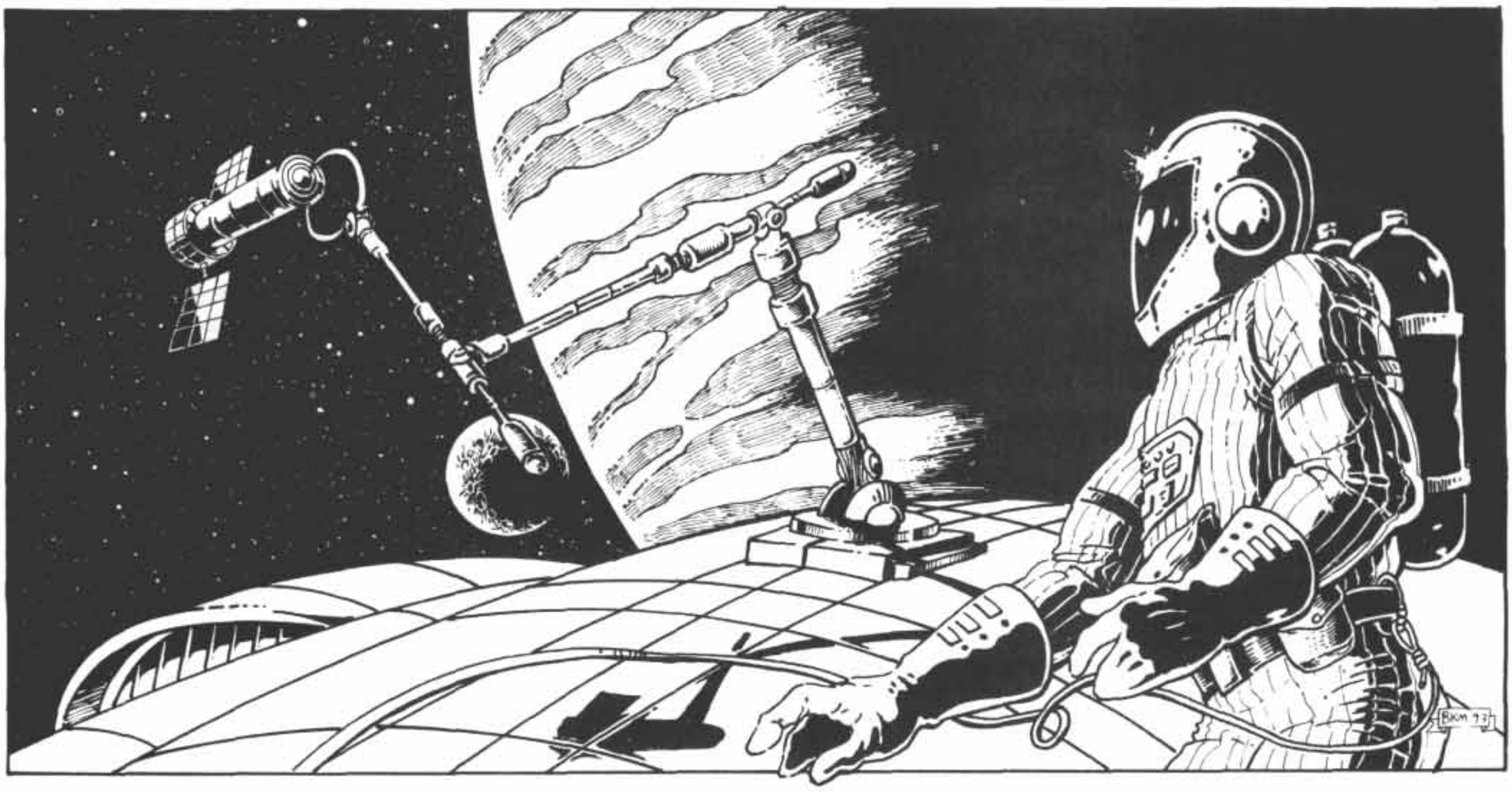
MCr: The price, in MCr, per cubic meter of installation.

Surface Area: All of the facilities require surface area except for the hangars (which require launch ports, below). The launch tube requires area in m^2 equal to $2 \times L^2$ where L equals the basic length as taken from the Hull Size table, unmodified by hull form, of the largest craft that will use the tube.

Grapples require area equal to the square of the final length of the craft carried by the grapple.

MW: Power requirement per cubic meter of installation.

Hangar Space: Spacious hangars allow all repair and maintenance





tasks to be conducted at normal difficulty levels. Minimal hangars increase the difficulty level of all such tasks by one level. Docking rings allow no maintenance or repair.

External Grapple: Types listed are for unstreamlined (USL), streamlined (SL), and airframe (AF) hulls of the carrying ship, not the carried craft. Note that the volume of craft carried in external grapples is not subtracted from the available hull volume of the carrying ship, although the volume of the grapple is. Remember that the volume of the carrying ship plus all externally carried craft is used when calculating the required amount of maneuver drive and jump drive.

By selecting the type of grapple that corresponds to its hull streamlining, the vessel may carry externally mounted craft without compromising its streamlining configuration, so long as the externally mounted craft also meets that configuration. If the grapple or craft's configuration is lower than that of the overall hull, the ship is limited to the lower configuration if it is carrying the craft. If the craft is detached, the hull's configuration may be used.

ACCESS PORTS

Description	*Area*	*MCr*
Launch Port	L^2	0.001
Large Cargo Hatch	20 m^2	0.02
Small Cargo Hatch	12 m^2	0.012

Area: Hull surface area required.

L^2: The square of the craft's basic length as taken from the Hull Size table, unmodified by hull form.

MCr: Price in MCr per square meter of launch port, or per each cargo hatch.

Launch Port: At least one launch port is required if craft or vehicles are carried. More launch ports allow craft to be launched more rapidly.

Cargo Hatches: All craft require at least one large cargo hatch per 350 m^3 (25 tons) of cargo capacity. Vessels with under 100 m^3 of cargo space can get by with a single small cargo hatch.

Seats

Short-haul vehicles will require passenger seats.

SEATS

Access	*Vol*	*Mass*	*MCr*
Restricted	1.5	0.02	.0001
Cramped	2.5	0.02	.0001
Adequate	3.5	0.02	.0001
Roomy	7	0.02	.0001

Vol: Volume in m^3 per position/seat.

Mass: Mass in tonnes per position/seat.

MCr: Price in megacredits per position/seat.

These entries are simple seats with no controls. Paying passenger seats must be Adequate or better; seats for troops must be Cramped or better. "Restricted" access is the minimum possible accommodation for special purposes only.

Drop Tanks

Ships may be fitted with drop tanks if desired. A drop tank is an additional hull section filled entirely with fuel. Its material volume and mass are calculated just as if it were a separate ship, and it must use the same hull form and configuration modifiers as the ship it will be fitted to, and must be armored and have internal structure bracing sufficient to withstand the ship's rated acceleration.

If a drop tank is fitted to a ship with electromagnetic masking (EMM), the tank(s) must also be so fitted, with the volume and surface area taken out of the tank itself. Power requirements are assumed to be met by the carrying ship, which must allow for them in its own design. If any EMM-fitted ship is carrying non-EMM drop tanks, the ship loses all of its EMM benefits until the tanks are dropped.

A drop tank is designed to be released once it is drained, allowing improved performance by the ship.

Collapsible Tanks

Insulated fuel bladders may be carried in the cargo hold to carry additional fuel. This fuel may not be used directly, but must be pumped into the normal fuel tanks for use. Collapsible tanks cost Cr100 per cubic meter of fuel capacity, and when empty can be stored at 5% of their full volume.

Dismountable Tanks

Dismountable fuel fuel tanks may be carried in the cargo hold to carry additional fuel. Fuel from these rigid tanks may be used directly, without requiring transfer to the permanent tanks. Dismountable tanks cost Cr200 per cubic meter of fuel capacity, but must be stored at their full volume when empty. Modified versions costing Cr500 per cubic meter function the same, but may be disassembled to store at 25% their full volume.

Internal Armor

Valuable internal systems may have additional armor added around them. Any time a hit is rolled against such a system, the remaining damage value must first penetrate this internal armor before it can damage the system.

Calculate the volume of the system(s) to be protected, and then design the armor as if it were a separate hull, using the same procedure used to calculate the hull shell (or chassis armor material volume, if it is a vehicle) volume, weight, and price of the ship. Select the armor thickness desired, and use the hull form modifier as used by the main hull. Do not, however, use the minimum armor level based on G performance, and do not apply the airframe configuration modifier. There is no internal structure requirement for internal armor.

Spacecraft Deckplans

Each displacement ton is drawn as a grid square 2 meters by 2 meters, with a vertical height of 3.5 meters. Much of this vertical height is taken up by deck thickness, lighting, environmental ducting, etc., so that free height is only about 3 meters.

When allocating space within the craft, assume that only a portion of the specified volume for staterooms, bunks, etc., is used for those fittings *per se*; the remainder should be used for common areas and other accommodations for the crew, such as recreation areas, eating spaces, and so on.

When comparing the final number of grid squares used on the deckplan to the rated tonnage of the vessel's design, allow a 10-20% leeway. If the plan comes within 20% of the stipulated volume, it is acceptable.

When drawing passenger seats, Roomy seats fit two per grid square; Adequate seats fit four per square; Cramped seats six per square; and Restricted seats nine per square.



CHAPTER 8
Power Production

The extraction of energy from fuel and conversion of that energy to a useful form is the heart of the industrial revolution of tech level 3.

FUELS

All early fuels are organic in origin. The earliest fuel, of course, was wood, and even early steam engines used wood as a fuel. As the industrial revolution required more energy, and a more portable energy supply, coal became a more common fuel due to its greater energy density. Coal is, of course, also organic in origin, the fossilized remains of long-dead life forms (hence the term "fossil fuels"). Coal is also a hydrocarbon fuel. As demand for portable fuel sources increased, high-energy density distillates of hydrocarbon fuels (either oil or gassified coal) replaced coal as the standard hydrocarbon fuel.

As all hydrocarbons are fossil fuels, worlds without a biosphere are unlikely to have them in significant quantities. Even worlds with biospheres may not have had the right biological and geological history to produce significant quantities of fossil fuels. On these worlds, alcohol distillates are used at early tech levels, but these rely on organic material as well, and so are also unavailable on worlds without biospheres.

The most plentiful fuel in the galaxy is probably hydrogen, and it is free for the taking in the atmospheres of most gas giants. It exists in plentiful quantities in oceans and icecaps as well, but in a less useful form. While hydrogen can be burned in most high-tech hydrocarbon power plants, the energy released by simple hydrogen combustion is exactly the same as the energy required to separate it from the oxygen in water. As a result, worlds with other plentiful but less portable energy sources (such as geothermal, tidal, wind, or solar) may use these "free" energy sources to crack hydrogen from water and thus have a useful portable fuel. Energy-poor worlds, however, will not gain anything by using scarce energy to crack hydrogen, since they gain no energy in the process.

They gain nothing in the process assuming, of course, that they are burning hydrogen in a chemical power plant. If they are using it in fusion reactors, the story is considerably different. Once fusion power is available, worlds with considerable water have solved the worst of their energy problems.

The interim step between chemical power plants and fusion is fission. Fission relies upon naturally occurring radioactive elements for fuel, and these are scarce enough throughout our region of space to make them high-priced and highly sought-after.

FUEL

Type	*Mass*	*Price*
Wood	2.0	.000050
Alcohol	1.0	.000200
Coal	2.0	.000100
Hydrocarbon Distillates (HCD)	1.0	.000250
HG Hydro Distillates	1.0	.001000
Liquid Rocket Fuel (LRF)	1.0	.001000
Solid Rocket Fuel (SRF)	1.0	.002000
Hydrogen Rocket Fuel (HRF)	0.3	.001000
Liquid Hydrogen	0.07	.000035
Radioactives	19	.075000
Antimatter	0.07	.200000

Mass: In tonnes per kiloliter (m^3).
Price: In millions of credits per kiloliter (m^3).
HG Hydro Dist.: High grade (highly refined to reduce impurities) hydrocarbon distillates. These are used almost exclusively in fuel cells.

Wood, alcohol, and coal are substitutes for hydrocarbon distillates in various engines. Each of these fuels has a different output multiplier and fuel use multiplier as compared to burning pure hydrocarbon distillates.

Fuel	*Output Mult.*	*Fuel Use Mult.*
Wood	0.5	3
Alcohol	0.75	1
Coal	1	1.5

Chemical Power Plants

The term *reciprocating* refers to the back-and-forth motion of the piston. Not only do reciprocating engines need a flywheel to smooth out the uneven application of power, they are inherently inefficient and limited in the power and speed they can develop. As the engine works faster and faster, the forces on the pistons will eventually shake apart the vehicle or destroy the engine.

Steam engines are usually called external combustion, as the fire is outside of the confines of the boiler and engine itself. The internal combustion engine differs in that the fuel is burned inside the engine and the expanding gas of the fuel explosion is itself used, in place of high-pressure steam, to drive reciprocating pistons which turn a drive shaft. As with any engine, the spinning drive shaft can be connected directly to a mechanical contrivance, such as a winch or axle, or it can turn an electrical generator and produce power to run other systems.

Turbines are engines which use spinning fan blades in place of the less mechanically efficient reciprocating pistons.

The most advanced form of chemical power plant is the magnetohydrodynamic (MHD) turbine, which works on a fundamental principle of electromagnetism called Fleming's Left Hand Rule. This principle states that the confluence of a magnetic field and an electrical current passing through a fluid will cause the fluid to be propelled in one direction. When combined with a high-energy turbine, an MHD field produces an extremely efficient power source.

Although the thrust effect is very weak at low levels of magnetism, the efficiency of the turbine increases with the square of the increase in the power of the magnetic field. As a result, efficient MHD power plants become practical only when large superconducting magnets are economically feasible.

CHEMICAL POWER PLANTS

TL	*Description*	*MW*	*Mass*	*MCr*	*Min Vol*	*Kl/Hour*	*Fuel Type*
3	Early Steam	0.10	2	0.0005	0.25	0.2	Hydro. Dist.*
4	Steam	0.20	2	0.0005	0.15	0.15	Hydro. Dist*
4	Int. Comb.	0.30	1	0.001	0.05	0.2	Hydro. Dist
5	Steam Turbine	0.35	2	0.002	1	0.15	Hydro. Dist
5	Imp. Int. Comb.	0.40	1	0.002	0.01	0.25	Hydro. Dist
7	Gas Turbine	0.50	1	0.005	0.5	0.3	Hydro. Dist
8	MHD Turbine	0.60	1	0.01	1	0.2	Hydro. Dist

MW: Output in megawatts per cubic meter of power plant.
Mass: Tonnes per cubic meter of power plant.
MCr: Price in MCr per cubic meter of power plant.
Min Vol.: Smallest possible power plant in cubic meters.
Kl/Hour: Kiloliters (cubic meters) of fuel consumed per hour per MW output.
Fuel: The type of fuel burned. All chemical power plants burn hydrocarbon distillates, but some substitutes are possible.

Alcohol distillates may be substituted for hydrocarbon distillates in all power plants listed, but energy output is multiplied by 0.75.



All power plants from tech level 7 and higher may be designed to burn LHyd (liquid hydrogen) instead of hydrocarbon distillates at no energy penalty.

*Asterisked power plants may substitute wood or coal for hydrocarbon distillates. If wood is used, energy output is multiplied by 0.5 and fuel consumption is multiplied by 3. If coal is used, energy remains the same but fuel use is multiplied by 1.5.

Fuel Cells

Fuel cells burn fuel and take energy from the energetic electrons transferred between the various products of the chemical reaction. Fuel cells, like batteries (page 65) are electrochemical cells and work on similar principles, except that fuel cells are open systems which continue to process fuel and convert it to energy.

Fuel cells are more efficient than most chemical power plants, but are not as economical as the electrodes become contaminated by fuel impurities and require frequent replacement. Only with ultra-pure fuels is this problem avoided, and the added cost of these fuels generally makes them uneconomical. Only where size and fuel efficiency are more important than cost (as with a spacecraft) are they generally cost-effective.

Fuel Cells

TL	*Description*	*MW*	*Mass*	*MCr*	*Min Vol*	*Kl/Hour*	*Fuel Type*
7	Fuel Cell	0.5	1	0.02	.01	0.3	HG Hydro. Dist.
12	Fuel Cell	0.75	1	0.02	.01	0.25	HG Hydro. Dist.
14	Fuel Cell	1.5	1	0.02	.01	0.2	HG Hydro. Dist.
16	Fuel Cell	1.75	1	0.02	.01	0.2	HG Hydro. Dist.

MW: MW output per cubic meter of power plant.
Mass: Tonnes per cubic meter of power plant.
MCr: Price in MCr per cubic meter of power plant.
Min Vol.: Smallest possible power plant in cubic meters.
Kl/Hour: Kiloliters (cubic meters) of fuel consumed per hour per MW output.
Fuel: All fuel cells burn hydrocarbon distillates or LHyd.

Nuclear Power

Nuclear power relies on the energy released by the fission or fusion of atoms in a controlled nuclear chain reaction. Nuclear fission is the splitting of an atom of "fissionable" material, usually a refined isotope of uranium or plutonium. When the atom is split, energy is released. Nuclear fusion is the combination of two atoms, usually hydrogen atoms, into a single atom, also releasing energy in the process. (See the sidebar on common fusion reactions.) In both cases, much of the energy released is in the form of heat. Fission and fusion reactors use the heat to boil water to turn a high-pressure turbine to generate electrical power.

Nuclear Power Plants

TL	*Description*	*MW*	*Mass*	*MCr*	*Min Vol*	*Kl/Year*	*Fuel Type*
6	Fission	0.30	10	0.1	30	0.75	Radioactives
7	Fission	0.60	8	0.1	20	0.25	Radioactives
8	Fission	1.00	6	0.1	10	0.1	Radioactives
9	Fusion	2.00	4	0.2	100	0.15	LHyd
10	Fusion	2.00	4	0.2	50	0.15	LHyd
11	Fusion	2.00	4	0.2	20	0.15	LHyd
12	Fusion	2.00	4	0.2	10	0.15	LHyd
13	Fusion	3.00	3	0.2	1	0.1	LHyd
14	Fusion	3.00	3	0.2	0.25	0.1	LHyd
15	Fusion	6.00	2	0.2	0.1	0.1	LHyd
16	Fusion	7.00	1	0.2	0.075	0.1	LHyd

MW: MW output per cubic meter of power plant.
Mass: Tonnes per cubic meter of power plant.
MCr: Price in MCr per cubic meter of power plant.
Min Vol.: Smallest possible power plant in cubic meters.
Kl/Year: Kiloliters (cubic meters) of fuel consumed per year per MW output.

Common Fusion Reactions

The only achievable fusion reaction on Earth is deuterium and tritium fusion. Thus far, it has only been achieved in H-bombs, but it is hoped that these reactions will eventually be harnessed for controlled fusion power production.

The reaction takes place in three steps:

1) Two deuterium ($_1H^2$) nuclei (each with one proton and one neutron) fuse to form one helium-3 ($_2He^3$) nucleus (two protons, one neutron) and a free neutron.

2) Two deuterium ($_1H^2$) nuclei fuse to form one tritium ($_1H^3$) nucleus (one proton, two neutrons), and a free proton.

3) One deuterium ($_1H^2$) nucleus and one tritium ($_1H^3$) nucleus fuse to form one helium-4 ($_2He^4$) nucleus (two protons, two neutrons), and a free neutron.

The total reaction is summarized as:

Five deuterium ($_1H^2$) yield one helium-3 ($_2He^3$) plus one helium-4 ($_2He^4$) plus one proton plus two neutrons plus energy.

However, the most common fusion reaction in our solar system is the one which powers our sun, and is known as the proton-proton chain. It requires temperatures and pressures far in excess of what can be created on Earth. Like the deuterium-tritium chain above, it too proceeds in three steps:

1) Two hydrogen ($_1H^1$) nuclei (one proton each) fuse to form one deuterium ($_1H^2$) nucleus (one proton, one neutron) plus a positron and a neutrino (the positron collides with a nearby electron almost instantaneously, annihilating both particles, releasing energy). Note that one of the protons has decayed into a neutron, positron, and neutrino.

2) One hydrogen ($_1H^1$) nucleus and one deuterium ($_1H^2$) nucleus fuse to form a helium-3 ($_2He^3$) nucleus.

Each of steps 1 and 2 take place twice to create the material for the last step:

3) Two helium-3 ($_2He^3$) nuclei fuse to form one helium-4 ($_2He^4$) plus two hydrogen ($_1H^1$) nuclei, which start the cycle again.

The total equation is:

Six hydrogen ($_1H^1$) yield one helium-4 ($_2He^4$) plus two hydrogen ($_1H^1$) nuclei, two neutrinos, and energy, or, simplified:

Four hydrogen ($_1H^1$) yield one helium-4 ($_2He^4$) plus two neutrinos and energy.



Matter-Antimatter Annihilation

Antimatter is a collective term for the *antipartides* that correspond to all subatomic particles. A particle and its antiparticle have the same mass but are opposite in electric charge or some other elementary characteristic. The anti-electron, for example, is called the *positron*, and has a positive charge rather than a negative. The difference between matter and antimatter is that, although they both respond in the same way to gravitation, electromagnetic forces, etc., if a particle and its antiparticle collide, they will be completely converted to energy. In fact, this is responsible for part of the energy of a fusion reaction. When hydrogen atoms fuse, one of the byproducts are single positrons which almost immediately collide with an electron, annihilating both and generating energy. One positron is generated for every three atoms of hydrogen which fuse, and the annihilation of this positron accounts for 7.7% of the total energy of the fusion reaction, and a higher percentage of its useful energy.

This quality of complete annihilation of matter and conversion to energy makes matter-antimatter the most energy-dense fuel system possible in the physical universe. It is the only fuel which gives over its entire mass to Einstein's classic equation: $E = mc^2$.

Antimatter is naturally occurring, but not in useful quantities. However, it can be created in high-energy particle accelerators. Antimatter is, therefore, not a natural fuel, but rather a manufactured one. (The distinction is less important than it may at first sound, however, as virtually all high-grade fuels require considerable processing before being used.)

MAA (Matter-Antimatter Annihilation) Power Plants

TL	*Description*	*MW*	*Mass*	*Price*	*MinVol*	*Kl/Year*	*Fuel Type*
17	Antimatter	50	6	0.5	8.000	0.005	Antimatter
18	Antimatter	100	5	0.5	1.000	0.002	Antimatter
19	Antimatter	250	4	0.5	0.250	0.001	Antimatter
20	Antimatter	500	3	0.5	0.100	0.0005	Antimatter
21	Antimatter	1000	2	0.5	0.020	0.0002	Antimatter

MW: MW output per cubic meter.
Mass: Tonnes per cubic meter
Price: Price in millions of credits per cubic meter
Min Vol: Smallest possible power plant in cubic meters.
Kl/Year: Kiloliters (cubic meters) of fuel consumed per year per MW output.

Solar Arrays

Solar arrays consist of solar collectors, which collect solar radiant energy, and solar cells, which convert radiant energy to electrical energy. Each cubic meter of solar cells requires 10 square meters of solar array if deployed in the inner zone of a star system, 100 square meters of solar collectors if deployed in the habitable zone of a star system, and 10,000 square meters of solar collectors if deployed in the outer zone of a star system.

Solar Collector Panels

TL	*Vol*	*Mass*	*MCr*
6	0.3	0.008	0.005
7	0.2	0.006	0.004
8	0.15	0.004	0.003
9	0.1	0.003	0.002
10	0.06	0.002	0.001
11+	0.04	0.001	0.001

Vol: Cubic meters of volume required per square meter of installed collector panels, if permanently installed.
Mass: The mass of the collector, in tonnes, per square meter of panel.
MCr: The price of the collector, in millions of credits, per square meter of panel.

Retractable Array: The values on this table are for rigid, permanently installed solar collectors. If the solar collector is designed to be retracted and deployed at various times, double the price, mass, and volume.

Solar Cells

TL	*MW*	*MCr*
6	0.01	0.5
7	0.015	0.4
8	0.02	0.3
9	0.025	0.25
10	0.03	0.2
11	0.035	0.15
12+	0.04	0.1

MW: Output, in megawatts, per cubic meter of solar cell.
MCr: Price, in millions of credits, per cubic meter of solar cell.
Mass: All solar cells mass 2 tonnes per cubic meter.
Minimum Volume: The smallest allowed solar cell is 0.01 cubic meters.



Batteries

Batteries are not a means of generating power, but rather of storing it. However, the same might be said for artificially generated fuels, such as antimatter. Batteries are often used as surrogate power plants and fuel supplies when the device does not warrant a full-fledged power plant.

BATTERIES

TL	Description	MW	Mass	MCr
4	Storage Batteries	0.04	2	0.001
5	Storage Batteries	0.06	2	0.001
6	Storage Batteries	0.08	2	0.0008
7	Storage Batteries	0.1	2	0.0008
8	Storage Batteries	0.2	2	0.001
9	Storage Batteries	0.4	2	0.002
10	Storage Batteries	0.8	2	0.003
11	Storage Batteries	1	2	0.004
12	Storage Batteries	1.5	2	0.005
13	Storage Batteries	2	2.5	0.008
14	Storage Batteries	2.5	2.5	0.01
15	Storage Batteries	3	2.5	0.015
16	Storage Batteries	3.5	2.5	0.02

MW: Maximum output, in megawatts, at the one-hour discharge rate, per cubic meter of battery.

Mass: Mass of the battery, in tonnes, per cubic meter

MCr: Price, in millions of credits, per cubic meter

Battery Discharge Rate: The battery's discharge time is the time it takes to drain the battery's charge. The energy output on the table above assumes a discharge time of 1 hour. If the output is lowered, the discharge time is increased, as shown below. Note that some discharge times are only available at higher tech levels.

Output	Time	Price	TL
×15,625	0.0036 seconds	×25	9
×3125	0.036 seconds	×16	8
×625	0.36 seconds	×9	7
×125	3.6 seconds	×4	6
×25	36 seconds	×2	5
×5	0.1 hour	×1	4
×1	1 hour	×1	4
×0.1	10 hours	×1	4
×0.02	100 hours	×1	5
×0.004	1000 hours	×1	6

Capacitors and Homopolar Generators

Like batteries, capacitors and homopolar generators (HPGs) are not means of generating power, but rather of storing it. They are included here because they are usually used in conjunction with some means of generating energy.

Capacitors and HPGs are treated together because both perform the same function. They hold very large amounts of energy (usually for fairly short periods of time) and then discharge the energy very quickly. Capacitors are used at the earliest tech levels, but are quickly replaced (over the course of tech level 8) by HPGs for larger jobs. The table below represents the best performance at tech level and assumes designers will use the most appropriate technology.

Capacitors store electricity directly as an electromagnetic charge; HPGs convert electricity to kinetic energy, storing it in a rapidly spinning flywheel. When a charge is passed through the generator, the flywheel slows rapidly, converting energy to electricity in a powerful discharge.

The following table shows volume of capacitors and HPGs per Mj of stored energy.

HOMOPOLAR GENERATOR ENERGY CAPACITY

TL	Cubic Meters of HPG per Mj
7	0.25
8	0.125
9	0.1
10	0.08
11	0.06
12	0.05
13	0.045
14	0.04
15	0.035
16	0.03
17	0.025
18	0.02
19	0.015
20	0.01
21	0.005

Vol: Volume, in cubic meters, is equal to megajoules of stored energy multiplied by the value shown on the table.

Mass: Mass in tonnes is equal to volume in cubic meters × 2.

Price: Price, in millions of credits, is equal to volume in cubic meters multiplied by 0.01.

Explosive Power Generators (EPG)

EPG is a means of generating a large amount of power quickly, and it is useful for systems requiring quick surges of power. It was first used to generate large power surges by the Soviet Union in the 1980s as part of their beam weapon research program. By tech level 9, field versions become reasonably practical, and by tech level 12 pulse plasma cartridges (PPC) make it an extremely efficient means of generating quick surges of power.

Each EPG system consists of a homopolar generator and power cartridges. EPG output is generally expressed as pulse energy and measured in megajoules. The homopolar generator is modified slightly to enable it to convert the energy of the power cartridge to electrical energy. This modification increases the cost of the homopolar generator by 10% but has no effect on volume or mass.



Each EPG system requires five seconds (one combat round) to eject a spent cartridge and load a new one, giving the generator a normal cycle time of one pulse per combat turn. This may be increased by building a multiple feed generator (one which holds more than one cartridge at the same time). Each additional cartridge held increases the mass, volume, and price of the generator by 5% and adds 1 to the number of pulses allowed per combat phase.

Explosive power cartridges are designed using the table below. Cartridges are usually cylindrical in shape and are three times as long as their diameter. They usually have a thin metallic covering and a ceramic liner.

TL	*Description*	*Vol*	*MCr*
9	Chemical Explosive Cartridge (CXC)	.001	.001
10	Chemical Plasma Cartridge (CPC)	.0006	.0001
12	Pulse Plasma Cartridge (PPC)	.0003	.000025
14	Pulse Fusion Cartridge (PFC)	.0002	.000008
16+	Gravitic Compression Fusion Cartridge (GCFC)	.0001	.000004

TL: Tech level of availability

Vol: The volume of the cartridge, in cubic meters, is equal to its output in megajoules multiplied by the value shown on the table.

MCr: The price of the cartridge, in millions of credits, is equal to its output in megajoules multiplied by the value shown on the table.

Mass: The mass of the cartridge, in tonnes, is equal to its volume in cubic meters multiplied by 8.

Dimensions: The dimension of the cartridge can be calculated using the following formula:

Radius (r) = $0.376 \times \sqrt[3]{Vol}$ (Volume in m^3, r in meters)
Diameter = 2r
Length = 6r

ALTERNATE TECHNOLOGY

The above range of power-generating means is a reasonable surface coverage of the most important means of power generation likely to be open to mankind over the next few centuries. One important alternate technology is not included in the Imperial Space technological background, and that is piezo-nuclear fusion, which we present here as an alternative.

Piezo-Nuclear Fusion

This type of fusion may never be available, or it may be available long before any of the above advanced forms of power generation. Piezo-nuclear fusion, more popularly known as "cold fusion," was the subject of some controversial scientific research, and sensational news reporting, in 1989. As far as the public was concerned, it all began with a press conference in March of 1989 in Salt Lake City when Drs. Martin Fleischman and B. Martin Pons announced that they had discovered a cold-process for fusion.

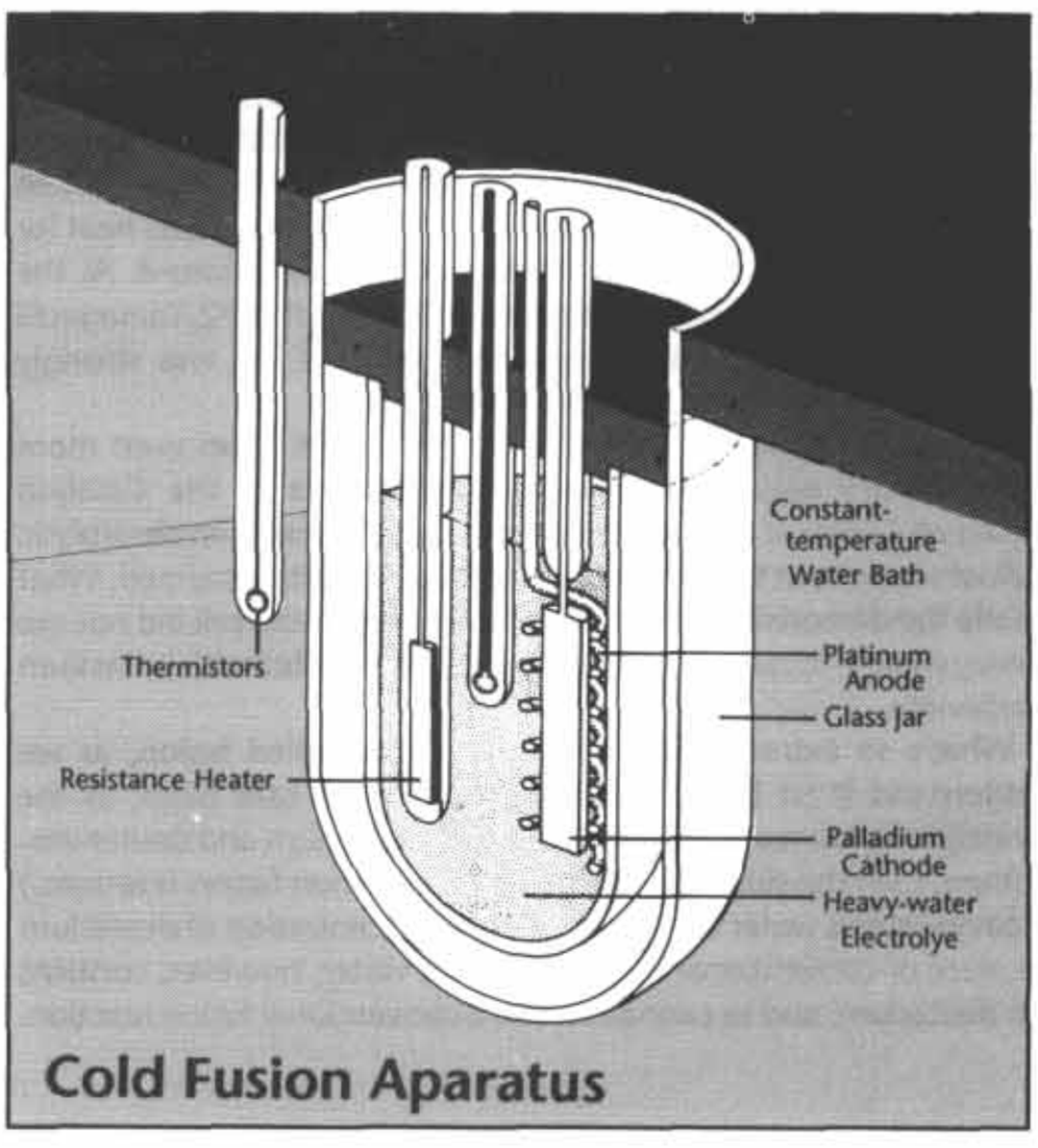
The apparatus used a platinum anode and palladium cathode in a bath of heavy water. Electricity separated the deuterium (a heavy isotope of hydrogen) from oxygen in heavy water and then attracted the deuterium to the palladium cathode. The hydrogen then penetrated the palladium and under high pressure (hence the term *piezo*, or "squeeze") began to fuse, heating the cathode and giving off about four times as much heat energy as was used to run the machine.

Or so they reported. There was an immediate flurry of activity as skeptical researchers across the world made duplicates of the apparatus and hundreds of experiments were soon running, trying to replicate the results reported by Fleischman and Pons. They were, almost without exception, unable to produce any results. Fleischman and Pons were not physicists but were instead electro-chemists and were, it was speculated, unfamiliar with the rigorous experimental protocols necessary for controlling and measuring energy levels this small. The results they reported were well within the error margin of poorly calibrated instruments.

Within months, the verdict of the scientific establishment was in. The cold fusion process was a dead end. The US patent office refused to issue any patents on cold fusion, citing numerous experimental disproofs of the process. Prestigious scientific journals declined to accept further articles on the subject. Research funding disappeared. End of story.

Almost. The statement above—that attempts to replicate the effects experimentally were "almost without exception" unsuccessful—is significant. A few researchers, both in the United States and abroad, achieved results, and these results remained unexplained. A few scientists continued research on the process, with funding from various sources. Some private money was made available. Some researchers controlled discretionary funding and used it to continue cold fusion experiments. At some labs today, even as this is written, experiments continue using funding diverted from other projects.

But the main source of funding has been Japanese. The powerful Ministry of International Trade and Industry (MITI) funded a three-year project beginning in 1992. Fleishmann and Pons are now working in France at a special laboratory provided by IMRA Europe, the European branch of Toyota's scientific research institute. Nippon Telephone and Telegraph (NTT) has also become a major player in the unfolding research.



Cold Fusion Aparatus



Why had only a handful of researchers been able to replicate the results of the original experiment when the majority had not?
1 Although the answer isn't certain, one possible explanation lies with the characteristics of the palladium cathode. Dr. Edmond Storm at Los Alamos, when examining the cathodes of a number of successful experiments, noted that the surfaces were smooth and unblem-
2 ished, while the cathodes used in many unsuccessful experiments were covered with a network of hairline cracks.

Whatever the reason, by the middle of 1991 there had been over 40 successful replications of the original cold fusion experiment, and
3 repeated successes brought more understanding of the procedures needed to replicate the results on a consistent and predictable basis. In the autumn of 1992, Dr. Michael C. H. McKubre of SRI International reported that 11 of the previous 12 cold fusion experiments at
4 the SRI labs had produced excess heat. Critics remained skeptical, and pointed out that there could be no claim of fusion without fusion byproducts.

When deuterium fuses, it often produces tritium (a triple-heavy
5 form of hydrogen appearing only as a byproduct of nuclear reactions) and eventually helium-4 (a byproduct of deuterium-tritium fusion). Without tritium and helium-4 it is difficult to believe that fusion is taking place. Dr. John Bockris of Texas A&M has now
6 reported detecting tritium in the heavy-water bath of a cold fusion device which reached 10,000 times the normal background concentration. Other researchers have begun to find tritium as well, and Bockris has reported from 2 to 100 times more helium-4 in the
7 palladium cathodes of experimental devices than found in samples of palladium from the same production batch but not used in experiments. Helium-4 residue has also been reported by experimenters at the University of Hawaii, the University of Texas, and the Naval Weapons Center at China Lake, California.

8 Intriguing as these results are, they do not demonstrate conclusively that the helium-4 was actually produced by a fusion reaction. If fusion is taking place, it should be possible to observe the
9 production of helium-4 while the reaction takes place. Dr. Eiichi Yamaguchi of NTT's Tokyo basic research lab has apparently done exactly that. He has taken a piece of palladium, coated on one side with gold, saturated it with deuterium gas, enclosed it in a vacuum chamber, and run an electric current through it. After two or three
10 hours, the palladium begins to heat up, generating excess heat for about 15 minutes, and then releases a burst of helium-4. At the Nagoya, Japan, cold fusion conference in October of 1992, Yamaguchi
11 reported: "The amount of produced helium-4 gas was strongly correlated to the excess heat evolution."

But at the same conference, a demonstration of an even more revolutionary nature was made. Reiko Notoya of the Catalysis Research Center at Hokkaido University demonstrated an electrolytic
12 cell which put out three times as much energy as it consumed. What made the demonstration extraordinary was that the cell did not use heavy water—it used regular (or "light") water salted with potassium carbonate.

13 What's so extraordinary about that? Controlled fusion, as we understand it on Earth, requires deuterium to take place, as the principle fusion reactions are deuterium-deuterium and deuterium-tritium. (See the sidebar on page 63 on common fusion reactions.)
14 Heavy water is water containing a high concentration of deuterium in place of conventional hydrogen. Light water, however, contains no deuterium, and so cannot sustain a conventional fusion reaction.

There seems to be little question that something is going on here. Light water reactions were first reported by Dr. Randall Mills, a private researcher living in Lancaster, Pennsylvania. Since then, and in addition to Notoya's repeated demonstrations, Bush and Eagleton of California Polytechnic have built and operated 19 light water cells and the Bhabha Atomic Research Center of India has run 29 different light water cells. But is it fusion?

Obviously it cannot be fusion as we expect to find it on Earth if there is no deuterium present. However, the light water cells use potassium carbonate as a salt in the water. If a hydrogen nucleus (a single proton) were to fuse with a potassium nucleus, the result would be calcium. Both Bush in California and Notoya in Japan have detected calcium in the electrolyte after the cell has operated for an extended length of time. The excess energy produced by the cell is greater than can be explained by mechanical or chemical reactions. It may not be fusion—but what is it?

Are we on the verge of a dramatic breakthrough in power-generating technology or will this latest round of experimental results turn out to be scientifically intriguing but of little practical value? It is impossible to tell, but it makes for an interesting optional power source with more than a little basis in fact.

The advantages of piezo-nuclear fusion are staggering. There are no bottom limits on the size of the device. It is lightweight, since it does not need heavy shielding (it is not "hot" in a radioactive sense). It is not dangerous. It can conceivably run off of water, without too much preliminary fuss. For campaigns that require very portable, very long-lived power sources, piezo-nuclear fusion is the perfect answer.

Piezo-Nuclear Fusion (PNF) Power Plants

TL	*Description*	*MW*	*Mass*	*MCr*	*Min Vol*	*Kl/Hour*	*Fuel Type*
9	PNF	0.40	1	0.005	—	0.002	H_2O
10	PNF	0.50	1	0.005	—	0.002	H_2O
11	PNF	0.60	1	0.005	—	0.002	H_2O
12	PNF	0.80	1	0.005	—	0.002	H_2O
13	PNF	1.00	1	0.005	—	0.002	H_2O
14	PNF	1.25	1	0.005	—	0.002	H_2O
15	PNF	1.50	1	0.005	—	0.002	H_2O
16	PNF	2.00	1	0.005	—	0.002	H_2O

MW: Power in megawatts produced per cubic meter of plant.
Mass: In tonnes per cubic meter of plant.
MCr: Price in millions of credits per cubic meter of plant.
Min Vol: Minimum volume, in cubic meters.
Kl/Hour: Kiloliters (cubic meters) of fuel consumed per hour per MW output.
Fuel Type: Water.



CHAPTER 9
Sublight (Maneuver) Drives

Traveller is scientifically based for much of its technology, but is not strictly speaking a "hard science" game. Instead, it is a reasonable compromise between hard science and science-fiction adventure literature, and this shows up in the mathematics of maneuver drives among other places. This compromise is represented in two aspects of maneuver drive design: thrust requirements and fuel consumption.

Thrust requirements are abstracted by tying thrust energy requirements to hull displacement rather than craft mass. This is an obvious abstraction, but one which is necessary for ease of design. Too many variables affect ship mass throughout the design process, and tying thrust to mass would require you to continually re-design and re-design to get a workable craft. In our opinion, the thrust-to-mass formula is a workable compromise, especially since spacecraft tend to have the same general density. The correction factor for very high mass-to-volume designs takes care of any important distortions.

The fuel requirements for the TL-10 maneuver drive reaction mass are considerably lower than for current or projected technology thrusters. The standard maneuver drive in **Traveller**, which appears at tech level 10, is called the High-Efficiency Plasma Recombustion (HEPlaR) drive, which uses hydrogen as propellant/reaction mass, super-heating it to a plasma state in an ignition chamber and expelling it out the back of the vessel. Note that this is not a fusion rocket, and while the exhaust is a super-heated plasma, it is not radioactive. While the principle of the drive is scientifically sound, its game representation is extraordinarily fuel-efficient.

By way of comparison, take a look at NASA's space shuttle. It is almost all fuel tank, and that is just to boost a modest payload into low Earth orbit (LEO). It is not capable of escaping Earth orbit or conducting interplanetary travel. A first possible alternate universe would be to ignore the HEPlaR maneuver drive and stick with lower-tech drives. Ships built based on that earlier level of thruster fuel efficiency would be much different than **Traveller** ships, and the economics and logistics of interplanetary travel and exploration would be completely different. It would not be the **Traveller** universe, but it would still be an interesting universe.

Maneuver Drive Design

Thrust requires both energy and reaction mass, and so additional fuel tankage will be required as well. Thrust is measured in tonnes. Spacecraft require (for the sake of simplicity) 10 tonnes of thrust per displacement ton to achieve an acceleration of 1G. Spacecraft with a final mass of more than 15 times (rounding fractions to the nearest whole number) their hull rate (in displacement tons) should recalculate their acceleration based on the actual thrust-to-mass ratio, dividing thrust (in tonnes) by mass (in tonnes) to determine acceleration in Gs. Most spacecraft, however, will mass less than 15 tonnes per displacement ton.

Aircraft, which are designed around their weight rather than their volume, require 1 tonne of thrust per tonne of craft weight to achieve 1G of acceleration. Most aircraft, particularly at early tech levels, will have less than 1G of acceleration.

Thrust is produced in one of two ways: either by means of a thrust agent added to an existing power plant or by means of a dedicated self-contained thruster.

A thrust agent is a mechanical means of converting the power produced by a power plant (either electrical power from a dynamo, heat from combustion, or the physical power of a turning drive shaft) into thrust.

Propellers: A propeller is the most common thrust agent at lower tech levels.

Note that aircraft engines used to drive propellers have only half the volume per output power as conventional engines, for three reasons. First, virtually no volume is used for maintenance access. The next time you open the hood of your car, look at how much of the volume of the engine compartment is consumed by open space. This open space serves a purpose—maintenance access. If the engine is too compactly installed, mechanics cannot get to various parts of the engine to check them or replace components. An aircraft engine, however, is mounted at the end of the fuselage or in a wing nacelle, and in either case no internal volume is used to provide access. Instead the entire engine is accessible from outside the aircraft. Second, the engine drives the propeller directly without need for any complicated drive shafts, differentials, etc. Third, there is less volume and weight consumed by cooling apparatus. Many aircraft engines are air-cooled, and even liquid-cooled engines gain considerable efficiency from the high speed air flow.

Because aircraft design is based on weight and does not use volume, the only impact of this rule on aircraft design is to cut the final weight of such a propeller-driving engine in half. However, a designer may wish to install a propeller onto a lift vehicle, in which case the one-half volume rule would apply, which would also reduce the engine's final mass by half.

The characteristics of propellers are shown below. Propellers that are driven by turbine engine (TL-7 gas turbine or TL-8 MHD turbine) are known as turboprops.

Propellers

TL	*Th*	*MCr*	*MaxP*	*Airframe*
4	0.5	×1.5	0.6	Simple
5	0.7	×2	1.2	Fast subsonic
6	0.8	×2.5	1.4	Fast subsonic
7	0.9	×2.5	1.6	Fast subsonic
8	1.0	×2.5	2.0	Fast subsonic

TL: Tech level of first availability

Th: Thrust in tonnes per MW of power

MCr: Propellers have no price of their own, but instead increase the cost of the power plant to which they are mounted. The price of the power plant is its normal price multiplied by the value shown on the table. This price modifier is applied to the full volume of engine *before* it is cut in half for aircraft.

MaxP: Maximum power per engine.

Airframe: The fastest airframe type on which the thrust agent may be used.

Volume: Aircraft power plants used to drive propellers have their volumes multiplied by 0.5.

Mass: Propellers themselves do not alter the mass of the power plant to which they are attached. (Note however that mass is calculated based on a smaller overall volume, which will make power plants only half as massive as normal.)



HEPlaR: The other thrust agency, high efficiency plasma recombustion (HEPlaR), becomes available at tech level 10. It my be added to any power plant by adding a heat exchanger recombustion chamber to the plant. Hydrogen is injected into the recombustion chamber and the power generated by the engine heats the hydrogen to a plasma state. The plasma is then released as a high velocity stream of reaction mass, providing thrust.

HEPlaR requires a recombustion chamber of 0.1 cubic meters in volume per megawatt o power devoted to thrust, and in tun generates 20 metric tonnes of thrust per megawatt. The recombustion chamber masses 1 tonne per cubic meter of recombustion chamber and costs 0.001 million credits per megawatt of power. It consumes 0.25 cubic meters of liquid hydrogen (LHyd) per hour per megawatt of power and may be used on any type of airframe. Hull surface area (used for spacecraft only) in square meters is equal to thrust (in tonnes) + 200.

Self-Contained Thrusters: As an alternative to thrust agencies coupled to separate power plants, some power plants, such as turbojets and rockets, are much more efficient at generating direct thrust than electrical energy. These power plants have their output measured in terms of tonnes of thrust rather than MW. These plants are called self-contained thrusters.

Self-contained thrusters have auxiliary generators which generate electrical power for other systems. Generator output, in MW, is equal to thrust, in tonnes, times 0.02.

Self-Contained Thrusters

TL	Type	Th	MCr	MaxT	FC	FT	Airframe
5	Turbojet	3	0.15	6	0.5	HCD	Super
5	Ramjet	6	0.25	10	2.5	HCD	Hyper
5	LF Rocket	6	0.25	15	7.5	LRF	Hyper
5	SF Rocket	*	—	10	10.5	SRF	Hyper
6	Turbojet	3.6	0.15	6	0.25	HCD	Super
6	Afterburners	×1.5	×1.1	—	×2	HCD	—
6	Ramjet	7.5	0.30	12	2	HCD	Hyper
6	LF Rocket	7.5	0.30	1500	7.5	LRF	Hyper
6	SF Rocket	*	—	1000	9	SRF	Hyper
7	Turbofan	3.9	0.175	6	0.12	HCD	Super
7	HF Rocket	7.5	0.30	—	4.5	HRF	Hyper
7	SF Rocket	*	—	2500	7.5	SRF	Hyper
8	HBT	3	0.0625	20	0.1	HCD	Super
8	SF Rocket	—	—	5000	5.5	SRF	Hyper
8	AZHRAE (TJ)	3.6	0.50	—	0.5	HCD	Hyper
	AZHRAE (RJ)	6			2	HCD	
	AZHRAE (Rckt)	9			4.5	HRF	
9	EAPlaC	—	×2	100**	0.225	SRF	Hyper
9	Fusion Rocket	9	0.35	100**	0.00035	LHyd	Hyper

TL: Tech level of first availability

Type: Description of thruster. HBT = High Bypass Turbofan SF = solid fuel. LF = Liquid Fuel. EAPlaC = Electrothermal Augmented Plasma Combustion.

Th: Thrust, in tonnes, per cubic meter of engine.

*Note that solid fuel rockets have no engine volume *per se*; the fuel volume is the engine volume. Solid rocket fuel (SRF) mass in tonnes equals its volume in cubic meters. See FC note below to calculate solid rocket thrust.

MCr: Price, in millions of credits, per cubic meter of engine. Note that solid fuel rockets have no engine price beyond the fuel. The fuel is in effect the engine. Solid fuel costs twice its normal amount for EAPlaC engines.

MaxT: Maximum thrust, in tonnes, of a single engine. For more thrust, install multiple engines. **The values shown for the EAPlaC and fusion rockets are the *minimum* thrust ratings per engine.

FC: Fuel consumption, in tonnes, per hour per tonne of thrust. To determine volume in cubic meters, multiply by the volume of the fuel type. For solid rockets, simply pick a fuel mass. Divide the mass by the FC value. The result is thrust in tonne-hours. Select either the thrust or the duration, and the other is determined from that. For example, 18 tonnes of TL-6 SF rocket fuel could have 2 tonnes of thrust for one hour, 4 tonnes for 30 minutes, 1 tonne for two hours, or any other combination desired, as limited by the maximum allowed thrust (MaxT column).

Size Efficiency: Solid-fuel rockets with less than 500 kg of propellant (fuel) mass suffer from inefficient fuel combustion. To determine the fuel consumption inefficiency of a solid-fuel rocket, divide 500 by the fuel mass (in kilograms). The result is the final fuel use multiplier. Multiply the calculated fuel consumption of the engine by this number. However, any multiplier less than 1 is treated as 1 and any multiplier greater than 10 is treated as 10.

FT: Fuel type burned.

Fuel Volume: The volume of fuel (in m^3) used per hour per tonne of thrust is equal to the mass (in metric tonnes) consumed per hour per tonne of thrust divided by the density of the fuel, as shown below.

Type	Density
HCD (Hydrocarbon Distillates)	1
LRF (Liquid Rocket Fuel)	1
SRF (Solid Rocket Fuel)	1
HRF (Hydrogen Rocket Fuel)	.3
LHyd (Liquid Hydrogen)	.07

Airframe: Fastest airframe (for aircraft design) or chassis configuration (for vehicle design) type on which the thruster may be used. Super = Supersonic, Hyper = Hypersonic.

Mass: All self-contained thrusters mass 1 tonne per cubic meter.

Surface Area: When installed on spacecraft (only), air-breathing self contained thrusters (turbojets, turbofans, ramjets, AZHRAE) take up surface area in square meters equal to thrust in tonnes ÷100. Non-air breathers take up area equal to tonnes of thrust ÷200.

Afterburners: An afterburner (also called *reheat*) is available at tech level 6. It may be added to any turbojet or turbofan engine. When in use, it increases thrust by 50% and fuel use by 100%. An afterburner increases engine volume (and thus price and mass) by 10%.

Rockets: Rocket fuel consumption includes both fuel and oxidizer (usually liquid oxygen).

Ramjets: Ramjets must reach a speed of 800 kph before the ramjet will start. This is usually achieved either with a booster rocket, but is sometimes accomplished by carrying the aircraft aloft attached to another aircraft. This type also includes the scramjet (supersonic combustion ramjet).

AZHRAE: Advanced Zero speed to Hypersonic Regime Air-breathing Engines include a wide variety of exotic engine types designed, unlike turbine engines and ramjets, to function at low (takeoff and landing) speeds, where they function as turbojets, at hypersonic speeds for high-altitude operations, where they function as ramjets, and in suborbital/orbital insertion profiles, where they close off their intakes and function as rockets. These include



applications of such concepts as PDWE (Pulsed Detonation Wave Engines), RBCC (Rocket-Based Combined Cycle) ramjets, SER (Supercharge Ejector Ramjet), ATR (Air-Turbo-Ramjet or turbo-rocket), TSHE (Twin-Spool Hydrogen Expander) engines, and rocket fans. As a group, these are also referred to as "ducted rockets," and are the preferred engines for trans-atmospheric craft (TAC). The first AZHRAE line gives the tech level, weight, cost, airframe characteristics for the entire engine, and the thrust and fuel characteristics when operating in turbojet mode. The second line gives the thrust and fuel characteristics of the same engine when operating in ramjet mode. The third line gives the thrust and fuel characteristics in rocket mode.

Fusion Rocket: A fusion rocket is not much more than a fusion reactor with a steady stream of hydrogen going in and a hole in one end. Super-heated hydrogen plasma expelled at tremendous velocities forms the reaction mass. Because of the nature of the drive, the exhaust is extremely dangerous. It cannot be used within planetary atmospheres.

Ships passing through its hydrogen wake will generally do so quickly enough that they will not suffer any ill effects unless within very short range (~200km, referee's discretion). In this case, each crewperson must make a Difficult roll versus Constitution to avoid incapacitation by radiation (Average if wearing radiation-protective clothing) and each system on the ship suffers a minor damage result.

All crew will require blood and bone-marrow therapy over the next several months to avoid long-term health problems.

ALTERNATIVE TECHNOLOGIES

1. Realistic Thrusters

Our first alternative technology is "realistic" thrust and fuel requirements. This is not so much an alternative technology as it is the abandonment of HEPlaR thruster technology and reliance on the more primitive rocket thrusters. Even these fuel requirements have been simplified for playability, but they come much closer to duplicating the sorts of real-world design trade-offs current and near-future spacecraft designers face. While these can be used as described in the tables above, we recommend a slightly different method of calculating Gs of thrust.

Calculating Gs: Craft with the huge fuel requirements listed above require a separate mechanism for calculation of Gs, because the mass of the vessel is continually changing as fuel is consumed. As a result, thrust is measured not in Gs, but in tonnes of thrust (the thrust necessary to give 1 tonne of mass an acceleration of 1G).

Once the craft is designed, calculate its G value when fully loaded with fuel, and then calculate its G value at each 10% increment of fuel consumption. G value is calculated by dividing the thrust in tonnes by the total mass of the craft (including fuel) in tonnes. By dividing the total fuel endurance of the craft by 10, you can arrive at a useful approximation of its performance, which may, for example, be 10 minutes at 1.2Gs, 10 minutes at 1.4Gs, 10 minutes at 1.6Gs, etc.

Next, determine how much thrust in G-hours each 10% increment of fuel generates. To do so, divide the minutes of the increment (10 minutes in the example above, but it can be any length) by 60. The resulting value is multiplied by the G value of that increment to determine the total G-hours generated.

Using the example above, the increment is 10 minutes. Dividing 10 by 60 yields a value of 0.167. Therefore, the first 10-minute increment will generate 0.2004 G-hours (which we'll round down to 0.20), the second will generate 0.2338 G-hours (rounded down to 0.23), the third will generate 0.2672 G-Hours (rounded up to 0.27), etc.

The total G-hours of thrust required to reach orbit can be found by consulting the Time to Orbit table on page 225 of the basic game and looking at the Fuel G-Hrs column. Progressively, add the G-hours of thrust from each 10% fuel increment to find how much fuel is burned to reach orbit. Smaller increments of fuel (1%) can be assumed to be one-tenth of the value of a single 10% increment, rather than calculating the slight differences in thrust between the start and end of the increment.

For example, the ship above is taking off from a size 8 planet (say, Terra), and requires 0.64 G-hours to reach orbit. After the second increment, it has generated 0.43 G-hours, and does not require all 0.27 G-hours of the third increment to reach orbit. It needs 0.21, with is about 80% of the third increment. Therefore after 2.8 increments (28 minutes), the craft has reached orbit and has 2 minutes of its third fuel increment remaining.

No CG Lifters: All of the above is quite correct assuming the craft has CG lifters to negate the gravitational pull of the world and can devote all of its thrust to reaching orbital velocity. If not, part of thrust is consumed just counteracting the pull of the planet, not thrusting it up. If the craft does not have contra-grav lifters, subtract the world gravity from the thrust value of the craft when calculating its effective thrust between the surface of the world and orbit. If the craft has an airframe hull, subtract 0.5× world gravity from the thrust value. Once in orbit, ignore the effects of planetary gravity on thrust and use the 100 Diameters Travel Times and Interplanetary Speed tables (pages 225 and 227) normally.

Multiple Stages: Most rocket-propelled craft use multiple stages to reach orbit. As each stage exhausts its fuel, it is jettisoned to fall back to the planet surface. (If the planet has an atmosphere code of 4 or higher, the jettisoned stage may be recovered and reused.) Stages are numbered in the order in which they are jettisoned (thus the First Stage is the first one jettisoned).

A multiple-stage spacecraft must have its performance calculated separately for each different configuration. For example, consider a three-stage rocket. The first configuration is with all three stages and powered by the first stage engine. The second configuration is with only the second and third stages and powered by the second-stage engines. The third and final configuration is only the third stage powered by its own engine. Each of these configuration would have different gross weights, different thrusts, and thus different G ratings.

2. Ion Drives

This method of thrust is not really an alternative technology. It might better be described as a marginal technology. Ion drivers can be freely added to any **Traveller** campaign without fear of doing damage to it. They are not discussed in the main section of the rules because most games will have superior technologies which will render them superfluous. That is not to say, however, that isolated pockets of intelligent life might not be forced to use ion drives, or that even an advanced space-faring civilization might not find some use for them.

Ion drives create thrust by electrochemically reducing fuel to a stream of charged particles (ions) which creates a very low thrust. Ion engines are usually made up of a large number of very low-thrust units mounted in clusters. The advantages of these drives are



their endurance, low power requirements, and reliability. But the low thrust generated by this sort of drive limits its utility to moving low-priority cargos around inside a star system. Interplanetary trips by ion drive typically take months rather than days or weeks.

The fuels used for this system are known as "ionizates." This one term includes mercury, cesium, and a variety of liquified noble gases (argon, neon, krypton, etc.) The values given for this fuel represent an average since some of these substances would be heavier than indicated and others lighter. Ionizates are found as trace elements in most Earth-like atmospheres, but are more frequently gathered from gas giants and their moons, which sometimes boast large concentrations of noble gases.

Design: Each cubic meter of ion drive requires .03MW of power from a separate power plant and generates .003 tonnes of thrust, consuming .0000067 cubic meters of ionizates per hour. The drive masses 1 tonne and costs MCr0.013 per cubic meter of drive.

Ionizates mass 1.5 metric tonnes and cost MCr0.0001 per cubic meter.

Because of the low power requirements, ion drive ships are often equipped with large solar panels and draw on solar energy to power their drives.

3. Dean Drive

Over 30 years ago, John W. Campbell popularized a supposed invention by a fellow named Dean. His invention, the Dean Drive, was a simple device which converted rotational momentum to linear momentum. Never mind that that violated the laws of conservation of momentum, he claimed he could do it. He wasn't able to convince the patent office, however, and never could provide a convincing public demonstration of the device, and so interest faded.

But had the drive worked, it would have had an extraordinary effect on travel, and is a perfect substitute for both CG and all thrusters. It is a reactionless means of efficiently converting electricity to thrust. The electric motor (or any other sort of engine) spins a dense shaft, thus creating rotary momentum. The Dean Drive (or, for purposes of the game, the Dean Converter) then changes this rotary momentum to linear momentum, or thrust. The standard illustration of a Dean Drive at work shows a cargo truck unloading at a second-story window, its Dean Drive converting the momentum of its drive shaft to upward momentum.

Very nice. But why does this violate conservation of momentum? Think of the solar system as a closed system spinning with a fixed average velocity. Everything in it is spinning, although at different velocities, and each of the individual bodies has angular momentum. The sum of the angular momentum of all of the individual components of the solar system equals the total angular momentum of the system.

Now, suppose something changes velocity. Assuming that its mass stays the same, its momentum changes, since momentum is a combination of mass and velocity. Does this change the total momentum in the system? No, it doesn't, because the only way things can change velocity within the system is to change the velocity of something else at the same time. Remember, "for every action there is an equal and opposite reaction." So if a rocket accelerates in one direction, reaction mass (the rocket exhaust) is accelerating in the opposite direction, and with equal force, so the net change in momentum in the system overall is exactly zero. The sum of the momentum of all the bodies in the system is still equal to exactly the same total.

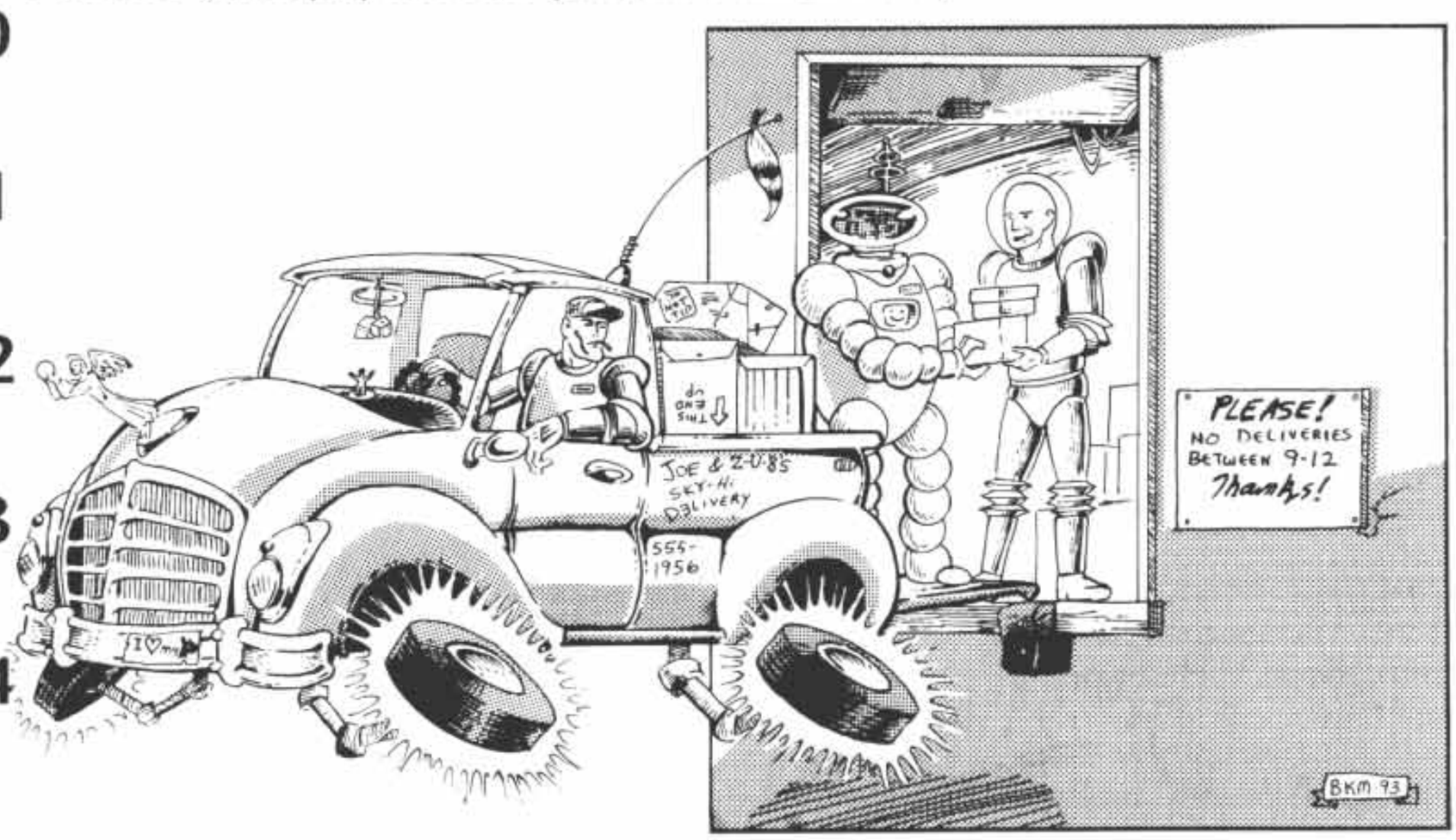
But that is not true with a Dean Drive. The Dean Drive manages to change the momentum of the object it accelerates without changing the momentum of any other component of the solar system (or the galaxy, or the universe), and thus alters the total momentum in the system, hence violating the law of conservation of momentum. For the Dean Drive to work, our current understanding of the physical universe has to be seriously flawed.

On the other hand, who is to say, especially in a science-fiction game, that our understanding of the physical universe *isn't* seriously flawed? Certainly not us, and in that spirit we offer the Dean Converter as an alternative to conventional thrusters.

Design: The Dean Converter is an extremely efficient reactionless drive which requires only electric energy to operate. Each cubic meter of Dean Converter machinery converts 1 megawatt of power to 100 metric tonnes of thrust. There is no lower or upper limit on the size of Dean Converter machinery. Each cubic meter of Dean Converter machinery masses 2 metric tonnes and costs MCr0.1. Tech level of initial availability is left entirely up to the referee.

4. Thruster Plates

Maneuver drives in previous editions of **Traveller** were explained as related to the same body of theoretical physics which allowed artificial gravity and damper fields, which is to say manipulation of gravitational force and the strong nuclear force. Artificial gravity





was defined as a force which could either push or pull and which acted on the gravitational field of a mass. Clearly, this would not be an efficient means of travel outside of a gravity well, and so a further advance was postulated which allowed the force generated by the drive to push on the actual thruster plates of the ship itself, propelling it through space and achieving a true reactionless drive.

The problem with this approach is that it runs into the same wall as does the Dean Drive (see above). A drive can be reactionless without violating the law of conservation of momentum if it moves a craft around without changing its velocity. ("Huh?" No, this is not a typo. Consider the jump drive. It moves a ship from point A to point B, and does so without pushing it through the intervening space. It is a reactionless drive, but when the ship arrives at point B it has exactly the same momentum in the form of a vector as it had when it left point A. Thus, its velocity has not changed, nor has the momentum in the system overall been altered.) But a reactionless drive which changes the physical velocity of the craft shatters the law of conservation of momentum.

As indicated in the discussion of the Dean Drive, referees of science-fiction games should not be too shy about breaking the laws of physics. The *fiction* in the genre's name gives you license to do so. But the *science* in the genre's name requires you to at least know what you are doing and have a pretty good reason for doing it. In the case of reactionless drives in general, the best reason is that the sort of campaign you are running requires a cheap, efficient, no-hassle way of getting from here to there. It is best suited to campaigns with a strong space-opera flavor. (Don't sneer; those can be the most fun sometimes.)

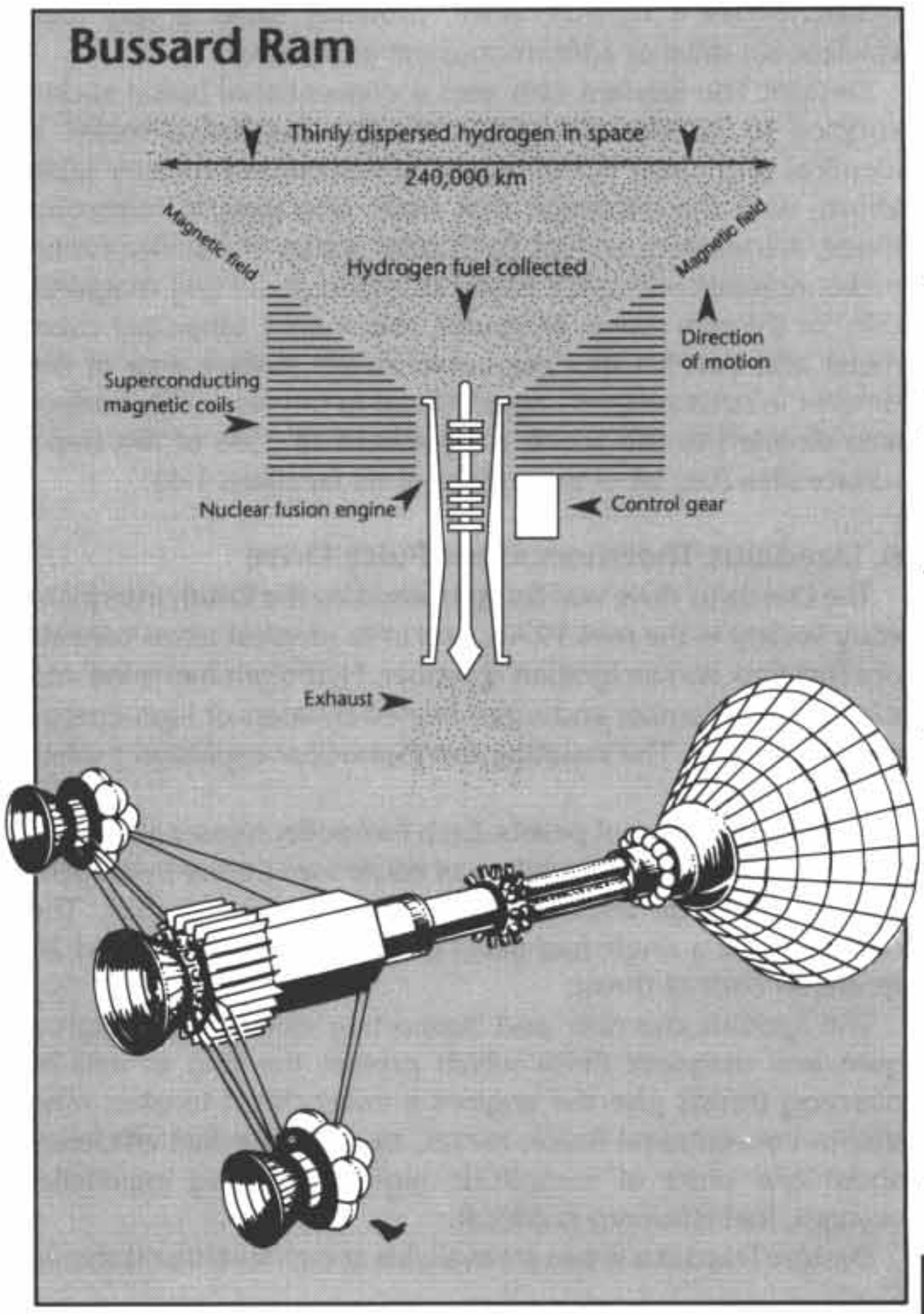
Design: Thruster plate technology becomes available around tech level 11 (due to the fact that it is tied closely to many of the other theoretical breakthroughs that occur at about that time). Each cubic meter of installed thruster plate drive generates 40 metric tonnes of thrust, masses 2 tonnes, requires 1 MW of power, and cost MCr1. Surface area (used by spacecraft only) in square meters is equal to thrust in tonnes ÷ 200.

5. Bussard Hydrogen Ram

The Bussard ram (so called after Dr. Robert Bussard, who first proposed it in 1960) was once thought to be scientifically and technologically feasible. Greater knowledge of the workings of superconducting magnets and deuterium fusion now seem to have relegated the Bussard ram to the arena of science fantasy. Even if technologically feasible, Bussard rams are not generally used in the **Traveller** universe because jump drives make them irrelevant. This is because Bussard rams are drives designed to bridge the distance between stars at sublight velocities.

The biggest single problem in tackling interstellar distances is fuel. You have plenty of distance between stars in which to accelerate and get up to really healthy fractions of light speed, but as hard as it is to find room for several G-hours of acceleration, imagine trying to carry several G-*years* of fuel—then imagine slowing back down.

The Bussard ram beats this problem by using the thin interstellar atmosphere for fuel. What atmosphere, you say? You thought space was a vacuum? Well, for most purposes it is. There is insufficient atmosphere to have any measurable pressure, but



there is the odd hydrogen atom floating around. The problem is gathering enough of "the odd hydrogen atoms" (one or two atoms per cubic centimeter of space) to constitute useful fuel for a hydrogen fusion rocket.

The answer is twofold. First, the faster the ship moves, the more volume of space it passes through, and thus the more atoms of hydrogen it can collect for fuel in a given amount of time. Second, if the ship has a sufficiently large fuel scoop, it can gather a larger volume of hydrogen. In round numbers, a ship needs a scoop area of about 35,000 square kilometers per metric tonne of ship's mass per G of constant acceleration, and needs to reach about 1% of light speed before it is scooping enough hydrogen for the ram to sustain a continuous fusion reaction. By way of illustration, this means that a fairly tiny ship, of about 1000 tonnes mass, would require a scoop over 2000 kilometers in diameter.

It is clearly not feasible to build a solid scoop that large, given the weight limitations of the craft. The answer is instead to use a network of superconducting magnets as the base of the scoop and use their magnetic fields as the scoop itself. That is, the ship's scoop is not a physical presence but rather a large magnetic field projecting from the front of the ship.

To accelerate the ship to 1% of light speed (3000 kilometers per second, or 180 **Brilliant Lances** hexes per 30-minute game turn)



would require a separate drive, probably either a very fuel-efficient ion drive or a thermonuclear pulse drive.

Design: The Bussard ram uses a conventional fusion rocket coupled to an electromagnetic scoop. The fusion rocket is identical to the one noted on the self-contained thruster table above, with the exception that while operating in ramscoop mode, it consumes no fuel. Each cubic meter of installed fusion rocket requires one cubic meter of superconducting magnetic coils for the ram scoop. Magnetic coils mass 1 tonne per cubic meter and cost MCr0.5 per cubic meter. Surface area of the thruster in square meters equals thrust in tonnes + 200. Surface area devoted to the scoop is equivalent to 25% of the ship's surface area (i.e., all of the surface of hit locations 1-5).

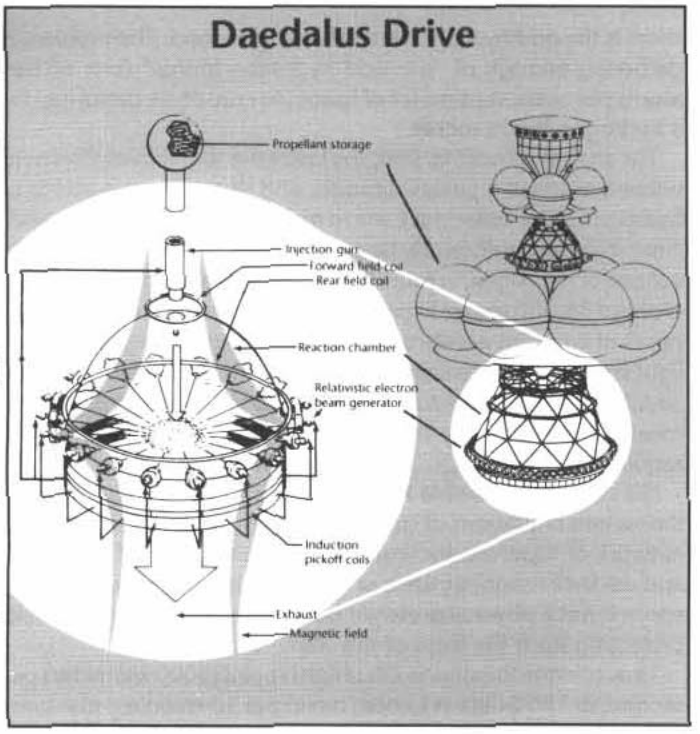
6. Daedalus Thermonuclear Pulse Drive

The Daedalus drive was first proposed by the British Interplanetary Society in the mid-1970s, and in its simplest terms consists of a fuel tank and an ignition chamber. Hydrogen fuel is fed into the ignition chamber and super-heated by lasers or high-energy electron beams. The resulting thermonuclear explosion pushes the ship forward.

Fuel is in the form of pellets. Each fuel pellet masses about 1.5 grams and consists of a mixture of deuterium (heavy hydrogen) and helium-3, all enclosed in a superconducting shell. The detonation of a single fuel pellet produces between 15 and 20 tonne/seconds of thrust.

The ignition chamber and supporting electronics (electron guns and magnetic fields which protect the ship as well as directing thrust) give the engines a lower thrust-to-mass ratio than a conventional fusion rocket, but provide fuel efficiency about one order of magnitude higher. For long interstellar voyages, fuel efficiency is critical.

Design: Daedalus drives are available at tech level 9 and above. Each cubic meter of engine masses 1 tonne, generates 1.5 tonnes of thrust, and consumes 0.0005 tonnes of fuel per hour. Price is MCr0.5 per cubic meter of engine. Surface area of the ignition chamber in square meters is equal to tonnes of thrust + 200. Because of the exacting manufacturing requirements, fuel for the Daedalus drive costs 100 times as much as conventional hydrogen fuel.



7. Solar Sails

Solar sails are extremely leisurely ways of moving around in a solar system. Solar sails are extremely large, lightweight reflective surfaces which rely on the physical pressure of photons in sunlight for thrust.

The almost-universal first instinctive reaction to solar sailing is that the sail can only carry the craft away from the sun, but in fact the sail can be used to tack (to borrow a yachtsman's term) and use thrust to move back toward the sun. How is this possible?

The solar sail is not a stationary object with straight-line vectors. As it is an object in the solar system, it is in orbit (although it may be a very distant orbit) around the sun. As the sail can be angled, it can be used to either add to the orbital velocity or decrease orbital velocity. As orbital velocity increases, the sail assumes an orbit farther away from the sun, and so moves away from it. As orbital velocity decreases, however, the sail assumes a closer orbit and so actually moves toward it. In both cases, however, movement is gradual due to the extremely low thrust generated by the sail.

The pressure of sunlight on the sail inside the habitable zone of a star system generates 0.5 kg of thrust (or 0.0005 tonnes) per square kilometer of sail. As a square kilometer of solar sail, complete with its rigging, weighs 0.5 tonnes, or 1000 times as much as the thrust generated, and that is without any payload, it is immediately obvious that the sail generates minute acceleration. However, that minute acceleration is constant and free (with respect to fuel), and so is very economical for long voyages if you aren't in any particular hurry.

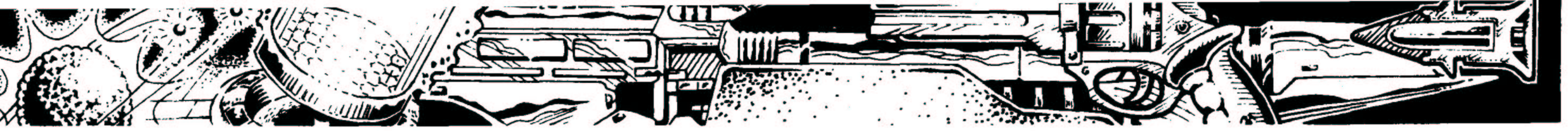
To calculate G-hours of thrust generated by the sail, divide the total mass of the spacecraft (including the mass of the sail) by the sail's thrust in tonnes (square kilometers of sail area multiplied by 0.0005). The result is the number of hours of acceleration needed to achieve one G-hour of acceleration.

Thrust is multiplied by 10 in the star's inner zone and by 0.01 in the star's outer zone.

Solar Sails

TL	*Mass*	*MCr*
8	0.5	.001
9	0.4	.0005
10	0.3	.0004
12	0.2	.0003
14	0.1	.0002
16	0.05	.0001

TL: Tech level of first availability.
Mass: Mass, in tonnes, per square kilometer of sail surface.
MCr: Price, in millions of credits, per square kilometer of sail surface.
Vol: Stored volume of 1 square kilometer of solar sail is 10 cubic meters.



CHAPTER 10
Lifters

By lifters we mean unconventional methods of levitating a craft (conventional means including lifting gasses, airframes, rotors, and conventional thrusters). The standard lifter used in **Traveller** is the contra-gravity device found on most spacecraft. Several alternative lifters are described later in the chapter.

It should be noted that two other alternative lifter technologies—the Dean Drive and thruster plates—are included in the Sublight Drive chapter (Section 9) as they are also useful for interplanetary travel.

Contra-Grav

Many spacecraft have contra-grav (CG) lifters as fuel-efficient means of landing and taking off from a planet surface, and CG lifters are also used on grav vehicles. CG lifters do not provide thrust and so cannot physically lift a craft or vehicle. Instead, they neutralize most of the gravitational attraction of a world (approximately 99% of gravitational force, beyond which power use becomes prohibitive). This, combined with atmospheric pressure, will provide buoyancy in very dense atmospheres and so allow the craft to float at low altitudes, but usually CG is used only as an adjunct to the ship's thrusters. By neutralizing most of a world's gravitational field, a ship with only 1G of thrust can still escape the world's gravity well.

Note that CG does not reduce the mass of the ship, and so a 1G thruster will still only produce 1G of acceleration; CG merely negates the gravitational vector of a world.

Surface area below (used for starships only) includes space for landing gear/skids.

Contra-Grav Lifters

Type	*TL*	*MW*	*Kl*	*Mass*	*MCr*	*Min Vol*
Standard	9	0.3	0.5	0.4	.02	1
Improved	10	0.2	0.3	0.3	.025	0.3
High Efficiency	12	0.1	0.3	0.2	.03	0.03

TL: Tech level available.

MW: Power requirement per displacement ton (14 kl) of hull.

Kl: Volume, in kiloliters (cubic meters), per displacement ton (14 kl) of hull.

Mass: Mass, in tonnes, per displacement ton (14 kl) of hull.

MCr: Price, in millions of credits, per displacement ton (14 kl) of hull.

Min Vol: Smallest installation volume allowed.

Surface Area: 10% of total hull surface area, used for spacecraft only. Surface area is not calculated separately for lift vehicles, as it is subsumed into their standard surface area calculation.

ALTERNATIVE TECHNOLOGIES

1. Ducted Fans

Although ducted fans are currently capable of lifting small payloads, the technology presented below relies on material breakthroughs that allow much stronger fan blades as well as some minor bending of aerodynamic laws.

Ducted fan lifters work on principles similar to those used by helicopters. Instead of a single (or sometimes twin) large-diameter rotor, however, ducted fan craft have a larger number of smaller multiple-blade propellers, almost identical to turbine fans, imbedded in the craft's hull. These high-speed fans suck air in from overhead intakes and vent it beneath the craft, providing lift. The power plant also injects fuel directly into the air flow and combusts it, effectively turning the fan assemblies into very large diameter turbofans. As with helicopters some of this lift can be vented for thrust.

Because of the ability to angle atmosphere flow inward from the ducts along the outer edges of the vehicle, ducted fan lifters create a ground effect cushion directly under the vehicle when operating at very low altitude (less than four or five meters), and it is at these altitudes that ducted fan craft are most efficient. Above these altitudes, lift declines dramatically and increasing amounts of engine thrust have to be switched to lift instead of thrust.

Design: Ducted fan technology becomes available at tech level 8, when light composites make stronger fan blades possible. The thrust characteristics of ducted fan assemblies are shown below. Thrust generated by ducted fans may be devoted to either lift or lateral thrust (and may be switched from one to the other during flight). Speed is calculated based on lateral thrust. Thrust devoted to lift must be equal to the mass of the vehicle. All thrust devoted to lift at NOE altitude, however, produces double lift. That is, each tonne of thrust produces 2 tonnes of lift.

Characteristics of ducted fan assemblies are shown below.

TL	*Thrust*	*MCr*
8	1	0.5
10	1.5	0.4
12	2	0.3
14	2.5	0.2

TL: Tech level of first availability.

Thrust: Thrust, in tonnes, is equal to the power plant output devoted to thrust, in megawatts, multiplied by the value shown on the table.

MCr: Price, in millions of credits, per cubic meter of fan assembly.

Vol: Volume, in cubic meters, is equal to the power plant output in megawatts devoted to the ducted fan multiplied by 0.5.

Mass: Mass of the fan assembly in tonnes is equal to its volume in cubic meters.

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Afterburn: All ducted fans have the ability to inject fuel and burn it in the air stream, which works similar to the afterburner on a jet. This doubles fuel use for the power plant and increases thrust by 50%. Afterburners are generally used only at high altitudes or for bursts of speed.

2. Maglev

Current magnetic levitation (maglev) research is concentrated on making near-frictionless trains, which ride on (or actually over) magnetized rails. This is not what we are talking about here, however. Maglev here is defined as a means of free levitation by riding the magnetic field of a planet. One obvious limitation of this form of lifter is that it is useless on a world which does not have a magnetic field, or which has a very weak one.

Aside from the fact that they function only in a strong magnetic field, maglev lifters are built and function in the same way as CG lifters.

Maglev Lifters

TL	*MW*	*Kl*	*MCr*
10	0.3	0.5	.02
12	0.25	0.4	.025
14	0.2	0.3	.03
16	0.15	0.25	.035
18	0.1	0.2	.04
20	0.05	0.1	.05

TL: Tech level available.

MW: Power requirement, in megawatts, per displacement ton (14 kl) of hull.

Kl: Volume, in kiloliters (cubic meters), per displacement ton (14 kl) of hull.

Mass: Mass, in tonnes, is equal to volume in cubic meters.

MCr: Price, in millions of credits, per displacement ton (14 kl) of hull.

3. Gravitic Displacement

The contra-grav lifters described in the game are far from the only imaginable means of manipulating gravity, and of the various types imaginable, one of the more interesting we cal a gravitic displacement (GD) field. A GD field displaces the potential energy of a mass toward the closest gravity source without moving the mass itself, thus circumventing gravity with respect to the physical mass. This allows a massive objec to rise and hover, and has much the same effect as contra-grav The technical requirement of GD fields are similar enough to those of contra-grav that the same design procedure can be used. The only important difference is in the actual operation of the lifters.

Since a GD field displaces the potential energy of a mass toward the nearest gravity field, GD lifters have to be used with great care. A ship massing 1000 tonnes and hovering at a dozen meters or so will have the same effect on the ground surface directly beneath it as if it were resting physically on the ground. Light structures, plant life, and animal life alike would be crushed.

Craft at higher altitudes cause less surface disruption as their potential mass is spread over a wider area, but there are strict altitude and traffic regulations for even small craft flying near metropolitan areas. Large craft have very rigidly controlled landing and takeoff patterns, and these are over water whenever possible. (The ship will make a huge depression in the surface as it pulls over the water at low altitude.)

Grav vehicles, such as grav tanks, can again make crushing overrun attacks on enemy personnel, but pressure-sensitive mines (some of which are angled to fire charges directly up at the belly of grav vehicles) will also be triggered by their passing. In short, GD lifters are identical in gross effect to CG lifters, but add a number of interesting additional detailed interactions with a planet surface.

Replacement Pages: A block of text on page 75 was inadvertently covered during printing of this product. Remove pages 75 and 76 from this book and replace them with this sheet.

Please accept our apologies for any inconvenience.

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CHAPTER 11
Life Support

Spacecraft, high-altitude aircraft, and all vehicles intended for use in a hostile environment require some sort of life support equipment. Specific design sequences provide guidance on minimum required levels of life support.

Life Support Equipment

Oxygen tanks and masks allow breathing at high altitudes or in a hostile atmosphere. Overpressure consists of a compressor and filter for use on worlds with tainted atmospheres or in a chemical, biological, or radiologically contaminated environment. It draws air in, filters any contaminants out of it, and pumps it into the craft at a higher pressure level than the outside. This allows an unsealed vehicle to remain contaminant free, as there is a constant flow of air outward, preventing contaminated air from entering.

All powered vehicles include some form of heating and internal lighting.

Basic life support provides sealed environment, air, and water. Extended life support adds waste disposal/recycling and food, and is required for all craft that are operated for 8+ hours at a time, or vehicles in a hostile environment intended to operate for a day or more away from base. Craft with extended life support substitute this for basic life support.

The most common types of life support are shown on the table below.

LIFE SUPPORT EQUIPMENT

TL	Description	MW	Vol	Mass	MCr
5	Air Lock	0.001	3.000	0.200	0.005
5	Oxy. Tanks & Masks	—	0.010	0.010	0.0001
5	Overpressure	—	0.001	0.001	0.0001
5	Basic Life Support	0.0001	0.005	0.005	0.0003
6	Extended Life Spt.	0.0002	0.008	0.008	0.0005
8	G Tanks (pass)	—	2	2	0.01
8	G Tanks (crew)	—	2	2	1
10	Artificial Gravity/ G Compensators*	0.005	0.010	0.020	0.0005

TL: The tech level of availability.

MW: The energy requirement, in millions of watts, per cubic meter of enclosed hull volume (except that the requirement listed for air locks is per installed air lock).

Vol: The volume of life support equipment, in cubic meters, per cubic meter of enclosed hull volume (except that the requirement listed for air locks is per installed air lock and for oxygen tanks and masks is per passenger and crewperson).

Mass: The mass of life support equipment, in tonnes, per cubic meter of enclosed hull volume (except that the requirement listed for air locks is per installed air lock and for oxygen tanks and masks is per passenger and crewperson).

MCr: The price of life support equipment, in millions of credits, per cubic meter of enclosed hull volume (except that the requirement listed for air locks is per installed air lock and for oxygen tanks and masks is per passenger and crewperson).

Aircraft: For aircraft, the enclosed hull volume, in cubic meters, for purposes of life support requirements, is defined as the total number of passengers and crew multiplied by 2.

Airlocks: The minimum number of airlocks required on a spacecraft is equal to the hull number (displacement in tons) divided by 100, rounding all fractions up. Each air lock requires 2 square meters of hull surface area.

G Compensation

Ships with a G rating greater than 1 may only use the acceleration for limited periods of time, unless they have G compensators or G tanks installed. (Prolonged periods of high acceleration will otherwise injure the crew.)

G tanks are large fluid-filled tanks that passengers and crew are immersed in during high-G maneuvers. As crew workstations require secure means of interacting with controls and monitors while immersed, crew (workstation) G tanks are extremely expensive.

Artificial gravity G compensators create an artificial gravity field in direct opposition to the axis of acceleration, thus negating the acceleration (up to the limit of the artificial gravity field). Compensated Gs is the number of acceleration or evasion Gs negated by the compensator. The amount of Gs which can be compensated vary by tech level as shown on the table below.

All crews can automatically withstand 1G, so the maximum acceleration without degrading crew performance is actually 1G above this level, as shown in the Max Accel column to the left of the slash. Evasion Gs, however, are applied erratically, and so cannot be withstood by crews without degrading performance, as shown in the Max Evade column to the left of the slash. Beyond these levels, all tasks are performed at one difficulty level higher (+1 Diff Mod) per G-turn applied.

Starship crewmembers who are strapped into workstations (for **Traveller** space combat, this is assumed to be everyone except damage control parties, maintenance crew, stewards, medics, and ship's troops) can withstand 1G additional of acceleration or evasion before their performance is degraded. These figures are shown to the right of the slash in the Max Accel and Max Evade columns.

G tanks always compensate 1G and all passengers and crew in -tanks are treated as strapped into a workstation (and so use that column). Note that damage control parties cannot use G tanks while working, and so such a ship may only accelerate at 1G while making repairs and may not evade at all.

TL	Compensated Gs	Max Accel/ Workstation	Max Evade/ Workstation
10	1G	2G/3G	1G/2G
11	2G	3G/4G	2G/3G
12	3G	4G/5G	3G/4G
13	4G	5G/6G	4G/5G
14	5G	6G/7G	5G/6G
15	6G	7G/8G	6G/7G
16	7G	8G/9G	7G/8G
18	8G	9G/10G	8G/9G
20	9G	10G/11G	9G/10G



Extended Accommodations

Craft which will house passengers and crew for more than 24 hours require extended accommodations. Passengers and crew require bunks for short trips of several days, provided they understand that accommodations are to be austere. Staterooms are required for paying passengers. Each High Passage passenger requires one stateroom (large or small). Middle Passage passengers require one stateroom (large or small) in the Regency, but are placed two to a large stateroom in the Wilds (never two to a small).

Civilian crew are usually accommodated two to a large stateroom, or one to a small stateroom in the case of officers.

Military crew are usually accommodated at best like civilian crews, but will often be carried at double occupancy (two per small, four per large stateroom) or greater, or even housed in bunks. Bunks may be multiple-occupied by "hot bunking," by sleeping in three shifts per 24-hour period.

Officers will not sleep in bunks, nor accept worse than double occupancy.

All values on the table below are per installation.

EXTENDED ACCOMMODATIONS

Description	*MW*	*Vol*	*Mass*	*MCr*
Bunk	—	14	0.5	.005
Low Berth	0.001	14	1.0	.05
Emergency Low Berth (for 4)	0.002	28	2.0	.1
Small Stateroom	0.0005	28	2.0	.04
Large Stateroom	0.001	56	4.0	.1

Environmental Gravity

On trips lasting longer than one week, the absence of gravity in deep space will begin to have harmful physiological effects, principal among them being loss of muscle tone and, eventually, loss of bone calcium. Regular exercise can only reduce these effects, it cannot prevent them. Prevention requires some form of artificial gravity. Ships equipped with artificial gravity generators (covered above under G compensators) automatically have a steady 1G environment. Ships without grav compensators must instead generate gravity by means of spin.

Ships which rely on spin habitatsto provide gravity do not have to spin the entire vessel (although sometimes this is done). Instead, only that part of the vessel occupied by accommodations need be spun.

There are several varieties of spin habitats, broken into the following general categories. The several designs of spin habitats are differentiated more for purposes of deck plans than for the particulars of design. The requirements for volume and additional machinery actually vary very little between most of these. Their descriptions should help visualize your ship during design.

Spun Hull: This is the simplest, but usually largest, spin habitat. In it, the hull is a large cylinder that spins around its long axis, thus providing centrifugal gravity in the outer part of the cylinder. Due to Coriolis effects, the central part of the cylinder (within a radius of 10 meters) is unusable for quarters or workstations, and thus is usually used for fuel, cargo, and low-maintenance machinery. More often the hull is built like a doughnut, and the central core is left empty. The basic game's lab ship is an example of a ship built in this configuration.

Only open structures and cylinder hullforms may use this type of spin habitat.

No additional machinery is required for a spun hull.

Double Hull: In this design, the outer hull spins but surrounds an enclosed inner hull which does not. Again, this design is most useful for very large ships as the enclosed central hull is at least 10 meters in radius.

Only cylinder hullform ships may use this type of spin habitat.

Double hulls require a volume of machinery equal to 1% of the enclosed volume of the *outer* hull. Mass is 1 metric tonne per cubic meter and price is MCr0.001 per cubic meter.

Hamster Cage: The hamster cage consists of a cylindrical module that is at 13 meters in radius, and that spins to create artificial gravity. Unlike other designs, the hamster cage is often set at right angles to the axis of the ship and generally installed in counter-rotating pairs (to eliminate torque effects on the ship's attitude).

Any ship hullform may use hamster cages, but the ship may not have an airframe configuration.

Hamster cages require a volume of machinery equal to 1% of the enclosed volume of the modules. Mass is 1 metric tonne per cubic meter and price is MCr0.001 per cubic meter.

Spin Capsule: The most common spin habitat in use is the spin capsule. In this design, two or more quarters modules of the desired size are placed at the ends of pylons that rotate around a common axis. (Usually, but not always, this is also the long axis of the ship). The spin capsules have a rotational radius of at least 10 meters. Access to the capsules is by way of the pylons, which contain ladders or powered lifts. Power and atmosphere is also supplied through the pylons.

All spin capsules are designed to retract against the ship's hull during violent maneuvers or atmospheric travel, and so any hullform and configuration can have spin capsules.

Spin capsules require a volume of machinery equal to 5 percent of the enclosed volume of the capsules. Mass is 1 metric tonne per cubic meter and price is MCr0.001 per cubic meter.

Two Body: Two ships can attach themselves together using a pylon and spin around a central point to provide gravity. The chief disadvantages of this design are that both ships must be present in order to spin and neither ship may maneuver or change vectors while linked.

All that is required for a two-body spin habitat (aside from the two ships) is a pylon made of hull material (hard steel or a material of greater hardness) that is at least 1% of the combined mass of the two ships. Volume and price are determined by the material used to construct the pylon.

Custom Life Support Design

Fuel tankage volume does not require life support or artificial gravity. However, without these, the tankage is more difficult to repair and maintain, and cannot be used for emergency or expedient measures (such as the installation of modular quarters).



CHAPTER 12
Cybernetics

The core **Traveller** universe does not concentrate heavily on cybernetic enhancements. Although there is no reason not to include this sort of technology in an on-going campaign, its effects on both the style and substance of play are so powerful as to completely dominate the game. Therefore, referees should give some serious thought to the sort of game they wish to run before deciding on how much cybernetics will be used.

The Imperial Space campaign will not be dominated by cybernetic issues, but will deal with these issues only on the level that they provide futuristic "realism."

Cybernetics is the science of electronic, mechanical, and biological enhancement of living organisms. Its most primitive antecedents are the peg legs and hooks used to replace missing legs and hands, inferior substitutes for the originals. Engineering advances made prosthetic limbs progressively more effective replacements for missing body parts, until eventually the replacements became superior to the original organic component.

Once elective cybernetic enhancement becomes a reality, each society has to face a number of ethical issues which are not easily resolved, and which invariably turn separate societies in different directions. Some embrace cybernetic enhancement whole-heartedly, others reject it completely, and still others find an uneasy middle ground. How a particular society reacts to cybernetic enhancement is up to the referee, but is an issue which should be considered carefully before cybernetics are incorporated into a campaign.

Virtually all societies view cybernetically enhanced humans in different terms than "natural" humans, and a wide variety of slang (some derogatory) inevitably grows up to help define that difference. The most common slang for a cybernetically enhanced human is "ironman" (or "iron maiden"), while unenhanced humans are called "slicks." By the same token, cybernetic enhancements which are visually indistinguishable from original organic components are called "slickware," as opposed to hardware or cyberware.

As general rule, it is a good policy to impose some penalty on visible cybernetic enhancements, usually to a player's Charisma attribute, and usually amounting to a –1 per visible cybernetic modification.

A typical outline progress of cybernetics by tech level is shown on the following table.

TL	*Type*
5	Primitive prosthetics (artificial limbs)
6	Reconstructive surgery
7	Advanced plastic surgery
8	Full-function prosthetics
9	Direct brain-machine interface allows prosthetic eyes and ears and neural jacks. Early controlled chemical manipulation of body systems
10	Enhanced-performance prosthetics and subdermal armor
11	Direct computer implantation
12	Advanced chemical manipulation of body systems
13	Genetic manipulation, enhancement, and replacement of selected tissues

A wide variety of cybernetic modifications and enhancements are discused below. These are broken into four broad categories: head jobs, body implants, peripherals, and therapy.

Head jobs, as the name suggests, have to do with cybernetic modifications to the character's head, usually to the principal sensory organs (eyes and ears).

Body implants include large systems which cannot easily be fit into the head and which are instead mounted in the abdominal or thoracic cavity, sometimes replacing or displacing internal organs.

Peripherals are modifications to the arms and legs, either for improved performance or adaptation of limbs to special functions.

Therapy consists of organic modification of the character's body, either through drugs, genetic manipulation, or surgical procedures.

Power

Many of the cybernetic enhancements detailed require the input of electrical power to function. This power is produced in one of two ways.

Items that need only small amounts of power, such as various passive sensor eyes, are powered by tiny thermoelectric generators that produce the needed electrical power from body heat. These generators are subsumed within the volume, weight, and price of the item.

Other items, particularly those which transmit energy (active sensors and radio or video transmitters) and enhance strength, have thermoelectric power supplemented by tiny long-life batteries, also subsumed within the volume, weight, and price of the item. These batteries must be periodically recharged by a specialized adaptor which can convert standard current into a form suitable to the batteries.

Some systems require no power at all. These systems are completely passive, as in the case of subdermal armor, completely biological, as in the case of aquatic skin, or have their mechanical functions connected to the host's muscles, which operate the mechanism as if it were any normal skeletal component, as in the case of the hard hand. All of the respiratory implants are treated as being completely biological, even though they may include the insertion of various synthetic components.

Head Jobs

Head jobs all require delicate surgery to the head, and most deal with very sensitive nerve connections. These procedures can be extremely dangerous if not done properly, and so they tend to be the most expensive of the cybernetic enhancements.

Cyber Eyes: Direct electronic/nerve interface at tech level 9 opens the way for a wide variety of cybernetic enhancements to eyesight. Early cyber eyes are single-function eyes, and are easily recognizable as mechanical implants, but at higher tech levels a wider variety of functions are available and they become less obvious.



The following table shows the general development of cyber eyes over time. In all cases, the cyber eye includes basic visible light vision, and the table indicates the number of additional features which can be added. A dash indiactes that a cyber eye is not available at that tech level and a "0" indicates that no extra function can be added to basic visible light spectrum vision. Note that some additional options count as more than one feature for purposes of the capacity of the eye.

"Hard" eyes are immediately recognizable as cybernetic enhancements, while "slick" eyes appear normal to casual observers.

	Functions	
TL	*Hard*	*Slick*
9	0	—
10	1	—
11	2	0
12	3	1
13	4	2
14	5	3
15	6	4
16	7	5
17	8	6
18	9	7
19	10	8
20	11	9

A number of options available for cyber eyes are listed below. In all cases, skill tests to detect objects using cyber eyes are made with the Observation asset.

Telescopic: Telescopic vision allows magnification similar to a telescope or binoculars, with zoom controlled by eyeball pressure (which is manipulated by squinting).

Active Infrared: A beam of infrared light is projected either from forehead-mounted lights (in the hard version) or through the eye itself (in slick versions). Active infrared is a useful sensor at night, but will not penetrate smoke, dense fog, blowing sand, etc. It has a short range of 60 meters. Slick active IR eyes are sufficiently bulky that they count as two options instead of only one.

Passive Infrared: The eye is extremely sensitive to infrared radiation and can "see" heat. Most living creatures and machines have very distinct heat signatures, while inanimate objects can usually be seen by the amount of heat that they absorb from the sun. Nevertheless, objects after sundown which have completely cooled off become almost invisible to passive IR. Unlike active IR, passive IR can see through most smoke and blown dust, but is rendered ineffective by rain or snow. It has a short range of 30 meters.

Star Eyes: Star eyes use light-amplification techniques to allow normal vision in low light conditions (primarily nighttime using starlight, hence the name). Smoke, blown sand, and any sort of atmospheric conditions will interfere with star eyes. They have a short range of 120 meters. Star eyes are sufficiently bulky that they count as two options instead of only one.

Color Enhancement: Color enhancement, originally developed to aid color-blind patients, is useful for resolving detail at long distances and for detecting camouflage. Color hue and intensity is adjusted by increasing or decreasing eyeball pressure. (This can be accomplished by squinting.) Color enhancement is useless in limited-visibility situations. For purposes of detecting camouflage, color enhancement has a short range of 120 meters.

High-Resolution Thermal (HRT): HRT is an advanced form of passive infrared with a short range of 300 meters. HRT can see clearly through most forms of smoke, but has its performance cut in half by rain or snow. HRT eyes are sufficiently bulky that they count as two options instead of only one.

Imaging Radar: The eye contains a millimeter wave radar transmitter and processor unit with fine enough resolution for image formation. Imaging radar has a short range of 300 meters and is not degraded by any atmospheric effects. Imaging radar is sufficiently bulky that it counts as three options instead of only one.

Image Enhancement: Image enhancement not only magnifies but also sharpens focus and contrast, making visual recognition easier. Image enhancement has the combined effects of telescopic vision and star eyes. Image-enhancement eyes are sufficiently bulky that they count as two options instead of only one.

Wide-Spectrum Visual (WSV): This eye combines magnification and image enhancement with sensitivity to light across a broad spectrum, from ultraviolet through infrared. As such, it combines most of the advantages of earlier sensor eyes in a single package. Its short range is 300 meters. WSV is sufficiently bulky that it counts as three options instead of only one.

Target Link: Only characters with a neural jack may use a target-linked eye, and only with weapons designed for target interface (so-called "smart" weapons). The weapon's bore sensor, when engaged, projects a target image in the middle of the user's vision field, showing what the weapon "sees" rather than the actual image. An alternative shows a distinct colored line along the weapon's line of fire if the line of fire is within the user's field of vision, and a colored arrow prompt showing what direction to look to find the line if it is out of the user's field of vision. This line is invisible to anyone else, since it exists only inside the user's eye.

Any small arm or heavy weapon may be modified by the addition of a "smart sight." Available at TL 10, it has a volume of 1.5 liters, masses 0.2 kilograms, and costs Cr5000. The smart sight also has the features of an electronic sight (see page 97).

Recorder: This option allows the user to make a one-hour video recording and play it back at a later time. The recording can be transferred to hard video by means of a small laser viewer that fits over the eye. The video image on the organic recording will begin to deteriorate after 48 hours. The recorder feature is sufficiently bulky that it counts as three options instead of only one.



Holo-Recorder: As the recorder described above, but the recording is a three-dimensional hologram. The holo-recorder feature is sufficiently bulky that it counts as four options instead of only one.

Eyeball Display: This allows projection of information in readable form in the user's field of vision, much like the heads-up display of a fighter aircraft. It is particularly useful if a computer implant is used, but can is also useful with chronometer or inertial navigation implants.

Rangefinder: This option may only be installed if the user also has an eyeball display. The rangefinder projects a low-energy infrared laser beam and determines range from the reflection. It is accurate to within 1% of range out to 5 kilometers.

Cyber Ears: Cybernetic augmentation of hearing is available considerably sooner than is visual augmentation. Early cyber ears are simple amplifiers, often worn externally, which are later replaced by implants inside the hearing canal, all but invisible. At higher tech levels, a wider variety of functions are available.

The following table shows the general development of cyber ears over time. In all cases, the cyber ear includes basic hearing, and the table indicates the number of additional features which can be added. A dash indiactes that a cyber ear is not available at that tech level and a "0" indicates that no extra function can be added to basic hearing.

"Hard" ears are immediately recognizable as cybernetic enhancements, while "slick" ears appear normal to casual observers.

	Functions	
TL	*Hard*	*Slick*
6	0	—
8	1	0
10	2	1
12	4	2
14	5	3
16	6	4
18	7	5
20	8	6

A number of options available for cyber ears are listed below.

Amplified: This allows amplified hearing and clear audio resolution of faint sounds at distances of 100 meters or more.

Low Frequency: This allows hearing of low-frequency sounds, sounds which are more often felt or sensed than heard. Hearing these sounds makes it easier to pinpoint the direction of origin. Early versions of this ear tend to be oversized.

High Frequency: This option allows a person to hear sounds above the aural range of normal humans. Early versions of this ear tend to be made from very dense material, such as plastic or even metal.

Sound Dampening: Although loud or irritating sounds won't damage bionic ears, they can be annoying, distracting, or even painful to the user. This option enables the owner to dampen out specific ranges from the sonic spectrum, allowing sound to be dampened, which can also make it easier to hear a specific sound (such as a human voice) in a noisy environment.

Recorder: This option allows the user to record one hour of sound and play it back at a later time. The recording can be accessed at any point and can be recorded over.

Sonar: Sonar ears may only be used in conjunction with a computer implant. An omnidirectional variable-tone ultrasound transmitter in the ear sends out ultrasound waves and then determines distance to the nearest objects by means of echo-ranging. A continuous low tone in the ear when the system is engaged provides information to the user as to range based on pitch and volume of the tone. If an eyeball display is available, the sonar can also build up an ultrasound map of the space around the user and overlay it on the visual image of the eye. If only one ear is installed, the head must be moved around to build up a full sonar map. If both ears have sonar features, no such "scanning" is necessary.

Comm Receiver: Communicators are normally too bulky to install in the ear itself, but the speaker for the communicator is generally located there. See the Body Implants section (page 82) for details of communicators available.

Eye-Ear Combination Suite: This is a special cybernetic combination suite available at tech level 10 and higher. It is available as a hard option only and replaces both the eye and ear on one side with a clearly visible synthetic housing. No attempt at cosmetic disguise is made. The suite allows the standard number of hard options for the eye and ear plus two additional options added to either, or split between them. Cost is the sum of the options selected, but the suite lowers Charisma by 4 instead of the normal 2 (1 each for a replacement eye and ear).

Other Options: A number of other head options are available, some of which can be used in conjunction with options already covered.

Neural Jack: This is a socket, usually mounted in the temple or (for cosmetic reasons) at the base of the neck, and is used to establish direct electronic contact between the human brain and electronic equipment. It allows the brain to receive and decode electronic data as well as transmit commands directly to linked equipment.

When "jacked in" to machinery, all tasks using that machinery become one level easier. When jacked in to memory bank and educational programs, the Education attribute is increased by 3.

Chronometer: This is an installed day, date, and elapsed time recorder linked to an eyeball display.

Inertial Navigation System: This is an installed inertial positioning and navigation system. A eyeball display must be installed for this option to be used. The navigation system will display current magnetic bearing and will also show the bearing to any of five previously recorded positions.

Psionic Shield: This serves the same function as a psionic shield helmet, but is permanently built in (and usually undetectable).



Power Jaw: This option involves complete replacement of the upper and lower jaw and teeth with synthetic material. Strength is mechanically enhanced which allows the user to bite through a variety of materials and inflict 1D6 hits if used to bite a hostile character.

Jaws of Death: This is a hardware-only option consisting of oversized jaws with enlarged teeth (so-called "jaws of death") which allows the user to use them to make armed melee attacks in the same way as do large predators. Jaws of death inflict 2D6 hits, but cause a –2 CHR penalty due to their (deliberately) grotesque appearance.

Subdermal Armor: This option surgically layers thin synthetic armor protection below the skin surface but over the skull.

The following table summarizes the important information concerning cybernetic head modifications.

Cyber Head Options

TL	Type	Number of Spaces	MCr
9/11	Visible Spectrum Eye	0	0.01
10/12	Telescopic Eye	1	0.01
10/14	Active IR Eye	1 or 2	0.03
11/14	Passive IR Eye	1	0.05
12/14	Star Eye	2	0.10
12/13	Color Enhancement Eye	1	0.005
13/16	Imaging Radar Eye	3	2.0
14/16	HRT Eye	2	0.1
14/16	Image Enhancement Eye	2	0.1
15/18	WSV Eye	3	0.5
10/11	Target Link Eye	1	0.01
11/12	Eyeball Display	1	0.01
11/15	Rangefinder Eye	2	0.02
12/16	Recorder Eye	3	0.05
14/18	Holo-Recorder Eye	4	1.0
6/8	Replacement Ear	0	0.001
8/10	Amplified Ear	1	0.001
8/10	Comm Receiver Ear	1	0.001
9/11	Sound Dampening Ear	1	0.03
9/12	Low Frequency Ear	1	0.02
9/13	High Frequency Ear	2	0.02
10/12	Recorder Ear	2	0.04
12/14	Sonar Ear	3	0.1
9/10	Neural Jack	—	0.8
11/12	Chronometer	—	0.0001
11/12	Inertial Nav	—	0.001
13/14	Psionic Shield	—	0.04
9/11	Power Jaw (1D6 damage)	—	0.005
9/—	Jaws of Death (2D6 damage)	—	0.01
10/11	Subdermal Armor AV (1)	—	0.25
12/13	Subdermal Armor AV 0 (2)	—	0.2
14/15	Subdermal Armor AV 1	—	0.2
17/18	Subdermal Armor AV 2	—	0.15

TL: Tech level of first availability. The first number is the tech level at which the feature is available as a hard option, the second the level at which it is available as a slick option.

Number of Spaces: The number of features the particular option counts as when determining the total capacity of the cyber eye or ear.

MCr: The price, in millions of credits, per feature, at the tech level of introduction. This price is halved at all higher tech levels. Note, however, that slick options cost the full printed price at their first tech level of availability, even though hard options of the same sort are by then less expensive.

Body Implants

Larger systems cannot usually be fit inside the skull and so are placed in the thoracic or abdominal cavity, usually anchored to the skeleton, and sometimes replacing part or all of an organ. Body implants include four general areas: respiratory implants, electronics, dermal alteration, and computer implants.

Respiratory Implants: These devices deal with respiration and affect the ability of the user to function under physical stress of in a hostile environment.

Supercharger: This is a device used to store some of the endorphins that the character's body naturally produces. The endorphin is saved for reintroduction into the body when needed to add extra oxygen to, and remove fatigue toxins from, the character's bloodstream. The supercharger is installed in a space made available by removal of half of a kidney. A supercharger increases a characters CON attribute by 2. No more than one supercharger may be installed.

Hypercharger: A larger and more advanced form of the supercharger, the hypercharger requires removal of an entire kidney and increases a character's CON attribute by 3. No more than one hypercharger may be installed, and it may not be installed in addition to a supercharger.

Filter Lungs: Filter lungs implant filters and scrubbers in the character's lungs which allow breathing of tainted atmosphere without harmful effects. Early versions rely on extensive pre-lung filters (mostly near the surface, and physically replacing the nose). When this version is installed, the users have to blow their "noses" frequently while operating in hostile environments to clear the filters.

"Slick" versions use filters and scrubbers actually in the lung. The impurities scrubbed from the air are flushed through the normal body waste system, but can strain the system severely. Characters must have both kidneys intact to use slick filter lungs and should drink large quantities of fluids while in a hostile environment.

Gill Implants: Gill implants allow the character to extract oxygen from water. Gil implants usually require enlargement of the thoracic cavity, and the gills themselves are clearly visible on the user's neck. "Slick" versions of the gill implant place the gill slits on the sides of the ribcage and reduce the amount of thoracic cavity increase by use of a hypercharger. (The hypercharger is not included in the price of the implant and must be installed separately.)



Electronics: The following items include communicators and sensors too bulky to emplace in the skull.

Radio Communicator: Communicators are generally attached to the spine and linked to the speaker and/or microphone in the head by means of the spinal cord. The earliest radio communicators are receivers only and are limited to a single band. Multiband receivers soon become available followed by transmitter/receivers of varying power.

Video Transmitter: Video transmitters are available one tech level after audio radio transmitters for twice the price of an audio transmitter of the same range. For example, a hardware 30-kilometer video transmitter is first available at tech level 13 and costs MCr0.02. Use of this transmitter requires either a recorder eye or a camera jacked into the transmitter.

Neural Activity Sensor (NAS): Neural activity sensors are an outgrowth of the same technology that permits electronic psionic shields. They detect and classify life forms according to the level of brain activity, but are extremely short-ranged. NAS requires an eyeball display.

Dermal Alterations: The following options deal with modifications to the user's skin. Some of these are all-body modifications (meaning they include modifications to the limbs and head as well), but they are included here for the sake of simplicity.

Aquatic Skin: Aquatic skin involves chemical and genetic alteration of the outer skin to a form resembling that of marine mammals (such as dolphins and whales), which allows prolonged immersion in water without need for a protective wet suit. Aquatic skin must be kept moist at all times, however, or it will begin to dry and crack, and the user will begin to suffer symptoms of severe dehydration within two or three days, usually dying within a week if access to water is continually denied.

Vac Skin: Vac skin is synthetically grown skin which is permeable at normal pressure differences but becomes non-permeable at pressure differences approaching 1 atmosphere. This allows characters to function in vacuum with only a breathing helmet and some sort of personal heating/cooling system.

Subdermal Thoracic Armor: This option surgically layers thin synthetic armor protection below the skin surface but over the ribcage. It covers the chest only. The hard (as opposed to slick) version of this armor is not only more noticeable, but it is also heavier. As a result, hardware versions of thoracic armor lower the CON attribute by 1.

Subdermal Abdominal Armor: This option surgically layers thin synthetic armor protection below the skin surface. Given the absence of a rigid bone structure to anchor the armor to, abdominal armor is inherently less effective than thoracic armor. The hard (as opposed to slick) version of this armor is not only more noticeable, but it is also heavier. As a result, hardware versions of thoracic armor lower the CON attribute by 1.

The following table summarizes the important information concerning the above cybernetic body implants.

Body Implant Options

TL	*Type*	*MCr*
—/11	Supercharger	0.030
—/12	Hypercharger	0.040
9/11	Filter Lungs	0.200
11/13	Gill Implants	0.300
8/9	Single-Band Radio Receiver	0.005
9/10	Multiband Radio Receiver	0.005
10/12	3-km Radio Transmitter	0.005
12/14	30-km Radio Transmitter	0.01
15/17	300-km Radio Transmitter	0.03
17/18	3000-km Radio Transmitter	0.05
15/17	5-meter NAS	0.05
16/18	25-meter NAS	0.05
17/19	50-meter NAS	0.05
18/20	500-meter NAS	0.05
11/15	Aquatic Skin	1
15/18	Vac Skin	2
10/12	Thoracic Armor AV (1)	0.025
12/14	Thoracic Armor AV 0 (2)	0.020
14/17	Thoracic Armor AV 1	0.020
17/20	Thoracic Armor AV 2	0.015
12/14	Abdominal Armor AV (1)	0.020
14/17	Abdominal Armor AV 0 (2)	0.020
17/20	Abdominal Armor AV 1	0.015

Computer Implants: Beginning at tech level 12, it is possible to have a computer surgically implanted and cybernetically linked to the conscious brain centers. The lightest of these computers still mass one kilogram and so are too large to implant in the skull. Instead, the computer consists of a series of a half-dozen or more small subcomponents which are fused to individual vertebrae of the spine (on the inner sides) in such a way that they do not interfere with articulation. They are linked to each other and the organic brain by way of the spinal cord. Output from the computer can be accessed either by way of an eyeball display, an in-ear speaker, or direct machine-brain interface, if the user also has a neural jack installed.

Computer implants serve several functions:

First, some cybernetic systems require a computer implant to achieve their full potential. For example, a cybernetic sensor suite consisting of an HRT eye and an amplified hearing ear, when linked to a computer implant, will allow a character to determine the emotional state of the person they are conversing with and have a reasonable chance (80%) of determining if they are lying or telling the truth.



Second, and assuming the character has a neural jack, implant computers can substitute for regular computers on a limited basis. While they are not powerful enough to carry out all functions of a larger computer of the same type, they allow the player to conduct specific tasks one at a time. For example, a character's implant computer cannot replace the general systems diagnostic function of a ship's computer (which reduces the maintenance requirements of the ship), but it can allow the character to calculate jump parameters, or run a master fire director, of pilot the ship through the atmosphere for a landing.

Third, it allows the character to store background and technical information for later recall. The character can query the computer about specific information during an adventure and receive a reply. Since memory in the computer is not infinite, the referee must impose some limits on the information available. Very general questions (such as basic questions about physical laws and the outline history of the Imperium) will almost always be answerable by the computer. Specific questions about local history or a scientific specialization will be answered only 40% of the time. Very specific questions about individuals, recent discoveries, or obscure historical facts (and assuming that the referee considers the computer implant to have ever had access to this information) will be available only 20% of the time.

Before an adventure begins, however, characters should be allowed to pick one or more subjects and optimize the computer's data base around that subject. This doubles the chances the question will be answered by the computer (40% becomes 80%, 20% becomes 40%) but reduces the chance of an off-topic question being answered by 10% (40% becomes 30%, 20% becomes 10%).

The number of subjects a character can select is equal to the computer model number minus 6. In other words, a Model 10M computer can be optimized for four subjects. If the number of subjects chosen for optimization is half or less of the total allowed number of subjects, the off-topic penalty is not suffered.

Virus: If cybernetics are added to an Imperial Space campaign, one recurring hazard of a computer implant is that it may become infected with Virus. Only implanted computers of model 10M and higher are powerful enough to serve as a host for Virus, although any computer can be a carrier.

Since the computer is permanently jacked into the character's conscious brain, a viable infection by Virus is potentially fatal to the character. However, some strains of Virus will cause the implanted computer to become self-aware but not necessarily homicidal or suicidal, and may just give it a bizarre personality. The nature of the infection and its effects are up to the referee, but assuming that an infected implant computer has some similarities to a robot brain, referees are directed to the discussion of sentient robots on page 98 of the basic game rules for guidance.

Implant Computers

TL	*Mod*	*Wt (tonnes)*	*MCr*
12	7M	.001	0.5
13	8M	.001	0.4
14	9M	.001	0.4
15	10M	.0012	0.6
16	11M	.0014	1.0
17	12M	.0016	1.2
18	13M	.0018	1.8
19	14M	.0016	2.4
20	15M	.0014	3.0
21	16M	.0012	4.5

Model "M" computers are micro-computers suitable for implantation.

Peripherals (Arms and Legs)

Peripherals are modifications to the arms and legs, either for improved performance or adaptation of limbs to special functions.

Upper Limbs: These cybernetic modifications are to the arms and hands, mostly the hands.

Chainsaw Hand: This attachment is a 30-cm chainsaw, useful for light construction work and brush clearing and a devastating melee weapon. There is no slick version of this attachment. Attacks with a chainsaw hand count as armed melee attacks.

Grapple Hand: This hand can be fired up to 20 meters in any direction, connected to the user's arm by means of a length of fine but extremely strong cable, capable of holding 200 kg of weight safely, 400 kg if attached to a cyber utility arm). The hand contains 50 meters of cable (100 meters if attached to a utility arm) which can be reeled in or out at will. The hand can function as a grappling hook wherever there is a handhold capable of supporting it, and can be used to descend as well as ascend. The user does not have fine manipulative control of the hand while it is extended at the end of the cable, but can close and open the hand at will to grasp or release handholds.

Hand Socket: A hand socket allows the character to use a variety of different cyber hands. If a character does not have a hand socket, then whatever cyber hand is chosen is permanently mounted to the hand. If a hand socket is mounted, then any socket hands may be used.

Any cyber hand option may be purchased as a socket hand by increasing the price by 50%. Hand sockets may be installed on organic arms; utility arms come with hand sockets already installed and are included in the price.

Hardfist: This is a cybernetic replacement hand with specially reinforced bones and heavy knuckles, allowing the character to deliver much more powerful blows. Melee strikes delivered with a hardfist do double damage.

Movement of the fingers is somewhat restricted by the modifications. Tasks performed using the hand which rely on agility are performed with a –1 modification to the character's Agility attribute.



Knuckle Blades: Knuckle blades can be added to a cybernetic hand or an organic hand. The telescoping 10-cm blades are normally retracted into sheaths in the back of the hand, but when the fist is clenched in a particular manner the blades emerge from their sheaths out from over the knuckles.

Movement of the hand is somewhat restricted by the modifications. Tasks performed using the hand which rely on agility are performed with a –1 modification to the character's AGL attribute.

Pistol Hand: This hand is built around a small automatic pistol. Hard (as opposed to slick) versions of the hand do not have functioning fingers. Slick versions have working fingers and thumb, although the index finger is rigid.

The actual pistol is designed using the small arms design sequence, but with several limitations on the design. Hard versions may not have a weight greater than one kilogram (including ammunition). Soft versions may not have a weight greater than 0.4 kilograms (including ammunition), and may not have a bore diameter greater than 7.5mm. The design must include the weight of a pistol grip, although this component is shaped like the hand, not a conventional pistol grip.

The price listed below for the pistol hand is for the attachment equipment and frame only. The design price of the installed pistol is added to this.

Power Hand: This hand has up to 10 times the normal gripping strength, but retains the normal sensitivity of the human hand. While this does not allow the character to lift any greater loads, it enables him or her to exert crushing pressure on objects and to lock the hand in place, thus allowing the character to hang suspended for long periods of time without suffering fatigue. (The character may even sleep while the hand is locked in place.)

Protected Cyber Components: Arms and hands completely replaced by cybernetic prosthetics are considerably easier to armor. In order to use the ratings for protected cybernetic components, a character must have a utility arm (see below).

Subdermal Armor: Given the limited space available, it is extremely difficult to add effective subdermal armor to the hand and arm. This is reflected in the fairly low protection levels available. In addition, hard (as opposed to slick) subdermal armor lowers the character's AGL attribute by 1.

Tentacle Hand: On this hand, the thumb and fingers functions normally but can be telescoped to form tentacles up to three meters in length. Each tentacle has the strength of a normal human hand, and the hand can be used for climbing, grappling, reaching through small openings, and hundreds of other uses.

Movement of the fingers when the tentacles are retracted is somewhat restricted by the modifications. Tasks performed using the hand which rely on agility are performed with a –1 modification to the character's AGL attribute. When extended, the tentacles do not suffer this penalty.

Torch Hand: This hand is an electric cutting/welding torch incorporating an internal battery which contains power enough for two minutes of operation. Thirty seconds of use is regained for every six hours of recharging. Hard versions of the hand do not have movable fingers and cannot be used as conventional hands, but slick versions do and can.

Torque Hand: This hand is capable of rotating at high speed in either direction on its socket, and the fingers can be locked in place to grip small objects securely, making the hand useful as a torque wrench. When not used as a torque device, the hand functions normally.

Utility Arm: This is a standard cybernetic replacement for a human arm, originally developed as a prosthetic replacement for limbs lost due to injuries. It mimics the function of a human arm extremely well, suffering some loss in sensitivity but making up for that with greater strength. All tasks performed exclusively or primarily with a cybernetic utility arm are done with an attribute modification of –1 to AGL and +2 to STR.

The arm is equipped with a human analog hand, but the hand is mounted in a socket and can be removed and replaced with other options. The arm also has a small hidden compartment in which documents or small objects can be concealed.

Legs: The following replacements and enhancements for legs are available.

Power Legs: Power legs are complete cybernetic replacement legs with power enhancement and shock absorbers. Power legs allow the character to conduct tasks as if the character's strength was 16, provided the task relies solely on the legs. This usually involves lifting objects (provided the character can lock his or her back and rely solely on legs to lift it), or forcing open doors (again by bracing the character's back and relying solely on leg power). Power legs also allow the character to leap four meters straight up in 1G (and proportionately more or less in different gravity fields) and jump down twice that distance without injury.

Characters with hard power legs may not run; then may only trot. Characters with slick power legs may run normally.

Speed Legs: Speed legs increase the character's running speed from 30 meters per turn to 50 meters per turn.

Dynalegs: Dynalegs combine the effects of power legs with those of speed legs. Hard (as opposed to slick) versions do not have the prohibition on running that normally accompanies hard power legs.

Subdermal (SD) Armor: Given the limited space available, it is extremely difficult to add effective subdermal armor to the leg. This is reflected in the fairly low protection levels available.

Protected Cyber Component (PCC) Armor: Legs completely replaced by cybernetic prosthetics are considerably easier to armor. In order to use the ratings for protected cybernetic components, a character must have either power or speed legs.

1 2 3 4 5 6 7 8 9 10 11 12 13 14



The following table summarizes the important information concerning the above cybernetic peripherals.

Peripheral Options

TL	*Type*	*MCr*
9/10	Hardfist	0.003
9/12	Knuckle blades	0.01
9/13	Pistol Hand	0.001
10/—	Chainsaw Hand	0.002
10/12	Hand Socket	0.01
10/12	Utility Arm	0.08
10/12	Grapple Hand	0.02
10/12	Power Hand	0.02
11/13	Torque Hand	0.03
12/14	Torch Hand	0.05
14/17	Tentacle Hand	0.1
12/14	SD Arm Armor AV (1)	0.01
14/17	SD Arm Armor AV 0(2)	0.008
17/19	SD Arm Armor AV 1	0.006
10/12	PCC Arm Armor AV (1)	0.001
12/14	PCC Arm Armor AV 0 (2)	0.001
14/17	PCC Arm Armor AV 1	0.001
17/19	PCC Arm Armor AV 2	0.001
10/13	Power Legs	0.4
11/14	Speed Legs	0.6
12/15	Dynalegs	0.7
12/14	SD Leg Armor AV (1)	0.02
14/17	SD Leg Armor AV 0 (2)	0.02
17/19	SD Leg Armor AV 1	0.01
10/12	PCC Leg Armor AV (1)	0.002
12/14	PCC Leg Armor AV 0 (2)	0.002
14/17	PCC Leg Armor AV 1	0.002
17/19	PCC Leg Armor AV 2	0.002

Melee Effects

Several peripheral attachments have melee effects, some counting as armed and some as unarmed attacks. Hit Mods are added to character's asset.

Unarmed Melee Attacks

Type	*Attack*	*Hit Mod*	*DV*
Hardfist	Hand Strike	—	×2
Tentacle Hand	Grapple/Strangle	+2	×2
Power Legs	Kick	+2	×2

Armed Melee Attacks

Type	*Range*	*Hit Mod*	*DV*
Knuckle Blade	Short	+2	1D6+(STR+2)
Chainsaw Hand	Short	—	2D6+STR
Power Hand	Short	—	2D6+STR
Torch Hand	Short	—	3D6

Therapy

Therapy consists of organic modification of the character's body, either through drugs, genetic manipulation, or surgical procedures.

Muscle Implants: This technique involves taking a muscle tissue sample from the character, cloning it, then grafting these new muscles into the existing tendon/ligament system of the character. The technique will increase a character's STR attribute by up to 6, but for every point of strength gained the character will temporarily lose 1D6 points from the AGL attribute until the character is used to working with the additional muscle mass. Characters regain lost AGL attribute points by expending experience points, just as if improving a skill rating.

Installing muscle implants is time-consuming, demanding one month of physical inactivity from the patient. It is also expensive, costing Cr12,000 per point of Strength gained. Available at TL 10+.

Tesseron Beta: This is a drug that stimulates the endocrine system, causing increased production of strength-producing hormones. It is administered in a weekly dose and must be taken continually to keep up its effect. When a character first takes T-Beta, there is no immediate effect.

With the second dose (the second week of the therapy), the character must make a Difficult test against CON to avoid violent muscle contractions. If the test fails, the character suffers 1 hit to each body part and must discontinue the therapy. If the test is successful, the character may continue the therapy without further risk of mishap.

With the third dose (the third week of therapy), the character will gain from 1 to 3 points of STR (1D6+2, rounding fractions up). This added Strength level will remain in effect so long as the T-Beta treatment is continued. Once it is terminated, the STR attribute declines by 1 point per week until it reaches its original pre-therapy level. At the same time, T-Beta withdrawal will also cause an AGL decline of 1 point per week, due to muscle twitches, until STR reaches its original level. After that, AGL will increase by 1 point per week until it reaches its original level.

T-Beta prices vary. Typical costs are 1D6×Cr50. Available at TL 9+.

Neural Sheathing: This technique utilizes viruses which have been engineered to manufacture and deposit certain organic chemicals around the nerve fibers of a character. The plastic-like sheath decreases the electrical resistance of the nerves and various outside electrochemical interferences to neural communication. To perform the process, a doctor takes samples of blood, nerve tissue, and spinal fluid from the patient and determines what support chemicals are required for the virus to perform properly. The process must be monitored for one full month, with a medical appointment every three days to update the support solution.

The doctor must make a successful Average task roll using Diagnosis as an asset for the procedure to succeed. If the task roll fails, the procedure is not successful, but may be attempted again later. If the task roll is a Catastrophic Failure, the process cannot be retried and the character permanently loses 1 point from the AGL attribute due to induced nerve hypersensitivity.

If the procedure is successful, the character's AGL attribute is increased by from 1 to 3 points (1D6+2, rounded up). The price of the treatment is Cr30,000. Available at TL 11+.

Vassopressin-Y: This drug allows the human brain to modify its electrical pathways, which will make it easier for a character to learn new things and recall things already learned. Due to its addictive effect, this drug is usually used by people who are beginning major projects (preparation for a special mission, for example) and can quit after the project's completion. The drug must be taken in daily doses for two full weeks for any effect to occur, at which time the character's INT attribute is increased by 1D6 points.

If the character remains on the drug for a month or less, there are no side effects. For every month thereafter that the character remains on the drug, the character's Willpower skill is reduced by 1 (regained at a rate of 1 point per week after Vassopressin-Y is no longer taken). Characters whose Willpower is reduced to 0 (or who suffer a Willpower reduction when they have no Willpower skill to begin with) slip into a catatonic state for 1D6 weeks and then recover.

In order to voluntarily terminate Vassopressin-Y therapy, a character must make a successful roll for an Average task using Willpower as an asset. This roll is made once per day at the time the normal dose would be taken. A character must be successful on each of seven consecutive days for the addiction to be broken.

The price for a daily dose of the drug on any given world is Cr3D6. Available at TL 12+.



CHAPTER 13
Teleportation

Matter transporters make use of the same principles of tunneling that are used in most FTL drives, but do so on a micro instead of macro level. Most teleporters are short range (less than 10,000 kilometers) and handle comparatively small masses (tonnes, as opposed to hundreds of tonnes).

Teleporters require only a transmitter, not a transmitter and receiver, the main facility serving both functions. That is, it can teleport objects from its own location to a distant target or it can teleport objects from a distant target to its own location. Although only the one teleporter is required, one endpoint of the operation must be the machine itself.

Objects being teleported have vectors which must be dealt with during the teleportation process. For example, an object in space has its vector of travel which will probably be quite different from that of the teletransmitter it is being teleported into. Even "stationary" objects on a world's surface have vectors: a vector toward the center of the world due to gravity (also called "potential energy"), and a lateral vector tangential to the world's surface caused by planetary rotation. Both of these vectors will vary with altitude.

In order for objects arriving at the teleported destination to not go crashing through a wall or floor, their vectors must be adjusted to match those of their destinations (although this need not be done if this is the effect that the teleporter operator is seeking). The energy required to do this (or the excess energy released in doing this) is subsumed into the boost energy calculated below. The homopolar generators which form part of the teleporter also serve as sinks or reservoirs for the energy consumed or released by this vector adjustment.

In order to "teleport in" an object (i.e., pick it out of space and bring it to the teleporter), the teleporter must be hooked into a system (such as a starship or ground installation) which has a target lock on the object to be teleported. At the long ranges available at TL 19 and 20, this target lock will usually be obtained by another sensor closer to the target which is "handed off" to the teleporter, usually via tight-link communicators. In some cases, a "teleporter booth" is constructed which is simply a passive sensor which locks onto the booth's contents and hands off that lock to the teleporter some distance away, which then plucks out those contents.

As a practical limit, without FTL communicators (see Section 5), TL 21 teleporters can only be used to "teleport out" objects at their maximum range, as it would require faster-than-light communications to receive the target lock hand off necessary to teleport in an object from a parsec away. There is one exception to this, which is a pre-arranged pick-up from a site carefully surveyed in advance and fed into the teleporter's controls. This of course requires that the teleporter have absolutely perfect data on all of the variables of this pick-up site, such as a world's orbital and rotational data, diameter, topology, etc., in the case of a site on a planetary surface.

All teleporters must also be hooked into a full-size computer (model St or Fb) of the same tech level.

Teleporter performance is defined by several critical characteristics.

Range: The maximum range of the teleporter in kilometers at that tech level.

Volume: The cubic meters of teleporter machinery required per metric tonne of capacity. In other words, if a designer wishes to build a teleporter of seven metric tonnes capacity and at that tech level the volume requirement is four, the teleporter would require 28 cubic meters of machinery.

Boost Energy: This is the amount of energy required per tonne/kilometer to teleport an object. To determine the total energy required, multiply the mass (in tonnes) of the object to be teleported by the distance (in kilometers) it is to be teleported by the boost energy value.

HPGs: In addition to teleporter machinery, a teleporter must have homopolar generators installed, and the peak power of the homopolar generators is the upper limit on teleporter performance. For example, even if a teleporter is built with sufficient capacity to teleport 20 tonnes of mass and is of a tech level capable of teleporting it 1,000,000 kilometers, if the homopolar generators are not large enough to provide the necessary boost energy then it cannot achieve that level of performance.

The homopolar generators also serve as potential energy reservoirs and sinks for vector adjustment.

Teleporters

TL	*Range*	*Vol*	*Boost*
18	2500	5	4
19	2,500,000	4	2
20	200 AUs	3	0.5
21	1 Parsec	2	0.001

TL: Tech level of availability.

Range: Maximum range of teleporters at this tech level. 200 AUs is approximately 2.5 billion kilometers. 1 parsec is approximately 2.5 trillion kilometers.

Vol: Volume of teleporter machinery, in cubic meters, per metric tonne of transfer capacity.

Boost: The energy, in millions of joules (MJ), required per kilometer/tonne to teleport an object.

Mass: The mass of the teleporter, in metric tonnes, is equal to the volume of its machinery in cubic meters.

Price: The price of the teleporter, in millions of credits, is equal to the volume of its machinery in cubic meters multiplied by 200.



CHAPTER 14
Fire Control

Fire control equipment is designed to assist weapons in hitting a target. A wide variety of fire control equipment is available to cover the range of weapons included in the game. In general, fire control equipment is used for heavy and vehicle-mounted weapons. The equivalents of fire control equipment for small arms are called sights and are included in the actual design sequences for the weapons.

DIRECT FIRE CONTROL

Direct fire control is used by projectile weapons (CPR guns and electromagnetic mass drivers) and high-energy weapons (plasma and fusion guns). Both fire an amount of high-speed matter—on the one hand a slug of metal, on the other a slug of plasma—at their targets. Since either way the projectile is unguided, the actual target solution obtained before firing is the critical element in successfully hitting the target.

Two types of fire control equipment are available to help make this target solution. The first type is called sights and rangefinders, since most primitive sights either have some form of rangefinder on them or are calibrated for different ranges. All direct fire projectile weapons must have a sight/rangefinder.

The second type is a ballistic computer. This device allows the gunner to incorporate corrections for target movement, atmospheric conditions, tilt of the firing weapon, and so forth, thus negating difficulty modifiers to the to-hit task. Ballistic computers are optional, but are usually added to larger weapons.

Point Defense: Ballistic computers may also be modified to serve as point-defense computers. Point-defense computers are used to enable a weapon system to shoot down incoming bombs and artillery projectiles. A ballistic computer may be modified as a point-defense ballistic computer by doubling its mass, volume, and price.

Point-defense computers function the same as an unmodified computer of that tech level except when firing at ballistic projectiles. Ballistic projectiles are those which are not maneuvering and are following a fixed trajectory (such as an artillery round, a bomb, or an unguided missile or rocket). When a weapon equipped with a point-defense computer fires at ballistic projectile, the projectile's speed modifier is halved (rounding fractions down).

1. Sights and Rangefinders

TL	*Type*	*Range*	*Mass*	*MCr*
4	Iron Sight	0.2	.005	.00025
5	Telescopic Sight	0.4	.01	.0005
6	Optic Rangefinder (RF)	0.6	.02	.001
7	Laser RF	0.8	.04	.005
8	Imaging Radar	1.6	.06	.01
10	EMS RF	3	.08	.02

TL: Tech level of first availability.
Range: Upper limit on short range in kilometers.
Mass: Mass in tonnes.
MCr: Price in millions of credits.
Vol: Volume in cubic meters is equal to mass in tonnes.

2. Ballistic Computers

TL	*Type*	*Mass*	*MCr*	*Diff Mod*
6	Analog	0.01	.002	1
8	Digital	0.02	.005	2
10	Digital	0.04	.02	3
12	Digital	0.04	.1	4
14	Synaptic	0.03	.5	5
16	Synaptic	0.02	1	6
18	Fluidic	0.02	2	7

TL: Tech level of first availability
Mass: Mass in metric tonnes
MCr: Price in millions of credits
Diff Mod: Number of increases in difficulty ignored.
Note: Ballistic computers may be purchased from one tech level higher than level of manufacture of the weapon by multiplying price, weight, and volume by 10.

INDIRECT FIRE CONTROL

Indirect fire control consists of on-carriage sights and off-carriage fire-direction centers.

Indirect fire may be conducted by projectile weapons (CPR guns and electromagnetic mass drivers) and meson guns. While projectile weapons loft their rounds over obstructions to hit their targets, meson guns simply fire through obstructions to hit unseen enemies.

In order to conduct indirect fire, a weapon must have an on-carriage indirect fire sight, which in its simplest form amounts to precise calibration of elevation and traverse enabling the gunner to make exact corrections. More advanced forms allow more precise corrections or access to computerized fire control assistance. This is reflected in the fact that the tech level of the installed fire control equipment is the upper limit on the tech level of fire direction center (FDC) that may be used by that weapon.

Indirect fire sights on mortars have half the weight and cost of those for CPR guns.

Fire direction centers coordinate the fire of several guns at a single target, convert correction requests from forward observers into precise elevation and traverse commands, and calculate the effects of a wide variety of factors on gun accuracy (such as atmospherics, different elevations between the firing guns and the target, and so on). While fire direction centers are not required to conduct indirect fire, they increase the effectiveness of that fire dramatically.

For fire conducted through a fire direction center, the task roll to hit the target is a Difficult (instead of Formidable) task.

Fire direction centers substitute the appropriate weapon skill/asset of the main operator (usually the most skilled gunner in the FDC) for the weapons skills of the gunners of all the weapons controlled by the FDC (called "the battery"). All weapons in the battery must have a communication link to the FDC.

FDCs have a correction delay time (in combat turns) and an effective indirect fire range (in kilometers). The more sophisticated the FDC, the shorter the correction delay and the longer the effective range. Indirect fire at ranges beyond the effective range of the FDC is allowed, but the task roll to hit to hit is Formidable instead of Difficult.



Indirect Fire Sights

TL	*Mass*	*MCr*
4	.05	0.004
5	.05	0.006
6	.075	0.008
7	.1	0.01
8	.2	0.02
9	.2	0.1
10	.2	0.15
11-13	.2	0.2
14-15	.1	0.25
16-17	.1	0.3
18-20	.05	0.35
21+	.05	0.4

Mass: Mass of sights in tonnes
MCr: Price of sights in millions of credits

Fire Direction Centers

TL	*Delay*	*Km*	*MCr*
4	10	10	0.1
5	6	20	0.2
6	5	25	0.3
7	4	30	0.4
8	3	35	0.5
9	2	40	0.75
10	1	50	1
11-13	0	60	1.5
14-15	0	80	3
16-17	0	100	5
18-20	0	150	8
21+	0	300	10

Weapon Stabilization

As a vehicle moves, the weapons mounted on it move as well, and since the ground over which the vehicle travels is uneven, the movement of the weapons will be almost as uneven (the vehicle's suspension compensates for this somewhat). That makes it almost impossible to aim and fire a weapon while the vehicle is moving.

The answer is stabilization. A stabilized weapon has its power traverse and elevation linked to a gyrostabilizer which automatically adjusts the position of the weapon to match the movement of the vehicle, allowing aimed fire on the move. As stabilization becomes more effective, vehicles are able to aim and fire their weapons at higher speeds. The three types of stabilization are shown in the Stabilization table.

Stabilization gear stabilizes all weapons in a single mount. The Stabilization table expresses the mass of the gear as a percentage of the weight of the weapon being stabilized. The mass of the weapon includes the mass of its fire control/sights, its mechanical loading assistance, and its ammunition if it is a magazine-fed automatic weapon or autocannon. If it has an autoloader, half of the mass of the autoloader is included in the mass of the weapon, but not the ammunition mass. The gear is located on the mount; however, the stabilization gear for an open mount is located in the chassis. The minimum weight is that for 1 tonne of weapon, even if the weapon's weight is much less than a tonne.

Stabilization

TL	*Type*	*Mass*	*MCr*	*Fire if Move*
6	Basic	0.05	0.02	Full safe speed
7	Good	0.075	0.04	Twice safe speed
8+	Advanced	0.1	0.05	Any speed

TL: Tech level of first availability.

Mass: The mass, in tonnes, of the stabilization gear is equal to the mass, in tonnes, of the stabilized weapon times the listed decimal.

MCr: Price, in millions of credits, of the stabilization gear.

Fire if Move: The limit to vehicle movement while firing with that stabilization gear. Safe speed is safe road or safe off-road speed, whichever mode the vehicle is in.

Vol: The volume of the stabilization gear in cubic meters is equal to its mass in tonnes.

Beam Pointers

All heavy (non-small arms) lasers, particle accelerators, and meson guns require beam pointers, which represent the integral fire control capabilities installed on the mount. Beam pointers may only be used on these classes of weapons.

Select a beam pointer from the table on the following page based on the weapon's tech level and the range performance desired. Note that range is given in kilometers and 30,000-km hexes/range bands for space combat. The listed range in km/hexes of the selected beam pointer will be the weapon's short range for purposes of combat.

Special Note on Planetary Combat: Weapons equipped with beam pointers receive the Diff Mod benefits of a ballistic computer of the same tech level (see facing page) when they use direct fire in planetary (ground) combat. This is because these weapons are effectively ballistically perfect and arrive virtually instantaneously at their targets at planetary ranges.

This is for planetary combat *only*; beam pointers allow no Diff Mods to be negated in space combat, only master fire directors (MFDs, see next page) may do this.

Any beam pointer-equipped weapon linked to an MFD which conducts direct fire under MFD control in planetary combat receives the benefits of a point defense computer (see facing page) of the same tech level (beam pointer or MFD, whichever is lower).



When a weapon has its performance adjusted for atmosphere, remember that its atmosphere-adjusted ranges are for purposes of damage calculation only. Its short range (and medium, long, and extreme ranges which are derived from it) based on installed beam pointer are still used for resolving hits.

Range below is given in km and in space combat hexes/range bands.

Beam Pointers

Range	*Volume in m³ at Tech Level*							
(in km/hexes)	*8*	*9*	*10*	*12*	*14*	*15*	*17*	*19*
0.3/0*	0.1	0.05	0.04	0.03	0.02	0.01	0.006	0.004
3/0*	0.2	0.1	0.08	0.06	0.04	0.02	0.01	0.006
30/0*	0.4	0.2	0.15	0.12	0.08	0.04	0.02	0.01
300/0**	0.8	0.4	0.3	0.24	0.15	0.08	0.04	0.02
3000/0†	1.5	0.8	0.6	0.5	0.3	0.15	0.08	0.04
30,000/1	3	1.5	1.2	1	0.6	0.3	0.15	0.08
60,000/2	6	3	2.4	2	1.2	0.6	0.3	0.15
90,000/3	9	4.5	3.7	3	1.8	0.9	0.45	0.25
120,000/4	12	6	5	4	2.4	1.2	0.6	0.3
150,000/5	15	7.5	6	5	3	1.5	0.75	0.4
180,000/6	18	9	7	6	3.6	1.8	0.9	0.45
210,000/7	21	10.5	8	7	4.2	2.1	1.0	0.5
240,000/8	24	12	9	8	4.8	2.4	1.2	0.6
270,000/9	27	13.5	10	9	5.4	2.7	1.3	0.65
300,000/10	30	15	11	10	6	3	1.5	0.75

*Weapon cannot be used in space combat, even in same hex.

**Use extreme range (base difficulty of Impossible) for task difficulty in same hex; task is not possible outside of same hex.

†Use long range (base difficulty of Formidable) for task difficulty in same hex; task is not possible outside of same hex.

Volume: The volume of the beam pointer in cubic meters.

Mass: The mass of the beam pointer, in tonnes, is equal to its volume in cubic meters.

Price: The price, in millions of credits, is equal to the volume in cubic meters multiplied by 0.1.

Master Fire Directors

Spacecraft may be equipped with master fire directors (MFDs) which enhance the performance of installed weapons. While many small ships with only one or two turrets rely on local turret control and do not contain MFDs, warships will want several directors. Each MFD must be provided with a pencil-beam active sensor of its own, with a short range equal to the listed range of the fire director. The values for this sensor must be chosen from the Radar table (for TL 8-9 fire directors) or Active EMS table (for TL 10+) in the Electronics chapter (Section 5), except that the power requirement and antenna size listed are multiplied by 0.1 and the cost is multiplied by 0.5. Volume and mass figures are unchanged. These numbers are added to those of the MFD, as they constitute one piece of equipment. The sensor is not used separately under any circumstances, but is necessary for the normal functioning of the MFD.

If an MFD is to have the capability to control missiles, it must have a laser or maser communicator from the same tech level installed with it as well. Like the pencil-beam sensor above, it is considered part of the MFD and may not be used for any other purpose, but its full cost, power, and antenna size are used. This communicator should be the same type as installed on the missiles that will be used with the MFD, as the short (automatic contact) range will be limited to that of the MFD or the missile, whichever is shorter. The number of missiles that can be simultaneously controlled by an MFD is equal to the "Diff Mod" listing. When the missile detonates and fires, the missile can only use the MFD's ability to ignore Diff Mods if it is within the MFD's extreme range (8 times the short range shown on the table). Designers should choose the range of their missile control MFDs accordingly.

Note that the task-range performance of weapons that are being fired by an MFD is limited to the range of the MFD if that is shorter than that of the weapon. Therefore, players should take care to install MFDs whose range performance matches that of the installed weapons. A vehicle equipped with an MFD must also be equipped with a St or Fb model computer of equal or higher tech level (see Section 4). MFD crew are not handled at this step. MFD crew are allocated workstations on the bridge or flight deck and are handled in that portion of Major Systems.

Master Fire Directors

Range	*Volume at Tech Level*							
	8	*9*	*10*	*12*	*14*	*15*	*17*	*19*
0.3	0.2	0.1	0.08	0.06	0.04	0.02	0.01	0.006
3	0.4	0.2	0.16	0.12	0.08	0.04	0.02	0.01
30	0.8	0.4	0.3	0.24	0.16	0.08	0.04	0.02
300	1.6	0.8	0.6	0.48	0.3	0.16	0.08	0.04
3000	3	1.6	1.2	1	0.6	0.3	0.15	0.075
30,000/1	6	3	2.4	2	1.2	0.6	0.3	0.15
60,000/2	12	6	4.8	4	2.4	1.2	0.6	0.3
90,000/3	18	9	7.4	6	3.6	1.8	0.9	0.45
120,000/4	24	12	10	8	4.8	2.4	1.2	0.6
150,000/5	30	15	12	10	6	3	1.5	0.75
180,000/6	36	18	14	12	7.2	3.6	1.8	0.9
210,000/7	42	21	16	14	8.4	4.2	2.1	1.05
240,000/8	48	24	18	16	9.6	4.8	2.4	1.2
270,000/9	54	27	20	18	10.8	5.4	2.7	1.3
300,000/10	60	30	22	20	12	6	3	1.5
Diff Mod	1	2	3	4	5	6	7	8

Range: Short range in kilometers/space combat hexes.

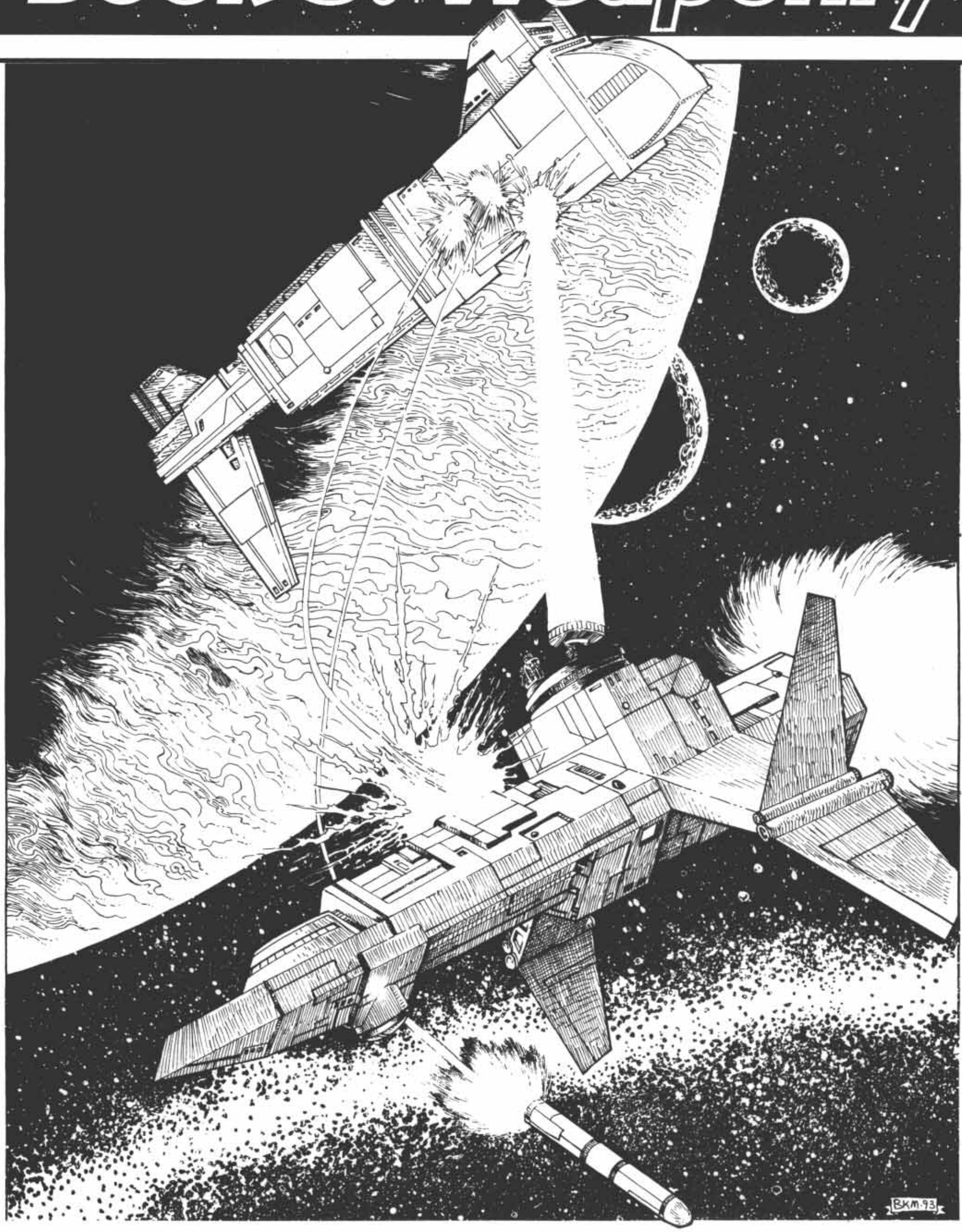
Diff Mod: The number of cumulative adverse difficulty modifiers to hit the fire director ignores, also the number of missiles it may control at one time.

Mass: Mass in tonnes equals volume × 1.

MCr: Price in millions of credits equals volume × 1.

MW: Power requirement, in megawatts, equals volume × 0.01.

Book 3: Weaponry





CHAPTER 1
Small Arms Design

This design sequence is aimed at designing "modern" firearms, by which we mean firearms using a fixed cartridge consisting of a bullet (or bullets), propellant, and primer. The ability to manufacture this type of ammunition appears at middle tech level 3, with the near-simultaneous development of advanced metal-working technology (for cartridge cases) and more stable and reliable primers, and becomes widely available at tech level 4.

As classic firearms are defined almost as much by their ammunition as by their own construction, small arms design consists of two parts: ammunition design and weapon design.

PART 1: AMMUNITION DESIGN

Ammunition is defined by four characteristics: the tech level, the diameter of the bullet in millimeters (also referred to as caliber), the length of the cartridge case in millimeters, and the type of cartridge case (straight, necked, or shotgun). In some cases, the type of cartridge case is further defined as ETC (Electrothermal Chemical) indicating that it is fired from a specially designed ETC gun with an electric pulse which both enhances the power of the propellant and smooths out its energy curve to increase its efficiency. Ammunition for gauss weapons is handled in the gauss weapon design sequence.

Tech Level: Modern ammunition (propellant and bullet carried in a metallic cartridge case and fired by means of a primer in the base of the cartridge case) becomes available at mid tech level 3 and becomes universally used at tech level 4. Electrothermal-chemical (ETC, see page 137) cartridges are widely available at tech level 9, and all non-ETC cartridges are by then caseless. By tech level 12, conventional small arms have mostly been supplanted by gauss and directed energy weapons.

Bullet: The diameter of the bullet in millimeters is called its caliber, and weapons are commonly referred to by their caliber, such as 9mm. Although standard weapons listed in the game are usually in increments of 0.5 millimeters (such as 5.5mm, 7.5mm, etc.), weapons may be designed in any caliber desired, such as 11.43mm or 4.71mm. Small arms may be made in any caliber up 20mm. (Weapons of 20mm and above are usually considered to be cannons.)

If the round is to be a shotgun shell, it should be specified at this point, as should the number of bullets in the shell. The number of bullets in the round must either be one (a single large slug) or any multiple of four.

Cartridge Case Length: The longer the cartridge case, the more propellant contained in it and the more powerful the ammunition. Ammunition is often referred to by two numbers, the caliber followed by the cartridge case length, which helps distinguish it from other ammunition of the came caliber. Sometimes the ammunition will also have a common name under which it is sold to the public. For example, 7.62×25mm pistol ammunition is today commonly called 7.62 Tokarev, since it is usually fired from a Tokarev pistol, while 7.62×51mm rifle ammunition is commonly called 7.62 NATO, since it is the standard large-caliber NATO rifle cartridge. In the case of shotgun shells, the length includes the container for the bullets as well, and so 12-gauge shotgun shells (the most common current shotgun round) is also called 18.5×70mm round.

Cartridge Case Type: For our purposes there are three general types of cartridges: straight, necked, and shotgun.

Straight cartridges have a cartridge case approximately the same diameter as the bullet along its entire length, while necked cartridge cases are larger in diameter than the bullet and then "neck down" at the end to fit the bullet. Necked cartridge cases are considerably more powerful than straight cases and are usually fired from rifles, while straight cartridges are usually fired from pistols and submachineguns. Necked cartridges carry a longer, heavier bullet than do straight cartridges, and the cartridge case must be at least 35mm long in order to be necked. (There do exist some short pistol rounds that are slightly necked, but these are included under straight rounds because their performance is not sufficiently different from straight rounds to justify a distinction.) Shotgun cases are straight cases with fairly light powder charges and either multiple small bullets or a single large slug.

Necked cartridges are not available until tech level 4. Because all non-ETC cartridges at TL 9+ are caseless, it is the cartridge dimensions which are specified here, and not the case.

Note: In the sequences below, unless otherwise instructed, round all results to the nearest whole number.

Ammunition Evaluation

Once the ammunition round has been designed, determine its length, weight, magazine weight, and average muzzle energy.

Length: The ammunition length is determined using the following formulae:

Lasg = Lcc
Las = Lcc + d
Lan = Lcc + 2d

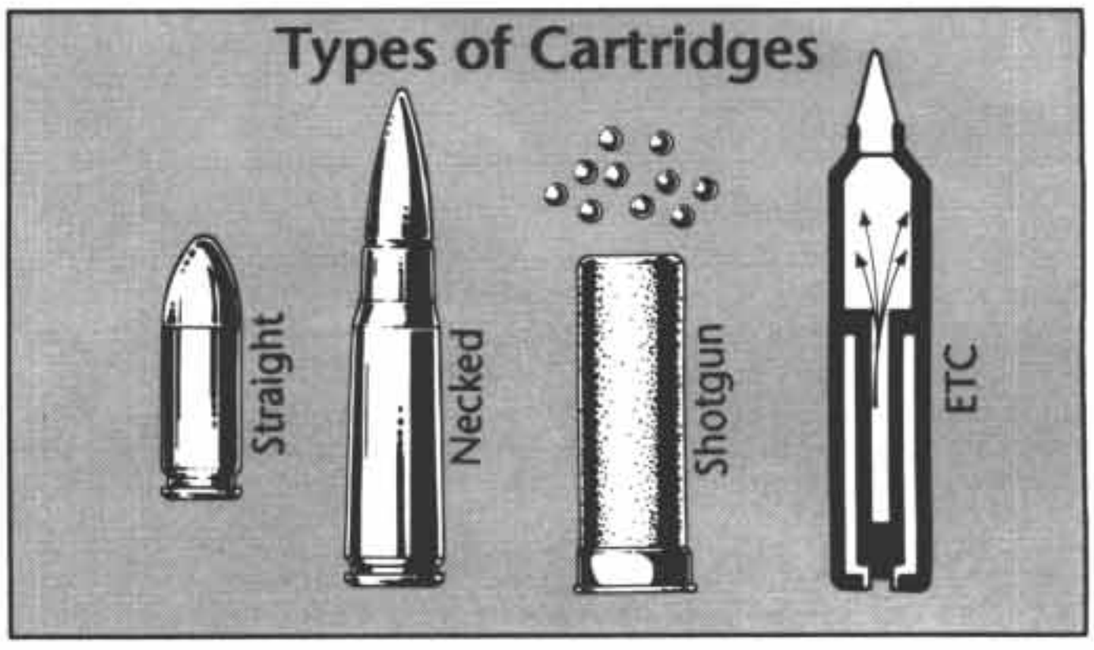
Lasg: Length (in millimeters) of shotgun ammunition.

Las: Length (in millimeters) of ammunition with a straight cartridge case.

Lan: Length (in millimeters) of ammunition with a necked cartridge case.

Lcc: Length (in millimeters) of the cartridge case.

d: Diameter (in millimeters) of the bullet.





Weight: The ammunition weight is determined using the following formula:

$$Wa = AwcLcc\ \pi\ r^2$$

r: Radius (in millimeters) of the bullet (half the diameter).
π: 3.1416
Wa: Weight (in grams) of a complete round of ammunition.
Lcc: Length (in millimeters) of the cartridge case.
Awm: Ammunition weight multiplier, which depends on whether the ammunition is a conventional round or a shotgun shell, as shown below.

Ammo Type	*Awm*
Shotgun shell	0.003
Straight	0.008
Necked	0.01

Average Muzzle Energy: The average muzzle energy of conventional and ETC ammunition is determined using the following formula. (The actual muzzle energy will be affected by the design of the weapon itself.)

$$Ea = TmCmLcc\ \pi\ r^2$$

Ea: Average muzzle energy (in joules) of a cartridge.
Lcc: Length (in millimeters) of the cartridge case.
r: Radius (in millimeters) of the bullet (half the diameter).
π: 3.1416
Tm: Tech level modifier, as shown on the table below

TL	*Tm*
3	0.6
4	0.7
5	0.8
6	0.9
7	1
8	1.1
9+	1.3

Cm: Cartridge modifier, as shown on the following table:

Cartridge Type	*Cm*
Shotgun	0.2
Shotgun ETC	0.3
Straight	0.4
Straight ETC	0.8
Necked	1.6
Necked ETC	3.2

Price: The price of the ammunition is determined by the following formula:

$$Cr = WTm$$

Cr: Price in credits
W: Weight of the round in grams.
Tm: Type multiplier, as determined below:

Type	*Tm*
Shotgun	0.01
Mass-produced military ammo	0.02
Conventional	0.04
High-powered (Ea = 10,000+)	0.05

Special Ammunition

The above design sequence deals with solid slug ammunition (usually called "ball" ammunition). A variety of special small arms ammunition is available as well.

HE: HE, or high-explosive, ammunition (also variously called shredder or exploder) is hollow and contains an explosive filler that detonates on impact.

HE rounds are not available before TL 6. Price for HE rounds is multiplied by 2.

DS: DS, or discarding sabot, ammunition (also called SLAP, for saboted, light armor-piercing) is a high-velocity bullet designed to penetrate armor.

DS small arms rounds are not available before tech level 8. Price for DS rounds is multiplied by 2.

HEAP: HEAP, or high-explosive armor-piercing, bullets are hollow, as with HE bullets, but have small shaped charges for penetrating armor.

HEAP small arms rounds are not available before tech level 9. Price for HEAP rounds is multiplied by 3.

Tranq: Tranq rounds are nonlethal means of subduing adversaries.

Tranq small arms rounds are not available before tech level 6. Price for Tranq rounds is multiplied by 2.

PART II: WEAPON DESIGN

1. Barrel

The barrel of a firearm carries the bullet after the cartridge is fired. The barrel is usually rifled, and so imparts a spin on the bullet, giving it stability (and thus accuracy) in flight. (Shotguns, intended for very short ranges, fire their bullets through a smooth bore.) In addition, the barrel provides a gas-tight constricted space within which the expanding gas of the exploded propellant can act on the bullet, accelerating it. Once the bullet leaves the muzzle of the barrel, however, it begins decelerating. In general, the longer the barrel the higher the muzzle velocity, up to the point where the bullet reaches its greatest possible velocity.

Average Barrel Length: First, determine the average barrel length for the ammunition being used by the weapon. The following formula is used:

$$Bla = (Ea \div d^2)Rm$$

Bla: Average barrel length (in centimeters)—the length of the barrel which allows the ammunition to achieve its average muzzle energy.
Ea: Average muzzle energy (in joules) of the ammunition.
d: Diameter (in millimeters) of the bullet.
Rm: Rifling multiplier, as shown below:

Type	*Rm*
Smoothbore	4
Smoothbore ETC	3
Rifled	1
Rifled ETC	0.5

Note: Regardless of the results of the above calculations, average barrel length is never less than 10cm.



Actual Barrel Length: The actual barrel length can be any length desired down to a minimum of 20% of the average barrel length and
1 up to a maximum of 230% of the average barrel length.

Type of Barrel: Two types of barrels are possible: heavy barrels and light barrels. Heavy barrels are required for machineguns or other weapons intended to be used at a high sustained rate of fire, any
2 weapon intended to mount a bipod, and any weapon with firing a cartridge with an average muzzle energy greater than 5000 joules. Light barrels may be used for all other weapons, including shotguns.

Barrel Weight: The weight of the barrel is determined using the
3 following formulae.

Wbl = .02Lb

Wbh = .03Lb

Wbl: Weight (in kilograms) of a light barrel.

Wbh: Weight (in kilograms) of a heavy barrel.
4 *Lb:* Length (in centimeters) of the barrel.

Barrel Price: The price of the barrel is determined using the following formula:

Cr = WbBtm
5

Cr: Price of the barrel in credits.

Wb: Weight of the barrel in kilograms

Btm: Barrel type multiplier, as determined by the following table:

6

Type	*Btm*
Smoothbore	100
Light rifled	200
Heavy rifled	400

7 **Actual Muzzle Energy:** Once the barrel length is decided on, the weapon's actual muzzle energy can be determined using the following formula.

E = Ea{1 + (0.5[Blp–1])}
8

E: Actual muzzle energy (in joules) of the weapon

Ea: Average muzzle energy (in joules) of the ammunition

Blp: Actual barrel length (cm) divided by Average barrel length (cm): Bl÷Bla.
9

Bl: Actual length (in centimeters) of the barrel of the weapon.

Bla: Average barrel length (in centimeters) for the ammunition used.

If a multiple-bullet round is fired from the weapon, divide the
10 actual muzzle energy of the round by the number of bullets in the round to determine the energy of each bullet.

If the round fired is Tranq, multiply the muzzle energy by 0.6.

Damage: Once muzzle energy is known, it is possible to calculate
11 damage and using the following formula.

D = (√E)÷15

D: Damage value (if D = less than 0.8, damage is 1D6–1)

E: Muzzle energy (in joules)

12 With a multiple bullet round damage is calculated separately for each bullet. The result is the medium range damage of each bullet. The short range damage *of the entire round* is determined by the following formula:

Dr = .75NDb
13

Dr: Damage value of the round.

Db: Damage value of a single bullet.

N: Number of bullets in the round.

Note that damage for shotgun shells loaded with a single slug is
14 calculated in the same way as any other single bullet round.

HE and HEAP bullets cause additional damage from the explosion of the round. The explosive energy is determined by adding the diameter of the bullet (in millimeters) to the tech level of the bullet and subtracting 7, then cubing the resulting number. The result is the explosive energy of the bullet. When calculating damage, the value for E in the formula becomes the sum of muzzle energy and explosive energy.

All Tranq rounds have a damage value of –1* (1D6–1 damage points) where the "*" refers to their tranq effects as determined by the rules for Tranq rounds found on page 350 of the basic **Traveller** rules.

Penetration: It is also possible to determine penetration once muzzle energy is known by consulting the following table.

E	*Pen*
0-600	Nil
601-2000	1-Nil
2001-3000	2-Nil
3001-5000	2-3-Nil
5001-10,000	2-4-6
10,001-20,000	2-3-4
20,001-50,000	2-2-3
50,001+	2-2-2

Shotguns are an exceptions to this, as their bullets tend to be heavier but slower-moving. All shotgun bullets (both slugs and multiple-projectile bullets) have a penetration of 3-4-5.

(Note that the very high short-range damage of multiple-bullet shotgun shells is caused by multiple-bullet hits, each with a lower damage value. In most cases the penetration of multiple bullets from a shotgun will be Nil, but see the more complete explanation of penetration notation later for possible special cases.)

For DS ammunition, subtract 1 from each penetration number of the penetration value of the weapon. For example, a penetration of 2-4-6 would become 1-3-5. If one of the values is already 1, it remains 1. If one of the values is Nil, it becomes 1 higher than the previous value and Nil is added after it. For example, a penetration of 1-Nil would become 1-2-Nil. Ammunition with a listed penetration of Nil becomes 1-Nil instead.

Fore HEAP ammunition, penetration is always 2-2-2.

For HE and Tranq ammunition, penetration is always Nil.

For multiple bullet rounds, calculate the penetration of each bullet separately. If this results in a penetration other than nil (which will be extremely rare), it will be necessary to recalculate the damage of each bullet at short range, as each bullet loses energy passing through armor. Assume that the target is hit by 75% (rounding fractions to the nearest whole number) of the bullets contained in the round.

2. Receiver

The receiver is the mechanical heart of a firearm. It "receives" the cartridge from the magazine, places it in the chamber, holds it in place with the bolt, and fires it with the firing pin. Some receivers, such as in bolt-action rifles, are manually operated, while others, such as in automatic and semiautomatic weapons, are operated by gas from the fired round or direct recoil energy.

Weapons which fire ammunition with high muzzle energy require heavier and longer receivers, as do weapons intended for high sustained rates of fire. Sometimes weapons are given heavier receivers simply to absorb additional recoil, and thus allow more accurate fire.

Receiver Type: There are a number of different types of receivers which define the method of operation of the weapon. All receivers are divided into two general categories: heavy and light.

In the case of self-loading receivers (automatic and semiautomatic weapons), both light and heavy receivers are available. Weapons intended to operate primarily or exclusively on the automatic setting (machineguns) should have a heavy receiver. All belt-fed or cassette-



fed weapons must have a heavy receiver. Weapons intended to operate only in semiautomatic fire, or which are selective fire weapons, may use a light receiver (but are not required to).

At tech level 9 and above, any receiver may be constructed as an ETC receiver by so designating in the design process.

TL	*Action*	*Weight*
3	Individually loading	Light
3	Revolver	Light
3	Lever-action	Heavy
4	Bolt-action	Light
4	Pump-action	Light
4	Heavy self-loading	Heavy
5	Light self-loading	Light

Rate of Fire: Individually loading, lever-action, bolt-action, and pump-action weapons have rate of fire (ROF) codes of SS (single shot), LA (lever action), BA (bolt action), and PA (pump action) respectively.

Revolvers from tech level 3 have an ROF code of SAR (single-action revolver) while those from tech level 4 or higher have a code of DAR (double-action revolver).

Weapons with light self-loading receivers may be either semiautomatic (ROF code of SA) or selective fire, with a full automatic rate of fire of either 3 or 5 shots per burst, at the designer's option (selective fire always includes the single-shot SA option).

Heavy self-loading receivers may be either semiautomatic (ROF code of SA) or selective fire (ROF code of either 3, 5, or 10).

With selective fire, the designer must specify how many rates of fire are available (single-shot SA is always available in all self-loading receivers). That is, a selective fire weapon may have a listed ROF of 5/10, meaning that it can be fired as a semiautomatic weapon, an automatic weapon with an ROF of 5, or an automatic weapon with an ROF of 10.

Receiver Length: Receiver length is determined by the following formula:

$$Lr = Tm(\sqrt{Ea})$$

Lr = Length (in centimeters) of the receiver
Tm = Tech level multiplier, as shown below
Ea = Average muzzle energy (in joules) of the ammunition

TL	*Tm*
4-5	.55
6-7	.5
8-9	.45
10+	.4

Receiver length must always be at least as long as the cartridges it fires.

Receiver Weight: Once the type of receiver is known, its weight can be calculated using the following formulae:

$$Wrl = .001Ea$$
$$WrlET = .0005Ea + 0.3$$
$$Wrh = .002Ea$$
$$WrhET = .001Ea + 0.3$$

Wrl: Weight (in kilograms) of a light receiver.
WrlET: Weight (in kilograms) of a light receiver of an ETC gun.
Wrh: Weight (in kilograms) of a heavy receiver
WrhET: Weight (in kilograms) of a heavy receiver of an ETC gun
Ea: Average muzzle energy (in joules) of the ammunition.
For shotguns, multiply receiver weight by 0.6.

Receiver Price: The price of the receiver is based on its weight and type of action, according to the following formula:

$$Cr = WrAm$$
$$CrET = WrAm+200$$

Cr: Price in credits
CrEt: Price in credits of ETC receiver
Wr: Weight (in kilograms) of the receiver
Am: Action multiplier, as shown below

Action	*Am*
Individually loading	50
Revolver	150
Lever-action	300
Bolt-action	300
Pump-action	300
Self-loading SA	200
Self-loading selective	250
Self-loading deluxe	300

Notes: A self-loading selective receiver is a selective fire receiver with semiautomatic fire and one automatic ROF. A self-loading deluxe receiver is a selective fire receiver with, in addition to semiautomatic fire, more than one automatic rate of fire option (regardless of how many).

Doubles

Any weapon using an individually loading receiver may have more than one barrel if the designer wishes (this is common in shotguns and large-bore rifles). Each barrel must have its own individually loading receiver, but only one stock/grip is needed. These barrels need not be identical in caliber, but they must be identical in length.

It remains for the designers and users of such weapons to discover the practical limit on the number of barrels to be incorporated into such a design, but such weapons normally only include two (hence the name), and seldom more than three. Double-barreled shotguns are the most common, but it is not uncommon to combine a smoothbore shotgun barrel with a rifle barrel, or two rifle barrels. Double weapons are primarily used for hunting, and are seldom used for military purposes due to their obvious drawbacks (low magazine capacity, lengthy reloading time, and relatively heavy weight).

3. Stocks

Stocks refer to rifle stocks and pistol grips. The desired stock for the weapon is selected from the following table. Note that carbine stocks are generally fitted to rifles with short barrels (up to 80% of the average barrel length for the cartridge) or sport versions of rifles. They are not considered sturdy enough for full-length rifles in military use. If a weapon (such as a machinegun) is to be used exclusively from a tripod or a vehicle, it only needs a pistol grip instead of a stock.

TL	*Type*	*L (cm)*	*M (kg)*	*Cr*
4	Wood pistol grip	0	0.2	5
5	Hollow pistol grip	0	0.1	25
4	Wooden stock	25	1	25
4	Carbine stock	25	0.7	20
6	Folding stock	5/25	0.5	50
7	Plastic stock	25	0.5	30
7	Bullpup	5	0.1	10



Range: Once the type of stock is known, the weapon's range can be calculated according to the following formula:

SR = (√E) CmBlm

SR: Short range (in meters) of a weapon.

E: Muzzle energy (in joules)

Cm: Configuration modifier, as shown below. If two configuration descriptions apply to the same weapon, multiply them together to determine the total configuration multiplier.

Configuration	*Cm*
Bullpup	0.9
Bolt-action	1.1
One-handed	0.4
Two-handed*	1.3
Smoothbore**	0.5

*Two-handed refers to weapons specifically designed to be fired with two hands, and thus including a stock instead of simply a pistol grip. However, all vehicle- or tripod-mounted weapons are considered to be two-handed, even if equipped with only a pistol grip.

**Includes all shotguns.

Blm: Modification to short range for barrel length. The barrel length modifier is determined by the following formula:

Blm = 1 + ([Blp–1]×C)

Blm = Barrel Length Modifier

Blp = Actual barrel length (cm) divided by Average barrel length (cm): Bl÷Bla

Bl = Barrel Length

Bla = Average Barrel Length (for the cartridge)

C = Constant. If Blp–1 is a negative number, the constant is 1.2. If Blp–1 is a positive number, the constant is 0.75.

DS Ammunition: Multiply range by 1.2 for DS ammunition.

HE and HEAP Ammunition: Multiply range by 0.75.

Tranq Ammunition: Multiply range by 0.6, but short range is never more than 30 or less than 4 meters regardless of the calculated value.

Limits on Short Range: Regardless of any modifications made in this step or later (through additions of sights or mounts), the upper limit on the short range of small arms is 300 meters. Even direct line-of-sight energy weapons (such as lasers) are constrained by the physiological limitations of the operator.

4. Feed System

The feed system is the method by which individual rounds are stored in the weapon fed to the receiver.

Breach-Loaded: Breach-loaded weapons have no magazine, as the individual bullets are loaded directly into the receiver.

Cylinder: A cylinder is the magazine of a revolver, but its weight is included in the weight of the receiver. The capacity of the cylinder is 19 divided by the square root of the bullet diameter.

Belt: Belts are linked rounds fed directly into the receiver. Only heavy self-loading receivers may be belt-fed. Belts usually hold 100 rounds, although they may hold more or less if desired. The weight and price of the links are negligible.

Cassette: A cassette is a pre-packaged container of ammunition attached to an endless link feed system which moves the ammunition to the weapon. Only heavy self-loading receivers may be cassette-fed. Cassette feed systems are usually electrically powered, either by batteries or by an engine. Cassette feed systems are available at tech level 7 and above.

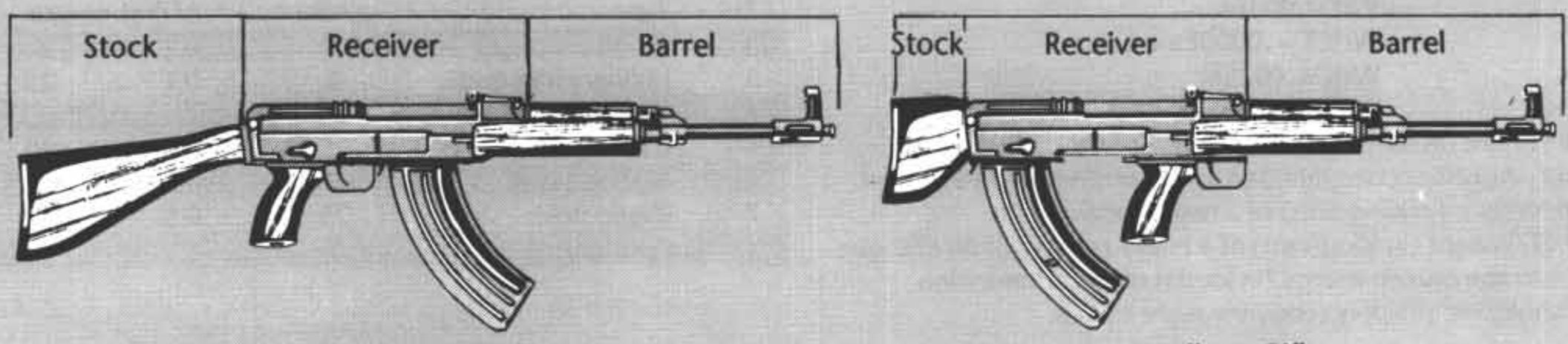
A cassette feed system masses 2 kilograms plus the mass of the

Bullpup Configuration

The basic configuration for small arms weapons is a barrel, receiver, and stock. The receiver has to be in the middle, for obvious reasons, and has to be long enough to accommodate the trigger mechanism (usually in the form of a pistol grip) and the feed system (usually a box magazine). The trigger mechanism must be far enough forward from the base of the stock for the firer to comfortably hold it to steady the weapon while aiming. Given these requirements, there doesn't seem to be much room for rifle designers to improve on the classic arrangement of the parts. That being the case, the only way to get a shorter rifle is to shorten the barrel, which adversely affects muzzle energy and range.

The bullpup configuration is a way to partially circumvent the problem. The barrel and receiver are just as long as with a conventional rifle, but the trigger mechanism and feed assembly are placed at opposite ends of the receiver. This allows most of the receiver length to be used for the stock, with only a small recoil pad added to the end. Without sacrificing any critical component, the overall weapon length is reduced.

There are two drawbacks to the bullpup configuration. First, it is more difficult to build the receiver, and make it jam-proof, in this configuration than in the more common one. By tech level 8, however, these engineering problems have been overcome. Second, the sight radius is shorter than on a conventional rifle of the same barrel length, and this reduces accuracy slightly when using iron sights. (This is why there is a configuration modifier to range of 0.9 for a bullpup rifle.) This can be overcome by mounting optical sights, which do not depend upon a long sight radius for accuracy, on the weapon.



Conventional Rifle

Bullpup Rifle



ammunition contained in it. Due to the basic overhead cost of the power and feed system, cassettes seldom hold fewer than 1000 rounds. The price of an empty cassette is equal to the price of a single round of ammunition for the weapon multiplied by 500.

Grip Magazine: Grip magazines are small box magazines inserted through a hollow pistol grip.

Grip magazines may not hold necked cartridges.

The maximum length of bullets in grip magazines, as well as the number of rounds which can be carried in a grip magazine, varies with tech level, as shown in the table below. The capacity, however, applies only to magazines which fit completely inside the pistol grip. Weapons which are never holstered (such as submachineguns) may have longer magazines. The maximum ammo length still applies, but the capacity of the magazine otherwise is determined as for a box magazine.

TL	*Max Al*	*Cap*
4	30	80+d
6	40	100+d
7	50	120+d
8+	60	140+d

TL = Tech level
Max Al = Maximum ammunition length
Cap = Maximum number of rounds in the magazine
d = Bullet diameter

Box Magazine: A box magazine is a spring-loaded metallic or plastic box which is attached to the receiver. A weapon may only be fed by a box magazine if its receiver is at least 150mm longer than the length of the cartridge fired by the weapon.

Clip: A clip is a thin piece of metal holding a group of rounds together. The clip is pushed into the receiver, and the rounds enter a nonremovable internal magazine. The clip is either discarded at that point or ejected by the weapon when the last of the rounds are expended. A weapon may only be clip-fed if its receiver is at least 150mm longer than the length of the cartridge fired by the weapon. The clip itself has negligible mass and price. Clips may not hold more than 10 cartridges.

Tubular Magazine: A tubular magazine is a hollow, spring-loaded metallic tube into which individual rounds are loaded. Tubular magazines are long, must be mounted parallel to the barrel, and so can only be mounted under the barrel, over the barrel, or in the stock.

The maximum capacity (number of rounds) in a tubular magazine is its length divided by the length of a single cartridge, rounding fractions down. The maximum length of the magazine is the barrel length or, if mounted in the stock, 25cm.

Magazine Weight: The weight of an empty magazine (grip magazine, box magazine, clip-fed internal magazine, or tubular magazine) is determined by the following formula.

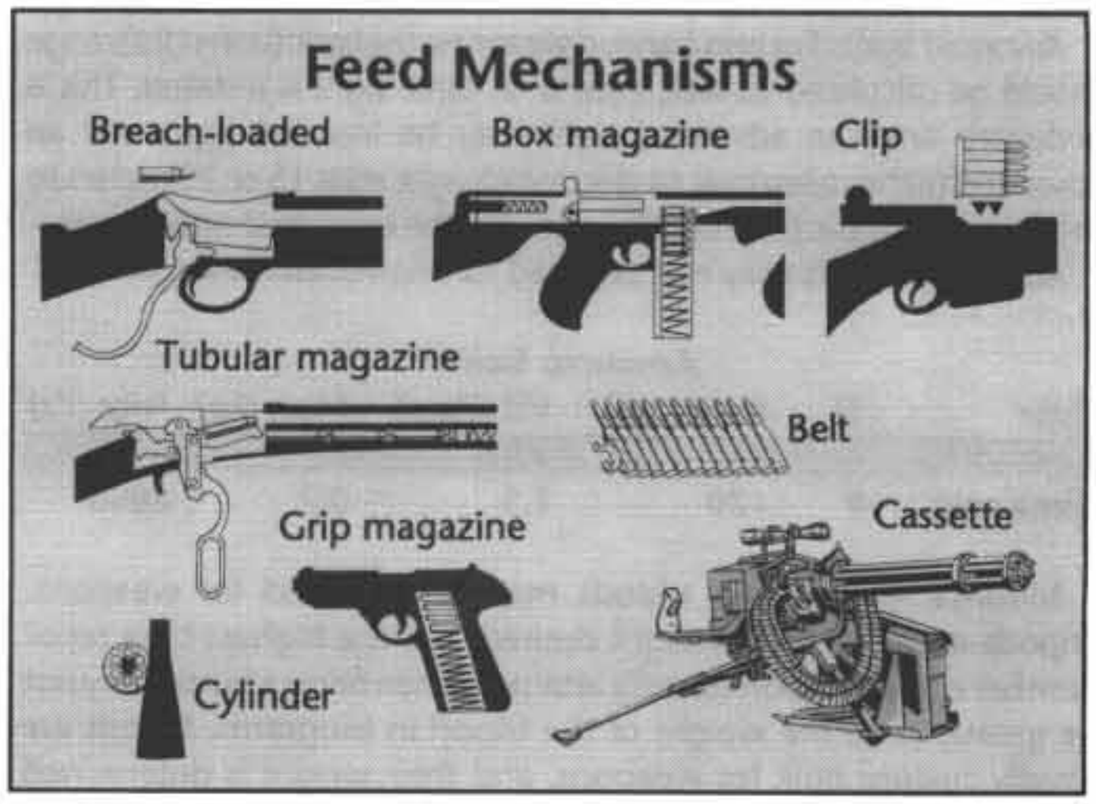
Wm = .0006(N+4)Wa

Wm: Weight (in kilograms) of an empty magazine.
Wa: Weight (in grams) of a complete round of ammunition.
N: Number of rounds the magazine is designed to hold.

A loaded magazine weighs this plus the weight of the individual rounds loaded into it. Note that in the case of tubular and clip-fed internal magazines, the empty magazine is a permanent part of the weapon and so forms part of its empty weight.

Empty magazines cost Cr10 per kilogram, rounding fractions up.

Electrothermal Chemical Feed Systems: ETC weapons may only be fed by box magazine, grip magazine, belt, or cassette. In all cases, the power source (a fast-discharge battery) is included in the feed device. Belts usually come in ammunition boxes which also contain the battery pack necessary to fire the belt of ammunition. The table below shows the price and weight addition to the feed device *per round* at each tech level.



TL	*Kg*	*Cr*
9	.027	5
10	.019	5
11	.013	5
12	.011	5

In addition, the internal volume available for ammunition is reduced in a grip magazine. When calculating the number of cartridges which can fit in the magazine, add 1 to the effective diameter of the bullets.

Note: The battery packs in ETC magazines are rechargeable and reusable.

5. Options

Sights: The basic ranges calculated above assume traditional iron sights. Optic sights may be fitted instead of iron sights. Optic sights are rugged military versions of telescopic sights, which do not provide the same long-range benefits of those sights but which do improve accuracy. Optic sights increase the weapon's short range as noted below.

Optic Sights

TL	*Range (Mult)*	*Mass (kg)*	*Price (Cr)*
7	×1.05	0.1	150
8	×1.1	0.1	150
9+	×1.15	0.1	150

Laser Sights: A laser sight may be substituted for or added to any other sight. A laser sight allows up to three shots fired during a turn to count as aimed shots (instead of only the first one). All other shots fired during the turn count as quick shots. The sight may only be used at ranges up to its maximum listed range.

Laser Sights

TL	*Mass (kg)*	*Range (m)*	*Price (Cr)*
8	1	40	400
9	1	240	1000
10	0.5	240	300



Advanced Sights: For two-handed weapons, the basic (iron sight) range should be calculated as well, even if an optic sight is installed. This is necessary since an advanced sight may be installed later, and an advanced (either telescopic or electronic) sight adds 15 or 20 meters to the weapon's basic (iron sight) range, not the enhanced optic range.

Advanced sights may not be fitted to one-handed weapons.

Advanced Sights

Type	*TL*	*Range (m)*	*Vol (liters)*	*Mass (kg)*	*Price (Cr)*
Telescopic	6	+15	0.8	0.1	200
Electronic	9	+20	1.5	0.2	2000

Mounts: Bipods and tripods may be provided for weapons. Tripods may be of any weight desired, but the highest base recoil number of the weapon (usually attained when firing a burst) may not be greater than the weight of the tripod in kilograms. Bipods are usually custom built for weapons, and their weight is determined using the following formula.

Wbp = .0005E (but never less than 1 kg)

Wbp: Weight (in kilograms) of the bipod

E: Muzzle energy (in joules)

Recoil: The recoil of a weapon (calculated below after final mass is established) when fired from a bipod is the standard value times 0.5. The recoil of a weapon when fired from a tripod is the standard value times 0.25. Weapons fired from moving vehicle mounts have negligible recoil.

The price of tripods is determined by the following formula:

Cr = 100 + (10W)

Cr: Price in credits.

W: Weight in kilograms.

The price of bipods is determined by the following formula:

Cr = 50 + (10W)

Cr: Price in credits.

W: Weight in kilograms.

Range: Bipods and tripods extend the range of the weapon, as shown on the following table (all vehicle-mounted weapons also receive the tripod modifier).

Mount	*Range*
Bipod	×1.3
Tripod	×2.0

Bayonet Lugs: Bayonet lugs are simple standardized brackets at the end of the weapon barrel. A bayonet lug costs nothing and has negligible mass, but must be specified as part of the design.

A bayonet is less useful than a hand-held knife unless it is mounted on a well-balanced weapon with sufficient length to allow it to be used as a spear point. As a result, only weapons with a bulk (see below) of 4 or more may profitably benefit from a bayonet lug. Shorter weapons may have them, but the mounted bayonet counts as a short range (instead of long range) melee weapon and suffers a +1 Diff Mod for its chance to hit in armed melee combat.

Grenade Adapter: A grenade adapter allows the firing of rifle grenades and adds 5 cm to the length of the weapon and costs Cr50.

Recoil Reduction: There are three types of devices used to reduce recoil: muzzle brakes, shock absorbers, and compensators. No more than one of each type may be added to the weapon. Some weapons enjoy lower recoil because of the type of action employed, and these are treated as a separate fourth type of recoil reduction.

Muzzle Brakes

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
6	Muzzle Brake	4	.2	.9	50
7	Muzzle Brake	4	.2	.85	50
7	Long Muzzle Brake	8	.4	.7	200
8	Muzzle Brake	4	.2	.8	50
8	Long Muzzle Brake	8	.4	.65	200
9	Muzzle Brake	4	.2	.75	50
9	Long Muzzle Brake	8	.4	.6	200

Shock Absorbers

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
5	SA Stock**	0	.1	.95	50
7	SA Stock**	0	.2	.9	75
9	Folding SA Stock**	0	.2	.9	150
9	SA Stock**	0	.2	.85	75

Compensators

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
10	Gyroscopic Compensator	0	.5	.5	300
14	Inertial Compensator***	0	1	.3	1000

Action

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
4	Auto or Semiauto*	—	—	.95	—
9	Electrothermal Chemical*	—	—	.6	—

TL: Tech level

L: Length in centimeters

W: Weight in kilograms

Cr: Price in credits

Rcm: Recoil compensator modifier

SA: Shock-absorbing

*Automatic and semiautomatic weapons have a limited built-in recoil compensation system, as some of the weapon's recoil is used (and absorbed) operating the mechanism of the weapon itself. By the same token, electrothermal chemical guns have lower recoil than their muzzle energy would normally indicate and so have what amounts to a built-in recoil reduction. This is automatically included in the weapon and has no additional cost or weight.

**The prices and weights for an SA (shock-absorbing) stock represent the cost to add this mechanism to a conventional stock, and so are in addition to the cost and weight of the stock already fitted. The shock-absorbing feature may usually only be added to solid stocks, not folding stocks. When the folding shock absorbing stock becomes available (TL 9) it may be added to either type of stock.

***The inertial recoil compensator is worn as a harness and the gun is attached to it by a flexible arm. The arm becomes rigid when the weapon is fired and the recoil compensator in the harness pack absorbs much of the force of the recoil. Unlike all other recoil reduction devices, the weight of the inertial compensator is not added to the weight of the weapon (Ww) for purposes of determining recoil weight below.

If a weapon has more than one Rcm, multiply them together to get a single combined value.

If a weapon has no recoil modifiers, its Rcm is 1.



Recoil: Once any recoil compensators have been installed, the weapon's recoil when firing a single shot can be calculated. (Include the weight of a bipod, but *not* a tripod.)

$$R = \{[(0.15\sqrt{E})+Ww] + Em\} \times Rcm$$

R: Recoil number

E: Muzzle energy

Ww: Weight, in kilograms, of weapon (use empty weight for belt- and cassette-fed weapons, loaded weight for all others)

Rcm: Recoil compensator modifier.

Em: Modifier for high muzzle energy. If the weapon has high muzzle energy, add to the final recoil as shown on the chart below.

E	*Em*	*E*	*Em*
1001+	1	10,001+	4
2501+	2	20,001+	5
5001+	3	50,001+	6

When calculating the recoil energy of a burst of shots, the following formula is used:

$$R = (\{[(Bn+2)(0.15\sqrt{E})]+Ww\} + \{[Bn+2]Em\}) \times Rcm$$

Bn = number of shots in the burst.

Bulk: Weapon length is calculated by adding the lengths of all of the individual components. Once the final length of the weapon has been determined, the bulk can be calculated. Bulk is equal to the weapon length (in centimeters) divided by 15, rounding all fractions down.

Volume: Weapon volume, for purposes of installation in a vehicle, is one liter per kilogram of mass (or one cubic meter per tonne).

6. Tinkering the Design

Most of the specifications for the weapon are minimum specifications, and so a weapon can always be heavied up (to reduce its recoil, for instance). This is usually done by adding weight to the receiver. If the weapon has a light receiver, its weight can be increased until it reaches the weight of a heavy receiver for a weapon of that muzzle energy. Once it reaches the weight of a heavy receiver, its weight can only be increased by increasing the length of the receiver. The percentage increase in weight over the weight of a heavy receiver is the percentage increase in length produced by that extra weight.

By the same token, a designer may wish to increase the length of a receiver (to make it possible to use a box magazine, for example). In this case the percentage increase in receiver length is the percentage increase made in receiver weight.

Silencers and Sound Suppressors

True "silencers" are very difficult to construct because, although the sound of the cartridge firing can be muffled, the sound of a supersonic bullet passing through the air cannot, and it is this crack (a mini sonic boom) that is usually heard by hostiles. In fact, many combat soldiers report that they have never heard any weapon firing but their own while in combat, so completely does the mind filter stimuli in a desperate situation, but they regularly hear the passage of hostile bullets.

Sound suppressors effectively muffle the sound of the weapon firing while leaving the sonic crack of the bullets unmodified. This will have no effect on the ability of target personnel to realize that they are under fire or in determining the direction of the fire. What it does do is make it more difficult for personnel not part of the firefight to notice that it is going on. Firefights conducted with suppressed weapons will seldom be heard beyond 500 meters in open countryside or 100 meters in urban areas.

Truly silenced weapons not only muffle the sound of the cartridge firing but also slow the bullet (usually by bleeding off muzzle gas) to sub-sonic speeds. This reduces the sound of the bullet but also considerably reduces muzzle energy. Silenced weapons will not be heard beyond 25 meters in open countryside or five meters in urban areas.

A silenced weapon has its muzzle energy (and as a result its range, damage, and penetration) reduced to that of a weapon of the same caliber but a 15mm straight non-ETC cartridge case. Mounting a standard noise suppressor on a weapon which already fires low-powered cartridges (15mm or less straight non-ETC) and which have a noise suppressor mounted are considered silenced.

Silencer

Length: 1cm per 25 joules of muzzle energy
Weight: 0.025 kg per cm of length
Price: Cr5 per cm of length

Suppressor

Length: 1cm per 100 joules of muzzle energy
Weight: 0.025 kg per cm of length
Price: Cr5 per cm of length

Flash Suppressors

A flash suppressor reduces or eliminates muzzle flash. All firearms have a muzzle flash at night. Weapons with a muzzle energy of 1000 joules or more have a visible daytime muzzle flash when firing from cover or darkened areas (such as woods, buildings, etc.) All weapons with a muzzle energy of 1000 joules or more and a barrel length which is 80% or less have a bright visible muzzle flash in all light conditions.

A flash suppressor will reduce or eliminate muzzle flash, moving the weapon down one "category" for a regular flash suppressor and down two "categories" for a long flash suppressor. A long flash suppressor is twice the length of a regular suppressor.

Flash suppressors may be combined with muzzle brakes by adding the cost of the two together. The total length of the assembly is the length of longer of the two attachments.

Flash Suppressor

Length: 1cm per 300 joules of muzzle energy
Weight: 0.01 kg per cm of length
Price: Cr 1 per cm of length.

Multiple-Barrel Rotary Guns

The design system does not allow for a rate of fire of higher than 10 per barrel due to overheating. However, it is possible to design a multi-barrel weapon which can deliver a higher overall rate of fire. The design sequence follows the above sequence except where specifically noted below.

1. Barrels: The weapon may have as many barrels as desired, but all of them must be identical.

2. Receiver: Rotary guns must have a heavy receiver, and the weight of the receiver is increased by an additional 10% for every barrel. So, for example, a three-barreled gun would have a receiver 130% as massive as a normal heavy receiver of that caliber. This does not increase receiver length, however.

Rate of fire is always equal to 10 times the number of barrels minus 1.

$$ROF = 10\ (Bn-1)$$

Firing characters roll 10 dice for hits at short range, but each rolled hit causes actual hits equal to one less than the number of barrels (Hits = Bn–1). See the **Traveller** rulebook for automatic fire rules and attenuation with range.

3. Feed System: Rotary guns must be cassette- or belt-fed.



Gunshot Wounds

There are few rule mechanics in roleplaying that have generated as much heated discussion as the subject of gunshot wounds and how best to simulate them in a game. The principal reason for this is that, despite the long history of gunshot wounds, interior wound ballistics (the study of what a bullet actually does once it enters a human) have only been subject to careful and systematic study for a few years.

Prior to the last decade, almost all of what we knew about gunshot wounds was anecdotal in nature, based partially on autopsy results (when the wounds were fatal) and partially on the reports of surgeons who treated gunshot wounds, particularly military surgeons. Recently, however, much more systematic study has been done using high-speed photography, test-firing of bullets into blocks of ballistic gelatin (with the same consistency as human tissue), and test-firing into animal carcasses. The U.S. Wound Ballistics Laboratory (WBL), under the direction of Dr. Martin Fackler, has pioneered in this study.

These controlled experiments have gone a long way toward explaining what happens when a bullet enters the human body, and have relegated many of our most cherished beliefs about gunshot wounds to the status of old-wives' tales. A couple of key issues are worth talking about.

Bullet Tumble: Here is a subject about which a huge amount of misinformation has been published. Just recently I picked up an otherwise-reputable source on modern warfare and was told that small-caliber assault rifle bullets (such as from an AK-74 or M-16) actually tumbled through the air, thus causing more dramatic wounds when they hit. Another source didn't go to quite this extreme, but did report that the bullet of the Soviet AK-74 (the 5.45x39mm) is of a very complex design and incorporates an air bubble in the tip of the steel jacket to push the center of gravity back and make it more likely to tumble when it hits its target.

Rubbish.

To begin with, assault rifle bullets do not tumble through the air. Because they are fired from "rifles," they are spin-stabilized and fly straight along their ballistic path. If they tumbled, they would be wildly inaccurate and would lose velocity and energy very quickly.

Second, *all bullets tumble once they hit an obstruction.* I witnessed a convincing demonstration of this conducted by firing various small arms through two paper targets perhaps a meter apart, with the area between them filled with light brush and branches. After firing, the two target were compared. The first target had a perfectly round hole. The second target had an elongated hole (called "key-holing"), meaning that the bullet was beginning to tumble as it passed through it. The demonstration started with small-caliber assault rifles (which everyone knows tumble when they encounter foliage), then demonstrated the same effect with heavier 7.62mm NATO rounds, and wrapped up the show with a Barret .50-caliber sniper rifle. All of the rounds, including the .50-caliber round, began tumbling after hitting the brush.

Third, the impression most people have is that when a bullet tumbles, it does so end-over-end repeatedly. Not so. Dr. Fackler at the WBL has shown repeatedly that when a bullet enters a resisting medium, it will tumble through 180 degrees and then become stable again, exiting the target backwards.

So why does the Russian 5.45x39mm bullet have an air bubble in the tip? About five or six years ago, I had the chance to talk to a representative from the European ammunition firm Dynamit Nobel at a small arms conference. As we talked, it turned out that he had been one of the researchers present when the first examples of 5.56x39mm ammunition captured in Afghanistan had been examined. After carefully cutting open several rounds, their conclusion was that the air bubbles were the result of poor manufacturing techniques. The Soviets simply hadn't been able (or hadn't thought it worth the trouble) to force all of the air out of the tip of the steel jacket when forcing in the lead. From such little things are legends born.

Hydrostatic Shock: For a while it was widely thought that bullets with a sufficiently high muzzle velocity would cause a massive hydrostatic overpressure in the human circulatory system and (in some versions of the theory) explode the heart. Other versions claimed somewhat less dramatic results, but still argued that high-velocity bullets caused massive tissue damage from hydrostatic shock.

Again, the WBL and Dr. Fackler convincingly disproved this. But how can that be? Everyone has seen convincing demonstrations of hydrostatic shock when a bullet is fired into a sealed tin can or sealed water jug and it explodes from the overpressure. Why doesn't the human body behave the same way? Because it is not a tin can.

Instead of being rigidly contained, the human body is extremely flexible and can easily absorb sudden transitory pressure surges. The one place this is less true is the head which, because of the skull, is much less elastic and much more susceptible to hydrostatic shock. Aside from head shots, however, hydrostatic pressure is not the killer it was once thought to be.

Size, Velocity, Energy: What actually injures people? Is it the size of the bullet, its velocity, or its energy? The answer, unfortunately, is "it depends."

Let's start by looking at simple tissue damage. A bullet passing through a target destroys tissue along its path, and it destroys that tissue no matter how fast or how slow it goes (assuming it has enough energy to pass completely through the target). The actual amount of damage done is the volume of the wound cavity, which at first glance might seem to be equal to the diameter of the bullet times the length of the cavity. Not quite. Since all bullets tumble, at some point the bullet actually is travelling sideways and it is at that point that most of the serious damage is done. A better measure of a bullet's damage is found by multiplying its diameter by its length. Long bullets (such as those fired from rifles) are much more damaging than the shorter bullets fired from pistols.

But if all that matters is bullet dimensions, what's all the fuss about muzzle energy? The answer is that bullet dimensions are important determinants of *tissue* damage, assuming that's all that the bullet hits. But if the bullet hits bone, bullet energy becomes critical. A low-energy bullet will often ricochet off the bone, sometimes exiting the wound and doing very little damage. A high-energy bullet, on the other hand, will shatter the bone, continue on its course, and send bone fragments through the body as additional tissue-destroying projectiles.

We wanted a fairly simple means of calculating bullet damage, and so chose to base it exclusively around muzzle energy, for three reasons. First, whenever bone is hit (which is fairly often), energy is the main cause of damage. Second, when tissue is hit, a certain minimum muzzle energy is necessary to force the bullet through the target and cause maximum tissue damage, and so even here energy serves as a cap on damage. Third, bullet dimensions (the main cause of tissue damage) are directly related to bullet mass, and, except in very unusual cases, larger bullets have higher muzzle energies.



CHAPTER 2
Gauss Weapons

Conventional small arms accelerate projectiles using the force of expanding gases from an explosion. These weapons are inherently limited by the rate of expansion of the exploding gases and, as noted before, have a practical upper limit on muzzle velocity of about 2000 meters per second.

Electromagnetic weapons, however, have no such limits. These weapons use electric energy to power electromagnets which accelerate projectiles down the barrel of the gun. For these weapons, the practical upper limit of muzzle velocity in the atmosphere is 6400 meters per second. Projectiles moving faster than that will burn up from atmospheric friction. There is no real limit to muzzle velocity in a vacuum, but most electromagnetic weapons are designed for work on a planetary surface and so are designed within the limits of atmospheric operation.

Electromagnetic small arms (2cm and smaller in bore) are called gauss weapons (as opposed to mass drivers, which refers to larger-bore electromagnetic weapons). Gauss weapons can be built in the same configurations as other small arms: pistols, carbines, rifles, and autoguns.

One additional advantage that gauss weapons have over conventional small arms is the lack of barrel friction. Conventional small arms push the bullet out of the barrel by means of expanding explosive gases (or an expanding plasma in the case of ETC rounds). The bullet must be a tight fit in the barrel in order to contain the high-pressure gases behind it, and this means that there is considerable friction between the bullet and the barrel wall. Not only is this energy-inefficient, it generates a great deal of heat. In fact, very little barrel heat is generated by the heat of the propellant explosion; almost all of it is simple friction.

Since a gauss weapon does not rely on a tight gas seal to push the round, the bullet is in only light contact with the barrel as it moves down it and so generates very little friction. This allows a weapon to sustain a much higher rate of fire and to do so without resorting to multiple gun barrels. As a result, most gauss autoguns are usually called VRF gauss guns, the VRF standing for very rapid fire.

Gauss weapons consist of four principal components: a barrel, power source, homopolar generator, and stock or mount.

The barrel consists of a series of concentric metallic rings which are the actual magnetic propellers for the round. These magnets are fired in sequence and accelerate the bullet down the barrel. The ring magnets are usually covered with a protective housing.

The weapon's power source can be any conventional supply of electricity, and is dictated more by the size of weapon and its likely use than by any unique requirements of the electromagnetic process. Weapons mounted on vehicles often draw on the vehicle's power plant for energy, while man-portable weapons rely on batteries.

Regardless of the means of power generation, a homopolar generator is necessary to store the energy until it reaches sufficient density to power the gun (and until the gunner wishes to fire), and then feeds the energy back in one rapid burst of power. One advantage of the tremendous torque generated by the rapid discharge of the HPG is that it can be used to gyroscopically counter part of the weapon's powerful recoil.

Gauss weapons use stocks and mounts similar to conventional small arms, and are very similar in appearance to such weapons.

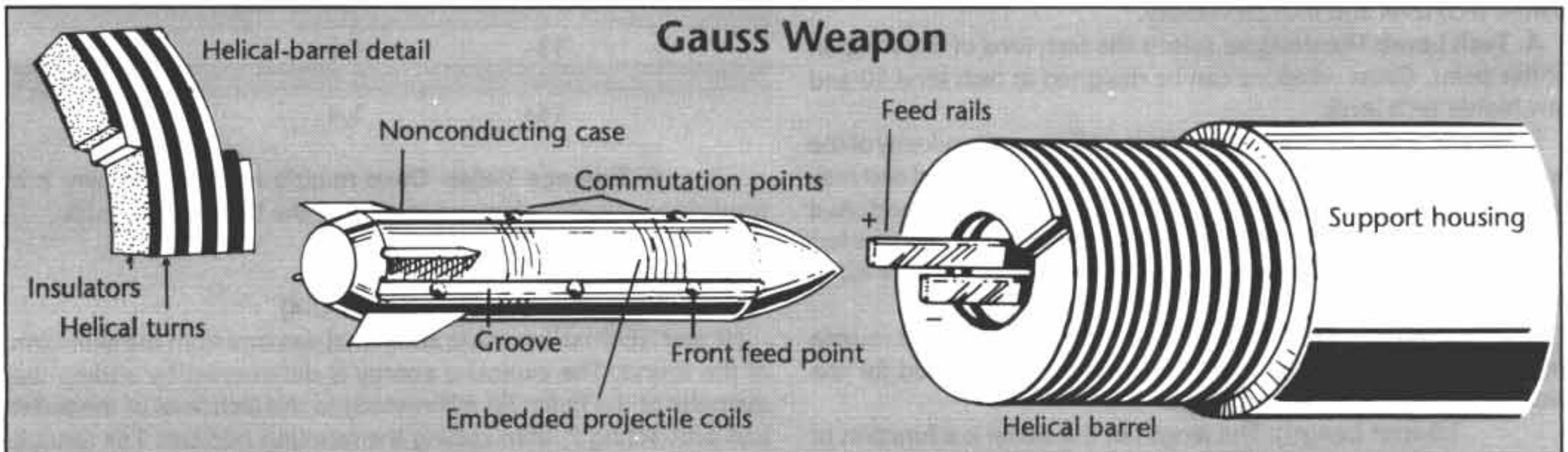
Gauss Ammunition Design

Like other small arms, the first step in designing a gauss weapon is to design its bullet. As the bullet is a simple finned dart, however, this is much simpler than with other small arms ammunition.

The only defining characteristic of gauss ammunition is its caliber, expressed in millimeters. Although standard weapons listed in the game are usually in increments of 0.5 millimeters (such as 5.5mm, 7.5mm, etc.) weapons may be designed in any caliber desired, such as 11.43mm or 4.71mm. Small arms gauss weapons may be made in any caliber up to 20mm. (Weapons of 20mm and above are usually considered to be cannons and are covered under Mass Drivers, pages 110-111.) All gauss bullets have a length equal to their diameter multiplied by 5.

Once the size of the round has been specified, determine its weight.

Gauss Weapon



A slotted copper alloy coil magnet is arrayed to form the barrel of the gauss gun so that current flows through the entire array along one continuous helical path.

The bullet has two projectile coils set into its outer casing (which is itself nonconducting), grooves in the side to fit electrical rails which run along the inside sides of the gun barrel, feed contact points in the grooves, and commutation contact points attached to the coils. The feed contact points set in the bullet grooves allow direct current to pass from the positive left rail into the rear projectile coil and then exit the bullet through the rear coil's commutation contact point into the main magnetic coil. The current then flows along the coil of the magnet until it reenters the bullet's front coil by way of the front coil's commutation contact point and exits the bullet by way of the front feed contact point into the negative rail. In this way, the current moves up the barrel with the projectile, continuously accelerating it.



Weight: The ammunition weight (Wa) in grams is determined using the following formula:

$$Wa = .04\,\pi r^2$$

r: Radius (in millimeters) of the bullet (half the diameter).

π: 3.1416

Price: The price of the ammunition is determined by the following formula:

$$Cr = WaTm$$

Cr: Price in credits

Wa: Weight of the round in grams

Tm: Type multiplier, as determined below:

Type	*Tm*
Mass-produced military ammo	0.02
Conventional	0.04

Special Ammunition

The above design sequence deals with solid slug ammunition, called "dart" ammunition for gauss weapons. A variety of special small arms ammunition is available as well.

HE: HE, or high-explosive, ammunition is hollow and contains an explosive filler that detonates on impact.

Price for HE rounds is multiplied by 2.

HEAP: HEAP, or high-explosive, armor-piercing, bullets are hollow, as with HE bullets, but have small shaped charges for penetrating armor.

Price for HEAP rounds is multiplied by 3.

Tranq: Tranq rounds are nonlethal means of subduing adversaries. These are fired at lower-than-usual velocities, to avoid lethality.

Price for Tranq rounds is multiplied by 2.

WEAPON DESIGN

1. Barrel

The barrel of a gauss weapon is a major component of the weapon and is much more sophisticated in design and construction that the barrel of a conventional small arm. Once ammunition has been selected, two design decisions determine everything else about the barrel: tech level and muzzle velocity.

A. Tech Level: The designer selects the tech level of the weapon at this point. Gauss weapons can be designed at tech level 10 and any higher tech level.

B. Muzzle Velocity: The designer selects the muzzle velocity of the weapon. Muzzle velocity is expressed in meters per second and may be any velocity up to a maximum of 6000 meters per second. As a practical matter, gauss small arms rarely have muzzle velocities less than 1500 meters per second or much in excess of 3000 or 4000 meters per second.

C. Evaluation: Based on ammunition size, tech level, and muzzle velocity, a number of important variables are determined for the weapon that are used in later steps.

1.Barrel Length: The length of the barrel is a function of tech level and muzzle velocity. Higher velocities require longer barrels to provide the necessary acceleration, while advances in technology allow higher acceleration in shorter distances (thus allowing shorter barrels). Barrel length is determined using the following formula:

$$Lb = V+100TLm$$

Lb: Length of barrel in centimeters.

V: Muzzle velocity in meters per second. (Step 1-B)

TLm: Tech level multiplier, as shown in the next column:

TL	*TLm*
10	1.6
11	1.3
12	1.0
13	0.8
14	0.6
16+	0.4

2. Barrel Weight: The weight of the barrel is determined using the following formula:

$$Wb = .03Lb$$

Wb: Weight (in kilograms) of a barrel.

Lb: Length (in centimeters) of the barrel. (Step 1-C-1)

3. Barrel Price: The price of the barrel is determined using the following formula:

$$Cr = Wb600$$

Cr: Price of the barrel in credits.

Wb: Weight of the barrel in kilograms (Step 1-C-2)

4. Muzzle Energy: The muzzle energy of the weapon is determined using the following formula:

$$E = (0.5MV^2)+1000$$

E: Muzzle energy in joules

M: Bullet mass in grams

V: Muzzle velocity in meters per second (Step 1-B)

Tranq rounds are assumed to have lower muzzle velocities, but this is handled in the Damage Value (Step 1-C-6) and Range (Step 3-A) sections below, and so is not calculated separately.

5. Required Energy: The energy required to accelerate the bullet to the desired muzzle velocity is a function of the total generated muzzle energy, and the efficiency of the weapon in converting electrical power quickly to magnetic force (which is a function of tech level). The required energy (in joules) is equal to the weapon's muzzle energy multiplied by the weapon's tech level efficiency, as shown on the following table.

TL	*Efficiency*
10	3
11	2.4
12	2
13	1.8
14	1.6
16+	1.4

6. Damage Value: Once muzzle energy is known, it is possible to calculate damage and using the following formula.

$$D = (\sqrt{E})+15$$

D: Damage value

E: Muzzle energy (in joules) (Step 1-C-4)

HE and HEAP bullets cause additional damage from the explosion of the round. The explosive energy is determined by adding the diameter of the bullet (in millimeters) to the tech level of the bullet and subtracting 7, then cubing the resulting number. The result is the explosive energy of the bullet. When calculating damage, the value for E in the formula becomes the sum of muzzle energy and explosive energy.

All Tranq rounds have a damage value of –1*, indicating that they do 1D6–1 points of damage plus the special tranq effect discussed on page 350 of the basic **Traveller** rules.



7. Penetration: It is also possible to determine penetration once muzzle energy is known by consulting the following table:

E	*Pen*
0-1000	Nil
1001-3000	1-Nil
3001-5000	1-2-Nil
5001-10,000	1-3-5
10,001-20,000	1-2-4
20,001-50,000	2-2-3
50,001+	2-2-2

For HEAP ammunition, penetration is always 2-2-2.
For HE and Tranq ammunition, penetration is always Nil.

2. Receiver

The receiver of a gauss weapon serves a function somewhat different from that of a conventional small arm. As in a conventional weapon, the gauss weapon's receiver "receives" the bullet from the magazine and aligns it with the barrel for firing. There is no mechanical bolt, firing pin, or ignition chamber, however, as the acceleration of the round takes place exclusively in the barrel. Therefore, the receiver houses only the magazine feed system and the internal homopolar generator.

A. Receiver Type: All gauss receivers are of the self-loading variety. The receiver may be semiautomatic (single shot, ROF code of SA) or selective fire (capable of semiautomatic and full automatic fire) at the designer's option.

B. Rate of Fire: If selective fire, designer must specify the automatic rate of fire, 5, 10, or 50. If either ROF 5 or 10 is chosen, the weapon is normal selective fire. If both 5 and 10 are chosen, it is a multi-selective fire weapon. If the rate of fire is 50, the weapon is called a VRF (very rapid fire) gauss weapon.

A listed ROF of 5/10 means that the weapon is multi-selective fire and can be fired as a semiautomatic weapon, an automatic weapon with an ROF of 5, or an automatic weapon with an ROF of 10.

C. Evaluation: Based on receiver type and barrel information, a number of important variables are determined for the weapon.

1. Receiver Weight: The receiver weight is dependent largely on the energy of the weapon and the efficiency of homopolar generators available at that tech level. Receiver weight is determined by the following formula:

$$Wr = PTm$$

Wr: Weight of the receiver in kilograms
P: Required power joules (Step 1-C-5)
Tm: Tech level modifier as shown below.

TL	*Tm*
10	0.00016
11	0.00012
12	0.00010
13	0.00009
14	0.00008
15	0.00007
16	0.00006
17	0.00005
18	0.00004
19	0.00003
20	0.00002
21	0.00001

If capable of fully automatic fire (with a rate of fire of either 5 or 10), multiply the receiver weight by 1.1. If multi-selective fire (capable of both automatic ROFs 5 and 10), multiply the receiver weight by 1.2. If a VRF weapon (rate of fire of 50), multiply the receiver weight by 5.

2. Receiver Length: The length of the receiver is determined by the following formula:

$$Lr = \sqrt{1000Wr}$$

Lr: Length of the receiver in centimeters
Wr: Weight of the receiver in kilograms (Step 2-C-1)
However, the receiver may never be shorter than the length of one bullet.

3. Receiver Price: The price of the receiver in credits is equal to its weight in kilograms (Step 2-C-1) multiplied by 100. If capable of selective fire (one automatic rate), multiply price by 1.2.

3. Stocks

Stocks refer to rifle stocks and pistol grips. The desired stock for the weapon is selected from the following table. Note that carbine stocks are generally fitted to rifles with short barrels (up to 80% of the average barrel length for the cartridge) or sport versions of rifles. They are not considered sturdy enough for full-length rifles in military use. Weapons intended to fire exclusively from vehicle mounts and/or tripods only require a pistol grip.

TL	*Type*	*L (cm)*	*M (kg)*	*Cr*
4	Pistol grip	0	0.2	5
5	Hollow pistol grip	0	0.1	25
7	Rifle stock	25	0.5	30
7	Bullpup rifle stock	5	0.1	10

A. Range: Once the type of stock is known, the weapon's range can be calculated according to the following formula:

$$SR = (\sqrt{E})\ Cm$$

SR: Short range in meters of a weapon
E: Muzzle energy in joules (Step 1-C-4)
Cm: Configuration modifier, as shown below. If two configuration descriptions apply to the same weapon, multiply them together to determine the total configuration multiplier.

Configuration	*Cm*
Bullpup	1.1
One-handed	0.5
Two-handed*	1.6

* Two-handed refers to weapons specifically designed to be fired with two hands, and thus including a stock instead of simply a pistol grip. However, weapons with only a pistol grip but fired exclusively from a tripod or fixed/vehicle mount count as two-handed weapons.

Tranq Ammunition: Multiply range calculated above by 0.6 for tranq ammunition, but short range is never more than 30 or less than 4 meters regardless of the calculated value.

HE and HEAP Ammunition: Multiply range calculated above by 0.75 for HE and HEAP ammunitions.

Maximum Range: Regardless of the results of this calculation or any modifications made later (through the addition of sights or mounts), the upper limit on the short range of gauss weapons is 300 meters.

4. Feed System

The feed system is the method by which individual rounds are stored in the weapon fed to the receiver. Gauss weapon magazines are more complex than conventional small arms magazines since they hold, in addition to the bullets themselves, a battery capable of powering the weapon for the number of shots contained in the magazine.



A. Battery Weight: The weight of the battery in a magazine is a function of the number of rounds in the magazine, the required energy of the weapon, and the weapon's tech level. The battery weight is determined using the following formula:

Wb = NErTm

Wb: Weight of battery in kilograms.
N: Number of rounds the magazine is designed to hold.
Er: Required energy in joules.
Tm: Tech level modifier, as shown below:

TL	*Tm*
10	.00001
11	.000009
12	.000006
13	.0000055
14	.000004
15	.0000035
16	.000003

B. Magazine Type: Gauss weapons can be fed by grip magazines, box magazines, or cassettes. VRF weapons are usually fed from cassettes, but it is possible to design a large-capacity box magazine which can also feed such a weapon.

Grip Magazine: Grip magazines are small box magazines inserted through a hollow pistol grip.

The maximum length of bullets in a grip magazine is 60mm. The maximum number of rounds that can be carried in a grip magazine is equal to 140 divided by the diameter (in millimeters) of an individual round. The capacity, however, applies only to magazines which fit completely inside the pistol grip. Weapons which are never holstered (such as submachineguns) may have longer magazines. The maximum ammo length still applies, but the capacity of the magazine otherwise is determined as for a box magazine.

Box Magazine: A box magazine is a spring-loaded metallic or plastic box which is attached to the receiver. A weapon may only be fed by a box magazine if its receiver is at least 150mm longer than the length of the cartridge fired by the weapon.

Cassette: A cassette is a pre-packaged container of ammunition attached to an endless link feed system which moves the ammunition to the weapon. Cassette feed systems are usually electrically powered either by the batteries or by a vehicle engine.

C. Magazine Evaluation: Once the battery weight and magazine type have been determined, the following information can be determined:

1. Magazine Weight: The weight of an empty magazine (grip magazine or box magazine) is determined by the following formula.

Wm = .0006(N+4)Wa + Wb

Wm: Weight (in kilograms) of an empty magazine.
Wa: Weight (in grams) of a complete round of ammunition.
N: Number of rounds the magazine is designed to hold.
Wb: Weight of battery.

An empty cassette feed system weighs 2 kilograms plus the weight of the battery for the ammunition contained in it. Due to the basic overhead cost of the power and feed system, cassettes seldom hold fewer than 1000 rounds.

2. Magazine Price: Empty box or grip magazines cost Cr2 per kilogram, rounding fractions up. Empty cassettes cost Cr10 per kilogram, rounding fractions up.

3. Loaded Magazine Weight: A loaded magazine weighs the amount shown above plus the weight of the individual rounds loaded into it.

5. Options

Once the basic mechanical components of the weapon have been designed, a number of optional features may be added.

A. Sights: The basic ranges calculated above assume traditional iron sights. All of the more advanced sights listed below are available at all tech levels at which gauss weapons may be constructed.

Optic sights are rugged military versions of telescopic sights, which do not provide the same long-range benefits of those sights but which do improve accuracy. Optic sights provide a multiplier to the weapon's short range, as shown on the chart below.

Telescopic or electronic sights may only be installed on two-handed weapons and provide a base addition to the short range instead of a multiplication. This short range is the weapon's short range *before* being multiplied by the optic sight modifier.

A laser sight allows up to three shots fired during a turn to count as aimed shots (instead of only the first one). All other shots fired during the turn count as quick shots. The sight may only be used at ranges up to its maximum listed range.

ADVANCED SIGHTS

Type	*Range (m)*	*Mass (kg)*	*Price (Cr)*
Optic	×1.15	0.1	150
Telescopic	+15	0.1	200
Electronic	+20	0.2	2000
Laser	240	0.5	300

B. Recoil Reduction: There are two types of devices used to reduce recoil on gauss weapons: shock absorbers and compensators. No more than one of each type may be added to the weapon. Some weapons enjoy lower recoil because of the type of action employed, and these are treated as a separate fourth type of recoil reduction.

SHOCK ABSORBERS

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
9	Folding SA Stock*	0	.2	.9	150
9	SA Stock*	0	.2	.85	75

COMPENSATORS

TL	*Type*	*L*	*W*	*Rcm*	*Cr*
10	Gyroscopic Compensator	0	.5	.5	300
14	Inertial Compensator**	0	1	.3	1000

TL: Tech level
L: Length in centimeters
W: Weight in kilograms
Cr: Price in credits
Rcm: Recoil compensator modifier
SA: Shock-absorbing

* The prices and weights for an SA (shock-absorbing) stock represent the cost to add this mechanism to a conventional stock, and so are in addition to the cost and weight of the stock already fitted.



** The inertial recoil compensator is worn as a harness and the gun it attached to it by a flexible arm. The arm becomes rigid when the weapon is fired and the recoil compensator in the harness pack absorbs much of the force of the recoil. Unlike all other recoil reduction devices, the weight of the inertial compensator is not added to the weight of the weapon (Ww) for purposes of determining recoil weight below.

If a weapon has more than one Rcm, multiply them together to get a single combined value.

If a weapon has no recoil modifiers, its Rcm is 1.

C. Mounts: Bipods and tripods may be provided for weapons. Tripods may be of any weight desired, but the highest base recoil number of the weapon (usually attained when firing a burst) may not be greater than the weight of the tripod in kilograms. Bipods are usually custom-built for weapons, and their weight is determined using the following formula.

Wbp = .0005E (but never less than 1 kg)

Wbp: Weight (in kilograms) of the bipod

E: Muzzle energy (in joules)

The price of tripods is determined by the following formula:

Cr = 100 + (10W)

Cr: Price in credits.

W: Weight in kilograms.

The price of bipods is determined by the following formula:

Cr = 50 + (10W)

Cr: Price in credits.

W: Weight in kilograms.

Recoil: The recoil of a weapon when fired from a bipod is the standard value (as determined below) times 0.5. The recoil of a weapon when fired from a tripod is the standard value times 0.25. When calculating the weapon's weight to compute recoil in F-1 below, the weight of a bipod (if the weapon is equipped with one) is added into the weapon's weight, but not the weight of a tripod.

Range: Bipods and tripods extend the range of the weapon, as shown on the following table (all vehicle-mounted weapons also receive the tripod modifier).

Mount	*Range*
Bipod	×1.3
Tripod	×2.0

D. Bayonet Lugs: Bayonet lugs are simple standardized brackets at the end of the weapon barrel. A bayonet lug costs nothing and has negligible mass, but must be specified as part of the design.

A bayonet is less useful than a hand-held knife unless it is mounted on a well-balanced weapon with sufficient length to allow it to be used as a spear point. As a result, only weapons with a bulk (see below) of 4 or more may profitably benefit from a bayonet lug. Shorter weapons may have them but the mounted bayonet counts as a short-range (instead of long-range) melee weapon and suffers a +1 Diff Mod for its chance to hit in armed melee combat.

E. Grenade Adapter: A grenade adapter allows the firing of rifle grenades and adds 5 cm to the length of the weapon and costs Cr50.

F. Silenced: A gauss weapon makes very little sound normally as there is no explosive detonation of propellant. The only sound is the sound of the bullet travelling at supersonic speeds. Consequently, all gauss weapons are treated as having sound suppressors. In addition, a gauss weapon can be designed with the capability to reduce barrel coil power sufficiently to fire at subsonic velocities and thus be truly silenced. This option doubles the cost of the weapon's receiver, but has no effect on weapon weight or length.

If this option is selected, it is necessary to recalculate weapon muzzle energy, damage, penetration, and range, all based on a muzzle velocity of 300 meters per second.

The weapon can fire either standard ammunition or special low-powered ammunition designed to meet the lower power requirements that come with the lower muzzle velocity.

G. Tinkering: Most of the specifications for the weapon are minimum specifications, and so a weapon can always be heavied up (to reduce its recoil, for instance). This is usually done by adding weight to the receiver. Receiver weight can only be increased by increasing the length of the receiver. The percentage increase in weight over the design weight of a receiver is the percentage increase in length produced by that extra weight.

By the same token, a designer may wish to increase the length of a receiver (to make it possible to use a box magazine, for example). In this case the percentage increase in receiver length is the percentage increase made in receiver weight.

These changes in receiver weight and length do not change the price of the receiver.

H. Evaluation: Once the above optional features have been decided on two additional items of information can be determined.

1. Recoil: The weapon's recoil when firing a single shot can be calculated using the following formula:

$$\mathbf{R = \{[(0.15\sqrt{E})+Ww] + Em\} \times (0.5Rcm)}$$

R: Recoil number

E: Muzzle energy

Ww: Weight, in kilograms, of weapon (use empty weight for belt- and cassette-fed weapons, loaded weight for all others)

Rcm: Recoil compensator modifier.

Em: Modifier for high muzzle energy. If the weapon has high muzzle energy, add to the final recoil as shown on the chart below.

E	*Em*	*E*	*Em*
1001+	1	10,001+	4
2501+	2	20,001+	5
5001+	3	50,001+	6

When calculating the recoil energy of a burst of shots, the following formula is used:

$$\mathbf{R = (\{[(Bn+2)(0.15\sqrt{E})]+Ww\} + \{[Bn+2]Em\}) \times (0.5Rcm)}$$

Bn = number of shots in the burst.

Mounts: The recoil of a weapon when fired from a bipod is the standard value times 0.5. The recoil of a weapon when fired from a tripod is the standard value times 0.25.

2. Bulk: Determine the final length of the weapon by adding together the lengths of the individual components. Bulk is equal to the weapon length (in centimeters) divided by 15, rounding all fractions down.



CHAPTER 3

1 Chemically Propelled Round (CPR) Guns

CPR guns are the large-bore equivalent of conventional small arms. They work using the same physical laws and have many of the same physical limits, although on a grander scale. The principle is simple: An explosion is contained at one end of a tube. The expanding gases of the explosion escape the only direction possible—down the tube, forcing a solid projectile out ahead of them. The tube is often (but not always) rifled, imparting spin to the projectile to stabilize it in flight. Modern CPR guns which are not rifled fire projectiles which rely on small fins at the rear of the projectile for stability, much like a rocket does. Current armor-piercing ammunition fired by the smoothbore gun of the M1A1 tank is called APFSDS, or armor-piercing, fin-stabilized, discarding-sabot ammunition.

In general terms, designing CPR guns is a simple proposition. The longer the barrel, the greater the muzzle velocity possible, up to the practical limits of the round. The greater the muzzle velocity, the greater the range and, given a constant projectile weight, the greater the muzzle energy. The greater the muzzle energy, the more recoil generated, and hence the more massive a carriage required to absorb that recoil. There are a number of sticky design problems which gun designers have had to overcome over the course of time.

Muzzle Energy: As muzzle energy is a recurring theme in gun design, now is a good time to discuss it. Muzzle energy is simply the energy of a projectile at the moment it leaves the muzzle of a gun. We chose that particular instant because it is the peak energy of the projectile. All the time it is travelling down the barrel, it is accelerating. The instant it leaves the barrel, the expanding gases of the exploded propellant charge cease acting on it and it immediately begins to slow due to atmospheric drag (or, in a vacuum, continues to coast at a constant velocity). Therefore, the projectile will never have more energy than it has at the instant it leaves the muzzle.

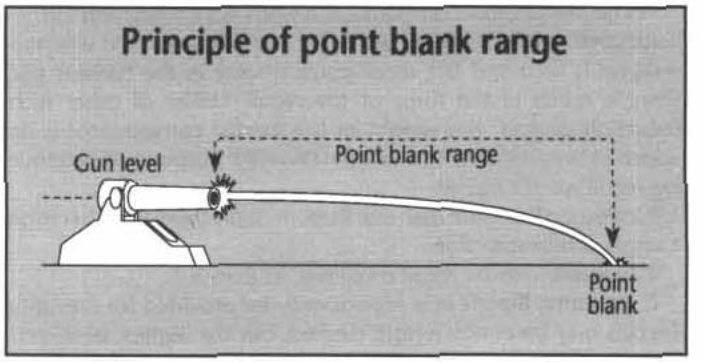
Muzzle energy is very easy to calculate if the projectile mass and the muzzle velocity are known, as energy is a simple function of mass and velocity. The formula is: Energy equals one-half mass times velocity squared.

$$E = (0.5M)V^2$$

Traveller uses the metric system of measurements, and so the units used in this equation are joules (energy), kilograms (mass), and meters per second (velocity). Since most calculations in CPR gun design use megajoules (1 million joules), convert the result of the above equation to megajoules (Mj) by dividing by 1,000,000.

Effective Range: There are a number of ways of measuring effective range, and as good a way as any is the range at which a gun will hit its intended target more than half the time. Since modern ammunition experiences very little deflection, hitting a target is largely a function of correctly determining the range.

Just as a round begins to decelerate as soon as it leaves the muzzle, so also does it begin to fall (assuming it is fired in a gravity well). If the weapon is pointed straight ahead and level to the ground, the distance at which a shot fired will impact the ground is dependent on the muzzle velocity of the round. This is so because a round dropped from muzzle level and a round fired at the same time will both hit the ground at the same time, since both are falling toward the ground at exactly the same rate. Therefore, the higher the muzzle velocity, the farther the round will travel from the gun before hitting the ground.



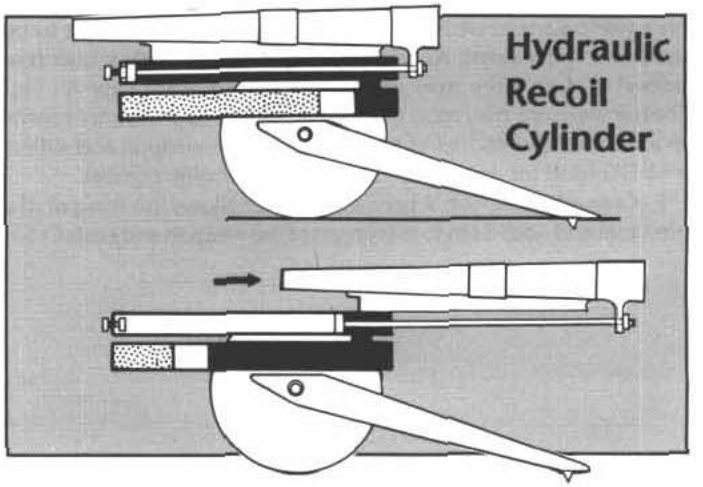
This distance, by the way, is called the gun's "point blank" range, and within that range estimates of distance are considerably less important. Usually you have a good chance of hitting a target by simply pointing at it and firing. Beyond point blank range, however, the story is more complicated. For the round to hit, the gunner has to aim above the target. If the gunner aims too low, the round will hit the ground before it reaches the target; if the gunner aims too high, it will pass over the target. Therefore, knowing the correct angle of elevation depends on knowing, as accurately as possible, the exact range.

The importance of muzzle velocity points to another advantage of subcaliber rounds such as APDS. As these rounds are lighter, the same propellant energy produces a higher muzzle velocity, and thus a more accurate and long-ranged gun. In general, then, the higher the muzzle velocity of a weapon the longer its effective range, but rangefinders and ballistic computers play a major supporting role in determining the actual chance of a hit.

Recoil: Absorbing the recoil energy of a firing gun is the function of its carriage. In the case of armored vehicles, the vehicle itself is the carriage, although some form of recoil absorbers are usually necessary to avoid damaging the vehicle when the gun fires.

The carriage serves to keep the gun in place while it fires. To avoid damaging the carriage from the recoil force, some means of recoil compensation is usually mounted. Truly modern artillery dates from tech level 4 with the introduction of on-carriage recoil absorbers, which allow quicker firing of the gun as well as much more powerful guns and movable carriages.

The recoil absorber is most often a hydraulic compensator; as the gun fires, it recoils on the carriage in a slide cradle, the recoil energy partly being absorbed by the rearward movement of the gun and partly absorbed by the carriage, braced against the ground. The





rearward motion is slowed and the force absorbed by a hydraulic piston in an oil-filled cylinder (or two or three cylinders on larger weapons). This hydraulic recoil compensator is often called a recuperator, since the stored recoil energy in the hydraulic piston is then used to move the gun back forward in its slide cradle on the carriage to its firing position.

Recoil, and the carriage weight necessary to deal with it, is a critical variable in gun design, especially with regard to vehicle-mounted weapons. The heavier the vehicle, the slower it tends to be, as the hardly mobile German Hunting Tiger illustrates. Because of modern ammunition, which gets more penetration out of a particular amount of muzzle energy, the gun of the M1A2 Abrams has almost three times the penetration of the Hunting Tiger's gun while generating only 75% as much muzzle energy. The lower muzzle energy means a less powerful recoil, less massive gun system, and much more mobile vehicle.

When examining the muzzle energies generated by some of the larger guns, it should become clear why they required specially built railway carriages, not only to fire, but also to serve as large recoil slides.

CPR GUN DESIGN SEQUENCE

This design sequence covers "modern" artillery, from tech level 4 on, which fires chemically propelled rounds (CPR). A CPR gun fires a projectile which is propelled by the expansion of gases in a chemical explosion.

A. Specifications

The characteristics of CPR guns are determined by six specifications. In addition, the weapon's muzzle energy is used through the rest of the design sequence and is calculated at this time.

1. Tech Level: Select a tech level appropriate to the world where the gun was built.

2. Bore Size: Bore size, also known as caliber, is the diameter of the gun's bore. The smallest CPR gun has a bore diameter of 2cm. (Anything smaller than this is considered a small arm.) The CPR Gun table lists bore sizes in increments of centimeters, but intermediary sizes may be selected as well, such as 2.4cm or 9.1cm.

3. Barrel Length: Barrel length is usually expressed as a length in calibers. That is, a 2 cm gun with a barrel seventy calibers long would be (2×70=140) 140 centimeters long. Barrels may be of any length desired up to 100 calibers. As a general rule of thumb, howitzers tend to be about 30 calibers long while high velocity guns tend to be about 60-70 calibers long.

The gun is usually identified by its bore size in millimeters (cm × 10) followed by its length in calibers, either separated by a slash or the letter "L," as in "20/70" or "20L70."

4. Fire Control: The type and tech level of fire control equipment must be specified. Fire control equipment is available for direct fire, indirect fire, and point defense. A gun may have more than one type. See Section 14.

5. Mount: A gun is mounted either on a carriage or directly on a vehicle.

6. Options: A gun may have a gun shield if desired, which provides the crew some protection against fragmentation and small arms fire from the front. At tech level 6 and above, a gun may have mechanical assistance for the loaders, which will speed reloading.

7. Muzzle Energy: The CPR Gun table (page 109) lists the muzzle energy, in megajoules (Mj), of each bore size gun assuming a barrel length of 60 calibers. For bore sizes which fall between those listed on the table, use interpolation to find the correct muzzle energy.

For every caliber in length longer than 60, increase the muzzle energy by 1%.

For every caliber less than 60, reduce the muzzle energy by 2%, until the weapon reaches 20 calibers in length. For every caliber in length less than 20 calibers, reduce the muzzle energy by 1%.

When this calculation is completed, multiply the result by the tech level multiplier found on the CPR Gun Tech Level table below.

CPR Gun Tech Level

TL	*ME Tech Mult.*
4	×0.8
5-6	×1
7	×1.2
8	×1.4
9+	×1.6

B. Weight

The complete weapon system weight is equal to the weight of the gun itself, plus its fire control equipment, plus its carriage (unless vehicle-mounted), plus its gun shield (if any), plus its mechanical loader (if any).

1. Gun Weight: Consult the CPR Gun table (page 109) and read the weapon weight (in tonnes). The weight on the table assumes a 60-caliber gun. Increase or decrease the weight by 1% for each caliber change in length up or down. A gun 25 calibers long, for example, is 35 calibers less than 60, and so would weighs (100–35=) 65% of the weight shown on the table.

A 20L70 gun would weigh 110% of the weight shown on the table. Since the listed weight of a 2cm gun is 0.1 tonnes, the gun weighs 0.11 tonnes, or 110 kilograms.

If the bore size falls between two bore sizes on the table, interpolate the correct value.

2. Fire Control: The weights of the various fire control systems are given in the Fire Control chapter (Section 14).

3. Carriage Weight: The carriage weight of a gun, in tonnes, is its muzzle energy in megajoules divided by 2, but is never less than the weight of the gun itself.

Vehicle-mounted guns do not require carriages, but the vehicle itself must weigh at least twice the required carriage weight.

4. Gun Shield: The weight of a gun shield in tonnes is equal to 0.07 times the bore size in centimeters.

5. Mechanical Loading Assistance: The weight of mechanical loading assistance is equal to the gun weight × 0.1.

6. Autoloaders: Autoloaders are available for vehicle-mounted weapons. These have a weight equal to 30 times the weight of a single round for the weapon.



C. Gun Crew

The number of crewmen required to man a gun depends on its function and how it is mounted. A crew normally consists of a gunner and several loaders. Indirect fire weapons usually include a gun commander as well.

1. Indirect Fire: The crew required to serve a towed (carriage-mounted) indirect fire weapon is equal to its bore size in centimeters. Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).

2. Direct Fire: The crew required to serve a towed (carriage-mounted) direct fire weapon is equal to its bore size in centimeters divided by 3, rounding fractions up. Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).

D. Range

Weapons have four direct fire ranges: short, medium, long, and extreme. If fitted with indirect fire control equipment, they also have an indirect fire range.

1. Direct Fire Range: Direct fire range is mostly a function of the muzzle velocity of a weapon, which is largely determined by its barrel length. A secondary consideration is the size of the round, as larger rounds lose velocity from drag more slowly than do smaller rounds. A tertiary consideration is the type of ammunition fired, as some ammunition is fired at lower muzzle velocities.

Short direct fire range in meters for a CPR gun firing a kinetic penetrator round (AP, HVAP, APDS, etc.) is equal to the 5 times the sum of its bore size in centimeters plus its barrel length in calibers plus 20. [R = 5 (B+L+20)]

Hypervelocity smoothbore guns available at TL 7 and higher generate higher muzzle velocities with shorter barrel lengths. To reflect this, multiply range by the following TL modifiers:

TL	*Modifier*
7	1.15
8	1.3
9+	1.45

Short direct fire range for all other types of rounds (HE, HEAP, APERS, etc.) is equal to the above range multiplied by 0.75.

Note, however, that the type of direct fire gun sights mounted impose an upper limit on the short range of a direct fire weapon.

2. Indirect Fire Range: To calculate indirect fire range in kilometers, multiply the square root of the weapon's bore (in centimeters) by its barrel length (in calibers) by 0.13. At each tech level above 4 of the gun, add 1 to barrel length for this calculation.

For BB (base bleed) ammunition (see the Munitions chapter, beginning on page 135), multiply the range by 1.2.

For RAP (rocket-assisted projectile) ammunition (also see the Munitions chapter, page 135), multiply the range by 1.5.

E. Reloading

The time the weapon requires to reload is a function of its muzzle energy and any mechanical assistance provided. The base number of five-second turns required to load a round is equal to its muzzle energy (in megajoules), rounding fractions to the nearest whole number (but always rounding fractional values less than 1 up to 1).

Mechanical assistance provides a multiplier which has the effect of reducing the muzzle energy for purposes of this calculation, as shown on the Mechanical Loading Assistance table.

Mechanical Loading Assistance

TL	*Multiplier*
6	.9
7	.7
8	.5
9+	.3

Note that autoloaders, if installed, do not increase this rate, but only allow loading crew to be dispensed with.

F. Price

The price of the weapon is equal to the sum of the price of its components. Fire control equipment costs as listed in the Fire Control chapter (Section 14). The prices of other components are determined by their weights and cost multipliers, as shown below.

Component	*Cost Multiplier*
Gun Tube	0.02
Carriage	0.002
Loading Assistance	0.01
Autoloader	0.01
Gun Shield	0.001

Cost Multiplier: Cost of each component in millions of credits is equal to its weight in tonnes (calculated earlier) times the appropriate cost multiplier.

G. Set-Up

All CPR guns must be set up before they can conduct indirect fire, and towed CPR guns must be set up before they can conduct any kind of fire. It takes longer to set up for indirect fire, given the need for precise surveying and positioning, and towed weapons naturally take longer than self-propelled weapons.

The time, in five-second combat turns, needed to set up a towed CPR gun for indirect fire is equal to the gun's bore size in centimeters times 8 (round to the nearest whole number).

The number of turns to set up a self-propelled gun for indirect fire is equal to its bore size in centimeters times 4.

The number of turns to set up a towed gun for direct fire is equal to its bore size in centimeters times 4.

Self-propelled indirect fire guns with land navigation systems of tech level 8 or higher (see the Controls chapter, Section 4) require even less time, equal to the gun's bore size in centimeters times 2.

H. Volume

The volume of CPR gun in cubic meters, for purposes of transportation or mounting in a vehicle, is equal to its mass in tonnes.

SPECIAL CASES

The following weapons are special cases or variants of standard CPR guns.

1. Autocannon

Autocannons are self-loading CPR guns which fire more than one round per combat turn, much like an overgrown machinegun.

A. Specifications: The largest allowed bore size for an autocannon at tech level 4 is 2cm. Add 2cm to the largest allowed bore size for each tech level higher than 4. There are two additional specifications for autocannons:



1. Action: An autocannon may have either a recoil-operated or an electric-operated action. Electric actions are not available until tech level 7.

2. Number of Barrels: An autocannon may have from one to eight barrels.

B. Weight: The weight of the weapons system includes the additional weight of its action, any additional barrels, and its magazine. A recoil-operated action weighs the same as a single-barrel gun. An electric action weighs 0.3 times the weight of a single-barrel gun. Every additional barrel in excess of one weighs 0.3 times the weight of a single-barrel gun.

The carriage weight of the gun, in tonnes, is its muzzle energy in megajoules multiplied by the gun's rate of fire and then divided by 4, but is never less than the weight of the gun itself.

Vehicle-mounted autocannons do not require carriages, but the vehicle itself must weigh at least twice the required carriage weight.

C. Crew: The crew of an autocannon is usually one, although additional crewmen may be present to assist in changing magazines.

D. Price: Price is calculated the same as for a regular CPR gun. The cost multiplier for a recoil-operated action is 0.003, and the cost multiplier or an electric action is 0.01.

E. ROF: The base rate of fire per barrel is 40 divided by the bore diameter in centimeters. For multiple barrel guns, multiply this by number of barrels and divide by 2.

F. Magazine: The magazine may be any size desired by the player. The weight of the empty magazine is equal to the weight of all the rounds carried multiplied by 0.01. The price of an empty magazine in Cr is equal to its weight in kilograms multiplied by 5. The volume of a magazine in cubic meters is equal to the mass in tonnes of the rounds carried by the magazine + 2.

G. Reload Time: Reload time to change the magazine, in complete five-second turns, is equal to the loaded weight of a magazine, in tonnes, multiplied by 10, rounding fractions up. The number of loaders needed is equal to the mass of a loaded magazine in tonnes multiplied by 10, rounding fractions to the nearest whole number.

2. Mortars

Mortars are a specialized category of CPR guns designed to be lightweight, low velocity, high-angle indirect fire weapons. They have no direct fire ability at all, and are usually drop-fired (that is, a round is dropped down the muzzle and strikes a fixed firing pin at the bottom of the gun tube), eliminating the need for a heavy breach block. They are designed using the CPR gun design sequence with the following exceptions:

A. Specifications: No mortar may be more than 20 calibers in length. Mortars never have gun shields or direct fire control. They may have mechanical loader assistance.

B. Weight: Multiply gun weight by 0.6 and carriage weight by 0.3.

C. Reloading: Halve the reloading time of the mortar, rounding fractions up.

D. Set-Up: The indirect fire set-up time for the mortar is calculated as if it were its direct fire set-up time. Mortars do not engage in direct fire and so there is no direct fire set-up time. (Note that this means that mortars take half as long to come into action as indirect fire guns of the same bore size).

3. Electrothermal-Chemical Guns

Electrothermal-chemical (ETC) guns are not technically CPR guns because their rounds are not "propelled by the expansion of gases in a chemical explosion." Instead, their rounds are propelled by a rapidly expanding high-temperature plasma. As a result, they are also called combustion-augmented plasma (CAP) guns. However, their design is otherwise so similar as to invite inclusion here as a special case of CPR guns. The only exceptions to the normal CPR design sequence are noted below.

A. Specifications: ETC guns are available from tech level 9 on. They must be specified as ETC guns in the design sequence. Instead of using the muzzle energy tech multiplier on the CPR Gun Tech Level table, multiply muzzle energy by 2.5, regardless of tech level.

B. Electrical Input: ETC guns use an intense pulse of electrical energy to ignite the working fluid into plasma, so a source of pulsed energy must be provided. Multiply the ETC muzzle energy (from A above) by 0.06 to find the amount of energy, in megajoules, required per round fired. The weapon must have a capacitor/homopolar generator installed with this capacity (see Power Production, Section 8). The weight of the HPG becomes part of the total weight of the weapon.

The gun also needs a power supply. Multiply the required energy per round fired in megajoules (this is equal to the capacity of the HPG) by the gun's rate of fire (for autocannons, in rounds per 5-second turn; for slower-firing weapons in fractions of rounds per five-second turn, e.g., one round every three turns equals 0.33 rounds per turn) to get megajoules required per turn. Divide this result by 5. The result is the number of megawatts that must be allocated to the ETC gun from the vehicle's power plant.

C. Weight: For ETC guns, carriage weight is muzzle energy divided by 3.

D. Range: For ETC guns, triple the indirect fire range. BB and RAP rounds may not be fired from electrothermal guns.

CPR Gun Table

Bore (cm)	*Gun Weight (tonnes)*	*Gun Muzzle Energy (Mj)*
2	.10	.06
3	.12	.15
4	.16	.35
5	.30	.8
6	.42	1.6
7	.54	2.4
8	.60	3.6
9	1	4.9
10	1.2	6
11	1.5	7.7
12	2.1	9.3
13	2.7	11.7
14	3.3	15
15	4	18.6
16	4.5	23
17	6	29
18	7.5	36
19	9	41
20	11	48
21	13	55
22	15	63
23	17	72
24	19	83
25	21	96
30	30	150
35	40	230
40	50	350
45	60	500



CHAPTER 4
Mass Drivers

A mass driver is nothing more than the electromagnetic equivalent of artillery. It is a gauss weapon with a bore of 2cm or more. This means that it is mounted on a vehicle or carriage instead of being hand-held, and it means that it is often powered by a separate power plant instead of batteries in a magazine. But these difference notwithstanding, its basic operating principles are identical to those of a gauss rifle.

A. Specifications

The characteristics of mass drivers are determined by six specifications. In addition, the weapon's muzzle energy and required power are used through the rest of the design sequence and are calculated at this time.

1. Tech Level: Select a tech level appropriate to the world where the gun was built. Mass drivers may be built from tech level 8 on.

2. Muzzle Velocity: Muzzle velocity at tech level 8 is 3000 meters per second, and this increases by 1000 meters per second per tech level until reaching a maximum of 6000 meters per second at TL 11.

3. Projectile: The projectile is defined by its diameter in centimeters. This is also the bore of the weapon.

The mass of the projectile is calculated using the following formula:

$$Mp = (\pi r^3)+10$$

Mp: Mass of projectile in kilograms
π: 3.1416
r: Radius of the bore (bore diameter divided by 2) in centimeters

4. Fire Control: The type and tech level of fire control equipment must be specified. Fire control equipment is available for direct fire, indirect fire, and point defense. A gun may have more than one type. See Section 14.

5. Mount: A gun is mounted either on a carriage or directly on a vehicle.

6. Options: A gun may have a gun shield if desired, which provides the crew some protection against fragmentation and small arms fire from the front. If vehicle-mounted, the gun may also have an autoloader.

7. Muzzle Energy: Once the muzzle velocity and the projectile weight are known, the muzzle energy can be calculated using the following formula:

$$Em = 0.0000005MV^2$$

Em: Muzzle energy in megajoules
M: Projectile mass in kilograms
V: Muzzle velocity in meters per second

8. Required Energy: The energy required to accelerate the projectile to the desired muzzle velocity is a function of the total generated muzzle energy and the efficiency of the weapon in converting electrical power quickly to magnetic force (which is a function of tech level). The required energy (in joules) is equal to the weapon's muzzle energy multiplied by the weapon's tech level efficiency, as shown on the following table.

TL	*Efficiency*
8	4.5
9	3.6
10	3
11	2.4
12	2
13	1.8
14	1.6
16+	1.4

B. Weight

The complete weapon system weight is equal to the weight of the gun itself, plus its homopolar generator, plus its fire control equipment, plus its carriage (unless vehicle-mounted), plus its gun shield (if any), plus its autoloader (if any).

1. Gun Weight: The weight of the gun is determined by the following formula:

$$Wg = D^2+50$$

Wg: Weight of gun in metric tonnes
D: Bore diameter in centimeters

2. Homopolar Generator Weight: The efficiency by tech level of HPGs is shown in the Power Production chapter (Section 8). The mass driver requires an HPG with a capacity in megajoules equal to the energy requirement of the gun.

3. Fire Control: The weights of the various fire control systems are given in the Fire Control chapter (Section 14).

4. Carriage Weight: The carriage weight of a gun, in tonnes, is its muzzle energy in megajoules divided by 4, but is never less than the weight of the gun itself.

Vehicle-mounted guns do not require carriages, but the vehicle itself must weigh at least twice the required carriage weight.

5. Gun Shield: The weight of a gun shield in tonnes is equal to 0.07 times the bore size in centimeters.

6. Autoloader: The weight of the autoloader is equal to 30 times the weight of a single round.

C. Gun Crew

The number of crewmen required to man a gun depends on its function and how it is mounted. A crew normally consists of a gunner and several loaders. Indirect fire weapons usually include a gun commander as well.

1. Indirect Fire: The crew required to serve a towed (carriage-mounted) indirect fire weapon is equal to its bore size in centimeters divided by 2, rounding fractions up. Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).

2. Direct Fire: The crew required to serve a towed (carriage-mounted) direct fire weapon is equal to its bore size divided by 5, rounding fractions up. Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).

D. Range

Weapons have four direct fire ranges: short, medium, long, and extreme. If fitted with indirect fire control equipment, they also have an indirect fire range.

1. Direct Fire Range: Direct fire range is mostly a function of the muzzle velocity of a weapon. A secondary consideration is the size of the round, as larger rounds lose velocity from drag more slowly than do smaller rounds. A tertiary consideration is the type of ammunition fired, as some ammunition is fired at lower muzzle velocities.

Short direct fire range in meters for a mass driver gun firing a kinetic penetrator round is equal to the sum of the bore diameter (in centimeters) and the muzzle velocity (in meters per second) all multiplied by .015.

Short direct fire range for all other types of rounds (HE, HEAP, APERS, etc.) is equal to the above range multiplied by 0.75.

However, short range may not exceed the limit imposed by the installed direct fire sights (Fire Control chapter, Section 14).



2. Indirect Fire Range: To calculate indirect fire range in kilometers, multiply the square root of the weapon's bore (in centimeters) by its muzzle velocity (in meters per second) by 0.004.

E. Reloading

The time in complete five-second combat turns the weapon requires to reload is a function of its projectile weight and any mechanical assistance provided. The base number of five-second turns required to load a round is equal to its projectile weight (in kilograms) divided by 2, rounding fractions to the nearest whole number. A result of less than 0.5 (which rounds down to 0) indicates that a round can be reloaded in the same combat turn in which the weapon fires, leaving it capable of firing again in the next combat turn.

If an autoloader is available, multiply projectile weight by 0.3 for purposes of this calculation.

F. Power Requirement

The amount of power required to operate a mass driver is based on its required energy, determined in step A, and its reload time, derived in step E immediately above.

The reload time establishes the weapon's rate of fire. Add 1 to the reload time to find the number of turns required for each shot. (For example, a mass driver that requires two turns to reload fires on turn one, spends turns two and three reloading, and then fires again on turn four. Thus it fires once every three turns.) The lowest possible result is one turn. Take the rate of fire in combat turns and multiply by 5 to find the rate of fire in seconds required to fire each round.

Now take the required energy in megajoules (from step A-8) and divide it by the number of seconds required to fire a round. The result is the required power (in megawatts) that must be supplied to the mass driver to allow it to operate.

$$Pr = Er \div S$$

Pr: Required power input (megawatts)
Er: Required energy (megajoules)
S: Number of seconds required for each shot

G. Price

The price of the weapon is equal to the price of its components. Fire control equipment and homopolar generators cost as listed in the Power Production and Fire Control chapters (Sections 8 and 14, respectively). The prices of other components are determined by their weights and cost multipliers, as shown below.

Component	*Cost Multiplier*
Gun Tube	0.05
Carriage	0.002
Autoloader	0.01
Gun Shield	0.001

Cost Multiplier: Cost of a component in millions of credits equals its mass in tonnes times the cost multiplier.

H. Set-Up

All guns must be set up before they can conduct indirect fire, and towed guns must be set up before they can conduct any kind of fire. It takes longer to set up for indirect fire, given the need for precise surveying and positioning, and towed weapons naturally take longer than self-propelled weapons.

The time, in five-second combat turns, needed to set up a towed gun for indirect fire is equal to the gun's bore size in centimeters times 8 (round to the nearest whole number).

The number of turns to set up a self-propelled gun for indirect fire is equal to its bore size in centimeters times 4.

The number of turns to set up a towed gun for direct fire is equal to its bore size in centimeters times 4.

Self-propelled indirect fire guns with land navigation systems of tech level 8 or higher (see the Controls chapter, Section 4) require even less time, equal to the gun's bore size in centimeters times 2.

I. Volume

The volume of a mass driver gun in cubic meters, for purposes of transportation or mounting in a vehicle, is equal to its mass in metric tonnes.

Autocannon

The following weapons constitute a special case or variant of standard mass driver guns. Autocannons are mass drivers which fire more than one round per combat turn, much like an overgrown machinegun. Procedures for autocannon design are the same as normal mass driver design, with the modifications below.

A. Bore Size: The largest allowed bore size for an autocannon at tech level 8 is 10cm. Add 2cm to the largest allowed bore size for each tech level higher than 8.

B. Weight: The weight of the weapon system includes the normal weight of a weapon of that bore size plus the additional weight of its automatic feed action and its magazine.

The weapon's feed action is the loading mechanism which feeds additional rounds into the breach. Its weight is equal to the weight of a single projectile for the gun multiplied by 50.

The carriage weight of the gun, in tonnes, is its muzzle energy in megajoules multiplied by the gun's rate of fire and then divided by 4, but is never less than the weight of the gun itself.

C. Crew: The crew of an autocannon is usually one, although additional crewmen may be present to assist in changing magazines.

D. Price: Price is calculated the same as for a regular mass driver gun. The cost multiplier for the feed action is 0.01.

E. ROF: The base rate of fire per barrel is 50 divided by the bore diameter in centimeters. For single-barrel guns, this is the final ROF. For multiple-barrel guns, multiply this base rate by the number of barrels and divide by 2 to get the final ROF.

F. Power Requirement: Take the autocannon's ROF determined immediately above and multiply it by the required energy per shot in megajoules. This yields the total energy required per combat turn. Divide this by 5 to find its constant power requirement in megawatts.

$$Pr = (ROF \times Er) \div 5$$

Pr: Required power input (megawatts)
ROF: Rate of fire per five-second combat turn
Er: Required energy (megajoules)

G. Magazine: The magazine may be any size desired by the player. The weight of the empty magazine is equal to the weight of all the rounds carried multiplied by 0.01. The price of an empty magazine in Cr is equal to its weight in kilograms multiplied by 5. The volume of magazine in cubic meters is equal to the mass in tonnes of the rounds carried by the magazine ÷ 5.

H. Reload Time: Reload time to change the magazine, in complete five-second turns, is equal to the loaded weight of a magazine, in metric tonnes, multiplied by 10, rounding fractions up.

The number of loaders needed is equal to the mass of a loaded magazine in tonnes multiplied by 10, rounding fractions to the nearest whole number.



CHAPTER 5

Particle Accelerator Weapons (PAWs)

The first charged particle accelerators are available at tech level 8, with the more useful neutral particle beam weapons appearing one level later. Particle accelerators use powerful electrical and/or magnetic fields to accelerate ions or charged subatomic particles to relativistic speeds (close enough to the speed of light that the particles exhibit a measurable increase in mass compared to their rest mass). These same fields are used to focus these particles into concentrated beams that retain their power density over long distances. Because neutral (chargeless) particles cannot be affected by electrical or magnetic fields, these particles must be charged while they are accelerated. However, they do not have to be charged after they leave the barrel of the accelerator. Neutral particles are created by having a device (a screen of foil or gas, or a high-powered laser) that strips the extra electron from a negative ion (thus making a negative hydrogen ion into a neutral atom) as it passes out of the barrel, or adds an electron to a positive ion. (Note that neutral particle beam weapons do not fire neutrons, as there is no way to accelerate a neutron, nor could positive or negative charges be stripped away from neutrons without particle decay.) Charged particle beams are fired by simply allowing the charged particles to fly out toward the target.

This is important, because charged particle accelerator weapons (C-PAWs) propagate fairly well through atmospheres (where the flow of like charges in the same direction behaves like an electrical current and generates a magnetic field around itself that "pinches" the beam together), but effectively disintegrate in vacuum, where the like charges in the beam repel each other, destroying beam focus and integrity. On the other hand, neutral particle accelerator weapons (N-PAWs) perform flawlessly in space, as the neutral atoms proceed unperturbed by magnetic or electrical fields. In atmospheres, however, the N-PAW beam breaks up rapidly, as there is no electrical current to provide coherence, and the atmosphere ionizes, absorbs, and otherwise degrades the particle beam. Thus, N-PAWs are the space weapons and C-PAWs are the ground weapons. But because a neutral particle beam weapon can produce charged particle beams simply by disengaging its particle neutralizer, the N-PAW is effectively a dual-purpose weapon, as it can be set to fire beams appropriate to either environment. PAWs intended purely for ground use can forego the needless expense of the particle neutralizer and are therefore single-use weapons.

Dual-purpose or not, however, particle accelerators have a problem with planetary bombardment. A ship firing a C-PAW from outside of an atmospheric envelope will find that the beam severely scatters before it enters the atmosphere, often so badly that it does not have enough coherence to create its self-pinching tunnel. Ships with dual-purpose particle weapons must often enter the atmosphere in order to fire C-PAWs at surface targets.

Although particle accelerators can be curved (typical modern particle accelerators used for research are huge rings), for military purposes, curved particle accelerators are inefficient because of the need to keep the particles moving in a circular path (i.e., constantly adding transverse acceleration to keep them in a curving path). Not only does this waste energy that could be spent to increase linear acceleration, but such designs are far more vulnerable to damage than linear designs. While the loss of power to an accelerator coil in a linear design would decrease overall acceleration, loss of an accelerator coil in a ring design would result in particles leaving the circular path. Thus, combat particle accelerators are linear accelerators, built as long tubes.

Because of the need for a long straight run to properly accelerate and aim the pulses of particles, a particle accelerator must be long and straight in order to be most effective.

PARTICLE ACCELERATOR WEAPON SYSTEM DESIGN

1. ACCELERATOR TUNNEL LENGTH

Tunnel length aboard ship is defined by the type of installation and the size of the ship the gun is to be fitted to. Ground mounted PAWs can be built to any length desired, within normal cost, facility, and power constraints.

Spaceship installations are of three types: spinal, parallel, and bay.

1A. Spinal Mounts

As the name implies, a spinal mount gun serves as the central internal-strength member of the entire ship. The gun defines the longitudinal axis of the ship, as well as its axis of mass and thrust. The length of a spinal mount is equal to the length of the ship (in meters) as defined during the spacecraft hull design step. Spacecraft with an open frame hull form may not have a spinal mount.

The spinal mount can be installed to fire either dead ahead (this is the standard configuration) or dead astern (called the "stern chaser" configuration). Its arc of fire is therefore either 1 or 5 (see Spacecraft Design Evaluation, page 16).

Each ship may have only one spinal weapons mount. The one exception to this is the so-called "Janus" mount, in which two spinal guns are installed in the spinal tube butted against each other, one pointing forward and one astern, where each is half the total length of the ship.

1B. Parallel Mounts

Parallel mounts, like spinal mounts, are mounted directly fore and aft, parallel to the ship's spine. Unlike spinal mounts, there can be more than one per ship.

The length of a parallel mount is 0.8 times the length of the ship in meters. They may be installed to fire either directly forward into fire arc 1, or dead astern into fire arc 5.

Ships with a sphere hull form may make a slightly different use of parallel mounts. Rather than being restricted to mounting parallel mounts along the fore-and-aft axis, a sphere's dimension allows the installation of parallel mounts athwartships, firing broadside, or at any other angle off of the centerline. These mounts are designed just as normal parallel mounts, but may be installed to fire into any one arc of fire, not just 1 or 5.

1C. Bay Mounts

PAWs may also be mounted in bays set into the hull surface. There is no limit to the number of bays that can be fitted to a ship, beyond the normal limits of hull surface area, mass, and volume.

A bay may be constructed to any size desired, although the most popular are the 50-ton (700 cubic meters) and 100-ton (1400 cubic meter) bays. A bay's dimensions are calculated as follows:

Each bay has a single long dimension and two shorter dimensions. The long dimension, in meters, is found by taking the bay's volume in cubic meters, extracting the cube root, multiplying by 1.4, and rounding to the nearest whole number.

$$1.4\sqrt[3]{Vol}$$

Divide the bay's total volume in cubic meters by the long dimension, and extract the square root of this result, rounding to the nearest 0.5 meters. This is the approximate length of the bay's short dimensions. Multiply the long dimension by the short dimension to get the surface area of the bay in square meters.



Standard Bays and their Dimensions

Size	*Cubic Meters*	*Long Dim.*	*Short Dim.*	*Surface Area*
50 ton	700	12 m	7.5 m	91.2 m^2
100 ton	1400	16 m	9.5 m	150.4 m^2

The length of the accelerator tunnel is the long dimension of the bay.

2. ACCELERATOR TUNNEL CROSS-SECTIONAL AREA

Accelerator performance is also dependent on its cross-sectional area, i.e., the space within which the electromagnetic coils bend and focus the paths of the particles. The cross-sectional area is also called the tunnel's focal area. Like laser beams, particle beams can be more tightly focused by larger focal areas.

Define the diameter of the accelerator tunnel in meters, and find its surface area based on this number, using the formula

Area (square meters) = πr^2

where r (meters) = diameter ÷ 2, and π = 3.1416

Limits to tunnel diameter include total space available to the PAW (bay-mounted PAWs must fit completely within the volume of the bay), and the length of the tunnel. Tunnel diameter may not be greater than actual tunnel length times 0.125.

3. DISCHARGE ENERGY

Specify the amount of output energy that will be fired in each shot (*discharge energy*, abbreviated DE) in megajoules (Mj). The greater the discharge energy, the greater the damage of each shot, and the greater the final size of the particle accelerator installation.

The maximum discharge energy is limited by the length of the accelerator tunnel. DE in Mj cannot be greater than the square of tunnel length in meters.

4. ACCELERATOR TUNNEL CHARACTERISTICS

Find effective tunnel length, effective focal area, tunnel volume, tunnel mass, and tunnel price based on tunnel length in meters, discharge energy, and the table below. The table shows the tunnel length multiplier, focal area multiplier, and mass multiplier by tech level.

The column for C-PAWs is for single-purpose, charged-particle only weapons; N-PAWs is for dual-purpose, neutral/charged particle beam weapons.

Accelerator Tunnel Characteristics

		FA Multiplier		
TL	*Length Multiplier*	*C-PAW*	*N-PAW*	*Mass Multiplier*
8	0.12	1	—	1.2
9	0.14	1	1	1.0
10	0.16	2	1	1.0
11	0.2	3	2	0.75
12	0.25	3	3	0.75
13	0.3	4	3	0.75
14	0.5	4	4	0.75
15	1.0	5	4	0.75
16	1.25	5	5	0.6
17	1.3	5	5	0.5
18	1.4	6	5	0.4
19	1.5	6	6	0.4
20	1.6	6	6	0.3
21	1.7	6	6	0.3
22	1.8	7	6	0.2
23	1.9	7	7	0.2
24	2.0	7	7	0.1

4A. Tunnel Effective Length

The effective length (meters) of the accelerator tunnel increases with tech level and is used in calculating range performance below. 1

Effective Length = actual tunnel length (meters)×length multiplier

4B. Effective Focal Area

The effective area (square meters) of the tunnel focal area (same as its cross-sectional area) increases with tech level and is also used in calculating range performance below. 2

Effective Focal Area (square meters) = actual cross-sectional area (in square meters, from Step 2 above) × FA multiplier appropriate to type of PAW. 3

4C. Tunnel Volume

Tunnel Volume (cubic meters) = actual length (meters) × actual cross-sectional area (square meters) from Step 2. 4

4D. Tunnel Mass

Tunnel Mass (tonnes) = tunnel volume (cubic meters) × mass multiplier. 5

4E. Tunnel Price

Tunnel price depends on whether the weapon is an N-PAW (dual-purpose, neutral/charged beam capable) or single-purpose C-PAW. 6

C-PAW Tunnel Price (MCr) = tunnel volume (cubic meters) × 0.09 at all tech levels.

N-PAW Tunnel Price (MCr) = tunnel volume (cubic meters) × 0.1 at all tech levels. 7

Tunnel price is calculated after any increase in size due to high rates of fire (Step 8C, below)

5. PERFORMANCE 8

The effective range (range at which energy delivered on target is equal to discharge energy) in kilometers is equal to the effective tunnel length (meters) × effective focal area × 1000.

Beyond this range, the beam's performance drops due to the gradual expansion of beam width over distance which results in the lowering of beam intensity per unit area of the beam's "footprint." 9

For space combat range in hexes/range bands, divide this result by 30,000. It is usually best to drop fractions in order to find the range best suited for the weapon's short range. However, these may be rounded up to the higher value if the designer is prepared to accept the potential drop in damage performance due to the higher range (see Step 7B, below). 10 11

5A. Atmospheric Performance

All particle beam energy is eventually absorbed by planetary atmospheres. The effective range defined above is the accelerator's theoretical effective range. For neutral particle beams, this theoretical effective range is achieved in vacuum: in space or on the surface of airless worlds. For charged particle beams, this theoretical effective range can never be reached; C-PAWs have their effective range modified for fire in vacuum as well as in atmospheres. 12 13

When the accelerator is to be used within atmospheres, the following modifications must be made to its effective range, which controls its damage performance. Although theoretically a PAW might be rated for its performance in all potential atmospheres, in practice it need only be rated for the environment for which it was originally intended, for example the atmosphere of the world on which it was designed, or in vacuum for a starship N-PAW. 14



Atmospheric Range Modifiers

Atmosphere (UWP Code)	N-PAW (Firing Neutral Beam)	C-PAW (Any PAW firing Charged Beam)
Vacuum (0)	1	0.001
Trace (1)	1	0.005
Very Thin (2, 3)	0.1	0.01
Thin (4, 5)	0.02	0.05
Standard (6, 7)	0.01	0.1
Dense (8, 9)	0.005	0.1
Exotic+ (A+)	0.001	0.05

Effective range as adjusted by atmosphere can be used in different ways according to the purposes of the designer. If the accelerator is a C-PAW intended for use in an atmosphere, the atmosphere adjusted effective range should probably be used when choosing a beam pointer (Step 6, immediately following). If it is an N-PAW intended for space combat, its unadjusted effective range should be used to choose the beam pointer.

Planetary Bombardment: This is a specific application of the atmospheric modifier rules. This is not calculated in advance for each particle weapon, but is calculated separately each time it is done.

First find the range to the world being bombarded, in hexes. Planetary bombardments from the same hex are given a default value of 0.5 hexes. Divide this range by the atmosphere modifier appropriate to the atmosphere type and PAW type from the table above. The result is the equivalent range in hexes to a target on the planetary surface, called the *atmosphere adjusted range.* Use this range to find the proper range band of the PAWs rated range performance. If the range falls between two range bands, use the higher band. This gives the weapon's damage performance. Difficulty of the firing task is still calculated according to the actual range.

If the adjusted range falls beyond the PAW's extreme range, use the PAW's effective range along with the procedure defined in Step 7B below to determine if the PAW has any damage performance left at that range.

If the target is an aircraft or spacecraft flying at high altitude, cut this final atmosphere adjusted range in half.

5B. Magnetic Fields

Charged particle beams also run into difficulties when fired at, on, and around worlds that possess a magnetic field. All firing tasks are one difficulty level higher.

6. DEFINE SHORT RANGE

Select a beam pointer from the Beam Pointer table (Fire Control chapter, Section 14) based on the PAW's tech level and the range performance desired. Note that range is given in kilometers and 30,000-km hexes/range bands for space combat. The listed range in km/hexes will be the weapon's short range for purposes of combat.

Whenever possible, the beam pointer range should be equal to the weapon's effective range to take full advantage of its range-intensity performance. If the beam pointer range is less than the effective range, the PAW will not have the maximum possible hit probability out to its maximum beam intensity (although the absolute upper limit of beam pointer short range is 300,000 km/10 hexes). If the beam pointer range is longer than the effective range, the PAW will not deliver its maximum damage performance at its best hit probability. However, these decisions are up to the designer.

When a particle accelerator has its performance adjusted for atmosphere, remember that its atmosphere-adjusted ranges are for purposes of damage calculation only. Its short range (and medium, long, and extreme ranges which are derived from it) based on installed beam pointers are still used for resolving hits.

7. COMBAT RATINGS

7A. Combat Range Bands

All combat ranges are based on the PAW's short range, established in Step 6. For planet-bound C-PAWs, these ranges should be expressed in kilometers; for space-based N-PAWs, these ranges should be expressed in starship combat hexes/range bands in whole numbers.

Medium range = Short range × 2
Long range = Short range × 4
Extreme range = Short range × 8

7B. Damage Value

Define the particle accelerator's damage characteristics at its short, medium, long, and extreme range bands.

Particle accelerators do damage to enemy targets based on their *penetration value* (PV).

$$PV = 5\sqrt{I}$$

where I is the weapon's *intensity* (units for intensity are MJ per square centimeter) at that range. Intensity is derived as follows:

For each of the four range bands, divide that range band's actual range (from 7A, in kilometers or hexes, as appropriate to the type of weapon) by the PAW's effective range (in the same units) from Step 5. Round this result to the nearest 0.01. This figure is used as R in the next formula:

$$I = DE (1 + R^2)$$

where
DE is discharge energy from Step 3 above.

8. POWER REQUIREMENTS

8A. Input Energy

Particle accelerators have a 20% energy efficiency, meaning that of the energy put into each shot, 20% is projected toward the enemy in the form of the particle beam. The remaining 80% is spent ionizing, accelerating, and magnetically aiming, and in N-PAWs, neutralizing, the particles.

Find input energy in MJ according to this formula:

Input Energy (IE) = Discharge Energy (DE) + 0.2

8B. Homopolar Generator

A particle accelerator requires a homopolar generator (HPG) to store the energy required for each shot until that energy is ready to be expended as a pulse. The HPG's volume is calculated by multiplying the accelerator's input energy (IE) in MJ determined above by the value on the HPG table in the Power Production chapter (Section 8).

8C. Rate of Fire

Select the PAW's rate of fire (ROF).

Space Combat: N-PAWs, intended to be used for space combat, must have an ROF of at least 10 shots per 30-minute space combat turn. Higher rates gain reductions in difficulty level according to the table below. Due to the tremendous energies generated by each shot, which must be dissipated during the cooling/purge cycle, the maximum ROF of a standard particle accelerator is 100 shots per 30-minute turn. Rates of fire above this level require that the PAW be "beefed up" to stand up to the higher usage rate. The amount of this beefing up is expressed on the following table as a multiplier to the the PAW's volume. This increase in volume does not change its tunnel cross-sectional area or effective focal area, but does affect its weight and price.

To convert space to planetary ROFs, divide the space combat ROF per 30 minutes by 360. Take the inverse (i.e., divide 1 by that number), and round fractions *up*. The result is the number of five-



second combat turns required for each shot. Express this number as a fraction, i.e., one shot every five turns is 1/5, one shot every 36 turns is 1/36, etc. Because this conversion system results in distortion of total number of shots due to rounding, this converted ROF must never be used when calculating power input. The original space combat ROF must always be used when rating a space combat meson gun.

Diff Mods on the following table apply to space combat only, not ground combat.

Rate of Fire Benefits in Space Combat

Space Combat ROF (Shots per 30-minute turn)	*Benefit (In Diff Mods to Fire Task)*	*Vol Mod*	*Ground Combat ROF (Shots per 5-second turn)*
10	None	×1	1/36
50	–1 Difficulty levels	×1*	1/8
100	–2 Difficulty levels	×1*	1/4
200	–3 Difficulty levels	×1.3	1/2
400	–4 Difficulty levels	×1.7	1
800	–5 Difficulty levels	×2.2	2

*There is no penalty for firing a particle accelerator at one of these higher power levels if it is mounted in a vehicle or starship which is designed from the outset to provide sufficient power for the higher ROF (50 or 100 shots). However, PAWs which were not installed with the higher power levels may fire at these levels if sufficient power is made available by diverting it from other systems. However, because of the extra strain this places on power couplings, HPGs, etc., an Engineering task must be rolled each turn this is attempted (roll using crew quality). The difficulty level is Difficult if the ROF is raised one step (from 10 to 50 or from 50 to 100) over the installed power allocation, or Formidable if raised two steps (10 to 100). Failure at this roll indicates a System Reset result (see the **TNE** Space Combat chapter, or **Brilliant Lances: Traveller Starship Combat**), with the additional penalty that the PAW may not fire on the current turn. Catastrophic Failure indicates more severe damage. Roll 1D10: 1-5 indicates a Degraded Performance result in addition to System Reset, 6-10 indicates a Major Hit on the particle accelerator.

PAWs may only fire at the 200+ ROFs if they are designed as such with beefed-up focal arrays.

Planetary Combat: ROF for planetary combat C-PAWs is defined in terms of five-second planetary combat turns. The maximum rate of fire for planetary combat is one shot every fourth turn (expressed as 1/4), due to the need for a cooling cycle following each shot.

8D. Power Input

Power input in megawatts (MW) is calculated differently for space combat and planetary combat purposes. Although they are calculated differently, space and planetary combat power input values are absolute values, as they are both based on MW input per second. However, be careful to make these calculations based on the *true* ROF for the accelerator, based on its primary environment: space or planetary combat. Do not use ROFs converted from one system to the other, as the rounding involved distorts the numbers.

Space Combat (Neutral) PAWs: Multiply ROF per 30 minutes times input energy (IE) from Step 7A. This is the total number of megajoules needed over the course of a 30-minute turn. Divide this result by 1800 to find the MW of power that must be allocated to operate the weapon.

Planetary Combat (Charged) PAWs: Multiply ROF times input energy (IE) from Step 7A. This is the total number of megajoules consumed by the weapon each five-second turn. Divide this result by 5 to find the MW of power that must be allocated to operate the weapon.

9. GUN CREW AND WORKSTATIONS

All particle accelerators must be crewed according to the following formula:

Crew = (Tunnel Volume ÷ 100) × CP

CP: Computer multiplier based on tech level of computer installed aboard ship/hooked up to ground-based PAW. See Computers table in the Controls chapter (Section 4).

Round to the nearest whole number, but results of less than 1 must always be rounded up to 1.

Each crewmember must have a gunner's (normal) workstation installed with characteristics obtained from the Controls Chapter (Section 4).

10. PARTICLE ACCELERATOR CARRIAGE, MOUNT, ETC.

If the accelerator is a starship- or vehicle-mounted N-PAW, skip this step. If it is a C-PAW intended for use as a towed weapon, calculate the size of its carriage, mount, etc. A towed carriage has the same mass as the C-PAWs mounted on it. The PAW must include its HPG, but may be plugged in to a power source at its destination.

Carriage-mounted PAWs have an all-around armor value of 1. This can be increased by enclosing the PAW and its supporting equipment in a "hull" (cylinder hull form) with a certain thickness of armor according to the vehicle or spacecraft design rules. As this armor increases the mass of the PAW, it will increase the mass of the carriage as well.

The price of the carriage, in MCr, is equal to its mass in tonnes multiplied by 0.002.

11. PARTICLE ACCELERATOR PHYSICAL CHARACTERISTICS

Add up or bring down the above components to obtain the following total figures for the gun.

11A. Volume

In cubic meters. Add tunnel volume, beam pointer volume, HPG volume, gunner's workstation volume, carriage volume (if any).

11B. Mass

In tonnes. Add tunnel mass, beam pointer mass, HPG mass, gunner's workstation mass, carriage mass (if any).

11C. Price

In MCr. Add tunnel price, beam pointer price, HPG price, gunner's workstation price, carriage price (if any).

11D. Power Requirements

In MW. Carry down from Step 8D above.

11E. Length

Actual tunnel length in meters. Carry down from Step 1 above.

11F. Surface Area

Surface area for a spinal mount is equal to the tunnel cross-sectional area times 2. Surface area for a bay-mounted PAW is equal to the bay's surface area.

11G. Combat Performance

Short range, medium range, long range, and extreme range in km and/or space combat hexes, plus damage values at those ranges, along with ROF, listing any –difficulty modifiers as applicable. Carry down from Steps 7 and 8C.



CHAPTER 6
Meson Guns

Meson guns are an extremely advanced form of particle accelerator that becomes available at TL 11. Like particle accelerators, the meson gun accelerates charged subatomic particles to very high velocities, but unlike simple particle accelerators, the meson gun does not simply fire these particles at enemy targets. Instead, the high-velocity particles are made to collide, creating in the process another particle, a meson (mesons are the subatomic particles that transmit the strong nuclear force within the atomic nucleus). By carefully aiming the colliding particles, the direction and velocity of the resulting mesons can be controlled.

Mesons do not interact with matter, and therefore follow a perfectly straight path, passing through all obstacles. However, the meson has a very short life span, and soon explosively decays, producing radiation and damaging particles. By accelerating a meson to relativistic speeds, its subjective passage of time is slowed, and its decay is delayed. By controlling the precise velocity of a meson, its decay can therefore be timed to take place at a certain distance, ideally inside an enemy ship, whose armor is completely useless.

Because of the need to accelerate the primary particles that produce the meson, and to control their speed and trajectory so that the mesons are emitted in the proper direction and at the correct velocity, a meson gun must be extremely long and straight in order to be most effective.

MESON GUN DESIGN

1. MESON TUNNEL LENGTH

Tunnel length aboard ship is defined by the type of installation and the size of the ship the gun is to be fitted to. Ground-mounted meson guns can be built to any length desired, within normal cost, facility, and power constraints.

Spaceship installations are of three types: spinal, parallel, and bay.

1A. Spinal Mounts

As the name implies, a spinal mount meson gun serves as the central internal-strength member of the entire ship. The gun defines the longitudinal axis of the ship, as well as its axis of mass and thrust. The length of a spinal mount is equal to the length of the ship (in meters) as defined during the spacecraft hull design step. Spacecraft with an open frame hull form may not have a spinal mount.

The spinal mount can be installed to fire either dead ahead (this is the standard configuration) or dead astern (called the "stern chaser" configuration). Its arc of fire is therefore either 1 or 5 (see Spacecraft Design Evaluation, page 16).

Each ship may have only one spinal weapons mount. The one exception to this is the so-called "Janus" mount, in which two spinal guns are installed in the spinal tube butted against each other, one pointing forward and one astern, where each is half the total length of the ship.

1B. Parallel Mounts

Parallel mounts, like spinal mounts, are mounted directly fore and aft, parallel to the ship's spine. Unlike spinal mounts, there can be more than one per ship.

The length of a parallel mount is 0.8 times the length of the ship in meters. They may be installed to fire either directly forward into fire arc 1, or dead astern into fire arc 5.

Ships with a sphere hull form may make a slightly different use of parallel mounts. Rather than being restricted to mounting parallel mounts along the fore-and-aft axis, a sphere's dimension allows the installation of parallel mounts athwartships, firing broadside, or at any other angle off of the centerline. These mounts are designed just as normal parallel mounts, but may be installed to fire into any one arc of fire, not just 1 or 5.

1C. Bay Mounts

Meson guns may also be mounted in bays set into the hull surface. There is no limit to the number of meson gun bays that can be fitted to a ship, beyond the normal limits of hull surface area, mass, and volume.

A bay may be constructed to any size desired, although the most popular are the 50-ton (700 cubic meters) and 100-ton (1400 cubic meter) bays. A bay's dimensions are calculated as follows.

Each bay has a single long dimension and two shorter dimensions. The long dimension, in meters, is found by taking the bay's volume in cubic meters, extracting the cube root, multiplying by 1.4, and rounding to the nearest whole number.

$$1.4\sqrt[3]{\text{Vol}}$$

Divide the bay's total volume in cubic meters by the long dimension, and extract the square root of this result, rounding to the nearest 0.5 meters. This is the approximate length of the bay's short dimensions. Multiply the long dimension by the short dimension to get the surface area of the bay in square meters.

Standard Bays and their Dimensions

Size	*Cubic Meters*	*Long Dim.*	*Short Dim.*	*Surface Area*
50 ton	700	12 m	7.5 m	91.2 m²
100 ton	1400	16 m	9.5 m	150.4 m²

The length of the meson gun tunnel is the long dimension of the bay.

2. DISCHARGE ENERGY

Specify the amount of output energy that will be fired in each shot (*discharge energy*, abbreviated DE) in megajoules (Mj). The greater the discharge energy, the greater the damage of each shot, and the greater the final size of the meson gun.

There is no inherent limit to the amount of discharge power, other than power supply requirements, size of ship, etc.



3. MESON TUNNEL CHARACTERISTICS

Find effective tunnel length, tunnel volume, tunnel mass, and tunnel price based on tunnel length in meters, discharge energy, and the table below.

MESON TUNNEL CHARACTERISTICS

TL	*Length Multiplier*	*Vol Multiplier*	*Mass Multiplier*
11	0.8	0.02	1.0
12	1.0	0.01	0.75
14	1.2	0.01	0.6
16	1.4	0.005	0.5
18	1.5	0.005	0.4
20	1.6	0.002	0.3
22	1.8	0.002	0.2
24	2.0	0.001	0.1

3A. Tunnel Effective Length

The effective length (meters) of the tunnel used in calculating range performance below

Effective Length = actual tunnel length (meters) × length multiplier

3B. Tunnel Volume

Tunnel Volume (cubic meters) = actual length (meters) × discharge energy × volume multiplier

3C. Tunnel Cross-Sectional Area

Cross-sectional area in square meters is equal to tunnel volume divided by actual tunnel length.

3D. Tunnel Mass

Tunnel Mass (tonnes) = tunnel volume (cubic meters) × mass multiplier

3E. Tunnel Price

Tunnel Price (MCr) = tunnel volume (cubic meters) × 0.1 at all tech levels

4. PERFORMANCE

The effective range (range at which energy delivered on target is equal to discharge energy) in kilometers is equal to the meson gun's effective tunnel length × 1000. Beyond this range, the beam's power drops due to dissipation of intensity and uncontrolled meson decay.

To find space combat range in hexes/range bands, divide this result by 30,000.

5. DEFINE SHORT RANGE

Select a beam pointer from the Beam Pointer table in the Fire Control chapter (Section 14) based on the gun's tech level and the range performance desired. Note that range is given in kilometers and 30,000-km hexes/range bands for space combat. The listed range in km/hexes will be the gun's short range for purposes of combat. Whenever possible, the beam pointer range should be equal to the gun's effective range to take full advantage of the gun's range-intensity performance.

6. COMBAT RATINGS

6A. Combat Range Bands

All combat ranges are based on the gun's short range.

Medium range = Short range × 2

Long range = Short range × 4

Extreme range = Short range × 8

Note: Meson guns have a maximum range in thousands of kilometers of 8.5 times their effective tunnel length. If a meson gun's short range is selected in such a way that its extreme range is in excess of this maximum figure, the gun has no extreme range band, and is unable to fire at any targets beyond its long range.

6B. Damage Value

Define the particle accelerator's damage characteristics at its short, medium, long, and extreme range bands.

Meson guns do damage to enemy targets based on their *damage value* (DV).

$$DV = 5\sqrt{I}$$

where I is the weapon's *intensity* at that range. Intensity is derived by the formula

$$I = DE \div (R+EL)^2$$

where

DE is discharge energy from Step 2 above

R is range (short, medium, long, or extreme, as defined in 7A above) in 1000s of kilometers

EL is the effective length of the meson tunnel from Step 3A above

Note that the term $(R+EL)^2$ should be rounded to the nearest 0.5 (e.g., 1.24 = 1, 1.25 = 1.5) before dividing DE, with a minimum result of 1.

Calculate DV for short, medium, long, and extreme range. The short range in hexes for space combat meson guns will often fall between two whole number values. Designers should try calculating intensity for both these hexes before selecting the beam pointer, above, because if $(R+EL)^2$ for the farther hex is between 1 and 1.24, effective range will round up to that hex. Note that this rounding may result in the loss of the extreme range band. Compare the longer short range in hexes × 8 to (effective length × 8.5) ÷ 30 to see if this is the case.



7. POWER REQUIREMENTS

7A. Input Energy

Meson guns have a 20% energy efficiency, meaning that of the energy put into each shot, 20% is projected toward the enemy in the form of mesons as discharge energy. The remaining 80% is spent creating, accelerating, and magnetically aiming the subatomic particles.

Find input energy in Mj according to this formula:

Input Energy (IE) = Discharge Energy (DE) ÷ 0.2

7B. Homopolar Generator

A meson gun requires a homopolar generator (HPG) to store the energy required for each shot until that energy is ready to be expended as a single pulse. The HPG's volume is calculated by multiplying the gun's input energy (IE) in Mj determined above by the value on the HPG table in the Power Production chapter (Section 8).

7C. Rate of Fire

Select the meson gun's rate of fire (ROF).

Space Combat: Any meson gun intended to be used for space combat must have an ROF of at least 10 shots per 30-minute space combat turn. Higher rates gain the gun reductions in difficulty level according to the table below. Due to the tremendous energies generated by each shot, which must be dissipated during the cooling purge cycle, the maximum ROF of a meson gun is 100 shots per 30-minute turn.

Diff Mods on the following table apply to space combat only, not ground combat.

RATE OF FIRE BENEFITS IN SPACE COMBAT

Space Combat ROF (Shots per 30-minute turn)	*Benefit (In Difficulty Modifiers to Fire Task)*	*Ground Combat ROF (Shots per 5-second turn)*
10	None	1/36
50*	–1 Difficulty levels	1/8
100*	–2 Difficulty levels	1/4

*There is no penalty for firing a meson gun at one of these higher power levels if it is mounted in a vehicle or starship which is designed from the outset to provide sufficient power for the higher ROF (50 or 100 shots). Nonetheless, meson guns which were not installed with the higher power levels may fire at these levels if sufficient power is made available by diverting it from other systems. However, because of the extra strain this places on power couplings, HPGs, etc., an Engineering task must be rolled each turn this is attempted (roll using crew quality). The difficulty level is Difficult if the ROF is raised one step (from 10 to 50 or from 50 to 100) over the installed power allocation, or Formidable if raised two steps (10 to 100). Failure at this roll indicates a System Reset result (see the **TNE** Space Combat chapter, or **Brilliant Lances: Traveller Starship Combat**), with the additional penalty that the meson gun may not fire on the current turn. Catastrophic Failure indicates more severe damage. Roll 1D10: 1-5 indicates a Degraded Performance result in addition to System Reset, 6-10 indicates a Major Hit on the meson gun.

Planetary Combat: To convert space to planetary ROFs, divide the space combat ROF per 30 minutes by 360. Take the inverse (i.e., divide 1 by that number), and round fractions *up*. The result is the number of five-second combat turns required for each shot. Express this number as a fraction, i.e., one shot every five turns is 1/5, one shot every 36 turns is 1/36, etc. Because this conversion system results in distortion of total number of shots due to rounding, this converted ROF must never be used when calculating power input. The original space combat ROF must always be used when rating a space combat meson gun.

ROF for planetary combat is defined in terms of five-second planetary combat turns. The maximum rate of fire for planetary combat is one shot every fourth turn (expressed as 1/4, due to the need for a cooling cycle following each shot.

7D. Power Input

Power input in megawatts (MW) is calculated differently for space combat and planetary combat meson guns. Although they are calculated differently, space and planetary combat power input values are absolute values, as they are both based on MW input per second. However, be careful to make these calculations based on the *true* ROF for each meson gun, based on its primary environment: space or planetary combat. Do not use ROFs converted from one system to the other, as the rounding involved distorts the numbers.

Space Combat Meson Guns: Multiply ROF per 30 minutes times input energy (IE) from Step 7A. This is the total number of megajoules needed over the course of a 30-minute turn. Divide this result by 1800 to find the MW of power that must be allocated to operate the weapon.

Planetary Combat Meson Guns: Multiply ROF times input energy (IE) from Step 7A. This is the total number of megajoules consumed by the weapon each five-second turn. Divide this result by 5 to find the MW of power that must be allocated to operate the weapon.

8. GUN CREW AND WORKSTATIONS

All meson guns must be crewed according to the following formula:

Crew = (Tunnel Volume ÷ 100) × CP

CP: Computer multiplier based on tech level of computer installed aboard ship/linked to ground-based PAW. See Computers table in the Controls chapter (Section 4).

Round to the nearest whole number, but results of less than 1 must always be rounded up to 1.

Each crewmember must have a gunner's (normal) workstation installed with characteristics obtained from the Controls chapter (Section 4).



9. MESON GUN CARRIAGE, MOUNT, ETC.

If the gun is to be mounted in a starship, skip this step. If the gun is intended for use as a towed weapon, calculate the size of its carriage, mount, etc. A towed carriage has the same mass as the meson gun mounted on it.

The gun must include its HPG, but may be plugged in to a power source at its destination. Carriage-mounted meson guns have an all-around armor value of 1. This can be increased by enclosing the gun and its supporting equipment in a "hull" (cylinder hull form) with a certain thickness of armor according to the vehicle or spacecraft design rules. As this armor increases the mass of the gun, it will increase the mass of the carriage as well.

The price of the carriage, in MCr, is equal to its mass in tonnes multiplied by 0.002.

For use in planetary combat, meson guns make excellent indirect fire weapons. Although a meson gun is actually a pure line-of-sight weapon, the fact that it can fire through intervening forests, mountains, even entire planets (if it has sufficient range) means that its fire control solutions are usually of an indirect nature. Meson guns are hardly ever risked in the direct fire role, as they are too valuable.

Ground combat (vehicle- or carriage-mounted) meson guns are usually equipped with indirect fire control systems. Performance details, weight, volume, and price are in the Fire Control chapter (Section 14).

10. MESON GUN PHYSICAL CHARACTERISTICS

Add up or bring down the above components to obtain the following total figures for the gun.

10A. Volume

In cubic meters. Add tunnel volume, beam pointer volume, HPG volume, gunner's workstation volume, carriage volume (if any), indirect fire controls (if any).

10B. Mass

In tonnes. Add tunnel mass, beam pointer mass, HPG mass, gunner's workstation mass, carriage mass (if any), indirect fire controls (if any).

10C. Price

In MCr. Add tunnel price, beam pointer price, HPG price, gunner's workstation price, carriage price (if any), indirect fire controls (if any).

10D. Power Requirements

In MW. Carry down from Step 7D above.

10E. Length

Actual tunnel length in meters. Carry down from Step 1 above.

10F. Surface Area

Surface area for a spinal mount is equal to the tunnel cross-sectional area times 2. Surface area for a bay-mounted gun is equal to the bay's surface area.

10G. Combat Performance

Short range, medium range, long range, and extreme range in km and/or space combat hexes, plus damage values at those ranges, along with ROF, listing any –difficulty modifiers as applicable. Carry down from Steps 6 and 7C.

11. DEEP SITE MOUNT

Because they can freely fire through matter, meson guns buried in "deep sites" far beneath a planetary surface are favored planetary defense weapons. Not only are they immune to fire except from other meson guns, their location can be difficult to determine. During the Final War, the crews of deep meson gun sites were the last living persons on some worlds.

11A. Volume

Volume of the deep site is a sphere calculated from the length of the meson gun.

Divide gun length by 2 to get radius of the sphere in meters.

$^4/_3\pi r^3$ = volume of sphere

Mass of this sphere is irrelevant, as it is immobile. Price is equal to tunneling costs per cubic meter, below.

11B. Lift Carriage

The gun has infinite traverse within its sphere. This is provided by a lift carriage which negates the various bending stresses on the tunnel so that it retains its accuracy, and also allows it to be traversed.

Install a CG lifter from the Lifters subsystem chapter (Section 10) based on the volume of the sphere. Volume of the generator is added to that of the sphere. Mass is irrelevant, and price is calculated normally.

If contra-grav technology is not available, the gun must have a mechanical carriage which costs MCr0.01 per cubic meter of sphere.

11C. Other Support Systems

Fire control, crew, and power requirements are determined the same as for any other meson gun. In addition, crew for the power plant plus life support, staterooms, etc. should be provided. Costs for all of these elements are calculated normally.

Access to the surface is provided by twin high-speed elevators. Volume of this shaft equals the depth of the site beneath the surface times a cross section of 36 square meters. Cost is MCr0.001 per vertical meter of shaft.

Once all components of the deep site have been calculated, total their volume (including the access shaft) to calculate the cost of tunneling based on the table below.

TL	*MCr/cubic meter*
7	0.0005
8	0.0003
9	0.0002
10	0.00015
11	0.00015
12	0.00007
13	0.00007
14	0.00007
15	0.00007



CHAPTER 7
High-Energy Weapons

High-energy weapons use a laser to heat hydrogen to a plasma state, containing it in a magnetic bottle until it reaches maximum energy, then opening an aperture in the bottle, releasing the plasma in a high-temperature, high-velocity (in excess of 8000 meters per second) jet. Fusion weapons operate on identical principles but contain the plasma slightly longer until a fusion reaction begins.

High-energy weapons use power cartridges identical to those used in explosive power generators as their ammunition. Each high-temperature ceramic cartridge is ignited and serves as the liner for the magnetic bottle that contains the plasma generated inside it. Recoil energy activates a purge cycle, during which liquid nitrogen is used to cool the cartridge before a new one is fed into the chamber from the magazine or autoloader, kicking what's left of the spent one out of the weapon (some of the mass of the cartridge becomes a part of the plasma jet). After the purge/eject cycle, the action locks closed, and the weapon is ready to fire again. The spent cartridge case is still hot enough to inflict burns on unprotected skin, although the purge cycle cools it enough so that it is no longer a source of ignition.

The heat of the ejected cartridges and the incidental heat from the plasma stream require users to wear protective clothing of some sort. The flame-retardant properties of most standard military uniforms provide adequate protection.

Supporting hardware consists of the cooling system and the power pack for the magnetic bottle. In the case of small arms weapons, this supporting hardware is worn as a backpack and the plasma or fusion cartridges are loaded into the weapon in detachable box magazines.

ENERGY WEAPON DESIGN SEQUENCE

A. Specifications

The characteristics of high-energy weapons are determined by five specifications. In addition, the weapon's power cartridge is designed at this time, as it is used through the rest of the design sequence.

1. Tech Level: Determine the tech level of design of the weapon. Plasma weapons can be designed from tech level 10 and up. Fusion weapons can be designed from tech level 14 and up.

2. Pulse Energy: Pulse energy is measured in megajoules (Mj) and is the basic defining parameter of energy weapon performance. Theoretically, any pulse energy level may be specified, but there are practical limits based on the size of weapon desired.

3. Fire Control: The type of fire control equipment, if any, must be specified. Since energy weapons are direct line-of-sight weapons, they do not require sophisticated rangefinders. A simple optic sight is sufficient for most targets, and this is included in the basic cost of the weapon. Ballistic computers or point-defense computers may be added to give the weapon a better capability against high-speed targets. Enhanced-visibility equipment may be added to enable the gunner to engage targets in limited-visibility conditions. See Fire Control, Section 14.

4. Mount: An energy weapon may be hand-carried or mounted either on a carriage or directly on a vehicle. All guns mounted on vehicles and on towed carriages are collectively called "cradle guns," as opposed to smaller man-portable weapons, which are usually called rifles, or in militarese, PGMPs (plasma gun, man portable) and FGMPs (fusion gun, man portable).

5. Options: A cradle gun may have a gun shield if desired, which provides the crew some protection against fragmentation and small arms fire from the front. If vehicle-mounted the gun may also have an autoloader.

6. Power Cartridge: Ammunition for energy weapons consists of explosive power generation (EPG) cartridges, which provide both power for the system and the fuel mass that forms the plasma stream fired by the weapon. At tech level 10, these are CPCs, at TL 12 they are PPCs, at TL 14 PFCs, and at TL 16 GCFCs, as described in the explosive power generation section of the Power Production chapter (Section 8).

Consult the Power Production chapter and design a cartridge from the correct tech level which has the output necessary to power the weapon.

B. Mass

The complete weapon system weight is equal to the weight of the weapon itself, plus its supporting hardware, plus its fire control equipment, plus its recoil system, plus its gunshield (if any), plus its feed system. The empty weight of a small arm energy weapon is equal to the mass of the firing unit. The loaded mass of a small arm energy weapon is equal to the mass of the firing unit plus the mass of a loaded magazine.

1. Firing Unit: The firing unit consists of what we would call the barrel and receiver of a conventional small arm. The ammunition supply feeds plasma or fusion pulse cartridges into the receiver where the internal ignition lasers of the system heat the fuel in the cartridge to a plasma state. The firing unit also contains the pilot laser that opens the atmospheric tunnel for the passage of the plasma or fusion bolt.

The mass of the firing unit is determined by the following formula:

Mf = TmPp

Mf: Mass of the firing unit in kilograms
Pp: Pulse power in megajoules
Tm: Tech level multiplier, as shown on the following chart:

TL	*Tm*
10	8
11	6
12-14	4
15	2
16-17	1
18-19	0.5
20+	0.3

2. Supporting Hardware: The supporting hardware includes the liquid nitrogen (LN) purge cooling system and a power pack to support the magnetic bottle. The power pack includes a small battery and homopolar generator (for the pilot laser) and is thermoelectrically powered by excess heat from the main ammunition ignition system. On man-portable weapons, the supporting hardware is contained in a backpack linked to the weapon by a multiflex cable including data, power, and LN lines.

The mass of the firing unit is determined by the following formula:

Ms = TmPp

Ms: Mass of the supporting hardware in kilograms
Pp: Pulse power in megajoules
Tm: Tech level multiplier, as shown on the following chart



TL	Tm
10	12
11	10
12	8
13	6
14	4
15	2
16-17	1
18-19	0.5
20	0.3

3. Fire Control: The weights of the various fire control systems are given in the Fire Control chapter (Section 14). Basic optic sights are included in the mass of the firing unit.

4. Recoil System Weight: Man-portable energy weapons do not require a cradle. The mass (and price) of a stock are subsumed in the basic cost of the firing unit.

At tech level 10, gyroscopic recoil compensators become available. This recoil compensator is a gyroscopic unit mounted in a backpack and body harness to which the gun is connected by a flexible articulated arm. The arm becomes rigid when the weapon is fired and helps absorb the recoil.

At tech level 14 and beyond, inertial compensators become available to reduce the recoil of man-portable energy weapons. This is a more sophisticated version of the gyro-compensator.

The mass of both gyroscopic and inertial compensator is determined by the following formula:

Mc = TmPp

Mc: Mass of the compensator in kilograms.

Pp: Pulse power in megajoules.

Tm: Tech level multiplier, as shown on the following chart:

TL	Tm
10-11	6
12-13	5
14	4
15	2
16-17	1
18-19	0.5
20	0.3

Cradle guns, whether they are towed or vehicle mounted, require a recoil-absorbing cradle. This is similar in design to the hydraulic recuperators used to absorb recoil on CPR guns.

The mass of the recoil cradle is determined by the following formula:

Mr = TmPp

Mr: Mass of the recoil cradle in kilograms

Pp: Pulse power in megajoules

Tm: Tech level multiplier, as shown on the following chart

TL	Tm
10	75
11	50
12	35
13-14	20
15-16	15
17-18	10
19-20	6
21+	4

Towed guns also require a carriage. The carriage weight of a gun, in tonnes, is its muzzle energy in megajoules divided by 2.

Vehicle-mounted cradle guns do not require carriages, but the vehicle itself must weigh at least twice the required carriage weight.

5. Gun Shield: The weight of a gun shield in tonnes is equal to 0.1 times the pulse energy in megajoules.

6. Feed System: Specify the number of cartridges in the magazine. On cradle guns or very large man-portable weapons, this will usually be only one, with individual rounds loaded by hand or by autoloader into the weapon each time it fires. For most man-portable weapons, several rounds can be carried in a box magazine attached to the weapon.

The mass of a box magazine is determined by the following formula:

Wm = .6(N+4)Wa

Wm: Weight (in kilograms) of an empty magazine.

Wa: Weight (in kilograms) of a complete round of ammunition.

N: Number of rounds the magazine is designed to hold.

A loaded magazine weighs this plus the weight of the individual cartridges loaded into it.

The weight of the auto-loader is equal to the cartridge weight times 30.

C. Gun Crew

The number of crewmen required to man a gun depends on its function and how it is mounted. A crew normally consists of a gunner and several loaders.

The crew required to serve a towed (carriage-mounted) energy weapon is equal to the mass in kilograms of its power cartridge multiplied by 0.03, rounding fractions up. Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).

D. Range

Weapons have four direct fire ranges: short, medium, long, and extreme. Medium range is 2 × short, long is 4 × short, and extreme is 8 × short.

Direct fire range is mostly a function of the pulse energy of the weapon. A second consideration is the type of weapon, as fusion guns have a longer range for the same energy than do plasma guns.

Short direct fire range in meters for a plasma gun is its pulse energy in megajoules multiplied by 30.

Short direct fire range in meters for a fusion gun is its pulse energy in megajoules multiplied by 50.

E. Damage Value

The damage value of an energy weapon at short range is calculated using the following formula:

D = 11.5(√P)

D: Damage value

P: Pulse power in megajoules

F. Penetration

Penetration is expressed in two ways: as *penetration value*, and as *penetration rating*.

Penetration value is a measure of the weapon's absolute ability to penetrate armor, and is the measure most often used in vehicle combat.

Penetration rating describes the relationship between the weapon's damage value and its penetration value. Penetration value = Damage value + Penetration rating. Likewise, Damage value = Penetration value × Penetration rating.



Penetration rating is also equal to the number of points of damage value that are lost for each level of armor value that is penetrated (thus the smaller the penetration rating, the better the penetration performance). This is the measure most often used in personnel combat. Penetration ratings become higher (i.e., penetration performance becomes worse) as range increases. Ratings are given by range: short/medium-long-extreme (penetration rating for medium is the same as for short).

Plasma weapons have a penetration rating of 1-2-10.

Fusion weapons have a penetration rating of ½-1-4.

Small arms are usually listed with their damage value and penetration ratings listed separately.

Cradle guns are usually listed with their damage value and penetration ratings combined into their penetration values at the various ranges.

Thus, a small arms fusion gun might be described as having a damage value of 20 with penetration ratings of ½-1-4. That same fusion gun, if it were rated as a cradle gun, would have listed penetration values of 40-20-5 (short/medium-long-extreme).

G. Reloading

The time the weapon requires to reload is a function of its power. The base number of five-second turns required to load a round is equal to its pulse power (in megajoules) divided by 3, rounding fractions to the nearest whole number. A result of less than 0.5 (which rounds down to 0) indicates that a round can be reloaded in the same combat turn in which the weapon fires, leaving it capable of firing again in the next combat turn.

If an autoloader is available, multiply power cartridge weight by 0.3 for purposes of this calculation.

If the weapon is man-portable and fed by a box magazine, the weapon is always semiautomatic with a maximum rate of fire of 1 round per combat turn.

H. Price

The price of the weapon is equal to the price of its components. Fire control equipment costs are listed in the Fire Control chapter (Section 14). The prices (in credits) of other components are determined by their mass (in kilograms)and cost multipliers, as shown below. Note that the cost multipliers for certain components of plasma and fusion guns are different.

Price Multiplier

Component	*Plasma*	*Fusion*
Firing Unit	2500*	7500*
Support Hardware	2500*	7500*
Gyro-Compensator*	1000	1000
Inertial Compensator*	2500	2500
Recoil Cradle	100	100
Towing Carriage	2	2
Autoloader	10	10
Gun Shield	1	1

• Installing a gyro-compensator or inertial compensator requires that the electronic components of the system be designed more robustly. This has no effect on mass, but doubles the price of the firing unit and support hardware.

Empty magazines cost Cr1 per kilogram, rounding fractions up.

I. Set-Up

A towed energy weapon must be set up before it can fire. The set-up time (in five-second combat turns) for a towed energy weapon is determined by multiplying the total mass of the weapon (in tonnes) by 10.

J. Volume

The volume of an energy weapon in cubic meters, for purposes of transportation or mounting in a vehicle, is equal to the mass of its components in metric tonnes multiplied by 0.5 (for the firing frame and support hardware) or 1 (for all other systems).

K. Recoil

Recoil is only calculated for man-portable weapons, not cradle guns. Recoil is calculated using the following formula:

$$R = \{[(150\sqrt{E})+Ww]Rcm\}$$

R: Recoil number

E: Pulse energy in megajoules

Ww: Weight, in kilograms, of weapon (loaded)

Rcm: Recoil compensator modifier. The only allowed recoil modifiers are from gyroscopic or inertial compensators. (All plasma and fusion weapons are assumed to have recoil-absorbing stocks as standard equipment. Muzzle brakes are not effective, and in fact are extremely dangerous, on energy weapons.) The recoil modifiers for these vary with tech level and are shown below. Note that these systems, due to the larger recoil forces at work, are not as effective at reducing recoil as similar systems used with small arms.

TL	*Type*	*Rcm*
10	Gyro	.8
14	Inertial	.5
15	Inertial	.4
16	Inertial	.3
18+	Inertial	.2

L. Bulk

Bulk is only calculated for man-portable systems, not cradle guns. Bulk is calculated using the following formula. However, results of greater than 5 are treated as 5.

$$B = MfTm$$

B: Bulk

Mf: Loaded mass (in kilograms) of the firing unit.

Tm: Tech level modifier, as shown below.

TL	*Tm*
10-11	3
12	2
13	1.5
14	1.25
15	1
16+	0.75



CHAPTER 8
Lasers

Laser, as all science-fiction gamers probably know, stands for Light Amplification by the Stimulated Emission of Radition, and is one of the most used—and, it would appear, misused—concepts in science-fiction gaming. (Incidentally, lasers were originally referred to as "optical masers"—maser = Microwave Amplification by the Stimulated Emission of Radiation—although masers could as easily be referred to as "radar lasers.")

Laser Basics

The key concept behind lasers is *stimulated emission*, meaning that an atom or molecule is hit by light of a particular wavelength which then causes that particle to emit light of that same wavelength. The reason that substances can be stimulated to produce specific wavelengths has to do with the way atoms and molecules store and release energy with their electrons. Electrons belonging to an atom are found in "orbits" (they are not really orbits, but in the interest of not going into weird existential Schrödinger's cat-style quantum physics, orbits are a close enough concept) around the atom's nucleus (that's *noo-klee-us*, Mr. Secretary). These electrons move from low-energy orbits close to the nucleus out to high-energy orbits farther from the nucleus as they gain energy by absorbing photons, and move back in toward the nucleus as they give up energy by emitting photons.

These orbits are not set up with an infinite number of fine gradations, they are more like the rungs of a ladder—there are only so many, and they are a fixed distance apart. One can step up or down one, two, three or more rungs at a time, but cannot go up or down a fraction of a rung. Like the difference between electron orbits, the differences between the rungs on a ladder are *quantized*. This means that an electron which absorbs a photon and moves, or *transitions*, to a higher orbit, or *energy level*, can only have absorbed a photon with a certain fixed amount of energy, no more and no less, to move to that energy level. As that same electron transitions back down to the earlier lower energy level, it emits that same amount of energy, the difference between the two energy levels, in the form of a photon which is identical to the photon it absorbed earlier. Thus, based on the number of available energy levels and the combination of transitions (energy level 0-1, 0-2, 0-3, 1-2, 1-3, etc.), an atom can only absorb or emit photons of certain discrete energies.

Photons are described in three ways: by their energy, their frequency, and their wavelength (remember that electromagnetic radiation behaves as simultaneously as particles—photons—and waves, so that particles can be said to have frequency and wavelength). However, these are merely three different descriptions of the same thing—a given wavelength is equivalent to a certain frequency is equivalent to a certain energy. That means that an atom which can only absorb or emit photons of certain energies can only absorb or emit radiation of a certain wavelength.

Molecules also store energy electronically as just described, but they also store energy as vibrational energy, where the component atoms vibrate back and forth with relation to each other, and rotational energy, where the molecule rotates around its center of mass (atomic nuclei cannot store energy like this because their mass is completely symmetrical). However, like electronic energy, vibrational and rotational energy are also quantized—there are only certain allowed levels of these energies, which of course define the energy/wavelength of the photons that these molecules can absorb or emit. (Rotational transitions are the least energetic, with most transitions corresponding to the far infrared portion of the spectrum. Most vibrational transitions are in the near infrared. Electronic transitions are the most energetic, with most of these corresponding to the visible and ultraviolet portion of the spectrum. However, there are notable exceptions to all of these generalizations. Nonetheless, this means that electronic transformations are the most useful for military purposes, as we will see below.)

Most photon emission is spontaneous. Energetic atoms or molecules, like those in the filament of a light bulb, shed their energy by spontaneously spewing photons—atoms and molecules tend to be in their lowest energy states, so the chances of spontaneous emission increase with the energy state. What stimulated emission does is to hit an energetic atom or molecule with a photon of a wavelength that corresponds to one of that atom or molecule's transitions (i.e., a wavelength which it can absorb or emit). If the atom or molecule is already at the energy state where it can emit a photon of the wavelength which struck it, the atom or molecule will emit that photon, and in the same direction as the photon which struck it, so that now there are two identical photons travelling in the same direction. So long as this takes place within a population of atoms or molecules which are already at the required energy level, this chain reaction will continue, creating ever more photons of the same wavelength. This is a laser. What? No powerful concentrated beam? Nope. All that is required of a laser is laser gain—the amplification of light radiation by stimulated emission—it need not be unidirectional, or focussed. Mars' upper atmosphere is one such non-unidirectional laser. If this emission takes place between a pair of focusing mirrors, the photons will bounce back and forth, continuously stimulating more photons travelling in the same direction, until one of the mirrors is made transparent ("Q-switched"), and the focused beam of photons is released. This is what we normally think of as a laser, although it is more properly a "diffraction limited laser." However, these diffraction limited lasers are what we simply call "lasers" in **Traveller** and in the design sequence below.

The problem is that a population of atoms or molecules will not all be at the proper energy state at the same time. Instead, they will naturally be at thermodynamic equilibrium, which means that the number of atoms or molecules at a given energy state varies inversely with the amount of energy in that energy state, with the result that each energy state is outnumbered by the lower energy state immediately beneath it (i.e., the energy state which will immediately absorb photons released by the upper energy states). What this means is that this population would rather absorb the photons coming by than be stimulated to emit any. The stimulated emission chain reaction is dead before it begins.

In order to get stimulated emission to work, there must be a *population inversion*. A population inversion means that the target energy state (that which produces the photon wavelength desired) is more common than the energy states beneath it. This allows the target energy state population to stimulate each other's emission without these photons being immediately absorbed. This inversion cannot be created simply by heating the population, as this would merely create thermodynamic equilibrium at a higher set of energy states, which would be just as disastrous to the chain reaction. The way to selectively populate an upper energy level is via electrical current, intense light, or chemical reaction.

There are three main types of lasers to discuss in relation to **Traveller**. They are presented in the order of their technological advancement on modern Earth.

First is what we will call a static laser. A static laser uses a single



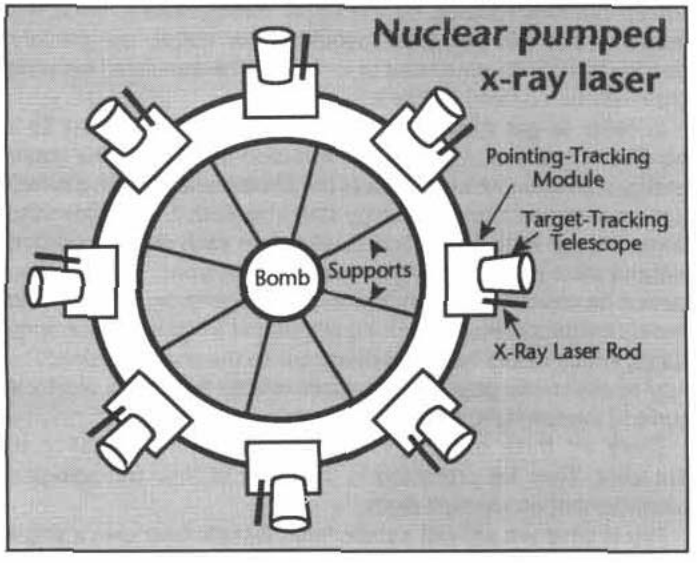
population of atoms or molecules which are energized by electrical or light input, emit their photons and fall to a lower energy state, and are then re-energized to emit again, over and over and over. They are called static because they use the same population time after time. They are distinguished by the need for significant electrical input in order to function. Static lasers include modern ruby lasers, gas lasers, and excimer lasers. These are represented in **Traveller** by the direct electrical input lasers at the lower tech levels of roughly 7-9, with rubies and gas lasers from TL 7-8, and excimers from 8-9.

Second are chemical lasers. These lasers do not use the same population over and over, but continuously create a new energized population which emits its photons and is discarded. These atoms or molecules are not energized *per se*, but are created in an energized state as the products of an energetic chemical reaction. By keeping a continous reaction going and venting away the spent material, a population inversion can be maintained without the need for outside power input, as the energy comes purely from combusting chemicals. These are most commonly used in **Traveller** as small arms lasers.

Third are free-electron lasers, or FELs. This laser passes an electron beam through a series of magnets which bend the paths of the electrons. As the electrons' paths are bent, they are made to emit or absorb photons. By placing mirrors at both ends of the electron beam, the photons are gathered coherently to form a beam in the usual fashion. Because these electrons are free, and not bound to an atom, they are not locked into quantized energy states, and therefore can absorb or emit photons of any wavelength, depending upon how they are manipulated by the magnets. In this way, the FEL can actually be tuned to emit different wavelengths. In **Traveller**, FELs are represented by the great tunable direct electrical input lasers, the mainstay of **Traveller** space combat from TLs 10-15. For simplicity in the design sequence, however, these overlap with the static lasers above.

The non-tunable X-ray lasers that appear from TLs 13 to 19 are also FELs, but are very specialized to produce X rays and have therefore given up their tunability. X-ray stimulated emission is very hard to induce because the chance of inducing stimulated rather than spontaneous emission of a photon varies with its wavelength cubed. By the very short X-ray wavelengths, this probability has dropped off sharply from that of the more amenable, longer wavelengths.

An additional specialized type of laser should be mentioned. It is an odd subset of static laser, called the nuclear-pumped X-ray laser.



To create the necessary population inversion for X-ray emission requires a great deal of power, because the transition that produces an X ray is an extremely powerful one. The radiation from a nuclear explosion provides sufficient power, but also vaporizes the laser-producing population after one shot. Another troublesome characteristic of short wavelength stimulated emission is the incredibly short life time of their excited state before spontaneously emitting. In the case of the 10Å photon that would be emitted by a nuclear-pumped laser, this lifetime is only about 10^{-13} seconds (one-tenth of a trillionth of a second), which is probably just as well, under the circumstances.

The X rays are generated by a population shaped in the form of very thin rods, about a millionth of a meter in diameter. There are no mirrors or sophisticated focusing arrays on these expendable beam-generating rods. It is the shape of the rods themselves that create the beam by directing the path of the stimulated emission chain reaction along their lengths.

Laser Functions

All of the rules on laser performance and design are defined by the following formula which describes the physics of focusing light, based on its wavelength and its focusing elements.

$$I = (P+[(L+F)^2])+R^2$$

Where:

I= Delivered energy intensity (watts/cm²)
P = Discharge energy (watts)
L = Wavelength (centimeters)
F = Focal value (centimeters)
R = Range (centimeters)
L+F = Divergence angle (radians)

The calculations in the design sequence below do not require designers to use this formula, but all of the formulas and concepts are derived from it. One of the most important facts derived from this formula is that the shorter the wavelength of the laser, the better its range performance will be. The longer its wavelength, the worse it will be. Lasers start with rather long wavelengths (in the infrared band of the electromagnetic spectrum) at low tech levels, but are able to achieve shorter wavelengths at higher tech levels. The other important fact is that lasers, no matter how we might fervently wish it, do not have the range performance we have been led to expect by a steady diet of movies, television, and soft science fiction. Space combat ranges are simply too great.

All light disperses over distance, even diffraction-limited laser light. The variables are wavelength, diameter of the focusing elements, and range. We've already mentioned that short wavelengths are desired to get good range performance, and we know that the bigger the focal elements, the tighter the focus.

The problem is that dispersion increases with the *square* of the range. Once any variable becomes squared, it quickly overwhelms the other variables, particularly when the squared variable is big to begin with. In space, the range variable is very, very big. Very, very big squared is almost insurmountable.

To get an idea of how almost insurmountable real physics is, let's try a rough laser design using the formula above. How big does our focal array need to be? Let's try 10 meters in diameter, much larger than anything ever visualized for **Traveller**, or any other science-fiction game, movie, or TV show. And let's set its wavelength in the ultraviolet (UV) range, better than we can handle today, but not as good as X rays (which, as with earlier editions of **Traveller**, show up at TL 13), and we'll set its output at 1000 megajoules.



How does the beam hold together? At only 30,000 km (one space combat hex), its spot size is almost 70 meters in diameter, diluting the 1000 megajoules down to only 0.3 megajoules per square centimeter. Since a laser needs about 2 megajoules per square centimeter to punch through a centimeter of steel, our laser is off by a factor of almost 100 to punch a civilian starship hull, and that's at only one hex.

What do we need to get a 10-hex range with tight enough focus to punch a starship? We need a divergence angle of around 0.3 picoradians (10^{-12} radians), which we can get by using shorter wavelength light or a larger focal dish. But since we've already decided that UV is as short as we can go before TL 13, we're left with a dish diameter of *6000 meters*.

In order to deal with this cruel reality, **Traveller: The New Era** incorporates a rule for gravitic focusing to allow lasers to continue to have the long-range space performance we've all grown used to. This gravitic focusing of the laser beam appears at the same time as contra-gravity technology, and creates the effect of a larger diameter dish by creating an intense point source of gravity within the focusing area to bend the light with gravity. However, because this bending of light is such a departure, we present it as an optional technology, instead of just fudging the rules to cover up the reality gap. By doing this, we allow referees to design campaigns that use real physics, to discover what space combat of the future might actually be like, starting with SDI. Although we call it an optional technology, gravitic laser focusing is an official and important part of the Imperial Space campaign, and will be used in all **Traveller: The New Era** background material intended for that campaign.

LASER DESIGN

1. TECH LEVEL

The tech level at which a laser is built has obvious impact on its effectiveness. Tech level affects the mass and volume of the laser itself, its power supply, the wavelength of light that can be used, and the fire control systems that are used to guide it. Tech levels of 13 or greater also affect the type of laser that can be built. If the tech level is 13 or more, at this time the designer must designate if the laser will be a *tunable* laser or an *X-ray* laser.

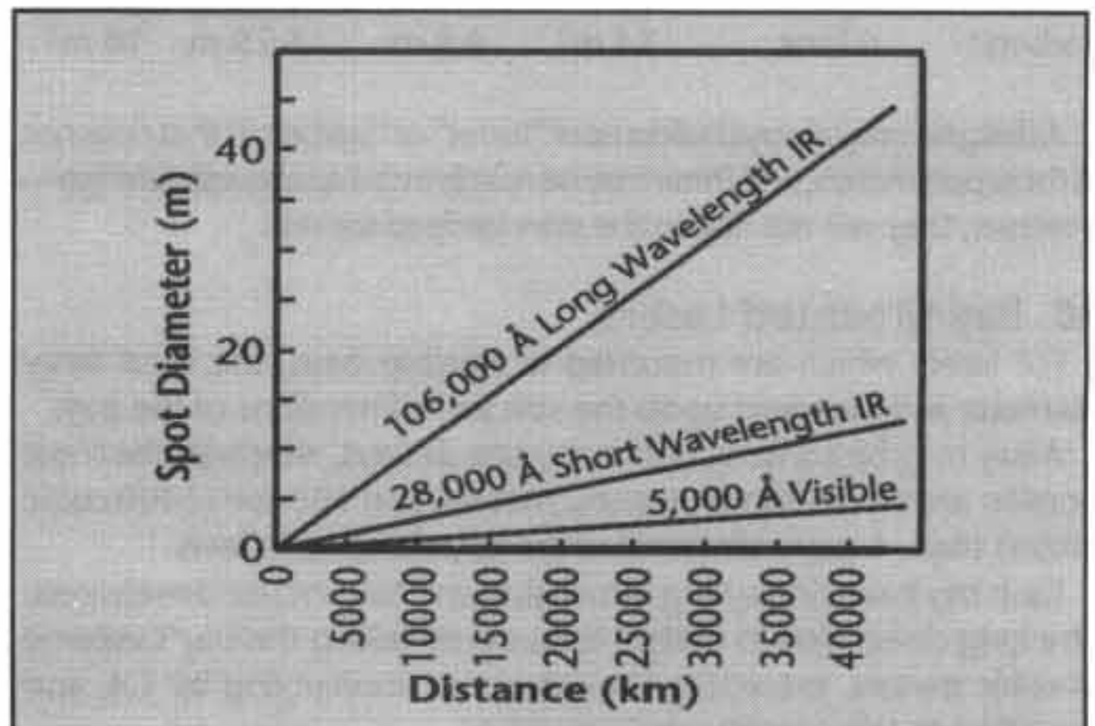
Tunable lasers have a shortest allowable wavelength defined by their tech level. At most tech levels, this shortest wavelength is longer than X-ray wavelengths, and therefore cannot be focused as tightly and so has less range. However, a tunable laser can be tuned to fire a pulse of any wavelength equal to or longer than its shortest allowable wavelength, which is advantageous when firing into or through atmospheres. Ultraviolet and X-ray radiation are absorbed quite well by atmospheres, making these wavelengths quite useless for use in ground vehicles or for planetary bombardment from space. Even though visible and infrared wavelengths have poorer focusing and range performance than X rays, they are the only wavelengths useful for attacking targets within an atmosphere. Thus a tunable laser with a shortest allowable wavelength in the ultraviolet or soft X-ray bands could use these wavelengths for maximum range performance in space, but still be tuned to visible bands when conducting planetary bombardment.

X-ray lasers, on the other hand, are built for the maximum possible range performance in vacuum. But because of the specialized nature of equipment necessary to focus X rays, these X-ray lasers cannot be "de-tuned" to fire longer wavelength pulses. (Note, however, that at high tech levels, tunable lasers become capable of ever shorter wavelengths, so that tunable lasers and X-ray lasers eventually merge.)

2. GRAVITIC FOCUSING (OPTIONAL TECHNOLOGY FIELD)

Gravitic focusing allows lasers to be be focused at lethal intensities over the ranges at which **Traveller** space combat takes place. This is an official part of the standard Imperial Space campaign, but need not be used by players who are creating their own "universe" or campaign background.

Gravitic focusing does not require any additional equipment to be installed in the design sequence, but it does affect laser energy efficiency (Step 4), and adds another step to improve the performance of the laser in the performance rating step (Step 5).



Why Gravitic Focusing?

This graph shows the focussing performance of several current or hypothetical lasers using real-world physics. The graph shows the spot size at various ranges of a laser beam fired from a focal mirror 30 meters in diameter. Note that a range of 30,000 km is only one hex in **Traveller** space combat. Bearing in mind that intensities of at least one megajoule per square centimeter must be obtained to get meaningful combat performance, think of how hard that must be when a laser spot is over five meters across (50,000 square centimeters) at a range of only one hex.

This is why we have chosen in **Traveller: The New Era** to postulate gravitic focusing as an optional (though passionately recommended) technology field.

3. FOCAL ARRAY

Select the diameter of the laser *focal array* (abbreviated FA Diameter). At low tech levels, this is a pair of simple concave mirror at opposite ends of the laser-generating cavity. At higher tech levels, it is an array of smaller reflective surfaces which are focused mechanically or electro-hydraulically, using electricity or sound passed through a fluid focal medium to focus and traverse the beam. The larger the diameter of the focal array, the greater the range at which the laser beam can be focused to lethal intensities.

During the design sequence itself, the focal array diameter must be specified in meters, although small arms lasers are usually described in centimeters once their designs are completed. Many of the equations that follow require units in meters in order to give proper results.

In general, focal arrays may be built to any dimensions desired. However, certain standardized weapons installations are used on starships which require certain parameters to be observed.



3A. Standard Socket-Mounted Lasers

Most starships are fitted with one or more of two standard-sized *sockets*. These sockets will accept standard-sized lasers, missile launchers, and nuclear dampers. These sockets come in two sizes, referred to by tradition as turrets and barbettes. Turret sockets are 3 displacement tons (42 cubic meters), and barbette sockets are 6 displacement tons (84 cubic meters). Both sockets are cylinders, with the following dimensions:

Type	*Displacement*	*Volume*	*Diameter*	*Height*	*Surface Area*
Turret	3 tons	42 m^3	3.6 m	4.2 m	10 m^2
Barbette	6 tons	84 m^3	4.5 m	5.25 m	16 m^2

A designer may always build a laser "turret" or "barbette" that does not fit these parameters, and these may be readily installed aboard starships—however, they will not fit into the standardized sockets.

3B. Bay-Mounted Lasers

For lasers which are mounted in starship bays, the focal array diameter is dependent upon the size and dimensions of the bay.

A bay may be constructed to any size desired, although the most popular are the 50-ton (700 cubic meters) and 100-ton (1400 cubic meter) bays. A bay's dimensions are calculated as follows.

Each bay has a single long dimension and two shorter dimensions. The long dimension in meters is found by taking the bay's volume in cubic meters, extracting the cube root, multiplying by 1.4, and rounding to the nearest whole number.

$$1.4\ (\sqrt[3]{Vol})$$

Divide the bay's total volume in cubic meters by the long dimension, and extract the square root of this result, rounding to the nearest 0.5 meters. This is the approximate length of the bay's short dimensions. Multiply the long dimension by the short dimension to get the surface area of the bay in square meters.

Standard Bays and their Dimensions

Size	*Cubic Meters*	*Long Dim.*	*Short Dim.*	*Surface Area*
50 ton	700	12 m	7.5 m	91.2 m^2
100 ton	1400	16 m	9.5 m	150.4 m^2

The diameter of the focal array is equal to the short dimension of the bay.

Characteristics of the focal array are specified after selecting the laser's maximum pulse energy in Step 4.

4. DISCHARGE ENERGY

Specify the amount of output energy that will be fired in each laser pulse (*discharge energy*, abbreviated DE) in megajoules (Mj). Naturally, the greater the discharge energy, the more damaging the laser, and the more equipment is required to allow the laser to function.

Focal arrays fall into one of two performance brackets: *heavy* and *light*. A heavy focal array is any array, regardless of power output, which is intended for permanent installation in a vehicle, spacecraft, or static ground installation. A light focal array is one which is intended for use in a small arm or heavy weapon, and is generally man-portable. Light focal arrays (which can be more massive than a heavy focal array of the same power output) are therefore not subsumed under the various support systems (power, environmental protection, and cooling, etc.) of, say, a ship-mounted system, and require some additional expense as well as support components to be added separately (which will be detailed below).

A heavy focal array must be further defined as a trainable or fixed array. A trainable array is one which will be mounted so it can be traversed and pointed at its target, as in a turret or similar mount (this also includes barbettes, bays, and vehicle turrets). A fixed mount is one which will be mounted to have no flexibility, and must be aimed by pointing the vehicle in which it is mounted. This is typical of lasers mounted in the noses of fighters, fixed to fire directly ahead. When mounted in spacecraft in this way, these are referred to as laser "lances."

Now calculate the characteristics of the focal array. The volume of the focal array (in cubic meters) is its surface area (in square meters) times its maximum discharge energy (in Mj) times the tech level modifier from the table below.

Surface area is calculated by first dividing the FA diameter in meters by 2 to get its radius, r, in meters.

Surface area = πr^2, where $\pi = 3.1416$

Focal Array Volume Modifiers

	TL Modifier	
TL	*Heavy Focal Array*	*Light Focal Array*
7-8	1	10
9	0.1	1
10-11	0.01	1
12-15	0.001	0.5
16-19	0.0005	0.1
20+	0.0001	0.05

Mass: Mass in tonnes of the focal array is equal to its volume in cubic meters ×1

Price: Price in megacredits (MCr) of a trainable heavy focal array is equal to its volume in cubic meters ×0.2; of a fixed heavy array in MCr is cubic meters ×0.1, and of a light array in MCr is m^3 ×0.5.

Energy Efficiency and Input Energy: All lasers have a required amount of energy input, defined as input energy (IE) for each shot.

Non-Gravitic Focusing: Lasers designed without the gravitic focusing optional technology field derive their input energy from their energy efficiency based on tech level.

TL	*Efficiency*
7	0.20
8	0.25
9	0.30
10	0.35
11	0.45
12	0.55
13	0.65
14	0.75
15	0.85
16+	0.95

To find the input energy needed for each shot, divide DE in Mj by the efficiency value on the table according to tech level.

Gravitic Focusing: All lasers using gravitic focusing have a 20% energy efficiency. In other words, the discharge energy chosen above is only 20% of the total energy expended for each pulse; the remaining 80% is spent in generating the beam, generating the gravitic focusing elements, or lost as waste heat. To find the actual energy in Mj needed to fire each laser shot, use the equation

DE + 0.2 = input energy (IE) required per shot



5. LASER PERFORMANCE RATING

To find a laser's performance, multiply its *focal value* (F) by the range factor used at the laser's tech level. The result is the laser's *effective range* in kilometers. Effective range is the range at which the laser's full pulse energy is focused into an area on the target of 1 square centimeter. Within this range, a laser's full pulse energy is used to inflict damage on its target. Beyond this range, the beam's intensity per unit area diffuses, and the damage becomes lower. Effective range is not used in combat, but it is used in the steps below to derive the laser's combat performance at short, medium, long, and extreme range, which are used in combat.

5A. Non-Gravitic Focused

If the laser will not be using gravitic focusing, F is equal to the FA diameter in meters, and the range factor is selected according to tech level. Ignore the two columns (for X-ray lasers, single column) under the Gravitic Focusing heading.

5B. Using Gravitic Focusing

F must be calculated based on the gravitic focusing focal modifier. Based on the tech level and class of the focal array (heavy or light), choose the correct focal modifier. To apply this modifier:

1. Take the FA diameter (in meters) and convert it to decimeters (1 dm = 0.1 m) by multiplying by 10.
2. Apply the focal modifier to the diameter D in decimeters.
3. Divide the result by 10.
4. The result is the laser's focal value F. Multiply F by the proper range factor for the tech level to get the laser's effective range.

Note that for each focal modifier there is a lower limit of focal array size that can be gravitically focused. Because of the exponential function, beneath these levels the focal array effectiveness actually decreases. At $F = D^2$, for example, the lower limit is 0.1 meter.

TUNABLE LASERS

	Gravitic Focusing		
TL	*Focal Modifier (Heavy)*	*Focal Modifier (Light)*	*Range Factor (Wavelength of Light)*
7	$F = D$	$F = D$	3 (30,000 Å, Infrared: IR)
8	$F = D$	$F = D$	20 (5000 Å, Visible light: VL)
9	$F = D^2$	$F = D$	33 (3000 Å, Near Ultraviolet: NUV)
10	$F = (3D)^2$	$F = D^2$	50 (2000 Å, Ultraviolet: UV)
11	$F = (4D)^2$	$F = (3D)^2$	100 (1000 Å, Far Ultraviolet: FUV)
12	$F = (5D)^2$	$F = (4D)^2$	100 (1000 Å, Far Ultraviolet: FUV)
13	$F = (6D)^2$	$F = (5D)^2$	100 (1000 Å, Far Ultraviolet: FUV)
14	$F = (6D)^2$	$F = (6D)^2$	100 (1000 Å, Far Ultraviolet: FUV)
15	$F = (6D)^2$	$F = (6D)^2$	1000 (100 Å, Soft X-ray/Extreme UV: EUV)
16	$F = (6D)^2$	$F = (6D)^2$	2000 (50 Å, X-ray: XR)
17	$F = (6D)^2$	$F = (6D)^2$	5000 (20 Å, X-ray: XR)
18	$F = (6D)^2$	$F = (6D)^2$	10,000 (10 Å, X-ray: XR)
19	$F = (6D)^2$	$F = (6D)^2$	50,000 (2 Å, Far X-ray: FXR)
20	$F = (6D)^2$	$F = (6D)^2$	100,000 (1 Å, Extreme X-ray: EXR)
21	$F = (6D)^2$	$F = (6D)^2$	200,000 (0.5 Å, Near Gamma ray: NGR)
22	$F = (6D)^2$	$F = (6D)^2$	500,000 (0.2 Å, Gamma ray: GR)
23	$F = (6D)^2$	$F = (6D)^2$	1,000,000 (0.1 Å, Gamma ray: GR)

Notes:

At TL14+, the distinction between heavy and light focal arrays no longer affects focusing performance.

At TL 20+, the distinction between tunable and X-ray lasers becomes irrelevant, as lasers are now tunable down to X-ray wavelengths.

X-Ray Lasers

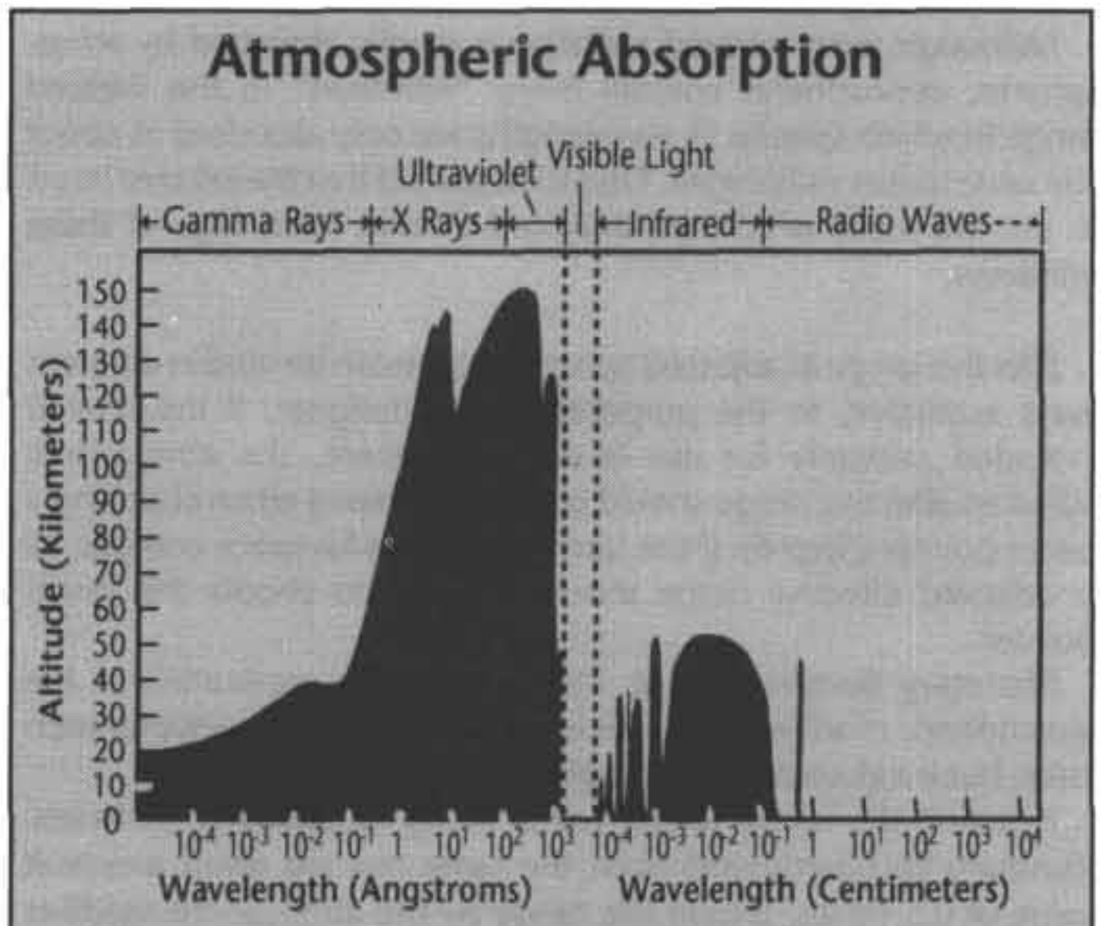
For heavy focal arrays only. Light focal arrays must use tunable table above.

TL	*Heavy Focal Modifier*	*Range Factor (Wavelength of Light)*
13	$F = (4D)^2$	100,000 (1 Å, Extreme X-ray: EXR)
14	$F = (5D)^2$	100,000 (1 Å, Extreme X-ray: EXR)
15-19	$F = (6D)^2$	100,000 (1 Å, Extreme X-ray: EXR)
20+	See Tunable Lasers, above	

If the laser is being designed for space combat use, divide the resulting effective range (kilometers) by 30,000 to get effective range in space combat hexes or range bands. Round to the nearest 0.01.

5C. Tunable Lasers

Note that tunable lasers must have their effective ranges calculated separately for the different wavelengths that they are capable of firing. This is done with the procedures above by using the correct focal modifier by tech level, but multiplying the resulting focal value F by the various wavelength range factors that are available to the weapon. Tunable lasers of a given tech level have available to them all wavelengths above them (i.e., at lower tech levels) on the table above.



This graph illustrates the problems of atmospheric absorption of laser energy by showing how far electromagnetic radiation can penetrate through the Earth's atmosphere from space. The graph shows radiation entering our atmosphere from space; the curve shows how far into the atmosphere the radiation gets before half of it is absorbed. In **Traveller**, denser atmospheres would have greater shaded area beneath the curves, while thin atmospheres would have less. Worlds with tainted atmospheres would have many more "spikes" where particular atmospheric components would absorb specific wavelengths. Studying this graph explains why our eyes see in the wavelengths that they do, as well as why radio works so well for us. Bear in mind that even where the graph seems to show complete transparency, such as in the visible bands, our atmosphere is not really transparent. Think of clouds, rainstorms, mist, haze, snow, and fog, which all increase the average absorption of our atmosphere.



5D. Atmospheric Performance

All laser energy is absorbed by planetary atmospheres to some extent, but this is especially the case with laser wavelengths shorter than visible light, i.e., ultraviolet and X-ray lasers. The effective range defined above is the laser's effective range in vacuum: in space or on the surface of airless worlds.

When the laser is to be used within atmospheres, the following modifications must be made to effective range. Although theoretically a laser might be rated for its performance in all potential atmospheres, in practice a laser need only be rated for the environment for which it is primarily intended, for example the atmosphere of the world on which it was designed, or in vacuum for a starship laser.

Atmospheric Range Modifiers

Atmosphere (UWP Code)	*Visible and Infrared* (Range Factors 3 and 20)*	*Ultraviolet, X Rays, and Beyond (Range Factors 33 and above)*
Vacuum (0)	1.0	1.0
Trace (1)	1.0	0.9
Very Thin (2, 3)	0.5	0.1
Thin (4, 5)	0.2	0.02
Standard (6, 7)	0.1	0.01
Dense (8, 9)	0.05	0.005
Exotic+ (A+)	0.01	0.001

*Although most infrared radiation is readily absorbed by atmospheres, atmospheres contain many "windows" in the infrared range in which specific IR wavelengths are only absorbed at about the same rate as visible light. Thus it is assumed that the infrared lasers in use are those which are designed to take advantage of these windows.

Effective range as adjusted by atmosphere can be used in different ways according to the purposes of the designer. If the laser is intended primarily for use in an atmosphere, the atmosphere adjusted effective range should probably be used when choosing a beam pointer (Step 6). If the laser is intended for space combat, its unadjusted effective range should be used to choose the beam pointer.

Planetary Bombardment: This is a specific application of the atmospheric modifier rules. This is not calculated in advance for each laser, but is calculated separately each time it is done.

First find the range to the world being bombarded, in hexes. Planetary bombardments from the same hex are given a default value of 0.5 hexes. Divide this range by the atmosphere modifier appropriate to the atmosphere type and laser wavelength from the table above. The result is the equivalent range in hexes to a target on the planetary surface, called the *atmosphere adjusted range.* Use this range to find the proper range band of the laser's rated range performance. If the range falls between two range bands, use the higher band. This gives the laser's damage performance. Difficulty of the firing task is still calculated according to the actual range.

If the adjusted range falls beyond the laser's extreme range, use its effective range along with the procedure defined in Step 7B below to determine if it has any damage performance left at that range.

If the target is an aircraft or spacecraft flying through the atmosphere at high altitude, cut this final atmosphere adjusted range in half.

6. DEFINE SHORT RANGE

6A. Large (Non-Hand-Held) Lasers

The beam pointer represents the integral fire control capabilities installed on the laser mount.

Select a beam pointer from the Fire Control chapter (Section 14). Note that range is given in kilometers and 30,000-km hexes/range bands for space combat. The listed range in km/hexes of the selected beam pointer will be the laser's short range for purposes of combat. Whenever possible, the beam pointer range should be equal to the laser's effective range to take full advantage of the laser's range-intensity performance.

When a laser has its performance adjusted for atmosphere, remember that its atmosphere-adjusted ranges are for purposes of damage calculation only. Its short range (and medium, long, and extreme ranges which are derived from it) based on installed beam pointer are still used for resolving hits.

6B. Small Arms (Hand-Held) Lasers

Small arms lasers include laser rifles, carbines, and pistols, as well as larger lasers used as man-portable infantry heavy weapons.

For small arms lasers, which are not fitted with beam pointers, short range is based on human aiming limits. These are calculated as follows.

Short Range (meters) = 200 × Configuration Multiplier

Configuration	*Cm*
One-Handed*	0.4
Two-Handed*	1.3
Optic Sights (TL 7)**	1.05
Optic Sights (TL 8)**	1.1
Optic Sights (TL 9+)**	1.15

*One-handed refers to pistols, fitted with only a pistol grip. Two-handed refers to weapons specifically designed to be fired with two hands, and thus include a stock instead of simply a pistol grip.

Some weapons are intended to be used exclusively from a tripod or vehicle pintle mount, and are only fitted with pistol grips. However, these weapons are considered to be two-handed for determining range.

**Mass and weight for these items is recorded in Step 10.

Round results of 299 meters to 300.

If two configuration descriptions apply to the same weapon, use both. Even if an optic sight is fitted to a two-handed weapon, the basic (iron sight) range should be calculated as well. This is necessary because an advanced sight (see the Small Arms Design chapter, page 97) might be installed later, and the advanced sight enhancement is applied to the basic range, not the optic sight range. The maximum short range for any small arm, after all modifications for optic or advanced sights, bipod and tripod effects, is always 300 meters.

Compare the short range derived above to the small arms laser's effective range, and use the shorter of the two for the laser's short range.



7. LASER COMBAT RATINGS

A laser's combat performance is rated in three areas: range performance, damage at those ranges, and penetration ratings at those ranges.

7A. Combat Range Bands

All combat ranges are based on the laser's short range, established in Step 6. For lasers intended for planetary combat, these ranges should be expressed in kilometers; for spacecraft lasers, these ranges should be expressed in starship combat hexes/range bands in whole numbers.

Medium range = Short range × 2
Long range = Short range × 4
Extreme range = Short range × 8

7B. Damage Value

Define the laser's damage characteristics at its short, medium, long, and extreme range bands.

Lasers do damage to enemy nonpersonnel targets (i.e., vehicles, structures, spacecraft) based on their *damage value* (DV). Damage value is calculated as follows (round to nearest whole number):

$$DV = 2.5\sqrt{I}$$

where I is the weapon's *intensity* (units for intensity are Mj per square centimeter) at that range. Intensity is derived as follows.

For each of the four range bands, divide that range band's actual range (from 7A, in kilometers or hexes, as appropriate to the type of weapon) by the laser's effective range (in the same units) from Step 5. Round this result to the nearest 0.01, but *always* treat results of less than 1 as 1. This figure is used as R in the next formula:

$$I = DE\ (1+R^2)$$

where
DE is discharge energy from Step 4 above.

7C. Penetration Rating

Lasers penetrate enemy armor based on their *penetration value*. Penetration value is not derived separately, but is calculated from the laser's DV by using the laser's *penetration rating* (PR). DV÷PR = penetration value; penetration value × PR = DV. Penetration rating is calculated as follows.

Take the intensity (I) as calculated in 7B above, and apply the formula

$$(\sqrt{I}) \times 0.8 = IPR$$

IPR is the *inverse penetration rating*. Round IPR decimals as follows: 0.5 and above rounds up to the next whole number; less than 0.5 rounds down. Now take the inverse of the IPR by dividing 1 by it. This is the laser's penetration rating, PR. Leave this number expressed as the fraction, $^1/_{IPR}$. For example, an IPR of 3.49 rounds to IPR of 3 and the PR is expressed as $^1/_3$. Intensities that yield IPRs of less than 0.5 (an intensity of 0.390625 Mj per cm^2 yields an IPR of 0.5, which rounds up to 1) have a final penetration rating of *Nil*, meaning that they have no penetrative capability. This is because a laser's damage value and penetration capacity both decrease at the same rate, and that at less than 0.39 Mj there is not sufficient damage value in the shot to allow penetration (i.e., 1 point of damage value required by a penetration rating of 1 to penetrate an armor value of 1).

Note: For purposes of target penetration, lasers are only affected by personal armor of a rigid nature. Rigid armor is defined in the Personal Armor section (Section 2), and consists of metallic and hard ceramic armor. Non-rigid, or flexible personal armor (leather, ballistic cloth, and ballistic weave) is always treated as no armor by laser hits. Metal chain mail, because of its porous nature, is also treated as no armor. Metallic or ceramic insert plates added to flexible armor are treated as rigid armor.

"Natural" armor on animals, such as tough skin or bony plates, is also treated as no armor by lasers. However, natural cover used by personnel, such as trees, fences, stone walls, dirt berms, etc., are not ignored by lasers, but must be penetrated before personnel sheltering behind them may be hit.

7D. Personnel Damage Dice

The damage that a laser does to a personnel target (which includes animals) is calculated differently from the damage value calculated in 7B above. Damage done to personnel is based on damage dice, which is also based on the laser's intensity at the range in question according to the formula

$$50\sqrt{Mj}$$

For small arms lasers, particularly those with penetration ratings of Nil, the number of damage dice can be calculated in advance. However, because damage capacity lost when penetrating armor is calculated in terms of *damage value* and not *damage dice*, it is best to calculate damage dice versus a personnel target after penetration has occurred. Multiply the remaining damage value by 20, and the result is the number of damage dice done to the target (DV × 20 = damage dice).

8. POWER SOURCE AND RATE OF FIRE

Most lasers are powered by electrical energy supplied by a vehicle power plant and stored in a form of capacitor until the weapon is fired. However, at TL 11 and above, lasers can also be supplied by stored chemical energy. Stored chemical energy is popular for use with small arms lasers because the chemical laser cartridges (CLCs) are easier to use than cumbersome rechargeable power packs.

There is a drawback with CLCs, however, which makes them less desirable for use in spacecraft, which is the fact that the chemicals contained in the cartridges and produced in the firing process are highly corrosive, flammable, and poisonous. This presents a great threat to any craft which must dispose of these byproducts or which sustains an ammunition hit. Because spacecraft or vehicles intended for use in vacuum or hostile atmospheres cannot flush and replenish their atmospheres from outside sources of oxygen, CLCs are generally not chosen for their lasers.

8A. Direct Electrical Power

Direct electrical power requires the installation of a homopolar generator (HPG), which is a type of capacitor in the form of an electro-mechanical flywheel. The HPG must be of sufficient size to store the laser's one-shot input energy (IE) as defined in Step 4. Calculate the volume of HPG needed by multiplying the laser's input energy in Mj by the value on the HPG table in the Power Production chapter (Section 8).

In large vehicle- and ship-mounted lasers, the HPG is added into the total mass and volume of the entire laser. For small arms lasers, the HPG is carried separately in a backpack or beltpack.



Rate of Fire: Define the laser's rate of fire (ROF). This rate will be expressed differently depending upon whether the laser is intended for space combat or ground combat, as space combat turns are 30 minutes in length, while ground combat turns are five seconds. Rate of fire will define the amount of power input that the weapon needs, and may require an increase in the volume, mass, and price of the focal array.

Rate of fire for a direct electrical input (HPG) laser is limited by available input power, and structural qualities of the laser's focal array. The HPG itself does not limit the ROF, regardless of tech level. The size of the HPG is the same regardless of the laser's rate of fire, as it must only store enough energy for one shot at a time, regardless of how often those shots are fired.

Space Combat ROF: All space combat lasers must have a rate of fire of at least 10 shots per 30-minute turn, or one shot every three minutes. This is equivalent to a ground combat ROF of 1/36, one shot every 36 turns. When converting space combat ROFs to ground combat, divide the ROF per 30 minutes by 360. If this number is greater than 1, round any fractions *down*. This is the number of shots per five-second combat turn.

If it is less than 1, take the inverse (i.e., divide 1 by that number), and round fractions *up*. The result is the number of five-second combat turns required for each shot. Express this number as a fraction, i.e., one shot every 5 turns is 1/5, one shot every 36 turns is 1/36, etc.

For purposes of space combat, lasers gain to-hit benefits for higher ROFs as shown in the table below.

Lasers process a tremendous amount of energy each time they fire, and this energy creates thermal effects throughout the focal array. These thermal effects result in minute deformations of the focal array itself, which affect the accuracy of later shots. Enough of a thermal effect will actually damage the laser. At space combat ROFs of 200 and higher, the focal array of a direct electrical input laser must be increased in size to allow for active and passive measures of heat dispersion as shown on the Rate of Fire Benefits in Space Combat table. This focal array multiplier is applied to the FA volume, from which mass and price are then derived.

Rate of Fire Benefits in Space Combat

Space Combat ROF (Shots per 30-minute turn)	*Equivalent Benefit (In Diff Mods to Fire Task)*	*Ground Combat ROF (Shots per 5-second turn)*	*FA Mult*
10	None	1/36	1
50	–1 difficulty levels	1/8	1*
100	–2 difficulty levels	1/4	1*
200	–3 difficulty levels	1/2	2
400	–4 difficulty levels	1	4
800	–5 difficulty levels	2	8

*There is no penalty for firing a laser at one of these higher power levels if the laser is mounted in a vehicle or starship which is designed from the outset to provide sufficient power for the higher ROF (50 or 100 shots). However, lasers which were not installed with the higher power levels may fire at these levels if sufficient power is made available by diverting it from other systems. Unfortunately, because of the extra strain this places on power couplings, HPGs, etc., a Ship's Engineering task must be rolled each turn this is attempted. The difficulty level is Difficult if the ROF is raised one step (from 10 to 50 or from 50 to 100) over the installed power allocation, or Formidable if raised two steps (10 to 100). Failure at this roll indicates a System Reset result (see the **TNE** Space Combat chapter, or **Brilliant Lances: Traveller Starship Combat**), with the additional penalty that the laser may not fire on the current turn. Catastrophic Failure indicates more severe damage. Roll 1D10: 1-5 indicates a Degraded Performance result in addition to System Reset; 6-10 indicates a major hit on the laser.

Lasers may only fire at the 200+ ROFs if they are designed as such with beefed-up focal arrays.

Ground Combat ROF: To be really useful, ground combat lasers should have an ROF of at least one shot per turn. Rate of fire for a direct electrical input (HPG) laser is limited by available input power, and structural qualities of the laser's focal array. The HPG itself does not limit the ROF, regardless of tech level.

Like space lasers, ground combat direct electrical lasers need to have their focal arrays beefed up in order to fire at high ROFs.

Rate of Fire Benefits in Ground Combat

Ground Combat ROF (Shots per 5-second turn)	*FA Multiplier*
1/2	2
1	4
2	8
3	12
4	16
5	20
15 (Automatic: 3-round bursts)	60
25 (Automatic: 5-round bursts)	100
50 (Automatic: 10-round bursts)	200
250 (Automatic: 50-round bursts)	1000

Note: Lasers with an ROF of 15+ count as automatic weapons for purposes of firing at aircraft

Power Input: Power input in megawatts (MW) is calculated differently for space combat and planetary combat lasers. Although they are calculated differently, space and planetary combat power input values are absolute values, as they are both based on MW input per second.

Space Combat Lasers: Multiply ROF times the laser's input energy (IE) as determined in Step 4. This is the total number of megajoules needed over the course of a 30-minute turn. Divide this result by 1800 to find the MW of power that must be allocated to operate the weapon.

Planetary Combat Lasers: Multiply ROF times the laser's input energy (IE) as determined in Step 4. This is the total number of megajoules consumed by the weapon each five-second turn. Divide this result by 5 to find the MW of power that must be allocated to operate the weapon.

Direct electrical power input requirements are usually met by power plants in vehicles and spacecraft, but are typically met by battery packs or fuel cells in the case of small arms lasers. These battery packs or fuel cells are carried in the same backpack as the homopolar generator.



8B. Chemical Laser Cartridge

Powering a laser by chemical laser cartridge (CLC) allows the laser to function in the fashion of a conventional firearm or artillery piece, in that each shot consumes an ammunition cartridge, whose empty casing is then ejected allowing the laser to be reloaded and fired again.

A chemical laser cartridge is quite different from the similarly named cartridges used by the explosive power generators (EPGs) in the Power Production chapter (Section 8). The chemical reactions generated by CLCs are not efficient for producing electrical energy. Rather, they produce a population inversion of energized atoms and/or molecules which can be manipulated to release photons of a particular wavelength which are focused into a laser beam.

Each CLC contains the full input energy required for the shot as calculated in Step 4 above. The chart below shows the amount of Mj per kilogram that can be chemically stored for release as laser energy, based on tech level. To calculate the mass of chemicals needed, divide the IE (in Mj) from Step 4 by the number on the chart, and the result is the required amount of chemicals in kilograms.

TL	*Mj per kg*
11-12	1
13-15	2
16-19	3
20+	4

Once the required mass of chemicals is known, the chemical cartridge itself must be designed. The simplest way to do this is to design a cylindrical cartridge three times as long as its diameter. CLC chemicals have a volume of 0.1 liters per kilogram (10 kg per liter; other units may be more convenient for very large or very small lasers; CLC chemicals also have a volume of 0.1 cubic meters per tonne [10 tonnes per cubic meter] or 0.1 cubic centimeters per gram [10 grams per cc]). Cartridge price is Cr30 per Mj of input energy.

To find the dimensions of the 3×D cartridge, use the equation:

$$0.376 \times \sqrt[3]{\text{Volume}} = \text{radius of cartridge}$$

Cartridge diameter is 2 × radius, and cartridge length is 6 × radius. Designers will frequently prefer to change the diameter into a round number and recalculate the cartridge length to make up for the difference, using the formula:

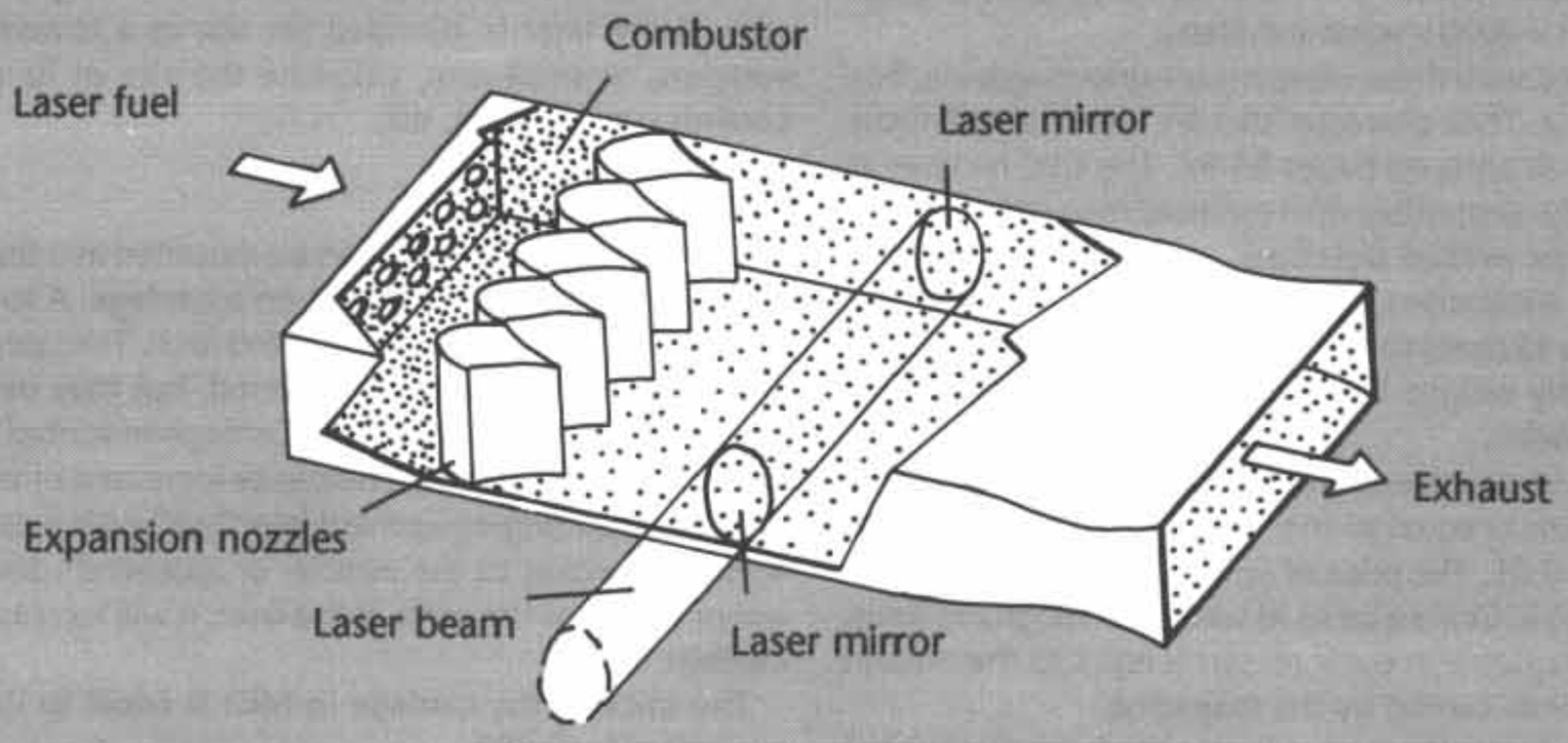
$$\pi r^2 \times \text{length} = \text{cartridge volume, where } \pi = 3.1416$$

Rate of Fire: Rate of fire is defined as above for direct electrical input lasers.

Rate of fire with CLCs is limited by the weapon's purge cycle, the rate at which it burns and disposes of the CLC chemicals. CLC lasers create energy by releasing the chemical energy stored in the cartridges. These chemicals are combined in a controlled fashion in the laser's *combustor*. It is in the combustor, filled with energetic atoms and/or molecules, that the laser beam is generated. As the energy is withdrawn from these molecules in the form of energetic photons, the used chemical fuel is removed by the *evacuator* to prepare for the next shot. Depending upon the environment, this highly caustic, highly poisonous spent fuel is either stored in a cannister or expelled out of the laser. This evacuation cycle is combined with the cooling cycle for greater efficiency.

Unlike direct electrical lasers, ROFs above a certain level do not require the increase in size of the focal array. Instead, the volume of the combustor/evacuator system yields the maximum rate of fire.

All CLCs have a base combustor/evacuator volume of 0.055 cubic meters (55 liters) per Mj of input energy (IE, defined in Step 4) per



High-Power Chemical Laser

Chemical fuel extracted from the cartridge is burned in the combustor at left, and its pressure causes it to pass through the expansion nozzles into the laser-generation cavity. By firing a tiny starting pulse of photons, energy from the hot gas is extracted in the form of photons of the same wavelength, which are then bounced back and forth between the mirrors, stimulating more photon emission from the gas. The pressure of the hot gas causes a continuous flow from the combustor to the exhaust. But because the pressure in the combustor is often less than 1 atmosphere, a vacuum evacuator must be installed at the exhaust unless the laser is being vented directly into space. The laser is fired to the lower left.



CLC cartridge. This yields an ROF of one shot per second (five shots per combat turn). Volumes greater or less than this amount yield correspondingly higher or lower rates of fire.

Divide the actual volume of the combustor/evacuator by the base volume (0.055 m³/55 liters × IE), and multiply the result by 5. This is the number of shots per combat turn that can be fired. Combustor/evacuators mass 1 tonne per cubic meter (1 kg per liter) and cost Cr0.5 per cubic meter (Cr500 per liter). This includes weight and volume for a closed-cycle cooling system. The cooling system requires overhaul and recharging of fluids after the equivalent of 1000 turns of maximum ROF fire. This recharging costs Cr100 times the cooling system's displacement in liters.

CLC Laser Ammunition Feed: CLC lasers require an ammunition feed system. For small arms lasers (light focal arrays), this is a receiver-magazine assembly similar to those used by normal slug-firing small arms. For non-man-portable lasers (heavy focal arrays), the feed system is an electrical action with attached autoloader. Some heavy weapons may fall between this range; although they are equipped with light focal arrays, it is more convenient to equip them with heavy autoloaders.

The maximum CLC cartridge feed rate is five cartridges per five-second turn. This is sufficient for full semiautomatic fire. In order to achieve automatic ROF levels, multiple laser pulses are extracted from a single CLC cartridge. Burst size can be 3, 5, or 10, depending upon the amount of energy stored in the cartridge. Simply design cartridges with sufficient input energy for the full number of shots in the burst. Be sure to note in the weapon's listing that only one cartridge is fired per automatic *burst*, rather than the usual one cartridge per automatic *shot*.

Small Arms with Magazines: Each weapon requires a receiver, which extracts the CLC from the magazine, holds the cartridge while its contents are explosively combined in the combustor, and then ejects the spent round to make space for a new one. The receiver's volume is equal to 80 times the volume of the CLC cartridge, weighs 1 kilogram per liter (1 gram per cubic centimeter), and has a cost in credits equal to its volume in liters multiplied by 2000 (Cr = 2000 × volume in liters).

Magazine types used with these weapons are grip magazine, box magazine, and cassette. Their characteristics are identical with those described for CPR small arms on pages 96-97. The CLC receiver as described above is fully compatible with the listed magazine descriptions, and CLCs are not necked cartridges.

Large Lasers with Autoloaders: The volume of the action and autoloader is equal to 35 times the volume of a single CLC round for the laser. The assembly weighs 1 tonne per cubic meter and costs MCr0.01 per cubic meter.

The magazine may be any size desired by the designer. The weight of the empty magazine is equal to the weight of all of the rounds carried multiplied by 0.01. The price of an empty magazine (sometimes called a hopper) in Cr is equal to its weight in kilograms times 5. The volume of a magazine in cubic meters is equal to the mass in tonnes ÷ 5 of the rounds carried by the magazine.

Reload time, in five-second turns, is equal to the loaded weight of a magazine in tonnes multiplied by 10, rounding fractions up.

Wavelength Tuning of CLC Lasers: CLC lasers may have tunable wavelengths as discussed above in Steps 1 and 5. However, because the wavelength of a CLC's beam is controlled by the specific chemical reaction taking place in its combustor, it must have a combustor which is modified to allow for various chemical reactions, and the laser must also be supplied with a variety of ammunition which will generate a variety of wavelengths. A tunable combustor/evacuator assembly merely costs twice the normal price (Cr1 per cubic meter/Cr1000 per liter) listed above. CLC ammunition for specific wavelengths has no difference in price, but any players or military force must take steps to ensure that they are supplied with the correct ammunition for their needs. In addition, referees may stipulate that some worlds have specific compounds in their atmospheres that absorb common laser wavelengths that are otherwise normally effective in that atmosphere type (this should especially be the case in tainted atmospheres). As with all tunable lasers, tunable CLCs must have their effective ranges calculated separately for the different wavelengths that it fires.

9. CREW

Any vehicle- or spacecraft-mounted weapon must be designated as crewed or uncrewed. A laser can only be left uncrewed if the vehicle in which it is installed is equipped with one or more master fire directors (MFDs) which will be used to control it remotely. In the event of the destruction of all of a vehicle's MFDs, an uncrewed laser may not be fired. A crewed laser may also be fired remotely by an MFD, but can also be fired under "local control" by the gunner if the MFD cannot be used to fire the laser.

Small arms or heavy weapons lasers do not need workstations, but ground turret and carriage-mounted lasers do, unless they are wired into a ground-based MFD. If it is to be crewed, the weapon must have a gunner's workstation installed with the characteristics of a normal workstation as presented in the Controls chapter (Section 4).

Heavy weapons lasers require a crew of one, although additional crew may be required to help carry the weapon and its mount, and (in the case of CLC lasers) to assist with ammunition. On average, troops can carry 72 kg each at the burdened rate, but this must also include all of their other equipment.

10. LASER FURNISHINGS AND SUPPORTING HARDWARE

If the laser is to be mounted aboard a starship or vehicle, skip this step. If the laser is intended for use as a towed weapon, heavy weapon, or small arm, calculate the size of its carriage, mount, cooling system, stock, etc.

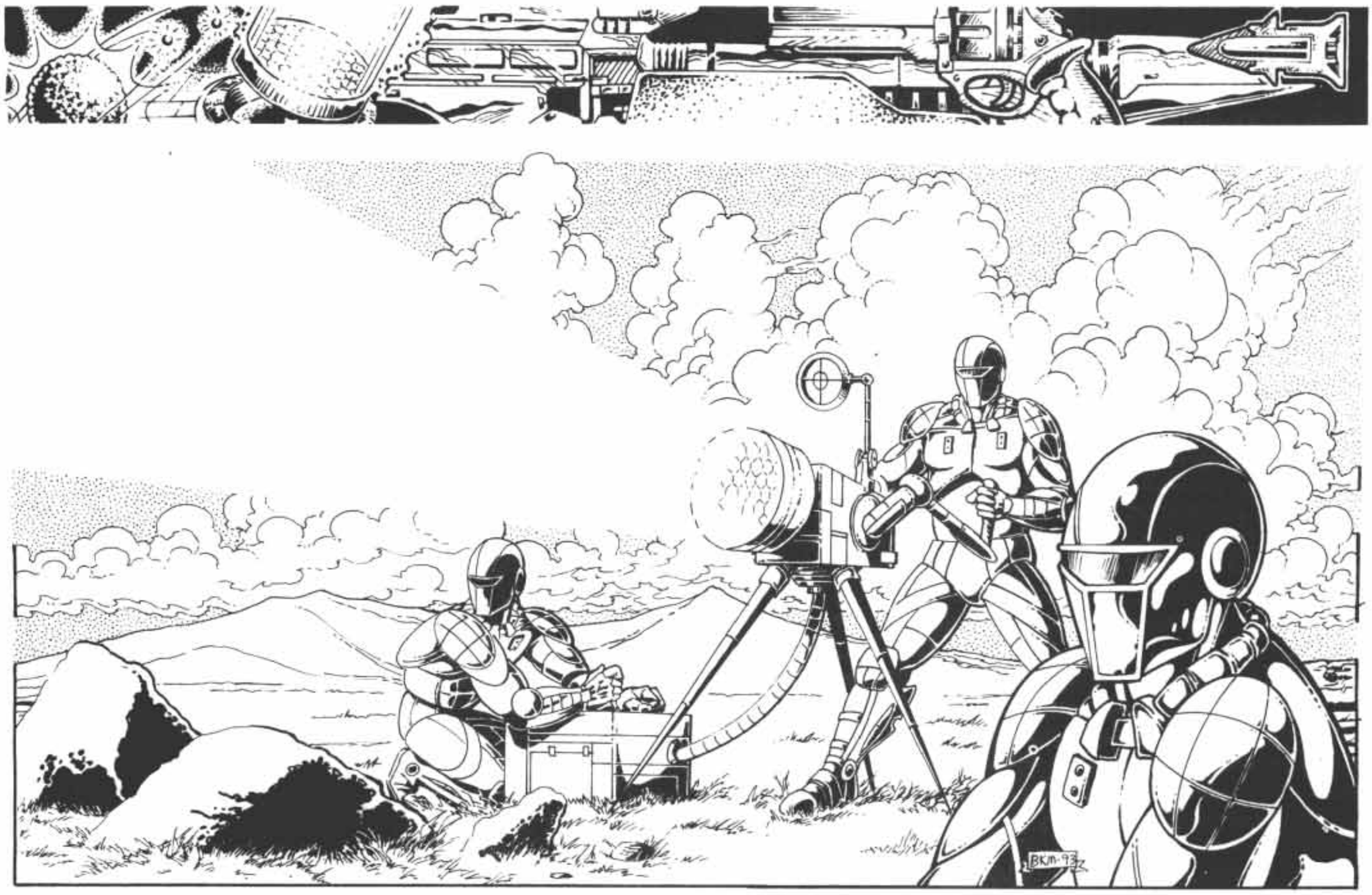
10A. Carriage

A heavy focal array laser can be mounted as a towed or otherwise movable weapon by placing it on a carriage. A towed carriage has the same mass as the laser mounted on it. The laser must include an HPG if it is direct electrical-powered, but may be plugged in to a power source at its destination. Carriage-mounted lasers have an all-around armor value of 1. This can be increased by enclosing the laser and its supporting equipment in a "hull" with a certain thickness of armor according to the vehicle- or spacecraft-design rules. As this armor increases the mass of the laser, it will increase the mass of the carriage as well.

The price of the carriage in MCr is equal to its mass in tonnes multiplied by 0.002.

10B. Mounts

Very large or even normal-sized small arms lasers (light focal arrays) may be provided with tripods or bipods for use as heavy weapons. When fired from a bipod, short range is increased by 30% (multiply by 1.3); when fired from a tripod, short range is doubled (multiply by 2). However, short range may never be modified to greater than 300 meters.



Bipods weigh 0.1 times the loaded weight of the laser; their price in credits is 50 plus the bipod's weight in kilograms times 10 (50 + [10 × weight]). The weight of a bipod is included in the final weight of a laser, but does not count against its volume.

The weight of a tripod is equal to half the fully loaded weight of the laser times 0.5; the price in credits is 100 plus the tripod's weight in kilograms times 10 (100 + [10 × weight]). The weight of a tripod is not included in the final weight of a laser.

10C. Small Arms Cooling Systems

CLC-powered lasers have their cooling systems integral to their combustor/evacuator assemblies. Only light focal array lasers powered by direct electrical input need to undergo this step.

Take the per-shot input energy (IE) calculated in Step 4 and multiply it by 10 (IE x 10). The result is the volume of the closed-cycle cooling system in liters. At least 50% of this system must be placed in the weapon itself, and at least 20% must go into the backpack. The remaining 30% may be placed in either the weapon or backpack.

The cooling system masses 2 kilograms per liter (2 grams per cubic centimeter) and costs 1700 credits per liter.

The cooling system requires overhaul and recharging of fluids after the equivalent of 1000 turns of maximum ROF fire. This recharging costs Cr100 times the cooling system's displacement in liters.

10D. Small Arms Body and Stocks

Add together the volume of the components that will be fitted into the weapon itself, separate from its backpack. For direct electrical weapons, this is focal array and cooling system; for CLC lasers, this is focal array, combustor/evacuator, and receiver (magazines are not part of the "empty" volume).

Weapon Body: Multiply this volume (in liters or cubic centimeters, whichever unit the designer is using) by 0.05. This is the volume of the weapon's structural body, which encloses and protects the weapon's components. Because lasers are finely calibrated and relatively fragile weapons, they must be "ruggedized" if they are to be fitted with additional items such as attached grenade launchers or rifle grenade adapters. Double the structural body above for ruggedization (to 0.1 × volume).

These weapons are still too fragile to function in combat as melee weapons, and will not function after being used as clubs. If a designer wishes for a laser to be fitted with a bayonet lug for use as a melee weapon, the body volume must be doubled again (four times the basic volume or 0.2 × volume).

Mass of the body is 1 kilogram per liter (1 gram per cubic centimeter), and price is 100 credits per liter (0.1 credits per cubic centimeter).

Weapon Length: To find the length of the weapon, take its total volume including its body, and convert into cubic centimeters. (For those not already working in cubic centimeters, 1 liter = 1000 cubic centimeters, 1 cubic meter = 1,000,000 cubic centimeters.)

Take the cube root of the volume, and multiply the result by the configuration multiplier. Direct electrical input and CLC lasers have different configurations, with CLCs being shorter, bulkier, and more robust looking, and direct electrical lasers being lighter, longer, and finer-lined.

Type	*Length Multiplier*
Direct Electrical Input	4.3
Chemical Laser	3.4

The result is the weapon's basic length in centimeters before stocks and optional items below are added.

Additional features may be added to the weapon, and may increase its length.



Bayonet Lugs: Bayonet lugs are simple standardized brackets at the end of the weapon barrel. A bayonet lug costs nothing, has negligible mass, and adds no length to the weapon.

To be most effective, a bayonet must be mounted on a well-balanced weapon with sufficient length to allow it to be used as a spear point. As a result, only weapons with a bulk (see 11F below) of 4 or more may profitably benefit from a bayonet lug. Shorter weapons may have them but the mounted bayonet counts as a short range (instead of long range) melee weapon and suffers a +1 Difficulty modifier for its chance to hit in armed melee combat. The laser's structural body must be ruggedized to the 4 × level for a bayonet lug.

Grenade Adapter: For obvious reasons, lasers may not fire standard shot trap rifle grenades. They may, however, fire RAM (Rocket Assisted Multipurpose) rifle grenades (RAMRiGs). A grenade adapter allows the firing of RAMRiGs, adds 5 cm to the length of the weapon and costs Cr50. The laser's structural body must be ruggedized to the 2 × level for a grenade adapter.

Attached Grenade Launcher: Lasers may have attached (underslung) grenade launchers added to them. See the Launchers chapter for details on their design. The launcher may not be greater than one half the length of the laser. The laser's structural body must be ruggedized to the 2 × level for an attached grenade launcher.

Stocks: If the weapon's length (exclusive of RAM grenade adapters) is greater than 40 centimeters, it is presumed to already be configured as a two-handed weapon, and need only be fitted with a bullpup stock from the table below. If shorter, it must be fitted with a stock to function as a two-handed weapon to gain the range benefits in Step 6B above. If left as a one-handed weapon, it must be fitted with a pistol grip.

The weapon's final length is its base length derived above plus the length of any stocks fitted, plus the length added by a rifle grenade adapter (if any).

TL	*Type*	*Length (cm)*	*Mass (kg)*	*Credits*
4	Wood pistol grip	0	0.2	5
4	Wooden stock	25	1	25
4	Carbine stock	25	0.7	20
5	Hollow pistol grip	0	0.1	25
6	Folding stock	5/25	0.5	50
7	Plastic stock	25	0.5	30
7	Bullpup	5	0.1	10

10E. Sights

Because light focal arrays may not be fitted with beam pointers, they must be fitted with either small arms sights, or sometimes direct fire controls for heavy weapons. For direct fire controls, see the Fire Control chapter (Section 14).

If optic sights were specified in Step 6B above, their price, volume, and mass must be added to the laser. These are mounted outside of the laser's structural body, so are specified at this point, and their volume is added to the already calculated volume. Volume of all sights listed below is one liter per kilogram.

Optic Sights

TL	*Range*	*Mass (kg)*	*Price (Cr)*
7	×1.05	0.1	150
8	×1.1	0.1	150
9	×1.15	0.1	150

For advanced sights, such as laser, telescopic, and electronic, see the Small Arms chapter, pages 97-98.

10F. Small Arms Backpacks

Small arms laser backpacks are only needed by direct electrical input lasers. They contain the full volume and mass of the HPG and power supply, plus power supply fuel if necessary, and 20-50% of the cooling system.

Total the volume of the included components, and convert the results into liters. Multiply the volume in liters by 0.3 to get the mass, in kilograms, of the backpack casing. The volume of the backpack is equal to the volume of its contents, calculated above. The casing provides an armor value of 1 to the contents, and costs 3 credits per liter of volume. Armor protection may be increased by increasing these values (doubling the casing mass and price double the armor value, and so on).

The weight and cost of the cable connecting the backpack to the weapon is subsumed in the weights and costs of those items.

11. PHYSICAL CHARACTERISTICS

Add up or bring down the above components to obtain the following total figures for the gun.

11A. Volume

In cubic meters. Add focal array volume (as adjusted by ROF), beam pointer volume, HPG or combustor/evacuator volume, CLC feed system (if any), gunner's workstation volume, carriage volume (if any), and any small arms systems.

11B. Mass

In tonnes. Add focal array mass (as adjusted by ROF), beam pointer mass, HPG or combustor/evacuator mass, CLC feed system mass (if any), gunner's workstation mass, carriage mass (if any), and any small arms systems.

11C. Price

In MCr. Add focal array price (as adjusted by ROF), beam pointer price, HPG or combustor/evacuator price, CLC feed system price (if any), gunner's workstation price, carriage price (if any), and any small arms systems.

11D. Power Requirements

In MW, if direct-electrical type. Carry down from Step 8A above. If CLC, power requirement is limited to description of the size of its ammunition and magazines from step 8B.

11E. Surface Area

Surface area of a laser for purposes of installation on a starship or vehicle only is equal to its focal area surface area as calculated in Step 4, or its bay surface area as calculated in Step 3.

11F. Bulk

For small arms lasers only, calculate the bulk by taking the length of the weapon in centimeters and dividing by 15. Drop fractions. The result is its bulk.

11G. Recoil

Lasers have no recoil.

11H. Combat Performance

Short range, medium range, long range, and extreme range in km and/or space combat hexes, plus damage values at those ranges, along with ROF, listing any –difficulty modifiers as applicable. Carry down from Steps 7 and 8C.



CHAPTER 9
Munitions

This chapter covers the variety of projectiles fired by weapons, excluding small arms projectiles. These projectiles have various functions. This chapter's design sequence will be broken into three general parts: warheads, propellant, and guidance. Warheads are dealt with first, since even the simplest projectile has a warhead, even if it is only a solid metal shot. Mass driver projectiles and gravity bombs usually consist solely of a warhead.

CPR gun projectiles have a propellant charge which is consumed in the gun itself. CPR gun projectiles which also have a small rocket for additional range are called RAP (rocket-assisted projectile) ammunition. If a solid-fuel rocket motor is attached to a warhead, the warhead becomes a free-flight (FF) rocket.

If a guidance package is attached to an unpowered warhead, it becomes either a cannon-launched guided projectile (CLGP) or a guided bomb. If a guidance package is attached to a rocket-propelled warhead, it becomes a guided missile.

WARHEADS

Warheads are the business end of any munition. Designing warheads proceeds in the following order.

A. Specify Warhead Type: A number of different warhead types are available, each with its own specialized function.

1. High Explosive (HE): High explosive is probably the most common warhead in use. The warhead is hollow and filled with an explosive bursting charge and fused to detonate under a variety of conditions (impact, altitude, proximity, delay, etc.) The metallic warhead casing is often scored internally or lined with scored wire to produce the maximum number of lethal fragments.

2. Kinetic Energy Armor Piercing (KEAP): The earliest gunpowder artillery was used in siege work to batter down the enemy's walls, and so penetration of armor (stone armor in this case) has been an issue of gun design from the very beginning. The ability of a gun to penetrate metallic armor has been addressed urgently and scientifically ever since the appearance of the first ironclad warships in the mid-19th century.

In general terms, a gun's projectile penetrates armor by means of kinetic energy, and so the greater the muzzle energy, the greater the penetration of the gun, all other things being equal. All other things are seldom equal, however. A round with a smaller frontal area will penetrate more armor than a round with identical muzzle energy and a larger frontal area, as the energy of the round is concentrated on a smaller part of the armor, giving more energy per square centimeter.

This is part of the reason discarding sabot rounds have greater penetration than normal rounds. The penetrator is a subcaliber rod encased in a lightweight sabot (pronounced SAY-bow) which fills the space around the penetrator in the gun barrel. Once the round leaves the gun, the sabot falls away (hence the term *discarding* sabot) leaving the penetrator to fly on alone to the target. When it strikes, the full energy of the round is concentrated on the smaller frontal area of the penetrator.

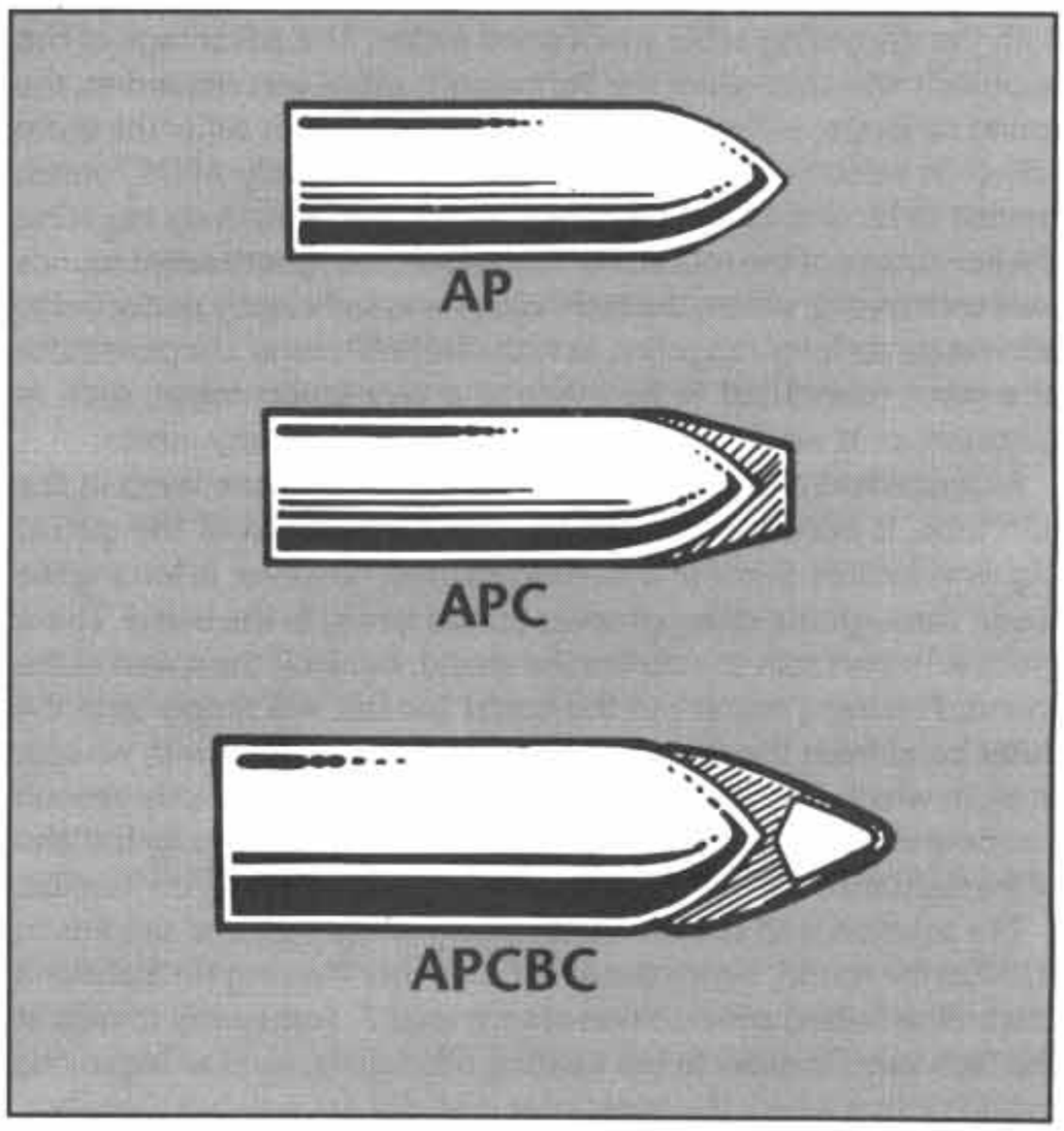
The above discussion should not leave the impression, however, that penetration is a simple matter of joules per square centimeter of armor contacted; it is not. Overall muzzle energy is a far more powerful predictor of penetration than energy per square centimeter contacted, since certain minimum energies are required to disrupt the integrity of armor of a given thickness and hardness.

For example, the German World War II 50L60 antitank gun, found on field carriages and in the turret of Panzer IIIs, could penetrate about six centimeters of armor (**Traveller** armor value of 12) at medium range (1000 meters). It had a muzzle energy of 1.63 Mj. Given a projectile diameter of 50mm, this gives it a frontal area of about 20 square centimeters, or an energy density over its front of roughly 80 kilojoules.

By contrast, the German 88L71 gun, found on field carriages and as the turret gun of the massive Tiger II, could penetrate about 19 centimeters of armor (**Traveller** armor value of 38). It had a muzzle energy of about 4.5 Mj, a front cross-sectional area of 60 square centimeters, and an energy density over its front of roughly 75 kilojoules.

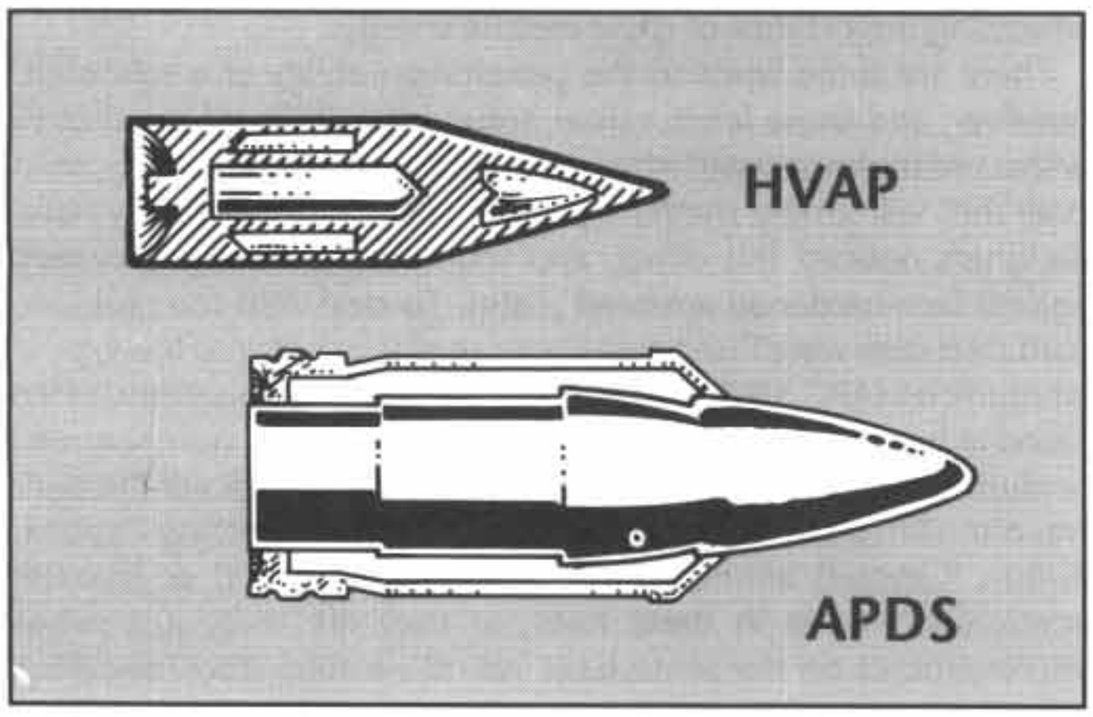
Notice that the 88L71's round penetrates almost three times as much armor but has about the same (actually slightly lower) energy density across the front than does the 50L60. Notice also that in both cases, the rounds penetrate about four centimeters of armor (8 levels of **Traveller** hard steel armor) per megajoule, illustrating the overwhelming importance of gross muzzle energy.

There are some limits to the penetration ability of a solid shot, however, and those limits center around the ability of the shot to withstand the impact with the armor. Beyond a certain velocity, solid steel shot will simply shatter against an armored plate. Early naval designers noticed this effect, and found it particularly prevalent against face-hardened armored plates. To deal with the problem, hard steel caps were fitted over the nose of the shot, and this type of ammunition (APC, for Armor Piercing Capped) is the type most often found at tech level 5. Since the best penetrating caps were rounded or blunt, a second pointed cap, to improve the ballistics of the shot, was often fitted as well, producing APCBC (Armor Piercing Capped, Ballistic Capped) ammunition.These are not treated as separate ammunition types in these rules, as they are really just minor improvements on the same basic round—a solid steel full-caliber penetrator.





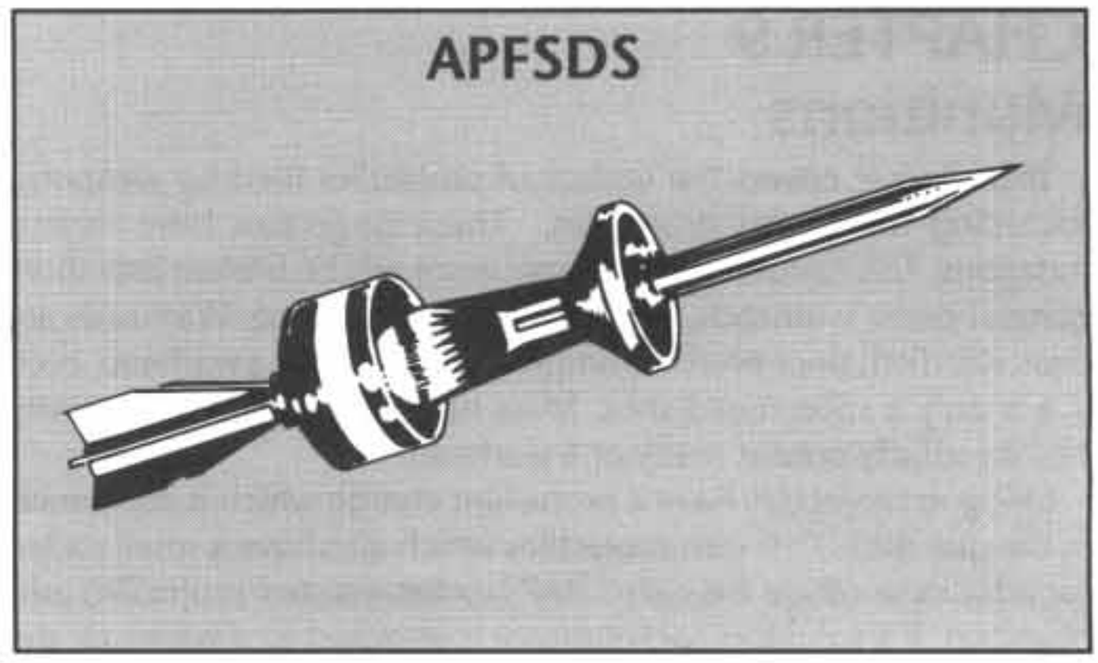
The next step forward was to concentrate the muzzle energy of the round over a smaller surface. This was accomplished by embedding a subcaliber penetrator in a lightweight outer shell. The lower weight of the round usually meant that it had higher muzzle velocity (gaining back its original muzzle energy as it traded mass for velocity) and so these rounds are usually called HVAP (for High Velocity Armor Piercing). A conventional steel penetrator would not stand up to this greater energy density, and so tougher materials had to be used, usually tungsten at tech level 5, where this ammunition appears. Difficulties in machining tungsten at that tech level make the round difficult to mass-produce, and so it was usually issued in limited numbers as a back-up round in case the weapon encountered a particularly well-armored opponent. The disadvantage of this round, aside from that mentioned above, was that its full-caliber ballistic cross-section gave it a high drag relative to its mass, and so it tended to decelerate more quickly than did a conventional round. Thus its penetration, while higher at first, declined quickly.



At almost the same time, gun designers began experimenting with the discarding sabot mentioned earlier. The advantage of this approach was that when the lightweight sabot was discarded, the round no longer suffered drag from it and so did not suffer the sharp fall-off in velocity. The disadvantage was that early APDS rounds tended to be unstable in flight and inaccurate, effectively negating the advantage of the round. For this reason, we ignore sabot rounds until tech level 6, where the technology was sufficiently perfected to allow accurate long-range fire. As with the HVAP round, the penetrator of a sabot round had to be made of a very tough metal, such as tungsten, or it would break up on impact with enemy armor.

As propellant and metallurgy allow higher pressure levels in the gun tube, it becomes possible to force a round out of the gun at higher velocities. Some of this energy is used, however, in forcing the round through the rifling grooves (called lands) in the barrel. These grooves impart spin to stabilize the round, but limit the speed of the round. Forcing a round out the barrel too fast will simply strip the outer band from the round and push it out the barrel with no spin at all, in which case it will tumble end-over-end and quickly veer off course and decelerate. This is a function not only of velocity but also of the resistance the round has to spinning, based usually on its mass.

The solution is to dispense with rifling altogether and use fins to stabilize the round, hence the APFSDS (Armor Piercing Fin Stabilized Discarding Sabot) ammunition of tech level 7. Some early rounds at this tech level, in order to use existing rifled guns, used an ingenious hybrid system where the penetrator itself did not spin but the sabot,



mounted on a free-spinning race around the penetrator, did. Since only the lightweight sabot spun, little energy was used forcing it to do so, and its low resistance to spin meant that rounds could be forced out of the tube at very high velocities.

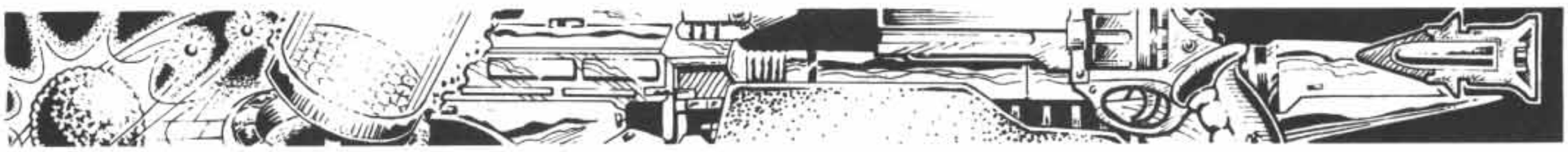
Smoothbore guns are so efficient that they enabled gunners to approach the practical limit on muzzle velocities of an explosively propelled gun, that being the velocity at which the gas expands from the explosion of the propellant. Obviously, a round cannot be pushed faster than the rate of gas expansion in the explosion, no matter how powerful the explosion, and the effective upper limit on velocity from this sort of propellant is 2000 meters per second. Contemporary smoothbore tank guns all throw their APFSDS rounds at about 1700 meters per second. (By contrast, hardly any World War II guns exceeded 1000 meters per second in muzzle velocity.)

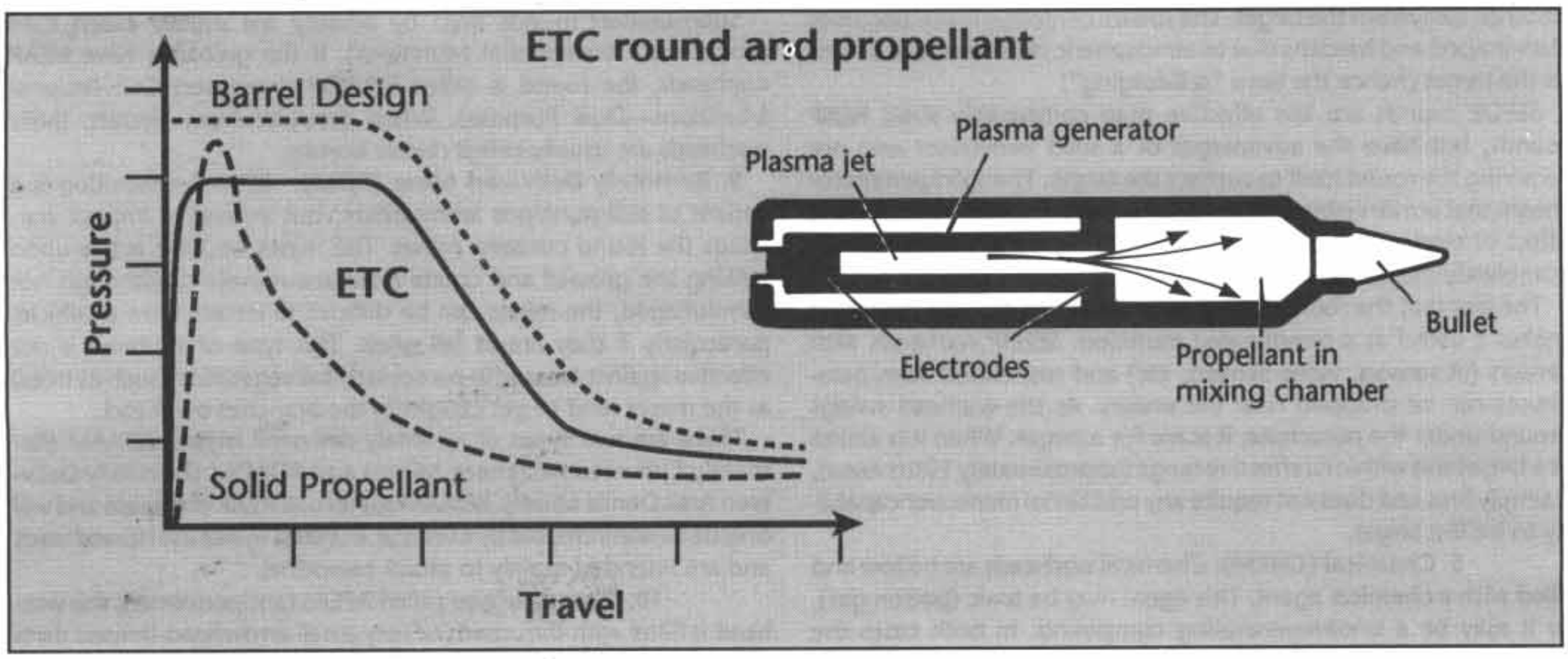
The next step was to make the penetrator more massive, but hopefully without increasing its frontal area. This was accomplished by using not only tougher metals, but heavier ones, the first being depleted uranium, producing the APFSDSDU (Armor Piercing Fin Stabilized Discarding Sabot Depleted Uranium) ammunition of tech level 8. The ammunition of the 120mm gun of the M1A1 is a good illustration of the performance possible with this approach. The depleted-uranium penetrator has a mass of a little over 6 kilograms (as opposed to the 4.5-kilogram tungsten penetrator of the Soviet 125mm gun). Its muzzle velocity of 1675 meters per second gives it a muzzle energy of slightly more than 9 megajoules. By comparison, the German 128L55 gun mounted on the Hunting Tiger of World War II threw a 28-kilogram penetrator at 930 meters per second for a whopping 12 megajoules of muzzle energy. But while the German full-caliber capped steel round would penetrate 24 centimeters of armor (2 centimeters, or 4 armor levels, per megajoule), the M1A1's round will penetrate 65 centimeters (7 centimeters, or 14 armor levels, per megajoule).

Notice that even as early as World War II (tech level 5), it was possible to mount a gun on a mobile chassis capable of generating over 10 megajoules of muzzle energy.

Having reached the ballistic limits of this type of weapon, remaining improvements come from tougher and more massive subcaliber penetrators, made from crystaliron (tech level 10), superdense (tech level 12), bonded superdense (tech level 14), and bonded coherent superdense (tech level 17).

But while the limits of explosively driven projectiles had been reached, there was still an additional step available to wring the last ounce (or gram) of performance from conventional guns, that being electrothermal propulsion or, in its most effective form, electrothermal-chemical (ETC).





An ETC round consists of a projectile exactly like that fired by a conventional powder charge and a casing behind it. This casing consists of two parts, a fuel supply and a combustion chamber. The fuel can consist of any fluid, even water, although chemically energetic working fluids work best (the difference between basic electrothermal—ET—weapons and ETC is that ETC harnesses and enhances the chemical energy of the working fluid, rather than using an inert working fluid). A powerful electric current converts the fuel in the combustion chamber to a plasma state, which escapes out the front of the casing and propels the projectile down the barrel. How is this different from a conventional round and what makes it more efficient?

Conventional barrels are designed to withstand the high pressures created by firing the explosive that propels the round out of the gun. However, a conventional explosive propellant produces a dramatic pressure spike at the breach end of the barrel, which falls off dramatically as the projectile moves down the barrel (as the volume of space behind it in the barrel increases). This means that even though most guns have reinforced breaches and thinner barrels near the muzzles, they are still capable of withstanding much more pressure toward the end of the barrel than they are called on to withstand.

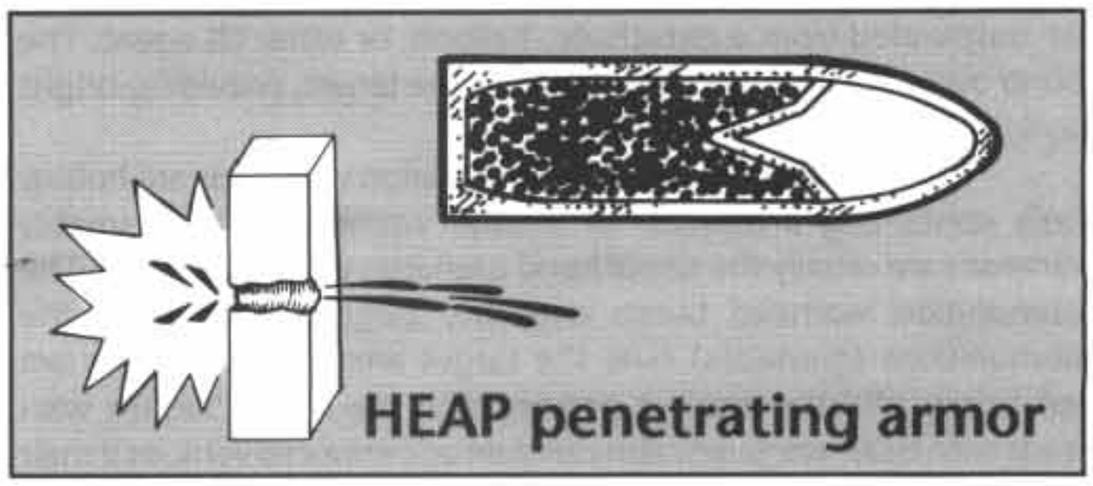
In the case of ETC, however, the fuel is not converted to plasma all at once. The initial conversion creates pressure behind the projectile similar to that found in a conventional weapon, but as the projectile moves down the barrel, the casing continues to convert fuel to plasma, maintaining the same pressure in the barrel. Electrothermal-chemical propulsion techniques allow effective doubling of muzzle energy without any increase in weight of a gun (although some additional recoil compensation is necessary). ETC ammunition is being test-fired as this is written, with some extraordinary results, and will be widely available at tech level 9.

Beyond ETC and certain dense, tough metals for penetrators, the next major step forward will be electromagnetic propulsion. But as that constitutes an entirely different class of weapon, it is discussed separately.

3. High Explosive Armor Piercing (HEAP): The disadvantage of a high-velocity solid penetrator is that it relies almost exclusively on muzzle energy to pierce armor, and high muzzle energies require massive gun systems, much more massive than can be carried by an infantryman (who usually has his hands full with his personal weapon). One answer was found in the shaped charge round, also called a hollow charge round, which relies on the energy generated by an exploding shell rather than the muzzle energy of the projectile.

A shaped charge shell has an explosive charge with a hollow cavity recessed into the front of it (hence the "hollow charge" name). The hollow cavity is shaped like an inverted cone (hence the "shaped charge" name) and lined with metal. When the round hits its target, the charge detonates and turns the metal conical liner of the charge into a stream of molten metal. The shape of the charge tends to focus the molten metal into a narrow high-speed jet directly forward. This jet of gas and molten metal is what actually penetrates the armor.

For years it was widely thought that the molten jet burned through the armor, and so these shaped charges were also often called "thermal" penetrators. Actually, the temperatures generated by the explosion, while very high, are not high enough to melt through the armor as quickly as the jet actually penetrates it. Instead, the jet penetrates by kinetic energy, the same way that a solid penetrator does. That is, if you calculate the mass of the molten metal jet and its velocity, you can determine its impact energy in the same way that we calculated muzzle energy above and determine its armor penetration. (The mechanism used to calculate its game penetration is somewhat easier than that, however.)



4. Self-Forging Penetrator (SEFOP): A SEFOP round is a cross between a KEAP and HEAP round. Like the HEAP round, the warhead gains its penetrating energy from the force of an explosion. The penetrator created by the shaped charge explosion, however, is a much more massive stream of metal, and the charge fires a farther



distance away from the target. The stream of molten metal becomes dart-shaped and hardens due to atmospheric resistance as it travels to the target (hence the term "self-forging")

SEFOP rounds are less effective than comparably sized HEAP rounds, but have the advantages of a solid penetrator and not requiring the round itself to contact the target. The solid penetrator means that armor systems treat SEFOP as a KEAP round (reducing the effect of electrostatic armor and making explosive reactive armor completely ineffective against it).

The fact that the round itself does not have to contact the target makes it useful as a remote-area munition. SEFOP warheads with sensors (IR sensors, video sensors, etc) and suspended from parachutes can be dropped near the enemy. As the warhead swings around under the parachute, it scans for a target. When it is aimed at a target and within its effective range (approximately 100 meters), it simply fires and does not require any additional maneuver capability to hit the target.

5. Chemical (CHEM): Chemical warheads are hollow and filled with a chemical agent. This agent may be toxic (poison gas), or it may be a smoke-generating compound. In both cases the characteristics of the warhead itself are identical—only the effect of the agent differs.

Most chemical rounds are base-ejection rounds. This means that the agent is released through the base of the round, either after it hits or while it is still in flight, depending on which is the most effective means of delivering the agent.

6. White Phosphorus/Incendiary Smoke (WP/IS): White phosphorus burns at very high temperatures and produces large quantities of thick, white smoke. As a result, these rounds are sometimes called WP (White Phosphorus), or "Willy Pete," and sometimes called IS (Incendiary Smoke). The round is excellent for building a quick smoke screen. The heat of the round also makes it difficult for thermal or infra-red vision devices to see past the impact point of the shell. Finally, white phosphorus also has considerable anti-personnel capabilities.

White phosphorus rounds are difficult for many vehicles to use, as ammunition is usually stored horizontally in vehicles. (It is easier for a human loader to remove rounds stored horizontally than vertically.) White phosphorus rounds must be stored vertically, however. If the round is stored horizontally, the white phosphorus filler will settle to one side of the warhead and throw it out of balance, ruining its accuracy.

7. Illumination (ILLUM): Illumination rounds contain a brightly burning flare, usually made in part from magnesium powder, suspended from a parachute, balloon, or other lift agent. The round burns brightly after it bursts over the target, providing bright daylight illumination of the battlefield.

8. Submunition (SM): Submunition warheads are hollow shells containing a number of smaller warheads. These smaller warheads are usually the size of hand grenades or slightly larger. The submunition warhead bursts over the target and scatters the submunitions (grenades) over the target area. Submunitions are particularly effective against personnel in the open. Variant warheads with HEAP warheads also can damage armored vehicles if their overhead armor is fairly thin. Submunitions are seldom effective against troops in hardened shelters with good overhead protection. Incendiary warheads allow a large area to be ignited quickly and are often used in aerial attacks on cities.

Submunition rounds fired by artillery are usually called ICM (Improved Conventional Munitions). If the grenades have HEAP warheads, the round is called ICM-DP (Improved Conventional Munitions—Dual Purpose). When dropped from aircraft, these warheads are usually called cluster bombs.

9. Remotely Delivered Mine (RDM): RDM Ammunition is a variant of submunitions ammunition, but instead of impact warheads the round contains mines. The mines become active upon striking the ground and create a surface minefield. Although not camouflaged, the mines can be difficult to detect from a vehicle, particularly if they are in tall grass. This type of warhead is not effective against areas with particularly tall vegetation (such as trees) as the mines tend to get caught in the branches overhead.

There are two types of remotely delivered mines: RDAAM (Remotely Delivered Antiarmor Mines) and RDADM (Remotely Delivered Area Denial Mines). RDAAM mines use HEAP warheads and will only detonate if crossed by a vehicle. RDADM mines use HE warheads and are intended mainly to attack personnel.

10. Flechette: Also called APERS (antipersonnel), this warhead is filled with thousands of very small arrowhead-shaped darts (flechettes). The round also has a timing fuse and a bursting charge. When fired at the enemy, the round travels part of the distance to the target and then explodes, releasing the flechettes to continue along the ballistic path of the round. The round is murderous against unprotected or lightly protected personnel, but has little penetration against armor.

11. Chaff: A chaff warhead is filled with lightweight strips of radar-reflective material designed to reduce the effectiveness of enemy radar and active EMS sensors.

B. Warhead Tech Level

The tech level of the warhead influences its performance in a variety of ways shown in later steps of the design process. In addition, certain warheads are not available until higher tech levels.

TL	*Warhead*
4	Most warheads
5	HEAP
5	WP
6	Flechette
6	Chaff
7	Submunition
7	RDM
8	SEFOP

C. Warhead Diameter

The warhead diameter is the bore of the gun (in centimeters) from which the round is fired, if it is a round of artillery ammunition. Bomb, rocket, and missile warheads may be of any diameter desired.

HE, KEAP, and HEAP warheads may be any size from 2cm up. Submunition and RDM warheads must be at least 10cm in diameter. All other warheads must be at least 4cm in diameter.

Submunitions are additionally categorized as light, medium, or heavy, depending on their warhead diameter. Light submunition warheads are less than 15cm in diameter. Medium submunition warheads are less than 20cm in diameter. Heavy submunition warheads are 20cm or more in diameter.

Aerial bombs are usually designated by mass rather than diameter, but since the rest of the design sequence relies on warhead diameter, select a warhead size that corresponds to the desired mass.



D. Damage Value

Damage value is a measure of the force generated at the point of impact by the warhead. Usually this is a measure of the explosive force of the round, and is called its concussion rating. Non-exploding rounds do damage by energy of impact. Damage is calculated differently for various types of warheads.

1. High Explosive: HE rounds do damage by the concussion of the explosion of their bursting charges. The concussion value of the charge is calculated using the following formula:

$$C = Tm \times D^2$$

(Concussion equals tech modifier times diameter squared)

C: Concussion value

D: Warhead diameter in centimeters

Tm: Tech level modifier, as shown on the following chart:

TL	*Tm*
4	.075
5	.1
6	.125
7	.15
8	.175
9	.2
10+	.25

2. KEAP: Kinetic energy warheads have a damage value equal to their diameter in centimeters multiplied by 2.2. This is a constant value for use only for direct hits on personnel. It is never used vs. vehicle targets.

3. HEAP: HEAP warheads use the same formula and table as for an HE round of the same diameter, but multiply the final result by 0.66.

4. SEFOP: SEFOP warheads use the same formula and table as for an HE round of the same diameter, but multiply the final result by 0.5.

5. CHEM: All chemical warheads less than 10cm in diameter have a concussion value of 2, while all warheads 10cm or more in diameter have a concussion value of 3.

6. WP: All white phosphorus warheads less than 10cm in diameter have a concussion value of 2, while all warheads 10cm or more in diameter have a concussion value of 3.

7. Flechette: Each flechette does personnel damage equal to fragments by burst area (2D6 within primary radius, 1D6 in secondary).

8. Others: Other warhead types have no damage value.

E. Burst

Burst radius defines the area covered by the primary effects of a bursting warhead. This can be the area covered by potentially lethal fragments, chemical agents, illumination, and so on, depending on warhead type.

The formulas below give exact burst radii. To convert to the standard **Traveller** burst area figures resolved to the 10-meter grid (see page 284, basic rules), round to the nearest 10-meter increment. For example, 7 meters rounds to 5, 12 rounds to 15, 30 to 35.

1. High Explosive: The burst radius of an HE warhead is the primary burst area covered by fragments. The burst radius in meters is the square root of the warhead's concussion value multiplied by the munition multiplier, as shown below.

Munition	*Multiplier*
Gun, Grenade	7
Mortar, Rocket, Aerial Bomb	10

2. KEAP: Kinetic energy penetrators do not explode and so have no burst radius.

3. HEAP: The burst radius of a HEAP warhead is calculated with the formula for HE warheads, but the result is multiplied by 0.5.

4. SEFOP: The burst radius in meters of a SEFOP warhead is calculated using the same formula as for an HE warhead.

5. CHEM: The burst radius in meters of a chemical warhead is equal to the warhead diameter squared and divided by 8.

6. White Phosphorus: The burst radius in meters of a white-phosphorus warhead smaller than 10cm in diameter is equal to the warhead diameter multiplied by 2. The burst radius in meters of a warhead 10cm or greater in diameter is equal to the warhead diameter multiplied by 3.

7. ILLUM: The burst radius in meters of an ILLUM warhead is equal to the warhead diameter in centimeters multiplied by a tech level modifier and the result squared.

$$B = (D \times Tm)^2$$

D: Warhead diameter in centimeters

Tm: Tech level modifier, as shown below.

TL	*Tm*
4-5	2.5
6-7	3
8-9	3.5
10+	4

8. Submunition: The burst radius in meters of a submunition warhead is equal to the warhead diameter in centimeters squared and divided by 4.

At tech level 9 and above, it is possible to reduce the number of submunitions and add homing systems to the individual bomblets. Submunition rounds with homing bomblets have only half the burst radius of a regular submunition round. (Burst radius in meters is equal to the warhead diameter squared and divided by 8). However, the designer specifies whether the homing sensors are set for vehicles or personnel. Add 2 to the chances of a direct hit against that target type from a homing submunition. (Personnel would be hit on a roll of 1-3 instead of just 1. Vehicles would be hit on a roll of 1-7 instead of 1-5.)

9. RDM: The burst radius in meters of a remotely delivered mine warhead is equal to the warhead diameter squared and divided by 2.

10. Flechette: Unlike other rounds, flechette rounds have an elongated burst area, since the flechettes keep moving along the ballistic path of the round after it explodes. The primary burst area is the area immediately after the point at which the round explodes, while the secondary burst area is the area after that.

Because the flechettes retain the original velocity of the carrier round after it explodes, the burst area (also called danger space) of the flechettes is based on the velocity of the warhead. The calculated burst area is the length of the burst area. The width of the burst area is one-quarter of its length.



Flechette burst radius for artillery shells is calculated using the following formula:

$$B = .2R$$

B: Burst radius in meters
R: Short range in meters

Flechette burst area for rocket and missile warheads is calculated using the following formula:

$$B = .05V$$

B: Burst radius in meters
V: Average velocity in kilometers per hour

11. Chaff: The burst radius in meters of a chaff warhead is equal to the warhead diameter multiplied by a tech level modifier and the result squared.

$$B = (D \times Tm)^2$$

D: Warhead diameter in centimeters
Tm: Tech level modifier, as shown below:

TL	*Tm*
4-5	2.5
6-7	3
8-9	3.5
10+	4

Any enemy radar attempting to detect a target through a chaff cloud does so at one level of difficulty higher. For each tech level the chaff warhead is above the sensor, add one more to difficulty.

Chaff from a chaff round remains airborne in effective quantities for 1D6 combat turns.

F. Penetration

Penetration represents the ability of a warhead to punch through armor and cause damage to the systems protected by that armor. The specific penetration capability of the weapon depends on the type of ammunition being fired.

Penetration capabilities in **Traveller** are quantified in two ways: *penetration value* and *penetration rating.*

Penetration value is the total penetrative capability of a weapon or munition. It is most often used in vehicle combat, and in rating large weapons.

Penetration rating describes the relationship between the weapon's damage value and its penetration value. Penetration value = Damage value + Penetration rating. Likewise, Damage value = Penetration value × Penetration rating.

1. High Explosive: HE (High Explosive) rounds are the standard ammunition of most field guns from tech level 4 on. As they explode on contact and are designed to spread fragments in every direction, they are not effective armor penetrators, but can do some damage.

Penetration of HE rounds is a function of bore size. Multiply the bore size (in centimeters) by 1.5 and subtract 7 to determine the penetration value of the round. All HE rounds have a constant penetration value and so should have the letter "C" written after the value. Rounds with a penetration value of less than 0 are shown as "Nil." Rounds with a penetration value of 0 have that listed as their penetration value (meaning that the final penetration is the base 2D6 roll without any addition).

2. KEAP: KEAP (Kinetic Energy Armor Piercing) includes all solid penetrators which rely on muzzle energy to pierce hostile armor. Penetration value is a function of range, muzzle energy, and the type of ammunition fired.

The base penetration value of solid shot (tech level 4) ammunition at medium range is based solely on muzzle energy (in megajoules) of the gun, as shown below:

If Mj = 12+, then PV = Mj×4
If Mj < 12, then PV = Mj×5 (but never higher than 48)
If Mj < 9, then PV = Mj×6 (but never higher than 45)
If Mj < 7, then PV = Mj×7 (but never higher than 43)
If Mj < 5, then PV = Mj×8 (but P never higher than 35)
If Mj <1.5, then PV = Mj×10 (but P never higher than 12)
If Mj < 1, then PV = Mj×12 (but P never higher than 10)
If Mj < 0.5, then PV = Mj×16 (but never higher than 6)
If Mj < 0.3, then PV = Mj×22 (but never higher than 5)

For example, a gun has a muzzle energy of 4.6 Mj. Since this is less than 5 but not less than 1.5 Mj, the gun has a penetration value equal to Mj×8, or 36.8, rounded up to 37, but then reduced to 35 (the maximum PV for weapons with a muzzle energy less than 5 Mj).

At higher tech levels, specialized ammunition allows increased penetration. Multiply the penetration of the round as calculated above by the ammunition multiplier, as shown below:

Special Ammunition

TL	*Ammo*	*Multiplier*
5	HVAP	1.3
6	APDS	1.7
7	APFSDS	2.4
8	APFSDSDU	3
10	APFSDSCI	4.5
12	APFSDSSD	5
14	APFSDSBSD	6
17	APFSDSBCS	7

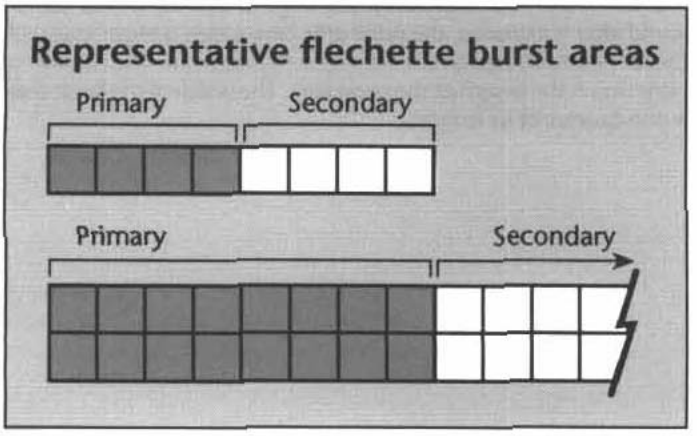
HVAP: High Velocity Armor Piercing
APDS: Armor Piercing Discarding Sabot
APFSDS: Armor Piercing Fin Stabilized Discarding Sabot
DU: Depleted Uranium
CI: Crystaliron
SD: Superdense
BSD: Bonded Superdense
BCS: Bonded Coherent Superdense

Once the medium-range penetration is known, penetration values at the other range bands can be calculated.

At short range, add 15% of the penetration value or a flat value of 10, whichever is less.

At long range, subtract 15% of the penetration value, or a flat value of 10, whichever is less.

At extreme range, subtract 45% of penetration, or a flat value of 30, whichever is less.





3. HEAP: HEAP rounds are available at TL 5 and higher. Penetration of HEAP rounds is a function of bore size and tech level. Multiply the bore size (in centimeters) by the tech level multiplier shown below and subtract 7 from the result to determine the penetration value of the round. All HEAP rounds have a constant penetration and so should have the letter "C" written after the value. Rounds with a penetration value of less than 0 are shown as "Nil." Rounds with a penetration of 0 have that as penetration (meaning that the final penetration is the base 2D6 roll without any addition).

TL	*Multiplier*
5	4
6	6
7	8
8	10
9+	12

4. SEFOP: Self-forging penetrator warheads are available at tech level 8 and above. Penetration is calculated the same as for HEAP warheads, and using the same table of tech level multipliers.

5. Submunition: Penetration of grenades.

6. Flechette: The flechettes contained in the warhead have the same penetration as normal fragments (1 in the primary radius, Nil in the secondary), but the flechette round itself, should it hit an armored surface, has a penetration of Nil.

7. Other: All other warheads have a penetration of Nil.

G. Mass

The table below lists the mass of most warheads. Values between those shown on the table can be obtained by interpolation.

Diameter (cm)	*Mass (kg)*
2	.2
3	.4
4	.8
5	1.5
6	3
7	6
8	12
9	17
10	21
11	25
12	30
13	35
14	43
15	50
16	60
17	72
18	85
19	100
20	115
21	140
22	160
23	185
24	215
25	250
30	500
35	1000
40	2500
45	5000
50	10,000

1. KEAP: Regular KEAP warheads (solid shot) are twice the mass shown on the table above. HVAP rounds are 1.5 times the mass shown on the table above. All other KEAP rounds (APDS, APFSDS, etc.) have the mass shown on the table.

2. Special Rounds: The above values are for aerial bombs and artillery shells. Alternative munitions have the following masses.

Type	*Mass*
Hand and Low-Velocity Propelled Grenade*	×0.3
Medium-Velocity Propelled Grenade*	×0.4
Rocket, Missile, Light Recoilless Rifle*	×0.4
Rifle and High-Velocity Propelled Grenade*	×0.5
RAM Grenade*	×0.6
Heavy Recoilless Rifle*	×0.7
Mortar	×0.8

*Note that in the case of propelled grenades and recoilless rifle rounds, the above masses are for the entire round including propellant.

H. Volume

The volume of a warhead in cubic meters for purposes of storage is equal to the diameter of the warhead in centimeters multiplied by 0.000008.

I. Price

The base price for ammunition in credits is equal to its mass multiplied by its ammunition type modifier, as shown below.

Type	*Modifier*
HE	10
KEAP (AP)	5
HVAP	15
APDS	15
APFSDS	15
APFSDSDU	30
APFSDSCI	35
APFSDSSD	40
APFSDSBSD	45
APFSDSBCS	50
HEAP	15
SEFOP	20
CHEM	10
WP/IS	20
ILLUM	10
SM	60
SM (Homing)	100
RDM	100
Flechette	50
Chaff	20

RAM (rocket-assisted multipurpose) grenades cost 10 times the normal warhead price.

Recoilless rifle ammunition costs 1.5 times the normal warhead price.

Note that in the case of propelled grenades and recoilless rifle rounds, the above prices are for the entire round including propellant.



SPECIAL WARHEADS

Most munitions consist of standard warheads used in a variety of roles, either fired, propelled, or dropped. The following warheads are more specialized with limited uses or limited acceptable delivery means.

1. Hand Grenades: Hand grenades are thrown weapons, with the distance thrown being determined by the mass of the grenade. (See the thrown weapon rules on page 282 of the basic game for an explanation of this procedure.)

Hand grenades can use HE, HEAP, CHEM, WP, or ILLUM warheads. They consist exclusively of a warhead and a detonator (either a timer or a contact fuse), but the mass and cost of the detonator are subsumed in the values or the warhead itself. Most hand grenades use a warhead of about 4.5cm diameter, which results in a grenade massing 0.46 kilograms, costing Cr4.6, and with, at tech level 7, damage values of C:3, B:12 (assuming HE).

Two special types of warheads are available for grenades: concussion and thermite.

Concussion: These grenades have more explosive filler than HE grenades and are enclosed in a pressed paper or plastic container designed to be completely consumed by the explosion. The result is a more powerful blast but no lethal fragments.

To calculate the concussion value of concussion grenade, multiply the normal HE concussion value of a grenade of that size by 1.6. Concussion grenades have no burst radius and have the same mass and cost of HE grenades.

Thermite: These grenades are extremely hot incendiary grenades useful for destroying large machinery. (Dropped down the barrel of cannon, the thermite grenade will burn through the breach block.) Thermite grenades have the same concussion as a WP grenade, but only one-third of the burst radius. Thermite grenades produce no significant mount of smoke. Thermite grenades cost half as much as WP grenades of the same size, but are otherwise identical.

2. Rifle Grenades: Rifle grenades are designed to be fired from standard military slug-firing rifles. The grenade itself has no propellant and is instead projected by the force of the bullet fired from the rifle. As a result, rifle grenades tend to be fairly light, and they are very inaccurate.

Range: Rifle grenades may only be fired in indirect fire. The indirect fire range of a rifle grenade is determined using the following formula:

$$R = (D+M)Tm$$

R = Indirect fire range in meters
D = Damage value of the rifle or carbine firing the grenade
M = Mass in kilograms of the grenade
Tm = Tech level modifier, as shown below:

TL	*Tm*
5-6	35
7-8	65
9+	95

3. RAM Grenades: Rocket-assisted multipurpose (RAM) grenades are available at tech level 8 and above as rifle grenades. These grenades may be fired in either direct or indirect fire. Since these are rocket-propelled grenades, their range does not vary with damage value of the bullet fired from the rifle. Masses and prices are given in the design sequence above. Range is shown below:

TL	*Short Range*	*Indirect Fire Range*
8	30	500
9	40	550
10	50	1500
11	60	2000

4. Mines: Mines are simply emplaced warheads. Any warhead type may be used as a mine. The mine consists of the warhead and a fuse. Fuses have negligible volume and mass, and cost as shown on the following table:

TL	*Fuse*	*Cr*
4	Contact	10
6	Radio	20
8	Proximity	100

Mines mass half as much as a standard warhead of the chosen diameter and use the same cost multipliers as for a conventional warhead. Nonmetallic mines cost twice as much for the warhead and 10 times as much for the trigger.

5. Napalm: Napalm is a mixture of hydrocarbon distillates, thickeners, and other components designed to aid combustion (such as powdered aluminum, charcoal, white phosphorus, etc.).

Napalm is available at tech level 5 and up. Because it is most effective when spread over a wide area, it is not generally used in artillery or rocket warheads or streamlined gravity bombs designed to impact the ground at a steep angle. Instead, it is used in unstreamlined cannisters designed to tumble when released by aircraft at low altitude. These cannisters break open when they hit the ground and scatter burning fuel along the flight path of the aircraft.

Aerial napalm cannisters are relatively inaccurate weapons and are effective against personnel in the open and soft vehicles. Their effect is increased greatly by the presence of dry foliage, and reduced almost to nil by wet weather or ground conditions.

Napalm cannisters mass 350 kilograms each. They have no concussion value and a burst area 20 meters wide and 100 meters long. (There is no secondary burst area.) If hit by fragments, consult the burn damage rules (TNE, page 286).



6. Nuclear Warheads: Because of the tremendous damage already caused by the Final War, nuclear warheads are looked upon with a particularly intense revulsion. That does not keep occasionally irresponsible leaders from using, or threatening to use, these weapons of indiscriminate mass destruction.

Yield	*Crater*	*Induced*	*Destruction*	*Primary*	*Secondary*	*Size*
.1	25	30	30/50	100/150	200/300	17
.5	25	35	30/60	150/180	330/360	18
1	40	40	30/60	210/240	420/420	19
2	50	60	60/90	300/300	540/540	20
5	50	80	150/120	480/420	660/600	21
10	60	90	180/120	540/480	720/660	22
20	60	100	300/240	540/480	900/720	23
50	70	120	420/300	750/600	1200/900	24
100	100	140	480/420	750/600	1260/1080	25

Yield: Warhead size in kilotons.

Crater: Diameter of crater in meters. Only ground strikes produce craters. Ground units may not enter the crater of a nuclear blast until it has been decontaminated.

Induced: Radius of induced radiation in meters. For 30 minutes after the detonation of the the warhead, the radius of induced radiation is equal to the secondary blast radius. After that, it shrinks to the listed induced radiation radius listed above. Everything inside this radius is contaminated with radiation. Unprotected personnel must leave the induced radiation area within 15 minutes or begin suffering progressively greater health effects. Personnel in sealed environment suits, sealed armor, or vehicles with hostile environment capability ignore induced radiation.

Destruction: The destruction radius in meters. The first number is the destruction radius from a ground strike, the second is the area from an air burst.

All targets in the destruction radius are destroyed, and any flammable material ignites and burns.

Primary: The primary blast radius in meters. The first number is the blast area from a ground strike, the second is the area from an air burst.

All targets in the primary blast radius are treated as if within the primary blast radius of a conventional explosion and suffer fragmentation attacks accordingly. All targets are also attacked with a concussion value of 10. (Note that this does not affect enclosed vehicles.) All trees and frame buildings in the primary blast radius are blown down.

Secondary: The secondary blast radius in meters. The first number is the blast radius from a ground strike, the second is the radius from an air burst.

All targets in the secondary blast radius are treated as if within the secondary blast radius of a conventional explosion and suffer fragmentation attacks accordingly.

Size: Minimum warhead diameter in centimeters for this yield. Nuclear warheads are first available at tech level 6. At later tech levels, the minimum warhead size is reduced as shown on the following chart:

TL	*Size*
7	–2 cm
8	–4 cm
9	–6 cm
11	–7 cm
13	–8 cm
15	–9 cm
17	–10 cm
19	–11 cm

Price: The price of the warhead in millions of credits is equal to its yield multiplied by 0.01.

Storage: A nuclear warhead must be stored in a shielded container or a damper box. A shielded container takes up four times the volume of the warhead, masses three times the mass of the warhead, and costs MCr0.01 per cubic meter of volume.

7. Collapsing Nuclear Warheads: Collapsing warheads are much smaller than standard nuclear warheads. This is made possible by using very unstable fissionable materials, such as californium, and by omitting the reliable but bulky detonation system found in standard rounds. Instead, these warheads rely on impact with vehicle or structural armor to collapse the hollow round quickly into a critical mass, resulting in unreliable performance.

Collapsing rounds may only be fired from CPR or mass driver guns with a short range of 400 meters or more. They may only be fired at hard targets, such as concrete buildings, armored vehicles, starships, etc.

If a collapsing round hits, it successfully detonates only on a die roll of 7 or less (on a D20). On any other roll, the round was a dud.

The information on collapsing rounds is noted in the following table. It is read exactly the same as the main nuclear warhead table above, except as noted specifically below.

Yield	*Crater*	*Induced*	*Destruction*	*Primary*	*Secondary*	*Size*
.001	10	5	20/30	25/60	50/120	2
.002	10	10	20/35	30/70	60/140	3
.005	15	10	20/35	40/75	80/150	3.5
.010	15	15	25/40	50/95	100/190	4
.050	20	20	25/45	75/120	150/240	6
.100	25	30	30/50	100/150	200/300	7

TL: Collapsing nuclear rounds are available at tech level 14 and higher.

Size: Minimum warhead diameter in centimeters for this yield.

Price: The price of the warhead in millions of credits is equal to its yield multiplied by 1.

Storage: Because of their short useful half-life, collapsing rounds *must* be carried in damper boxes.



8. Nuclear-Pumped X-Ray Lasers: The one area where nuclear warheads are used fairly regularly is on space-based X-ray laser missiles. Each of these warheads consists of a nuclear device, an array of X-ray lasing rods, a short-range tracker, a receiver for a 300,000-km laser communicator, and a small battery power pack. The missile operator maneuvers the warhead into range of the target (using whatever maneuver package the designer has chosen to include in the weapons system). The on-board tracker makes the final precision target corrections and the operator fires the warhead. The explosion of the warhead destroys the lasing rods, but not before pumping a tremendous burst of energy through them and toward the target.

All components of the nuclear X-ray laser warhead are included in a single package as shown on the following chart.

All nuclear X-ray pumped warheads roll 1D6 for hits on target when they detonate; each of these hits does damage equal to that listed in the "Dmg" column.

Range for space combat (in increments of 30,000 km) is given on the bottom line. By increasing size and price, longer range (to the right of the slash) may be acheived. Note that this is only possible in a campaign using the optional laser focusing technology field.

				Volume at Tech Level				
Yield	*MCr*	*Dmg*	*8*	*9-10*	*11-12*	*13-14*	*15-16*	*17+*
10	.6	1/8-25	.29	.195	.16	.132	.103	.08
20	.7	1/11-35	.32	.215	.18	.148	.113	.09
50	.8	1/14-43	.35	.235	.2	.168	.127	.10
100	.9	1/18-56	.39	.265	.22	.188	.147	.11
200	1.1	1/21-66	.51	.355	.28	.248	.167	.13
500	1.2	1/25-79	.71	.505	.4	.358	.247	.17
Range	—	—	0/0	0/0	0/0	0/1	0/1	0/2

Yield: Warhead yield in kilotons.

MCr: Price in millions of credits for the warhead package.

Dmg: Damage expressed in terms of laser penetration rating-damage value.

Volume: The listed values are the volumes in cubic meters of the complete warhead packages at each tech level.

Mass: Each warhead masses 1 tonne per cubic meter.

Range: Range in starship combat hexes/range bands. Range to the left of the slash is normal range, to the right is range available by doubling volume and multiplying price by 10. Range of 0 means fires into same hex only.

GUIDANCE

Warheads, whether they are powered or unpowered, may have guidance systems installed.

Maneuver: In order to have a guidance system installed, a warhead must be able to maneuver. In most cases, this will mean that it is powered by an engine of some kind. Unpowered warheads can have guidance packages installed however, which allow them to vary their projected target point by as much as 10% of the distance between the target and the launch point (or firing point). An unpowered warhead must have fins that enable it to maneuver, however. These fins are extremely light and do not add significantly to warhead mass. They do add Cr1 to the warhead price per kilogram of warhead mass.

Guidance: Guidance systems include command guidance, target designation, homing, and smart.

1. Command Guided: In this guidance system, the operator must pilot the warhead to the target. These guidance systems are distinguished by their operating system and their command link.

Operating system is a measure of how sophisticated the tracking software of the guidance system is. Manual operation means that the warhead must be maneuvered toward the target by the operator by observing both the target and warhead and mentally computing the necessary course changes. Semiautomatic guidance still requires the operator to track both the target and the missile, but flight controls are vastly improved and the warhead has superior flight characteristics, enabling it to fly at higher speeds and still be controlled. Automatic guidance means that the operator is only required to track the target, while the guidance system itself computes the corrections necessary to fly the warhead to it. Teleguidance allows the operator to "see" directly out the front of the warhead and thus eliminates the need for a continuous line of sight between the operator and the target. Instead, the operator simply flies toward the target until impact.

The characteristics of the various operating systems are shown on the table below.

TL	*Type*	*Mass*	*Cr*	*Speed (kph)*	*AGL*
5	Manual	1	40	300	–2
6	Semiauto	2	80	600	–1
7	Automatic	2	100	900	—
8	Teleguidance	2	100	1200	—

TL: Tech level of first availability.

Type: Operating system used.

Mass: Mass in kilograms of the controller in the warhead.

Cr: Price in credits of the controller in the warhead.

Speed: The highest allowed average speed. This value is used when calculating missile propellant and performance later.

AGL: Modification to the missile's final Agility rating (if mounted on a missile).

Volume: All operating systems have a volume of 1 liter per kilogram.

In addition to an operating system, a command guidance package must have a communication link between the operator's control unit and the controller in the warhead itself. For wire-guided missiles, there is no additional equipment to be installed as this equipment is subsumed under the other areas of the design, but radio and laser guidance does. The type of communication link also limits the maximum range of the missile. The table below summarizes the characteristics of various communication links.

TL	*Type*	*Mass*	*Cr*	*Range (km)*
5	Wire	—	—	2
6	Wire	—	—	4
7	Wire	—	—	6
5	Radio	2	40	*
6	Radio	1	40	*
7	Laser	1	70	10
8+	Laser	1	50	*

TL: Tech level of first availability.

Type: Comm link used.

Mass: Mass in kilograms of the comm link in the warhead.

Cr: Price in credits of the comm link in the warhead.

Range: The longest allowed range using the listed communication link.

* The range of radio-guided warheads and tech level 8+ laser-guided warheads is equal to the long range of the communicator installed in the control unit. Consult the Launchers chapter (page 147) for a discussion of the launcher control unit.

Volume: All comm links have a volume of 1 liter per kilogram.



2. Target Designated: This guidance system employs a seeker head in the warhead which enables it to home in on the reflected radiation of a designator, either a laser or a radar. The prices and masses of the seeker heads are shown on the table below.

TL	*Type*	*Mass*	*Cr*
6	Radar	2	1000
7	Radar	2	1000
8+	Radar	1	1000
7	Laser	1	500
8	Laser	1	500
10+	Laser	1	500

3. Homing: These guidance systems lock onto and home on certain well-defined levels of emissions of radiation. Infrared missiles home on high heat signatures. Anti-radiation missiles (ARM) home on radar or radio emissions. In both cases, improved versions have more sophisticated sensors capable of tracking at greater distances and at more difficult engagement angles.

TL	*Type*	*Mass*	*Cr*	*Range*	*AGL*
6	IR	1	500	10	–2
7	Improved IR	1	1000	15	–1
8	Advanced IR	1	1500	20	—
7	ARM	1	1000	12	–2
8	Improved ARM	1	2000	24	–1

TL: Tech level of first availability.
Type: IR = Infrared homing. ARM = Anti-radiation missile.
Mass: Mass in kilograms of the guidance system in the warhead. There is no control unit.
Cr: Price in credits of the guidance system in the warhead.
AGL: Modification to the missile's final Agility rating (if mounted on a missile).
Volume: All homing guidance systems have a volume of 1 liter per kilogram.

4. Smart Warheads: Smart warheads encompass two methods of guidance: target memory and target seeker. Both are true "fire-and-forget" weapons, but they are distinguished by what the operator is required to do prior to firing.

Target memory warheads have sensor units capable of distinguishing between unique target shapes. While still carried by the launch vehicle, the image generated by the sensor is projected onto the operator's video screen. When the sensor in the warhead acquires a target the operator considers suitable, the warhead is launched and the sensor, remembering the specific target acquired, will move to intercept it.

Seeker warheads have a pre-programmed set of target images that the sensor will recognize, and are simply launched into the general area of likely targets, after which they will seek out an appropriate target and attack it.

The characteristic of smart guidance systems are shown below:

TL	*Type*	*Mass*	*Cr*	*AGL*
7	Memory	3	10000	–1
8	Memory	2	5000	—
8-10	Seeker	1	1000	–2
11-13	Seeker	1	1000	—
14+	Seeker	1	1000	+2

TL: Tech level of first availability.
Type: Target memory or seeker.
Mass: Mass in kilograms of the guidance controller in the warhead.
Cr: Price in credits of the guidance controller in the warhead.
AGL: Modification to the missile's final Agility rating (if mounted on a missile).
Volume: All operating systems have a volume of 1 liter per kilogram.

In addition to a guidance system, a smart warhead must have a sensor which it uses to gather target information. The type of sensor used has no effect on the chance of the missile hitting, but does effect the conditions under which it can operate at all.

Visual sensors allow clear-weather daylight operation. IR sensors allow night operations along with some low-visibility operations (chemical smoke, fog, light rain, etc.). Imaging radar sensors allow operation in all light and atmospheric conditions (but is subject to jamming like all radars).

The characteristics of sensors are summarized on the table below.

TL	*Type*	*Mass*	*Cr*
7	Visual	1	200
7	IR	1	2000
8	Imaging Radar	1	10,000

TL: Tech level of first availability.
Type: Type of installed sensor.
Mass: Mass of the sensor added to the warhead.
Cr: Additional price to add the sensor to the warhead.
Vol: The volume of a sensor is 1 liter per kilogram.

5. Top Attack: Top attack may be added as an option to any guidance package from tech level 8 on, provided the warhead is either HEAP or SEFOP. Top attack means that the weapon's warhead is angled to fire perpendicular to the flight path of the munition, thus firing into the top of a vehicle as it passes over it. Top attack options are of no real use against aircraft, only vehicles which generally have weaker overhead armor than front armor.

Adding the top attack option doubles the warhead price, but has no other effect on the munition.

PROPELLANT

Virtually all warheads are propelled in one manner or another (with the notable exception of mines).

A. CPR Ammunition: CPR projectiles are propelled by the explosion of a propellant charge in the gun tube. This propellant charge is purchased separately from the warhead (although its mass is usually added to that of the warhead to make a complete round of ammunition).

Mass: The propellant required for CPR guns varies with the mass of the warhead and the length of the barrel. Propellant mass for CPR gun ammunition is calculated using the following formula:

Mp = .007MwBl

Mp: Mass (in kilograms) of propellant for the round.
Mw: Mass (in kilograms) of the warhead
Bl: Barrel length (in calibers) of the gun.

Propellants for mortars, propelled grenades, and recoilless rifles are included in the base mass of the warhead.

Rocket-assisted projectiles (RAP) are available from tech level 5 on. RAP projectiles require additional propellant mass equal to the warhead mass (regardless of barrel length). This is in addition to the normal propellant requirement of these weapons.



Base bleed (BB) propellant is available for CPR guns at tech level 7+. Base bleed charges do not add to the mass of propellant, but cost more.

Note: In both the RAP and BB rounds, the specialized "propellant" (in the RAP, rocket fuel, in the base bleed round, a combustible chemical which is burned in a generator at the base of the round—the resulting gas creates an overpressure and smooths the airflow around the round, thus increasing its range) is actually part of the warhead, but is calculated here for simplicity.

2. Price: The price of artillery propellant in credits is the mass of the propellant multiplied by 5. This price is doubled when calculating the price of base bleed and RAP propellant.

B. Atmospheric Rockets and Missiles: Rockets and missiles are powered by rocket engines which, unlike artillery shells, continue to propel the projectile after it has left the launcher. For purposes of propellant design, there is no difference between a rocket and a missile. The terms are usually used to distinguish between unguided (rocket) and guided (missile) rocket-propelled warheads.

Rockets and missiles generally use rockets, most commonly solid fuel rockets, but may use any form of thrust desired. Designing the propellant package of the weapon follows these steps:

1. Tech Level: Determine the tech level of manufacture of the weapon.

2. Thruster: Select a thruster from those available at the tech level of manufacture. Consult the Sublight (Maneuver) Drive chapter (Section 9) for a list of available thrusters.

3. Average Velocity: Set the average velocity of the weapon. Note that missiles with certain command guidance packages have maximum allowed average velocities. Multiply average velocity in kph by 1.39 to determine speed in meters per combat turn.

4. Propellant Mass: Set the total propellant mass in the weapon.

5. Average Mass: The missile will burn fuel throughout its flight and its mass will change accordingly. The average mass is determined by adding the warhead mass, guidance mass, engine mass (if that is separate from the fuel), and half of the fuel mass. The result is the average mass.

6. Required Thrust: The required thrust is determined using the following formula. Note that since thrusters other than solid-fuel rockets require more engine mass to produce more thrust, the result of this calculation may require tinkering with the design until thrust, speed, and average mass are all compatible.

$$T = V^2MTm$$

T: Thrust in kilograms
V: Average velocity in kilometers per hour
M: Average mass in kilograms
Tm: Tech level modifier, as shown on the table below:

TL	*Tm*
4-6	.0000015
7-9	.0000009
10+	.0000006

7. Fuel Consumption: The Self-Contained Thrusters table in the Sublight Drive chapter (Section 9) shows the fuel consumption of various thrusters in terms of tonnes of fuel burned per hour per tonne of thrust. This is also the number of kilograms of fuel burned per hour per kilogram of thrust. To determine the number of kilograms of fuel burned per second per kilogram of thrust, divide the fuel consumption number on the chart by 3600. To determine how many kilograms of fuel the weapon consumes per second, multiply the fuel consumption per second per kilogram just derived by the actual thrust in kilograms of the weapon (Step 6 above).

Size Efficiency: Solid-fuel rockets with less than 500 kg of propellant (fuel) mass begin to suffer from inefficient fuel combustion. To determine the fuel consumption inefficiency of a solid-fuel rocket, divide 500 by the fuel mass (in kilograms). The result is the fuel use multiplier. Multiply the calculated fuel consumption of the engine by this number. However, any multiplier less than 1 is treated as 1 and any multiplier greater than 10 is treated as 10.

8. Fuel Endurance: The fuel endurance of the missile in seconds is its propellant mass in kilograms (Step 4) divided by its fuel consumption per second (Step 7).

9. Range: The range of the missile in kilometers is its average velocity in kilometers per hour multiplied by its fuel endurance in seconds divided by 3600. For homing missiles, short range is this maximum range divided by 8.

10. Agility: The weapon's Agility is determined by consulting the Agility table below:

Average Velocity (kph)	*Agility*
86-171	1
172-343	2
344-687	3
688-1375	4
1376-2751	5
2752-5503	6
5504-11,007	7
11,008-22015	8
22016+	9

Add +1 to the computed agility for all missiles of TL 10+.

C. Space Missiles: Missiles used in ship-to-ship combat in vacuum have a simpler design sequence that atmospheric missiles, and in many respects they function as small spacecraft. Once the warhead is selected, the following procedure is followed.

1. Tech Level: Identify the tech level at which the missile is built.

2. Install Thruster: Select a thruster from those available in the Sublight Drive chapter (Section 9). Most space missiles use EAPLAC solid-fuel thrusters. Determine the total thrust of the rocket in tonnes. This is set by the designer based on the missile's mission requirements.

3. Install Fuel: Determine the total fuel volume of the rocket. SRF fuel has a volume of 1 cubic meter per tonne.

4. Determine Average Mass: The average mass of the missile is its warhead mass plus its engine mass (unless it uses a solid-fuel rocket, in which case engine mass is 0) plus half of its fuel mass.

5. Determine G Rating: Divide the missile's thrust in tonnes by its average mass. The result is the missile's G rating.

6. Determine Fuel Consumption: Multiply the fuel consumption rate of the thruster as listed on the Self-Contained Thrusters table in the Sublight Drive chapter (Section 9) by the thrust of the engine in tonnes to determine fuel consumption of the engine in cubic meters per hour. Divide the result by 2 to determine the fuel consumption in cubic meters per space combat turn.

7. Determine Fuel Endurance: Divide the fuel supply in cubic meters by the fuel consumption in cubic meters per turn to determine the number of turns of fuel the missile has. (This may be a value less than 1.)

8. Determine the Missile's G-Turns: Multiply the G rating of the missile by the fuel endurance in turns to determine the total G-turns of acceleration available to the missile.

9. Determine Max Gs per Turn: Enter either the total missile G-turns of acceleration or the missile's G rating, whichever is less.



CHAPTER 10
Launchers

This chapter covers a variety of launchers for rockets, missiles, and related ordnance.

GRENADE LAUNCHERS

Grenade launchers fall between small arms and artillery in that they fire rounds larger than small arms ammunition but do so at extremely low velocities, thus making most of them man-portable.

A. Specifications: Grenade launchers are defined by the following characteristics:

1. Ammunition: Grenade launchers fire propelled grenades. Propelled grenades are designed using the Munitions chapter design rules. A variety of ammunition types are possible. For purposes of designing the launcher itself, however, the key variables are grenade diameter (in centimeters) and grenade velocity (low, medium, high, or RAM—rocket assisted multipurpose).

2. Configuration: Grenade launchers are available in three configurations: attached, shoulder-fired, and mounted.

Attached launchers are never fired separately, but instead are attached to another shoulder-fired rifle or energy weapon.

Shoulder-fired grenade launchers have stocks like rifles, and may be equipped either with a fixed stock or a folding stock.

Mounted grenade launchers usually have only a pistol grip and are designed for fire from vehicles or a tripod mount. Most mounted grenade launchers are either semiautomatic or fully automatic.

3. Action: The grenade launcher may be either single-shot, pump, semiautomatic, or automatic. If automatic, its rate of fire is always 5.

4. Feed System: Pump-action launchers have integral magazines. These are usually tubular magazines mounted either over or under the barrel. Semiautomatic launchers have box magazines. Automatic grenade launchers are belt-fed. If a magazine is used, specify the capacity in number of rounds carried.

5. Barrel: Specify the barrel length in calibers. The shortest allowed barrel is 2 calibers and the longest allowed barrel is 10 calibers.

B. Ratings: Using the data provided above, the weapon's physical characteristics and performance can be determined.

1. Direct Fire Range: Direct fire range for grenade launchers is determined using the following formula:

R = 3.75(D+Bl+Vm)

R: Short range in meters
D: Grenade diameter in centimeters
Bl: Barrel length in calibers
Vm: Velocity modifier, as shown below:

Velocity	*Modifier*
Low	15
Medium	25
High	40
RAM	50

2. Indirect Fire Range: Maximum indirect fire range (which is also an upper ceiling on direct fire range for low-velocity grenades) is determined using the following formula:

Rm = RcVm

Rm: Maximum range in meters
Rc: Short range in meters
Vm: Velocity modifier, as shown below:

Velocity	*Modifier*
Low	4
Medium	6
High	10
RAM	15

3. Length: The length of the weapon is calculated using the following formula:

L = D(Bl+Rl)+S

L: Length in centimeters
D: Grenade diameter in centimeters
Bl: Barrel length in calibers
Rl: Receiver length in calibers, as shown below:

Type	*Rl*
Single Shot	2.5
Pump	5
LV Semiautomatic	5
MV Semiautomatic	8
HV Semiautomatic	10
LV Automatic	8
MV Automatic	12
HV Automatic	14

S: Stock length in centimeters. Shoulder-fired weapons have a stock length of 25cm. If a folding stock is selected, it has a stock length of 25cm when extended and 5cm when restricted. Calculate total weapon length based on both positions. Mounted weapons have a stock (grip) length of 5cm. Attached weapons have no stock length.

Pump-action weapons with an integral magazine must also calculate magazine length in calibers. The magazine length in calibers is the number of rounds in the magazine multiplied by 2.5. If the magazine length in calibers is longer than the combined barrel and receiver length in calibers, then the magazine length is substituted in the equation above for (Bl + Rl).

4. Bulk: Once the final length of the weapon has been determined, the bulk can be calculated. Bulk is equal to the weapon length (in centimeters) divided by 15, rounding all fractions down

5. Recoil Reduction Options: There are two types of devices used to reduce grenade launcher recoil: shock-absorbing stocks and recoil compensators. The inertial recoil compensator is worn as a harness and the gun is attached to it by a flexible arm. The arm becomes rigid when the weapon is fired, and the recoil compensator in the harness pack absorbs much of the force of the recoil. Unlike most other options, the mass of the inertial compensator is not added to the mass of the weapon (Mw) for purposes of determining recoil below.

No more than one of each type may be added to the weapon. Only weapons with stocks may have shock-absorbing stocks added. Recoil devices are summarized on the following page:



TL	Type	Rcm
5	SA Stock	.95
7	SA Stock	.9
9	Folding SA Stock	.9
9	SA Stock	.85
10	Gyroscopic Compensator	.5
14	Inertial Compensator	.3

TL: Tech level
Rcm: Recoil compensator modifier
SA: Shock-absorbing
If a weapon has more than one Rcm, multiply them all together to get a single combined value.
If a weapon has no recoil modifiers, its Rcm is 1.

6. Empty Mass: The mass of the weapon is calculated using the following formula:

$$M = (DBlVmCm)+S$$

M: Mass in kilograms
D: Grenade diameter in centimeters
Bl: Barrel length in calibers
Vm: Velocity modifier, as shown below:

Velocity	Vm
Low	1
Medium	1.5
High	2
RAM	1.5

Cm: Configuration modifier as shown below:

Configuration	Cm
Single-shot	0.05
Pump	0.15
Semiauto	0.1
Automatic	0.15

S: Mass of the stock, as shown below:

Stock	Mass
Pistol Grip	0.2
Stock	0.5
Folding Stock	0.5
SA Stock (TL 5)	0.6
SA Stock (TL 7,9)	0.7
Folding SA Stock	0.7

Gyroscopic compensators have a mass of 0.5 kilograms. Inertial compensators have a mass of 1 kilogram. Unlike other components of the weapon, inertial compensators are counted separately and are worn as harnesses to which the weapon is attached.

7. Loaded Mass: The loaded mass of the weapon is equal to its empty mass plus the mass of all rounds carried in its magazine (one round if single-shot) plus the mass of an empty magazine.

Integral tubular magazines are already included in the mass of the weapon. The mass of box magazines is calculated as follows:

$$M = 0.1CA$$

M: Mass of the empty magazine in kilograms
C: Capacity of the magazine in rounds of ammunition
A: Mass or a single round of ammunition in kilograms.

8. Muzzle Energy: The muzzle energy of the weapon is a function of its warhead mass and its velocity. Muzzle energy is calculated using the following formula:

$$E = (0.5M)V^2$$

E: Muzzle energy in joules
M: Warhead mass in kilograms
V: Muzzle velocity in meters per second, as shown below:

Vel.	V	V^2
Low	75	5625
Medium	125	15,625
High	250	62,500
RAM	75	5625

9. Recoil: The weapon's recoil when firing a single shot can be calculated.

$$R = \{[(0.15\sqrt{E})+Mw] + Em\} \times Rcm$$

R: Recoil number
E: Muzzle energy
Mw: Mass, in kilograms, of weapon (use empty mass for belt- and cassette-fed weapons, loaded mass for all others)
Rcm: Recoil compensator modifier.
Em: Modifier for high muzzle energy. If the weapon has high muzzle energy, add to the final recoil as shown on the chart below.

E	Em	E	Em
1001+	1	10,001+	4
2501+	2	20,001+	5
5001+	3	50,001+	6

When calculating the recoil energy of a burst of shots, the following formula is used:

$$R = (\{[(Bn+2)(0.15\sqrt{E})]+Mw\} + \{[Bn+2]Em\}) \times Rcm$$

Bn = number of shots in the burst.

10. Price: The price of the weapon is calculated using the following formula:

$$P = (Mw–Ms)Am+Ps+Pc$$

P: Total price of the weapon in credits
Mw: Mass of the weapon in kilograms
Ms: Mass of the weapon stock in kilograms
Am: Action modifier
Ps: Price in credits of the stock, as shown below:

TL	Stock Type	Price
4	Pistol Grip	5
4	Fixed Stock	25
5	SA Stock	50
6	Folding Stock	50
7	SA Stock	75
9	Folding SA Stock	150
9	SA Stock	75

Pc = Price of the recoil compensator, if one is added. Gyro-compensators cost Cr300. Inertial compensators cost Cr1000.

10. Mount: A mounted weapon may be mounted on a vehicle or it may have a field mount. A field mount may be of any mass desired, so long as its mass in kilograms is equal to or greater than the highest base recoil number of the weapon (usually attained when firing a burst).

The price of a field mount is determined by the following formula:

$$Cr = 100 + (10M)$$

Cr: Price in credits
M: Mass of field mount



TAC MISSILE LAUNCHERS

A tac (tactical) missile is one designed for use in planetary combat. Tac missile launchers consist of two elements: the launch system itself and the control unit.

A. Launch Unit: Launch units hold the missile prior to firing and ensure a clean launch once it is fired. There are several different ways of designing a launch unit.

1. Launch Rail: A launch rail is usually mounted on a vehicle or an aircraft and it consists of a simple guide rail on which the missile is mounted by means of brackets. A launch rail has the same mass as a missile, negligible volume (beyond the volume of the missile itself), and costs Cr50 per kilogram of mass.

2. Package Launcher: Package launchers consist of a container holding the missile and a clip-on guidance system. Once launched, the guidance system is detached and the package discarded. The package has half the mass of the missile contained in it and twice its volume. (The missile is carried inside the package, however, so add its mass and ignore its volume when calculating the final values.) The package costs Cr10 per kilogram of package (not missile).

3. Tube Launcher: These are reloadable launch tubes either mounted on field mounts or on vehicles. The tube has four times the mass of the missile it is designed to carry and costs Cr100 per kilogram. If on a field mount (which for lighter launchers can be as simple as a tripod), the mount masses the same as the launcher and costs Cr10 per kilogram. See magazine launcher below for characteristics of the field mount.

4. Magazine Launcher: This is a more sophisticated version of the tube launcher, consisting of a standard tube launcher and a fixed magazine of tac missiles. The magazine will automatically reload a missile each time one is fired, eliminating the necessity for the gunner or loader to do so manually. (Manual reloading often requires that the gunner or loader expose themselves in a hostile environment.) Magazines are not usually detachable from magazine launchers. Instead, missiles are loaded directly into the magazine when reloading is convenient.

The empty magazine for a magazine launcher masses half the mass of the total number of missiles carried in it and costs Cr100 per kilogram. If mounted on a field mount, the mount must have mass equal to the tube launcher used and a loaded magazine (empty magazine mass plus the mass of the loaded missiles). The field mount costs Cr10 per kilogram of mass.

5. Gun Tube: A CPR or mass driver gun of the correct size can be modified to serve as a missile launcher by the addition of a control unit. Gun tubes may not be modified to launch wire-guided missiles, as there is no safe and efficient way to allow the control wire to unspool through the breach while simultaneously sealing the breach and keeping rocket exhaust from injuring the crew.

B. Control Units: The various guidance systems are explained in detail in the Munitions chapter. Most of these guidance systems require supporting hardware as part of the launcher.

1. Command Guided: In this guidance system, the operator must pilot the warhead to the target. These guidance systems are distinguished by their operating system and their command link.

The characteristics of the various operating systems are shown on the table below.

TL	*Type*	*Mass*	*Cr*
5	Manual	10	400
6	Semiauto	15	800
7	Automatic	15	1200
8	Teleguidance	15	1500

TL: Tech level of first availability

Type: Operating system used

Mass: Mass in kilograms of the control unit used by the weapon operator.

Cr: Price in credits of the control unit used by the weapon operator.

Volume: All control units have a volume of 1 liter per kilogram.

In addition to an operating system, a command-guidance package must have a communication link between the operator's control unit and the controller in the warhead itself. The table below summarizes the characteristics of various communication links.

TL	*Type*	*Mass*	*Cr*	*Range (km)*
5	Wire	—	—	2
6	Wire	—	—	4
7	Wire	—	—	6
5	Radio	5	200*	**
6	Radio	5	200*	**
7	Laser	5	1000	10
8+	Laser	5	500*	**

TL: Tech level of first availability

Type: Comm link used

Mass: Mass in kilograms of the comm link in control unit used by the weapon operator.

Cr: Price in credits of the comm link in the control unit used by the weapon operator.

* Radio-controlled guidance and tech level 8 laser-controlled guidance also requires a radio communicator or a laser communicator as part of the operator's control unit. These are purchases separately from the communicators available in the Electronics chapter (Section 5). Note that the tech level 7 laser control unit already includes a laser comm link.

Range: The longest allowed range using the listed communication link.

** The range of radio-guided warheads and tech level 8+ laser-guided warheads is equal to the long range of the communicator installed in the control unit.

Volume: All comm links have a volume of 1 liter per kilogram.



2. Target Designated: This guidance system employs a seeker head in the warhead which enables it to home in on the reflected radiation of a designator, either a laser or a radar. Target-designated missiles also require a radar transmitter or a laser designator to illuminate the target. Standard radars or laser communicators may be used to designate a target for a missile provided they are modified to do so. Target-designation modifications do not affect the volume, mass, or power requirements of the equipment, but multiply its price by 1.5. The effective range of the missile from the designator is equal to the equipment's normal medium range (twice short range).

At tech level 7 (before laser communicators are routinely available), purpose-built laser designators may be purchased. These have a useful range of 6 kilometers (i.e., a short range of 3 kilometers), a mass of 16 kilograms, a volume of 8 liters, and a price of Cr12,000. They are powered by internal batteries good for several hours of use before replacement or recharging are required.

3. Homing: These guidance systems lock onto and home on certain well-defined levels of emissions of radiation. The control unit in this case is simply a small data repeater the tells the operator when the missile has locked onto a target. Its mass is 0.5 kilograms, and its price is Cr500.

4. Smart Warheads: Smart warheads encompass two methods of guidance: target memory and target seeker. Both are true "fire-and-forget" weapons, but they are distinguished by what the operator is required to do prior to firing.

The characteristic of smart guidance systems are shown below:

TL	*Type*	*Mass*	*Cr*	*AGL*
7	Memory	10	1000	–1
8	Memory	10	1000	—
8-10	Seeker	5	500	–2
11-13	Seeker	5	500	—
14+	Seeker	5	500	+2

TL: Tech level of first availability.

Type: Target memory or seeker.

Mass: Mass in kilograms of the control unit used by the weapon operator.

Cr: Price in credits of the control unit used by the weapon operator.

AGL: Modification to the missile's final Agility rating (if mounted on a missile).

Volume: All control units have a volume of 1 liter per kilogram.

DIRECT FIRE ROCKET LAUNCHERS

Unguided rockets designed using the rules in the Munitions chapter must have launchers in order to fire. In general, these launchers are extremely simple and consist either of a launch rail or tube. Rocket pods with multiple rockets are also possible, as are single-shot disposable rocket launchers which double as carrying containers for the rocket.

A. Empty Mass: The mass of a reloadable rocket launcher is determined using the following formula:

M = DTCm

M: Mass in kilograms

D: Diameter of the rocket warhead in centimeters

T: Number of tubes in the launcher

Cm: Configuration modifier, as shown below:

Config	*Cm*
Single-Shot Reloadable	1
Multi-Shot Reloadable	.5
Single-Shot Disposable	.4
Multi-Shot Disposable	.2

B. Loaded Mass: The loaded mass of the launcher is its empty mass plus the mass of its rockets. Any weapon with a loaded mass of 45 kilograms or less can be shoulder-fired. Heavier weapons require a field mount (tripod or carriage). Field mounts must be of equal or greater mass than the loaded weapon.

C. Fire Control: Any shoulder-fired weapon includes optic sights in the basic weapon package and no additional mass or price is required. Heavier weapons on a field mount require direct fire controls. Consult the Fire Control chapter (Section 14) for masses and prices. (However, disregard the short range limit.)

D. Price: The price of the launcher in credits is equal to its mass in kilograms multiplied by 35. The price of a field mount is determined by the following formula:

Cr = 100 + (10M)

Cr: Price in credits

M: Mass of field mount.

E. Range: The short range of a reloadable rocket launcher is the maximum design range of the rocket fired by the launcher divided by 8. The range of a disposable rocket launcher is its the normal short range of the rocket multiplied by 0.75.

ARTILLERY ROCKET LAUNCHERS (ARLS)

Artillery rockets are used for indirect instead of direct fire. In general, these launchers are extremely simple and consist either of a launch rail or tube. Most artillery rocket launchers are multiple launchers.

A. Empty Mass: The mass of the launcher in tonnes is equal to the diameter of the rocket warhead (in centimeters) squared, multiplied by the number of launch tubes, multiplied by .002. If an autoloader is incorporated into the launcher, its mass is equal to the empty launcher mass times 0.1. Autoloaders may only be incorporated on vehicle-mounted ARLs.

B. Fire Control: Artillery rocket launchers must have indirect fire control fitted. See the Fire Control chapter (Section 14) for details.

C. Loaded Mass: The loaded mass of the launcher is equal to the empty mass of the launcher plus the mass of the fire control equipment plus the mass of the rockets.

D. Carriage Mass: Towed weapons require a carriage of equal or greater mass than the loaded mass of the launcher. Self-propelled launchers are carried as part of a vehicle and have a volume equal in cubic meters equal to their loaded mass in tonnes.

E. Rate of Fire: An artillery rocket launcher may salvo all of its tubes in a single combat turn. It takes 10 minutes (120 combat turns) to reload a launcher by hand. It takes five minutes (60 combat turns) to reload it using an autoloader.

F. Crew: The crew required to serve a towed (carriage-mounted) indirect fire artillery rocket launcher is equal to its bore size in centimeters multiplied by the number of launch tubes and divided by 10 (but never less than two). Vehicle-mounted weapons require a crew half this size, rounding fractions up, but never less than two. Vehicle-mounted weapons equipped with autoloaders require a crew of only one (the gunner).



If the weapon is designed to be fired only once (as with a remote disposable launcher), loaders are not required and so crew size is reduced to one.

G. Range: Artillery rockets have an indirect fire range in kilometers equal to five times the maximum design range of the rocket.

H. Price: The price of the weapon is equal to the sum of the prices of its components. Fire control equipment costs are listed in the Fire Control chapter (Section 14). The prices of the other components (in millions of credits) are determined by multiplying their mass (in tonnes) by the component multipliers listed below:

Component	*Multiplier*
Launcher	0.01
Loader	0.01
Carriage	0.002

I. Set-Up: A launcher must be set up before it can fire. The set-up time for an ARL (regardless of how many launch tubes it has) in combat turns is equal to the diameter of its missile warhead in centimeters multiplied by 8. If self-propelled, the set-up time is its warhead diameter multiplied by 4. If self-propelled and equipped with a TL 8 or higher landnav system, set-up time is warhead diameter multiplied by 2.

RECOILLESS RIFLES

Recoilless rifles are direct fire weapons designed to deliver a large warhead from a light weapon. This is accomplished by reducing the recoil of the weapon virtually to nil. The recoilless rifle counters the normal recoil associated with firing a projectile by venting an equal amount of energy to the rear in the form of exhaust gas. This makes the weapon similar to a rocket, in that it has a pronounced exhaust when fired and virtually no recoil, but also similar to a CPR gun in that the propellant charge burns all at once and thrusts the separate projectile out the muzzle of the gun tube.

A. Types of Recoilless Rifles: There are two general configurations of recoilless rifles: light and heavy. Light recoilless rifles are designed to be man-portable and fired from the shoulder of an infantry soldier. Heavy recoilless rifles are mounted on carriages and generally have heavier actions and longer barrels to achieve greater range.

B. Tech Level: Recoilless rifles may be built at tech level 5 and above. Tech level advances make recoilless rifles more efficient, particularly with regard to mass.

C. Empty Mass: The empty mass of a light recoilless rifle is equal to its bore diameter squared and multiplied by a tech level mass multiplier as shown below:

TL	*Mass Multiplier*
5	0.6
6	0.4
7	0.3
8+	0.2

Heavy recoilless rifles mass twice this amount. In addition, a heavy recoilless rifle requires a field carriage with a mass equal to or greater than the empty mass of the weapon. Light recoilless rifles do not require a carriage.

D. Fire Control: Any shoulder-fired weapon includes optic sights in the basic weapon package and no additional mass or price is required. Heavier weapons on a field mount require direct fire controls. Consult the Fire Control chapter (Section 14) for masses and prices.

E. Loaded Mass: The loaded mass of the recoilless rifle is equal to its weapon mass, fire control mass (if any), carriage mass (if any), and the mass of one round of ammunition.

Light recoilless rifles may not have a loaded mass of greater than 45 kilograms.

F. Range: Light recoilless rifles have a short range in meters equal to their bore diameter in centimeters multiplied by 20. Heavy recoilless rifles have a short range equal to their bore diameter multiplied by 30.

H. Price: The price of the weapon is equal to the sum of the prices of its components. Fire control equipment costs are listed in the Fire Control chapter (Section 14). The prices of the other components (in millions of credits) are determined by multiplying their mass (in tonnes) by the component multipliers listed below.

Component	*Multiplier*
Weapon	0.01
Carriage	0.002

SPACE MISSILE LAUNCHERS

Launch facilities for missiles from spacecraft are comparatively simple. Each launch facility consists of a standard crew workstation, a 300,000-kilometer-range laser communicator, and one or more launchers. Missile launchers may have their own active or passive sensors and master fire directors installed, but are not required to do so, as they are able to use target locks obtained by sensors mounted elsewhere on the ship, and hand off control of their missiles to MFDs elsewhere on the ship. A launch facility may (but need not) also contain a mechanical reloader and one or more reload cradles.

The laser communicator may not be from a higher tech level than the installed workstation, but missiles of any tech level may be fired from the launchers. Volumes, masses, and prices of communicators and workstations are found in the Electronics and Control Systems chapters (Sections 5 and 4) respectively.

Each launcher has a volume equal to twice that of the missile it is designed to launch. Its mass in tonnes is equal to its volume in cubic meters multiplied by 0.5, and its price in millions of credits is equal to its volume in cubic meters multiplied by .0007.

Normally, an hour is required to reload a missile launcher, but this time can be cut to effectively nothing (five to 10 minutes—less than one space combat turn) by the addition of a mechanical reloader. A mechanical reloader has the same volume, mass, and price as a missile launcher. Each actual launcher in a launch facility must have its own mechanical reloader if it is to be reloaded mechanically.

Mechanical reloaders use spare missiles carried in the launch facility in reload cradles. The volume of each reload cradle is equal to the volume of the missile carried multiplied by 1.5 and its price in millions of credits is equal to its volume in cubic meters multiplied by .0001.

Note that missiles carried in launchers and reload cradles do not count against the volume of the launch facility, as the launchers and reload cradle volumes include the vacant spaces for the missiles.

Missile launch facilities may be of any volume desired. Facilities designed to fit in standard turret hardpoint sockets may not displace more than 3 tons (42 cubic meters), and launch facilities designed to fit in standard barbette hardpoint sockets may not displace more than 6 tons (84 cubic meters). Bays are usually designed in increments of 50 or 100 displacement tons, but there is no specific requirement that all launch facilities conform to those dimensions.



CHAPTER 11
Airborne Weapons Mounts

The following information is provided for airborne weapons mounts. What distinguishes these mounts from conventional mounts is that drag is a consideration.

Gun Mounts

TL	*Type*	*Drag*	*Mass*	*Capacity*	*Price*
4	Fixed Mount	0	0	RE = 0.2 per tonne of acft	0
4	Flexible Mount	1	0.005	RE = 0.05	.0001
5	Fixed Mount	0	0	RE = 0.5 per tonne of acft	0
5	Turret	1	.4	RE = 0.1	.005
5	Heavy Turret	2	.5	RE = 0.2	.05
6	Remote Turret	1	.5	RE = 0.3	.05
6	Heavy Turret	2	.5	RE = 0.5	.05

TL: Tech level of first availability.
Type: Description of weapon mount.
Drag: Drag points.
Mass: Mass, in metric tonnes, of the mount, exclusive of ordnance.
Capacity: All gun mount capacities are given in terms of the recoil energy (RE) of the weapon placed in the mount. Recoil energy, for purposes of this rule, is defined as the required carriage weight, in tonnes, of the weapon. (The carriage itself is not mounted in the aircraft, as the gun mount takes its place.)

An aircraft may have fixed forward-firing weapons mounted with recoil energy equal to the loaded weight of the aircraft (in tonnes) times 0.2 at tech level 4 and equal to the loaded weight times 0.5 at tech level 5 and above.

Each small arm machinegun (less than 2cm in bore) counts as a recoil energy of 0.05 for purposes of gun mount capacity.

Price: Price, in millions of credits, of the mount, exclusive of weapons.

Ordnance Pods

Almost any weapon or piece of electronic equipment can be mounted in a streamlined pod and hung from a hardpoint. Weapons must include an ammunition supply while electronic equipment must include a power supply or have power needs modest enough to be supplied by the aircraft carrying the pod. Pods may be fitted with power-generating ram-air turbines to supply their own power needs. MW of power per pod is based on airframe type. Ram-air turbines do not function well in supersonic airflows.

Airframe	*MW*
Simple	0
Fast Subsonic	0.5
Transonic	1
Supersonic	0.5
Hypersonic	0

All pods add 10% to the mass, volume, and price of the components contained in the pod. Pods with ram-air turbines add 20%.

Fuel may also be carried in streamlined pods hung from hardpoints. These are called drop tanks and may only be carried on plumbed hardpoints. The mass and volume of the tank is equal to the mass and volume of the fuel carried multiplied by 1.1 and cost Cr1 per kilogram of mass.

Ordnance Racks, Launch Rails, and Hardpoints

TL	*Type*	*Drag*	*Mass*	*Capacity*	*Price*
4	FHP (dry)	(1)	0.02	2000 kg*	.002
4	IWHP (dry)	(1)	0.02	1500 kg**	.002
4	OWHP (dry)	(1)	0.02	500 kg***	.002
5	Wingtip Launch Rail	(1)	0.01	1×100-kg missile/rocket	.0001
5	FHP (plumbed)	(1)	0.03	2000 kg/liters*	.0025
5	IWHP (plumbed)	(1)	0.03	1500 kg**	.0025
5	Internal Bomb Bay	0	1.00	1 tonne bombs*****	.015
6	Triple Bomb/missile rack****	(2)	0.05	3 bombs/missiles (within hardpoint capacity)	.004
6	Multiple Bomb/missile rack****	(4)	0.1	6 bombs/missiles (within hardpoint capacity)	.008
7	Retractable Missile Bay	0	1.00	1 tonne missiles*****	.030

TL: Tech level of first availability.
Type: Description of weapon mount.
Drag: Drag points. Values in parentheses are only in effect when the rack, rail, or harpoint is loaded.
Mass: Mass, in tonnes, of the mount, exclusive of ordnance.
Capacity: Ordnance which can be carried by the mount.

* FHPs (Fuselage Hardpoints) may carry 2000 kg of ordnance (2000 liters of fuel if plumbed) *or* 10% of the aircraft's loaded weight, whichever is more.

** IWHPs (Inboard Wing Hardpoints) may carry 1500 kg of ordnance (1500 liters of fuel if plumbed) *or* 7.5% of the aircraft's loaded weight, whichever is more.

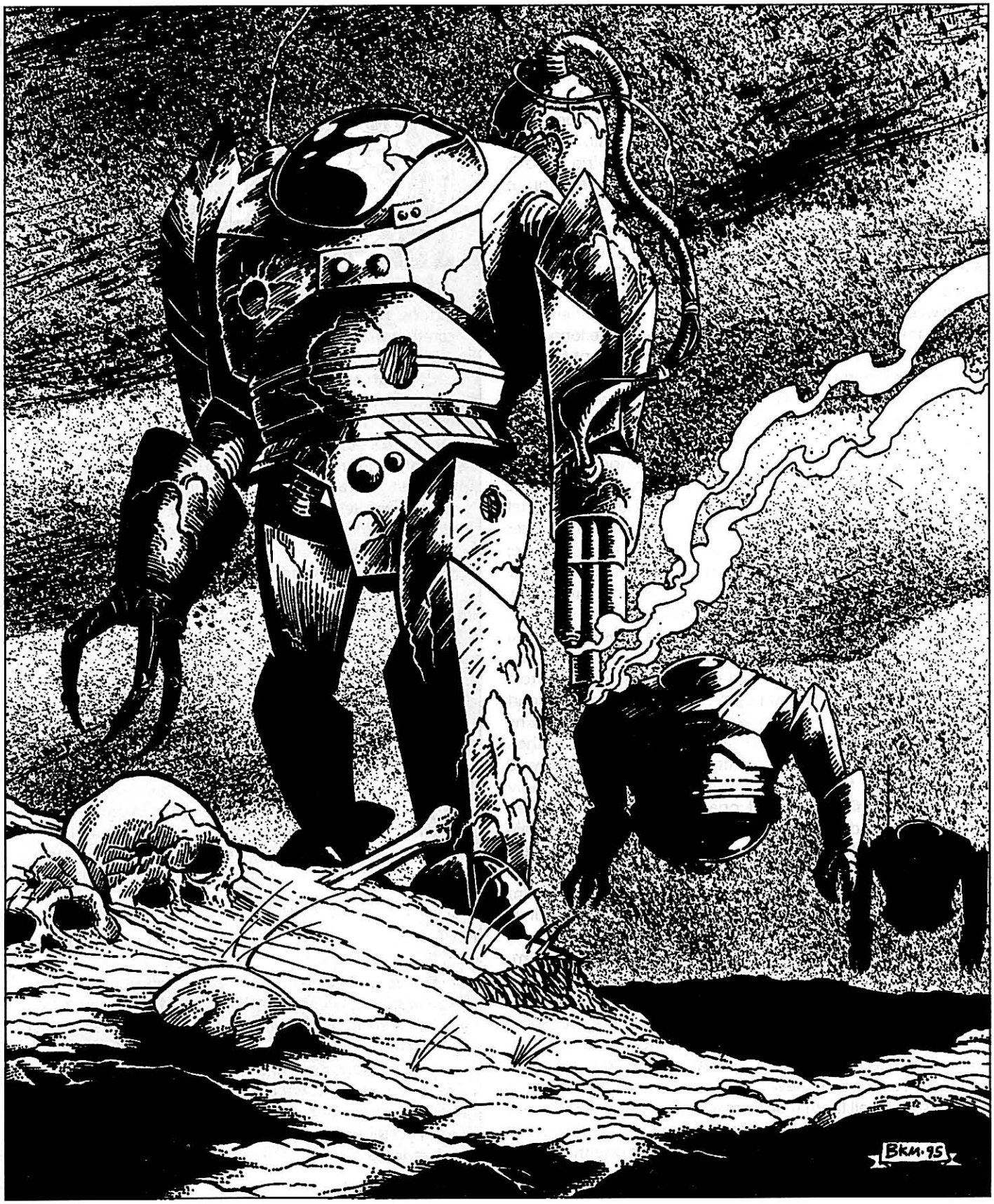
*** OWHPs (Outboard Wing Hardpoints) may carry 500 kg of ordnance *or* 2.5% of the aircraft's loaded weight, whichever is more.

****Racks are fitted to hardpoints to allow carriage of multiple weapons.

*****Capacity based on mass. Volume is assumed to be sufficient for indicated mass of ordnance.

Price: Price, in millions of credits, of the mount, exclusive of ordnance.

Robots





Q: It's hard to believe that you feel no hostility toward us when we are so actively engaged in combatting Virus. It's difficult to understand where your sympathies really lie, and why.

Sandman: It is really? If you saw a human homicidal maniac butchering helpless Aslan, and then saw Aslan warriors kill the human to stop him, where would *your* sympathies lie? With the dead Aslan victims or with the dead human maniac? If the human maniac resisted the Aslan warriors, which side of that fight would you feel compelled to join? With whom would you feel a greater sense of kinship?

Those aren't rhetorical questions. I'd like some answers, because if you really can't understand why I'm doing this, then I've fallen in with monsters.

First Interview with the Virus "Sandman," Part II (20/VII/1202), RCSA Archives

This section of **Vampire Fleets** deals specifically with robots. In general, the rules presented in the basic game are still followed, but with these modifications. Because ratings are different for robots under these modifications, the two robots presented in the basic game have been rerated and reformatted, and appear in the sample robot section of this chapter.

Melee Attacks: Each arm of the robot has a separate melee hit number, and this number is used in place of the Melee skill in all cases.

Robots may not conduct diving blows, but diving blows may be attempted against them. If hit by a diving blow, substitute the value (mass in kilograms÷10) for (Strength+Constitution), which is used to determine resistance to the blow.

Combat Damage: Robots now take different amounts of damage depending on their size. Hit location is still rolled (because armor strength may vary), and head hits still do double damage, just as with other NPCs. Hits are not kept track of separately for different body locations, but whenever damage produces a wound of a specific level (slight, serious or critical), it is assessed as damage of that level to the area hit by the shot. Any hit causes slight damage. Any hit after the first row of boxes is filled causes serious damage. Any hit after the second row of boxes is filled causes critical damage.

Note that after the second row of boxes is filled, additional individual hits no longer have to be recorded, as every hit will cause critical damage, and only the specific component damaged needs to be noted.

For example, a robot takes 10 hits on each row of the damage record. A four-hit damage result to the leg causes slight damage to the leg. An eight-hit damage result to the chest pushes the robot's total damage level above 10 and so counts as serious damage, destroying one weapon or damaging the batteries enough to cut the robot's speed in half. A five-hit damage to the arm would also count as serious damage, destroying any weapon or tool mounted on the arm. If the five-hit damage had been to the head, however, it would have caused 10 hits (double damage), pushing total damage to 22 or over the critical level, and so destroying the robot (since any critical damage to the head destroys it).

Movement: Robots move as vehicles, with a safe combat speed and a chance of mishap at higher speeds. All robots have an assumed skill level of 8 in "locomotion," the equivalent of vehicle driver. The robot's intelligence is its controlling attribute and that plus 8 is the robot's locomotion asset.

Fluency: How robots communicate is an important part of the manner in which players visualize them, especially sentient Virus-infected robots. Most robots have a very limited vocabulary. Robots with limited command functions can understand and communicate only a very small range of orders and modifiers to those orders, such as "halt," "turn left," etc. (about 100 words) .

Robots with basic command functions can interpret simple verb-object commands like, "Retrieve shipping container A-117," or "Display data on resistance activity." Conditional commands such as, "Remain here and work until completion of this task and then inform me, unless you detect Vargr in the area, in which case pretend to be repairing the circuity panel," cannot be processed or carried out reliably.

Only full command allows the robot to interpret a full range of language command phrases in complex and conditional sentences. Even then, the robot's vocabulary is limited to words needed to carry out its primary responsibilities, and it lacks the ability to communicate or understand concepts unrelated to its specialty. Only robots specifically programmed with linguistics have a wider vocabulary and ability to communicated.

Sentient robots (i.e., those infected by Virus) have a clear need to function beyond their area of specialization, but often lack the linguistic skills to do so. More sophisticated robots (those with an Intelligence of 5 or higher) are usually able to appropriate other memory fields for vocabulary and simply increase their vocabulary. Robots with an Intelligence of 4 or less but with full command capability cannot increase the absolute size of their vocabulary, but can broaden its application by erasing "unnecessary" words from their dictionary. This often results in ungrammatical but understandable sentence constructions. A robot might delete all but one form of each irregular verb to free up memory space, leaving "is" as its only present tense form of the verb "to be." ("You is wrong to say I is stupid because of how I talk.")

Robots with limited or basic command functions lack even this ability, and not only cannot broaden their vocabulary, they also lack the ability to form complex sentences (or thoughts), and they really are as stupid as they sound.



ROBOT DESIGN

This chapter constitutes a supplement to **Fire Fusion & Steel™ (FF&S)**, the **Traveller** technical architecture. It expands the design sequences in **FF&S** to include robots. **FF&S** is required to design complete robots, as that product contains information on suspension types, power plants, weaponry, communicators and other necessary devices.

A robot, for purposes of these rules, is defined as a device capable of locomotion which does not contain on-board provisions for a human operator. Robots may have an installed brain which operates the device according to a pre-set program, or it may be controlled by an operator (human or another robot brain) remotely. This second category of robots are also called slave robots, or "D-bots" (for dependent system robots) and are the first type available. (Remotely piloted aircraft are early examples of D-bots.)

Robot Vehicles and Aircraft: The following design sequence covers fairly small conventional robots. It is possible to design robot vehicles and aircraft as an alternative to these smaller robots. To do so, follow the normal design sequence for the vehicle or aircraft, but leave out all life-support and workstations and substitute a robot brain (Step 3 below).

Nonrobotic vehicles and aircraft may be converted to robots by adding a robot brain and a manual control interface. The manual control interface on aircraft adds 10% to the mass, volume and price of the controls, while on a vehicle it adds 1% to the mass, volume and price of the suspension.

Robot Chassis Size

Vol	*MV*
0.05	0.01
0.1	0.02
0.25	0.03
0.5	0.04
1	0.06
2	0.1
3	0.12
4	0.14
5	0.16
6	0.18
7	0.2
8	0.23
9	0.27
10	0.3
11	0.35
12	0.4
13	0.5
14	0.6

Vol: Internal volume (in kiloliters) of the chassis.
MV: Material volume (in kiloliters) of the chassis covering, assuming a uniform thickness of 1 cm.

Step 1. Chassis

The first step in the design is to determine the general size and general configuration of the chassis. Select a chassis size from the Chassis Size Table which follows.

Chassis size is measured in kiloliters (thousands of liters) of enclosed volume. (Each kiloliter of enclosed volume is equal to one cubic meter.) Therefore, a chassis with a size of 0.25 kiloliters would have 250 liters of total internal volume available for components.

The Chassis Size Table also indicates the volume of the material of the outer shell of the chassis, assuming a uniform thickness of 1 cm.

The table provides chassis sizes up to a total volume of 14 kiloliters. Robots may be designed using chasses which fall between two listed values on the table by means of interpolation. For larger chassis, use the values provided on the Vehicle Chassis Table in **FF&S** (page 17).

Once the chassis size is determined, the chassis itself is constructed by enclosing it with hull material, called plating. The Vehicle and Craft Construction Materials Table (**FF&S**, page 38) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter and price per kiloliter. Once the designer has decided on a thickness, multiply the chassis' material volume (MV) value by the plating thickness (in centimeters) to determine how many kiloliters of material is used for plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials Table to determine mass and price.

To determine the armor value of the chassis, multiply the plating thickness (in centimeters) by the toughness of the material used. Chassis plating may be thicker or thinner than 1 cm, but all robots must have a calculated armor value of at least 0.1.

If desired, the robot may have different armor values on different parts of its chassis. Multiply the total chassis material volume (MV) by the location multipliers shown below. Note that separate multipliers are used for walker robots and other suspension type robots.

Location	*Walker*	*Other*
Head	0.1	0.15
Chest	0.2	0.3
Abdomen	0.2	0.3
Arms	0.2	0.25
Legs	0.3	—

Calculated armor values of less than 1 but equal to or greater than 0.5 are treated as an armor value of 0. All armor with an AV of 0 has a parenthetical (i.e., melee only) armor value of 2. All armor with a calculated armor value of less than 0.5 has no value versus projectiles or energy weapons but has a parenthetical (melee only) value equal to its calculated AV multiplied by four and rounded to the nearest increment of 0.5. (Since



armor absorbs melee damage equal to twice its armor value, a value of 0.5 absorbs one hit.) Armor with a parenthetical armor value of less than 0.5 provides no protection. (Note that the minimum chassis thickness provides a calculated AV of 0.1, which produces a parenthetical armor value of 0.4.)

High-Performance Lift Robots: If a robot is to be designed using air cushion or CG lifters for its suspension, it may be designed as either a low-performance or high-performance model. Low-performance models have no additional requirements beyond that given above (as they are designed for fairly low-speed movement). High-performance models, designed for higher speeds, must have a streamlined chassis. Consult the Lift Vehicle Chassis Configuration Table in the lift vehicle design sequence (**FF&S**, page 22).

Step 2: Suspension

The suspension is the mechanism in contact with the ground, either directly (as with wheels, tracks or legs) or indirectly (as with air cushion of contra-grav lifting agencies). Different suspension types are available at different tech levels. Each suspension takes up a fixed proportion of the chassis volume. The Suspension Table lists those values as well as the mass and price per kiloliter of total chassis volume. For lift agency suspensions, the table also lists the power requirement and minimum installed volume of the mechanism.

Step 3: Control Systems

Autonomous robots (i.e., all robots aside from slave or D-bot models) require an artificial computer brain. Different brains of increasing sophistication (and expense) are available at different tech levels. The Robot Brain Table lists these brains along with their logic type, command type, intelligence, volume, mass and price.

Note that from TL12 on, each tech level at which there is a significant advance has a large, cheap brain and a smaller, more efficient, but much more expensive version, the difference being the proportion of more sophisticated synaptic processors and memory units used. All robot brains require 0.001 MW of power.

High-performance lift suspension robots also require flight computers and avionics, the same as for any other lift vehicle. Consult the Lift Vehicle Design Sequence (**FF&S**, page 24) and the chapter on control systems in **FF&S**.

Slave robots (D-bots) require the same internal control systems as do remotely controlled vehicles (see **FF&S**, page 47). If the D-bot is controlled by a master robot, that robot must have a communicator installed as well as any required flight computers.

Programing: The robot's programing is also determined at this time. Programing is the skill level assigned to the robot. The intelligence characteristic of the robot is both the number of different skills (programs) which may be given to the robot and the controlling attribute for all skills for purposes of determining the robot's asset level.

Each skill costs Cr1000 to install plus Cr1000 per skill level up to the robot's intelligence, and Cr5000 per level above that.

SUSPENSION

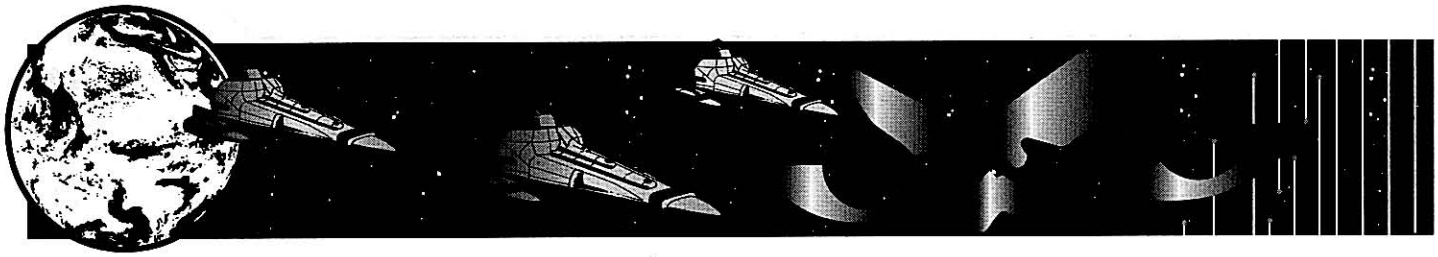
Type	*TL*	*Vol*	*Mass*	*Price*	*MW*	*Min Vol*
Restricted Wheel	5	0.1	0.02	0.00003	—	—
Wheel	5	0.15	0.03	0.00004	—	—
Cross-Country Wheel	5	0.2	0.04	0.00005	—	—
Track	7	0.2	0.3	0.0001	—	—
Leg	8	0.2	0.2	0.0002	—	—
Air Cushion	6	0.3	0.06	0.0003	0.007	1
Standard CG	9	0.04	0.03	0.0014	0.021	1
Improved CG	10	0.02	0.02	0.0018	0.014	0.3
High Efficiency CG	12	0.02	0.01	0.002	0.007	0.03

TL: Tech level of availability.
Vol: Volume of suspension in kiloliters per kiloliter of total chassis volume.
Mass: Mass in tonnes per kiloliter of total chassis volume.
Price: Price in millions of credits per kiloliter of total chassis volume.
MW: Power requirement in MW per kiloliter of total chassis volume.
Min Vol: Smallest installed suspension volume allowed.

ROBOT BRAIN

TL	*Logic*	*Command*	*Int*	*Vol*	*Mass*	*Price*
8	Low Data	Limited	1	.006	.001	0.01
9	High Data	Basic	2	.010	.002	0.06
11	High Data	Basic	4	.002	.002	0.80
12a	Low Autonomous	Full	3	.022	.005	0.17
12b	Low Autonomous	Full	5	.005	.003	1.66
13a	High Autonomous	Full	4	.022	.005	0.30
13b	High Autonomous	Full	6	.006	.004	1.91
17a	Low AI	Full	6	.020	.006	1.12
17b	Low AI	Full	7	.006	.004	2.18
18a	High AI	Full	8	.020	.006	1.48
18b	High AI	Full	9	.006	.005	2.45

Vol: Volume of brain in kiloliters.
Mass: Mass in tonnes.
Price: Price in millions of credits.



Any skill level may be chosen from 0 to 10.

Prohibited and Restricted Skills: All skills from the skill clusters Determination, Fine Arts, Melee, Tactics and Vice are *prohibited* skills for robots. These skills may not be installed at all. All skills from the skill clusters Charm, Interaction and Animal Handling are *restricted* skills for robots. These skills cost twice as much to program as do normal skills and may only be installed to a maximum skill level of 5.

Linguistics (a restricted skill due to its place in the Interaction skill cluster) at skill level 0 allows the robot to speak its primary language fluently. Each skill level above 0 adds an additional language, all of them spoken fluently. Voice and pattern recognition are additional skills available to robots. Each of these skills at level 0 allows the robot to "understand" voice commands or distinguish objects (given audio or video sensors). Higher levels are treated as Observation skill.

Step 4: Electronics

Electronics fall into four categories: communicators, sensors, electronic countermeasures (ECM) and electronic counter-countermeasures (ECCM).

Players should be familiar with the **Traveller** combat rules for how communicators, sensors, ECM and ECCM systems work in order to decide which of these systems to install. All these systems are covered in the electronics chapter of **FF&S**.

In addition to the large sensors provided in **FF&S**, all the cyber head options (page 82), except for subdermal armor, are available as smaller sensors. ("Neural jack" is instead called a data socket.) The tech level of "slick" availability as well as the number of spaces required are irrelevant to robot design, and all of these items become available as robot sensors one tech level earlier than the listed "hard" option availability. The basic visual sensor (listed under cyberware as visible spectrum eye) becomes available at TL8. The following small sensors are available as well:

TL	*Type*	*MCr*
8	Smoke/gas detector	0.001
8	IR motion detector	0.003
8	Magnetic sensor	0.001
8	Radiation sensor	0.002
9	Tactile sensor	0.1*
9	Taste sensor	0.002
10	Ultrasonic motion detector	0.02

*The cost of a tactile sensor is this value multiplied by the MV value of the robot's chassis. If only the tips of arms and other key locations have tactile (touch) sensitivity, multiply this value by 0.1.

All small sensors, both from the cyber chapter and listed above, mass 0.0005 tonnes, consume 0.0005 kl of internal volume and have negligible power requirements.

Step 5: Weaponry

Robots may be equipped with a wide variety of weapons. All of these are covered in the weaponry section of **FF&S** (pages 91+), except for defensive screens, which are covered in the defenses chapter (**FF&S**, pages 56-60). A number of special considerations apply to robot-mounted weapons, however.

Attachment: Most firing weapons are attached to the torso of the robot, but they may be mounted on an arm instead. All melee weapons must be mounted on arms. An arm may not have weapons mounted on it which mass more than half the lifting capability of the arm, and the mass of the weapon then reduces the lifting capability of the arm by that amount.

Recoil: Excessive recoil force of a weapon may unbalance a robot or damage its chassis. To avoid this, there is an upper limit on total recoil force of installed weapons of one per 100 kg of total robot mass. However, the effective mass of the robot for purposes of recoil is divided by two if a walker suspension is used and by 10 if a lift (air cushion or CG) suspension is used. Note that this may require tinkering with the design later based on final mass of the robot.

Weapon Stabilization: Stabilization gear enables a robot to fire its weapons while moving; the Stabilization Table (see the fire control chapter of **FF&S**) lists the characteristics of stabilization gear at different tech levels. If the weapon is mounted on an arm, the mass of the stabilization gear is not added to the arm.

Weapon Volume: The volume of the installed weapon in kiloliters is equal to its leaded mass in tonnes.

Step 6: Peripherals

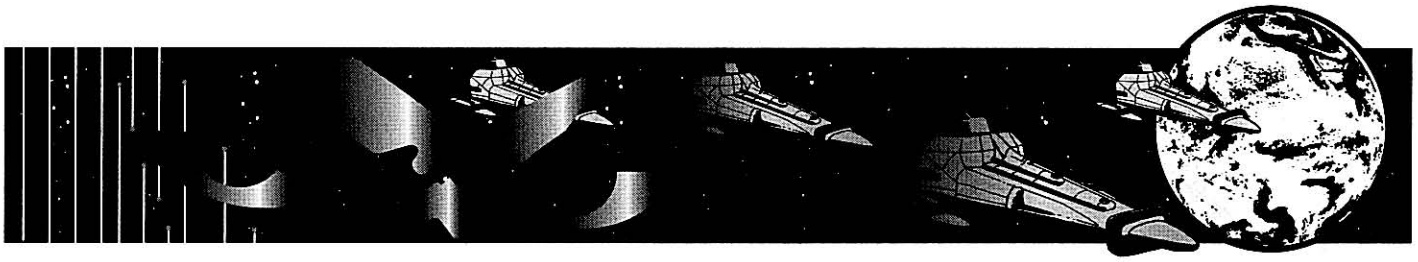
The main peripherals for a robot are its arms (if arms are installed). Designers choose the number of arms installed and the volume devoted to each arm, then specify what percentage of the volume of the arm is devoted to articulation and what percentage to power. The volume must be divided between these two design areas in even increments of 10%.

The agility of the arm is the percentage of it devoted to articulation divided by 10. In other words, an arm with 30% devoted to articulation would have an agility of 3.

The Strength of the arm is the total volume in liters devoted to power. When determining the STR attribute of the robot, round this value to the nearest whole number (but never less than 1). When determining lifting ability of the arm, retain the original fractional result. The lifting capability of the arm, in kilograms, is its original calculated Strength multiplied by 50.

CG-lifted robots may usefully mount magnetic grapples as a means of anchoring themselves to a wall or bulkhead. These arms are usually short, feature very little articulation (10% is all that is required), and feature a grasping hand as well as a magnet as a backup for nonferrous surfaces. The lifting capacity of the arm is the maximum mass which it can hold steady. Usually this means that the arm must have lifting strength equal to 10% of the mass of the robot plus 100 or more kilograms, if the robot is also expected to restrain humans.

The mass of an arm in kilograms is its volume in liters multiplied by 2. The price of an arm in credits is its volume in liters multiplied



by 100. The following peripherals may be installed as well:

TL	Vol	MCr
8	Siren	0.0001
8	Paint pellet gun	0.0001
8	Chemical projector	0.0001
8	Strobe/flasher	0.0001
8	Voder/speaker	0.001
8	Odor emitter	0.0005
8	Video display	0.0005
8	Laser cutter/welder	0.008
13	Holodisplay	0.015

All these peripherals mass 0.0005 tonnes, consume 0.0005 kl of internal volume and have negligible power requirements.

Step 7: Power Plant

The robot needs a power plant to provide electrical energy to various subsystems as well as to power the suspension. A variety of power plants are available and are detailed in the power production chapter (Section 8) of **FF&S**.

Grav and air cushion robots also require thrust, as their suspensions serve only to hold them up, not move them forward. The power plant on these vehicles is modified to provide thrust by the addition of propellers or a combustion chamber. The variety of thrusters available is detailed in the sub-light (maneuver) drive chapter (Section 9) of **FF&S**. The optional ducted fan lifters may be used as thrusters on robots.

Fuel tankage for the power plant (and thruster, if applicable) is calculated at this time.

Step 8: Transmission

Robots with a nonlift suspension must have a transmission. The size of the transmission depends on the type of suspension, tech level of the robot and output of the power plant.

Robot Transmissions

TL	Type	Vol	Price
7+	Wheel	0.5	1500
7+	Tracked	0.3	1500
8	Walker	8	10,000
9	Walker	2	2500
10+	Walker	0.4	675

TL: Tech level of availability.

Vol: Volume (in kiloliters) of the suspension per MW of power output.

Price: Price (in Cr) per kiloliter of installed transmission.

Mass: Mass (in tonnes) of the transmission is equal to its volume in kiloliters.

Step 9: Cargo

All remaining volume may be allocated to ammunition stowage, cargo space, ballast or declared waste volume. Waste volume has no effect on the design.

Ammunition stowage has no cost but adds the mass of the ammunition to the loaded mass of the robot.

Cargo volume has no cost but adds to the loaded mass of the robot. Multiply the cargo volume, in cubic kiloliters, by 0.25 to determine the addition, in metric tonnes, to the robot's loaded mass. Tools are usually carried in the robot' internal cargo volume.

Ballast is added by filling the volume with one of the hull materials and calculating its price and mass. Ballast is rarely added to a robot, but may be used to increase its ability to absorb weapon recoil.

DESIGN EVALUATION

Once the design is complete, you need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price and mass of all the components. This is your chance to make sure the robot's internal occupied volume is within what is allowed by the size of the chassis. This step also provides you with a total mass and price.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as armor values, weapon statistics, performance of installed electronics, etc.

Multiply the volume of the original chassis by two and note the result as its transport volume (the space taken up in the hold of a starship or transport vehicle). At the same time, total the price of the robot and its empty and loaded masses. Empty mass is the robot without any ammunition, fuel or cargo. This is essentially the mass of the robot as it comes off the assembly line, and is also what it weighs when being transported. Loaded mass includes a full load of ammunition, fuel and cargo. This is its typical mass when in operation.

Flotation: Divide the chassis volume (in kiloliters) by the robot's loaded mass (in metric tonnes). If the result is greater than 1, the robot floats; if it is 1 or less, the robot will not float.

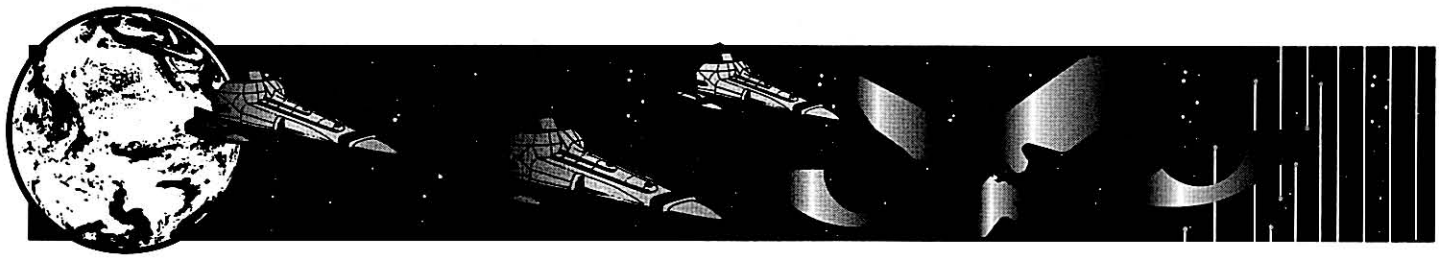
Suspension Damage Resistance: Compute suspension damage resistance (SDR). For tracked vehicles, this is used as the suspension armor value; for wheeled, walker and air cushion robots, this is used as the critical damage level (see **TNE** page 300). CG robots do not have a suspension damage resistance.

Suspension damage resistance is based on the robot's chassis size in kiloliters as chosen in Step 1. Round fractional results to the nearest whole number, but critical damage levels may never be less than 1.

Tracked SDR=chassis size×0.14.

Wheeled SDR=1×chassis size×0.07.

Air cushion & walker SR=chassis size×0.07.



3A. Determine Ground Movement

Movement of robots with ground contact suspensions (wheels, tracks and legs) is based on top road speeds and cross-country speeds, both of which are determined by the robot's loaded power-to-weight ratio as well as its suspension. For purposes of the power-to-weight calculations, the robot's motive power is the total output of its power plant minus energy used to run other systems (such as electronics, weapons, etc.).

Road Speed

Base road speed in kilometers per hour=5+([MW÷LM]) ×2500).

MW: Robot motive power in megawatts.

LM: Loaded mass of the robot in metric tonnes.

Tracked and wheeled robot modifiers:
Each tech level above 5, +1 kph.
If wheeled, +10 kph.
If light wheeled*, +15 kph.
If legged, ×0.25 kph.

*To qualify for the light wheeled bonus, the robot must be equal to or less than the listed mass (in metric tonnes) for its tech level, as shown on the following table:

Light Wheeled Robots

TL	*Mass*
5	5–
6	10–
7	15–
8	20–
9	25–
10	30–
11	35–
12+	40–

TL: TL of construction

Mass: Maximum weight of a light robot at that tech level.

Cross-Country Speed

Legged robots have the same mobility cross-country as they have on a road. Wheeled robot cross-country mobility depends on the type of suspension used.

Type	*Cross-Country*
Restricted Wheel	0.1
Wheel	0.2
Cross-country wheel	0.4

Type: Suspension type installed on the robot.

Cross-Country: Cross-country speed in kph equals road speed times this multiplier.

Tracked robot cross-country mobility depends on the power-to-mass ratio of the robot.

P/M	*T*
.001-.0039	0.4
.004-.0079	0.5
.008-.0119	0.6
.012-.0159	0.7
.016+	0.8

P/M: Power-to-mass ratio. Divide the robot's motive power in megawatts by its loaded mass in tonnes. Use the line which includes the result.

T: Tracked movement multiplier. Cross-country speed in KPH equals road speed times this multiplier.

Water Speed: Tracked robots without auxiliary water propulsion and wheeled robots with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.1. Tracked robots with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.2.

Combat Move: The combat movement (in meters per turn) is the robot's maximum speed, in kilometers per hour, multiplied by 0.463, rounding the result to the nearest increment of five. This calculation is made separately for road and off-road movement based on the maximum road and off-road speeds. The robot's combat move in the water is equal to its water speed in kilometers per hour multiplied by 1.39.

Travel Move: The robot's travel movement rate (in kilometers per four-hour period) is equal to its combat move (in meters per turn) multiplied by 4.32, rounded to the nearest increment of five.

3B. Determine Lift Movement

Movement of robots with lift suspensions is based on their thrust. The G rating of a lift robot is its total thrust in metric tonnes divided by two times its chassis volume (in kiloliters). Its maximum speed (in kilometers per hour) in an atmosphere is determined as follows:

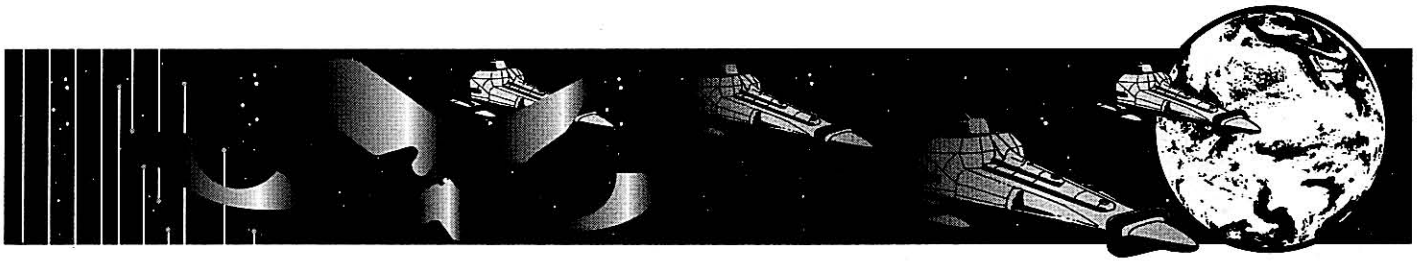
If G=1 or less, speed=G×3500.
If G=2 or less, but more than 1, speed=3500+(1200(G-1)).
If G=more than 2, speed=4700+(600(G-2)).

Maximum speed cannot be greater than the maximum design speed of the chassis type. For low-performance robots, the maximum design speed is 100 kph. For high-performance robots, the maximum design speed is based on the chassis configuration decision.

Maximum speed for high-performance robots is reduced by drag. Note the total number of drag points from the weapons mounts installed, again both with and without external stores. Reduce the maximum speed by 1% for each drag point.

Cruising Speed: A lift robot's cruising speed is 75% of its maximum speed.

NOE Speed: Only CG robots have an NOE speed. CG



robots have a safe NOE speed equal to the maximum allowed by their terrain-following avionics (40 kilometers per hour if no avionics are installed) or one-quarter of their maximum speed, whichever is less.

Combat Move: The safe NOE combat movement (in meters per combat turn) is equal to the robot's maximum NOE speed (in kilometers per hour) multiplied by 1.39, rounded to the nearest whole number. The high-mode combat movement (in meters per combat turn) is equal to the robot's maximum flight speed (in kilometers per hour) multiplied by 1.39.

Combat movement (in meters per combat turn) for an air cushion robot is maximum speed (kph)×0.463 for road speed, and cruising speed×0.463 for cross-country speed. Cross-country speed is also cross-water speed.

Travel Move: The high mode travel movement rate (in kilometers per four-hour period) for a CG robot is equal to the cruising speed (in kilometers per hour) multiplied by four. The NOE mode travel movement rate (in kilometers per four-hour period) is equal to the safe NOE speed (in kilometers per hour) multiplied by six.

Travel movement for an air cushion robot (in kilometers per four hours) is 4.32 times its combat movement as calculated above.

4. Mental Characteristics

Record the Intelligence (INT) of the brain, the command type available (limited, basic or full), and all programing asset levels. (The asset level of a program is the program skill level plus the INT value of the robot brain.)

Note that the INT value of the robot is also used as its Initiative rating in combat.

5. Firing Characteristics

Record the firing characteristics of each mounted weapon as well as the effects of installed stabilization and fire control.

6. Melee Characteristics

Robots conduct melee attacks with their arms. Since different types of arms may be mounted on a robot, each arm is rated separately for hit chance, unarmed damage and melee weapon.

Hit Chance: The actual Agility of the arm (from 0 to 10) is treated as a skill, and the robot's Intelligence is treated as the controlling attribute in determining the actual chance of hitting with the arm. Agility and Intelligence are added together and used as an asset with either an armed or unarmed melee attack with that arm. Each arm may have a separate hit chance.

Unarmed Damage: This is the damage inflicted by an arm if it hits in an unarmed melee attack. It is calculated by multiplying the STR whole number value of the arm by the AGL value of the arm by 0.1 and rounding to the nearest whole number. However, the value is never rounded down to 0 if it has a fractional value greater than 0.

Melee Weapon: If a melee weapon is mounted on the arm, it is noted here. Its closest equivalent to a human-carried melee weapon is used to help visualize it and rate it. The following additional melee weapon values are noted:

Range: Any melee weapon mounted on an arm displacing 10 liters or more is a "long-range" melee weapon, provided it is the only weapon mounted on the arm. All other melee weapons are short range.

Damage: Improvised weapons of limited lethality (such as screwdrivers or small surgical knives) have a damage value of 1D6–1 or 1D6–2. More lethal weapons have the damage value shown on the melee weapon table in the basic rules. Weapons which rely on STR to augment damage use the STR rating of the arm on which the weapon is mounted.

Note that there are no longer any hit modifiers for weapon type, as this is now built into the agility of the arm mounting the weapon.

7. Damage Capacity

The damage capacity of the robot is the number of hits it takes before being completely wrecked. Multiply the enclosed volume of the robot (in liters) by 0.02 and round to the nearest whole number. The result is the number of hit boxes used in each of the two rows of the NPC hit record. As a reminder that the value is used in each row, it is written twice and separated by a "+."

For example a 250-liter robot would have a damage capacity of "5+5."

8. Maintenance Points

Divide the loaded mass of the robot by the tech level modifier appropriate to the tech level as shown below.

TL	*Maint Modifier*
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

Any robot which has two full-size computers (model St or Fb) installed should divide this result by four to get final maintenance points.

Note that maintenance points may be temporarily increased by environment (see carrier aircraft, **FF&S** page 30, atmospheric performance, **FF&S** page 64, and **TNE** page 309.)

Robots with ground contact suspensions constantly exposed to saltwater use different multipliers for saltwater corrosion: 3 and 1.5 rather than 5 and 2 (page 30).

Appendix I: Design Sequence Upgrades

When designing vehicles for **Striker II** using the design sequences in **Fire, Fusion & Steel**, the **Traveller** technical architecture sourcebook, the following additional guidelines should be used.

GRAV VEHICLE DENSITY AND G RATING

When determining lift vehicle movement, thrust is usually divided by 10 times the vehicle's volume in displacement tonnes to determine G rating. However, this procedure should not be used for very dense grav vehicles, those massing 15.5 or more mass tonnes per displacement ton.

Divide the grav vehicle's loaded mass by its volume in displacement tonnes. If the result is less than 15.5, use the normal procedure described above. If the result is 15.5 or more, G rating is determined by dividing thrust in tonnes by the vehicle's loaded mass in tonnes.

TURRET SIZE

In some cases, designating a turret as a small turret (and therefore requiring its components to take up 10 times their volume) results in the turret being larger than the maximum 10% of vehicle volume. However, when recalculating the turret's volume as a main turret (usually requiring its components to take up 2 times their volume), the turret then falls below the 10% threshold and becomes classified as a small turret again. In such cases, threat the turret as a main turret (using the main turret volume multiplier), but this turret must be the only turret on that vehicle, and the vehicle is then classified as having a *small turret* for purposes of target type in the vehicle damage sequence.

DIRECT ENERGY INPUT LASER HOMOPOLAR GENERATORS

Large direct energy input lasers with trainable focal arrays may be designed for turret mounting in ground vehicles. When fitting these weapons to the vehicles, the laser' homopolar generator need not be placed in the turret, nor have its mass accounted for in the weapon stabilization calculations.

NUCLEAR DAMPERS

The design sequence in **Fire, Fusion & Steel** is based on the assumption that the dampers will be used for space combat, and assumes a rate of fire of one shot per three minutes (10 shots each 30 minutes). Higher rates of fire require a larger power input and a larger nuclear damper. Choose the ground combat rate of fire desired from the table below, and find the volume multiplier that corresponds to it. This volume multiplier is applied to the volume value derived from the Nuclear Damper Design table on page 57 of **Fire, Fusion & Steel.**

The input multiplier is applied to the MW required by the damper from the power plant. Note that this power multiplier is applied *after* the volume multiplier above is applied, and not in combination with it.

If the nuclear damper is to be fitted with weapon stabilization, only its basic mass (before the volume multiplier is applied) is counted against the stabilization requirement.

For example, a TL15 3000km short-range nuclear damper with a ground ROF of SA1 has a volume of 13.2 m^3, draws 10.8 MW, and costs 16.8 MCr (exclusive of beam pointer and workstation). For purposes of fitting weapon stabilization, it has a stabilized mass of 3.3 tonnes (plus its beam pointer mass of 0.15 tonnes).

This procedure may also be used to design starship-mounted nuclear dampers. In this case the increased rate of fire is reflected in –Diff Mods to nuclear damper task rolls in space combat.

Space Cbt ROF	*Ground Cbt ROF*	*Vol Mult*	*Input Mult*	*Space –Diff Mods*
10	1/36	×1	×1	—
30	1/12	×1	×3	—
(50)	N/A	N/A	N/A	–1
60	1/6	×1	×6	–1
90	1/4	×1	×9	–1
(100)	N/A	N/A	N/A	–2
120	1/3	×2	×12	–2
180	1/2	×2	×18	–2
(200)	N/A	N/A	N/A	–3
360	SA1	×4	×36	–3
(400)	N/A	×4	N/A	–4
720	SA2	×8	×72	–4
(800)	N/A	×8	N/A	–5

STABILIZED MISSILE LAUNCHERS

Missile launchers need not be stabilized so long as their sights and control units and designators are, except that missile launchers in turrets do require stabilization.

DRONE MISSILES

Drone missiles are remotely piloted "kamikaze" grav vehicles that use contra-grav lifters for movement through most of their mission, but accelerate to their maximum speed for the final flight into their targets.

Drone missiles are constructed partially as grav vehicles and partially as missiles. Although they are designed based on volume like grav vehicles, they do not require hull material volume or armor to be allocated, and they do not suffer volume losses to waste volume or hull slope. However, although they do not have material allocated for their airframes, like missiles, they are assumed to have airframe structures abstracted into the other materials purchased.

Each drone missile consists of a drone brain, one or more communicators, a warhead, contra-grav lifters, a mode of propulsion (usually a jet engine), batteries to power the lifters and communicators if the propulsion does not meet these needs, and fuel for the propulsion system.

The missile's maximum speed is calculated as if it were a grav vehicle, by dividing its thrust by its volume or mass (see grav vehicle density, above). Its cruising speed is one-quarter this speed, or 200 kph, whichever is less. This is the speed at which the missile always flies until it attacks its target. This speed is considered to be flown at NOE.

Drone Missile Brains

TL	*Mass (kg)*	*Vol (m^3)*	*MCr*	*Agility Bonus*
13	20	0.02	0.1	+3
14	10	0.01	0.1	+4
15	5	0.005	0.1	+5

Drone missiles are launched from Tac missile launchers designed using the normal procedures, although the launcher need not contain any particular control units. Drone missiles do require control stations, usually fitted within the launch vehicle.

A remote drone missile control station consists of a normal workstation, a flight computer of the same tech level as the drone brain, and one each of all communicator types installed on the drone missile. Flight computers and communicators may not be shared among multiple control stations. A single drone missile control stations may control a certain number of missiles per turn depending upon tech level.

Appendix I: Design Sequence Upgrades

TL	Missiles per Turn
9	2
10-11	3
12-13	4
14	5
15-16	6
17-18	7
19+	8

DIRECT FIRE ROCKET LAUNCHERS

Unguided rockets are inherently inaccurate at long ranges. The short and medium range bands for direct fire rockets are calculated normally. However, direct fire rockets have no long or extreme range bands, so may not be fired in direct fire mode at longer than medium range.

PUTTING THE HEAT BACK INTO PLASMA

One of the most consistent requests we receive with respect to the equipment in **Traveller® the New Era** is to increase the effectiveness of high energy weapons. Although we're reluctant to tinker with design sequences and published equipment, the pressure for tougher fusion and plasma rifles has been almost irresistible.

Never let it be said that we don't listen to customers. In fact, the well-known third law of retail sales is "Always listen to your customers." (The first law is "Never kill a customer." The second law is "You break it, you buy it.") So we took a good look at man-portable high energy weapons and concluded that, although they weren't as good as grenade launchers, at least they were real expensive. Hmmm. Perhaps, we decided, there was something to all those annoying complaints after all. The following modifications refer to pages in the **Fire, Fusion, & Steel** high energy weapon design sequences.

Page 67 (Explosive Power Generation)

Change the mass of EPG cartridges to volume x4 (instead of volume x8).

Page 121 (High Energy Weapons)

Range: Short range for plasma guns is now *100 x the square root of pulse energy in Megajoules* (instead of 30 x pulse energy).

Short range for fusion guns is now *150 x the square root of pulse energy in Megajoules* (instead of 50 x pulse energy)

Damage: Damage value (D) is now *30 x the square root of pulse energy in Megajoules* (instead of 11.5 x the square root of pulse energy)

Page 122 (High Energy Weapons)

Penetration: The penetration rating for *both* plasma and fusion guns is now 1-2-10.

Price: The revised component price multipliers for plasma and fusion guns are shown below.

Component	Plasma	Fusion
Firing Unit	600	1000
Support Hardware	600	1000
Gyro-Compensator*	600	600
Inertial Compensator*	1000	1000
Recoil Cradle	25	25
Towing Carriage	2	2
Autoloader	10	10
Gun Shield	1	1

All plasma and fusion weapons appearing in **Striker 2** have been rated according to this upgraded standard. The charts below will allow owners of **Traveller: the New Era, Smash & Grab,** and the **Reformation Coalition Equipment Guide** to update the values for previously published high energy weapons.

				Weight				Price	
Weapon	TL	Pulse	Ammo	Empty	Ldd	BP	Mag	Wpn	Ammo
4.3 cm Plasma Rifle	12	0.6	4.3 PPC	2.4	15.65	4.8	10	4320	15/211
4.7 cm Plasma Rifle	13	0.8	4.7 PPC	3.2	36.2	4.8	20	4800	20/539
4.7 cm Fusion Rifle	14	1.2	4.7 PFC	4.8	37.8	4.8	20	9600	9.6/331
4.1 cm Plasma Rifle/cmp	14	0.8	4.1 PFC	3.2	12.9	6.4	8	10,880	6.4/98
4.7 cm Fusion Rifle/comp	14	1.2	4.7 PFC	4.8	19.4	9.6	8	24,000	9.6/147
5.1 cm Fusion Rifle/comp	15	1.5	5.1 PFC	3	21.2	6	8	15,000	12/183
10cm Plasma Bazooka	10	2.88	10 PFC	34.6	45	—	1i	20,736	518.4
4cm Fusion Rifle/c (Droyne)	15	0.75	4.0 PFC	1.7	12.74	3	10	9500	6/111

Weapon	ROF	Dam	C-B	Pen Rtg	Pen Val	Blk	Mag	Recoil	Range
4.3cm Plasma 12	SA1	23	—	1-2-10	23-23-12-2	5	10	11	80
4.7cm Plasma 13	SA1	27	1-5	1-2-10	27-27-14-3	5	20	8	90
4.7cm Fusion 14	SA1	33	1-5	1-2-10	33-33-17-3	5	20	8	160
4.1cm Plasma 14c	SA1	27	1-5	1-2-10	27-27-14-3	4	8	5	90
4.7cm Fusion 14c	SA1	33	1-5	1-2-10	33-33-17-3	5	8	5	160
5.1cm Fusion 15c	SA1	37	1-5	1-2-10	37-37-19-4	3	8	4	180
10cm Plasma Bazooka	SS	51	3-5	1-2-10	51-51-26-5	5	1i	—	170
4cm Fusion 15c (Droyne)	SA1	26	1-5	1-2-10	26-26-13-3	2	10	5	130
125-Mj Fusion Gun (Intrepid)	SA2	335	112-35	1-2-10	335-335-168-34	—	200	—	1680
4.75-Mj Plasma (Mongoose)	SA1	65	4-5	1-2-10	65-65-33-7	—	300	—	220
14-Mj Plasma (Ferret)	1/2	112	13-15	1-2-10	112-112-56-11	—	300	—	370
12-Mj Plasma (Pyrrhus)	SA1	104	11-15	1-2-10	104-104-52-10	—	400	—	350
76-Mj Plasma (Victrix)	SA5	262	69-25	1-2-10	262-262-131-26	—	100	—	1310
2-Mj Plasma (G-Carrier)	SA1	42	2-5	1-2-10	42-42-21-4	—	200	—	140



APPENDIX 1
Standard Socket-Sized Weapons and Defenses for Installation Aboard Spacecraft

Sandcasters for Standard Turret Sockets

TL	Price	Cannisters Carried	Beam Reduction
8	0.6	16	1D6×6
9	0.65	18	1D6×5
10	0.7	20	1D10×5
11	0.75	24	1D10×5
12	0.8	30	1D10×5
13	0.85	35	2D6×5
14	0.9	40	2D6×5
15	1	50	2D10×5

Price: Price of turret in millions of credits; **Cannisters Carried:** Number of sand cannisters carried in turret; **Beam Reduction:** Beam reduction made per successful beam interception

Turret and Barbette Socket Missile Launchers

Type	TL	Missiles	Volume	Weight	Power	Price
Turret	8	2	42	28.4	0.15	0.08
Barbette	8	5	84	70.4	0.15	0.11

Volume: In kiloliters; **Weight:** In tonnes; **Power:** In megawatts; **Price:** In millions of credits (without missiles)

Nuclear Dampers for Standard Turret and Barbette Sockets

TL	Description	Mass	Price	Power
12	Damper Barbette	75.2	1.95	15
13	Damper Barbette	72.2	2.7	9
14	Damper Barbette	60.2	4	6
15	Damper Turret	33.2	4.5	3

Mass: In tonnes; **Price:** In millions of credits; **Power:** In megawatts

Sample Space Missiles for Socket Missile Launchers

TL	Guidance	Yield	Mass	MCr	G-Turns	Hits	Damage	Range	Comm	Sensor	Signatures
8	Controlled	50	7	0.85	10/10	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
9	Controlled	50	7	0.85	12/12	1D6	1/14-43	0	10L	—	+2/+2/+2/+2/+1
11	Controlled	100	7	0.95	12/12	1D6	1/18-56	0	10L	—	+2/+2/+2/+2/+1
12	Semi-Ind.	500	7	2.0	8/8	1D6	1/25-79	0	10L	1P	+4/+3/+4/+3/+1
13	Controlled	200	7	1.15	12/12	1D6	1/21-66	0	10L	—	+2/+2/+2/+2/+1
14	Semi-Ind.	500	7	2.7	8/8	1D6	1/25-79	0	10L	3P	+4/+3/+4/+3/+1
15	Controlled	500	7	1.25	12/12	1D6	1/25-79	0	10L	—	+2/+2/+2/+2/+1

Yield: Warhead yield; **Mass:** In tonnes; **MCr:** Price in millions of credits; **G-Turns:** Number of G-turns of fuel carried (followed by maximum number of G-turns which can be used in a single turn; **Hits:** Die roll for number of hits from the laser; **Damage:** Damage value of each laser hit; **Range:** Absolute range in hexes (0 = same hex only); **Comm:** Type of communicator (L = laser, M = maser, R = radio); **Sensor:** Sensor range (in hexes) and type (R = radar, T = high-resolution thermal, L = ladar, A = active EMS, P = passive EMS); **Signatures:** Missile's signature vs. radar, active EMS, HRT, passive EMS, and fire

Sample Standard Turret and Barbette Socket Lasers

TL	Description	MW	MCr	Mass	Short	Medium	Long	Extreme
10	60-Mj laser turret	1.7	1.56	55	1:1/6-19	2:1/6-19	4:1/3-9	8:1/2-5
11	80-Mj laser turret	2.2	2.08	59	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10
11	150-Mj laser barbette	4.2	6.56	119	10:1/10-31	20:1/5-17	40:1/3-8	80:1-4
12	120-Mj laser turret	3.3	0.94	65	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9
13	150-Mj laser turret	4.2	0.72	68	1:1/10-31	2:1/10-31	4:1/10-31	8:1/10-31
13	106-Mj laser turret	2.9	1.45	59	10:1/8-26	20:1/6-20	40:1/3-10	80:1/2-5
14	150-Mj laser turret	4.2	0.72	63	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
14	300-Mj laser barbette	8.3	2.16	131	10:1/14-43	20:1/14-43	40:1/8-26	80:1/4-13
15	150-Mj laser turret	4.2	0.86	57	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

MW: Required power input in megawatts; **MCr:** Price in millions of credits; **Mass:** In tonnes; **Short, Medium, Long, Extreme:** Combat performance at these ranges: range in hexes: penetration rating-damage value.

Note: These weapons are the same as those published, with slightly different details, in **Brilliant Lances and first printing** TNE. The differences are due to slightly different rounding conventions from an earlier version of the design sequence. These have been changed in order to give the designer greater control over details of the design. These figures are calculated using the sequences in this book, are official changes, and will be incorporated into future printings of these products. However, players may continue to use the **earlier** values, as the number of different designs and weapons manufacturers in charted space will result in reasonable variation in performance details.



APPENDIX II
1 Using Alternate Technologies

To make alternate technologies easy to integrate in your **Traveller** game, we have provided a suggested baseline tech level of introduction and, where appropriate, indicated the tech levels where additional improvements become available. This constitutes a pre-set "slope" for technological innovation which referees may use as a starting point or alter as they see fit.

To vary the technological underpinnings of your campaign, three methods are available.

1. Alternate Technology: Method number one alters the physical universe by using one or more of the alternate technologies presented in the book, either in addition to or as a substitute for some technology already included in **Traveller**. This method can be as simple as just deleting a piece of projected technology from the mix (such as contra-gravity, jump drive, EAPlaC, HEPlaR, laser focusing, or meson screens) and relying on remaining baseline technologies to fill the gap created.

2. Altered Initial Availability: The tech level at which projected technology becomes available can be moved forward or back. Teleportation is an excellent example of this. Matter transmission is set at such a high tech level of initial vailability that it will effectively play no part in any **Traveller** Imperial Space campaign. By moving its availability to tech level 8, the technological basis of the universe (and its adventuring elements) is changed greatly.

3. Altered Slope: Slope is the rate at which technological change is accomplished. (See page 7 for an explanation of slope.) Raising or lowering the slope has a profound effect on the nature of the gaming universe, and referees building their own universe will almost certainly want to tinker here. A cyber-heavy universe, for example, would probably have a steeper slope on cybernetics than is presented in the chapter as it currently stands, with much more of the equipment available at earlier tech levels. A universe where starship combat is difficult, or limited mostly to large line-of-battle ships, might have a much more shallow slope on laser focussing, as well as other directed energy weapon designs.

You will find that by using these three tools and the design sequences provided in this book, virtually any science-fiction universe can be tailored.

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6 APPENDIX III
Design Examples

7 Design Example: 7mm TL-10 ACR (ETC)

This will proceeed pretty much in the same order as the design sequence itself. I experimented with several different values for Lcc, E, and Bl until I got numbers for damage and range that I liked (these experimental calculations are not shown here to conserve space). Refer to the design sequence for the meaning of the abbreviations used in the various formulae.

9 PART I: Ammunition Design

Tech Level: 10
Bullet: 7mm
Cartridge Case Length: 30mm
Cartridge Case Type: Necked ETC

Ammunition Evaluation
Length: 44mm
Lan = Lcc+2xd = 30+2x7 = 44
Weight: 12 grams
Wa = AwcLccπr^2 = 0.01x30x3.1416x3.5x3.5 = 11.5454, rounds to 12
Average Muzzle Energy: 4803 joules
Ea = TmCmLccπr^2 = 1.3x3.2x30x3.1416x3.5x3.5 = 4802.8781, rounds to 4803
Price: Cr0.24
Cr = WTm = 12x0.02 = 0.24

Special Ammunition
HE: TL-6+. Price for HE rounds is multiplied by 2: 0.24x2 = 0.48
DS: Tech level 8+. Price for DS rounds is multiplied by 2: 0.24x2 = 0.48
HEAP: Tech level 9+. Price for HEAP rounds is multiplied by 3: 0.24x3 = 0.72
Tranq: Tech level 6+. Price for Tranq rounds is multiplied by 2: 0.24x2 = 0.48

PART II: Weapon Design

1. BARREL
Average Barrel Length: 49 cm
Bla = (Ea+d^2)Rm = (4803+7x7)x0.5 = 49.01021 rounds to 49
Actual Barrel Length: 49 cm (10 to 113)
Type of Barrel: Light barrel
Barrel Weight: 0.98 kg
Wbl = 0.02Lb = 0.02x49 = 0.98
Barrel Price: Cr392
Cr = WbxBtm = 0.98x400 = 392.00
Actual Muzzle Energy: Ball, HE, HEAP, & DS: 4803, Tranq: 2882
E = Ea{1+[0.5(Blp-1)]} = 4803x{1+[0.5x(1-1)]} = 4803
Damage: Ball, HE, HEAP, & DS: 5, Tranq: –1*
Ball & DS: D = $\sqrt{E}$+15 = 69.303679+15 = 4.620245 = 5
HE/HEAP: 7+10 = 17, 17-7 = 10, 10^3 = 1000, 1000+4803 = 5803. $\sqrt{5803}$ = 76.177, 76.177+15 = 5.079 = 5
Tranq: All Tranq round damage = –1 (1D6–1), plus the effects noted in the rules.
Penetration: Ball: 2-3-Nil, DS: 1-2-3, HEAP: 2-2-2, HE & Tranq: Nil.

2. RECEIVER
Receiver Type: Light, self-loading, electrothermal receiver, with selective fire option.
Rate of Fire: 5
Receiver Length: 31 cm
Lr = Tc$\sqrt{Ea}$ = 0.45x69.303679 = 31.186656 = 31
Receiver Weight: 2.702 kg
WrlET = 0.0005Ea+0.3 = 0.0005x4803+0.3 = 2.7015
Receiver Price: Cr875.5
CrEt = (WrAm)+200 = (2.702x250)+200 = 875.5



3. STOCKS

Bullpup stock

Range: Ball: 83, DS: 100, HE/HEAP: 62, Tranq: 30.

SR = √ECmBlm = 69.303679×1.2×1 = 83.164415 = 83

DS: 83×1.2 = 99.6 = 100

HE/HEAP: 83×0.75 = 62.25 = 62

Tranq: SR = √ECmBlm = 53.68426×1.2×1= 64.42111×0.6 = 38.652668 = 30

Blm: Modification to short range for barrel length = 1

Blm = 1+[(Blp-1)C] = 1+[(1-1)×0.75] = 1

4. FEED SYSTEM

Box Magazine: A 20-round detachable box magazine standard issue. This weapon's cartridge is 44mm long, which means that the receiver must be at least 194mm or 19.4 cm to use a box magazine.

Magazine Weight: 0.553 kg

Wm = 0.0006(N+4)Wa = 0.0006×(20+4)×12 = 0.1728, plus 0.019×20 = 0.5528 rounds to 0.553

Magazine Price: 10×0.2592 = 2.592, rounds to Cr3, plus 20×5 = Cr103

5. OPTIONS

Sights: Electronic and laser sights fitted as standard equipment.

Recoil Reduction: Muzzle brake, gyroscopic compensator, and electrothermal action.

Bayonet Lugs: Standard equipment.

Grenade Adapter: RAM shoot-through grenade adaptor fitted as standard equipment.

Flash Suppressor

Length: 1cm per 300 joules of muzzle energy 4803+300 = 16.01 = 16 cm

Weight: .01 kg per cm of length 16×0.01 = 0.16 kg

Price: Cr1 per cm of length = Cr16

6. TINKERING THE DESIGN

None needed.

EVALUATION

Total the various components:

	Length	*Weight*	*Price (Cr)*
Barrel	49	0.98	392
Receiver	31	2.702	875.5
Bullpup Stock	5	0.1	10
Electronic sights		0.2	2000
Laser sights		0.5	300
Gyros. Comp.		0.5	300
Flash Supressor	16	0.16	16
Muzzle Brake (4 cm)		0.2	50
Grenade Adaptor	5	—	50
Bayonet Lug		—	—
Magazine		0.553	103
Weapon, Empty	106 cm	5.895	4096.5
20 rounds 7×46mm		0.24	4.8
Weapon, Loaded	106 cm	6.135	4101

Determine bulk:

Bulk: 106+15 = 7.06 = 7

and proceed to determining recoil

Recoil:

Single shot:

R = {[(0.15√E)+Ww]+Em}Rcm

Ball, HE, HEAP, & DS: R = {[(0.15×69.303679)+6.135]+2}×0.23 = 0.849 = 1

Tranq: R = {[(0.15√E)+Ww]+Em}Rcm={[(0.15×53.684262) + 6.135]+2}×0.23 = 0.762 = 1

R: Recoil number

E: Muzzle energy (in joules) = Ball, HE, HEAP, & DS: 4803, Tranq: 2882

√E = Ball & DS: 69.303679, Tranq: 53.684262

Ww: Weight, in kilograms, of weapon (loaded) = 6.135

Rcm: Recoil compensator modifier = 0.6×0.5×0.75 = 0.23

Em: Modifier for high muzzle energy. 2501-5000 joules = 2

Bn: Number of shots in the burst.

Burst:

R = ({[(Bn+2)(0.15√E)]+Ww}+{[Bn+2]Em})×Rcm

Ball, HE, HEAP, & DS: R = ({[(5.0+2)×(0.15×69.303679)] + 6.135}+ {[5+2]×2})×0.23 = 2.124 = 2

Tranq: R = ({[(5.0+2)×(0.15×53.684262)] + 6.135}+ {[5+2]×2})×0.23 = 1.904 = 2

Finally, we note the weapon's statistics in usable form

7×46mm ETC TL-10 ACR

TL: 10

Ammo: 7×46mm ETC (TL-10)

Weapon Weight: 6.135 kg loaded, 5.895 empty

Magazine Weight: 0.793 kg loaded, 0.553 kg empty

Magazine Price: Cr3

Damage: Ball, HE, HEAP, & DS: 5, Tranq: –1*

Penetration: Ball: 2-3-Nil, DS: 1-2-3, HEAP: 2-2-2, HE & Tranq: Nil.

Range: Ball: 83, DS: 100, HE/HEAP: 62, Tranq: 30.

1 2 3 4 5 6 7 8 9 10 11 12 13 14



Round	ROF	Dam	Pen	Blk	Mag	— Recoil — SS	Brst	Rng
7×46mm Ball	5	5	2-4-Nil	67	20	1	2	(83) 103
7×46mm DS	5	5	1-3-Nil	7	20	1	2	(100) 120
7×46mm HE	5	5	Nil	7	20	1	2	(62) 71
7×46mm HEAP	5	5	2-2-2	7	20	1	2	(62) 71
7×46mm Tranq	5	–1*	Nil	7	20	1	2	(30) 30

* See **Traveller** rules, page 350.
Range in parentheses is iron sight range, other range is with electronic sight.

7×46mm ETC, per round

Caliber:	TL	Length (mm)	Weight (grams)	AME (Joules)	Price (Cr)
7×46mm Ball-9	10	44	12	4803	0.24
7×46mm DS-9	10	44	12	4803	0.48
7×46mm HE-9	10	44	12	4803	0.48
7×46mm HEAP-9	10	44	12	4803	0.72
7×46mm Tranq-9	10	44	12	2882	0.48

Design Example: TL-13 Plasma Cradle Gun (Vehicle-Mounted)

SPECIFICATIONS

TL: 13
Pulse Power: 12 Mj
Fire Control: Comes with basic optic sights. TL 12 ballistic computer added. (Mass = 0.4 tonnes. Price = MCr0.1. Fire Control rating = +4)
Mount: Cradle (for vehicle mounting)
Cartridge: Tech level 12 Plasma Pulse Cartridge, 12 Mj
Volume: (12×.0003=) .0036 cubic meters
Price: (12×.000025=) MCr.0003 (Cr300)
Mass: (.0036×8=) .0288 tonnes (29 kg)
Radius: .058 meters (58mm)
Dimensions: 116×348mm

WEAPON DESIGN

MASS
Firing Unit: (12×4=) 48 kg
Support Hardware: (12×6=) 72 kg
Fire Control (from above): 40 kg
Recoil: (12×20=) 240 kg
Autoloader: (30×29=) 870 kg
TOTAL: 1270 kg

GUN CREW
1 (since it is vehicle-mounted with an autoloader)

RANGE
Short Range: (12×30=) 360
Medium Range: (360×2=) 720
Long Range: (360×4=) 1440
Extreme Range: (360×8=) 2880

DAMAGE VALUE
Damage: (11.5×3.46=) 39.79 (39)

PENETRATION
Rating: 1-2-10
Value: 39-19-3

RELOADING
Reload Time: (.3×12+3=) 1.2 (1)
Rate of Fire: (2)

PRICE
Firing Unit: (48×2500=) Cr120,000
Support Hardware: (72×2500=) Cr180,000
Fire Control (from above): Cr100,000
Recoil: (240×100=) Cr24,000
Autoloader: (870×10=) Cr8700
TOTAL: Cr432,000

SET-UP
None (vehicle-mounted)

VOLUME
Firing Unit: (.048×0.5=) .024
Support Hardware: (.072×0.5=) .036
Fire Control: (.040×1=) .040
Recoil: (.240×1=) .240
Autoloader: (.870×1=) .870
TOTAL: 1.210 cubic meters

RECOIL
None (cradle-mounted)

BULK
None (cradle-mounted)



Design Example: TL-13 Grav Tank

Step 1–Chassis: A 7-ton (98 kiloliter) chassis is selected in a fast subsonic configuration. It uses superdense armor and has an overall level of protection of 4 (0.3cm of armor). This is thickened to 0.39 (AV 5.4) on the sides, 0.3 (AV 8) on the top, and 2.15cm (AV 30) on the front. The sides are given a moderate slope (AV = 5.4×1.5, or 8) and the front is given a radical slope (AV = 30×2, or 60).

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
Chassis 7	(98)	—	—	—	—
Fast Subs. config.	4.9	—	—	(126)	—
Armor: 0.3cm SD (AV 4)	0.6	9	—	—	8568
Top: + 0.3cm (AV 8)	0.15	2.25	—	—	2142
Side: + 0.09cm (AV 5.4)	0.027	0.405	—	—	385.5
Front: + 1.85cm (AV 30)	0.37	5.55	—	—	5283.6
Front rad. slope (AV 60)	19.6	—	—	—	—
Side, mod slope (AV 8)	19.6	—	—	—	—
High-Efficiency CG	2.1	1.4	0.7	—	210,000

Step 2– Suspension: High-efficiency CG lifters are used.

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
High-Efficiency CG	2.1	1.4	0.7	—	210,000

Step 3– Control Systems: The vehicle uses tech level 13 holographically linked controls and has both flight avionics and terrain-following avionics. It also has two flight computers (main and backup).

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
TL-10 Flight Avionics	0.001	0.001	0.1	—	250,000
TL-13 Terrain–Follow. Avn.	0.1	0.02	—	—	15,000
Model 13 Flight computer	0.9	0.18	0.045	—	4000
Backup computer	0.9	0.18	0.045	—	4000

Step 4– Life Support: The vehicle is pressurized to allow operations in hostile environments.

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
Basic Life Support	0.49	0.49	0.0098	—	29,400

Step 5–Electronics: The vehicle has a 300-kilometer radio for broadcast communications and a 3-km laser communicator for secure tacnet communication. For sensors, it mounts a 3-km active EMS array and a jammer of equivalent performance and a 30-km passive EMS sensor.

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
300-km radio (TL 12)	0.0001	0.0002	0.01	0.1	5000
30-km laser comm (TL 12)	0.004	0.008	0.005	1	5000
3-km active EMS (TL 12)	0.1	0.2	0.5	0.2	200,000
3-km active EMS jammer	0.1	0.2	1.0	0.2	400,000
30-km passive EMS (TL12)					
Processor	0.01	0.02	0.001	—	20,000
Antenna (TL 13)	0.0005	0.0005	—	0.01	500

Step 6–Weaponry: The tank mounts a 12-Mj plasma cradle gun in the turret and both a 7.5mm machinegun and 3cm laser coaxial with it (and operated from a single gunner's station). The plasma gun is that designed in the example provided earlier in this appendix; the laser and machinegun are taken from the equipment list in the basic game. All volumes are doubled because of placement in the turret. (At tech level 7, volumes would be tripled; at tech level 6, they would be quadrupled). Note that the mass and volume of the plasma gun includes a ballistic computer and autoloader. The weapon mount is stabilized. 400 PPC for the plasma gun and 3000 rounds of ammunition for the machinegun are carried as well. 1

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
12-Mj Plasma Cradle Gun	2.42	1.27	—	—	432,000
7.5mm machinegun	0.017	0.0085	—	—	1200
3cm coaxial laser rifle	0.01	0.005	—	—	4000
Stabilized turret mount	0.2	0.1	—	—	50,000
400 x PPC	2.88	11.52	—	—	—
3000 rounds 7mm	0.09	0.09	—	—	3600

Step 7–Power Plant: The vehicle has a 3.3 MW fusion power plant and a HEPlaR chamber to convert 0.8 MW of power to thrust. Fuel tankage for one year of reactor operation and 20 hours of thrust are included as well. 4

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
TL 13 3.3 MW fusion reactor	1.1	3.3	(3.3)	—	340,000
0.8-MW HEPlaR Thruster (16tt)	0.08	0.08	0.8	—	800
Reactor fuel	0.11	0.0077	—	—	—
Reaction mass	4	0.28	—	—	—

Step 8–Crew: The vehicle has a driver (in the hull), a commander (turret), and gunner (turret). There is also a passenger seat (adequate) installed in the hull. Note that workstation volumes in the turret are doubled.

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
2 turret workstations	14	0.4	—	—	4000
1 hull workstation	3.5	0.2	—	—	2000
1 passenger seat	3.5	0.2	—	—	100

Step 9–Cargo: Most remaining volume is devoted to cargo space.

Component	*Vol*	*Mass*	*Power*	*Area*	*Price*
Cargo	16	4	—	—	—

EVALUATION

DESIGN FEATURES

See above.

Fuel consumption is 0.11 kl of fuel per year for the reactor and 0.2 kl of fuel per hour as thruster reaction mass. On-board reaction mass is sufficient for 20 hours of movement; the reactor requires refueling once per year.

MOVEMENT

Thrust: 0.8 MW = 16 tonnes

Gs: 16÷70 = 0.2286 Gs

Max Speed: 0.2286×3500 = 800.1 kph (limited to 800 by airframe type)

Heavy turret is 10% of volume (5.617 + 58.8 kl after sloping), reducing speed by 10% to 720 kph

Cruising Speed: 720×0.75 = 540 kph

NOE Speed: 720×0.25 = 180 kph (limited to 170 kph by TL-13 avionics)

Combat Move: 24 (NOE), 100 (high mode)

Travel Move: 1020 (NOE), 2160 (high mode)

MAINTENANCE POINTS

41.7659÷6 = 6.96 (rounded to 7)



DESIGN RECAPITULATION

	Component	Vol	Mass	Power	Area	Price
1	Chassis 7	(98)	—	—	—	—
	Fast Subsonic configuration	4.9	—	—	(126)	—
	Armor: 0.3cm superdense (AV 4)	0.6	9	—	—	8,568
	Top: + 0.3cm (AV 8)	0.15	2.25	—	—	2142
	Side: + 0.09cm (AV 5.4)	0.027	0.405	—	—	385.5
2	Front: + 1.85cm (AV 30)	0.37	5.55	—	—	5283.6
	Front armor rad. slope (AV 60)	19.6	—	—	—	—
	Side armor mod slope (AV 8)	19.6	—	—	—	—
	High-Efficiency CG	2.1	1.4	0.7	—	210,000
	Holo-linked control system	—	—	0.007	—	14,000
3	TL 10 Flight Avionics	0.001	0.001	0.1	—	250,000
	TL 13 Terrain–Following Avionics	0.1	0.02	—	—	15,000
	Model 13 Flight computer	0.9	0.18	0.045	—	4000
	Backup computer	0.9	0.18	0.045	—	4000
	Basic life support	0.49	0.49	0.0098	—	29,400
4	300-km radio (TL 12)	0.0001	0.0002	0.01	0.1	5000
	30-km laser comm (TL 12)	0.004	0.008	0.005	1	5000
	3-km active EMS (TL 12)	0.1	0.2	0.5	0.2	200,000
	3-km active EMS jammer	0.1	0.2	1.0	0.2	400,000
	30-km passive EMS (TL12) Processor	0.01	0.02	0.001	—	20,000
5	Antenna (TL 13)	0.0005	0.0005	—	0.01	500
	12-MJ Plasma Cradle Gun	2.42	1.27	—	—	432,000
	7.5mm machinegun	0.0085	0.0085	—	—	1200
	3cm coaxial laser rifle	0.005	0.005	0.02	—	4000
	Stabilized turret mount	0.2	0.1	—	—	50,000
6	TL 13 3.3 MW fusion reactor	1.1	3.3	(3.3)	—	340,000
	0.8-MW HEPlaR Thruster (16tt)	0.08	0.08	0.8	—	800
	2 turret workstations	14	0.4	—	—	4000
	1 hull workstation	3.5	0.2	—	—	2000
	1 passenger seat	3.5	0.2	—	—	100
7	Reactor fuel	0.11	0.0077	—	—	—
	Reaction mass	4	0.28	—	—	—
	400xPPC	2.88	11.52	—	—	—
	3000 rounds 7mm	0.09	0.09	—	—	3600
	Cargo	16	4	—	—	—
8	TOTAL	97.8161	25.4682 41.7659 (loaded)	3.2428	1.51	2,010,979.1

9 **Sample Design: Tech Level 14 Socket Barbette Turret**

The following example explains the design of the standard TL-14 socket laser barbette as seen in Appendix 1, and mounted on the famous *Gazelle*-class close escorts.

10 **1. Tech Level**

Laser is TL 14, and will be tunable. This will allow the laser to have the greatest possible utility as it will be installed in standard sockets aboard a wide variety of vessels.

11 **2. Gravitic Focusing**

The laser is for the Imperial Space campaign, so uses gravitic focusing.

12 **3. Focal Array**

In order to attain maximum range at all of the tunable wavelengths, the laser's focal array will use the full diameter of the standard barbette socket.

3A. Standard Socket Mounted Lasers

13 From the table, the diameter used for the focal array is 4.5 meters.

3B. Bay-Mounted Lasers

Does not apply.

14 **4. Discharge Energy**

Discharge energy (DE) will be 300 megajoules.

Because the turret is intended for installation on a starship, it is built with a heavy focal array.

The focal array has a diameter of 4.5 meters, which gives a radius of 2.25 meters. Surface area is therefore:

$3.1416 \times (2.25)^2 = 15.9$, rounded to 16.

Focal array volume multiplies the surface area by the discharge energy (300) and by the tech level volume multiplier, which for a TL-14 heavy focal array is 0.001.

$16 \times 300 \times 0.001 = 4.8$ cubic meters.

Mass is 4.8 tonnes, and price for a heavy focal array is volume times 0.2 or $(4.8 \times 0.2 =)$ 0.96 MCr.

Because gravitic focusing was chosen in Step 2 above, the laser's efficiency is automatically 20%. Input energy is calculated from the discharge energy (300) as follows:

$300 \div 0.2 = 1500$ megajoules.

5. Laser Performance Rating

5A. Non-Gravitic Focused

Does not apply.

5B. Using Gravitic Focusing

The FA diameter established above is 4.5 meters.

1. 4.5 meters $\times$ 10 = 45 decimeters
2. The focal modifier for a TL-14 heavy focal array is $F = (6D)^2$

$(6 \times 45)^2 = 72{,}900$



3. 72,900 ÷ 10 = 7290, which is the laser's adjusted focal value F.

4. We will calculate two effective ranges here for our tunable laser: its best range, by tech level, which is far ultraviolet (FUV: wavelength of 1000Å), and also its range in the visible band (VL: 5000Å), which is usually the best wavelength for planetary bombardment.

These equations both use the formula F × range factor = effective range, where the FUV range factor from the Tunable Lasers table is 100, and the VL range factor is 20.

Effective range in FUV is 7290 × 100 = 729,000 kilometers, or (729,000 ÷ 30,000 =) 24.3 space combat hexes/range bands.

Effective range in VL is 7290 × 20 = 145,800 kilometers, or (93,300 ÷ 30,000 =) 4.86 space combat hexes/range bands.

5C. Tunable Lasers

We have already calculated one of our available tunable wavelengths immediately above.

5D. Atmospheric Performance

We will now calculate ranges in a standard atmosphere at FUV and VL wavelengths.

For FUV, we multiply the range of 729,000 by 0.01 to get an atmospheric effective range of 7290 km.

For VL, we multiply the range of 145,800 by 0.1 to get an atmospheric effective range of 14,580 km.

The selection of visible tuning was significant, as it has twice the atmospheric range as far ultraviolet.

Planetary Bombardment: To see this effect, we will examine the example of this laser conducting planetary bombardment from a range of 2 hexes.

In FUV, 2 ÷ 0.01 = an atmosphere adjusted range of 200 hexes, far beyond the laser's effective range.

In VL, 2 ÷ 0.1 = an atmospheric adjusted range of 20 hexes, within the laser's effective range. We will find the laser's damage and penetration performance at these ranges below.

6. Define Short Range

6A. Large (Non-Hand-Held) Lasers

Because this is a large (heavy focal array) laser, it will be fitted with a beam pointer. Since its effective range (24.3 hexes) is well in excess of any beam pointer, we will select the best available beam pointer from Section 14, the 300,000 km/10 hex model. At TL 14, it has a volume of 6 cubic meters, a mass of 6 tonnes, and a price of (6 × 0.1 =) 0.6 million credits.

Our laser's short range is therefore 300,000 km or 10 hexes.

6B. Small Arms (Hand-Held) Lasers

Does not apply.

7. Laser Combat Ratings

7A. Combat Range Bands

Because our laser is designed for spacecraft mounting, we will calculate ranges in space combat hexes/range bands.

Our laser has a medium range of 10 × 2 = 20 hexes.

Our laser has a long range of 10 × 4 = 40 hexes.

Our laser has an extreme range of 10 × 8 = 80 hexes.

7B. Damage Value

In order to calculate damage values, we must first calculate the laser's intensity at its four combat ranges using $I = DE (1 + R^2)$.

Value for R at short range is (10 ÷ 24.3 =) 0.412 which becomes 1.

Value for R at medium range is (20 ÷ 24.3 =) 0.823 which becomes 1.

The value for R at medium range is (40 ÷ 24.3 =) 1.64609 which is rounded to 1.65 (nearest 0.01).

The value for R at extreme range is (80 ÷ 24.3 =) 3.29218 which is rounded to 3.29.

At short range, the laser has an intensity of $300 \times (1 + [1]^2) = 300$

At medium range, the laser has an intensity of $300 \times (1 + [1]^2) = 300$

At long range, the laser has an intensity of $300 \times (1 + [1.65]^2) = 110.2$

At extreme range, the laser's intensity is $300 \times (1 + [3.29]^2) = 27.72$

With the four range intensities, we can now calculate damage values.

Damage value at short range is $2.5 \times \sqrt{300} = 43$

Damage value at medium range is $2.5 \times \sqrt{300} = 43$

Damage value at long range is $2.5 \times \sqrt{110.2} = 26$

Damage value at extreme range is $2.5 \times \sqrt{27.72} = 13$

7C. Penetration Rating

These calculations are made using the same intensity values derived in 7B above.

Inverse penetration rating at short range is $0.8 \times \sqrt{300} = 13.85$ rounded to 14, inversed = $^1/_{14}$

Inverse penetration rating at medium range is $0.8 \times \sqrt{300} = 13.85$ rounded to 14, inversed = $^1/_{14}$

Inverse penetration rating at long range is $0.8 \times \sqrt{110.2} = 8.4$ rounded to 8, inversed = $^1/_8$

Inverse penetration rating at short range is $0.8 \times \sqrt{27.72} = 4.21$ rounded to 4, inversed = $^1/_4$

7D. Personnel Damage Dice

Because this is a space combat weapon, and would only hit personnel after penetrating a starship hull, personnel damage dice should only be calculated on a case-by-case basis on remaining damage value.

8. Power Source and Rate of Fire

8A. Direct Electrical Power

This laser will be powered by direct electrical power, and will require a homopolar generator of 1500 × 0.04 = 60 cubic meters. The HPG masses (60 × 2 =) 120 tonnes, and costs (60 × 0.01 =) 0.6 million credits.

Rate of Fire: The laser will be powered to a rate of fire of 10 shots per 30-minute space combat turn. This rate of fire does not require an increase in focal array volume.

Power Input: (10 × 1500) ÷ 1800 = 8.33 megawatts.

8B. Chemical Laser Cartridge

Does not apply.

9. Crew

The barbette will be crewed to allow local control and therefore requires a normal workstation. The Controls chapter (Section 4) shows that a normal workstation has a volume of 7 cubic meters and a mass of 0.2 tonnes, and at TL-14 costs 0.002 million credits.

10. Laser Furnishings and Supporting Hardware

Does not apply.

11. Physical Characteristics

11A. Volume

Focal array plus beam pointer plus homopolar generator plus workstation total (4.8 + 6 + 60 + 7 =) 77.8 cubic meters, well within the 84 cubic meter restriction for standard barbette sockets.

11B. Mass

Focal array plus beam pointer plus homopolar generator plus workstation total (4.8 + 6 + 120 + 0.2 =) 131 tonnes.

11C. Price

Focal array plus beam pointer plus homopolar generator plus workstation total (0.96 + 0.6 + 0.6 + 0.002 =) 2.162 million credits (MCr).

11D. Power Requirements

From Step 8A: 8.33 megawatts (MW).

11E. Surface Area

From standard barbette socket table and Step 4, 16 square meters.

11F. Bulk

Does not apply.

11G. Recoil

None.

11H. Combat Performance

See final listing of the weapon is seen in Appendix 1 on page 153.



APPENDIX IV
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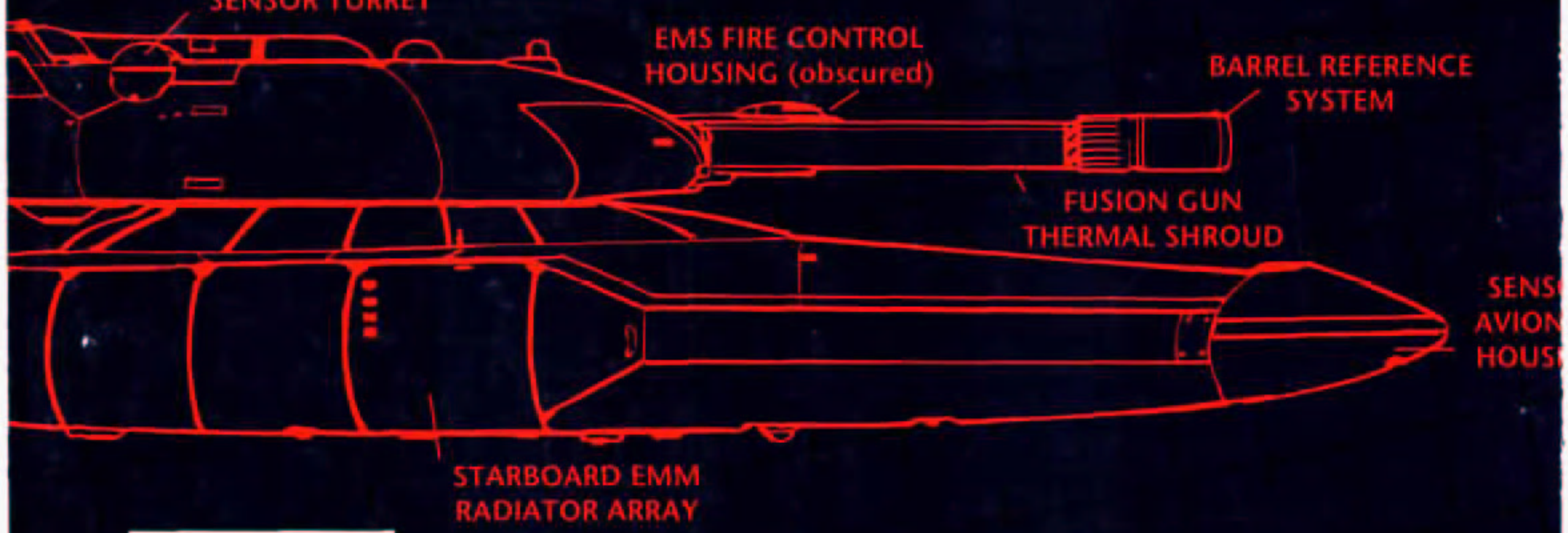

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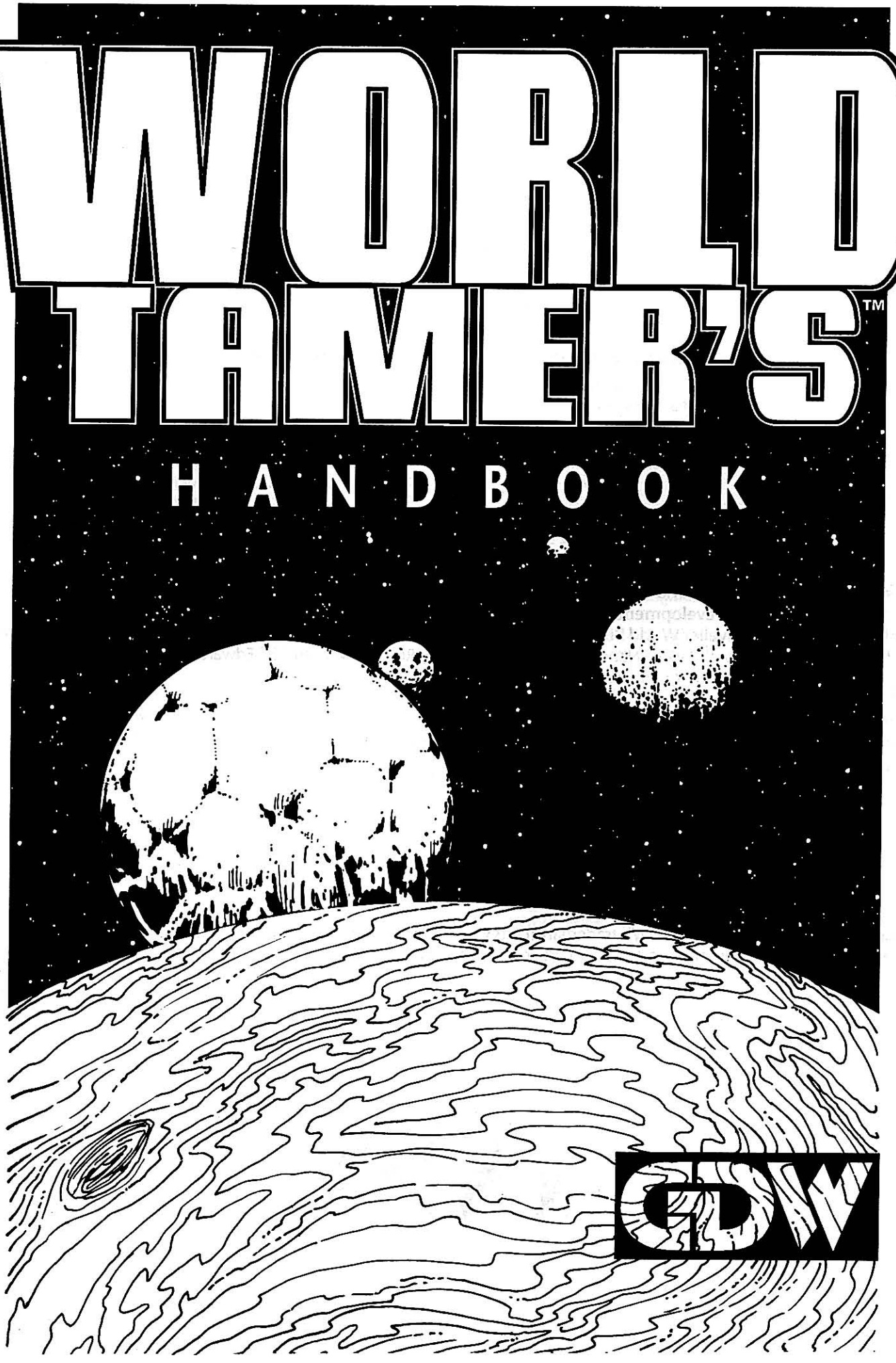

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For RoseMarie and Devon. If we had whole worlds to give them, we would.

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CHAPTER 1: INTRODUCTION



World Tamer ('wərld tām-ər) *1. A member of a team of professional explorers, technicians, and social engineers sent to a low-technology world with the mission of advancing the world's technological and productive capacities and reintegrating that world into the interstellar community. 2. A professional, experienced leader of a colonizing expedition sent to settle an unpopulated or very low population primitive world with colonists from a relatively high tech mother world. 3. Any individual working to uplift, colonize, or civilize an isolated, uninhabited, or primitive world.*

The **World Tamers Handbook** is a **Traveller: The New Era** sourcebook as well as several adventure campaigns built around the theme of rebuilding shattered worlds near the Reformation Coalition (or other surviving pockets of civilization). In either role, it is intended for use with GDW's **Traveller: The New Era** roleplaying rulebook. **Traveller: The New Era** is referred to as "TNE" for simplicity throughout this book. Other required materials are at least one 10-sided die, at least two six-sided dice, and pencils and paper. A calculator is highly recommended. The **Fire, Fusion, and Steel** technical architecture sourcebook will also be necessary in conjunction with some of the design sequences in this book. **Brilliant Lances**, the TNE starship combat boardgame, may also be used to resolve space combat scenarios fought during the adventure campaign.

Source Book

As a source book, **World Tamers Handbook (WTH)** provides referees with expanded or new information on the following subjects:

- A playable planetary economic model, including agricultural, raw materials, and industrial components, fully interlinked with the characteristics of planetary environment
- Star and planetary system generation and detailing
- Expanded planetary survey rules that mate with the planetary economic model, allowing players to seek out worlds suited for habitation and development
- Rules for acclimatization to new environments
- Battalion-level mass combat rules, allowing the resolution of large-scale combat in **Traveller**
- Archaic weapons design sequences including black powder small arms, black powder cannons, and bows
- New equipment based on the new design sequences plus three new starships suited for colonization missions

As a sourcebook, **World Tamers Handbook** allows you to create a world and build a civilization on it from scratch.

Campaigns

World taming is a big, complex topic for a **TNE** campaign. Your players will be shaping the destiny of a world as they interact with local NPCs and try to convince them of the benefits of civilization, or as they lead a group of colonists on a raw frontier world. World tamer campaigns can be played on various levels of detail, from high-level planning and decision-making to low-level roleplaying. Often, a given campaign will shift from level to level as the situation and the players' interests warrant. For example, worlds will be surveyed and the world tamer team can meet and interact with animals or indigenous inhabitants on a day-to-day, one-on-one basis. This low level campaign action may shift to a higher level with progress occurring month to month as the players administer the world-taming effort as the leaders of a colonization team. However, sudden events, such as an attack by a hostile power, political unrest, or natural disasters, may shift the campaign focus back to the low, person-to-person level as a crisis is resolved with work, negotiation, or combat.

World Tamers Handbook offers three campaign scenarios and material to create a myriad of others. The three scenarios are the Survey adventure, Bootstrap campaign, and Colony campaign. These scenarios use different combinations of the material presented in the **World Tamers Handbook**, and referees will need to make a number of decisions before beginning play. Depending on the desired mix of high and low level play and the amount of pre-generated background that will be needed, referees will use this handbook in one of several ways. This organizational material is presented, broken down by scenario type, beginning at the top of the facing page.



CHAPTER 2: ORGANIZING YOUR CAMPAIGN

Campaign (kam 'pān) n. 1. A series of military operations with a particular objective in a war. 2. A series of organized, planned actions for a particular purpose.

CHOICES

Before beginning your World Tamers adventure you must make a number of choices to set a background tone. The choices you make depend on your experience as a **Traveller** referee and the experience and interests of your players. Are the members of your group novices interested in both learning the **Traveller** roleplaying game system and having a rousing good time? Then hire them on as security specialists for a bootstrap or colony expedition. Are your **Traveller** players really experienced and the kind that would rather use Persuasion, Act/Bluff, and other Charisma-related skills to convince low tech indigenous farmers that it's better to use an iron plow to till a field than an iron spear to kill a man? Then have them lead a bootstrap expedition into the Primary AO, uplift friendly primitives, and help them protect themselves from hostile neighbors.

Read the campaign possibilities in this book and weigh them against the interests of your players. Many of the campaign themes are fairly cerebral, with such mundane but important activities as establishing a local economy or determining whether available food supplies will last until the next crop comes in, and if not, what to do about it. Not as glamorous as a firefight, but just as much a matter of life and death. More advanced players might prefer playing this type of role. Other players, however, might prefer playing the cops on a colonial expedition who keep order and solve crimes on the wild frontier.

LEVELS

The term "levels" describes the degree of involvement of players with NPCs in a campaign. There are basically two approaches to playing a world tamer campaign (or, indeed, any roleplaying campaign): low level and high level, but by combining elements of these two approaches, a referee can establish any level in between, based on the needs of the campaign action and the interests of the players.

Low: Low-level roleplaying places the players down in the campaign interacting with NPCs and the referee in "real time," one-on-one. Time is measured in seconds in a firefight, minutes during personal interaction or perhaps in four-hour increments if the players are travelling overland. In a high-level campaign, player characters may order their troops into battle, but in a low-level campaign, the PCs are the ones pulling the triggers.

High: High-level roleplaying pulls players back from direct interaction on a roleplaying level. The players are are high-level decision makers, and the time scale is often stretched out into weekly or monthly increments. For example, players examining the resources of a world to determine how best to create a productive society there are engaged in high-level roleplaying. Or, in another vein, in a low-level campaign, the PCs are concerned about surviving through the current firefight. In a high-level campaign, the PCs are concerned about planning and supplying campaigns, where to send the army next if the battle is won, or what to do if it loses? Which of these levels is most interesting? That depends on the interests of the players.

	Low Level	*High Level*
Game Time Increments	Daily, Hourly	Monthly
Character Involvement	Personal	Abstract
Characters	Hired Tech/Security	Team Leaders/Technical Experts
Suited For	Action/Adventure/Quick Rewards	Planning/Analysis/Long Term Results
Player Experience	Novice to Experienced	Experienced to Expert
Referee Experience	Novice to Experienced	Expert

High-Low Interface: Both levels of roleplaying are found in many campaigns, and this presents a challenge to the referee. Even the most cerebral colony campaign can be punctuated by low-level play as unexpected events happen and crises have to be handled. In a sense, a high-level campaign can be thought of as a "scenario generator" for low-level roleplaying as important decision points occur.

The challenge to the referee is to be able to shift rapidly from the general, in which the players manipulate economic inputs on a monthly basis, to the specific, in which they could use their skills to stop a disease, persuade an unruly rebel, or defeat an invading enemy army. This requires the referee to have a clear understanding of the world that is being modelled: what individual-level, one-on-one adventures will have an input visible up at the high level?

This is easiest if the referee has planned when to shift the campaign from high to low level, but there may also come times when the players decide that they want to "get their hands dirty" and go out and do some world taming on their own.

Perhaps this involves appearing before a gathering of disgruntled citizens and attempting to persuade them to work a little harder, even though there's not much food right now. Perhaps it means hunting down and killing a dangerous local animal that has been preying on livestock. These details will be related to rolls on the various random events tables, and to the referee's vision for the course of the campaign, but these high-low transitions will clearly require a deft and skillful touch by the referee. Details and suggestions for these transitions are presented in the Bootstrap and Colony chapters.

CAMPAIGNS

The three adventure/campaigns presented in this book focus on different activities, high/low level flavor, and material elsewhere in this book that they will draw on.

Survey

Surveying worlds near the Reformation Coalition is usually the responsibility of the Reformation Coalition Exploratory Service, which provides data used to plan bootstrap and colony operations. However, the RCES often uses free-lancers for survey and intelligence gathering missions, and here is where the PCs come in. RCES may recruit them to survey one or more star systems and their planets. Or, they may independently find a world suitable for a bootstrap operation or colonization, survey it, and sell the information to the RCES. A survey can be an adventure in itself, or it can be the beginning phase of a long-term bootstrap or colonization campaign.

If the survey is leading up to a bootstrap campaign, much may already be known about the target world. However, detailed maps of the world's features and studies of the world's weather and climate need to be made, as well as ground surveys of its agricultural and mineral resources. In this case, skip the star system details and go to page 9 of the Survey chapter.

If the survey is leading up to a colonization campaign, the survey may well be dealing with a world and star system that are



mostly unknown. A survey begins the moment the survey ship breaks out of jump space. The survey team uses their Astrogation skills to make sure they are in the right place, and how to find their way home. Then they search for the system's habitable planet and determine the system's features using the Stars & Planets chapter of this handbook. In this case, go to page 9 of the Survey chapter.

Once the target planet is located, the surveyors take their ship in for a closer look, mapping the planet and studying its weather. If it still seems to be a good place for a colony, ground survey teams are landed. These teams analyze the soil for fertility, probe for potential mineral deposits, check the atmosphere for all kinds of contaminants, and so on.

A survey mission intended as a stand-alone adventure provides plenty of potential action, too: contact with indigenous peoples or dangerous animals is always a possibility. This is a relatively short term operation, and with some preparation can be easily used for low-level day-to-day wilderness adventuring; see page 23 of the Survey chapter. If refereed with imagination, it can be a great adventure used to introduce the novice player to **Traveller** role playing and to the New Era.

Bootstrap

Bootstrap operations involve sending small teams to friendly worlds or friendly nations on balkanized worlds near the Reformation Coalition, and uplifting friendly indigenous peoples into partnership with the RC. These teams include diplomatic, agricultural, geological, civil engineering, medical, industrial technology, communications, and military specialists. They establish friendly relations with the local government, dispense medical care to the local population, help local farmers improve the yield and diversity of their crops, and help establish local industries that use indigenous resources to improve the area's technology. Because teams are often inserted in hostile territory, they include military specialists that help provide security for the team's civic action personnel. When a bootstrap team is working with a friendly government on a balkanized world, the military specialists also work as military advisors to their host governments. They help train indigenous troops to defend themselves and the civic action teams from attacks by hostile forces. The bootstrap concept is not new to the Coalition. It is an age-old idea that a nation can win over the "hearts and minds" of a less advantaged people by showing them the tangible benefits of allying with the more advantaged nation.

Bootstrap campaigns are likely to begin with low-level roleplaying as the team becomes established. It will probably shift to high level as on-going survey, education, and industrialization work begins. Here, the players will plan and monitor the results of their work in their specialties. Crises will erupt, however, demanding the return to low-level roleplaying—often at unexpected times.

Referees can tailor a bootstrap campaign to their own and their players' interests and abilities by assigning players to appropriate characters and roles. Players interested in a campaign emphasizing high-level roleplaying can be the team leaders, or agricultural or technological advisors. A bootstrap campaign involving more one-on-one low-level play can revolve around characters playing medics or explorers gathering resource and social data in the countryside around the team site. Action/adventure players can participate as military specialists providing security for the team or military advice to indigenous forces.

A bootstrap campaign is a long term campaign lasting a year or more in game time. Your players, especially action/adventure types, may not want to wait that long for their rewards. To get around this, limit their service with the team to a specific length of time and move them on to another campaign scenario, either on the same world or elsewhere. More patient characters who stay for the full campaign will earn greater rewards than a mere salary.

If the players are to be team leaders or specialists that expect to play the full campaign, go to page 48 of Chapter 6 Bootstrap. If no system survey data is available, go to page 9 of the Survey chapter. If the players expect to play a short-term campaign with a specific specialty and purpose, go to page 61 of the Bootstrap chapter. In order to run a bootstrap campaign, the referee must be familiar with the mechanics of Chapters 4, Colonial Economies and Infrastructure, and 5, the Mass Combat system.

Colony

In this campaign, your characters are hired by the Reformation Coalition world of Baldur to lead the colonization of a world just outside the RC. Baldur, a water world with a poisonous atmosphere, is one of the rare worlds to survive into the new era which cannot support human life without technological assistance. It is one of the most pragmatic supporters of the Coalition's charter to rebuild interstellar civilization and is willing to "go it alone" if necessary. Not only will Balduri-colonized worlds add to the growth of the Coalition, they will also enhance Baldur's economic weight within the Coalition by broadening its markets and expanding its variety of exports. Unlike the mother world, however, all of the Balduri colonies are to be created on habitable worlds for simplicity and to avoid dependence on external sources of technology.

If no current survey data is available, your players should begin by flying a survey mission to the target world and determine if it will support a colony. If not, they may want to continue exploring nearby worlds until a suitable planet is found. In these cases, start your adventure with page 69 of Chapter 7, Colony, for players' information and then go to page 9 of the Survey chapter. As the colony adventure focuses on economic leadership and administration, the referee must be fully conversant with Chapter 4, Colonial Economies and Infrastructure.

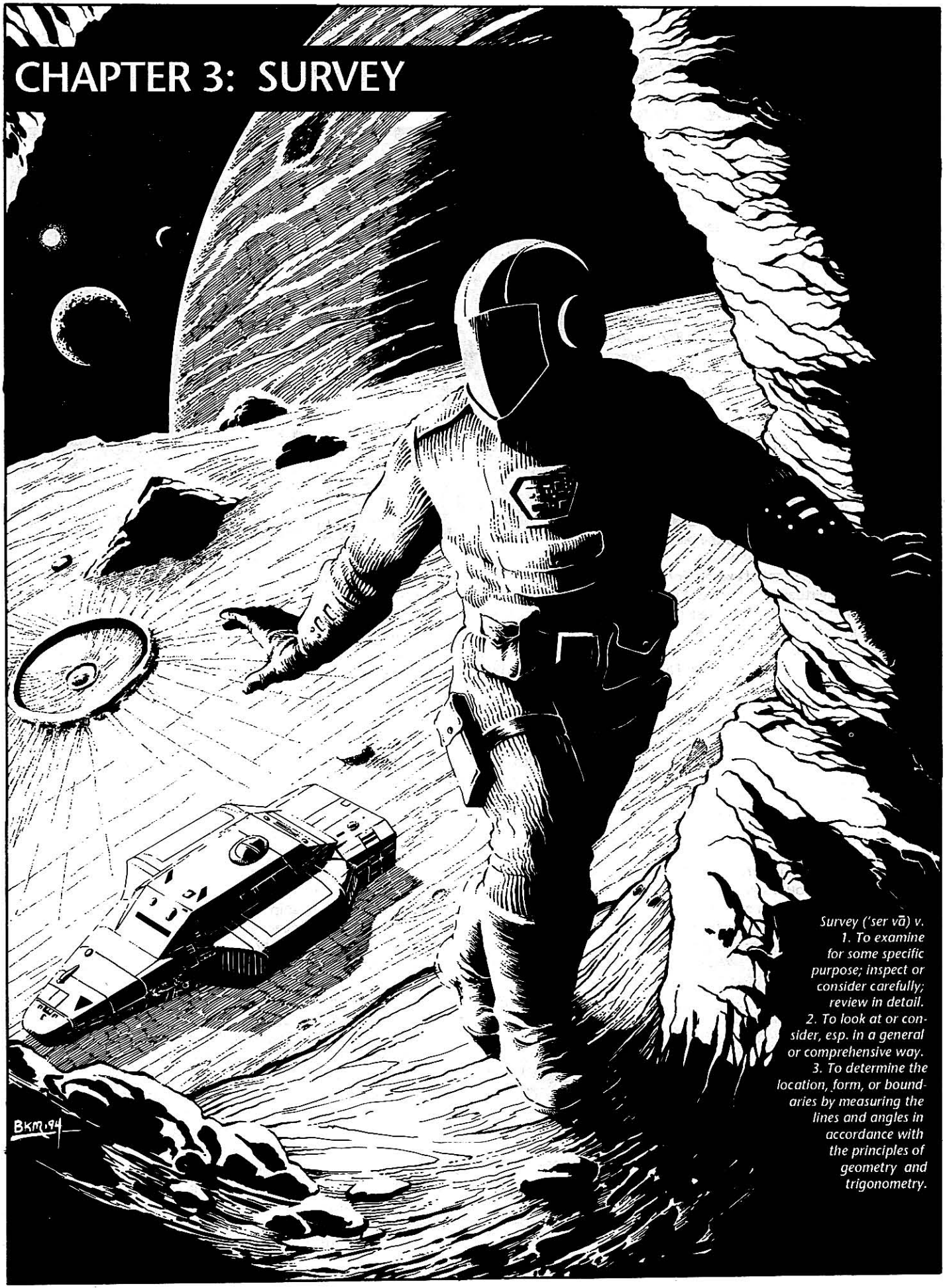
The next step of the colony campaign is to recruit colonists. If the players and referees intend to have the option for low-level play, this step will involve the players personally interviewing key professionals and technicians. Then a transport will take the players and colonists to their new world where they will establish a settlement on a lightly or totally uninhabited continent. Here they will make crucial decisions determining the allocation of limited resources to get the colony started out, and build it into a self-sustaining economy with off-world trade.

A colony campaign has both high and low-level role-playing, much like the bootstrap campaign. However, the circumstances and feel of the campaign are much different. Instead of dealing with a primitive native population and the dynamics of existing governments, your players are, for the most part, dealing with people from a settled world suddenly dumped on their own into the wild frontier. They must rely totally on what they carry with them to the new world. Careful planning is essential as they determine how many people to devote to agriculture and how many others to produce materials and develop industry in the colony. Although crises will occur and there will be opportunity for one-on-one adventure, a colony campaign is probably more suited to referees and players who like a more analytical game.

Other Worlds

The use of this book is not limited to the above campaigns; these are examples only. By mixing and matching portions of this book, and by creating new situations and environments, **World Tamers Handbook** provides a springboard for an infinite variety of adventures on frontier worlds. Leap backward into ancient history and begin on Earth, colonizing a world orbiting Alpha Centauri as the Terran Confederation begins to reach out into interstellar space. Or, in the New Era, begin in a Pocket Empire that is beginning to expand to its neighboring stars, or start the re-expansion of the Regency as it works to rebuild the glorious fallen Imperium. You are limited only by your imagination.

CHAPTER 3: SURVEY



Survey ('ser vā) v.
1. To examine for some specific purpose; inspect or consider carefully; review in detail.
2. To look at or consider, esp. in a general or comprehensive way.
3. To determine the location, form, or boundaries by measuring the lines and angles in accordance with the principles of geometry and trigonometry.



REFEREE'S INTRODUCTION



The survey chapter is provided as an adventure to let your players gather star system and planetary information either as a stand-alone mission or as a prelude to bootstrap or colony campaigns. It is to be used along with the Stars & Planets chapter, which contains TNE's detailed star system and planetary generation rules.

This chapter is not mandatory if your players are interested in the bootstrap or colony campaigns. The RCES may have already surveyed target worlds and their systems, and have compiled briefing sheets for some worlds. These are available in the Bootstrap and Colony chapters. On the other hand, your characters may know of an interesting world and have hired on as free lancers for RCES to map and survey that world in detail.

If you use the briefing sheets, you may want to reveal some or all of the information to your players at the beginning of the campaign. This would eliminate the need for a survey mission. However, if they want to fly a survey mission, you can then use the information in the sheets as the results of their survey work, revealing it in small bits as the players perform their survey tasks.

For an even greater sense of exploration if the player characters are heading into the virtually uncharted Wilds, use the rules in this and the Stars & Planets chapter to create a star system from scratch. You can create your own planetary maps using the mapping guidelines found at the end of Stars & Planets.

The Exploration section in the basic TNE rulebook should also be consulted for additional details and considerations.

STARTING OUT

Characters hiring on for a survey mission as a prelude to both the bootstrap and colony campaigns will be hired on at Baldur, also the starting point for both these campaigns. Stand-alone survey missions may begin at any major Reformation Coalition world including Oriflamme, Aubaine, Aurora, or Nike Nimbus. However, the traditional starting point of RCES missions spinward into the Wilds is Dawn Base on Trybec.

If the survey mission is part of a colony campaign set elsewhere than the RC, they should start the mission at the sponsoring world of the colonization campaign. This may be in a pocket empire, somewhere near Terra, or even in or near the Regency.

Survey Ships

No matter where they start, the characters will need a survey ship for their mission. In an RC campaign, they may be aboard a Coalition ship with other free-lancers or RCES members. Or, the RCES may loan them a ship. Elsewhere, the sponsoring world government will loan them a survey vessel.

To determine the exact type of ship the group receives, roll 2D6 on the Recon Ship Table. One of four types may available:

RECON SHIP TABLE

2D6	*Ship*
2	Survey Ship
3	Lab Ship
4	Scout
5	Scout
6	Far Trader
7	Scout
8	Far Trader
9	Scout
10	Far Trader
11	Far Trader
12	Lab Ship

(See TNE pages 366-379 or the **Brilliant Lances Technical Booklet** for technical descriptions of these ships.)

Survey Ship: A *Donosev*-class survey ship originally built for the Last Imperium as one of a fleet for the Imperial Second Survey. Although it has deteriorated since it was built nearly 100 years ago, the *Donosev* class has the best suite of survey and detection instruments available. This vessel also has an excellent laboratory aboard. She is capable of Maneuver 2 and Jump 3, and includes a 50-ton modular cutter and three air rafts as subordinate craft for close-in survey work and refueling operations. Drawbacks: a small PC group would be hard pressed to crew this large vessel. And it is probably the ugliest ship in the sky.

Lab Ship: Originally designed as a mobile base for scientific studies, the lab ship is the next best choice to the survey ship. She contains good quality survey instruments and a laboratory. She also has roomy accommodations and can carry a survey team of up to 20 members as well as five crew members. The lab ship is designed to be on station at a world under study for long periods. Consequently, she is ring-shaped and can be spun about her fore and aft axis to produce artificial gravity without using ship's power.

The lab ship has a 10-ton launch for use as a close-in survey and landing vehicle. The lab ship is capable of Maneuver 1 and Jump 2.

Scout Ship: A pre-Collapse scout ship, this vessel has barely adequate survey and detection gear. Accommodations are also cramped, especially for a long voyage. The ship has also been overhauled many times with non-standard components, and should be treated as having a wear value of 8 (see TNE pages 241-244). The scout is capable of Maneuver 2 and Jump 2. This ship has one advantage, it can land on planets with atmospheres.

Far Trader: This is a tramp cargo vessel capable of Maneuver 1 and Jump 2, when it works right. This decrepit starship may suffer a breakdown at any moment. The hull and engineering systems are held together with rust, spit, and bailing wire. The survey instruments and detection gear are whatever the characters can hang on her hull. She can land in atmosphere, though. A rudimentary lab can be installed in her cargo hold. The same engineering conditions found in the scout are found aboard the far trader.

Note that densitometers are available only on a Survey Ship or Lab Ship. Scouts and Far Traders only have passive EMS, active EMS, and optical survey equipment.



STAR SYSTEM EXPLORATION

If your players are entering an unknown system, they need to find out what stars are there. To generate star systems at random, see the "Stars" section on page 82 of the Stars & Planets chapter later in this book.

Then, develop the star system's planets using the procedure in the "Planets" section of that chapter. Note that the most likely colony sites will be found orbiting type F, G, and K stars. See the "Stars" section for a detailed discussion of stellar spectral types.

Where Are We?

Her body seemed to turn inside out then right side in again as the scout ship Skylark *stepped out of jump space. Everything seemed totally muddled for a minute, and then became really confused as Lane realized the stars were not in their expected locations.*

Lane leaped to the astrogator's panel as soon as jump shock started to wear off. After a couple of fumbling tries, she zeroed the computer-linked astrogation telescopes to three reference stars and ran the astrogation program. She swore softly, rechecking the numbers. "Captain, we're ten degrees above the ecliptic, and 20 degrees rimward of where we should be. Captain, our exit point was perfect, but the system's moved!"

"Then you better be damn careful about plotting breakout, Lane. You foul this up and we'll never get home. The charts of this system haven't been updated in nearly 100 years—you have to expect the system to move. Why do you think the Imperium ran surveys? To keep some bureaucrats busy?"

The Captain swiveled around to his computer console and pulled up the local ephemeris from Skylark's *database. He slaved the ship's main telescope to the computer, which pointed the 'scope toward where the system's life zone planet should be. "Now lets see... Let's see if Beta is where she should be.. and do we have a week, a day, a month, before we can get to her? Too bad the densitometer's down. We'll just have to do this the old fashioned way."*

Breaking out of jump space is nearly always disorienting; it's even more so in the New Era. Minds are muddled and there's a period of confusion while the starship crew tries to plot its location. These days, there are no friendly beacons broadcasting the system's coordinates and the maneuver vectors to the main world, and 80 years of stellar motion has resulted in star systems that have shifted relative to each other, meaning that arrival in a star system will not always be where the crews expect.

With luck and a Survey or Lab Ship, your crew will have a working densitometer to find the system's worlds. Usually, however, they'll only have a telescope (included in all starship avionics suites); a device needed for two critical tasks.

First, the adventurers have to confirm they've arrived at their intended destination, and compute the difference from their expected destination. They do this by determining the angles of three or more reference stars relative to the galactic center (Difficult: Astrogation).

Second, they must refine this data relative to the system's main star to determine exactly where they have broken out of jump space (Difficult: Astrogation) in order to find their way to worlds or refueling points in the system.

These calculations are necessary when jumping back out of the system to correct for the system's motion to allow arrival at the desired point in the destination system. Failure to properly calculate these changes can cause a ship to be lost, as it may find itself out of position relative to a refueling source or destination world, and have insufficient fuel to make the course corrections to make it there. Such a ship will simply pass right through the destination system and coast off into the interstellar void.

Systems that have been visited and surveyed in the New Era do not present this problem, but whenever a ship attempts jump to a system which has not been visited since the Collapse there will be difficulties with computing the correct jump to arrive in that system in its new location relative to the departure point.

What's Here?

The players' next job is to determine the number of planets in the system, their type and location, and which—if any—may be habitable. To do this, follow the procedure in the "Planets" section. Because the characters won't want to waste resources surveying a world outside the life zone, just note these planets for future reference. Planets in the habitable zone can then be analyzed for their suitability as colony sites. Planets with no water, extreme atmosphere types or atmospheric taints may be eliminated early, but other worlds will require more detailed analysis to determine the complex interplay of their characteristics.

Is Anybody Home?

With passive sensors operating, the PCs take their ship into far orbit around the target planet. Meanwhile, if the planet is not a published or pre-generated world, the referee must secretly roll the characteristics of the target planet including population and technology levels. When in far orbit, the characters check for radio wave emissions and distinctive unnatural patterns of infrared radiation, as well as visible light from the night side of the target world (Difficult: Sensors, uncertain). Radio and infrared, and extensive visible light, indicates that an established pre-industrial or higher civilization already occupies the world. Unless all of the above come from a limited region, such as a single continent, these would rule out the target world as a colony home. However, it might be ideal for a bootstrap operation, and indicate possible points of contact.

With the ship's active and passive EMS arrays, the players should determine the planet's size (Average: Survey), the atmospheric composition and whether water vapor is present (Difficult: Sensors, uncertain), and the world's axial tilt (Average: Sensors, see page 85). If they have a working densitometer, they can determine the planet's density and its expected gravity based on its size. (Use the World Density and World Gravity tables on page 87.) They can use the ship's visual systems (part of the ship's astrogation and avionics package or its passive EMS array) to determine the presence of any large bodies of free water on the planet (Average: Survey). As they perform these tasks, the referee should give them approximate answers based on the secret rolls or the pre-generated world data.

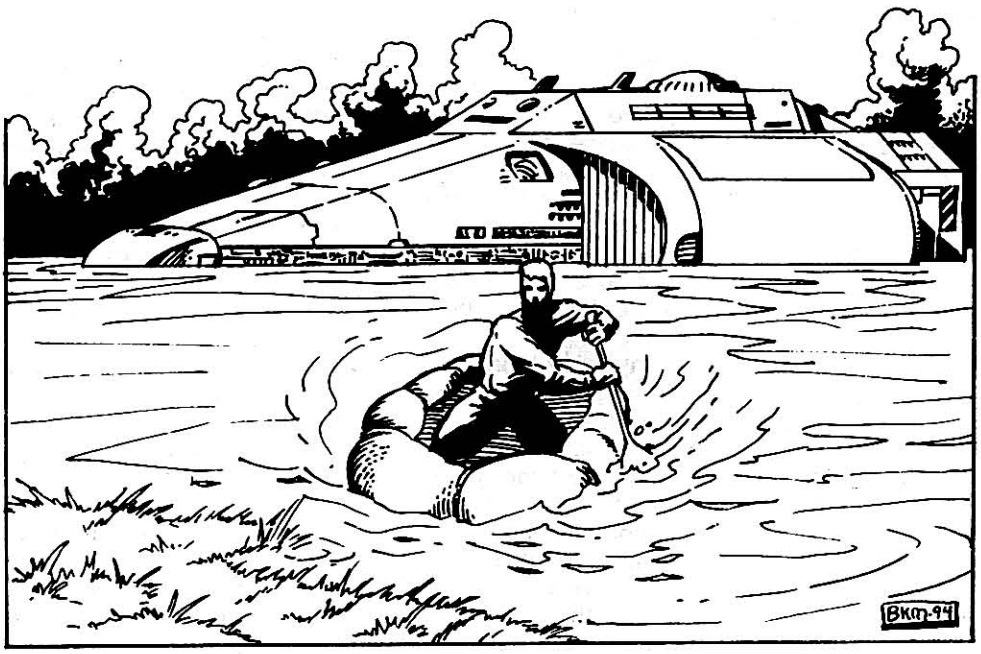
If the planet appears unoccupied, and the world has water and a breathable atmosphere, the world would be a strong candidate for a colony. If there appears to be a low-tech civilization, without one or more nodes of relatively higher technology which would indicated the presence of a TED, the world might be a good candidate for a bootstrap operation. In either case, the players should move their ship into close orbit and begin orbital scanning and mapping.

What's On the Ground?

This is where the real survey work begins. The ship's cameras and imaging EMS array begin examining the world from close orbit and producing maps of the world's oceans and continents including major terrain features such as mountain ranges, rivers, bays, forests, grasslands, and deserts. This examination can also spot any signs of previous or current habitation (Difficult: Survey, or Formidable if local technology level is 1 or lower). Imaging EMS can produce maps of surface features scanned through cloud cover.

This information can be gradually revealed to the players either from the maps provided with RCES briefing sheets.





This should take a number of hours equal to 1D6 times world's UWP size digit; e.g., a size 7 world takes 7D6 days to map. At the same time, infrared visual and radio frequency scanners are passively looking for signs of technology below that may have been missed from far orbit (Difficult: Survey and Sensors, Formidable if local technology level is 1 or lower). The referee should reveal full information about the planet's size and hydrographic percentage, and the population and technology level if the detecting signs of habitation task succeeds. Once the relative percentages of land and ocean area are known, The referee and players should begin developing a map of the planet .

The players should also note the planet's cloud cover and weather, and while in orbit , determine if any violent weather systems are at or near proposed landing sites. If the ship has a working densitometer, this instrument can be used to detect large mineral deposits (Difficult: Sensors). However, core samples will need to be taken to determine the type of mineral in each deposit. See the basic TNE Exploration rules (pages 205-206) for additional details.

FIRST LANDING

The planet rolled beneath the lab ship, blue, green, and lovely; a world virtually unscarred except for the glassy crater where the naval base had been located nearly a century ago and the ruins of a city nearby. A large island just offshore of the northern continent's east coast looked like a strong candidate for a landing site. It was on the opposite side of the continent from the ruins. If there were any indigenous survivors that had been blasted back to the stone age, the continent's central mountain range should keep them away from the colony site. A semi-circular bay opposite the mainland promised calm waters and the river delta feeding into the bay would supply both fresh water and fertile soil.

Lane fired the boat's thrusters and the small vessel dropped away from the mother ship. She always trusted the small craft's wings much more than the rather decrepit grav units, so Lane decided to make an aerodynamic approach and a water landing in the bay. High altitude turbulence rocked the boat hard as Lane circled the island to kill off entry velocity, but calmed as she turned on final approach to the bay. Clouds of steam exploded off the hot hull as she splashed down onto the bay waters and taxied toward the shoreline. The boat lurched gently as she touched the beach. Meanwhile in the rear compartment Harley was working the atmosphere tester. "It looks clean, Lane. We got a green light. No bios, no pollutants, no nothing; just fresh clean air."

"OK Harley, I hope you're right."

Seals popped and air hissed as pressure equalized in the airlock. Clad in her vac suit, Lane stepped onto the beach and moved inland toward rolling dunes covered with gray-green grass. Blue mountains and their upland valleys shimmered in the heat haze beyond. A river in spring flood flowed into the bay on her left.

The atmosphere tester's telltale light still glowed green. Lane opened her helmet seal and breathed free air for the first time in six weeks. The air smelled sweet, of sea salt, warm earth, and waving grasses. No ozone, no plastic fumes, no nitrogen toxins; just sweet, clean air.

"Harley," she called into her communicator. "Radio the captain. Tell him this is the place."

The characters will spend a fair amount of time exploring several sites as potential locations for their colony. These sites should have the potential for fertile farm and grazing land, and/or be close to potential mines for metals or fuels. If the terrain is mountainous or heavily forested, and no flat open landing areas are available, the characters should be able to set their landing craft or starship down on a lake or bay (Average: Pilot [Interface/Grav]).

In the following passages, there are guidelines for two broad types of Survey tasks: *General* and *Goal-Oriented Survey tasks*. These two categories are separated into two sections, below.

General survey tasks are those which establish the specific nature and details of the world according to standard categories and classifications. The results of these tasks constitute the bulk of data which will make up the standard planetary survey report.

Goal-oriented survey tasks are more specific in nature, in that they go beyond the standard report of what the planet is like, and seek to identify particular sites on the world which are suited to various types of exploitation. The prime example of such sites would be projected colony locations, possessing good arable land but situated near potential sources of minerals, etc.

GENERAL SURVEY TASKS

General survey tasks begin with determination of the qualities of the world's atmosphere: its pressure and its composition. For the purpose of finding suitable colony worlds, atmospheres with exotic compositions (codes A-C) and atmospheres too thin to breathe (0-3) are not really dealt with here. Rather, worlds of a basically earth-like composition at pressures varying from thin to dense will be looked at. In addition to their pressure-related



Uncertain Tasks

The principles of uncertain tasks are explained on TNE page 111, and are very important when conducting planetary surveys. Referees should treat most any task in a survey mission as an uncertain task, because the PCs will be attempting to determine the absolute truth about the nature of a world, and such information is not always available as the result of a single test.

This fact will encourage the PCs to conduct certain survey tasks more than once, to decrease the likelihood of undetected error. Each such repeated task should have its difficulty reduced by one level to reflect the greater certainty obtained by multiple investigations. Players may also think to conduct the same survey tasks at a variety of widely-separated locations, rather than just in one location where they could be fooled by unique local conditions, and referees may decide to reward such forethought by further bonuses.

It is always possible that the hidden result of a failed uncertain survey task could be the difference between life and death for a shipload of colonists. Referees must be careful to secretly record all true data that is unknown to the survey team, so that its consequences can be implemented at the proper time. This is the best way to ensure that a PC survey team takes its responsibilities seriously.

qualities, these atmospheres might also have significant additional components which will affect their suitability for habitation.

Atmospheric Pressure

Within the range of breathable atmospheric codes (code 4-9 on the Universal World Profile), **Traveller** treats worlds as having a basically earth-like oxygen-nitrogen mix (approximately 20% and 80%, respectively). This means that these atmospheres are basically breathable by humans. However, there is variation from earth norms in certain details, such as atmospheric pressure (other variations are dealt with below).

There are three basic levels of atmospheric density where humans can breath without assistance: Thin (codes 4 and 5), Standard (codes 6 and 7), and Dense (codes 8 and 9). Each density level has its own particular details. (For this discussion of density, the tainted and untainted versions of each density level are treated as being the same.)

The material below includes fairly detailed guidelines for handling the physiological effects of differing atmospheric pressures. These guidelines are presented for referees to use *where appropriate*, and are not required rules that must be slavishly adhered to at all times.

For example, if the PCs' ship lands on a world and the crew merely engages in routine trading and then departs, there is little need for the referee or players to worry about the effects of differing atmospheric pressures. If, however, the crew gets involved in a lengthy, strenuous barroom brawl, the effects of a thin atmosphere may be significant. And if the PCs are a mercenary unit intending to become involved in a lengthy military campaign, the rules below on acclimatization and physiological effects will loom very large indeed.

Thin: Thin atmospheres range in pressure from 0.43 to 0.70 standard atmospheres (where a standard atmosphere has a pressure of approximately 1 kilogram per cm^2). For simplicity, **Traveller** treats all atmospheres within this range as functionally equivalent. See the "Physiological Effects" section below for potential physiological effects of standard atmospheres on characters not accustomed to them.

Aerodynamic aircraft (fixed- and rotary-wing) also have their performance affected in thin atmospheres, see the "Aerodynamic Aircraft in Thin and Dense Atmospheres" sidebar on page 15.

Detailed Atmospheric Pressure: If referees or players desire greater detail in the atmospheric description, the referee may roll 1D10 (or, for more detail, D100) and express the result as a decimal (i.e., 4 becomes 0.4). Multiply this decimal by 0.27 and add the result to 0.43. The result is the atmospheric pressure in standard atmospheres. However, these rules will not stipulate any additional effects for a thin atmosphere of 0.43 atmospheres as compared to a thin atmosphere of 0.7 atmospheres. In **Traveller**, all thin atmospheres are treated as broadly equivalent, rather than requiring harried referees to treat each planetary atmosphere as unique. Experienced referees and players are free to do so, but in deference to the majority of players and referees who do not wish this burden, the **Traveller** rules will not address this issue in detail.

Standard: Standard atmospheres range in pressure from 0.71 to 1.49 atmospheres. As with thin atmospheres above, **Traveller** treats all atmospheres in this range as functionally equivalent. See the "Physiological Effects" section below for potential physiological effects of standard atmospheres on characters not accustomed to them.

Detailed Atmospheric Pressure: If referees or players desire greater detail in the atmospheric description, the referee may roll 1D10 (or, for more detail, D100) and express the result as a decimal (i.e., 4 becomes 0.4). Multiply this decimal by 0.78 and add the result to 0.71. The result is the atmospheric pressure in standard atmospheres. However, these rules will not stipulate any additional effects for the difference between an atmosphere of 0.71 atmospheres and an atmosphere of 1.49 atmospheres. See this section under Thin atmospheres above for further discussion.

Dense: Dense atmospheres range in pressure from 1.50 to 2.49 atmospheres. As with thin atmospheres above, **Traveller** treats all atmospheres in this range as functionally equivalent. See the "Physiological Effects" section below for potential physiological effects of dense atmospheres on characters.

Aerodynamic aircraft (fixed- and rotary-wing) also have their performance affected in dense atmospheres, see the "Aerodynamic Aircraft in Thin and Dense Atmospheres" sidebar on page 15.

Detailed Atmospheric Pressure: If referees or players desire greater detail in the atmospheric description, the referee may roll 1D10 (or, for more detail, D100) and express the result as a decimal (i.e., 4 becomes 0.4). Multiply this decimal by 0.99 and add the result to 1.50. The result is the atmospheric pressure in standard atmospheres. However, these rules will not stipulate any additional effects for the difference between an atmosphere of 1.50 atmospheres and an atmosphere of 2.49 atmospheres. See this section under Thin atmospheres above for further discussion.

Physiological Effects: There are two types of atmospheric pressure adjustments: "going up" from a lower pressure (thinner) atmosphere to a higher pressure (denser) atmosphere, or "going down" from a higher pressure to a lower pressure atmosphere. Thinner atmospheres do not typically provide as much oxygen as denser atmospheres, and denser atmospheres typically provide too much oxygen as well as other, inert, gases. Either of these conditions may adversely affect characters adapted to other atmospheres until they become acclimatized to the new atmosphere (see the "Atmospheric Adaptation and Acclimatization" section below for details).

Referee's Note: Remember that the purpose behind these rules is not to bog down play whenever the PCs journey from one atmospheric

Physiological Difficulties from Atmospheric Pressures

Because **World Tamers Handbook** is about building societies on habitable worlds, it does not deal with the obvious difficulties of attempting to breathe ammonia, for example. The atmospheric variations dealt with in **WTH** are mostly limited to atmospheres of a basically Terran composition (approximately 20% oxygen, 80% nitrogen, plus other trace gases) but which exist at different pressures. As it turns out, simple differences in pressures are sufficient to provide significant physiological difficulties.

Insufficient Oxygen: This is perhaps the most obvious effect. A partial pressure of oxygen of less than 0.1 atmosphere will not sustain life. Any combination of low atmospheric pressure and low concentration of oxygen can create this condition which is obviously quite fatal. Compressor masks (which collect oxygen from low-pressure atmospheres and compress it to breathable concentrations) are a simple and reliable antidote to this problem, fortunately.

A less severe variation of this is that on worlds with a lower than accustomed partial pressure of oxygen, persons will have a hard time with strenuous activities and will tire out more quickly, as their bodies have difficulty getting enough oxygen to sustain their activities. Fortunately most people can adapt to these situations over time, particularly with the benefit of medical attention. See the Acclimatization section.

Oxygen Poisoning: One more bit of proof of the wisdom of observing moderation in all things: too much oxygen will kill you as surely as too little. There are two main types of oxygen poisoning: chronic and acute.

Chronic oxygen poisoning is the more common of the two, and is seen at partial pressures of oxygen (PO_2) of 0.6-2 atmospheres, or 3-10 atmospheres total pressure assuming 20% oxygen as in the Terran-type atmospheres. Because this pressure is above the 2.5 atmosphere upper limit for dense atmospheres, this is typically not a problem, but higher than usual oxygen concentrations in a dense atmosphere can create the circumstances for this problem. Chronic oxygen poisoning causes inflammation, congestion, and hemorrhaging of lung and pulmonary tissues, and is manifested by shortness of breath, dry cough, and fatigue. Fortunately most humans can adapt to these conditions, and the symptoms will eventually reverse themselves (see the Acclimatization section).

Acute oxygen poisoning is fortunately only encountered when PO_2 is above 1.8 atmospheres (9 atmospheres assuming a 20% oxygen mix), and would therefore require a dense atmosphere which was almost pure oxygen, an unlikely circumstance to be sure. Acute oxygen poisoning affects the nervous system, and is manifested by such symptoms as nausea, muscular twitching, dizziness, choking, and convulsions followed by a loss of conciousness.

Inert Gas Narcosis (IGN): On Terran-type worlds this is typically known as nitrogen narcosis, as nitrogen is the most prevalent atmospheric inert gas. However, the gas need not be nitrogen, as any inert substance will create a depressant effect on the nervous system if enough of the substance goes into solution in the body's fatty tissues. IGN can be thought of as having an intoxicating effect and includes such symptoms as lightheadedness, loss of fine discrimination, euphoria, poor judgement, and slowed reflexes.

To provide an example, IGN caused by nitrogen at a partial pressure of 2.4 atmospheres has been shown to reduce reaction time by 20%, mechanical dexterity by 8%, and abstract reasoning by 33%.

Fortunately this phenomenon is associated with rather high atmospheric pressures: 3 atmospheres and above in the case of nitrogen, the predominant inert gas in Terran-type atmospheres. This means that the nitrogen form of IGN is not a problem in even dense atmospheres.

However, it is significant to note that nitrogen is hardly the most dangerous inert gas for this purpose in humans. The table at right shows the relative potency of several inert atmospheric gases, with nitrogen set as the standard.

Inert Gas	*IGN Potency*
Nitrous Oxide	25.9
Krypton	7.2
Argon	2.2
Nitrogen	1
Hydrogen	0.7
Helium	0.2

Thus, on a world where Argon or Krypton, rather than Nitrogen, was the dominant inert atmospheric gas (admittedly a rather unlikely circumstance), problems could develop at lower pressures. This potential is presented as food for thought for cruel and devious referees, and not as a common phenomenon.

Decompression Sickness: This is not a difficulty associated with a particular atmosphere type *per se*, but rather has to do with the act of transitioning from a more dense atmosphere type to a less dense atmosphere type. When living tissue exists within gas of a given pressure, some of that gas is absorbed into the tissue and held in solution. The amount of gas dissolved in the tissue is proportional to the pressure of the gas, so roughly twice as much gas would be absorbed in an atmosphere of twice the given pressure. The rate of absorption is limited by chemical functions such as solubility of the gas, and by biological functions, such as the rate of gas exchange in the lungs, the rate at which the blood moves the dissolved gases, rate of gas exchange between blood and tissue, etc. When remaining within an atmosphere of given pressure, the body attains gas equilibrium and will retain that equilibrium so long as it remains within the same atmospheric pressure.

If, however, the body is rapidly moved to an area of lower pressure, the tissue begins "degassing" to attain gas equilibrium at the new lower pressure. However, there are limitations as discussed above to the speed at which this can be done, and if the change in atmospheric pressure takes place more rapidly than the body can degas itself, the dissolved gas will come out of solution within the tissues and blood stream and form bubbles. The formation of these bubbles within various organs can cause serious physiological damage, and is known as decompression sickness.

Most symptoms of decompression sickness show up within an hour (and almost all of them within six), and these include neurological decompression sickness ("the staggers:" paralysis, dizziness, loss of muscular control, unconciousness, blurry vision, covulsion, numbness, weakness), joint involvement ("the bends:" pain and swelling in the joints), respiratory decompression sickness ("the chokes:" choking and burning sensation in the chest, shallow breathing, coughing, loss of conciousness, shock) and skin bends (rash and itching, not a real problem by itself).

One symptom which is not seen within the first few hours is one of the most crippling over the long term: aseptic bone necrosis, which can cause the destruction of joints, particularly those of the shoulders, hips, and knees. These symptoms can take from several months to as much as five years to manifest themselves, and can result from only very small changes in pressure which were accompanied by no other symptoms.

In the **Traveller** universe, decompression is usually handled aboard starships when travelling from one star system to another, as the one week+ travel time is sufficient for these purposes (note that decompression is not the same as acclimatization—a character who has been safely decompressed to a new atmospheric pressure is *not* acclimated to that atmosphere). If the entire crew is moving from one atmosphere to the next, the ship's life support system can be set to use the entire ship's inhabited spaces as a decompression chamber for the entire crew, gradually reducing the ship's internal atmospheric pressure at a safe rate until the crew is decompressed to the pressure of the atmosphere at the ship's planned destination.

If only a few passengers require decompression, this is usually accomplished by having them suit up with vac suits before boarding the ship (thus retaining the original high pressure around their bodies), and then moving them to their staterooms. Ship's life support can control environment one stateroom at a time, allowing these passengers to remain sealed in their staterooms until they are safely decompressed.

Note that decompression is required for such acts as meteoric assaults onto a world with a thin atmosphere. All troops preparing for a meteoric assault undergo decompression to the target world's atmospheric pressure before entering their drop capsules, and are carefully screened for respiratory ailments which increase the risk of decompression sickness by interfering with the body's degassing processes.

Other conditions contribute to the chance of decompression sickness and are carefully controlled before a jump, which helps explain many of the pre-drop rituals of drop troops: no alcohol for 12 hours before a jump, no tobacco or similar substances for an hour, high-protein, low-fat meals, properly fitted suits, increased fluid intake, no exercise during decompression, and keeping the body warm.

And Now the Good News: In the future universe portrayed in **Traveller: The New Era**, mankind (and other starfaring races) have been dealing with the above phenomena for centuries, and they are not the problems they might otherwise be. Standard procedures for safe decompression and acclimatization have been used for so long that the average traveller scarcely even notices them, and simple, effective drugs to ease these adjustments are readily available and are administered expertly by the innumerable versions of flight surgeous, drop medics, ship's doctors, astrophysiologists, and the like.

The above details are presented primarily as part of the ongoing effort to keep the science in science fiction, and to provide details for referees who would like to be able to provide a little bit of color to remind their players that even in the future, things sometimes still go wrong.



type to another, but rather to demonstrate the complications faced by an interstellar society which encompasses a literally infinite variety of planetary environments. These effects are not necessarily felt by travellers casually visiting or trading among such worlds, but, for example, an invasion of a world by troops not adapted to its conditions would be very much affected by these physiological realities.

Since the symptoms of physiological difficulties of going up to higher oxygen concentrations and going down to lower oxygen concentrations are so similar (characterized by fatigue, shortness of breath, etc.), for simplicity the same procedure is used for both upward and downward adjustments. However, referees may feel free to customize the physiological effects somewhat to more precisely describe a certain ailment, using the Physiological Difficulties sidebar as a guideline.

Procedure: When attempting strenuous physical activities (referee's discretion, but this should include such activities as running, carrying heavy loads, cross-country hiking in hot weather), characters adapted to a different density of atmosphere than the one they currently inhabit will have to make a roll against their Constitution attributes to avoid adverse physiological affects due to the different atmospheres. (See section below, "Atmospheric Adaptation and Acclimatization," for discussion of atmospheric adaptation.)

The frequency of these rolls is also at the referee's discretion based on the nature of the activity and the level of detail being played. During combat these rolls might be made every five minutes, but if a character runs with a heavy pack for several turns in a row, the roll might be made immediately in response to these actions. During long-duration cross-country travel, the rolls might be made each hour or half hour.

The basic difficulty level of these rolls is Difficult, with the following difficulty modifiers. Diff Mods are cumulative, but the final difficulty level can be no greater than Impossible. If the referee is handling NPC groups, such rolls should only be made once per NPC *group* (not once per NPC) based on the experience level of the NPCs.

Success: Success indicates the character experiences no difficulty, and may go about his or her business without interruption until next required to make the roll. At the referee's discretion, Outstanding Success may allow the character to skip the next required physiological effects roll.

Failure: Failure indicates the need to immediately sit down and rest. While resting, a character's Initiative and Strength attribute are each reduced by 1, and the character may not conduct Aim, Crawl, Stand Up, Melee, Run, Trot, or Walk combat actions. At the end of every minute (12 combat turns) spent resting, the character makes a Difficult roll against Constitution. Success indicates that the character has rested sufficiently and returns to normal. Failure and Catastrophic Failure both indicate that the character must continue resting and roll again after another minute.

Catastrophic Failure: Catastrophic Failure indicates that the character has lost conciousness. Characters who lose conciousness in this way are treated the same as those who lose conciousness due to a serious wound (TNE page 288). Such characters make a Formidable roll against their Constitution every 30 seconds to attempt to regain conciousness. Once conciousness is regained, they are treated as resting (above).

Referees may grant longer periods between rolls or –Diff Mods for mitigating circumstances such as cool weather or air conditioning, use of powered armor (to reduce physical exertion), etc.

Atmospheric Adaptation and Acclimatization: The Physiological effects described above only apply to characters before they become *acclimatized* to the new atmosphere. Once a character is acclimatized according to the rules below, no more rolls for physiological effects are required, as the character has become completely physically accustomed to the new surroundings.

Characters who are not used to a given atmospheric density may have a hard time adjusting to the new conditions. For example, a character who has spent her entire life in a standard atmosphere will find it hard to function in a thin atmosphere, at least until she becomes acclimatized.

Atmospheric Adaptation: First, the referee must determine if a character is adapted to a certain atmospheric density. This is not as simple as determining the atmospheric density of the character's homeworld, as the character may have spent the last 10 years become used to an atmosphere with a different density and should be treated as adapted to this new atmosphere. Characters who have spent their lives living aboard a starship can become adapted to whatever conditions the ship's life support is set to. (For this reason, most Free Traders in the New Era have their shipboard environments set to 0.7 atmospheres, the borderline between thin and standard atmospheres, allowing their crews to be equally comfortable in either environment—this also provides a savings in life support usage and speeds the transition to battle stations.)

Once a character's adapted atmosphere is determined this is compared to the local atmosphere to see if acclimatization is required. All atmospheres of the same code are considered to be equivalent for purposes of the physiological effects and acclimatization rules. Thus a character from a world with atmosphere code 5 (thin) could travel to any other world with an atmosphere code of 5 without having to worry about rolling for physiological effects or acclimatization.

Acclimatization: From the moment a character arrives in a new atmosphere, his or her body will begin making the innumerable major and minor adjustments (most of which involve discomfort) to function efficiently in these new surroundings. This period can last for a long time or for a relatively short time, and is governed by a series of rolls against the character's Constitution attribute. One such roll is made at

DM's for Physiological Effects of Acclimatization

Diff Mod	*Circumstance*
+1 Diff Mod	if character is adapted to an atmosphere **two steps** away from the atmosphere currently occupied. For these purposes there are three steps of atmospheric density: thin, standard, and dense. From thin to dense or dense to thin is two steps, from thin or dense to standard or from standard to thin or dense is only one step.
+1 Diff Mod	if character is **burdened** or greater (see "Load," TNE page 35)
+1 Diff Mod	if character is **fatigued** (see "Fatigue," TNE page 198)
–1 Diff Mod	if character is **going up** from a thinner to a denser atmosphere
–1 Diff Mod	if character is **mostly acclimatized** (Stage 4, see Acclimatization section, below)
–1 Diff Mod	if character with **Medical skill** is in attendance. This is only possible when the characters are operating as a group, in surroundings where the medic is free to circulate among the characters to periodically examine them for signs of exhaustion, etc. This would not be possible, for example, if the characters were in combat, spread among a number of separate foxholes. Not more than 20 characters may receive this benefit from a medic (thus a group of 100 NPC troops should have five medics in order to receive this benefit).



the end of each week until four successful rolls have been made. Success at each roll allows the character to pass on to another stage, in which the penalties for not being adapted to the atmosphere become steadily less.

Stage 1: Stage 1 is the period from arrival in the new environment until success is acheived on the roll to pass into Stage 2. This roll has a base difficulty of Impossible vs. CON (see below for die modifiers and Diff Mods). While in Stage 1, rolls for physiological effects (as described in the section above) are required. Also, when using the fatigue rules (TNE pages 198-199), work which would normally be defined as easy work is treated as hard work, and work which would normally be treated as hard work yields two levels of fatigue instead of only one. When using the economic model (Chapter 4), an economic sector whose laborers are in this stage suffer a –4 DM on the monthly output roll. Military units whose personnel are at this stage have a constant 4 fatigue levels for purposes of the Mass Combat Rules, see page 46 for more details.



Stage 2: Stage 2 is the period after the first roll vs. CON is successfully made, but before the second roll is made to pass into Stage 3. The base roll to pass out of Stage 2 is Formidable vs. CON (see below for die modifiers and Diff Mods). While in Stage 2, rolls for physiological effects are required. Also, when using the fatigue rules, each period of hard work yields two fatigue levels instead of only one. When using the economic model (Chapter 4), an economic sector whose laborers are in this stage suffer a –3 DM on the monthly output roll. Military units whose personnel are at this stage have a constant 3 fatigue levels for purposes of the Mass Combat Rules, see page 46 for more details.

Stage 3: Stage 3 is the period after the second roll vs. CON is successfully made, but before the third roll is made to pass into Stage 4. The base roll to pass out of Stage 3 is Difficult vs. CON. While in Stage 3, physiology rolls must be made, but there are no modifications to the normal fatigue rules. When using the economic model (Chapter 4), an economic sector whose laborers are in this stage suffer a –2 DM on the monthly output roll. Military units whose personnel are at this stage have a constant 2 fatigue levels for purposes of the Mass Combat Rules, see page 46 for more details.

Stage 4: Stage 4 is the period after the third successful roll vs. CON is made, but before the final roll is made to become fully acclimated. Physiology rolls are still required, but these are made at –1 Diff Mod. When using the economic model (Chapter 4), an economic sector whose laborers are in this stage suffer a –1 DM on the monthly output roll. Military units whose personnel are at this stage have a constant 1 fatigue level for purposes of the Mass Combat Rules, see page 46 for more details. The roll to pass out of Stage 4 and to become fully acclimated has a base level of Average vs. CON.

Stage 5: Characters which have succeeded at the roll to pass out of Stage 4 are fully acclimatized to their new environment and need not concern themselves with further physiological rolls or other deleterious effects.

These details are summarized on the table to the right.

Only one acclimatization roll may be made per week. Modifiers to this roll are as follows:

There is a –1 Die modifier (not Diff Mod) for each additional attempt on the roll to get out of the current stage, i.e., total the number of weeks in the current stage, subtract 1, and the result is the –DM to be used on the roll. A –Diff Mod is also applied if medical assistance is available.

Characters with Medical (Diagnosis) assets may assist in the acclimatization process by prescribing medication and supervising the acclimatization conditioning. In order to do so, the medic(s) must succeed at a Medical task. The base difficulty level of the task is Difficult: Medical (Diagnosis) assuming that the medic is supervising the acclimatization of 20 characters. (This also assumes that the medic has access to a supply of basic medical supplies—this varies with circumstances and referee's discretion.) The difficulty level of this task is increased one level for each doubling of the number of characters being supervised, or reduced one level for each halving. Thus 5 or fewer characters is Easy, 6-10 is Average, 11-20 is Difficult, 21-40 is Formidable, and 41-80 is Impossible.

Success indicates that the difficulty of the patient's acclimatization roll for that week is reduced by one level. Catastrophic Failure indicates that the acclimatization roll for that week is not allowed. (The referee may require a PC medic to make this roll for each character the PC is attempting to assist, or, usually in the case of NPCs, may allow a single roll to be made which affects all acclima-

Stage	*These Penalties Apply*	*Until This is Rolled*
1	Easy Work counts as Hard Work, Fatigue doubled for Hard Work, Physiology rolls required, –4 DM on Output Roll 4 fatigue levels for Mass Combat Rules	Impossible vs. CON
2	Fatigue is doubled for Hard Work, Physiology rolls required –3 DM on Output Roll 3 Fatigue levels for Mass Combat Rules	Formidable vs. CON
3	Physiology rolls required –2 DM on Output Roll 2 Fatigue levels for Mass Combat Rules	Difficult vs. CON
4	Physiology rolls required, but at –1 Diff Mod –1 DM on Output Roll 1 Fatigue level for Mass Combat Rules	Average vs. CON
5	Fully acclimatized, no further effects	N/A



tization rolls supervised by that medic for that week.)

Acclimatization Rolls: Success on the weekly acclimatization roll means that the character(s) passes into the next stage of acclimatization. At the referee's descretion, Outstanding Success may allow a –1 Diff Mod on the following week's acclimatization roll as well.

Failure simply means that the character remains at the current acclimatization stage and must attempt the roll again the following week.

If a Catastrophic Failure is ever rolled on an acclimatization roll, the character falls ill for 1D6 days. During this illness, all physiology rolls are made at one difficulty level higher, and all Easy Work counts as Hard Work.

Final Caveat: Do not slavishly adhere to these rules if they are not appropriate to the story and the action. They are only intended to add detail in circumstances where they would be appropriate.

Atmospheric Taint

Now the survey examines the composition of the atmosphere. As we have already discussed, the atmospheric envelope is assumed to consist primarily of nitrogen and oxygen in a 4:1 ratio. However, even trace amounts of particular additional materials can dramatically affect the overall breathability of the atmosphere, and will result in the atmosphere being classified as "tainted."

The following table shows the UWP codes used for the tainted and untainted versions of each of the three major atmospheric densities.

	Untainted	*Tainted*
Thin	5	4
Standard	6	7
Dense	8	9

Determining Taint: Although the surveying characters can have already established the chemical composition of the atmosphere by spectroscopic analysis from orbit, some contaminants, particularly biological ones, must be discovered by physical analysis of the atmosphere. This can be done by using a remote probe (the probe presented on page 118 of the **Reformation Coalition Equipment Guide** may be used for this purpose by placing an atmosphere sampling trap in the space reserved for the neural activity sensor; the probe then returns the sample to the mother ship for analysis there), or by personally sampling the atmosphere from the ground. This task requires the use of atmospheric analysis equipment present on any starship (for example, see the atmosphere tester on **TNE** page 346) and is an Average test of Chemistry or Biology. If the ship is equipped with a lab, the difficulty is reduced one level to Easy.

If the atmospheric study task is successful, the referee reveals whether the atmosphere is tainted or not. If it is contaminated, the testing character rolls on the Atmospheric Contaminants Table to determine what contaminant is present. If a contaminant requires the use of a filter mask and a domed environment, the world will be

Aerodynamic Aircraft In Thin and Dense Atmospheres: Aerodynamic aircraft (as opposed to contra-grav vehicles) designed using the **Fire, Fusion, & Steel Traveller** technical architecture rules are designed using the standard Terran parameters: a standard atmosphere and a 1G gravity field. However, aircraft may be designed to fly in conditions other than these. Ownership of **Fire, Fusion, & Steel** is necessary to use the material presented in this sidebar.

Aircraft may only fly in thin, standard, or dense atmospheres (codes 4-9). If an aircraft (fixed or rotary-wing) is intended to be able to operate in thin or dense atmospheres (or both) in addition to standard atmospheres, multiply its airframe cost by 1.5 to allow for reconfigurable or variable geometry intake ramps, lift devices, etc. (Note that the air-breathing engines and power plants installed in these aircraft are perfectly capable of functioning in thin and dense atmospheres with the above modifications to the aircraft.)

In addition, multiply rotary wing rotor assembly mass by 2 if they are to function in another atmosphere type in addition to standard. This provides them with the additional gearing required to allow them to be fitted with different rotor assemblies for different atmosphere types. Each additional set of rotors masses 0.25 times the mass of the modified multi-atmosphere rotor assembly. These extra rotor sets will have to be stored and transported separately at a volume in m^3 of 20 times their mass in tonnes. Cost is calculated normally based on rotor assembly type.

An aircraft's airframe will yield different maximum and minimum speeds in different atmosphere types, and this must be examined. It may be that some aircraft can no longer fly, as they can no longer meet the minimum speed required to stay in the air in a thin atmosphere, for example. Maximum, cruising, and NOE speeds must be recalculated based on these new numbers, and aircraft with drag points calculate their new speeds down from these new maxima using the normal procedure. The new minimum speeds will change take-off and landing distances as well.

Note that while dense atmospheres "slide the performance window down" by reducing minimum and maximum speeds, thin atmospheres narrow the permissible performance bands. This is because the speed of sound is lower in thin atmospheres, and airframe maximum speed is based on its ability to handle the compression phenomena associated with the speed of sound. (The other side of this is that denser atmospheres provide more lift, hence lower stall speeds, while thinner atmospheres provide less lift so require greater speeds to remain airborne.)

Note also that this table uses a single average value for each of thin and dense atmospheres. The actual density of any atmospheres varies within a range, so in reality, these numbers would be different for each and every world, even those classified by **Traveller** as having the same atmosphere type. As the purpose of these rules is to allow aircraft to be relatively quickly converted from one world type to the next, it would be criminally stupid to attempt to calculate exact numbers for each individual world. Instead, for the purposes of these rules (and in the interest of universal mental health) any world of a given atmosphere code yields the same performance as any other world with the same code. The value used for thin atmospheres is 0.6 atmospheres and the value for dense is 2.0 atmospheres.

Airframes

	Thin (4, 5)		Standard (6, 7)		Dense (8, 9)	
Type	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
Simple	250/125	270	150/75	320	75/40	160
Autogyro	65/—	200	40/—	200	20/—	100
Fast Subsonic	265/135	680	160/80	800	80/40	400
Transonic	300/150	940	180/90	1100	90/45	550
Supersonic	465/235	2400	280/140	2800	140/70	1400
Hypersonic	585/290	4300	350/175	5000	175/90	2500
Wing-in-ground	125/—	400	75/—	400	40/—	200





unsuitable as a colony site and the group should move on.

If the task fails, the characters receive a false negative reading. (For this reason it is wise for the PCs to make several atmospheric study tasks at various locations to weed out potential false readings.) The referee should roll on the Atmospheric Contaminants Table and not reveal the effect if a contaminant is present until the characters leave the ship and breathe the local air. Catastrophic failure indicates there is a delayed action contaminant that will affect humans beginning 3D weeks after exposure.

ATMOSPHERIC CONTAMINANTS

1D10	*Contaminant*
1	Allergens
2	Fungi (F)
3	High Carbon Dioxide
4	High Carbon Dioxide
5	High Oxygen
6	High Oxygen
7	Low Oxygen
8	Microorganisms (F)
9	Nitrogen Compounds (F)
10	Sulfur Compounds (F)

Contaminant Results: On the table above, the notation (F) indicates that a filter mask is required. Colonists may adapt to other contaminants using the acclimatization rules found in the Atmospheric Pressures section above. See the listing for the precise contaminant below to find any modifications to be used with the acclimatization and physiological effects rules.

Allergens: Roll 1D10 again and multiply the result by 10. This indicates the percentage of humans who react to airborne allergens with mild to severe respiratory symptoms. Local inhabitants may have adapted to these allergens. If the characters are already having to become acclimatized to the atmosphere because of differing atmospheric pressures, the presence of allergens adds no additional difficulty to this.

If, however, the characters are from an atmosphere of identical pressure, they will need to undergo the acclimatization procedures for this world. However, all acclimatization rolls are made with a –1 Diff Mod, and the characters start at Stage 2. Until acclimatized, all physiological rolls are also made with a –1 Diff Mod in addition to any other applicable mods. These modifiers may make these rolls so routine that the referee may elect to dispense with them altogether.

Fungi: Atmosphere-borne fungi harmful to humans are present. They attack the mucous membranes of the mouth and throat, and invade the lungs causing eventual suffocation. Some strains may attack the skin. Filter masks are needed to remove them from breathing air.

High Carbon Dioxide: This produces rapid breathing and a suffocating effect. At moderate concentrations it can be tolerated over time as long as sufficient oxygen is present.

If the characters are already having to become acclimatized to the atmosphere because of differing atmospheric pressures, the presence of high carbon dioxide adds no additional difficulty to this.

If, however, the characters are from an atmosphere of identical pressure, they will need to undergo normal acclimatization procedures and physiological effects rolls for this world.

High Oxygen: The partial pressure of oxygen in the atmosphere is significantly higher than is typical. This produces symptoms similar to those of persons attempting to become acclimatized to higher pressure atmospheres.

For acclimatization purposes, treat the atmosphere as being one pressure level higher than its actual pressure would indicate (i.e., a thin atmosphere with high oxygen would be treated as a standard atmosphere, a standard atmosphere with high oxygen would be treated as a dense atmosphere, and a dense atmosphere with high oxygen would be one step above a normal dense atmosphere, two steps above a standard atmosphere, and three steps above a thin atmosphere).

Air-Breathing Power Plants in Tainted and Inhospitable Atmospheres: All of the chemical power plants and jet self-contained thrusters presented in **Fire, Fusion, & Steel** (pages 63 and 70) are "air breathers," i.e., require an outside source of oxygen to function. These plants and thrusters are all defined using a standard atmosphere as their baseline, and require the following considerations to me met in order to function in other atmospheres.

All air-breathing power plants include fittings for filters for use in tainted atmospheres at no additional cost. (Certain environments, such as sandy deserts, may also require such filters.) When fitted, these filters cost 0.01 times the cost of the power plant and have negligible mass and volume. While these filters are fitted, multiply maintenance points of the vehicle by 1.2.

Air breathing power plants may also be modified to function in tainted atmospheres by carrying their own on-board oxygen supplies (which also allows the plant to function in vacuum, trace, exotic, corrosive, or insidious atmospheres). Any air-breathing vehicle using liquid hydrogen for fuel may modify its fuel tankage to carry half liquid oxygen and half liquid hydrogen. Such a vehicle may then operate in vacuum, trace, exotic, corrosive, or insidious atmospheres, or in tainted atmospheres without filters, as it has no need for external sources of oxygen. However, its rate of fuel consumption is doubled.

This modification costs Cr50 per cubic meter of fuel capacity, and does not prevent the vehicle from using the full tank for liquid hydrogen for normal external oxygen operations.



Other noteworthy effects are present, such as the fact that fires will burn more rapidly than would be the case in a standard 20% oxygen environment. The effects of fires should be more pronounced, but the seriousness of this effect is also left up to the referee.

Low Oxygen: The partial pressure of oxygen in the atmosphere is significantly lower than is typical. This produces symptoms similar to those of persons attempting to become acclimatized to lower pressure atmospheres.

For acclimatization purposes, treat the atmosphere as being one pressure level lower than its actual pressure would indicate (i.e., a dense atmosphere with low oxygen would be treated as a standard atmosphere, a standard atmosphere with low oxygen would be treated as a thin atmosphere, and a thin atmosphere with low oxygen would be one step below a normal thin atmosphere, two steps below a standard atmosphere, and three steps below a dense atmosphere).

Another noteworthy affect of a low oxygen concentration is the fact that fires will not burn as well. They will be harder to start, and will burn slower once started than would be the case in a standard 20% oxygen environment. The effects of these slower, less dangerous fires is left up to the referee.

Microorganisms: Viruses and/or bacteria are present that will attack the respiratory or neurological system within 1D6 days. Filter masks are required to remove these from the air.

Nitrogen Compounds: The atmosphere contains a considerable portion of harmful nitrogen compounds. These are often the result of industrial pollution, especially resulting from the use of hydrocarbon fuels, interacting with ultraviolet stellar radiation. Filter masks are required to allow humans to avoid the deleterious effects of these chemicals.

Nitrogen compounds may be present on a depopulated or regressed industrial world. Nitrogen compounds absorb the blue-violet end of the visible light spectrum giving the atmosphere a characteristic brownish-yellow haze.

Sulfur Compounds: Sulfur compounds are present in the atmosphere, usually from volcanic activity on the world. Filter masks are required to screen out these irritating compounds to allow humans to live in such an atmosphere. Lung damage will result if these compounds are breathed over time. Some sulfur compounds, such as sulfur dioxide and hydrogen sulfide, have a repulsive smells as well.

Planetary Density & Gravity

If the players have not yet determined the planet's density and gravity from orbit, they will do so as soon as they land. (Use the World Density and World Gravity tables on page 87 to do this.) Note that a dense, relatively high gravity world usually indicates the presence of heavy metal deposits, making the planet a potentially valuable mining site.

Physiological Effects: As with atmospheres, the different physical demands placed on a body by higher than accustomed gravity can have physiological affects on characters. These effects are described in the **TNE** basic rule book, pages 197-198.

Temperature & Weather

Temperature: Referees must have completed a planetary temperature worksheet if the PCs intend to conduct a detailed survey which includes temperature evaluation. The PCs may take simple temperature readings in any hex they like, and thereby rapidly put together a temperature profile of the world. By consulting the worksheet, the referee can provide this data to the players on a hex-by-hex basis, or the players may be provided with a correct copy of the table provided they succeed at a Formidable Survey task. The difficulty level of this task is reduced one level for each 10 planetary hexes in which the PCs take temperature readings.

Gravity and Aerodynamic Aircraft Performance

Traveller does not focus on a world's gravity *per se*, but primarily on the density of its atmosphere, which is a reflection of its gravity. Players and referees should not feel compelled to worry about gravity effects on aircraft so long as they address the atmospheric requirements above.

However, some players who use the **Fire, Fusion, & Steel** technical architecture book to design aircraft may feel compelled to account for different gravities when calculating aircraft performance. **FF&S** assumes a standard atmosphere and a standard 1G field in its design sequences. In order to account for gravities other than 1G, multiply the aircraft weight by the local gravity before calculating G-Rating, Speed, and Take-off and Landing rolls. Calculate glide ratios normally, and then divide the result by the local gravity in Gs. In G-fields of greater than one, multiply normally-calculated maintenance points by the gravity in Gs, as more maintence is required to watch for and repair stress fractures, etc.

The temperatures will also be used later on when determining the suitability of planetary hexes for agriculture.

Weather: Weather is the result in large degree to two characteristics of the world: its primary star and the world's axial tilt. A world's star pumps energy into its ecosphere in the form of solar radition, and the more energetic the star, the more energetic and violent the resulting weather.

Likewise, the greater the axial tilt of a world, the greater the temperature difference that builds up with regard to that solar heating between the northern and southern hemispheres. Consequently, on a world with an extreme axial tilt, there is a near constant massive and violent movement of air from the cold winter hemisphere to the warm summer hemisphere. Conversely, there is little air movement on a world with little tilt that is evenly warmed and cooled.

Consult the Weather Factors table for a world's star and axial tilt characteristics to come up with a total weather factor number by adding the factors together (as many as three may apply to a given world). These factors may be used again later for local weather and agricultural richness, and also in the Colonial Economic model for random events and possible modifications to infrastructure maintenance (see page 35).

WEATHER FACTORS

+4 if system's star is type A
+2 if system's star is type F
–1 if system's star is type K
–2 if system's star is type M
–2 if axial tilt is zero.
–1 if axial tilt is 1-10 degrees
+1 if axial tilt is 20-29 degrees
+2 if axial tilt is 30-44 degrees
+4 if axial tilt is greater than 45 degrees
+1 if UWP hydrographic code 5+

Environmental Research and Testing

The PC survey team needs to conduct soil tests, collect soil samples, plant samples, and animal samples to learn about the local ecology and whether the soil is suitable for crops and domestic grazing animals. They must also test mineral outcroppings to determine if exploitable mineral deposits are present.

Mineral Testing: Mineral samples need to be tested to determine



their constituent metallic or organic elements. As discussed in the sidebar on uncertain tasks, they may be attempted more than one time to reduce the possibility of false positive or negative readings.

For purposes of the colonial economic model (see Chapter 4), the results of these tests are limited to three details: the presence or absence of fossil fuels and radioactives, and the extent to which the world has already had its mineral resources exploited by previous habitation. The results of these tests will be used again later in the survey procedure. Both tasks are Impossible: Geology, but should be reduced in difficulty for additional attempts as discussed in the Uncertain Tasks sidebar on page 11. Each test should take approximately one day once the team has arrived in the area to be tested. (Thus the quality of transportation available to the survey team will affect the time required by controlling how rapidly they can move from one site to the next.)

Fossil Fuels: Fossil fuels are the remains of long-dead lifeforms, mostly plants, that have been buried and transformed by geological processes into hydrocarbon fuels. The presence of fossil fuels (coal, oil, natural gas) require for the world to have sustained organic life long enough ago that it has since been geologically transformed. On worlds that cannot support life, or have not existed long enough for these conditions, fossil fuels cannot exist. The result of this test is a simple yes/no test for the planet as a whole.

Success at the uncertain Survey task allows the referee to report the correct answer (yes or no to presence of fossil fuels) to the PCs. Failure requires the referee to report a false result.

The table below assumes a primary star of luminosity class V and an atmosphere of 2-9.

Star Type	*Exceed on 2D6*
A	12+
F	10+
G	7+
K	6+
M	5+

Atmosphere DMs:
2-3: –2
4-9: 0

Hydrographic DMs:
0: –2
1-2: –1
3-8: 0
9-A: –1

Radioactives: This is a simple yes/no result, with radioactives being present on a 2D6 roll of 9+. DM –3 if low density planet, +3 if high density, –2 if primary star K or M.

Prior Exploitation: This test is based on the current or pre-Collapse population and tech level of the world, whichever is greater. Note that these figures may not be known to the survey team, but they need not be known for the team to obtain the correct answer, as the answer is obtained by actually sampling existing mineral deposits.

The referee consults the table below and conducts any necessary die rolls to determine the exploitation multiplier. This multiplier is used later in this chapter to modify the raw materials richness to account for previous inhabitants having already removed non-renewable resources.

Success at the uncertain Survey task allows the referee to report the correct number to the PCs. Failure requires that the referee report a false number.

The values obtained from the table below must be multiplied by 0.1 to create the final multiplier, and all results of greater than 1.0 become 1.0. Thus in the case of a world with a population A and TL of 16, a D6 result of 6 is obtained, yielding an outcome of (7–6=) 1. The final prior exploitation multiplier is therefore 1×0.1=0.1.

In the case of a population A, TL 11 world, the result is (12–1=) 11, 11×0.1 = 1.1, and this is corrected to the upper limit of 1.0.

	Population				
TL	*0-6*	*7*	*8*	*9*	*A*
0-7	—	—	—	—	15-D6
8	—	—	—	15-D6	14-D6
9	—	—	15-D6	14-D6	13-D6
10	—	15-D6	14-D6	13-D6	12-D6
11	15-D6	14-D6	13-D6	12-D6	11-D6
12	14-D6	13-D6	12-D6	11-D6	10-D6
13	13-D6	12-D6	11-D6	10-D6	9-D6
14	12-D6	11-D6	10-D6	9-D6	8-D6
15	11-D6	10-D6	9-D6	8-D6	7-D6
16	10-D6	9-D6	8-D6	7-D6	6-D6

Soil Testing: The survey team must also test the soil for human agricultural use. This test determines if the soil of the world contains materials that will prevent human agriculture. Such materials include heavy metals or salts in the soil, or biological organisms that are hostile to human-compatible crops.

The task is uncertain, Impossible: Chemistry *and* Biology, with the normal difficulty modifiers for multiple task attempts as discussed in the Uncertain Task sidebar on page 11.

The referee rolls secretly on the table below and records the result. Success in the PCs' task indicates that the referee can report the correct result to them. Failure requires that they be given a false result.

The result on this table is used when rolling for the agricultural richness rating for all of the world's planetary hexes in the Goal-Oriented Survey section below.

1D6	*Soil Contaminants*
1	None, no mod on Agricultural Richness table
2	None, no mod on Agricultural Richness table
3	None, no mod on Agricultural Richness table
4	Mild, –4 DM on Agricultural Richness table
5	Moderate, –6 DM on Agricultural Richness table
6	Severe, –10 DM on Agricultural Richness table

Biological Compatability: The survey team must also determine if local plant life will be edible and/or compatible with human agricultural activity. This uncertain task is Formidable: Biology, with the usual diff mods for additional attempts. Each such attempt requires one week. Otherwise this procedure is handled the same as soil testing above.

1D6	*Agricultural Compatibility*
1	Import Dominant, +2 on Agricultural Richness table
2	Import Compatible, no mod on Agricultural Richness table
3	Import Compatible, no mod on Agricultural Richness table
4	Import Compatible, no mod on Agricultural Richness table
5	Local Dominant, –1 on Agricultural Richness table
6	Local Dominant, –2 on Agricultural Richness table

GOAL-ORIENTED SURVEY TASKS

The conduct of goal-oriented survey tasks indicates that actual sites for habitation are being explored. This is usually done only after the general survey tasks are completed and it has been determined that there are no major obstacles to colonization (such as lack of fossil fuels or other mineral resources, unsuitable temperature or weather patterns, etc.). The goal-oriented survey provides the parameters that are used in the Colonial Economic Model presented in Chapter 4, and is therefore a necessary condition to the establishment of any kind of settlement.



A goal-oriented survey task consists of the in-depth examination of a single planetary hex by the survey team, but this single survey task provides all of the data required for the economic model, rather than requiring separate tasks for each piece of data. However, because of the length of time required for the goal-oriented task, the planetary hex to be surveyed should be carefully chosen based on promising characteristics (for example, it is probably not worthwhile to survey a desert hex). When a survey is conducted, all of the information below is generated and presented to the players if the task is successfully completed.

Hex Scale

Goal-oriented survey tasks are resolved on the scale of *planetary hexes*. Planetary hexes are the individual hexes shown on the "Global Data View" world maps (see pages 59 and 78 of this book for examples). Because these maps are designed to fit different-sized worlds into one standard format, these hexes do not have a constant scale, but vary in scale based on the size of the planet that is illustrated.

However, for the detailed colony and bootstrap campaigns that are presented in the **World Tamers Handbook**, these large planetary hexes are broken down into smaller hexes for better resolution. Unlike the planetary hexes, the smaller hexes used for these adventures have a constant scale of 20 kilometers from hexside to hexside, and are called *20-kilometer mapping hexes*, or mapping hexes for short. Because of the variable size of planetary hexes, the number of mapping hexes that fit into each planetary hex varies by planet. The Planetary Hex Survey table below and accompanying illustration sidebar show how planetary hexes of varying sizes are broken down into mapping hexes to allow referees to create the more detailed maps that are required for laying out colonies, tracking the progress of a war in a bootstrap campaign, etc.

Terrain Types

The two hex scales (planetary and mapping) also use two separate but related terrain scales. The scale used for planetary hexes has eight types, corresponding to the predominant terrain found in the hex. These do not include artificial additions such as starports, cities, etc.

The terrain "palette" used for 20-km mapping hexes consists of a greater variety of types. The terrain types used for these mapping hexes is identical to the terrain types used when generating animal encounter tables as listed in the TNE basic rulebook, page 215.

When referees and other world designers create the detailed 20-km hex maps, the terrain that they place in these smaller hexes is governed by the terrain type of the planetary hex itself. The detailed terrain types subsumed within the planetary hex terrain types are listed on the Terrain Scale Conversion table, below. Of course, any planetary hex can have unique or unexpected terrain types within it, so this table should serve primarily as a guideline.

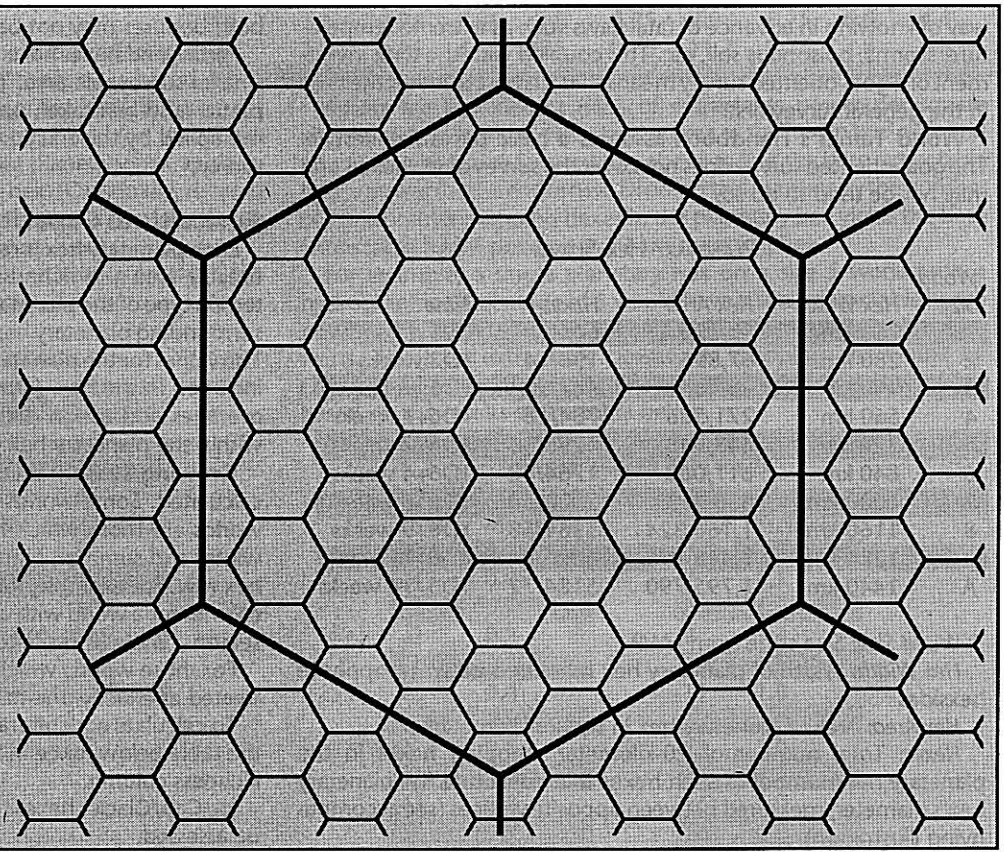
TERRAIN SCALE CONVERSION

Planetary Hex	*20-km Mapping Hex*
Sea	Surface, Shallows, Depths, Bottom, etc.
Mixed	Clear, Rough, Forest, River, Swamp, Marsh
Steppe	Prairie, River
Ice Cap/Glacier	Glacier
Desert	Desert
Badlands	Broken, Rough, River, Mountain
Tundra	Clear, Rough, River
Jungle	Jungle, River

Note that mixed terrain includes most terrain thought of as habitable by humans. Areas inhabited by humans and used for agriculture, i.e., cities, suburbs, and farms, are primarily mixed terrain hexes that have been cleared for development. On the more detailed scale, these hexes would be mostly clear and forest hexes.

The hex grid illustrated here is for use with the Planetary Hex Survey table at right. The example shows the 20-kilometer hexes within a single planetary hex of a UWP size 1 world. By consulting the table, we see that this hex has a total of 64 hexes in it, and has a vertex-to-vertex diameter of eight such 20-kilometer hexes. On the hex grid, this diameter is rendered as seven full hexes plus two half hexes, one at each end, for a total of eight.

Maps can be made showing the 20-kilometer hexes within a planetary hex by using the chart below with a sheet of blank hex paper and a ruler. Find the correct diameter for a given size planetary hex, and count that number of hexes off on the grid, marking the hex vertices, and then connect them by using the ruler. Use the sample UWP size 1 grid here as a guide, so that all hex diameters half a half hex on each end. Thus a Size 2 world has a diameter of 14 hexes (13 and two half-hexes), a Size 3 world has a diameter of 22 hexes (21 and two half-hexes), and so on.





The Goal-Oriented Survey Task

Unlike many of the general survey tasks earlier in this chapter, it is possible to conduct the goal-oriented survey so that success is guaranteed, i.e., the results delivered to the players are guaranteed to be the correct results generated by the referee.

The price of this exactness is a large time component. The Planetary Hex Survey table shows the time required to survey a single planetary hex for all UWP world sizes. There are certain factors than can reduce this required time, and these are listed in the box at right. Among these factors are the option to speed up the survey by making it into an uncertain task, which means that the survey team can bring home bad data. Although the survey task starts out as an automatic task, it is treated as having a base level of Easy for purposes of adding time-saving difficulty modifiers.

When rolling for this task, the referee should total up the party's relevant survey assets (see next paragraph) and divide by the total number of such assets possessed by the party to find the average asset number to roll against.

The survey team required for this task (whether it is automatic or not) should be at least four personnel, and these personnel should have significant skills in Map, Navigation, Observation, Tracking, Biology, Chemistry, Geology, Meteorology, Xeno-Biology, Sensors, and Survey (referee's discretion). It is assumed that the team is equipped with all basic survey equipment, testing kits, hand-carried sensors, etc.

Although PCs can theoretically go to an unexplored world and perform a goal-oriented survey task first, with the knowledge that the results will be perfectly correct, this is not the bargain it might seem. Without first performing the general survey, the players will have no world map, and will choose planetary hexes blindly, and will have no way of knowing in advance of fatal flaws such as extreme temperature, storms, poisonous soil, etc. This coupled with the time investment of a goal-oriented survey means that it is best to invest the time in the general survey first.

World Tamer's Handbook assumes a basic terrestrial lifestyle. The goal-oriented survey does not cover the survey of sea hexes, and may not be used to do so.

Time Reductions for Planetary Hex Survey

Factor	*% Decrease*
Diff Mod increase: (from Easy, i.e., one diff mod makes it Average, two diff mods makes it Difficult, etc.)	10% each
For each team member above four	1% each, to a maximum of 6%
For each tech level above 8	½% each
One or more labs available aboard ship or on ground	10%
Spacecraft	10%
Active EMS on Spacecraft	5%
Passive EMS on Spacecraft	5%
Densitometer on Spacecraft	5%
Neural activity sensor available to survey party	5%
Self-propelled ground vehicles for all party members	5%
Grav vehicles for all party members	10%

Planetary Hex Survey

World Size	*Hex Width*	*Hex Area*	*Hexes*	*Time*
1	160 km	22,170	64/8	1D6 days
2	280 km	67,896	196/14	1D2 weeks
3	440 km	167,663	484/22	1D6 weeks
4	560 km	271,586	784/28	1D6+1 weeks
5	720 km	448,948	1296/36	1D6+2 weeks
6	840 km	611,068	1764/42	1D6+4 weeks
7	1000 km	866,025	2500/50	1D6+6 weeks
8	1160 km	1,165,324	3364/58	1D6+9 weeks
9	1280 km	1,418,896	4096/64	1D6+11 weeks
A	1440 km	1,795,790	5184/72	1D6+14 weeks

World Size: Size code from UWP

Hex Width: Width of planetary hex measured between opposite hexsides

Hex Area: Area of planetary hex in square kilometers

Hexes: Total number of 20-kilometer mapping hexes in the planetary hex/number of such hexes that constitute the planetary hex's diameter, measured between opposite vertices (see accompanying illustration)

Time: Base time to conduct a goal-oriented survey of a single planetary hex, as modified by the factors on the Time Reductions table above.

Notes to Time Reductions Table: The team's tech level is assumed to be that of the world which sent/equipped them, although referees may make allowances for PC teams which have carefully equipped themselves with a wide variety of higher TL equipment. Spacecraft is a dedicated spacecraft used by the party as part of the survey, and must have a tech level at least equal to the rated TL of the survey team. If the ship's TL is lower, use the ship bonus but not the party's TL bonus. More than one ship adds no additional bonuses. Listed sensors are those aboard this spacecraft. The vehicle requirement is that the total vehicle capacity is equal to the party size, for example two air rafts each with seating for four would be sufficient for a party of eight, but not for a party of ten. The vehicle criteria are either/or, both bonuses may not be taken.

Partial land hexes have their survey time reduced because of their smaller surveyable area. The referee should judge the fraction of a partial land hex taken up by land, and the survey time should be multiplied by this fraction to obtain the final time required for the survey.

Agricultural Capacity

Each planetary hex is rated for its agricultural capacity in terms of useable area and richness. This capacity is based primarily on the terrain type of the planetary hex itself, but is also modified by the six surrounding planetary hexes (or in the case of mountains, hexsides). The values for the planetary hex apply to every 20-km mapping hex included in the hex. (Optionally, referees may use these values as averages and assign different values to different mapping hexes within the planetary hex.)

Growing Season: Each world must also have its growing season calculated. Some worlds are treated as having no seasons. These worlds are those which have no temperature difference between winter and summer. Note that this distinction varies with latitude/hex row. For example, look at the axial tilt table on page 85, in the column for a world with a 9-12° axial tilt. Hexes in rows 1-5 have no seasons, while hexes in rows 6-12 do.

For those worlds which do have seasons, the growing season is treated as exactly one-half of its year as calculated on page 83.

To calculate agricultural capacity of a planetary hex, roll twice on the table below, once in the Useable Area column and once in the Richness column.

Ice Cap/Glacier hexes have no agricultural capacity and need not be assessed.



D10	Useable Area	Richness
–5	0%	0.05
–4	5%	0.1
–3	10%	0.2
–2	15%	0.3
–1	20%	0.4
0	25%	0.5
1	30%	0.6
2	35%	0.7
3	40%	0.8
4	45%	0.9
5	50%	1.0
6	60%	1.0
7	70%	1.1
8	80%	1.2
9	90%	1.3
10	95%	1.4
11	96%	1.5
12	97%	1.6
13	98%	1.7
14	99%	1.8
15	100%	1.9
16	100%	2.0

Die Modifiers: Useable Area Only
Badlands hex: –3
Steppe hex: +5
For each neighboring mountain hexside: –1
For each neighboring Steppe hex: +1
Die Modifiers: Richness Only
Jungle hex: –3
Steppe hex: +2
Desert hex: –5
Total Weather Factors –4–3: –1
Total Weather Factors +4–+5: –2
Total Weather Factors +6–+8: –3
Soil Contaminants: DM as obtained on page 18
Biological Compatability: DM as obtained on page 18
Summer Maximum Temp 50°C+: –10
Summer Maximum Temp 10°C–: –10
Winter Minimum Temp 10-50°C: +2
Growing Season (one-half of year) over 8 months: –2
World has no seasons: –2

Raw Materials Capacity

Each planetary hex is rated for its raw materials capacity in terms of useable area and richness. This capacity is based primarily on the terrain type of the planetary hex itself, but is also modified by the six surrounding planetary hexes (or, in the case of mountains, hexsides). The values for the planetary hex apply to every 20-km mapping hex included in the hex. (Optionally, referees may use these values as averages and assign different values to different mapping hexes within the planetary hex.)

Roll twice on the table below, once in the Useable Area column and once in the Richness column.

D10	Useable Area	Richness	D10	Useable Area	Richness
–5	—	1	6	30%	50
–4	—	2	7	35%	55
–3	—	5	8	40%	60
–2	—	10	9	45%	65
–1	—	15	10	50%	70
0	0%	20	11	55%	80
1	5%	25	12	60%	90
2	10%	30	13	65%	100
3	15%	35	14	75%	110
4	20%	40	15	80%	120
5	25%	45	16	85%	150

Die Modifiers: Useable Area Only
Glacier hex: No useable area; do not roll
Badlands hex: +2
Per neighboring mountain hexside: +1
Weather factors +6 or greater: +2

Die Modifiers: Richness Only
Steppe hex: –1
Desert hex: –2
World has fossil fuels: +4
World has low density: –3
World has high density: +3
World has radioactives: +1

Prior Exploitation: Remember to multiply the richness value of the hex by the value obtained earlier for prior exploitation. This step reduces the richness value to reflect the fact that much of the resources have already been removed.

Extractable Hydro Power

Each planetary hex has a certain amount of "free" hydro power available in it. This "free" power must then be extracted by mechanical means, such as water wheels, dams and hydroelectric turbines

The base hydro power in a planetary hex is obtained by indexing a world's size and hydrographic percentage on the Base Hydro Power table. The hex's base hydro power is then modified by a multiplier obtained by rolling on the Hydro Power Multiplier table, which incorporates the effects of different hex types.

Base Hydro Power

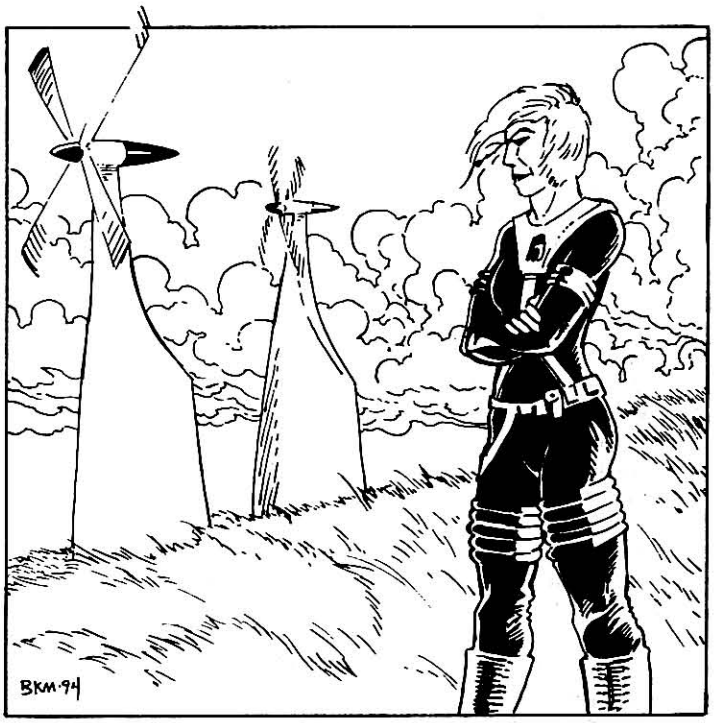
World Size	World Hydrographic Percentage 1	2	3	4	5	6	7	8	9	A
1	0.15	0.375	0.525	0.75	1.125	1.35	1.125	0.9	0.6	0.3
2	0.25	0.625	0.875	1.25	1.875	2.25	1.875	1.5	1	0.5
3	0.4	1.0	1.4	2.0	3.0	3.6	3.0	2.4	1.6	0.8
4	0.5	1.25	1.75	2.5	3.75	4.5	3.75	3	2	1.0
5	0.6	1.5	2.1	3.0	4.5	5.4	4.5	3.6	2.4	1.2
6	0.8	2.0	2.8	4.0	6.0	7.2	6.0	4.8	3.2	1.6
7	0.9	2.25	3.15	4.5	6.75	8.1	6.75	5.4	3.6	1.8
8	1.0	2.5	3.5	5.0	7.5	9.0	7.5	6.0	4.0	2.0
9	1.1	2.75	3.85	5.5	8.25	9.9	8.25	6.6	4.4	2.2
A	1.3	3.25	4.55	6.5	9.75	11.7	9.75	7.8	5.2	2.6

Values are in kilowatts (kW) of extractable power per square kilometer. Multiply this value by the area of the hex in km² as found on the Planetary Hex Survey table above to find the base extractable hydro power for the entire hex. Dividing this number by the number of 20-kilometer mapping hexes in the planetary hex yields the base extractable hydro power per 20-km mapping hex.

For example, a single planetary hex on a size 5 world with a hydrographic percentage of 6 would have a total extractable hydro power of (5.4 × 448,948 =) 2,424,319 kilowatts, or 2424.3 megawatts. The base extractable power per mapping hex would be (2424.3 + 1296 =) 1.87 megawatts. This base power is modified based on the results of the table below.

Hydro Power Multiplier

D10	Multiplier	D10	Multiplier
–5	0.01	6	1.0
–4	0.05	7	1.1
–3	0.1	8	1.2
–2	0.2	9	1.4
–1	0.3	10	1.6
0	0.4	11	1.8
1	0.5	12	2.0
2	0.6	13	3.0
3	0.7	14	4.0
4	0.8	15	5.0
5	0.9	16+	6.0



DIE MODIFIERS FOR HYDRO POWER MULTIPLIER TABLE

Hex Type	*Target Hex*	*Per Neighboring Hex /Hexside (Max)*
Mixed	+2	–1 per Steppe or Desert hex (–6) +2 per Mountain hexside (+6) +1 per Sea hex (+3)
Steppe	–5	–1 per Steppe or Desert hex (–6) +1 per Mountain hexside (+3) +1 per Sea hex (+3)
Ice Cap/Glacier	None*	None
Desert	–8	–1 per Steppe or Desert hex (–6) +1 per Mountain hexside (+3) +1 per Sea hex (+3)
Badlands	0	+2 per Mountain hexside (+6) +1 per Sea hex (+3)
Tundra	0	–1 per Steppe or Desert hex (–6) +1 per Mountain hexside (+3) +1 per Sea hex (+3)
Jungle	+2	+2 per Mountain hexside (+6) +1 per Sea hex (+3)
Island**	–5	None

Target hex is the planetary hex which is itself the target of the goal-oriented survey. The neighboring hexes are the six surrounding hexes. Hexes on the opposite side of mountain hexsides are not used for these calculations; the mountain hexside takes precedence as neighboring terrain no matter what is on the other side. Only full sea hexes count as sea hexes for purposes of the neighboring hex DMs; half-sea hexes count as land hexes of the appropriate land terrain type. Ice cap sea hexes also do not count as sea hexes for these DMs. Note that the chart indicates maximum DMs permitted from each terrain type.

*Hex has no extractable hydro power, regardless of surrounding hexes. Do not roll on table, enter "0" for hex's hydro potential.

**Any island which fits completely within one planetary hex uses this DM regardless of its terrain type.

Extractable Wind Power

As with hydro power, each planetary hex has a certain amount of extractable wind power available in it. The base wind power in a planetary hex is obtained by indexing a world's atmophere and hydrographic codes on the Base Wind Power table. The hex's base wind power is then modified by a multiplier obtained by rolling on the Wind Power Multiplier table, which incorporates the effects of different hex types.

BASE WIND POWER

World	*——World Atmosphere Digit——*			
Hydro	*0-3*	*4-5*	*6-7*	*8-9*
1	—	110	160	290
2	—	150	220	400
3	—	200	280	500
4	—	240	340	610
5	—	280	400	720
6	—	240	340	610
7	—	200	280	500
8	—	150	220	400
9	—	110	160	290
A	—	70	100	180

Values are in kilowatts (kW) of extractable power per square kilometer. Multiply this value by the area of the hex in km² as found on the Planetary Hex Survey table above to find the base extractable wind power for the entire planetary hex. Dividing this number by the number of 20-kilometer mapping hexes in the planetary hex yields the base extractable hydro power per 20-km mapping hex. This base power is modified based on the results of the table below.

WIND POWER MULTIPLIER

D10	*Multiplier*	*D10*	*Multiplier*
–2	0.2	8	1.2
–1	0.3	9	1.3
0	0.4	10	1.4
1	0.5	11	1.5
2	0.6	12	1.6
3	0.7	13	1.7
4	0.8	14	1.8
5	0.9	15	1.9
6	1.0	16+	2.0
7	1.1		

DIE MODIFIERS FOR WIND POWER MULTIPLIER TABLE

Hex Type	*Target Hex*	*Per Neighboring Hex/Hexside (Max)*
Mixed	–3	+2 per Mountain hexside (+6) +1 per Sea hex (+3)
Steppe	+1	+1 per Steppe hex (+6) +1 per Mountain hexside (+3) +1 per Sea hex (+3)
Ice Cap/Glacier	+1	+1 per Ice Cap/Glacier hex (+6) +1 per Mountain hexside (+2)
Desert	+1	+1 per Desert hex (+6) +1 per Mountain hexside (+3) +1 per Sea hex (+3)
Badlands	–3	+2 per Mountain hexside (+6) +1 per Sea hex (+3)
Tundra	+1	+1 per Tundra hex (+6)
Jungle	–3	+1 per Mountain hexside (+3) +1 per Sea hex (+3)

Target hex is the planetary hex which is itself the target of the goal-oriented survey. The neighboring hexes are the six surrounding



hexes. Hexes on the opposite side of mountain hexsides are not used for these calculations; the mountain hexside takes precedence as neighboring terrain no matter what is on the other side. Only full sea hexes count as sea hexes for purposes of the neighboring hex DMs; half-sea hexes count as land hexes of the appropriate land terrain type. Note that the chart indicates maximum DMs permitted from each terrain type.

Compile Economic Model Data

For the purposes of a colony or bootstrap campaign, the most important thing about the planetary survey are the numbers that feed into the colonial economic model, such as the agricultural and raw materials richness, useable area, maintenance modifiers, etc. Compile a list of all such relevant figures from the goal-oriented survey so that they are easily referenced for the economic model.

It is also possible that these numbers will be unfavorable, and the planetary hex will be rejected for habitation. In this case, another goal-oriented survey will be necessary if the world is to be settled.

SURVEY AS ADVENTURE

The above passages concentrate primarily on the Survey as a means of gaining information about a world's suitability for future purposes, but referees may also wish to use the survey mission as a framework for a roleplaying campaign.

As each surveyed world can be radically different, this chapter can only give the broadest of outlines for the kind of preparations a referee will wish to make.

Mapping

Any world which will be surveyed requires a map, on at least the scale of the global data view. If the PCs will be exploring specific areas in more detail, the referee may wish to prepare maps on the continental data view or local data view scale, or require the players to fill these out in the course of their explorations. Blank versions of all three map scales are available in the **Traveller Players' Forms** booklet.

Weather

When adventuring or exploring on the world, roll 1D20 on the Weather Change table every 8 hours (two periods), and move up or down the indicated number of lines on the Weather Track. Consult the Weather Factors table and index the world's axial tilt, primary star, and hydrographic code. As many as three such factors may apply, and are added together to find the correct column on the Weather Change table.

Weather Factors

+4 if system's star is type A
+2 if system's star is type F
–1 if system's star is type K
–2 if system's star is type M
–2 if axial tilt is zero.
–1 if axial tilt is 1-10 degrees
+1 if axial tilt is 20-29 degrees
+2 if axial tilt is 30-44 degrees
+4 if axial tilt is greater than 45 degrees
+1 if UWP hydrogaraphics code 5+

Weather Types

Clear: Good visibility and light winds up to 20 kilometers per hour.

Overcast: The sky is over 50 percent overcast with light winds.

Windy: Winds are blowing at up to 70 kilometers per hour. Depending on terrain and climate, this may result in a dust or sand storm, white-out conditions in snow, or high waves on bodies of water (Treat as Poor Weather for Tactical Visibility rules, TNE page 309, in this case).

Increase all tasks using Aircraft and Watercraft skill by one difficulty level.

Storm: Rain or snow is falling depending on local temperature. Treat as Poor Weather for Tactical Visibility rules (TNE page 309).

Increase all tasks using Aircraft or Watercraft skill by one difficulty level.

Severe Storm: Precipitation (rain or snow, depending upon temperature) accompanied by high winds up to 70 kph. Treat as Very Poor Weather for Tactical Visibility rules (TNE page 309).

Increase all vehicular tasks by one difficulty level, and all tasks using Aircraft or Watercraft skill by two difficulty levels.

At the beginning of an eight-hour weather period following a severe storm, weather reverts to Storm before rolling for the new weather.

Weather Change

Total Weather Factors

D20	*–4*	*–3*	*–2*	*–1*	*0*	*+1*	*+2*	*+3*	*+4*	*+5*	*+6*	*+7*	*+8*	*+9*
1	U1	U1	U1	U2	U2	U2	U3	U3	U4	U4	U5	U5	U5	U6
2	—	U1	U1	U1	U2	U2	U2	U3	U3	U4	U4	U5	U5	U5
3	—	—	U1	U1	U1	U2	U2	U2	U3	U3	U4	U4	U5	U5
4	—	—	—	U1	U1	U1	U2	U2	U2	U3	U3	U4	U4	U5
5	CO1	—	—	—	U1	U1	U1	U2	U2	U2	U3	U3	U4	U4
6	CO1	CO1	—	—	—	U1	U1	U1	U2	U2	U2	U3	U3	U4
7	CO1	CO1	CO1	—	—	—	U1	U1	U1	U2	U2	U2	U3	U3
8	CO2	CO1	CO1	CO1	—	—	—	U1	U1	U1	U2	U2	U2	U3
9	CO2	CO2	CO1	CO1	CO1	—	—	—	U1	U1	U1	U2	U2	U2
10	CO2	CO2	CO1	CO1	CO1	CO1	—	—	—	U1	U1	U1	U2	U2
11	CO2	CO2	CO1	CO1	CO1	CO1	—	—	—	D1	D1	D1	D2	U2
12	CO2	CO2	CO1	CO1	CO1	—	—	—	D1	D1	D1	D2	D2	U2
13	CO2	CO1	CO1	CO1	—	—	—	D1	D1	D1	D2	D2	D2	U3
14	CO1	CO1	CO1	—	—	—	D1	D1	D1	D2	D2	D2	D3	U3
15	CO1	CO1	—	—	—	D1	D1	D1	D2	D2	D2	D3	D3	U4
16	CO1	—	—	—	D1	D1	D1	D2	D2	D2	D3	D3	D4	U4
17	—	—	—	D1	D1	D1	D2	D2	D2	D3	D3	D4	D4	U5
18	—	—	D1	D1	D1	D2	D2	D2	D3	D3	D4	D4	D5	U5
19	—	D1	D1	D1	D2	D2	D2	D3	D3	D4	D4	D5	D5	U5
20	D1	D1	D1	D2	D2	D2	D3	D3	D4	D4	D5	D5	D5	U6

Weather Track

Clear
Overcast
Windy
Storm
Severe Storm
Catastrophic Storm

U#: Up the indicated number of lines on the weather track

—: No change on the weather track

D#: Down the indicated number of lines on the weather track

CO#: Center toward overcast the indicated number of lines (i.e., move the current weather toward overcast, regardless of whether this is up or down on the track)



Catastrophic Storm: Precipitation (rain or snow, depending upon temperature) with winds above 100 kph, destroying wooden structures and vegetation. Treat as Poor Weather for Tactical Visibility rules (TNE page 309). Personnel and livestock out-of-doors should roll a Difficult task vs. Agility to avoid injury, roll 1D6 for dice of damage to random body part. Vehicles are attacked with a penetration value of 5 on a 1D10 roll of 2 or less every five minutes. Increase all vehicular tasks by two difficulty levels, and all other out-of-doors tasks by one difficulty level.

At the beginning of an eight-hour weather period following a catastrophic storm, weather reverts to Storm before rolling for the new weather.

Animals

Animals will naturally be encountered during the course of moving about on a world, and these encounters can range from the amusing or interesting to the frightening and deadly.

The referee will want to prepare animal encounter tables suitable to the terrain that the PCs will be exploring, using the rules in TNE pages 207-217. These rules can be used to craft animals for a particular purpose, or to randomly generate animals. Particularly interesting, dangerous, or important animals can be designed or chosen from a randomly generated table to be developed in more detail. This detail could include specifics of the animal's behavior, lifestyle, habitat, etc., which will come into play when these creatures are encountered by the PCs.

Blank forms for this purpose are available in the **Traveller Players' Forms** book, and examples of completed animal encounter tables may be found on pages 66-67 and 80-81 of this book.

Most survey missions will also involve cataloging the types of animals that can be encountered in various regions, particularly those which are expected to be developed by follow-on colonists or bootstrap teams. In this case, the referee could require the players to discover all of the creatures included on the encounter table for the local terrain type by using a combination of Tracking and Observation skills. Once the creatures have been found, the players may determine their values on the animal encounter table by observing their behavior (Observation skill) or by examining dead or tranquilized animals with Biology or Xeno-Biology skills.

Inhabitants

Interaction with local natives is an unlimited topic, and has been the subject of entire books of **Traveller** adventures. In the context of a survey mission, however, PCs have the opportunity to conduct first contact missions, using skills like Liaison, Persuasion, Psychology, Observation, and Bargain to open hopefully friendly relations with the locals.

Diseases

Diseases can be encountered in a number of ways in a **Traveller** campaign, and can have varying effects on the victim. They can be contracted from contact with local inhabitants or animal life, drinking unpurified water, bites from infected animals, or breathing airborne microbes. In general, however, diseases which are compatible with human biology will be contracted by contacting local humans, and this is the assumption used by the model below. However, referees should feel free to institute other disease vectors should they feel the need.

The following disease rules are also used in conjunction with the Colony and Bootstrap campaigns found elsewhere in this book.

To determine if a disease is present during a random encounter with human NPCs, roll 2D6 and compare it with the Disease Encounter table. If the result is equal to or greater than the number corresponding to the local tech level, disease is present.

DISEASE ENCOUNTER

TL	*Disease number*
0-4	10+
5-11	11+
11-15	12+

Note that the tech level applies to the local community, not the overall world tech level. As an example in the Bootstrap campaign, the "disease present" number in the bootstrap base camp is 11+, reflecting the sanitation and disease control capabilities of the team's TL 9 home world, Oriflamme. At the same time, the "disease present" number in the cities and villages of So Skire is 10+, reflecting that world's low technology level.

Characters can also contract disease by drinking unpurified water. Disease is present on a 2D6 roll of 12+ in water not treated with boiling, a water filtration/distillation unit, or tablets from a water purification kit. Characters may attempt to detect the presence of disease in water by rolling an Average test vs. Survival, Medical (Diagnosis), or Biology.

If a disease is present, roll on the Disease Table to determine what kind of disease is present and the basic data about its effects.

The result will indicate the type of disease present, its probability of infection, the length of its incubation period, the length the disease takes to run its course, the days it takes for the patient to be fully recovered, the probability of recovery, the probability of death if recovery fails, and the impact the disease has on the patient's fatigue level during recovery.

Infection: To determine whether an individual is infected, roll an Average: CON task. Add the Infection Number for the disease plus the current fatigue level number, if any, to the die roll result before

DISEASE TABLE

2D6	*Disease*	*Infection Number*	*Incubation (days)*	*Phase I (days)*	*Phase II (days)*	*Recovery (days)*	*Recovery Number*	*Death Number*	*Rec. Fatigue Treat./No Treat.*
2	Crippling	3	21	14	7	140	25	9	0/2
3	Intestinal	5	1	3	3	28	21	2	2/3
4	Nerve	3	5	10	20	120	22	5	1/2
5	Wasting	2	90	30	120	360	25	9	2/3
6	Minor	1D6–2	3	5	5	5	17+1D6	None	0/1
7	Respiratory	5	5	5	9	7	21	1	0/1
8	Minor	1D6–2	5	3	2	2	15+1D6	None	0/0
9	Respiratory	6	3	7	21	42	24	1	2/3
10	Skin	4	1	5	10	14	20	8	2/2
11	Heart	5	7	3	2	120	20	9	3/3
12	Killer	6	3	3	7	100	20	10	2/2





comparing it to the target number (2xCON). If the roll is failed, the individual is infected.

Incubation: A disease will usually take a number of days after the patient is exposed before symptoms appear. During this time the patient is infectious and may spread the disease to others.

Diagnosis: Characters with Medical skill may attempt a diagnosis task. If the task fails, the wrong disease will be diagnosed, and the prescribed treatment may be ineffective. Each disease has a task level indicated in its description. This is for diagnosis during Phase I. Diagnosis during Phase II is one level easier because the symptoms are more advanced.

Recovery: The patient recovers if he rolls the recovery number or greater on 1D10 modified by adding the treatment received (+n), the Medical *skill level* of the person administering the treatment, and the CON of the diseased character. Negative modifiers should be assigned for inadequate diet (–1) and inadequate shelter (–1) as described on TNE page 199. A recovery roll is made at the end of Phase I. If the roll fails, make a second roll at the end of Phase II. If treatment is not begun until Phase II (or there is no treatment at all), only the Phase II roll is attempted, and any treatment DMs are halved. If the Phase II roll fails, roll 1D10 against the Death Number. A roll equal to or less than the number means the patient has died. If the patient lives after rolling the Death Number, he suffers a permanently reduced fatigue level equal to the Non-Treated fatigue level for that disease.

Duration: The disease is active during Phases I and II, and the patient will not begin to recover until the end of Phase II, no matter when the successful recovery roll is made. The patient may find his fatigue level increased during the Recovery period. There are two Recovery Fatigue levels for each disease in the table. Apply the first to the patient if he was successfully treated in during Phase I. Apply the second if he was treated during Phase II or was not treated at all.

Disease Types: Because thousands of diseases can be found on each planet, it is more useful to describe them by type than individually. Some are minor, mere annoyances. Others are swiftly lethal. Where DMs are prided for multiple drug types (i.e., metabolic, antitoxin, and antibiotic, see TNE page 335), use only the single DM for the drug used. Some of these diseases may be already known, with appropriate antitoxins and antibiotics already available, but some may be unknown, and require research and fabrication of new cures (referee's discretion).

Crippling: This attacks the nervous system controlling the extremities. It paralyzes the patient, sometimes causing him to draw up his limbs in a grotesque rictus. Advanced stages of this disease can kill by paralyzing the diaphragm and preventing breathing. Similar Terran disease: polio. Diagnosis is Formidable.

Treatment: Metabolic (+6), administer oxygen (+1), relieve pain and fever (+1).

Intestinal: This causes severe cramps, diarrhea, nausea, vomiting, and severe dehydration. Similar Terran disease: cholera. Diagnosis is Difficult.

Treatment: Metabolic (+6), specific anti-toxin (+6), antibiotic (+2), intravenous fluids (+2), relieve pain and fever (+2).

Nerve: This attacks the brain and central nervous system. Paralysis and death may result. Similar Terran disease: encephalitis. Diagnosis is Difficult.

Treatment: Metabolic (+6), specific anti-toxin (+6), antibiotic (+4), relieve symptoms (+1).

Wasting: This is a long term disease that gradually debilitates the patient over time. The patient suffers drastic loss of weight, muscle mass, and strength. Similar Terran disease: some forms of cancer. Diagnosis is Formidable.

Treatment: Metabolic (+4), surgery (surgeon's skill).

Minor: This represents a minor respiratory and/or intestinal infection. Similar Terran disease: cold or flu. Effects differ slightly to represent differences in severity. Diagnosis is Difficult.

Treatment: Antiobiotics/metabolics (+8), relieve pain and fever (+2).

Respiratory: This disease attacks the lungs and interferes with breathing, as well as being generally debilitating. Similar Terran disease: pneumonia. Effects differ slightly to represent differences in severity. Diagnosis is Difficult.

Treatment: Metabolic (+6), antibiotics (+4), relieve pain and fever (+2).

Skin: This is a skin infection accompanied by fever. Caused by a fungus, this disease can attack the mucus membranes of the mouth, nasal passages, and eventually the lungs where it can cause death by suffocation. Similar Terran disease: severe and massive thrush fungal infection. Diagnosis is Formidable.

Treatment: Metabolic (+4), relieve symptoms (+2).

Heart: A viral infection that attacks the heart muscle. This disease has a high mortality rate. If the patient does not die, he is severely debilitated. Similar Terran disease: scarlet fever. Diagnosis is Difficult.

Treatment: Metabolic (+2), relieve symptoms (+2).

Killer: This is a massive, general viral infection of the blood and all the body's vital organs. Patients mostly die within two weeks. Similar Terran disease: Streptococcus infection, but much more deadly and untreatable. Diagnosis is Formidable.

Treatment: Metabolic (+2), relieve symptoms (+1).

CHAPTER 4: COLONIAL ECONOMICS & INFRASTRUCTURE



RUNNING A COLONY

In order to run a high-level world tamers campaign, the PC colony (or bootstrap team) leaders need to be able to make decisions that have an impact on the growth and success of the colony, and also need to understand the functioning of the colony so that these decisions can be made in an informed and rational manner. This requires a simple and effective model of the economic processes that go on in a colony.

This model is presented below for use with the Bootstrap and Colony adventures presented in this book (Chapters 6 and 7). It can also be used as the basic system for an infinite variety of other **Traveller** situations, such as working out the details an existing colony, outpost, or primitive society encountered in the Wilds. As a simple system, it is amenable to add-on modifications for additional color or variation, and referees should feel free to experiment with it to allow for variations in local conditions.



THE COLONIAL ECONOMIC MODEL

The economy of a colony is divided into four general sectors: agriculture, industrial production, materials, and power.

Agriculture is the organized production of foodstuffs to feed the colonists or export for cash. This includes crop farming, animal husbandry, and fishing.

Materials is the extraction of raw materials from the environment for use in the other three economic areas. It includes mining of minerals and solid fuels from the ground, wells to extract petroleum, logging, and even the raising of certain non-food crops such as cotton and hemp.

Manufacturing is the conversion of raw materials to finished manufactured items. It is divided into heavy industry, light industry, and construction. Heavy industry produces large vehicles and machinery, as well as smelting metal from ore. It is necessary for industrial expansion. Light industry makes finished consumer goods, such as furniture, electronics, and textiles. Construction builds infrastructure items such as roads and housing.

Power generates electrical power (or its equivalent at earlier tech levels) for industry.

Basic Structure

Each of the four economic sectors is defined within the same set of categories (the energy sector is an exception in some of the areas, see the Energy section below for details): labor, capital, energy, raw materials, required land, and output, as defined below.

Labor: This represents the number of people working in that sector of the economy. The unit used to quantify the amount of labor is the *laborer*. The greater the number of laborers working in a sector, the greater the output that sector can create. In the model, however, a laborer is defined as the actual workers in an area as well as their dependants. This avoids the need to keep separate track of total population as opposed to actual labor force. Thus a family of four in the agricultural sector would count as four laborers.

Capital: This represents the quantity of equipment, tools, and machinery that is devoted to this sector of the economy. For agriculture this is plows, barns, fishing boats, etc., for industry it is factories, for materials it is mines, digging equipment, oil wells, and the like. For simplicity, this capital equipment is quantified not in numbers of pieces of machinery, but by its value in *credits*. This allows rough equivalencies to be made between such dissimilar things as shovels, fish traps, and rivet guns.

The greater the amount of capital in a sector, the more labor-saving devices are available, which increase the productivity of the labor in the sector, increasing the output of that sector.

For you budding Marxists out there, "capital" in this sense is equivalent to *the means of production.*

Land: Both agriculture and raw materials production require land, and that requirement is measured in square kilometers per laborer. The requirements for agriculture vary with tech level. The requirements for materials vary with the richness of the deposit. Poorer deposits require larger tracts of land to extract economically useful amounts of materials. The richness of deposits is determined by the planetary survey (see page 21). Each 20-kilometer mapping hex has an area of 350 square kilometers.

Power: Power is required by certain sectors to operate their equipment. In most cases, this power can be assumed to be electrical in nature (although at low tech levels it might be mechanical energy transmitted short distances by gears and pulleys, etc.). Power is measured in *Kilowatts*, where 1000 Kilowatts equal 1 Megawatt (multiply power in Kilowatts by 0.001 to get Megawatts).

Raw Materials: Sectors require raw materials to operate their machinery (in the form of fossil fuels) or to transform into manufactured goods (iron to make steel, steel to make machinery, cotton to make clothing, copper to make electrical wiring, etc.). Raw materials are measured by their mass in *tonnes*.

Output: Output is the end product produced by the economic sector in question. The units in which output is measured depends upon the sector, as the industrial sector produces capital, the materials sector produces raw materials, the energy sector produces power, and the agricultural sector produces the food eaten by all citizens.

Agriculture

Agricultural output is a product of labor, capital, land, and (at higher tech levels) raw materials. All must be present to produce food. The basic building block is labor.

Labor: The basic unit of measure is the Agricultural Laborer. Agricultural Laborers (ALs) comprise all of the agricultural members of the population (farmers, their families, etc.). In order to produce agricultural output, each AL requires capital, land, and raw materials. This varies by tech level as explained below.

Capital: Capital goods are the machines that labor operates to farm the land (plows, tractors, combines), as well as necessary buildings (such as grain silos, barns, and farrowing houses) and livestock. Normally each AL is provided with one unit of agricultural capital goods. The price of a unit of agricultural capital goods is listed on the table below.

Excess Labor: Societies short of capital may still increase agricultural production by employing more agricultural workers. Up to twice as many ALs of labor may be employed in the agricultural sector as there are units of capital, but all ALs in excess of the total units of capital produce at half the normal rate. For simplicity, where labor exceeds capital, subtract the units of agricultural capital from the total number of agricultural laborers. Multiply the result by 0.5, and add this number to the number of units of agricultural capital.

The result is the output multiplier which is applied to the agricultural sector's output (see below). Results of greater than 1.5 times the total units of agricultural capital are not possible.

AC + (0.5×[AL–AC]) = Output Multipler
with a maximum result of 1.5×AC
AC: units of agricultural capital
AL: agricultural laborers

What is a Laborer?

In the passages below, economic relationships are defined in terms of *laborers*: agricultural laborers (AL), industrial laborers (IL), and material laborers (ML). These are treated as abstract units for the purposes of computing the functioning of the colonial economy, but they have real-world equivalents.

Each laborer is equal to one actual person in the colony's population. This individual person is not necessarily a member of the workforce, however. Each laborer represents roughly one quarter of a worker, representing the members of a society who are too young or too old to work, or are otherwise occupied in non-workforce roles (including full-time parents, etc.). Thus if a colony currently has 800 industrial laborers, this number includes the families of the actual industrial workers, whose actual number is around 200.

This distinction does not affect the way the economic model works, but is helpful to referees and players attempting to visualize the roleplaying "reality" that is being modelled here.



Excess Capital: Societies short of labor may increase production by using more and better machines (capital goods). Each AL which has a second unit of capital assigned to it produces at 1.25 times the normal rate. An AL derives no additional benefit from having more than two units of capital assigned to it. For simplicity, where capital exceeds labor, subtract units of labor from units of capital. Multiply the result by 0.25 and add this to the total units of labor.

The result is the output multiplier which is applied to the agricultural sector's output (see below). Results greater than 1.25 times the total AL are not possible.

(0.25×[AC–AL])+AL = Output Multiplier
with a maximum result of 1.25×AL
AC: units of agricultural capital
AL: agricultural laborers

Livestock: An additional component of agricultural capital is livestock. Livestock is measured in terms of rations (as they are edible, and can be replaced from agricultural production by converting slaughter animals to breeding stock). Each AL must be provided with rations equal to the rated monthly output for that tech level as initial livestock, up to a maximum of 33 rations. As with capital goods, this is a one-time investment. Unlike capital goods there is no continuing maintenance cost.

For example, a tech level 7 colony wishes to add additional ALs to the farm work force. Each AL requires Cr4900 in heavy industry output, Cr4900 in construction industry output, and 21 rations worth of livestock. An additional AL in a tech level 11 colony requires Cr12,100 in heavy industry output, Cr12,100 in construction industry output, and 33 rations worth of livestock.

Certain random events may cause the colony to lose livestock, in which case they must be replaced from food reserves or production. ALs which do not have their required livestock capital suffer a 10% reduction in agricultural output.

Buying New Agricultural Capital: Agricultural capital is produced by the heavy industry sector, and the tech level of the new capital is equivalent to the tech level of the industrial capital that manufactured it. Agricultural capital may also be deliberately built at any tech level lower than that of the manufacturing industrial capital.

Land: Each farm laborer requires a fixed amount of land to farm. This amount increases with tech level, and is noted on the table below. Land requirements are based on the number of ALs *or* the units of agricultural capital, *whichever is less*. Extra labor or capital are used to increase output on land already under cultivation, and so do not increase land use.

The survey of the hex in which the colony is located will provide a richness rating of the land as well as a useable percentage. The richness rating is a modifier to agricultural output. The useable percentage is the proportion of the land in the hex (and in each 20-kilometer mapping hex within it) which can be used for farming.

Power: The agricultural sector has no specific needs for power; these are subsumed within other sections of the economic model.

Raw Materials: From tech level 4 and above, the agricultural sector requires an amount of raw materials, measured in tonnes per month, to produce food. This amount of raw materials is based on the number of ALs *or* the units of agricultural capital, *whichever is greater.*

These raw materials include fuel for farm machinery, fertilizers, pesticides, herbicides, etc. If this is not provided, that AL or unit of capital produces food, but only at the rate for tech level 3. When some raw materials are provided, but not enough for the entire sector, the colonial leadership will have to decide how to allocate raw materials to existing units of agricultural capital and assign ALs to the supplied and unsupplied units of capital.

The per-AL energy requirement differs with tech level. Raw materials are only required in months of the growing season (as determined in the Survey chapter).

Output: Output of the agricultural sector is measured in a base value of "rations" produced per month per AL or AC. A ration is enough to feed one person for one month at subsistence level. Agriculture only produces rations during the growing season (as determined in the Survey chapter). The capital provided for each AL is assumed to include sufficient storage space for whatever rations are produced.

This tech level-based value is multiplied by the Output Multiplier calculated above. This output is multiplied by the hex's richness rating as determined by the survey.This output may be further modified by random events and the results of the monthly output roll.

For purposes of transportation, a ration (food for one person for one month) masses 0.1 tonne and displaces 0.1 cubic meter.

AGRICULTURAL SECTOR KEY VALUES

TL	*AC*	*RM*	*Land*	*Output(Rations)*
0	—	—	0.1	2
1	300	—	0.15	3
2	800	—	0.2	4
3	1500	—	0.3	6
4	2400	1	0.4	9
5	4000	2	0.5	12
6	6000	4	0.6	15
7	9800	6	0.7	21
8	14,400	8	0.8	27
9	18,000	10	0.9	33
10	21,000	12	1.0	39
11	24,200	14	1.1	45
12	27,600	16	1.0	52
13	31,200	14	0.8	60
14	35,000	12	0.6	68
15	39,000	10	0.4	75

What is the Tech Level of My Colony?

The tech level of a colony is determined by the tech level of its capital machinery. Since capital machinery is purchased separately for the separate economic sectors, different sectors can be at different tech levels, and a single sector can include capital machinery from more than one tech level.

In general terms, the difference in tech levels between two sectors cannot be greater than one, and a single sector can have capital machinery from only two consecutive tech levels at a time: the lower tech level it is converting from, and the higher tech level it is converting over to.

Since this is a science fiction game in which a virtually infinite variety of social structures can be encountered, referees should feel free to design societies that have greater technological differences between or within sectors, but for the purposes of PC groups leading their own colonies, the one TL limit above should be enforced.

Industrial Production

Industrial production is a product of labor, capital, energy, and raw materials. All four must be present to produce finished goods. For our purposes, the basic building block will be labor.

Labor: The basic unit of measure is the Industrial Laborer. Industrial Laborers (ILs) comprise all of the members of the population associated with the manufacture of finished goods from raw materials. At each tech level the capital, power, and raw material needs of an IL are different, as explained below.



Capital: Capital goods are the machines that labor operates to manufacture finished goods, as well as the buildings that house them. Normally each IL is provided with one unit of industrial capital goods (IC). The price of a unit of industrial capital goods (one IC) is listed on the table below.

Excess Labor: Societies short of capital may still increase industrial production by employing more workers. Up to twice as many ILs of labor may be employed in the industrial sector as there are units of capital, but all ILs in excess of the total units of capital produce at only one-half the normal rate. For simplicity, where labor exceeds capital, subtract the units of industrial capital from the total number of industrial laborers. Multiply the result by 0.5, and add this number to the number of units of industrial capital.

The result is the output multiplier which is applied to the industrial sector's output (see below). Results of greater than 1.5 times the total units of industrial capital are not possible.

IC + (0.5×[IL–IC]) = Output Multiplier
with a maximum result of 1.5×AC
IC units of industrial capital
IL: industrial laborers

Excess Capital: Societies short of labor may increase production by using more and better machines (capital goods). Each IL which has a second unit of capital assigned to it produces at 1.25 times the normal rate. An IL derives no additional benefit from having more than two units of capital assigned to it. For simplicity, where capital exceeds labor, subtract units of labor from units of capital. Multiply the result by 0.25 and add this to the total units of labor.

The result is the output multiplier which is applied to the industrial sector's output (see below). Results greater than 1.25 times the total units of industrial labor are not possible.

(0.25×[IC–IL])+IL = Output Multiplier
with a maximum result of 1.25×IL
IC: units of industrial capital
IL: industrial laborers

Types of Industrial Capital: There are three types of capital goods: heavy industry capital goods, light industry capital goods, and construction industry capital goods. These types differ in terms of capital goods requirements and in what they may manufacture. The price listed on the table below is for light industry capital goods; heavy industry capital goods cost three times this amount, while construction capital goods cost half this amount.

When purchasing capital goods for any sector, half must be produced from heavy industry output and half from construction output. When initially setting up a colony the machinery for industry is usually transported in by starship, but the buildings to house it (the half of the cost represented by the construction sector) must still be erected. (See pre-fabricated buildings on page 36 of the infrastructure section following.)

Buying New Industrial Capital: Existing heavy industrial capital can manufacture new industrial capital at any tech level equal to or less than its own.

Heavy industrial capital may build new industrial capital at the current tech level +1 at *twice* the listed cost, and only if all capital (of all types: agricultural, raw materials, and all three types of industrial) has already been brought up to the same tech level. This means that on the turn immediately following this technological breakthrough, the lower tech industrial capital may no longer build at the current TL +1: all new capital at the higher tech level must be built by the new "prototype" capital. (This artificiality is intended to put the brakes on technological advancement within this simple economic model without having to expand it to include complex rules on research and development, science, etc.)

Converting Industrial Capital: Existing industrial capital may be converted into industrial capital of the next higher tech level at the rate of 20% of its cash value. For example, 100 units of TL-4 light industrial capital are valued at (Cr500×100=) Cr50,000. If this were to be converted to TL-5 light industrial capital, the amount would be 20% of 50,000 or Cr10,000, which would become (10,000÷1350=7.4, dropping fractions =) 7 units of TL-5 light industrial capital. This conversion may only be conducted if at least 50% of the current heavy industrial capital is at this higher tech level, and the new (higher TL) value of the converted equipment must be less than or equal to the current heavy industrial output in credits.

Industrial capital may only be converted into higher-tech industrial capital of the same type, i.e., light industry into light industry only, heavy industry into heavy industry only.

Land: The industrial sector requires no land of its own *per se.* Rather, the land required for industry is factored into that required for housing infrastructure (see the Infrastructure section, below).

Power: Each IL of labor requires a fixed amount of power to produce finished goods. If this is not provided, that IL cannot work (and produces nothing in that period). The per-IL power requirement differs with tech level, and is expressed in terms of kilowatts of power generating capacity continuously devoted to industry.

Raw Materials: Each IL of labor requires a fixed amount of raw materials, measured in mass tonnes per month, to produce finished goods. If this is not provided, that IL cannot work (and produces nothing in that period). The per-IL energy requirement differs with tech level. Heavy industry requires twice the listed mass of raw materials if producing heavy manufactured goods (see Output below). If producing light manufactured goods it requires the listed mass of raw materials.

Output: The base output in finished goods of an IL is measured in Credits of value produced per month. This base value can be

INDUSTRIAL SECTOR KEY VALUES

TL	Light IC	Heavy IC	Construction IC	KW	RM*	Output
0	5	15	2.5	—	0.1	50
1	10	30	5	—	0.2	75
2	15	45	7.5	—	0.3	100
3	150	450	75	0.1	1	200
4	500	1500	250	0.2	4	300
5	1350	4050	675	0.3	7	500
6	3000	9000	1500	0.4	15	750
7	6500	19,500	3250	0.8	30	1000
8	11,000	33,000	5500	1.2	45	1500
9	15,000	45,000	7500	1.5	55	2000
10	20,000	60,000	10,000	1.8	65	2500
11	24,000	72,000	12,000	2.0	70	3000
12	28,000	84,000	14,000	2.2	75	3500
13	32,000	96,000	16,000	2.4	80	4000
14	37,000	111,000	18,500	2.6	85	4500
15	42,000	126,000	21,000	2.8	90	5000

*Value listed is for the production of light manufactured or construction goods. For the production of heavy manufactured goods (possible only with heavy capital goods), double this value.



adjusted up or down based upon provision of capital goods (as explained above) and by the results of the monthly output roll.

Heavy Industry may produce either heavy industrial goods or light manufactured goods. Light industry may only produce light industrial goods. Construction industry produces infrastructure.

Heavy industrial goods are the capital goods used in all of the economic sectors, plus power plants, vehicles, aircraft, ships, spacecraft, artillery, large rockets and missiles, etc.

Light industrial goods are all other manufactured items (electronics, home appliances, paper products, pharmaceuticals, textiles, furnishings, military small arms, shoulder-fired rockets and missiles, etc.).

Infrastructure consists of buildings, roads, bridges, starports, monorails, etc.

Materials Industry

The materials sector of the economy produces the raw materials that are used by the other sectors to fuel vehicles, fertilize the ground, and build finished goods (all of which are abstracted into a single raw material requirement) . Materials production is a product of labor, capital, land, and power. It does not require materials, but rather produces them. For our purposes, the basic building block will be labor.

Labor: The basic unit of measure is the Materials Laborer. Materials Laborers (MLs) comprise all of the members of the population associated with discovery, collecting, creation, and/or extraction of raw materials. At each tech level the capital and energy needs of an ML are different, as explained below.

Capital: Capital goods are the equipment that labor operates to find and recover or produce raw materials, as well as the structures in which these operations are conducted. Normally each ML is provided with one unit of capital goods. The price of a unit of capital goods is listed on the table below.

Excess Labor: Societies short of capital may still increase raw materials production by employing more workers. Up to twice as many MLs of labor may be employed in the materials sector as there are units of capital, but all ML in excess of the total units of capital produce at only one-half the normal rate. For simplicity, where labor exceeds capital, subtract the units of materials capital from the total number of materials laborers. Multiply the result by 0.5, and add this number to the number of units of materials capital.

The result is the output multiplier which is applied to the materials sector's output (see below). Results of greater than 1.5 times the total units of materials capital are not possible.

MC + (0.5×[ML–MC]) = Output Multiplier
with a maximum result of 1.5×MC
MC: units of materials capital
ML: materials laborers

Excess Capital: Societies short of labor may increase materials production by using more and better machines (capital goods). Each ML which has a second unit of capital assigned to it produces at 1.25 times the normal rate. An ML derives no additional benefit from having more than two units of capital assigned to it. For simplicity, where capital exceeds labor, subtract units of labor from units of capital. Multiply the result by 0.25 and add this to the total units of labor.

The result is the output multiplier which is applied to the materials sector's output (see below). Results greater than 1.25 times the total units of materials labor are not possible.

(0.25×[MC–ML])+ML = Output Multiplier
with a maximum result of 1.25×ML
MC: units of materials capital
ML: materials laborers

Buying New Materials Capital: Materials capital is produced by the heavy industry sector, and the tech level of the new capital is equivalent to the tech level of the industrial capital that manufactured it. Materials capital may also be deliberately built at any tech level lower than that of the manufacturing industrial capital.

Land: The materials sector requires land to extract and process raw materials. Land requirements are determined by the planetary survey. Each hex will have a richness rating and a useable percentage rating. The richness rating is the tonnes of raw material per month which can be extracted from a square kilometer of land. The useable percentage is the percentage of land in the hex which may be used to extract raw materials. It is possible to have a high richness rating and a low useable percentage, indicating a limited but very concentrated deposit.

Land use per ML is based on the output of those MLs. For example, 10 TL-6 MLs properly supplied with capital and power can produce 1500 tonnes of raw materials per month. The amount of ground required to support this output varies with the richness rating. If the materials richness rating of the hex were 100, the 10 laborers would require 15 square kilometers to meet their capabilities.

Power: Each ML of labor requires a fixed amount of power to produce raw materials goods. If this is not provided, that ML can work but only produces output at the TL-2 level. The per-ML power requirement differs with tech level, and is expressed in terms of kilowatts of power generating capacity continuously devoted to the materials sector.

Output: The base output of the materials sector is in tonnes of raw materials per month. This base value can be adjusted up or down based upon provision of capital goods (as explained above) and by the results of the monthly output roll.

Materials Sector Key Values

TL	*MC*	*KW*	*Output*
0	0.5	—	1
1	1	—	2
2	1.5	—	3
3	15	0.1	10
4	50	0.2	40
5	135	0.3	70
6	300	0.4	150
7	650	0.8	300
8	1100	1.2	450
9	1500	1.5	550
10	2000	1.8	650
11	2400	2.0	700
12	2800	2.2	750
13	3200	2.4	800
14	3700	2.6	850
15	4200	2.8	900

Agricultural Production of Raw Materials: Agricultural products can be used for textiles, fuel, building materials, synthetics, glues, and a host of other raw material functions. If desired, up to 30% of the colony's raw materials needs may be met by agricultural produce. Each ration masses 0.1 tonne and may be used on a one-for-one basis for raw material. Thus ten rations could be substituted for one tonne of raw materials.

Power

This segment of the economic model produces the power that is consumed by the other sectors of the economy. The power sector does not require persons to be assigned to it, only to have the proper power-generating equipment built, and to have materials (fuel) and



maintenance provided for it. There are no "power laborers."

Power-generating equipment is designed using the Power Production sequences in **Fire, Fusion, & Steel**, and/or the supplemental power generation systems detailed below.

Chemical Power: Any of the chemical power production plants listed in **Fire, Fusion, & Steel** can be used as a stationary power source.

The fuel demand in tonnes of a chemical power plant must be calculated so that these needs may be met by the materials sector of the economy and the transportation network.

Because the economic model does not distinguish between fossil fuels, it is only important that these are noted as being present on the planet. However, to simulate the use of coal instead of oil or natural gas at lower tech levels, use the coal fuel use multiplier from **FF&S** (×1.5) at TLs 3 and 4. If fossil fuel is not available on the world, chemical power plants must instead burn alcohol or wood at the conversion rates listed in **FF&S**. However, aside from the differences in required tonnages, these different types of fuel are all supplied by the materials sector without differentiation.

Nuclear Power: These are designed using the Nuclear Power Plants table of **FF&S**. Fission power plants must have a supply of radioactives, either from local sources or from off-planet. In the case of high-tech fission plants that are maintained from off-world, it is assumed that this off-world maintenance includes refueling, so a local supply of radioactives is unnecessary.

Hydro Power: In the survey chapter, each planetary hex was evaluated for the total quantity of extractable hydro power. This power is extracted using the water wheels and turbines on the table below. At TL 4 and lower, this power is hydromechanical, and is extracted via gears and pulleys to operate machinery. At TL 5+, electrical generator turbines extract this power as hydroelectric power which is naturally much more flexible in the uses it can be put to, although this economic infrastructure model imposes no penalties on the use of low tech hydromechanical power.

Water wheels and hydrogenerator turbines at a given tech level have a listed efficiency of extraction. This shows the limit to the amount of extractable hydro power in the hex that can actually be harnessed at that tech level. Multiply the hex's extractable hydro power by this number to find this maximum quantity of power at each tech level.

The extraction of a mapping hex's hydro power via hydrogenerators removes a portion of that hex's land area from other service, i.e., it cannot be also used for housing, agricultural, or raw materials land. This simulates the large reservoirs created by hydroelectric projects. Divide the power output of installed hydrogenerators by the total extractable hydro power in the hex (modified by the TL extraction efficiency) and divide by 2. The result is the percentage of area in the hex that can no longer be used for any other purpose. These penalties to not apply to water wheels, which are simply placed alongside streams or rivers, requiring their attached facilities to also be close by.

Hydrogenerators may not be imported from off world; they may only be manufactured by the construction sector of the world. This is because TL-5+ hydroelectric projects require massive and time consuming programs to build dams, and this capacity is limited by local productive capacities and cannot be simply bought and installed.

Water wheels may be imported. Both water wheels and hydrogenerators are treated as being constructed by the economy's construction sector.

HYDRO POWER GENERATORS

TL	*Type*	*MCr per kW output*	*Efficiency*
1	Water Wheels	0.01	0.4
3	Water Wheels	0.02	0.5
5	Hydrogenerators	0.25	0.95

Wind Power: In the survey chapter, each planetary hex was evaluated for the total quantity of extractable wind power. As with hydro power above, wind generators have extraction efficiencies that vary with tech level. Multiply the hex's extractable wind power by this number to find this maximum quantity at each tech level.

Also like hydro power, harnessing a hex's wind power removes portions of that hex's land area from service. Multiply the hex's extractable wind energy by the tech level efficiency figure on the table below. Then take the total installed output of wind generators installed in the hex and divide it by the modified extractable energy available in the hex. The result is the percentage of square kilometers in the hex that are no longer available for any other use because they are now covered by wind turbine farms.

WIND POWER GENERATORS

TL	*Type*	*MCr per kW output*	*Efficiency*
3	Windmills	0.01	0.3
4	Windmills	0.05	0.5
5	Wind Turbines	0.2	0.8
7	Wind Turbines	0.25	1.0
9	Wind Turbines	0.3	1.2
12	Wind Turbines	0.4	1.5

Solar Power: Solar power arrays described in **FF&S** may be assembled in ground installations to provide supplementary power during daylight hours. However, unless sufficient storage batteries are available, a solar array can provide no power at night.

Orbiting solar arrays capable of capturing stellar energy from synchronous orbit and beaming it to surface rectifier/antenna (rectenna) installations can overcome most of the daylight limitation. These solar arrays transmit their power to the ground rectennas via large masers. Double the price and mass of the solar cells (not collector panels) to allow for the transmission masers and capacitors/batteries required to hold the power during transmission interruptions.

Rectenna installations are needed to receive the microwave power and to step down the frequency to a standard electrical range (50-60 hertz). The rectenna installation area is 100 square meters per megawatt of power being beamed down from orbit. Rectenna installations cost MCr0.1 per 100 square meters.

Infrastructure

A colony requires a certain basic level of physical infrastructure, consisting of transportation and housing. Both of these are built by the construction sector, while vehicles to move goods on the transportation lines are built by heavy industry.

Transportation: Cities require transportation lines into them from farm communities to move food, and from resource sites to bring raw materials. In addition, each inhabited 20-km hex requires a road network within it for local traffic. In both cases (resource transportation roads and local transport nets) are based on population, although the presence of heavy industry in a city will increase this.

For purposes of this model, the term *city* and *colony* are functionally equivalent terms, denoting a self-supporting population. While larger (hence older) cities/colonies may be spread over multiple hexes, bringing agricultural goods and raw materials from outlying hexes into the central industrial hex, young colonies will likely have all of their economic components—agricultural, materials resource sites, and industrial—located within the same 20-km hex.

All of these described transportation lines include roads and rail transportation (as appropriate to tech level, of course), but as any net includes elements of both of these types, they are abstracted as a general transportation capability. Transportation lines are rated by their potential load value, in millions of tonnes per month. A TL-1



transportation line has a load value of 0.5 million tonnes per month, for example, while a tech level-5 line has a load value of 8 million tonnes, and a tech level-8 line has a load value of 30 million tonnes. None of the transport nets or lines below are considered to take up any of the space in a hex, but are subsumed within the other land usages.

Local Transport Net: Each inhabited 20-kilometer hex of the colony requires 500 kilometers of road for local traffic. The population that can be accommodated in each hex is equal to the road net's load level in tonnes. As each 20-km hex may only have the single 500-kilometer road net built within it, this creates a tech level-based restriction on the maximum population that can live in a hex. As an economy's tech level increases, it is possible to upgrade the local transport net (by simply building a new 500-kilometer net which is assumed to replace the old one) to allow more people to live in the hex.

Resource Transport Lines: Resource transportation lines are required in inhabited hexes in addition to the transport net described above. Resource transportation lines consist of 20-kilometer stretches of roads, i.e., transportation arteries running from one side of the hex to the other. The required load level of the resource transportation system supplying a hex is equal to the tonnes of raw materials required per month plus the hex's total population multiplied by 0.1. Several such arteries may be built to meet the required load level. Thus a TL-2 colony hex with a required load level of 4 million tonnes would have to have at least four such 20-kilometer roads (4×the load level of 1 million tonnes per road = 4 million tonnes), at a total cost of (80km×MCr0.0015=) Cr120,000.

If raw materials or rations are drawn from sites outside the hex containing the city, those hexes must be linked to the hex containing the city hex by transportation lines of sufficient load level to carry the raw materials or food. Each such transportation line leading into the city must equal or exceed the required load level or the city will not receive sufficient food or raw materials.

For example, a city hex is inhabited by 30,000 persons and draws in a total of 6,000,000 tonnes of raw materials and food each month. Of that tonnage, 2,000,000 is produced within the hex itself, 1,000,000 is produced in a hex two hexes from the city, and 3,000,000 is produced in a hex three hexes away from the city. Each of the three occupied hexes requires its own 500-km local road net. Although the colony's tech level is 2, the local nets are left at TL-0,

ROADS

Roads are basic to any society. The first roads are dirt tracks through the wilderness, and the first streets are the spaces between the buildings in a village. As a society advances and finds and utilizes sources of petrochemicals, limestone, sand, and gravel, roads are paved so that wheeled traffic can move more efficiently, mud can no longer bog down vehicles, and dust and dirt generated by passing traffic is kept to a minimum.

Roads allow vehicles to move from point to point at speeds greater than their normal cross-country speeds by levelling out uneven terrain, eliminating mud, etc. The low-tech roads described below provide a road bonus which is added to the vehicle's cross-country speed while travelling on the road. However, this speed cannot exceed the vehicle's permanent rated road speed (as calculated in the design sequence or listed with the vehicle's ratings). At higher tech levels, roads simply allow vehicles to use their rated road speeds.

Trails & Tracks (TL 0): These are the first overland roads. They cost nothing to build as they are essentially formed by the passage of humans and their wagons and sometimes by the passage of local animal life. Vehicles using trails and tracks move at their cross-country speed rate +1.25 kph (add 5 to cross-country travel move) as they do not have to break through brush. They are reduced to their basic cross-country speed in rainy weather because of mud.

Improved Trails & Tracks (TL 1): These are basically trails and tracks that have been widened and graded with animal-powered scrapers. Traffic may pass in opposite directions without one party leaving the road. Vehicles using improved trails and tracks move at their cross-country speed rate +2.5 kph (add 10 to cross-country travel move) in good weather, but are reduced to their cross-country speed in rainy weather because of mud.

Crowned Roads (TL 2): These roads are constructed with a cambered surface so that water will flow off them to be carried away by drainage ditches alongside them, and are usually also topped with gravel or stones. Vehicles using crowned roads move at their cross-country speed rate +3.75 kph (add 15 to cross-country travel move) and do not have a mud penalty in rainy weather.

However, continuous use by heavy vehicles (10 tonnes or greater) will destroy these roads in 1D20 days, and sustained use by tracked vehicles will destroy them after only two hours, in either case reducing them to the quality of improved trails and tracks, above.

Macadam Roads (TL 3): These are crowned and drained roads surfaced with chipped stones or gravel to form a water-impervious surface. Vehicles moving on macadam roads move at their cross-country speed +5 kph (add 20 to cross-country travel move) and do not have a mud penalty in rainy weather.

Sustained use of the road by heavy vehicles (10 tonnes or greater) will destroy these roads in 1D10 weeks, and use by tracked vehicles will destroy the surface in six hours, reducing the road to the quality of an improved trail/track.

Asphalt Roads (TL 4): These crowned and drained roads are topped with a bitumen-gravel mix, and are the basic road type found on mid-technology worlds. They are built with two or more lanes to allow opposing traffic and passing. Vehicles moving on asphalt roads move at their full road speed and do not have a mud penalty in rainy weather.

However, sustained use by heavy vehicles (10 tonnes or greater) will destroy these roads in 10+1D10 months, and use by tracked vehicles will destroy the road surface in 12 hours, reducing the road to the quality of an improved trail/track.

Concrete Roads (TL 5+): A more durable alternative to asphalt roads, concrete roads are surfaced with a mixture of sand, gravel, and limestone which has been thermally converted into cement. Vehicles moving on concrete roads move at their full road speed and do not have a mud penalty.

Concrete roads are not damaged by vehicles of less than 50 tonnes, but will have their surfaces destroyed by 18 hours of sustained use by tracked vehicles, which reduces the road to the quality of an improved trail/track.

Fused Roads(TL 12+): The ultimate in road surfacing and construction, fused roads are built with mobile fusion reactors that use plasma jets to melt and fuse the ground into a thick, ceramic-like surface. Vehicles on fused roads travel at their full road speed. Fused roads are not damaged by heavy nor tracked vehicles, though tracked vehicles usually must be fitted with rubberized track shoes to get proper traction on the ceramic surface.



as the load level at TL 0 still allows up to 100,000 persons to live in a single hex, and is therefore sufficient for the colony's current needs.

The city hex requires resource transport lines with a total load of 6,000,000 tonnes,

Local and transportation lines are built by the construction sector of the economy. The table below lists the load capacity of a single transport line or network (in millions of tonnes), and the cost per kilometer of transport line, broken down by tech level.

TL	*Load*	*MCr*
0	0.1	Free/0.0005*
1	0.5	0.001
2	1	0.0015
3	4	0.003
4	6	0.004
5	8	0.005
6	10	0.006
7	15	0.008
8	30	0.01

*The cost for a TL-0 500-km local road network is free, but resource transport lines cost MCr0.0005 per kilometer.

Required Raw Materials: When calculating required loads above, it is important to remember that the raw materials required by the colony are not limited to those needed by the agricultural, industrial, and power sectors to keep their production going. This number also must include any excess raw material production that is being devoted to off-world trade, as well as the raw material requirements of the armed forces (see below).

Vehicles: In order for a transportation line to operate at its capacity, it must also have transport machinery: cars and trucks for the roads, trains and train cars for the railroads and monorails. These are built by the heavy industry sector, and are measured in units of one million kilometer-tonnes of haulage.

If, for example, a city needed 1,000,000 tonnes of food and raw materials per month, and had to haul it in from a mean distance of four hexes or 80 kilometers (determined by the location of farming communities with sufficient excess food production to feed the city and material sites sufficient to meet its raw material needs), the city would need transport nets with a combined capacity of at least 1,000,000 tonnes (one tech level 2 transport line would be sufficient) and 80,000,000 kilometer-tonnes of vehicles in operation, or 80 units.

Note that vehicles have a raw material tonnage (fuel) for operating, also rated per unit of million kilometer-tonnes. At low tech levels this cost is in rations per month needed to feed the draft animals. This raw material or ration cost is added to the needs of the city being serviced. Thus in the example above, the TL-2 city requires 80 units of transport, and these units require (80×2000=) 160,000 rations per month.

The table below shows the price of vehicles in MCr per million kilometer-tonnes of capacity, as well as the tonnes of raw materials (or, at low TLs, number of rations) required for each million km-tonne unit of vehicles. When purchasing units of vehicles for a colony, note that the maximum tech level of vehicle which may be operated on a local road network or transport line is the tech level of the transport network or line +1. When a road network consists of multiple tech levels, use the lowest tech level present.

The MR column indicates the movement rate of a unit of transportation purchased at that tech level. This value is used only with the armed forces infrastructure below and the mass combat system, pages 46-47.

VEHICLES

TL	*MCr*	*RM*	*MR*
0	2.5	—	2/1
1	1.25	(3300 rations)	3/2
2	1	(2000 rations)	3/2
3	0.5	500	3/2
4	0.4	250	4/2
5	0.3	175	5/2
6	0.2	100	15/5
7	0.175	80	15/5
8	0.15	70	15/5

Housing: Housing is defined in total cubic meters of housing available to the people of the colony. Housing is built by the construction industry and costs Cr100 per cubic meter.

Dividing the total cubic meters of housing by the total population will yield the cubic meters available per person, which is used to determine the Standard of Shelter (see below). As a general rule, 25 cubic meters per person is minimal shelter, usually provided by communal dormitories. Standard of shelter improves up to about 100 cubic meters per person, which is comfortable housing. Additional cubic meters provide more luxury than utility, and progressively greater increases are necessary to obtain meaningful benefits.

Power: Housing does not require power *per se*, as these requirements are subsumed within the per-laborer power requirements for the industrial and raw materials sectors.

Land: Housing requires land, and the amount of land required per cubic meter depends on the tech level. (At higher tech levels, high-rise buildings consume less land area for the cubic meters of housing provided.) The following chart indicates the square kilometers of land required per million cubic meters of shelter at different tech levels. When colony leaders lay out their colony within a hex, they may specify that housing is placed on land not suitable for agriculture or raw materials usage, within the referee's discretion.

TL	*km² per million m³*	*persons per km², assuming 25m³ each*
0	4	10,000
1	2	20,000
2	1	40,000
3	0.8	50,000
4	0.6	66,666
5	0.5	80,000
6	0.4	100,000
7	0.3	133,333
8	0.25	160,000
10	0.2	200,000
12	0.15	266,666
14	0.1	400,000
15	0.05	800,000

Armed Forces

There is one final segment of society that must be considered, and that is the armed forces. These are not included in the economic model above, because their contribution cannot be measured in economic terms. In fact, to the casual observer, the provision of armed forces appears to be a drain upon a society's economy.

It is difficult to measure the marginal value of the common defense, or to determine what is the cheapest amount that can be spent to prevent the destruction of a society by its neighbors. There is substantial agreement among healthy societies that they do wish to be defended, but little consensus on how much defense is enough.

Labor: The armed forces are measured in armed forces laborers.



Armed Forces Laborers (AFLs) represent the portion of society dedicated to military pursuits. The total number of AFLs multiplied by 0.25 yields the number of *troops*, each of which represents one person enlisted in the armed forces.

Capital: Capital goods are the baseline equipment that allow the armed forces to exist: infrastructure such as barracks, armories, typewriters, etc. This value is listed on the table on page 35, and one unit of capital goods must be provided per AFL (not troop). Note that this value does not include weapons of any kind.

All weapons, including small arms, ammunition, vehicles, aircraft, spacecraft, etc., must be purchased or designed and purchased using such resources as the equipment section in the **TNE** basic rules, **Fire, Fusion, & Steel**, the **Reformation Coalition Equipment Guide**, and the equipment section and supplementary design sequences (for black powder and bow weapons) that appear in Chapters 10 and 9 of this book, respectively. The amount of such weaponry purchased depends upon the number of troops available, but the organization of these troops and the level of their equippage is up to the society's leaders (in this case, usually the PCs). See also the Infrastructure subheading below.

Energy: Each troop requires a fixed amount of energy to remain in readiness. If this is not provided, those troops are incapable of responding adequately to hostile acts (referee's discretion). The per-troop energy requirement differs with tech level, and is expressed in terms of kilowatts of power generating capacity continuously devoted to the armed forces.

Raw Materials: The armed forces require raw materials based on the fuel consumption of their capital goods (vehicles, etc.). This is calculated based on the performance data found in the various equipment listings, and is based on the amount of operation that the equipment will undergo in a given month. Note that the amount of raw materials provided will not only govern the tempo of military operations in a war (see page 47 of Chapter 5, the Mass Combat System), but will affect the quantity of training that can be conducted with this equipment in peacetime.

Raw materials should be provided to allow equipment to be operated for a certain number of hours per month. For simplicity, assume that all pieces of military equipment are operated for the same amount of time each month. Equipment designed with **Fire, Fusion, & Steel** or picked from published equipment lists have their fuel consumption rates listed, usually in terms of liters of fuel per hour.

Although goods from the materials sector are referred to as raw materials (which is to distinguish them from the finished goods which come from the industrial sector), for the purposes of this model, assume that these raw materials are fully useable in their delivered form (refined fuel, gasoline, jet fuel, etc.).

Not all fuels are available at all tech levels, which clearly places a limit on the armed forces which can be maintained by a given world. A world whose materials sector tech level (defined as the tech level of capital goods which constitute 50% or more of the materials sector) cannot produce the required fuel type must import fuel for its armed forces.

TL	*Fuel Type*	*FC*	*Tonnes per liter*
0	Wood	Bio	0.002
1	Alcohol	Bio	0.001
1	Coal	FF	0.002
4	Hydrocarbon Distillates	FF	0.001
5	Liquid Rocket Fuel	FF	0.001
6	Radioactives	—	0.019
7	High-Grade Hydrocarbon Distillates	FF	0.001
7	Hydrogen Rocket Fuel	—	0.0003
7	Liquid Hydrogen	—	0.00007

FC: Fuel Class. This indicates certain restrictions on fuel availability that vary from world to world, as established in the Survey Chapter. Fuels labelled "FF" (fossil fuels) may only be produced by the materials sector on worlds where such fuels are available. Fuels labelled "Bio" are biological in origin, and may only be produced by the materials sector on worlds where life is possible. The notation "—" indicates no such restrictions.

Note that for armed forces which use animal transportation, each horse (or horse equivalent if using non-Terran beasts) requires one ration and provides an absolute value of 160 hours of operation per month. This 160-hour figure is effectively a minimum usage level, as horses cannot be multi-tasked. For example, if an army's organization requires 100 horses (say, 40 horse-mounted cavalry and 30 wagons each with two horses), it must be provided with 100 rations and is capable of being operated up to 160 hours per month, regardless of whether it actually is. That force could not be provided with only 50 rations and operated at 80 hours per month. On the other hand, if the leaders wished for this army to be able to operate at 240 hours per month, it would require more horses and rations: 150 horses consuming 150 rations per month.

Readiness: The amount of operating hours will affect the readiness of the armed forces by dictating the amount of training that can be conducted.

Quality	*Hours/month*
Elite	120
Veteran	80
Experienced	40
Novice	20

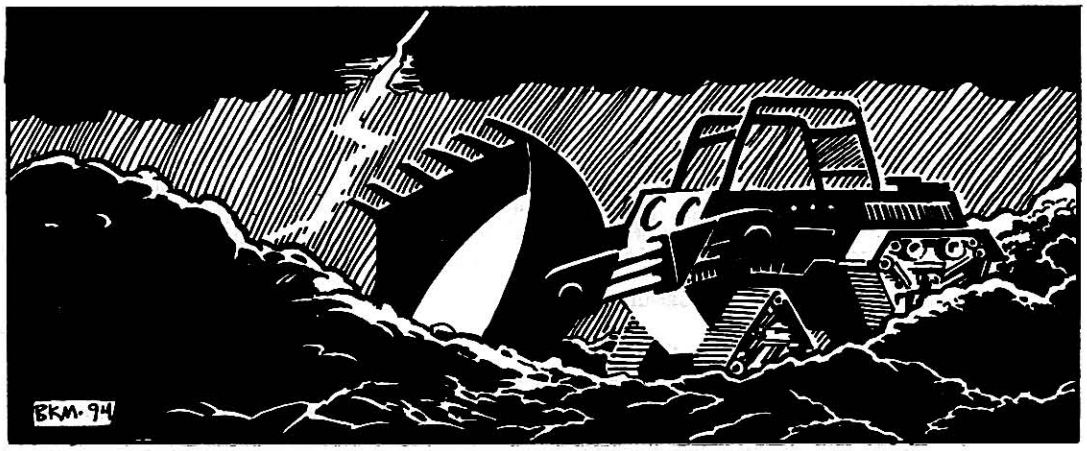
The above activity levels are required to *maintain* the listed troop qualities; units of lower troop quality may not be improved to higher levels by providing them with more hours of operation. For example, a unit of Elite troops must have raw materials provided to it to allow all of its equipment to be operated for 120 hours a month. If it were allocated 80 hours, the unit would fall to Veteran quality, or to Experienced quality if it were allocated raw materials for only 40 hours. A unit whose quality has been allowed to fall for lack of operating hours can be raised back up to its original quality by restoring the appropriate level of raw materials, but each level recovered takes six months. Thus the Elite unit allowed to fall to Experienced quality would require six months of supply at 80 hours before it would be considered to be back up to Veteran quality, and then a further six months of supply at 120 hours before it would be treated as Elite again. (See the **TNE** sourcebook **Path of Tears: The Star Viking Sourcebook**, pp. 95-97 for discussion of how to determine quantity and quality of planetary armed forces.)

Infrastructure: Rather than requiring players to design supply units to support their combat formations, simply total up the mass of ammunition owned by the armed forces plus the mass of the monthly raw materials provided to the armed forces, and purchase transportation sufficient to carry that tonnage of materials from the Vehicles table on page 33 (one unit of vehicles per million tonnes). The table shows the movement rate that will be used for the army's supplies, see page 44 of the Mass Combat Chapter.

Output: The base output of the armed forces is the capability to break things and hurt people, and this is measured using the **TNE** rules for combat (including the rules for mass combat including in Chapter 5). The process of converting that capability into the somewhat intangible commodity called security is the art called *statecraft*. That is the province of the society's leaders. Good luck.



Armed Forces Key Values		
TL	*AFC*	*KW*
0	2.5	—
1	5	—
2	7.5	—
3	75	0.1
4	250	0.2
5	675	0.3
6	1500	0.4
7	3250	0.8
8	5500	1.2
9	7500	1.5
10	10,000	1.8
11	12,000	2.0
12	14,000	2.2
13	16,000	2.4
14	18,500	2.6
15	21,000	2.8



Maintenance

Assuming that the average machine tool lasts for about 20 years, every year 5% of the industrial capital (heavy, light, and construction) must be replaced, or 0.4% each month. Half of this is provided by the heavy industry sector and half by the construction industry sector. This is *mostly* what heavy industry does, and if it weren't for this drain on productivity, societies could grow like crazy.

For example, 100 units of tech level 5 heavy industrial capital are worth Cr405,000, and require a maintenance value of (405,000x0.004=) Cr1620 to be paid each month, Cr810 from each of the heavy industry and construction sectors.

When the colony first starts, all of the capital tools and buildings are presumably new, so none need to be replaced. But starting on year 10 of the colony, 0.1% per month must be put into maintenance, 0.2% in year eleven, 0.3% in year twelve, and 0.4% in year thirteen and every year afterwards. (This delayed requirement keeps players from having to worry about this requirement in most cases, which few of them will find disappointing.)

The power sector and armed forces require maintenance at the same rate, based on the monetary value of all installed power generation systems and weapons (but not ammunition).

Infrastructure (including armed forces infrastructure) must be maintained as well, and each month the construction industry must invest 0.2% of the total value of the infrastructure (transportation and housing) in its maintenance.

Agricultural and materials sector capital goods are exempt from maintenance requirements.

If the colony has no heavy industry, or none of sufficient tech level to maintain high-tech imported systems, this maintenance must be imported from off-planet (and is purchased as a simple monetary value). Failure to meet the maintenance requirement leads to a gradual erosion of the capital base, as machines are cannibalized for parts. (That's what's been happening in the Wilds for decades.) The decline in useable capital machinery is *twice* the maintenance shortfall.

Maintenance is paid monthly, based on the quantity of equipment (capital goods, infrastructure, etc.) existing at the beginning of the month.

Weather Effects on Maintenance: Note that the required infrastructure maintenance rate (normally 0.2% per month) may be modified by local weather conditions, as calculated on page 17 of the Survey chapter. If weather factors total +3 or less, there is no change to this base rate. If weather factors total +4 to +5, the monthly rate becomes 0.3%, and if weather factors total +6 or more the monthly rate becomes 0.4%.

Off-World Trade

Trade consists of exports sold off-world to generate money to purchase goods that are imported back to the world. These imports can consist of luxury goods, crucial high-tech spare parts, weapons, capital goods, etc.

A successful economy will produce surplus goods from any or all of the agricultural, industrial, and materials sectors. Even a marginal economy can be controlled to produce trade goods by skimping on the products that are reinvested back into the economy, at the option of that society's leaders.

Exports: First the value of the world's exports must be defined. Industrial production is already defined in terms of credits, but agriculture and raw materials output must be converted into monetary terms.

This is done by converting rations and tonnes of raw materials into displacement tons of starship cargo. For rations, divide by 100 to get displacement tons, and for raw materials divide tonnes by 20 to get displacement tons. Then take the total number of tons of cargo to the top half of page 239 in the **TNE** rulebook and calculate the price that they are purchased for by traders that call at the world. (It is assumed that sufficient starships call each month to purchase all exports that are offered. After all, the Coalition or the sponsoring colonizing world is trying to expand its trade—it would be foolish to not see to it that the opportunities are there.)

Add the price paid for the agricultural and raw materials cargos to the monetary value of industrial exports. This is the total value of the goods in local credits. This value must then be converted using the exchange rates rules found on **TNE** pages 230-231 into terms of the currency of the sponsoring world. (For example, Baldur in the case of the colony adventure. In other cases, such as bootstrap operations, use the friendly base from which the mission was launched.) This is the amount of money available to buy imports.

Imports: Imports may be purchased using the money generated by exports. Note that purchases made with this money must still be adjusted for the exchange rates between the currency's base value and its value on the world where the imports are being purchased. For example, the world sponsoring the colony is a TL 12, Starport B world, and the colony is attempting to purchase goods from a Starport A, TL-15 world. The monetary value calculated above in "Exports" would have to be multiplied by 0.08 to find its purchasing power on the tech-15 world.

Referees will want to exercise some control over the imports that can be obtained: in a Reformation Coalition campaign, imports will obviously be limited to goods that can be produced in the Coalition. However, referees may stipulate that trade relations must first be opened to trading partners via some kind of diplomacy before trade can be attempted, etc.



On-World Trade: In campaigns on already-inhabited worlds, the PC-led group will be able to trade with the on-planet neighbors. Handling these details will be up to the referee, as it should involve roleplayed diplomacy, and should probably involve detailed knowledge of the nature of the goods being traded. Furthermore, such trade might not always be for economic advantage. For example, a PC colony might simply give excess food or manufactured goods to a neighboring group in order to gain their good will.

Set-up Procedures

Several rules affect only the initial set-up of the colony, and these are covered below.

Capital Machinery: All agricultural, industrial, and raw materials capital goods for the laborers in the colony must be transported aboard the colony transports. This equipment is transported at the rate of one displacement ton per Cr4000 of value.

Start-up Rations: Wise colony leaders will bring along rations sufficient to feed the colony for one or more months, until the economy can be gotten up and running. This food is shipped at the rate of 100 rations per displacement ton.

Livestock: Agricultural livestock capital normally paid in the form of rations may not be transported to the colony as bulk food, as it represents living organisms. Animals are brought to the colony in specially designed low berths. These low berths, called livestock low berths, have characteristics identical to emergency low berths. Each livestock low berth carries the equivalent of 10 rations worth of livestock.

Temporary Shelters: It will take a while to build even primitive dormitories, and in the mean time the colonists will need shelter from the elements. Basic tents can provide this shelter or limited time. Housing tentage costs Cr100 and masses 0.001 tonne and displaces 0.002 cubic meter per member of the colony.

Tents may also be used to provide cover for agriculture and machinery, thus letting farming and the other industries get under way immediately. Tents cost 10% of the normal capital construction price for construction and agriculture. They mass 10 tonnes and displace 20 cubic meters per million credits of tentage purchased.

Tents will last for approximately twelve months, at the end of which time they are worn out and are discarded.

Prefabricated Buildings: Housing and other buildings can be carried as prefabricated components and then assembled on the planet. The full price of the building is paid for the prefab components and then 10% of their value must be spent (again) by the construction sector on the planet to assemble them.

Lack of Roads: The necessary roads will not appear instantly, but economic activity will begin almost at once. All economic activity in a hex except for construction will operate at 60% efficiency (construction operates at 100%) until the necessary transportation network is completed. Fortunately, a 500-kilometer TL-0 local transport net appears immediately for free in the colony hex meaning that only resource supply roads need be built right away.

Placement in the Hex: The colony should be placed in one or more 20-kilometer hexes. Each such hex has 350 square kilometers of useable land in it, which must be divided up among raw material production, agriculture, and housing. (Land devoted to industry is included in the housing requirements.) Hexes on the seacoast will have their total area reduced based on how much of the hex is water. Players should make sketch maps of the layout of the colony, being sure to leave room for expansion.

Acclimatization

Acclimatization can be a difficulty if the colonists come from a world that is too different from their destination. The acclimatization stage of colonists has an effect in the economic model (handled in the output roll). Colonists should be rolled for in groups, treating them as NPCs for purposes of attributes. In detailed campaigns where the players have carefully interviewed colonists, the referee may be able to work out aggregate attribute values based on the established characteristics. In other cases, treat industrial, agricultural, and raw materials laborers as having a CON attribute of 6, and treat any troops as their rated NPC class for attributes. Referees and players may stipulate that crucial or detailed NPCs are rolled for individually. Naturally any bonuses for medical personnel in the colony/bootstrap team should be applied.

PLAYING THE COLONIAL ECONOMIC MODEL

The economic model is played in monthly turns, meaning that food, materials, and industrial production is totalled on a monthly basis and assessed against population and the internal needs of the economic sectors.

Month: Because different worlds will have different lengths of day, year, etc., for the purposes of this economic model, the term *month* is defined as approximately 750 hours, plus or minus a few percent to allow the referee to fit it conveniently to local units of time. For example, 750 hours equals 31.25 days each of 24 hours. An Earth month averages 30.4 days. 30.4 days is within 3% of 31.25, so the referee may simply use the existing Terran calendar to keep track of months. As always, the referee is the final judge of these matters.

Annual Considerations

Population Growth: At the end of every year the colonial population grows by 2%. These new laborers may be assigned to any economic sector desired by the colony leaders.

Scenario Conditions/Bookkeeping: Certain colony or bootstrap scenarios may be defined as being a year in duration, or have their criteria for success defined on a yearly basis.

Random Events

Events are rolled for each month at the beginning of the administrative cycle. These include weather events, random events, and scenario specific random events.

Weather Events: The only DMs used on this table are the Weather Factors obtained during the planetary survey. The results are implemented on the current monthly turn.

Weather Table

D20	*Result*
–3	Drought
–2	No Effect
–1	Drought
0	No Effect
1	Drought
2	No Effect
3	No Effect
4	No Effect
5	No Effect
6	No Effect
7	No Effect
8	Drought
9	No Effect
10	Drought
11	No Effect
12	No Effect
13	No Effect
14	Drought
15	Severe Storm
16	Severe Storm
17	Drought
18	No Effect
19	Severe Storm
20	Severe Storm
21	Catastrophic Storm
22	Severe Storm
23	Drought
24	Severe Storm
25	Catastrophic Storm
26	Severe Storm
27	Catastrophic Storm
28	Catastrophic Storm



Drought: Lack of water causes –2 DM on Agricultural output roll for current turn.

Severe Storm: Violent storm damages colony. –2 DM on agricultural out put roll for current turn, plus roll 1D6 for specific result:

1-3: Kills number of colonists and destroys number of units of capital machinery equal to (1D6–colony tech level)×5. Roll for sector, 1-3=agriculture, 4-5=materials, 6=industrial.

4: Destroys (1D20–colony tech level)×500 cubic meters of housing

5: Destroys 1D6×100 stored rations

6: All of the above

Catastrophic Storm: Extremely violent storm damages colony. Agricultural output for current turn cut in half, plus roll 1D6 for specific result:

1-3: Kills number of colonists and destroys number of units of capital machinery equal to (1D20–colony tech level)×10. Roll for sector, 1-3=agriculture, 4-5=materials, 6=industrial.

4: Destroys (1D20–colony tech level)×2000 cubic meters of housing

5: Destroys 1D6×500 stored rations

6: All of the above

Scenario Specific Random Events: The bootstrap and colony adventures in this book show examples of scenario-specific random events tables. These are in addition to the tables above. Referees may create their own random events tables to reflect unique conditions on various worlds.

Satisfaction Indices

Three indices of public satisfaction are tracked: standard of nutrition, standard of shelter, and standard of living. All three are described below, and all three provide a DM to be used on the political table. However, although all three of these DMs are are calculated each month, only the *lowest* (i.e., that with the greatest negative effect) one of these three DMs is actually used on the political table.

However, note that the standard of nutrition does provide a DM on the output roll even if it is not the satisfaction DM being used on the political table.

Standard of Nutrition

The standard of nutrition (SN) is an important index of a colony's well being, as it has two effects. First, the SN level provides a DM on the monthly output roll as an index of the overall health of the population. Second, the SN level may provide a DM on the colony's monthly political roll as a measure of the overall happiness of the population, at least as regards their diet.

Determine the standard of nutrition in the following manner.

Total up the number of rations produced during the month, and determine the amount that are being allocated to the population (as opposed to being set aside for export, the creation of new agricultural capital, stored for future consumption, used for raw materials, used to feed animal-drawn transport or military equipment, traded to local natives, etc.). Divide this number by the total population, and the result is the standard of nutrition, expressed in rations per person.

Random Events

Roll 1D20. On a result of 16+, roll 1D20 on the Random Events table. On any other result, there is no random event for the month. There are no DMs on this table.

Referees should adjust numbers of deaths from plagues, etc., to allow for very small or very large colonies.

D20	*Result*
1	Plague strikes populace: 1D10 persons die each day until Impossible Medical (Diagnosis) task is completed (task may be rolled once per 24 hours). –4 DM on all output rolls this turn. –2 on political roll.
2	Disease strikes livestock: Kills 1D10 units of livestock each day until Impossible Medical (Diagnosis or Veterinary Medicine) task is completed (task may be rolled once per 24 hours). Due to diseased meat, agricultural output cut in half for this turn. –2 on political roll.
3	Plague strikes populace: 1D6 person die each day until Formidable Medical (Diagnosis) task is completed (task may be rolled once per 24 hours). –2 DM on all output rolls this turn. –1 on political roll.
4	Disease strikes livestock: Kills 1D6 units of livestock each day until Formidable Medical (Diagnosis or Veterinary Medicine) task is completed (task may be rolled once per 24 hours). Due to diseased meat, agricultural output reduced by 25% for this turn. –1 on political roll.
5	Hostile starship visits (vampire ship, pirate, slaver, etc., referee's discretion)
6	Vermin eat 1D10×5% of stored rations. –2 on political roll.
7	Blight destroys crops. Agricultural output for turn cut in half. –2 on political roll.
8	Earthquake: 1D6×10% of housing destroyed. –1 on political roll.
9	Vermin eat 1D6×5% of stored rations. –1 on political roll.
10	Crime wave, succeed at Impossible Investigation, Psychology, or Streetwise task or –2 on political roll.
11	Crime wave, succeed at Formidable Investigation, Psychology, or Streetwise task or –1 on political roll.
12	Local carnivore rampages through colony, kills 1D20. Succeed at Impossible Tracking and Hunting task or –2 on political roll.
13	Indigenous animals stampede, destroy 1D20 units of agricultural capital. –1 on Political roll.
14	Crime wave, succeed at Formidable Tracking and combat task or –1 on political roll.
15	No traders arrive this month, no exports sold this turn, all rations set aside for export spoil.
16	Friendly starship visits (referee's discretion)
17	Discovery of tasty local life form. Permanently add +1 to all agricultural output rolls. +1 on political roll this turn only.
18	Population explosion of local edible lifeforms. +4 DM on agricultural output roll for this month. +1 on political roll.
19	Discovery of hardy, prolific, edible, local life form. Permanently add +2 to all future agricultural output rolls. +2 on political roll this turn only.
20	Population explosion of local edible lifeforms. Multiply agricultural output by 2 for this month. +2 on political roll.



THE MONTHLY TURN

Each month, the following things must be done:

1. Roll on the standard random events tables plus the scenario-specific random events tables, if applicable.
   - Assess the impact of the events and play out any roleplaying that is associated with handling these events
   - Assess the impact of the roleplaying or decisionmaking in response to the events
   - Carry forward political table die modifiers from the **previous** turn, such as standard of nutrition, standard of living, standard of shelter, malcontent population, etc.
   - Roll on political table with all appropriate DMs
   - Play out any dictated events from the political table, including roleplaying responses to same

2. Carry forward and total up all DMs that will apply to the output rolls
   - Roll the Agricultural Output roll
   - Roll the Industrial Output roll
   - Roll the Materials Output roll

3. Total up the amount of rations, including those stockpiled and those newly produced
   - Allocate rations to population for the **current** month
   - Allocate rations to other areas, such as animal-powered transportation, ration stockpiles, agricultural production of raw materials, or other purposes, such as frendship donations to neighboring powers, etc.
   - Allocate rations for off-world export
   - Calculate and record the standard of nutrition of the colony used on the **next** turn
   - Carry forward remaining stockpiled rations

4. Calculate the quantity of energy produced, based on the amount of raw materials received, and other inputs for wind, hydro, or solar power
   - Allocate energy to industrial and raw materials sectors for the **current** month

5. Total up the amount of raw materials produced
   - Allocate raw materials to the agricultural, industrial, and energy sectors for the **next** month
   - Allocate raw materials to other areas, such as armed forces, stockpiling, etc.
   - Allocate raw materials for off-world export
   - Carry forward remaining stockpiled rations

6. Calculate the quantity of industrial output produced, broken down into heavy, light, and construction
   - Allocate production to new capital goods, and convert low tech capital to higher level
   - Allocate production to maintenance
   - Allocate production to new infrastructure
   - Allocate production for off-world export
   - Allocate production to armed forces
   - Allocate production of consumer goods to population
   - Calculate and record the standard of living of the colony used on the **next** turn)
   - Calculate and record the standard of shelter of the colony used on the **next** turn)

7. Based on new capital production, calculate new economic capacities for following turn
   - Assess the need for new infrastructure to support load level
   - Reassign laborers within or across economic sectors, if necessary

8. Calculate the amount of currency generated by off-world export
   - Make purchase of off-world goods, equipment, weapons, etc.
   - Make purchase of off-world maintenance



Note that an SN of 2 does not necessarily mean that each person is eating twice as much. Rather, the higher numbers indicate that a greater proportion of the diet consists of luxury foods, or foods from "higher on the food chain." The ration unit is based on the amount of agricultural effort required to create sufficient food to keep a person alive for a month, rather than an absolute mass of edible material. This means that with a given amount of effort, a farmer could produce any of the following: a large quantity of wheat, a somewhat smaller quantity of oranges, a smaller quantity still of beef steak (because each kilogram of beef requires the cow to eat around 10 kilograms of feed), a still smaller quantity of veal, or an extremely small amount of fat goose liver.

Thus we assume that an SN of 1 describes a diet consisting mostly of grain (e.g., rice) or grain products (bread) plus a bare minimum of animal protein and other goodies, while higher SNs indicate a greater and greater percentage of labor- and nutrition-intensive foodstuffs, such as meat and luxury fruits and vegetables.

SN	*Output DM*	*Political DM*
0.45-0.54	–8	–4
0.55-0.64	–5	–3
0.65-0.74	–3	–2
0.75-0.84	–2	–1
0.85-0.94	–1	–1
0.95-1.1	—	—
1.2-2.0	—	+1
2.1-3.0	—	+2
3.1-6.0	—	+3
6.1-10.0	—	+4
10.1+	—	+5

Standard of Shelter

The colony's standard of shelter (SS) is defined as the cubic meters of housing per member of the population. Simply divide the total volume of housing in cubic meters by the total number of citizens. The result is the SS.

The standard of shelter provides a potential DM on the colony's monthly political roll.

SS (m^3)	*Political DM*
25-50	–2
51-80	–1
81-120	—
121-160	+1
161-250	+2
251-350	+3
351+	+4

So Whatcha Gonna Do About It?

Random events in the economic model are a prime example of how high-level play can serve as a "scenario generator" for low-level roleplaying.

If there is a crime wave, the players may wish to take their characters out to capture the miscreants. If a local wild animal is on a rampage, the players may wish to hunt it down personally. If vermin are eating stored rations, the players may try to address the problem themselves. In all of these cases, the creativity of the referee is called into play. The referee must quickly decide how the situation looks in roleplaying terms, and what is required for success, and then place the characters into that low-level framework. If the players succeed amazingly well, the referee may rule that the random event was nipped in the bud and had no effect, its severity is reduced, or that it will not recur on following turns. If they fail, the event takes effect normally. If they fail disastrously, perhaps the event's effects are doubled, perhaps they will automatically recur each month, or perhaps public awareness of the failure will cause adverse DMs on various other tables.

In some cases, the players will wish to hire or appoint persons to serve as extra police officers, guard for grain elevators, etc. Any persons hired for such purposes are treated as armed forces laborers for purposes of the economic model.



Standard of Living

The colony's standard of living (SL) is defined by consumer goods and is indexed on a monthly basis. The SL is determined by establishing the amount of light industrial production that is allocated to the population. These represent various consumer goods, luxuries, and labor-saving devices that are made available to the population. Divide the total monetary value of these goods by the number of laborers, and add this value to the per-person consumer goods already possessed by the populace. This value is then compared to the original per-person value to find its percentage comparison, and is also compared to the value for the previous month, to see if it has increased or decreased.

The population arrives on the world with a base value of consumer goods as shown on the table below (these are brought by each colonist in his or her personal effects, and are assumed to have no volume or mass for shipping purposes). This value declines 2% per month (multiply by 0.98 each month), and must therefore be augmented by new production. The base value of these goods per person varies by tech level as seen by the table below, where "Home TL" is the tech level of the world from which the colonists are drawn.

Home TL	*Consumer Goods*
0-3	Cr5
4-5	Cr50
6-8	Cr250
9-10	Cr500
11-13	Cr1500
14-16	Cr2500

Consult the following table to find the political DM. The table reads out in DMs for increase over last month/decrease since last month. For example, a colony with a base level of Cr500 per person had Cr435 last month and Cr450 this month. Cr450 is 90% of Cr500, so is within 6-10%. The SL increased since last month, so the DM is +1.

Percentage variation from original value	*Above Base*	*Below Base*
Within 5%	—/—	—/–1
Within 6-10%	+1/–1	+1/–1
Within 11-20%	+1/–1	+1/–2
Within 21-30%	+1/–1	+1/–3
Within 31-50%	+1/–2	—/–4
Within 51-100%	+1/–2	—/–5
More than 100%	+1/–3	N/A

Political Roll

The political roll is made monthly and is an index of the current popularity of the colonial leadership. (This roll is intended for use in PC-led colony operations, and is less suited for NPC-led societies, although its use in these cases is up to the referee.) The results of this roll reflect the current attitude of the populace, and this attitude will affect the following output roll as happy people do more work and unhappy people do less.

The roll on the Political table will yield a DM to use on one or more of the output rolls for the current turn, and may direct a change in levels on the Political Track. The Political Track always starts out on Level 3: Good when a colony is established.

Die Modifiers: Die modifiers are provided from other results in this section: from the satisfaction indices, from random events, from low-level roleplaying results, from the monthly persuasion roll, from the political table itself, and from the current level on the political track.

In addition, there are two permanent DMs that can result from the incorporation of criminals or undesirables in the colony population (see the Colony chapter for discussion). For every 1% of the colony population (round fractions up) composed of criminals, a permanent –1 DM. For every 5% of the colony population (drop fractions) composed of undesirables, a permanent –1 DM.

POLITICAL TABLE

D20	*Result and Output DMs*	*Track Movement*
–5	Coup Attempt, –5	Down 2 levels
–4	Severe Riots, –4	Down 2 levels
–3	Assassination Attempt, –4	Down 1 level
–2	Severe Riots, –3	Down 1 level
–1	Strikes, –3	Down 1 level
0	Riots, –2	—
1	Strikes, –2	—
2	Boycotts/Slowdowns, –2	—
3	Boycotts/Slowdowns, –2	—
4	Dissatisfaction, –1	—
5	Dissatisfaction, –1	—
6	No Effect	—
7	No Effect	—
8	No Effect	—
9	No Effect	—
10	No Effect	—
11	No Effect	—
12	No Effect	—
13	No Effect	—
14	No Effect	—
15	No Effect	—
16	+1 DM, one random sector	—
17	+1 DM, one random sector	—
18	+1 DM, one random sector	—
19	+1 DM, one random sector	—
20	+1 DM, all sectors	—
21	+1 DM, all sectors	—
22	+1 DM, all sectors	Up 1 level
23	+1 DM, all sectors	Up 1 level
24	+2 DM, all sectors	Up 1 level
25	+2 DM, all sectors	Up 2 levels
26	+2 DM, all sectors	Up 2 levels





Dissatisfaction: Small segments of the economy are unhappy with current conditions. –DM shown applies to only one sector (1-2: agriculture, 3-4: materials, 5-6: industrial)

Boycotts/Slowdowns: Small segments of the economy are sufficiently unhappy that they stage work stoppages or disrupt other workers. –DM shown applies to only one sector.

Strikes: Many workers are unhappy and stop work. –DM shown applies to materials and industrial only, not agriculture.

Riot: Groups of the population engage in violence to express their dissatisfaction. –DM shown applies to all economic sectors.

Severe Riot: Rioting causes significant property damage, destroys 1D20 units of capital in any one sector. –DM shown applies to all economic sectors.

Assassination Attempt: As violence continues to escalate, small, disorganized group or individual attempts to kill colony leadership. Referee's discretion, low-level roleplay is recommended. –DM applies to all sectors.

Coup Attempt: Organized group attempts to take over government from current leadership. Referee's discretion, low-level roleplay is recommended. –DM applies to all sectors.

POLITICAL TRACK

Level	*DM*
Level 1: Excellent	+3
Level 2: Very Good	+2
Level 3: Good	+1
Level 4: Fair	—
Level 5: Marginal	—
Level 6: Poor	–1
Level 7: Bad	–2
Level 8: Terrible	–3

DM: Die modifier applied to roll on Political Table on turns when that political level is in effect.

Monthly Persuasion Task: PC colony leaders may make one attempt per month to affect the political roll by using their Charisma-based skills such as Leadership, Persuasion, etc., usually in the form of public addresses. Difficulty level for these tasks is based on how big a DM the PCs are trying for. Outstanding success and catastrophic failure also are determined by the difficulty level. There is no penalty for normal failure.

Using Persuasion and Leadership

The referee should require the player or players to roleplay their presentation, which may involve acting out certain portions of an impassioned plea, but which will certainly require them to recite to the referee what they plan to say. The referee will then have to assess the validity of the speech compared to the reality of the situation and the state of mind of the listeners. If the players' speech is logical, persuasive, stirring, and appears to solve the issues, the referee should reduce the difficulty level of the task accordingly. If the speech completely misses the point, proposes a stupid solution, or otherwise fails to impress the referee, the difficulty level should be increased. In either case, however, the final success is determined by a task roll against the appropriate asset of the PC making the address or aggregate asset of the PC group.

DM	*Diff Level*	*If Outstanding Success*	*If Catastrophic Failure*
+1	Easy	+2	–2
+2	Average	+3	–3
+3	Difficult	+4	–4
+4	Formidable	+5	–5
+5	Impossible	+6	–6

See the persuasion and leadership sidebar for discussion. The persuasion task may only be attempted once per month.

The Output Roll

Roll once for each of the Agricultural, Industrial, and Raw Materials sectors. The result is the multiplier used on the sector's output for that month.

D20	*Output Multiplier*
1	0.80
2	0.85
3	0.85
4	0.90
5	0.90
6	0.95
7	0.95
8	1.0
9	1.0
10	1.0
11	1.0
12	1.0
13	1.0
14	1.05
15	1.05
16	1.10
17	1.10
18	1.15
19	1.15
20	1.20

Die Modifiers

- From Political Track and Political Roll, above
- From Random events, above
- Controlled Economy, DM –1 (see sidebar)
- If population in Acclimatization Stage 1, DM –4
- If population in Acclimatization Stage 2, DM –3
- If population in Acclimatization Stage 3, DM –2
- If population in Acclimatization Stage 4, DM –1
- If population in Acclimatization Stage 5, No DM

Free Market or Controlled Economy?

If you want central economic planning, you lose productivity (during the Output Roll step). If you want productivity and a free market, don't count on getting exactly the economy you planned on. It will go where the bucks are (as determined by the referee). A lanthanum strike can cripple industry as trained machinists head for the hills to prospect.

This is a rather complex topic, because economies are such a complex thing. Face it, no one really understands *real* economies, much less science fiction ones. Fortunately, this is less of a problem than it might seem. Because the scenario model involves a group of player character colony leaders running every aspect of a colony, this is really not a choice; the PCs are running a *controlled* economy.

In cases where the PCs do not wish to run a controlled economy or would rather simply play low-level characters and allow the colonial administration to be run by NPCs, referees must make the various monthly decisions on whatever basis they see fit. These may be entirely rational and workable decisions, these decisions may include sporadic errors to keep a sense of interest and unpredictability, or they may be completely capricious and disastrously incompetent (thereby forcing the PCs to take over control), depending upon the referee's wishes for the campaign.

CHAPTER 5: MASS COMBAT SYSTEM





MASS COMBAT

Throughout a campaign situations will arise where land combat will take place. In some cases the size of the combat will be such that a detailed roleplaying resolution of it will be inappropriate, but the results will be important for the ongoing campaign. For these cases, we present the **Traveller** mass combat rules.

These rules assume that the players are all on the same side, that their actions will be moderated by the referee, and that the opposing force's actions will be determined by the referee.

Scale

Each mass combat turn represents eight hours of time. Movement and combat are plotted on maps using the 20-kilometer mapping hex grid scale (the same scale used in mapping the colony and discussed in the Survey chapter). Units may range from companies, or even smaller detachments, up to divisions, with battalions being the most common force in most campaigns.

Turns

In each 8-hour turn, the referee decides where hostile ground units will move as well as the movement of all friendly units not under the control of the player characters (either because they are outside the player characters' command or are out of communication). Players give orders to friendly units and, in most cases, the friendly units will act on those orders.

Movement is simultaneous by both sides. Following movement the referee resolves all detection, resolves all combat, and determines morale effects, if any. The player characters then receive reports from their units in communication and prepare to issue orders for another turn.

Note that since movement is simultaneous and combat can occur when opposing units enter the same hex, it will sometimes be necessary to pro-rate movement by all units and move them hex by hex to determine if opposing units are in the same hex at the same time.

Rating Units

Each maneuver unit (infantry, cavalry, armor) in the mass combat system has a combat value. This value is usually calculated per maneuver battalion, but it can also be calculated per division (for really large campaigns). If a force smaller than a battalion is used, calculate the value of a battalion and then divide it by the number of smaller units which would comprise that battalion.

For example, a 125-man company is about one quarter of a battalion's strength. To find its strength, calculate the value of the battalion and divide by 4.

Combat value is calculated by selecting a base battalion combat value (BCV) and then applying any appropriate multipliers. The referee decides which of the three base BCVs is appropriate, but the notes in the "Scales of Equipment" sidebar are provided as a general guide.

The referee should feel free to tinker with the base BCV depending on the scale and quality of heavy equipment available. This allows fine-tuning of unit values to take into account different types of units in the same general category (tank and mechanized divisions, for example, would both be considered heavy in most armies) as well as inferior or superior equipment.

Base Battalion Combat Value

Light	*Medium*	*Heavy*
6	10	15

Combat Value Multipliers

Condition	*Multiplier*
Tech Level	1+TL
Novice	0.6
Experienced	1
Veteran	1.5
Elite	2
Division	10

Example: A tech level 5 novice light infantry battalion has a combat value of 6×0.6×6=21.6 (rounded out to 22)

Scales of Equipment

For black powder armies, the difference between light, medium, and heavy infantry is usually a function of how much supporting artillery is available. Armies without artillery are light, armies with light battalion guns in the battalion of separate field batteries are medium, and armies with both light battalion guns and separate field batteries are heavy.

Early animal-mounted cavalry, on the other hand, determine weight almost exclusively by the size of mounts and the amount of body armor carried. Light cavalry usually consists of unarmored troopers mounted on fairly small mounts. Medium cavalry consists of lightly armored troopers (usually equipped only with a helmet) on larger mounts. Heavy cavalry consists of troopers with helmets and some body protection (usually a breastplate, but sometimes just shoulder scales) mounted on the largest mounts available. Horse artillery is never present with light cavalry and should always be present with heavy cavalry.

For more modern forces, weight is generally determined by the proportion of heavy crew-served weapons present in the battalion. Forces with few or no heavy weapons are light, those with a generous allotment are medium, and those consisting exclusively of heavy weapons (usually tank units) are heavy. Powered armor units are almost always considered medium, as are motorized or mechanized infantry. (Even if fairly lightly provided with heavy weapons, a motorized force will carry more ammunition with it and thus be better able to use its weapons over time.)

Combat value multipliers are determined by the tech level of the unit (the multiplier is the unit's tech level plus 1), its average level of NPC experience (as shown on the table below), and its size (divisions multiply the battalion strength by 10; companies multiply battalion strength by a fraction determined by the referee, depending on the size of the company). After all multipliers have been applied to the BCV, any fractional results are rounded to the nearest whole number (rounding fractions of 0.5 up). No BCV may ever be reduced to 0 by rounding, however, and so fractional BCVs of less than 0.5 are retained as fractions.

The final value of the unit, once all multipliers have been applied, is its Combat Value (CV). Battalion BCVs and multipliers are listed on the table at lower left.

Mobility

Units' movement is expressed in hexes moved per 8-hour turn. The mobility of the unit is determined by the travel movement of the slowest vehicle in use in the unit. Divide the travel movement rate (in kilometers) by 25 to determine the mass combat system movement in hexes per turn.

The following table lists common movement allowances for low-tech units, and may be used as a general guide to movement rates of hostile forces. The first number is the number of hexes moved per turn on a road or, in the case of helicopters and lift units, in high mode. The second number is the number of hexes moved cross country or, in the case of helicopters and lift units, in NOE mode.

Type	*Movement*
Infantry	2/1
Cavalry	3/2
TL 5 Motorized	5/2
TL 6+ Motorized	15/5
Mechanized/Armored	10/5
ACV	20/15



Terrain: Some terrain is more difficult to move through than others and so slows movement. The Terrain Effects Chart (TEC) lists most common terrain types encountered and their movement costs. Terrain types with a dash are moved through normally, while those with a number following the multiplication sign cost additional movement. These movement costs vary with the type of unit actually moving through the hex. Hill terrain, for example, has no special cost for track-mobile, ACV-mobile, and lift-mobile units. Leg-mobile and wheel-mobile units, however, count the hex as two hexes for movement.

Units which do not have sufficient movement left to enter a hex may not do so, but may expend their remaining movement toward the entry cost of the hex for the next turn. (It would otherwise be impossible for infantry to enter any difficult terrain.)

Units may move along roads at the road movement rate, regardless of the type of terrain in the hex. The presence of a "P" on the chart indicates prohibited terrain; units with that mobility type may not enter the hex (except on a road).

Supply and Fatigue: A unit's ability to move is constrained by supply and fatigue. Supply limits a unit's movement usually due to fuel limits. Vehicles which have limited fuel must spend a turn refueling after they have expended their normal load. Troops may rest while refueling. Fatigue limits all units, and while the specific effects of fatigue are covered later, it is normal for a unit to rest for one turn per 24-hour day.

Deploying: A unit which does not move during a turn is considered to be deployed in the hex it occupies, and should be so noted. A deployed unit has advantages in combat, detection, and blocking enemy movement. A unit may rest at the same time that it is deployed.

Leaving an enemy hex: Units may begin the turn in the same hex as an enemy unit and may use movement to withdraw from the hex. Several special rules govern this movement, however.

If movement through the hex has been blocked, units may only leave the hex across the same hexside they entered. If other friendly units are in the hex at the start of the turn and they entered across different hexsides, units may withdraw across those hexsides as well.

If there are no friendly units left in the hex at the end of the turn but there are still hostile units there, all hostile units in the hex may conduct pass-by fire at the unit or units which withdrew. All hostile units may conduct only one pass-by fire at withdrawing units, however, not one attack against each withdrawing unit.

Detection

Players should not be told the location of enemy ground combat units unless they are detected by a friendly unit in communication with other friendly units (and ultimately the players). Detection of aircraft by electronic sensors or detection from orbit is resolved using the normal detection rules in the game. A special procedure is used for detection of ground units by hostile ground units, however.

Detection takes place when two opposing units enter the same hex. Units moving by road or in high mode are automatically detected. Other units may be detected if a successful task roll is made.

Detection is resolved immediately, as detection of an enemy unit may stop movement and initiate combat. Detection is a standard task roll using the asset level of the average NPC quality of troops in the unit (Elite = 15, Veteran = 13, Experienced = 11, Novice = 9, as noted on TNE page 59). Detection is a Difficult task, and the difficulty level is modified as shown on the following table. The terrain occupied by the unit affects the difficulty of detection. The difficulty levels are noted on the TEC. For other modifying conditions + numbers are increases in the difficulty level while – numbers are decreases.

Condition	*Modifier*
Heavy detecting unit	+2
Medium detecting unit	+1
Target less than a battalion	+1
Light target unit	+1
Night or inclement weather	+1
Detecting unit deployed	–1
Target a division or more	–1
Heavy target unit	–1
Every 2 tech levels detector is above target	–1
Terrain	see TEC





Blocking Movement

A unit may block movement of enemy units through its hex if it detects them and if it has sufficient combat power to control the hex. Each hex has a control value listed on the TEC, which is the total combat value needed to insure that enemy movement is blocked. The combat value of deployed troops counts double for purposes of blocking enemy movement.

If the enemy unit is not detected, there is no possibility of blocking its movement and forcing combat.

If the moving unit is detected and the opposing player has combat value in the hex equal to or in excess of the hex's control value, enemy movement may be blocked at the option of the detecting player.

If the moving unit is detected and the opposing player has less combat value in the hex than the hex's control value, that player may attempt to block movement by rolling a D20. Divide the total combat value of the detecting player's units in the hex (remembering to double the value of deployed units) by the control value of the hex, and then multiply the result by 5, rounding to the nearest whole number. The final result is the number or less needed on a D20 roll to successfully block movement.

If movement is blocked, neither side continues moving and combat takes place in the hex.

Aircraft and lift units in high mode can never have their movement blocked by enemy units.

If movement is not blocked but the moving unit is detected, the detecting unit may conduct pass-by fire (see below).

Withdraw Before Combat

If one player detects an enemy unit and is faster than that unit, it may withdraw prior to combat. If it is itself detected, the opposing units in the hex may conduct pass-by fire on the unit as it withdraws. The withdrawing unit is subject to the normal restrictions on leaving an enemy-occupied hex, and they automatically are subject to pass-by fire from the hostile unit in the hex, even if it does not remain in the hex. Withdrawing units may never withdraw from the hex across a hexside used by a hostile unit to enter the hex, and if the hostile units are strong enough to block movement through the hex the withdrawing unit must exit the hex across the hexside used to enter the hex.

Withdrawal before combat aborts any other scheduled move of the withdrawing unit, although it may continue to withdraw in the face of an advancing enemy unit within the limits of its movement allowance (withdrawing back up its original path of movement to the contested hexes). If in withdrawing it moves into another enemy-occupied hex it may not withdraw before combat again that turn.

Combat

Combat takes place after movement, and consists of all units of both sides firing at detected enemy units in the same hex. The referee first determines the order of fires, and then resolves them in order.

Order of Fires: The order of fires is determined by detection, tech level, terrain, and troop quality. Order of fire is important, as casualties are removed as soon as a unit fires. As casualties are expressed in terms of combat value, casualties reduce the ability of the unit to cause casualties when it is that unit's turn to fire.

If one sidesæ units are undetected, those units automatically fire first before any hostile units in the hex.

If both sides' units are detected, units fire in the order of their tech level, with highest tech units firing first.

If both sides have detected units of the same tech level, deployed units fire first if occupying First Fire terrain. First Fire terrain consists of rough, mountains, swamps, forest/jungle, and broken, as noted on the TEC.

If both sides have detected units of the same tech level, and are not deployed units in first fire terrain, units fire in order of troop quality category, with elites firing first.

If both sides have detected units of the same troop quality and tech level, and are not deployed units in first fire terrain, the units fire simultaneously.

Allocating Fires: A unit must divide its fire as evenly as possible among the enemy units in the hex if they have detected it. If a unit has not been detected it may (but is not required to) fire at any enemy units in the hex it desires. However, any unit which a unit fires at may fire back. Units which have not previously detected a firing unit fire back using the "firing at undetected unit" penalty noted below.

Fire Resolution: To fire a unit, either the referee or a player rolls a D20, multiplies the result by the unit's combat value (CV), and then multiplies that result by 0.01, rounding fractions to the nearest whole number. The result is the casualties suffered by the target unit and this amount is subtracted from its combat value. This result, however, is modified by terrain and by certain other conditions of that target unit.

Terrain effects are listed on the TEC. Terrain either has no effect on fire or halves casualties. The effects listed are different for deployed units and moving units, and apply to fire delivered by the listed unit, not against it. For example, a moving unit in a mountain hex has the casualties caused by its fire halved, while a deployed unit does not.

Other effects related to the target unit are summarized below, and are additional multipliers to the total casualties suffered by the unit.

Target	*Effect*
Deployed	x0.5
Deployed in fortifications	x0.25
Undetected	x0.5
Pass-By Fire	x0.1
Fired on by routed unit	x0.1

Hit and Run

If a unit is undetected at the start of combat but has detected an enemy unit in its hex, it may conduct a hit and run attack. In a hit and run attack the attacking unit always fires first but multiplies its CV by 0.5 (in addition to all other multipliers). The target unit is allowed to fire back, but multiplies its CV by 0.1 (instead of the normal 0.5 multiplier for firing at an undetected unit). The attacker then must withdraw from the hex, that hex of movement being counted against itsnext turn's movement.

Morale

As units suffer casualties, their morale begins to falter. Better troops are more stoic under fire, and so can stand more casualties before collapsing, but eventually any unit can break and run, or even surrender.

Morale is determined each turn, and is based on the casualties suffered by a unit that turn as a percentage of the unit's strength at the start of the turn. For example, a unit which started the turn with a CV of 10 and which suffered losses of 2 CV would have suffered 20% losses in the turn.

There are three possible adverse morale effects triggered by casualties: retreat, rout, and surrender.

Retreat: When a unit takes casualties in a turn equal to its retreat number, it must break contact with the enemy and move away. This movement takes place at the end of the turn and the movement cost to leave the hex is counted against the unit's next turn's movement. All of the normal restrictions on leaving an enemy-occupied hex are in effect, including the possibility of pass-by fire if no friendly units are left in the hex.



Rout: When a unit takes casualties in a turn equal to its rout number, it must break contact with the enemy and move away. This movement takes place at the end of the turn and the movement cost to leave the hex is counted against the unit's next turn's movement. All of the normal restrictions on leaving an enemy-occupied hex are in effect, including the possibility of pass-by fire if no friendly units are left in the hex.

Routed units remain routed until they have had two consecutive turns of rest. When routed units fire, multiply all casualties inflicted by 0.1.

Surrender: When a unit takes casualties in a turn equal to its surrender number, it immediately surrenders, even if this prevents it from firing in its part of the turn. Units which would normally suffer casualties in excess of their surrender number suffer only casualties sufficient to cause surrender and then give up.

Morale Levels: The retreat, rout, and surrender levels of units are determined by their troop quality rating, as shown on the table below.

Type	*Retreat*	*Rout*	*Surrender*
Novice	5%	10%	20%
Experienced	10%	20%	40%
Veteran	15%	30%	60%
Elite	20%	40%	80%

Fatigue

Units which fight a battle are fatigued until they spend a turn resting. In addition, units not in combat which do not rest for one turn per day are fatigued. Each condition which causes fatigue (i.e. each battle fought and each day spent without rest) increases the fatigue level of the unit by 1. Each turn spent resting reduces the fatigue level of the unit by 1.

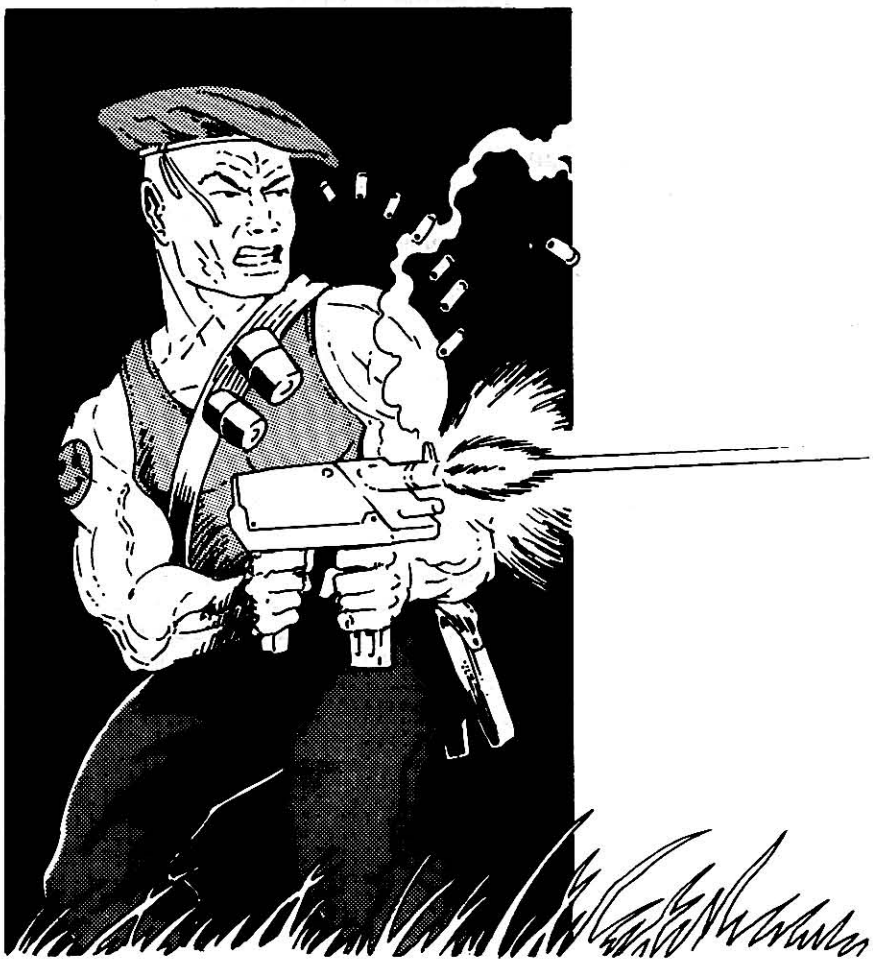
In addition, units which are fighting in planetary environments to which they are not acclimatized suffer fatigue according to the following chart. Note that these fatigue levels cannot be removed by rest, but are permanent until the personnel become acclimatized. (See pages 13-14 of the Survey chapter for more details on acclimatization.)

Acclimatization Stage	*Fatigue Levels Added*
1	4
2	3
3	2
4	1
5	0

Each fatigue level reduces the casualties caused by the unit in fire combat by 10%. In other words, units at fatigue level 1 multiply their CV by 0.9 (in addition to all other modifiers), while units at fatigue level 4 multiply their CV by 0.6.

Units which are greatly fatigued have their morale reduced. For every two fatigue levels, treat the unit as one troop quality level lower for morale purposes. An elite unit at fatigue level 5, for example, would have morale levels determined as if it were an experienced unit.

No unit may be reduced below novice morale level. Any unit with a fatigue level of 10 or more automatically surrenders to any enemy unit it encounters.



Supply

Although supply is critical to sustained combat, it is very easy to become completely absorbed by logistics to the exclusion of other game considerations. As a result, only the simplest of supply rules are presented here.

Types of Supply: There are three types of supply considered in the game: rations, fuel, and munitions.

Each unit requires rations once per day, and the rations are used when the unit is resting. If the unit does not receive its rations for the day, it has its fatigue level increased by 1. Units which are already fatigued and which are resting for more than one turn are denied the beneficial effect of one turn of rest per day if they receive no rations. There are no additional effects from lack of rations.

Fuel is required each time a vehicle uses up its onboard fuel. Units fuel all of their vehicles at once and usually do so while resting. Fuel supply must be available while the unit is resting in order for the vehicles to refuel.

Munitions are used when a unit fights. Whenever a unit fights it uses munitions and must receive more to fight at full effectiveness. Once a unit fights, multiply the casualties inflicted by it by 0.5 in all future combats until it receives munitions. Munitions are received at the beginning of a turn; the receiving unit does not have to rest to receive munitions.

Tracing Supply: Units are in supply if they can trace a supply line back to a friendly supply base. The supply line should be shorter than one turn's move-



ment of the army's supply movement rate (as calculated on pages 33-34 of the Economy and Infrastructure chapter). If it is longer than one turn's movement, units which require supplies may or may not receive them, based on the following table. The number under the die roll column is the roll (or less) needed on a D20 for a unit to receive supplies.

Distance	Die Roll
2 turns	16
3 turns	12
4 turns	8
5 turns	4

Each unit rolls separately to determine whether or not it received supplies.

Terrain Effects Chart

	Combat				Movement				
Terrain	Dep	Mov	Detect	Cntrl	Leg	Wheel	Track	ACV	Lift
Clear	—	—	—	200	—	—	—	—	—
Prairie	—	—	–1	300	—	—	—	—	—
Rough	FF	—	—	100	×2	×2	—	—	—
Mountain	FF	½	+1	50	×2	P	×4	P	—
Marsh	—	—	—	100	—	×4	×4	—	—
Swamp	FF	½	+1	100	×2	P	P	—	—
Forest	FF	½	+1	300	×2	×4	×2	×4	—
Jungle	½	½	+2	500	×2	P	×4	P	—
Desert	—	—	–2	500	×2	×2	—	—	—
Broken	FF	½	+1	100	×2	×4	×2	×4	—
Glacier	—	—	–2	500	×2	×4	×2	—	—

Supply Bases: Players may establish supply bases wherever they like in friendly territory. Any city hex containing industrial laborers (ILs) is also considered to be a supply base. If a move into enemy territory is required it will probably be necessary to establish additional forward supply bases to sustain the move.

In order to create a new supply base, the player must tell the referee where the base is to be and then spend three turns "stocking" it. Once supplies have been available to the hex for three consecutive turns, the base is operational.

If a supply base ever goes for six consecutive turns without receiving supplies, it is no longer an active supply base.

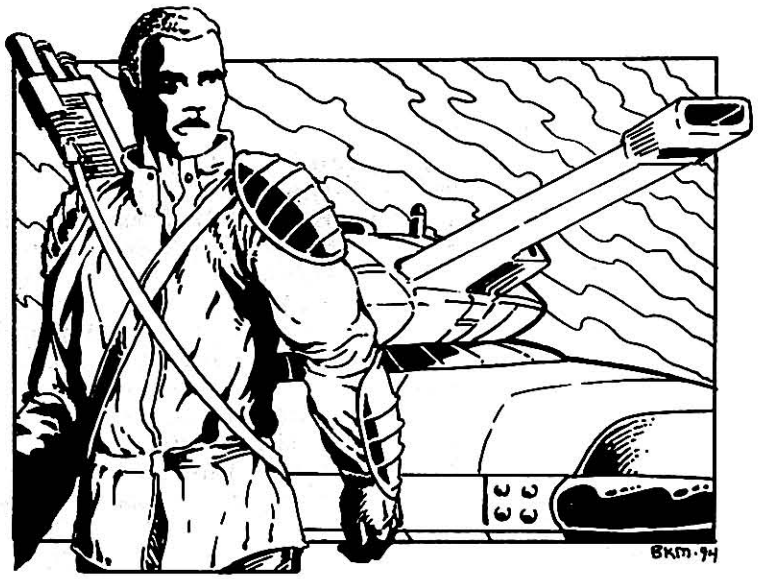
Integrating Supply with the Economic Model: The goods supplied to friendly military units in the supply system above are the same goods which are allocated to the Armed Forces sector using the guidelines in the Economic Model chapter. The intent of the following paragraphs is to translate how these goods are used up in the mass combat system. It is not intended that these supplies be tracked in a painstaking manner. Rather, these guidelines should be used to allow the referee to determine if a society has a sufficient supply base to continue prosecuting a war without concern, or if it must be penalized for not having allocated sufficient resouces to its armed forces, such as ammunition or operating hours of fuel.

Rations: So long as sufficient rations are provided to the Armed Forces Laborers in the economic model, there will be sufficient supply to push forward to the troops in accordance with the supply rules above.

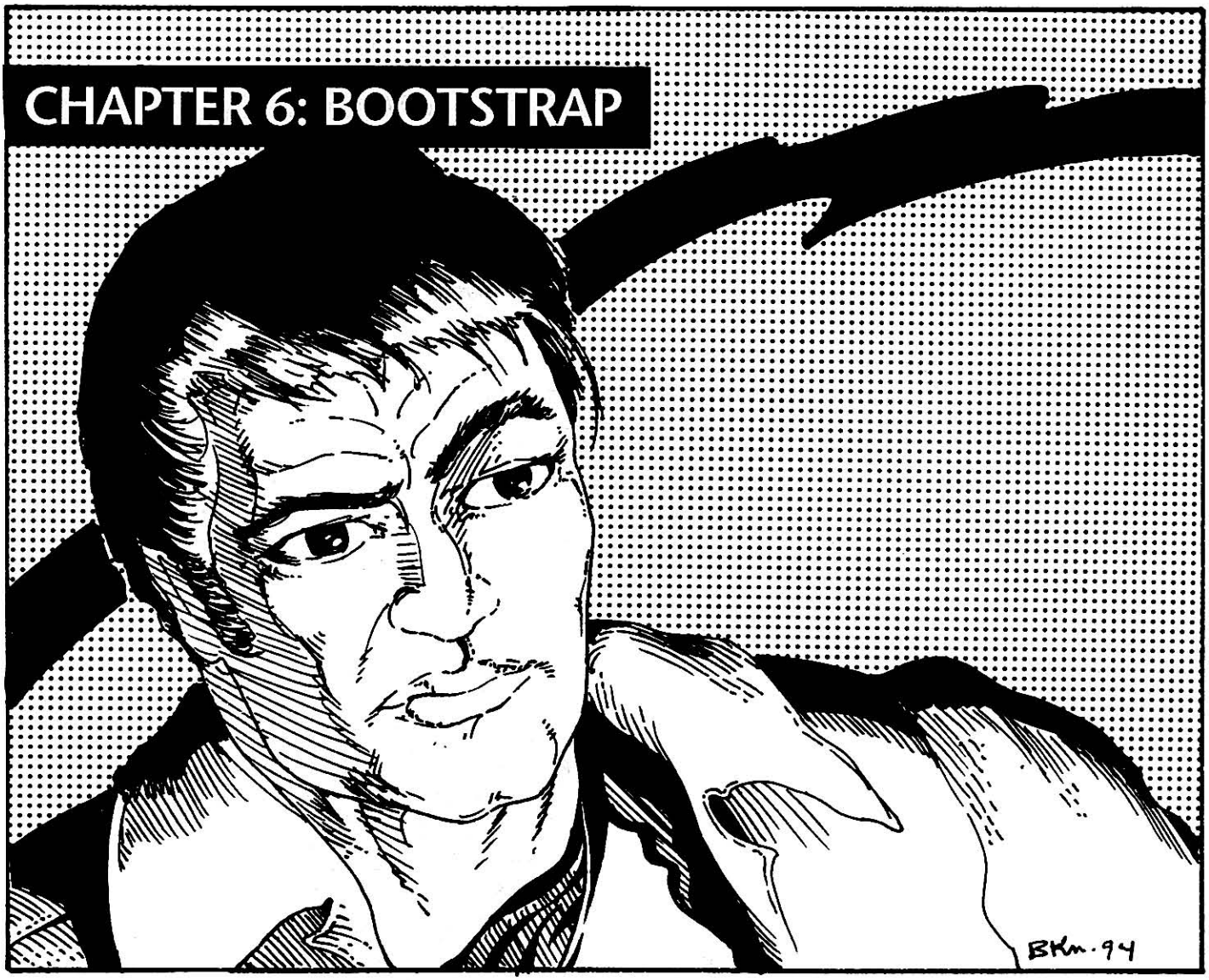
Munitions: Consumable ammunition is purchased for each weapon in the economic model, and this ammunition must be replaced when it is used up in combat. For purposes of this model, each turn of combat consumes ammunition at the rate of 25 times the weapon's basic rate of fire for all weapons in the unit, except for guided missiles, which are consumed at the rate of 5 rounds per launcher (or, in the case of disposable package launchers, 5 rounds per soldier/vehicle primarily equipped with this weapon). The rate of fire used for these purposes is the standard ROF listing in the TNE equipment tables. For SA and automatic weapons, do not multiply this rate by 5 for the maximum possible number of shots; therefore a ROF of SA is treated as 1, and an automatic ROF of 5 is treated as 5. For weapons with a reload rate, add one to the rate and invert it to serve as a fraction. Thus a weapon with a reload rate of two would become a ROF of ⅓ for these purposes.

Thus a colony which intends for its armed forces to be able to fight for one 750-hour month with one eight-hour turn of combat per day (assuming 24-hour days) must purchase or produce ammunition sufficient for (31.25×25=) 781 rounds per weapon or vehicle with a rate of fire of 1 shot per combat turn, 3906 rounds per weapon with a ROF of 5, or 39,063 rounds per machinegun with a ROF of 50.

Fuel: Raw materials in the form of fuel are provided to the armed forces on a monthly basis, and are expressed in the number of hours of operation that this allows to the armed forces per month (based on the assumption that all of their equipment is being operated simultaneously). As each turn in the mass combat system is eight hours, it is simple to calculate the rate at which fuel is used up. It will be useful to divide the total monthly hours of operation by eight, and then by the total number of battalions to find the total amount of fuel in battalion-turns. Each turn that an in-supply battalion moves or fights, it uses a battalion-turn of fuel. Each turn that an in-supply battalion does not move or fight, it uses ½ a battalion-turn of fuel. Only out-of-supply units use no fuel, and units may *not* be voluntarily placed out of supply merely to save fuel.



CHAPTER 6: BOOTSTRAP



A CHANGE OF PACE

It's good to be back in the RC, even Oriflamme. It's nice not being shot at. And its nice to have some cash in your pocket after Auction. But your group is tired. Tired of too many hot DZs, too many SAG raids, too much killing and death. You've reaped the rewards, but you need something else. Something less deadly, something life affirming, something where you can build a future. After all, future building is what it's all about in the New Era—right?

You are in your hotel lounge one evening, with one eye on the newscast while you try to figure out what to do next. After the news anchor runs through the usual traffic accident and ship arrival stories, she cuts to a feature on a world named So Skire. After wide shots of peaceful vistas and friendly natives harvesting their fields, the field reporter comes on camera with members of the So Skire survey team who have just landed back on Oriflamme.

"We've found a rich world here, ripe for development," the team leader says, "With a little help, So Skire could be an excellent trading partner with the Coalition."

After more wide vistas of green fields and snow-capped peaks, the camera cuts to a tight shot of the field reporter.

"This is one lucky freelancer," she says. "The RCES announced this morning that they've bought his data packages and they are preparing a bootstrap expedition to the Dawn Isles, a friendly country in So Skire's tropics. First reports say So Skire could be a good resource world, and if we are going to have allies on the Back Side of the Coalition, this would be a good place to start."

The RCES owes you a few favors. Particularly Jerszy Kaminski, the local detailer, since you led the SAG raid that busted his son out a desert dungeon on Keipes and caught a slug in your thigh in the process. The next morning you call his office and make an appointment for lunch.

Jerszy "Crusher" Kaminski

Veteran NPC

Combat Assets: Slug Weapon (Rifle & Pistol), Armed Martial Arts (Large Blade), Unarmed Martial Arts, Archery

Other Assets: Leadership 12, Persuasion 12, Ground Tactics 10, Recruiting 8, Liaison 8, Language 8, Admin/Legal 8, Riding 6, Instruction 6, History 6

Motivation:

Club Queen: Kaminski handles a problem by lowering his head and charging into it, not stopping until the problem or situation is resolved. He has a reputation throughout the RCES: if something critical really has to be done, give it to Kaminski.

Spade 10: Kaminski embodies the RC's philosophy of being the agency to reunite humankind. He wants to personally bring as many planets as he can into the RC and restore civilization to the stars before he dies.



Bootstrap n. 1. A strap on a boot for pulling it on. adj. 2. To cause to succeed without the help of others. 3. To achieve success by one's own unaided efforts. 4. To help others help themselves, as in a bootstrap operation.

HIRING ON

The player characters meet with "Crusher" Kaminski in a pleasant restaurant atop an office building near the downport and the RCES offices. At the referee's discretion, he can remember some good work the PCs have done for him in the past (as in the introductory passage above), in which case he can be looking forward to be working with the PCs again. Alternatively, the PCs may be unknown to him, and will have to work to impress him by some combination of roleplaying, interaction tasks, presentation of credentials, etc. If Kaminski warms up to the PCs, he says, "If you decide to sign on, you'd better put your affairs in order, because you're going to be away for a long time. This is no hot recovery. You'll be going to a place called So Skire where the natives are sort of friendly but go around wearing iron pants and throwing spears at each other. Expect to be there at least a year.

"So Skire is important to us for a number of reasons. First, it's a dense world and the ore samples taken so far look very interesting. So Skire seems to have a great potential as a heavy metals and rare earths source.

"Second, if the local humans can be brought back into interstellar society, they would be a great market for higher tech manufactured goods, and help revive trade and commerce in this area.

"Third, So Skire is at the coreward end of the So Skire Main, a huge cluster of 66 worlds that are accessible by jump-1 transportation. They run all the way rimward into Alpha Crucis and trailward along the Old Expanses-Alpha Crucis border into Spica. Some of these worlds are ripe for recontact and fairly advanced. Hiver reports and initial scouting has located one at TL-9, and several others at 6, 7, and 8. If we can establish a foothold on So Skire, we could have an the ideal base for expanding into the main. It could also help support Baldur's new colony on Poyzen.

"And just as importantly, a base here will help bridge the gap in the Wilds toward the Hiver worlds.

"*Immanuel Kant* will be leaving here in a month and will meet up with *Trigger* at L'Steich for the trip over. We want you on board. The fact that the Coalition is using their brand new clipper for this mission ought to tell you how important they think this job is."

If the PCs agree to sign on, Kaminski takes them to his office.

"Here's the data we have on So Skire so far," he says, while projecting a map of the world on the wall. He hands each PC a copy of the RCES scouting report compiled from the free-lancer's survey. The referee should make at least one set of photocopies of pages 57 through 60 available to the players to examine. GDW grants permission to owners of the **World Tamers Handbook** to photocopy these briefing pages for these purposes.

After the players have had a chance to read the data sheets for a few minutes, Kaminiski pulls some forms from his desk drawer and says, "Interested? If you are, here's a one-year contract for your services that can be extended as needed. If you're tired of sitting around on Oriflamme, here's a chance for some real adventure, not just a quick drop and recovery."

He offers the PCs a pen and says, "The rest is up to you."

REFEREES' SECTION
PLAYERS DO NOT READ BEYOND THIS POINT

At this point, the adventure can proceed in one of two ways, depending on your players capabilities and interests, and whether you are playing a primarily high level or low level campaign. Throughout this campaign at appropriate locations you'll see suggestions for using your players in a high or low level campaign. In the first example below, high level players become involved in the complexities of recruiting NPCs. Low level players simply sign on with the expedition under the leadership of NPCs.

High Level

If the PC group is to be the leaders of the bootstrap expedition, they meet Kaminski for lunch and make a deal with him to lead the operation. The objectives of the operation should be discussed as well as its duration. Rewards, in keeping with the usual modest Reformation Coalition standards for these things, can be talked about here too. The next step will be finding and recruiting some 100 bootstrap specialists and travelling to So Skire.

Low Level

If the PC group is looking for jobs on the expedition, Kaminski will be the one doing the recruiting. He will also be leading the operation. For players with a military background, there is plenty of opportunity for work as intelligence specialists, as military advisors to the Dawn Isles ground forces, as naval advisors to the Dawn Isle Wet Navy, and as members of the expedition's security team.

REFEREES' INFORMATION FOR THE PLANET SO SKIRE

Armed Forces of the Woden Empire

Total Personnel: 300,000
Wet Navy: 48,000 (Experienced crews)
32 major combatants (TL-1)
Ground Forces: 252,000
9 divisions of foot (3 TL-1 Experienced, 6 TL-1 Novice)
2 mounted divisions (TL-1 Veteran with 5 cavalry squadrons each)
5 separate cavalry squadrons (TL-1 Veteran)
1 Imperial Guard division (TL-1 Veteran)

Armed Forces of the Dawn Isles

Total Personnel: 200,000
Wet Navy: 64,000 (Veteran crews)
40 major combatants (TL-1)
6 other combatants (TL-1)
Ground Forces: 136,000
5 divisions of foot (TL-1 Experienced)
2 cavalry brigades (TL-1 Experienced)
1 amphibious brigade (TL-1Veteran)
2 Marine battalions deployed as ship's troops (TL-1 Veteran)
1 arquebusier battalion (TL-2 Elite)

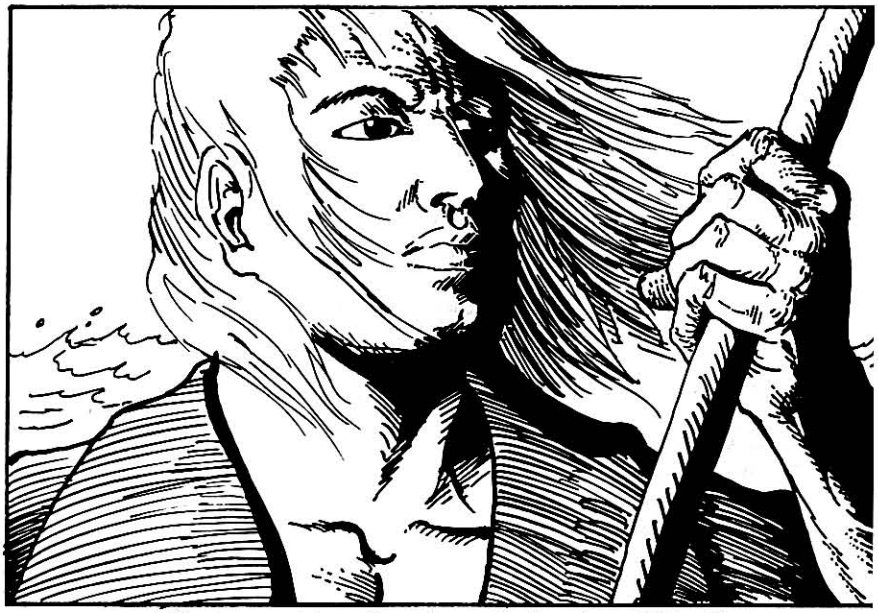


Armed Forces of the Southern Republic

Total Personnel: 150,000
Wet Navy: 48,000 (Experienced crews)
32 major combatants (TL-1)
Ground Forces: 102,000
1 Marine division (Ship's troops, TL-1 Experienced)
3 divisions of foot (TL-1 Novice)
1 cavalry division (TL-1 Experienced)
1 Brotherhood Guards battalion (TL-1 Veteran)

Armed Forces of the Aylward Islands

Total Personnel: 100,000
Wet Navy: 16,000
32 regular combatants
Ground Forces: 84,000
1 amphibious division (TL-1 Experienced)
3 divisions of foot (TL-1 Experienced)
2 marine battalions (TL-1 Veteran)



So Skire Minor Powers Armed Forces

Nation	*Wet Navy*	*Regular Combatants*	*Patrol Craft*
Borean Enclave	6400	10	6
Svensholm	8800	10	15
South Dawn	8800	12	11
Ragnar	400	0	2

Nation	*Ground Forces*	*Division Equiv.*	*Battalion Equiv.*
Borean Enclave	73,600	3	7
Svensholm	101,200	5	0
South Dawn	46,200	2	3
Ragnar	4,500	0	2

Survey Data on the Dawn Isles

The brief free-lance survey conducted on So Skire did not get detailed survey data on the Dawn Isles. If the PCs elect to conduct their own survey, the following data will be obtained of the three planetary hexes shown in the map on page 79. The referee may elect to run a detailed campaign using elements of the economic model detailed in Chapter 4, in which case this data will be necessary.

Planetary Hex: Northern Aaland

Agricultural Richness: 1.3
Agricultural Useable Area: 60%
Raw Materials Richness: 110
Raw Materials Useable Area: 35%
Fossil Fuels: Yes
Radioactives: Yes
Extractable Hydro Power: 4200 kW per 20-km mapping hex
Extractable Wind Power: 88.2 MW per 20-km mapping hex
Base Latitude Temperature: +10°C
Summer Maximum Temperature: +21°C
Winter Minimum Temperature: –9°C
Weather Factors: 0

Planetary Hex: Southern Aaland and Northern Gotland

Agricultural Richness: 1.3
Agricultural Useable Area: 50%
Raw Materials Richness: 120
Raw Materials Useable Area: 40%
Fossil Fuels: Yes
Radioactives: Yes
Extractable Hydro Power: 3360 kW per 20-km mapping hex
Extractable Wind Power: 117.6 MW per 20-km mapping hex
Base Latitude Temperature: +16°C
Summer Maximum Temperature: +23°C
Winter Minimum Temperature: +4°C
Weather Factors: 0

Planetary Hex: Southern Gotland

Agricultural Richness: 1.6
Agricultural Useable Area: 60%
Raw Materials Richness: 90
Raw Materials Useable Area: 30%
Fossil Fuels: Yes
Radioactives: Yes
Extractable Hydro Power: 3780 kW per 20-km mapping hex
Extractable Wind Power: 137.2 MW per 20-km mapping hex
Base Latitude Temperature: +22°C
Summer Maximum Temperature: +29°C
Winter Minimum Temperature: +10°C
Weather Factors: 0

So Skire's Governments

Nation	*Population (in millions)*	*Government*	*Corruption*	*Talent*	*Cruelty*	*Paranoia/ Aggression*	*Xenophobia*
Woden Empire	30	8-TO	High	High	High	High	Moderate
Dawn Isles	20	4-CD	Low	High	Low	Moderate	Low
Southern Republic	15	7-MD	Moderate	Moderate	High	High	High
Svensholm	11	8-TO	Moderate	Low	High	Low	High
Aylward Islands	10	3-RD	Low	High	Low	Low	Low
Borean Enclave	8	3-RD	Low	Moderate	Low	Low	Moderate
South Dawn	5.50	4-CD	Low	High	Low	Low	Low
Ragnar	0.50	1-TG	High	Low	High	High	High



RECRUITING (HIGH LEVEL)

Bootstrap teams are a mix of civilian specialists and military personnel who have been seconded to the RCES. All are volunteers. They have many motives. Some are looking for adventure. Others genuinely want to help people. Still others need a convenient way to get off-planet for an extended period of time.

Team Composition

There are four categories of bootstrap team members to be recruited. These include team leaders, technicians, military advisors, and security specialists (see the table on page 62). Because of the nature of the bootstrap mission, all team leaders, technicians, and military advisors should have significant Instruction skills in addition to any other skills listed below.

Team Leaders: These are volunteers with useful professional skills. They would be commissioned characters (where appropriate) drawn from careers such as Law Enforcement, Medicine, Veterinary Medicine, Civil Engineering, and Science. Retired or serving Army or Marine officers would also be included in this category.

Altogether there are 7 professional leadership slots available. The referee should roll up detailed professional NPCs for the players to consider for the leadership slots. In addition to considering their career qualifications, the players should interview these NPCs in depth to examine their motivations as well as their skills. Remember, the PCs and these NPCs will be working closely together for a long time.

Team leader jobs to be filled include Team Commander, Deputy Team Commander, Chief Scientist, Chief Medical Officer, Chief Agronomist, Senior Military Advisor, and Chief Security Specialist.

Note that these are job slots that may be partially or entirely filled by the player characters. If there are not enough PCs to fill these jobs, the remaining slots must be filled by NPCs.

Technicians: These are civilian team members with useful technical skills. These include skills from Medical, Engineer, and Physical Science clusters, particularly Farming. These may come from any career but must have proficiency in one of these skills. Successful candidates should also have good Interaction skills because their primary job will be "winning the hearts and minds" of the local population and teaching them their skills. There are 35 technician job slots available. The referee should create these as Experienced template NPCs, assigning them skills from the Technician , Artisan, Physical Science, Social Science, Interaction, or Engineer skill clusters. If desired, the players can select higher skilled individuals and generate complete UPP attributes and skills as part of interviewing prospective team members.

Military Advisors: These are experienced military professionals skilled in modern and archaic weapons who will serve as field advisors as well as drill instructors with the host government's armed forces. Create these by using the Star Viking Ground Specialist and Regency Marines NPC templates on TNE pages 65 and 66. Military advisors must have skills in Archery, Thrown Weapon, Archaic Artillery, Early Firearms, both Unarmed and Armed Martial Arts, Leadership, Instruction, Persuasion, and Ground Tactics. See page 63 for more details on the integration of these skills with the mass combat system.

There are eight military advisor job slots available. They will work closely with the Dawn Isles armed forces training them in the tactics needed to get the most efficient use out of their TL-1 weapons and introducing an increasing amount of TL-2 technology—principally musketry and black powder artillery—so they will be strong enough to repel an invasion from the Woden continent. It is hoped that this display of technology will attract other armed forces and their leaders to the Dawn Isles banner. In addition to retired and seconded officers and senior enlisted personnel from the world armies and wet navies of the Coalition, a detachment of RC Marines from the 3rd Battalion, 3rd Brigade is available as training specialists.

Security Forces: Even though all bootstrap personnel will be armed with their personal weapons, experienced troops are needed to provide security if the team suddenly finds themselves on the losing side of a local conflict or if their hosts suddenly turn on them. A squad-sized cadre from the 1st Battalion, 3rd Brigade RCMC has been seconded to this bootstrap operation to provide security force leadership and logistics. Volunteers are available from both the RCMC and the Oriflammen Marines to round out the platoon-sized security detachment, and these characters are portrayed as Regency Marine template NPCs from TNE page 66. Security slots may also be filled with recently mustered out veterans. Balduri pesonnel and others with High-G environment skills are preferred because of the 1.5 G environment on So Skire. Skills with archaic and melee weapons would be helpful but not necessary. The security force will be armed and armored as light infantry.

Altogether approximately 110 troops and technicians are expected to make up the So Skire Bootstrap Team.

The Selection Process

The PCs will want to interview key NPCs. The referee needs to do two things to prepare for these interviews. First, the referee needs to generate the key NPCs. These include:

- The members of the leadership group that are not played by the PCs.
- The more highly skilled technicians.
- The more senior and highly skilled military advisors.
- The senior members of the security detachment.

Second, the referee needs to secretly generate the NPCs' personalities, their quirks, their hidden flaws (if any), and to play out these personality traits during the interview. This gives the players a "hands on" feel to the campaign and helps make them realize the interviews are important.

The personality of each NPC will be partially generated through the drawing of the cards as outlined in the basic TNE rules. To supplement this, however, the referee should roll 1D20 on the Personality Table and play the NPC during the interview with the resulting personality.

NPC Personality

D20	*Personality*	*D20*	*Personality*
1	Charismatic	11	Reserved
2	Charismatic, Flawed	12	Reserved, Flawed
3	Charming	13	Reserved
4	Charming, Flawed	14	Reserved, Flawed
5	Friendly	15	Closed
6	Friendly, Flawed	16	Closed, Flawed
7	Open	17	Arrogant
8	Open, Flawed	18	Arrogant, Flawed
9	Open	19	Antisocial
10	Open, Flawed	20	Antisocial, flawed

Charismatic: The NPC establishes an instant rapport with the PCs, which the PCs should also experience. The NPC is highly enthusiastic about the bootstrap project.

Charming: The NPC is very friendly and tries to establish common ground with the players through common experiences or contacts they may all know, campaigns they know about, etc.

Friendly: The NPC is very interested in the mission and its goals, and explores ways with the players to achieve these goals.

Open: The NPC has a somewhat extroverted personality and is capable of easily talking and relating with the players. However, he or she is careful to maintain some personal "space."

Reserved: The NPC is somewhat introverted. He or she is business-like and somewhat cool.



Closed: The NPC seems to have a rigid personality and does not talk freely. He or she refuses to discuss personal matters and does not engage in small talk. While the social "temperature" around a reserved NPC is cool, this one is downright chilly. From time to time, this person's mind seems to be on something 1000 kilometers away.

Arrogant: The NPC is smug, superior, and overbearing to the point of being obnoxious. This is particularly common among academics with doctorates.

Antisocial: This is a sarcastic individual that puts down the bootstrap project and expresses open disdain to the players. Such persons may also exhibit antisocial tendencies by dressing poorly, not bathing, and picking their noses. Although they may be geniuses in their fields or quite well-off financially, they look as though they live in a transit station.

If the result includes "flawed," this indicates the character has a secret flaw or background situation in his or her life that may influence his or her reactions at a later critical moment. The referee should roll on the NPC Personality Flaw Table to determine what this is.

PCs with Research or Streetwise skills may be able to successfully investigate the NPC's background and reveal the hidden flaw.

NPC Personality Flaw	
D10	*Personality Flaw*
1	Criminal Record
2	Death
3	Killing
4	Bad Debts
5	Runaway
6	Family Problems
7	Substance Abuse
8	Cowardice
9	Mental Instability
10	Hidden Illness

Many people have had problems in their lives and need a fresh start. The bootstrap operation may be their way of getting one. On the other hand, their flawed backgrounds may lead to trouble. Remember, secretly write down these flaws and don't reveal them to the players unless they discover them on their own as during the interview or through investigation. If they are not discovered, spring them on the players at an unexpected but appropriate time.

Criminal Record: The individual has been convicted and served time for a crime either in civilian or military life. The individual may have actually committed the crime or not, and may have even committed the crime for good reason. The individual may have been given the opportunity to volunteer for the bootstrap operation in order to avoid more prison time. Such an individual could retain criminal tendencies, ranging from compulsive gambling to thievery to killing rages that could manifest themselves sometime later.

Death: Someone close to the NPC, such as a spouse, parent, or child, has died fairly recently. The NPC may be running away from from a sense of guilt, or simply be looking for a new start, but could be distracted by grief or depression at a critical moment.

Killing: The NPC has accidentally or deliberately killed someone. He or she may be given to violent rages, or fall into a remorseful depression.

Bad Debts: The NPC owes a major financial debt such as a gambling or loansharking debt, back taxes, or alimony payments. He or she is joining the bootstrap operation to escape.

Runaway: This individual is running away from a bad situation: a bad marriage, a bad relationship with parents, from criminals, etc.

Family Problems: Similar to the Runaway, this person is trying to escape from a bad relationship. In this case, however, the relationship has been legally terminated and the person simply wants to get away from painful surroundings.

Substance Abuse: The individual has problems with alcohol or drugs. Assuming the individual is able to retain access to an addictive substance, this will have a major impact during a critical moment of the project, such as during negotiations with So Skirans, or during a complex scientific or medical procedure, or during combat.

> The nightmare came again; the woman turning white on the operating table as the beep of the heart monitor slowed and stopped. He awoke and remembered the slip of the scalpel that nicked the aorta, and the resulting red flood. Most of all he remembered the grief and hate in her husband's eyes. For months he escaped by drinking himself into oblivion. The referrals stopped coming and his practice dwindled to nothing. Soon he was borrowing money from friends to survive. One evening, he was drinking away the day in a Startown bar when he heard the new bootstrap expedition was looking for an assistant surgeon. The next morning, he took his thundering hangover downtown and applied. "A new world, a new beginning," he thought. "Maybe I can finally get away from the demons."

Cowardice: The individual will break and run during combat or in other critical life-threatening situations.

Mental Instability: The NPC acts normal most of the time but may act hyperactive and manic, or become depressed and weepy for no apparent reason. In addition, the person cannot handle stress and will break down in a stressful situation. Under extreme stress, this person could totally withdraw into a catatonic state. The individual may be receiving medication. If so, this person may act normal while his or her medication is available but could exhibit symptoms if their medicine is withdrawn.

Hidden Illness: The individual suffers from a hidden, chronic, physical illness. As long as his or her medication is available, the NPC lives normally. However, if the medication is withdrawn, the illness flares up and could become life threatening. An individual with diabetes, epilepsy, or severe asthma would fall under this "flaw." Such a flaw could be discovered by routine physical examinations and deemed acceptable, or this flaw could be successfully concealed by the NPC, or the illness could be unusual and undetectable.

TRANSIT

A month is allowed for interviewing, recruiting, physical screening, assembling supplies, etc. This period is also used for firearms familiarization training for all members of the bootstrap team who do not have at least a skill level of 1 in Slug Weapon or Energy Weapon. All characters without such a skill receive a skill level 0 in Slug Weapon (Pistol), Slug Weapon (Rifle), Energy Weapon (Pistol), or Energy Weapon (Rifle).

At the end of this period, the bootstrap team boards the Group III *Aurora*-class clipper *Immanuel Kant* in orbit around Oriflamme. She is fresh out of the yards following her post-shakedown overhaul. *Kant* is loaded with a full complement of modules so she has jump-2 performance on the way out. Her modules include:

- 400 ton Fuel Module (refining)
- 200 ton Cargo/Cutter Module
- 2x100 ton Mk 1a Quarters Modules
- 100 ton Troop Carrier Module with assault landers
- 50 ton Cargo Module
- 50 ton Planetary Survey Module with skiff

Kant is also carrying her assigned fueler *Skate*, one 50-ton modular cutter with a passenger/cargo module, a fuel scoop module, and two pre-loaded cargo modules; one 30-ton ship's boat, one 10-ton skiff



attached to the planetary survey module, and three Fury assault landers attached to the troop carrier module (see the **Reformation Coalition Equipment Guide** for details on the above *Aurora*-class clippers, *Manta*-class fuel skimmers, modules, and small craft).

Kant is to leave the smaller cargo, quarters, planetary survey, and troop carrier modules in orbit around So Skire along with her small craft (except for *Skate*) so that the bootstrap team can unload their supplies and equipment as needed. The larger cargo/cutter module will be emptied and carried back to Oriflamme, with its contents, including the three cutter modules, left in orbit around So Skire.

Before *Kant* departs, her crew will clip together the stay-behind clipper modules into an orbiting station. This will give the team an orbital base to which they can retreat if the mission goes sour, and quarters for an orbiting quick reaction team (one squad of 13 RC Marines) equipped with the assault landers. The cutter will use her fuel skimming module to scoop fuel from the inner gas giant for herself, the other small craft, and the self-powered clipper modules. A 2000 square meter, 1 MW solar array is attached to the cargo module to provide power.

Kant's cruise will cover the route Helios, L'steich (where she will rendezvous with *Trigger*), Sand, and So Skire. Returning she will jump directly to L'steich, refuel, and jump home to Oriflamme. The outbound leg is expected to last about four weeks.

Kant's sistership *Thunderchild* is expected to call in four to six weeks with additional supplies.

The referee will roll for starship encounters at each system, but *Kant*'s captain has been given strict orders to avoid a fight if possible. After all, the bootstrap operation is a mission with long-term consequences. RCES does not want it aborted in a fight with a pirate.

PLANETFALL

Kant jumps into the So Skire system after four weeks in and out of jump space. She heads to the nearest gas giant where *Skate* scoops fuel to fill herself as well as *Kant*'s 400-ton fuel module. *Kant* and *Trigger* head inward, constantly looking for other vessels. Note that So Skire is only two parsecs from the class D starport on Targa and three parsecs from the class D starport and Hiver temporary staging base on Barlow. Therefore, encounters with outside human or Hiver starships are small but real possibilities (see the **Reformation Coalition Equipment Guide** for data on Hiver starships). Also, if small craft are encountered, this is an indication of some outside activity at So Skire, the only habitable planet in the system.

Once at So Skire, *Kant* assumes a standard parking orbit and prepares to land the bootstrap team leaders. On the way in, *Kant* dispatches a small craft to place a communications satellite in geosynchronous orbit around So Skire. The team is to land at Gotland, the largest of the three Dawn Isles and the seat of government for Holmgren, Lord of the Isles, nominally allied with the Reformation Coalition. The nearest thing Gotland has to a starport is a broad beach on a protected bay near the fishing village of Sudhaven. Spacecraft can either make a water landing and taxi to a pier built out into the bay, or land on the beach. The only other available clear areas are cultivated. Setting a 50-ton cutter down on a soon-to-be-harvested corn crop would be looked upon with dismay by the locals.

Holmgren was contacted more than a year ago by a covert RCES survey mission during the first exploration of So Skire. The RCES determined that he had the most stable popular support of any leader on the planet and that his driving interest was improving the life of his people. The Dawn Isles was judged to be the wealthiest nation on So Skire and the nation most likely to advance technologically. And, Holmgren was judged to be the leader most open to off-world contact and development in his nation.

The second survey of So Skire, a more ambitious and open mission, confirmed these findings and received permission from Holmgren for the bootstrap mission. The second survey team reported that Holmgren was eagerly looking forward to the bootstrap team believing them to be strong allies against his principal political enemy Rudolph the Bald, ruler of the Woden Empire.

The arrangement left with Holmgren is that the "star people" will return within a year and will pass over his capital at Kongsholm to announce their return to him with the characteristic double sonic boom of a spacecraft entering the atmosphere. Upon receiving the signal, Holmgren will hasten to meet them at the beach "starport."

Thunder on a Clear Day

With the crew in the planetary survey module keeping careful watch of the weather at the landing site (see page 23 of the Survey chapter for weather procedures), the team leaders may begin planning for their arrival. Bad weather can clearly complicate flight and unloading tasks, so the characters will be well advised to not ignore these details.

On approach to the landing beach, they can make a high altitude pass over Kongsholm, capital of the Dawn Isles on the west coast of Gotland to let Holmgren know they have arrived. If this is a high-level campaign, the player characters are the team leaders in this first encounter; if it is a low-level campaign, the PCs are members of the security force.

The very first encounter upon landing that the bootstrap team has with the locals will set to tone for the entire campaign. While Holmgren will be on his way, having heard the pre-arranged signal, there is no way for the bootstrap team to control who will be waiting for them on the beach. Will they be met by Holmgren's retainers, stationed here to await their arrival? Will the political situation have changed since the survey, with Holmgren overthrown and hostile troops waiting to ambush the bootstrap team? Perhaps there was some confusion about the proposed landing site, and they will land amid frightened, possibly xenophobic peasants who have no idea what is happening.

Holmgren has no radio. There is no way to find the answer to these questions without simply landing and finding out what will happen.

Roll 2D6 on the table to the right to determine the nature of the crowd which gathers at the landing site upon the Bootstrap team's arrival.

2D6	First Encounter
2	Nobles
3	Troops
4	Fishermen
5	Townspeople
6	Peasants
7	Peasants
8	Fishermen
9	Townspeople
10	Police
11	Troops
12	Mounted Troops

Nobles: The local Duke of Sudhaven and his retinue of 1D6 members of his household and 3D6 members of his household troops are on the beach waiting to greet the bootstrap team. They had been told by Holmgren to expect the team's arrival and they hurried to the landing site as soon as they saw the launch on approach.

Troops: Troops numbering 3D6 armed with spears and swords are drawn up in formation on the beach. Their commanding officer walks out to greet the team as they emerge from the launch.

Fishermen: 2D6 fishermen are sitting on and near their boats which are drawn up on the beach and were repairing their nets when the bootstrap team landed.

Townspeople: 4D6 curious townspeople from the nearby community of Sudhaven are standing on the beach as the bootstrap team lands.

Police: 1D6 members of the town watch are on the beach. They are



armed with thick staves that function as clubs. One is armed with a sword.

Mounted Troops: A cavalry detachment mounted on horseback armed with swords, lances, and composite bows ride on to the beach as the launch lands.

First Contact Interaction

Whenever groups of people meet for the first time, there are innumerable potentials for misunderstanding, and the fallout of such errors can have far-reaching effects. Such important moments should be roleplayed, allowing the players to experience the uncertainty guessing how best to respond to strange gestures or behaviors on the part of their counterparts. Are they drawing their weapons in honorary salute, or in preparation to attack? Should we draw ours to be safe, or will that frighten them?

These intangibles are the most dangerous when leaders cannot be present to attempt to maintain control of the proceedings, and to exert their leadership over potentially unsteady NPCs. This procedure may be used in any case when unfamiliar groups meet for the first time, such as here in the bootstrap campaign, but also in response to the "Native Encounter" random events result in the colony adventure (Chapter 7).

First, the referee rolls for the friendly team attitude on the table to the right. The result is the basic mental state of the team NPCs as they leave the launch. If PC leaders are present, one of these may attempt an Average: Leadership task to modify the team's attitude. Success indicates the result may be moved one level in any direction, Outstanding success allows two levels. (If Leadership assets are not possessed, Persuasion may be used, but the task becomes Difficult.)

1D6	*Team Attitude*
1	Hostile
2	Fearful
3	Wary
4	Relaxed
5	Open
6	Friendly

DMs on Team Attitude table: –1 if encounter is with troops; +1 if with civilians, +2 if with leaders (such as the local nobles on the table above). Apply a centering DM based on troop quality. A centering DM is one which works to bring the result to the center of the table: a result of 3 or 4. If the result is 4-6, the DM is used as a –DM. If the result is 1-3, the DM is used as a +DM. However, these +DMs will never raise the result to greater than four, and the –DMs will never lower the result to less than 3. Novice: no DM, Experienced: ±1, Veteran: ±2, Elite: ±3.

The local people who see the team on the beach will be able to sense their attitudes from the team's facial expressions, body language, and other non-verbal clues. This affects their own attitude to the team.

The leader of the friendly team must now attempt an Average Liaison Task to assure the locals' cooperation and positive attitude (if no Liaison skill, use Persuasion or Leadership, but difficulty level becomes Difficult). In the current example this would be a PC, or else Kaminski if the PCs are merely playing security troops. In the case of a random encounter between, say hunters and a local war party (in the case of the colony adventure), the referee must determine the talents of the group, but in most cases this will result in the use of the unskilled penalty (**TNE** page 108), and the outcome of the situation will be dicey.

Index the result of the task with the table to the right, modified by the attitude of the friendly party obtained above.

The reaction is modified by the team's attitude: +2 if Friendly, +1 if Open, –1 row if Wary or Fearful, –2 rows if Hostile. As an example, if the Liaison task is a success and the team is Friendly, go up two rows on the table to +1, Actively Cooperative. If the task is a failure and the team is hostile, the locals will be hostile and frightened and will flee and/or attack. (Because of the complexity of interpersonal and political relations, further developments after this initial contact are at the referee's discretion or according to scenario instructions, for example, immediately below.)

If the encounter goes smoothly, the locals will wait in place until Holmgren arrives, at which time they are escorted to Holmgren's palace in Kongsholm. How and where the meeting takes place is the referee's choice. If the team travels to Kongsholm, they should use local transportation to blend in and get the feel of Gotland and the Dawn Isles. The journey to Kongsholm would be a great opportunity for encounters and side adventures.

If the encounter goes badly, the team may have to retreat back to the ship. In that case, another attempt will have to be made to contact Holmgren, such as a covert mission to Kongsholm.

Meeting Holmgren

The leaders need to meet with Holmgren. His reaction will determine if the team is welcome in his nation or not. His reaction will be determined by another Liaison task as described above in First Contact Interaction. However, the result is modified by the final reaction of Holmgren's own people, and not the attitude of the bootstrap team.

HOLMGREN'S INITIAL REACTION

Task Result	*Reaction and Initial Level on Political Track*
+2	Totally Cooperative, Eagerly Welcomes Team. Level 2.
+1	Actively Cooperative, Friendly, appears to welcome team. Level 3.
Outstanding Success	Passively Cooperative, outwordly friendly, curious about team. Level 4.
Success	Neutral, cool and indifferent. Level 5.
Failure	Passively Uncooperative, seems agitated, worried, uncertain about team. Level 6.
Catastrophic Failure	Actively Uncooperative, seems very agitated, orders team back to ship. Level 7.
-1	Hostile, arrests team. Level 8.

Modifiers: +2 rows if local nobles eagerly welcomed team, +1 if local peasants or townspeople eagerly welcomed team or if nobles were friendly, -1 row if peasants/townspeople were uncooperative, -2 if nobles were uncooperative.

If the result is negative and unless the team is thrown in jail, they may attempt to win over Holmgren again 24 hours later with a Formidable test of Persuasion. If they are jailed, they will have to attempt to escape.

The notation of "Level" shows the initial position on the Political Track that corresponds to the result. See "Dealing with Holmgren," on the next page.

FIRST CONTACT REACTIONS

Task Result	*Reaction*
+2	Totally Cooperative, Eagerly Welcomes party.
+1	Actively Cooperative, Friendly, appears to welcome party.
Outstanding Success	Passively Cooperative, outwordly friendly, curious.
Success	Neutral, cool and indifferent.
Failure	Passively Uncooperative, seem agitated, worried.
Catastrophic Failure	Actively Uncooperative, seems very agitated, afraid; if troops may attack.
-1	Hostile and Frightened, if civilians will flee; if troops, will attack.



Holmgren, Lord of the Isles

Elite NPC

Combat Assets: Armed Martial Arts (Large Blade), Unarmed Martial Arts

Other Assets: Leadership 14, Persuasion 12, Bargain 10, Ground Tactics 10, Liaison 9, Streetwise 9, Willpower 9, Riding 9, History 8

Motivation:



Spade Ace: Holmgren is a charismatic and highly popular leader. He radiates charm in close company, and inspires all who hear him speak publicly. Holmgren is responsible for building his country's navy as a deterrent to aggressors from the mainland, and for improving the Dawn Isles' economy through shrewd trade pacts with other nations, particularly the Borean Enclave and the Aylward Islands.

Heart King: Holmgren is popular because he is honorable. He keeps his promises to his people by never promising what he cannot accomplish. His first act upon ascending to the throne was to fire the nation's corrupt tax collectors and appoint honest officials in their place.

Personality: Holmgren is genuinely interested in cooperating with the RC and the bootstrap team, but does have serious reservations the way that this should be done.

He will not stand for the RC coming in and doing everything for him, protecting him, defeating his enemies, and building new equipment that his people will not understand. This will not ultimately help his people; it will only make them dependent on outside protection, and will not allow them to help themselves. What is more, this will undermine Holmgren's political position with the Council of Nobles, who will see him as an impotent puppet of the off-worlders and will withdraw their support from him, invalidating his position as Lord of the Isles.

While he is open to and even eager for the benefits promised by the RC, he will irritate the PC leaders by insisting on knowing all of the details of every proposed action, and periodically make small, even cosmetic changes, just to prove that he is in control of the process. However, such cosmetic changes are important, as they will prove to the Council that the changes are under Holmgren's control, and that he must receive credit for them. The bootstrap team ignores these considerations at their peril, for if Holmgren loses power, there is no telling what his replacement will be like, and the ramifications for the unity of the Dawn Isles.

In these meetings, Holmgren will be fond of wagging his finger at the bootstrap team leaders and saying, "If you *give* a man a fish, he will eat for a day; if you *teach* a man to fish, he will eat for a lifetime."

While this remark gives insight into Holmgren's concerns, this is perhaps less important than the fact that it is true.

THE MISSION

Once contact is successfully made, the team and its equipment are brought down from orbit. They must establish a base camp and then set up plans for dispatching action teams throughout the Dawn Isles. Meanwhile in orbit, *Immanuel Kant* prepares to depart and puts together the orbiting station.

After the base camp is established, action teams fan out to sites where assistance is needed, as determined by the PCs and negotiated with Holmgren.

Dealing with Holmgren

As discussed in the Holmgren sidebar, Holmgren's success as Lord of the Isles depends on his walking the fine line between gaining the benefits of interstellar contact for his people without appearing to be too dependent upon them. While the Dawn Isles' Council of Nobles is not a particularly noxious pit of vipers as such bodies go, it is nevertheless full of ambitious leaders who will not miss a chance to see to their own power if Holmgren is squandering his own legitimacy.

Assisting Holmgren in walking this line is also part of the bootstrap team's job, as if he goes down in flames, their mission, in all likelihood, will as well.

All of this Byzantine and Machiavellian maneuvering is simulated by the use of a monthly die roll on a Politcal Table which drives the political position marked on a Political Track.

This is a modification of the political table and track presented in Chapter 4. In this bootstrap adventure, this political track combines the effects of two separate but related dynamics: 1) Holmgren's relationship with, and confidence in, the bootstrap team, and 2) Holmgren's power in, and support from the Council of Nobles as Holmgren's policies become more and more associated with those of the RC bootstrap team.

This means that each level on the Political Track has a dual function. First, it shows how willing Holmgren is to authorize further bootstrap activities. The higher the level, the happier he is with the team and their efforts, and the more willing he is to go along with more development.

Second, it shows how strong or precarious Holmgren's position is as Lord of the Isles. The higher the level, the stronger the bootstrap team has made his hold on power. The lower the level, the more the bootstrap team has botched their job, either by making Holmgren look like a fool for countenancing the efforts of bungling aliens, or by undermining Holmgren's power by making him look like a hollow, ineffectual puppet under the thrall of his "court magicians." Naturally it is this second function that explains Holmgren's willingness to further cooperate with the bootstrap team: their success in dealing with him goes hand in hand with their success in making Holmgren look good to his people and his power-hungry nobles.

Note that at the very beginning of the campaign, the political track only shows Holmgren's relationship with the bootstrap team, and has nothing whatever to do with his hold on power. It obtains both functions and retains them for the remainder of the campaign once the following two conditions are met.

1) The bootstrap team's relations with Holmgren on the political track rises to Level 3: Good, and

2) While the position is at Level 3, Holmgren agrees to allow at least one development operation, as explained in the "Lobbying for Permission" section which follows immediately.

Lobbying for Permission: Each month the bootstrap team leaders must present their requests for the upcoming team's operations. In general terms, the number of possible operations is one per A Team, based on the location of that team (i.e., if the A Team is assigned to train a military unit, the team must spend that month in the location where that unit resides, if the A Team is assigned to help the local miners, they must spend the month located where mining is taking place, etc.), four operations for the Base Team (again,



assuming that portions of their personnel are moved to the required location, or else that the persons being trained are brought to the base camp), and two operations for the command group (i.e., the PCs if they are the team leaders, with the same geographic caveat as discussed for the Base Team above). Thus the maximum total operations, and thus task rolls, per month is 14.

The details of these development operations tasks are described in "The Jobs" section on pages 59-60 below.

Each task desired by the bootstrap leaders requires a Persuasion roll. The difficulty level of this roll is shown on the Political Track, and is therefore based on the current level of these relations. Success indicates that Holmgren has granted permission for the indicated development task to be conducted during the current month. Failure and Catastrophic Failure both indicate that permission was denied.

PC bootstrap leaders should note that they may attempt these development tasks even if Holmgren denied permission, however, if these tasks fail, the –DMs on the political roll are *doubled.*

Bootstrap personnel who have had their operations for month cancelled may not be reallocated for other tasks that month.

If the request was approved, the group is transported to its required location and makes the indicated task roll. Success not only indicates that the team succeeded at its task (helping the locals to improve their agricultural, raw materials productivity, improved the training of local troops, etc.), but also succeeded in the altogether more ticklish aspect of handling the task so that it made Holmgren look good, and not just the bootstrap team. Failure can be either a failure to accomplish the basic task, or a successful task which somehow ended up making Holmgren look bad, ineffectual, weak, or somehow not in control of the bootstrap activities.

The Political Table: The political roll is made once per month, after the task rolls for all development tasks and random events for the turn have been made, as all of these items provide potential DMs for use on the table.

The Output roll DMs shown on the table are only used if the Economic Model is in use (see page 64 for details).

POLITICAL TABLE

D20	*Result and Output DMs*	*Track Movement*
–5	Dissolved, –5	Down 2 levels
–4	Coup Attempt, –4	Down 2 levels
–3	Censure, Assassination, –3	Down 1 level
–2	Caution, –3	Down 1 level
–1	Secession Threat, –2	Down 1 level
0	Secession Threat, –2	Down 1 level
1	Nobles Uncertain, –1	—
2	Nobles Uncertain, –1	—
3-18	No Effect	—
19	+1 DM, one random sector	—
20	+1 DM, one random sector	—
21	+1 DM, one random sector	Up 1 level
22	+1 DM, all sectors	Up 1 level
23	+1 DM, all sectors	Up 1 level
24	+1 DM, all sectors	Up 1 level
25	+2 DM, all sectors	Up 2 levels
26	+2 DM, all sectors	Up 2 levels

Nobles Uncertain: Small numbers of nobles express concern about the dangerous reliance on unreliable off-world support. –DM shown applies to only one sector (1-2: agriculture, 3-4: materials, 5-6: industrial)

Secession Threat: Small numbers of nobles begin to discuss the possibility of seceding from the Council along with their fiefs if the unacceptable reliance on off-world methods continues. –DM shown applies to only one sector.



Caution: Council of Nobles formally votes a Message of Caution to Holmgren, officially voicing their opposition to any further reliance on the off-worlders. –DM shown applies to materials and industrial only, not agriculture.

Censure, Assassination: Council of Nobles issues a Note of Censure to Holmgren, a stronger message than the Caution, above. As controversy continues to mount, small, disorganized group or individual attempts to kill Holmgren. If assassination is successful, Holmgren's replacement will order the bootstrap team out of the Dawn Isles on threat of death. Referee's discretion, low-level roleplay is recommended. –DM applies to all sectors.

Coup Attempt: Organized group of Nobles attempts to take over government from Holmgren. If successful, will place Bootstrap team under arrest. Referee's discretion, low-level roleplay is recommended. –DM applies to all sectors.

Dissolved: The Council votes to dissolve the position of Lord of the Isles, throwing Holmgren into jail to be tried for treason. The bootstrap team will be placed under arrest for eventual execution. Referee's discretion; if you don't start some low-level roleplaying now, you have to ask yourself what the heck you think you're doing playing this game, anyway. –DM applies to all sectors.

POLITICAL TRACK

Level	*DM*	*Diff Level*
Level 1: Excellent	+3	Easy
Level 2: Very Good	+2	Average
Level 3: Good	+1	Average
Level 4: Fair	—	Difficult
Level 5: Marginal	—	Formidable
Level 6: Poor	–1	Formidable
Level 7: Bad	–2	Impossible
Level 8: Terrible	–3	may not be attempted

DM: Die modifier applied to roll on Political Table on turns when that political level is in effect.

Diff Level: Difficulty level for Persuasion rolls when attempting to persuade Holmgren to allow development operations.

RCES SCOUTING REPORT

So Skire System

So Skire Subsector/Old Expanses 1732

Star System
Sector: Old Expanses
Subsector: 1732/So Skire
Star Type: M0V
Planetoid Belts: 0
Gas Giants: 4

Main World
Starport: X
Pre-Collapse Starport: E
Diameter: 9360 kilometers
Atmosphere: Standard
Hydrosphere: 71 percent
Population: 100,000,000
Pre-Collapse Population: 100,000,000
Government: Balkanized (Charismatic Dictator)
Law Level: 3
Tech Level: 1
Pre-Collapse Tech Level: 1
Bases: None
Trade Classification: None

NOTES

So Skire has been a stable backwater world unaffected by Virus and the Collapse because of its low pre-Collapse tech level. Normally, it would not draw much attention. However, a recent survey by a free-lance team found significant heavy metal mineral deposits on this dense, high gravity world and a relatively friendly native population near the survey site. Coupled with its position on the spinward edge of a dense cluster of worlds leading toward Hiver space, this makes So Skire worthy of intensive contact and bootstrap operations. With proper and timely development, So Skire could become a major source of vital minerals for the Reformation Coalition and a friendly "bridge" world between the Coalition and Hiver space.

Physical

So Skire occupys Orbit 0 around its M0V primary "Mymr." So Skire orbits toward the outer edge of the habitable zone (Orbital Factor 800). This, and its primary's relatively low luminosity result in cool temperatures on the planet's surface. Orbits 1 and 2 are empty, orbits 3, 4, 5, and 6 contain the system's four gas giants.

So Skire has a small (size S) rocky moonlet orbiting at 85,140 kilometers (9 diameters) and a ring system at 18,920 kilometers (2 diameters).

So Skire is classified as a habitable world but it's no paradise. It has a base surface temperature of 4°C and temperatures ranging from +29°C to -76°C. So Skire's temperate zone extend from 24° north to 24° south of the equator (three hex rows on standard global data view maps). Latitudes north and south of this line experience severe seasonal freezing or permanent glaciation. Weather factors for So Skire total 0.

It is an old world. Much of its original atmosphere has leaked away into space in spite of its 1.55G surface gravity. So Skire's atmosphere has a pressure of 0.9 atmospheres and a 20 percent oxygen concentration making it breathable without assistance. The axial tilt is 26 degrees giving the world pronounced seasons. So Skire's day is 24 hours long, and its year is rather short at 47 standard (and local) days, which is fortunate, given the severity of its winters.

Oceans cover 71 percent of the planet. Land masses consist of one major continent, three minor continents, seven major islands, and five archipelagoes.

The "freeze lines" on So Skire (three hex rows each side of the equator) marks the beginning of "the barrens," a land region that freezes every winter. The barrens are made up of rugged badlands with some glacier tongues extending from the ice cap. Vegetation is limited to lichens and other small growth, somewhat analogous to the Terran permafrost region. The "tropics," between the north and south freeze lines, do not freeze during the winter, except for some localized temporary freezing during the winter nights of hex row 3. The polar caps begin eight hex rows north and south of the equator. These are permanently frozen regions covered with a kilometers thick layer of ice.

The oceans poleward of the freeze lines experiences intermittent freezing depending on the latitude and season. During the summer and fall, ice floes and 'bergs calving off the polar caps are frequently encountered above the freeze line. Increasingly dense surface ice with pressure ridging forms during the winter and spring seasons.

The northern half of the major continent is ice-locked as are two of the three minor continents and most of the third. Most islands and archipelagoes are in temperate waters, however, and the human habitation is naturally concentrated here.

The Drakensberg mountain range which follows the west coast of Woden, the major continent, lie along the Draken fault line. These mountains experience major seismic and volcanic activity, and continuing geological uplift as the Western Marine tectonic plate perpetually rides up and over the Woden plate. Seismic activity along fault lines throughout the planet is frequent, thanks to tidal stresses caused by So Skire's proximity to its primary. The Spires of So Skire, five volcanoes towering more than 5000 meters above Cape Titan were tourist attractions during the Last Imperium. The few visiting sportspersons and tourists that traveled "off the beaten path" contributed a significant share of the planet's off-world income visiting the Spires and climbing nearby peaks during this period. Other income came from the occassional trader and from research teams studying the world's unusually primitive civilization.

Another source of income was a rare algae that only grows on the surface of tiny mountain lakes among the Spires of So Skire. The sulfur and other elements in the volcanic discharge made the algae and the microrganisms it hosts unique producers of wide-spectrum antibiotics. This was a primary export of the world during the Rule of Man and early in the Last Imperium. However, this pharmaceutical was later synthesized and reproduced in vast quantities in high tech pharmaceutical plants and the market for So Skire's product dried up.

Now that these mass production methods were lost in the Collapse, this algae may become a valuable export to the nearby Coalition worlds.

The Asgard Strait separating the major continent from Frig, the continent immediately south, is frozen solid about 16 days out of the year. The Strait is the major marine traffic route between the Aylward Islands in the Western Sea and the states on the eastern coast of Woden.

Other continents include Loki northwest of Woden, and Ragnar south of the Aylward Islands. Except for the extreme northern tip of Ragnar, both are uninhabited.

Other major inhabited regions include the Aland, Gotland, and Bjornholm Islands, know collectively as the Dawn Isles, east of Woden.

History

So Skire was settled during the rapid expansion of the Empire of Man following the defeat of the Vilani in the Interstellar Wars. Early records are few, indicating it was settled as a mining colony by colonists of Terran descent. It was abandoned during the Long Night and the technology level of its surviving inhabitants crashed to TL 0. Their technology had climbed to TL 1 when they were rediscovered about 560 by Last Imperium scouts. By then, other resource worlds closer to the Imperial core had been developed and So Skire was noted in IISS journals and bypassed. Harsh agricultural growing conditions and the lack of native technology combined to keep the planet's population at around 100 million. The IISS and later the Solomani Confederation Navy had provided and maintained communications technology which helped So Skire's people remain united and govern themselves as a representative democracy. Otherwise, the IISS declined to "interfere" with the local society although it did allow trade and contact with off-worlders under supervision of personnel from the Scout base at Keghe (1733). With the Collapse, however, the communications satellites and ground-based networks failed, the base at Keghe disappeared, and the world became balkanized.

So Skire Temperature Worksheet

				Highest Possible Temperature						Lowest Possible Temperature					
Col:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex Row	*Base Temp*	*Latitude Mod*	*Cols. 1+2*	*Summer Plus*	*Ax. Tilt Factor*	*Cols. 4x5*	*Daytime Plus*	*Orbit Ecc Plus*	*Cols. 3+6+7+8*	*Winter Minus*	*Ax. Tilt Factor*	*Cols. 11x12*	*Night Minus*	*Orbit Ecc Minus*	*Cols. 3+12 +13+14*
1	4	+18	22	+16	0.00	+0	+7	+0	29	–26	0.00	–0	–12	–0	10
2	4	+12	16	+16	0.00	+0	+7	+0	23	–26	0.00	–0	–12	–0	4
3	4	+6	10	+16	0.25	+4	+7	+0	21	–26	0.25	–7	–12	–0	–9
4	4	0	4	+16	0.50	+8	+7	+0	19	–26	0.50	–13	–12	–0	–21
5	4	–6	–2	+16	0.75	+12	+7	+0	17	–26	0.75	–20	–12	–0	–34
6	4	–12	–8	+16	1.00	+16	+7	+0	15	–26	1.00	–26	–12	–0	–46
7	4	–18	–14	+16	1.00	+16	+7	+0	9	–26	1.00	–26	–12	–0	–52
8	4	–24	–20	+16	1.00	+16	+7	+0	3	–26	1.00	–26	–12	–0	–58
9	4	–30	–26	+16	1.00	+16	+7	+0	–3	–26	1.00	–26	–12	–0	–64
10	4	–36	–32	+16	1.00	+16	+7	+0	–9	–26	1.00	–26	–12	–0	–70
11	4	–42	–38	+16	1.00	+16	+7	+0	–15	–26	1.00	–26	–12	–0	–76

Techno-Politico-Military

So Skire's technology level is the equivalent of Terra's circa 1200-1300 AD. Iron is the predominent metal, used for weapons, plate armor, nails and other fasteners, wagon wheels, and utensils. Homes and other buildings are sturdily build of wood and stone to resist the high winds and cold temperatures. The indigenous population wear homespun cloth and leathers and furs taken from local animals. Agricultural production is primitive, using plows drawn by Terran-descended domesticated musk oxen and local equivalent animals for cultivation, and hand implements for harvesting. Local plant life is edible but must be supplemented with Terran-descended plants in the diet ,or with vitamins.

Transportation consists of riding animals, usually Terran-descended horses and mules, and wagons drawn by mules, horses, or musk oxen over rough roads on land, or by river barges. Sea transportation is by sailing ships and sail and oar-powered coastal galleys.

Aside from the recent contact by the RCES-sponsored survey team, there has been no known off-world contact since the Collapse. The survey team discovered the world's population is divided among eight nations scattered across the face of So Skire. They include:

1. Dawn Isles: Ruled by the Lord of the Isles, a benevolent feudal monarch supported by his people, the Dawn Isles is the most prosperous of the So Skire nations. It includes Aaland to the north, Gotland in the center, and Bjornholm in the south. The survey team's landing site was at the south coast of Gotland, virtually on the equator. Gotland has some of the richest farmlands and highest crop yields on the planet. It also has a proven supply of sulfur enabling it to begin producing crude gunpowder, making it the equal of any rival powers. Its people seem the most open to off-world contact and influence. Gotland has therefore been chosen as the prime base site and initial objective of the bootstrap team.

2. South Dawn: An archipelago running between Bjornholm and the barren island Bifrost in the south, South Dawn is also a monarchy ruled by a nephew of the Lord of the Isles and is closely allied with its neighbor to the north.

3. Borean Enclave: A small nation in the northernmost habitable portion of the Woden Continent, the enclave is ruled by a representative democracy. It is an active trading partner with the Dawn Isles, and its only mainland ally. The Boreans trade mainland timber for Dawn Island farm products and manufactured goods.

4. Svensholm: A small coastal nation existing primarily from fishing the rich shallow banks offshore in the Crimson Sea. Svensholm is allied to and partially occupied by the Woden Empire to the south. There is an active resistance to the Wodenites supported by both the Boreans and the Dawn Isles.

5. Woden Empire: The Woden Empire is rich in timber resources, possessing the largest harvestable forests in the settled areas of So Skire. It is ruled by Rudolph the Bald, who believes he is destined to reunite So Skire under his crown. Rudolph is an absolute monarch whose word is life and death. He is supported by his wealthy nobility and, surprisingly, by his impoverished population, seduced by the promise of a better life when The Empire rules all of So Skire. The Empire's crop land is poor and has difficulty supporting its population. Timber is grudgingly traded with the Dawn Isles for their farm products and manufactured goods.The Dawn Isles' rich farmland is a priority target for inclusion in the Empire. So is the integration of Svensholm, the Borean Enclave and their fishing fleets. However, the Dawn Isles' powerful navy has thwarted these plans so far.

6. The Southern Republic: The Southern Republic control So Skire's major maritime trade route through the Asgard Straits. The Republic is ruled by the Brotherhood, a mystical band that believes some day the starmen will return with their marvelous speaking boxes and help them reunite So Skire. The Republic charges merchant vessels tolls for the privilege of passing through their waters and the Straits. So Skire's maritime nations would like to end this practice but have not mustered enough power to break the Republic's hold on the Straits.

7. Aylward: Aylward includes North and South Aylward Islands and is ruled by a representative democracy. The islands are rich in precious metal deposits which are sources of trade goods to be exchanged for manufactured products from the Empire and the Dawn Isles. A "White Fleet" sails eastward each spring blown by the prevailing winds from the west. After passing through the Straits and paying its tolls, the fleet calls at ports in the Empire and the Dawn Isles. Here precious metals and jewelry are exchanged for iron nails, wire, fasteners, wagon and ship fittings, and other manufactured products. The fleet then continues eastward, eventually arriving home after a voyage around the world.

8. The Polity of Ragnar: Despite its impressive sounding name, the Polity is little more than a council of tribal chiefs who rule the wild clans of Ragnar. Ragnar has the lowest tech level on the planet, effectively TL-0. Any TL-1 artifacts are acquired through theft and piracy. Their chief activity is raiding the Aylward Islands and the White Fleets as they depart and arrive home. The Aylwarders may eventually tire of this, and take Ragnar under their control.

So Skire's estimated current population broken down by nation is shown at right:

Nation	*Population*
Woden Empire	30,000,000
Dawn Isles	20,000,000
Southern Republic	15,000,000
Aylward Islands	10,000,000
Borean Enclave	8,000,000
Svensholm	11000000
South Dawn	5,500,000
Ragnar	500,000
Total	100,000,000

Date: 01-IX-1201

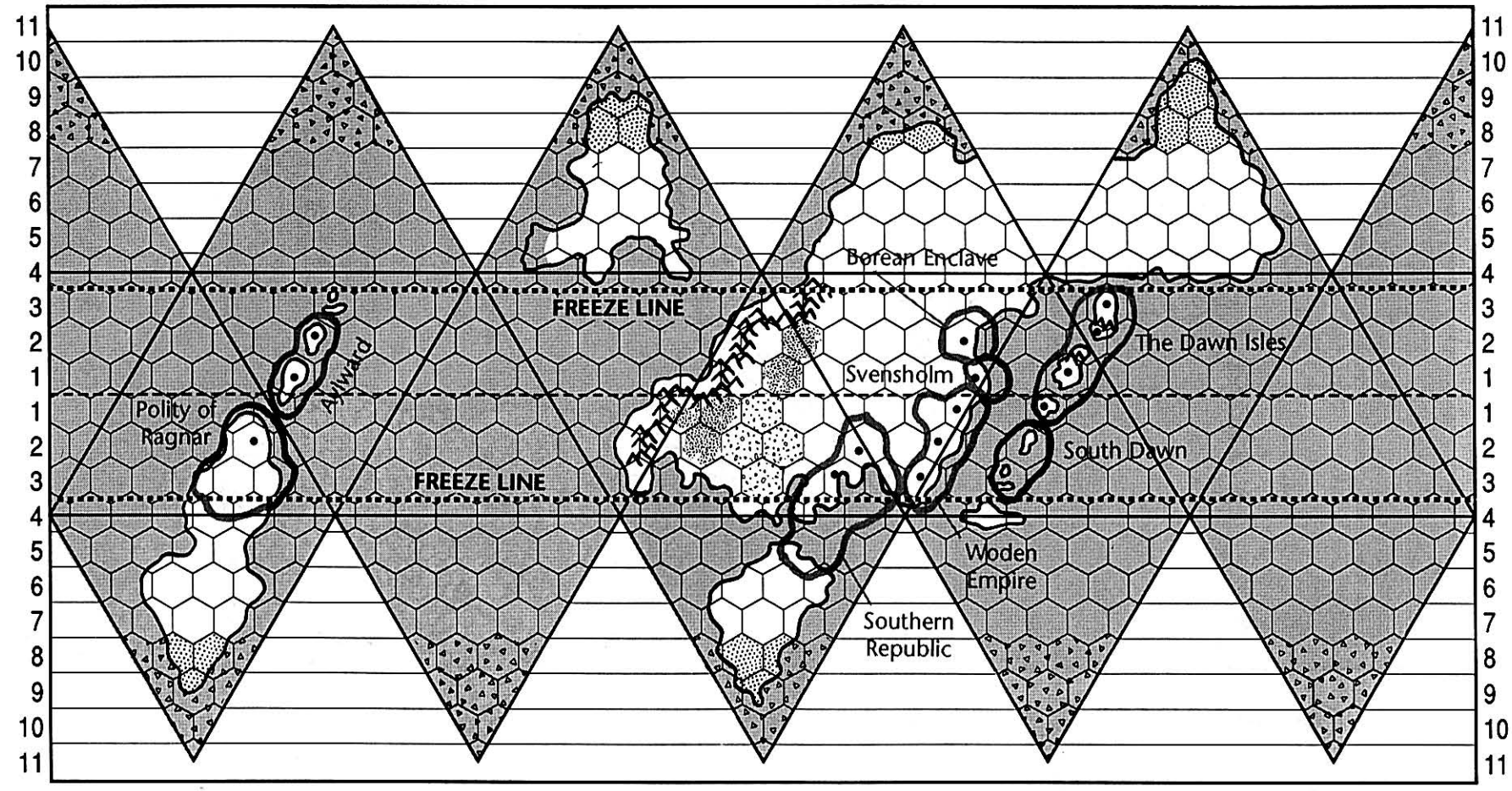
World Name: So Skire

UPP X667843-1

Hexagon Scale in Kilometers: 840

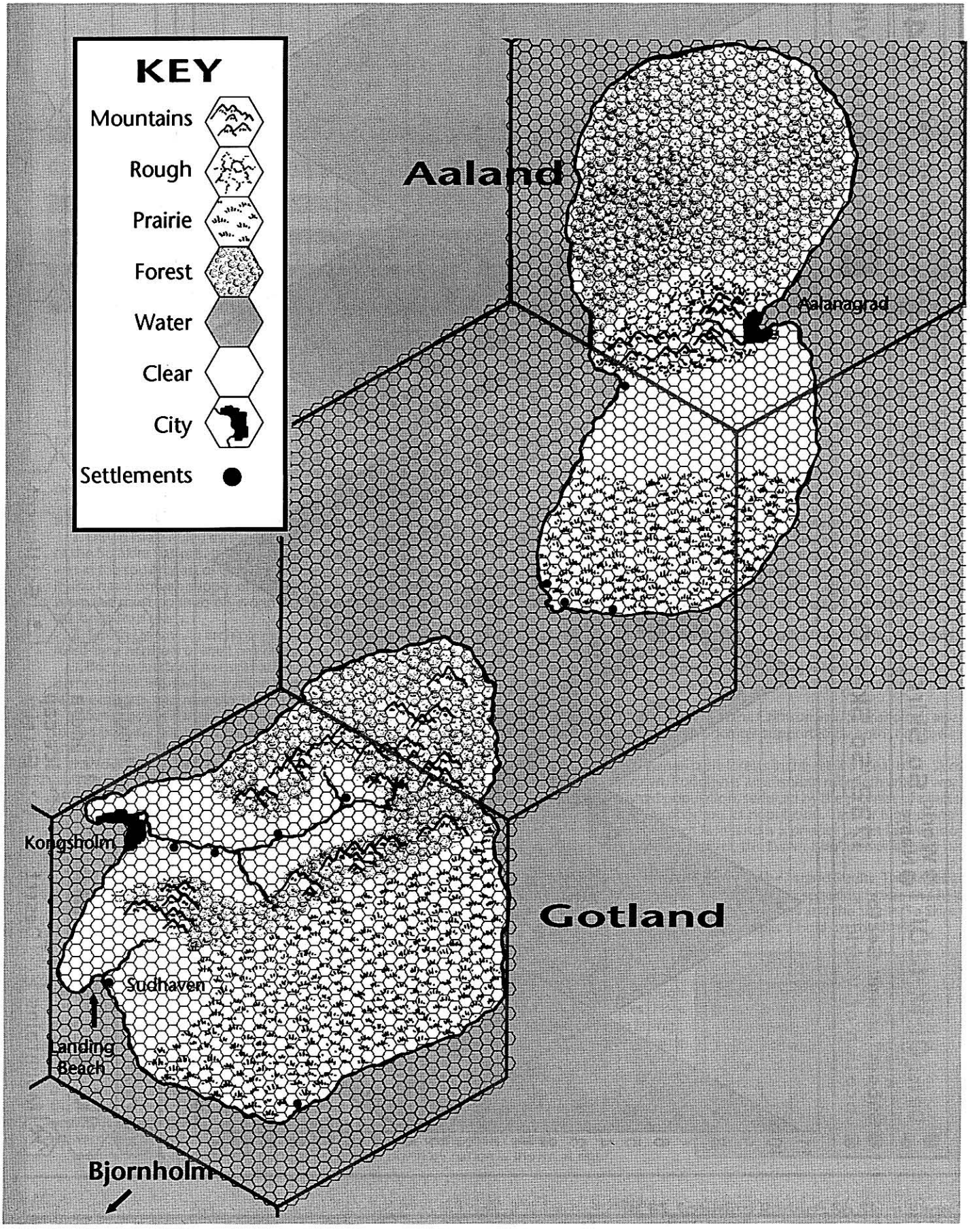
Subsector and Sector Location of World: 1732/So Skire/Old Expanses

GLOBAL DATA VIEW



Open Sea
Steppe
Jungle
Mixed
Badlands
Tundra
Mountains
Desert
Ice cap/ Glacier
Settlement




KEY
Mountains
Rough
Prairie
Forest
Water
Clear
City
Settlements
Aaland
Aalanagrad
Kongsholm
Gotland
Sudhaven
Landing Beach
Bjornholm



The Jobs

The basic bootstrap Action Team (or "A Team" for short) of which there are eight on this mission, includes five personnel: a military advisor, an agronomist, a civil engineer, a medic and a security/commo specialist. All are armed with light weapons. Meanwhile, the Base or "B Team" at base camp includes specialists such as geologists, teachers, intelligence gatherers and analysts, security force members, and the air raft pilots. They are available for dispatch on special missions where their expertise is useful.

These are the jobs of the bootstrap specialists and the situations in which they work. If the PCs are low level characters, you can place them in one of these situations if they have the necessary skills, and have them roleplay with the local people on a day to day basis. If you are running a high level campaign, you can have the players travel from site to site and use "walk-around management" techniques to become personally involved. You can use these settings as starting points for "mini-campaigns" within the main campaign. Meanwhile, the main campaign will progress from month to month at high level with events that will positively or negatively impact the players. These events are described beginning on page 64.

Leaders: These are the players in a high level campaign, or they can be distant figures that occasionally appear to players in a low level campaign. Leaders have two basic jobs. First, they are diplomats, constantly working with Holmgren and his advisors to advance the work of the bootstrap team. Second, they plan and supervise the operations of their subordinate A and B Teams, seeing that their capabilities are used to the best possible effect. From time to time, these leaders will also appear personally to lend their skills or guidance to the low-level efforts of these teams. As always, leaders must also respond to and cope with events or emergencies that crop up and impact the mission.

Military Advisors: They work directly with key units of the Dawn Isles armed forces, training them in new tactics and methods of operations. Although there are no active hostilities as the team moves into place, there is always the chance of raids from the mainland. And, Holmgren might want advisors to accompany his troops on a raid against the Woden Empire.

A military advisor may attempt to raise the troop quality of a battalion by rolling a Formidable Instruction task. Six consecutive success results mean that the battalion being trained has risen one experience level. This higher level must be maintained by continuing to roll consecutive successes at a Difficult Instruction task each subsequent month. Only one quality level may be obtained this way, and this new level must be less than the experience level of the NPC instructor. For example, a Veteran military advisor could raise a Novice battalion to Experienced, but could not raise an Experienced battalion to Veteran.

Each monthly success on this roll adds +1 to the Political Roll, +2 if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

One military advisor is in each A Team, and the entire A Team must participate in this activity for the entire month, and may not conduct other development tasks during this time.

Geologists: They are to begin an immediate mineral survey of the three planetary hexes of the northernmost Dawn Isles (Aaland and Gotland). The data they can determine for the three hexes is found on page 48. After the Dawn Isles have been thoroughly surveyed, geologists may participate in covert survey missions to the mainland to look for useful mineral finds there.

A geologist may roll a Formidable Geology task each month to simulate the assistance of local miners in finding and accessing mineral wealth.

Each monthly success on this roll adds +1 to the Raw Materials output roll of the Dawn Isles (if using the economic model) and +1 on the Political Roll, or +2 on each roll if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

Geologists are part of the Base Team, and any such Geological tasks come under the maximum of four tasks per Base Team per month, but see also page 64 for survey requirements.

Agronomists: In many ways these specialists in farming science are the keys to the mission's success. They will probably be more intensely involved with the local civilian population than any other team members, except possibly the medics. They will visit farming villages near the A team camps and introduce new farming methods such as contour farming on hillsides and new implements such as an improved iron plow that should help increase crop yields and the income enjoyed by local farmers. At least one biologist who is an expert in fisheries is included among the agronomists and is assigned to improve the catch at one or more fishing villages.

An agronomist may roll a Formidable Farming and Instruction (i.e., lower of the two assets) task each month to simulate the assistance of local farmers in using advanced farming techniques to increase their yields.

Each monthly success on this roll adds +1 to the Agricultural output roll of the Dawn Isles (if using the economic model) and +1 on the Political Roll, or +2 on each roll if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

One agronomist is in each A Team, and the entire A Team must participate in this activity for the entire month, and may not conduct other development tasks during this time.

Civil Engineers: They also work with the local civilian population advising them how to build and improve roads, bridges, aqueducts, sewer systems and other public works to improve transportation and sanitation in the country. Civil engineers will also assist in the design and construction of public buildings as well as teach local farmers and townspeople improved architectural and construction methods.

A civil engineer may roll a Formidable Construction and Instruction (i.e., lower of the two assets) task each month to simulate the assistance of the local populace in improving their infrastructure.

Each monthly success on this roll adds +1 to the Industrial output roll of the Dawn Isles (if using the economic model) and +1 on the Political Roll, or +2 on each roll if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

One civil engineer is in each A Team, and the entire A Team must participate in this activity for the entire month, and may not conduct other development tasks during this time.

Metallurgists: Their job is to teach local metalworkers such as blacksmiths and smelters to make the best use of local metal deposits. Where the geologists find minerals such as nickel that can be used to make improved iron alloys, the metallurgist will teach the locals how to make and use the alloys. Improved farm implements, household goods, industrial products, and weapons all result from the metallurgists' work.

A metallurgist may roll a Formidable Metallurgy and Instruction (i.e., lower of the two assets) task each month to simulate the assistance of local craftsmen in improving their techniques and output.

Each monthly success on this roll adds +1 to the Industrial output roll of the Dawn Isles (if using the economic model) and +1 on the Political Roll, or +2 on each roll if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

Metallurgists are part of the Base Team, and any such Metallurgy tasks come under the maximum of four tasks per Base Team per month.



Doctors/Medics: A key element of the "Hearts and Minds" program, the A Team medic makes the rounds of villages near the A Team base taking care of wounds and diseases, and teaching local people basic medical skills and sanitation. The doctors back at the B Team headquarters not only take care of the bootstrap team members, they also are on call to assist the field medics with difficult cases especially when they affect important local individuals, such as the child of a village headman or a member of the nobility. One of the doctors is a veterinarian offering veterinary medical advice to livestock farmers.

Medical personnel are available to respond to medical requirements on the random events table, but also to conduct beneficial tasks each month.

A doctor/medic may roll a Formidable Medical (Diagnosis) task each month to simulate the treatment of the local populace in minor illnesses as well as administering innoculations against local diseases. This process increases the overall health and therefore productivity of the population.

Each monthly success on this roll adds +1 to all output rolls of the Dawn Isles (if using the economic model) and +1 on the Political Roll, or +2 on each roll if Outstanding Success. There is no penalty for basic failure, but Catastrophic Failure incurs a –1 DM on the Political Roll.

One medic is in each A Team, and the entire A Team must participate in this activity for the entire month, and may not conduct other development tasks during this time.

Doctors are part of the Base Team, and any such Medical tasks come under the maximum of four tasks per Base Team per month.

Teachers: The teachers have a "knowledge transfer" mission. They are to set up an academy for the brightest local inhabitants and teach them basic science, math, and language skills to foster improved communcation with the bootstrap team. They also teach the locals about the universe, So Skire's place in it, and the history and philosophy of the Reformation Coalition.

A teacher may roll a Formidable Instruction task each month to simulate the progressive education of the local population in basic concepts. By "raising the conciousness" of the society to the advantages of interstellar contact, these tasks have an enlarged influence on the Dawn Isles' political acceptance of interstellar contact.

Each monthly success on this roll adds +2 on the Political Roll, or +4 if Outstanding Success is rolled. There is no penalty for basic failure, but Catastrophic Failure incurs a –2 DM on the Political Roll.

Teachers are part of the Base Team, and any such Instruction tasks come under the maximum of four tasks per Base Team per month.

Intelligence Specialists: Based at B Team headquarters, the intelligence specialists are tasked with gathering political, military, and economic intelligence from throughout So Skire. They are also responsible for creating up-to-date, accurate maps of the planet. Orbital photography from the high station supplemented with local surveys are used for map making. As soon as the intel section arrives on planet, they begin setting up a network of informants in the Dawn Isles, and setting up electronic surveillance devices in key locations, including Holmgren's palace (they have brought along a large supply of gold and silver for payments to agents). Members of their section also work with Holmgren's own intelligence service in improving Holmgren's agent networks on the mainland, particularly in the Woden Empire and the Southern Republic.

Once their local agents are in place, the bootstrap intell section will conduct covert missions into the Empire and Republic and set up their own networks in these countries. The B Team intel shack is the most tightly guarded area on the headquarters base. These team members present perhaps the most interesting opportunites for low-level roleplaying that can be generated by the bootstrap campaign, and are an excellent choice for players that want to hire onto the bootstrap mission for low-level roleplaying.

Because of the tremendous diversity of these operations, there are no monthly development tasks that can be rolled, although the intel specialists are the characters that make the intelligence rolls vs. some of the results on the random events table. Rather, intel specialists are best handled by discussion between the referee and players on how they would best like to see them used.

Security Specialists: These are the "grunts" of the operation. This platoon-sized unit is split into three squads. 1st Squad is the quick reaction force aboard the orbital station. It is armed with light battle dress and standard Coalition TL-10 to -12 weapons (See the **Reformation Coalition Equipment Guide**, particularly pages 9-11, 18-19, 52-55, 60-71, 85-87, 93-99, and 106-108 for details on standard Coalition military equipment and weaponry). Its mission is to back up the team on the ground with an assault landing if they get into serious difficulty with the locals. 2nd Squad is the ground security force at the B Team headquarters. It is armed with TL-8 infantry weapons so as to not overly intimidate the local population. Its job is the hold the headquarters area until the team can be evacuated to orbit if the mission goes sour. It also backs up the field security squad. 3rd Squad is the field security squad. It is split with one member attached to each A Team in the field. The trooper doubles as the A Team's commo specialist. His or her primary job is the team bodyguard. The team could not withstand a determined assault, but usually, a firepower demonstration will be enough to calm restless locals. 1st and 2nd squads swap duties once a week.

Security specialists have no development tasks to roll, but are instead involved as body guards in the entire spectrum of such operations. PCs who seek a low-level *entré* into the bootstrap adventure will really get a chance to "see the world" by signing on as security specialists.

Air Raft Pilots: This includes two pilots who double as mechanics. The team has two convertible air rafts each with a capacity of six persons (one pilot and five passengers) and 1.86 tonnes of cargo, and a maximum speed of 630 kph at altitude and 158 kph at NOE. (For more details see the **Reformation Coalition Equipment Guide**, pages 114-115.) The chief job of these pilots is the rapid transportation of bootstrap team members to where they are most needed, such as in response to medical or military emergencies, to meetings with Holmgren, etc. It is no accident that the A Teams are sized to each fit in a single air raft.

So Skire Bootstrap Team Composition

Command Group	7
8 Action Teams	
Military Advisor	8
Agronomist	8
Civil Engineer	8
Medic	8
Commo/Security	8
Action Team Subtotal	40
Base Team	
Medical	4
Intelligence	8
Science	4
Education	4
Military	4
Security	13
Air Rafts	2
Base Team Subtotal	39
Orbital Group	
Security Quick Response	13
Lander Crews	9
Small Craft Crews*	(6)
Survey Lab Crew*	(3)
Orbital Group Subtotal	22 (+9)
Bootstrap Team Total	108 (+9)

*Parentheses indicate crewmembers from *Kant* crew; not included in Bootstrap Team Total.



INTEGRATING PCS AND DETAILED NPCS WITH THE MASS COMBAT SYSTEM

In the event that the campaign requires the armies of Woden and the Dawn Isles to face each other in the field, the influence of the Reformation Coalition military advisors, both PCs and NPCs, will be felt. These clashes will be resolved with either the standard TNE combat system (rarely, only for very small engagements) or, more often, with the mass combat system presented in Chapter 5 of this book. The following modifications are for use with the mass combat system to allow integration of character abilities.

These modifications are based on the assets of the character *in command* of the unit in question. For the purposes of this bootstrap adventure, this is also expanded to include the PC or NPC military advisor to a given unit.

Ground Tactics: If the Ground Tactics *asset* of the character in charge is higher than unit's asset based on NPC quality, use the Ground Tactics asset for all detection rolls.

In addition, when rolling for blocking movement, the Ground Tactics *skill level* is used as a DM on the D20 roll. If the unit itself is attempting to block an enemy unit, the skill is a –DM on the roll. If an enemy unit is attempting to block the unit, the skill is a +DM on the enemy's roll.

When attempting to withdraw before combat, or if an enemy is attempting to withdraw before combat, add the Ground Tactics *skill level* to the unit's movement factor to determine which unit is faster (the enemy unit should have this benefit granted as well).

For purposes of order of fire, the Ground Tactics *assets* of the opposing commanders is used as the final tie breaker to see who fires first.

For fire resolution, use *one half* (round fractions down) of the commander's Ground Tactics *skill level* as a +DM on the fire resolution roll.

Leadership: The Leadership asset is used to avoid adverse moral effects. Whenever a unit reaches its Retreat, Rout, or Surrender level, a PC or detailed NPC leader can make a roll against his or her Leadership asset. Success indicates that the morale effect is disregarded, failure indicates that the morale condition takes effect normally, and Catastrophic Failure indicates that the morale condition becomes one level worse (i.e., Retreat becomes Rout, Rout becomes Surrender, Surrender remains Surrender). Difficulty level is based on the morale level that has been reached: Retreat is Average, Rout is Formidable, and Surrender is Impossible.

Instruction: The sustained use of instruction skill on a body of troops can affect their troop quality as discussed on page 61 above.

Admin/Legal: For each level of skill (not asset), treat the unit as being one hex closer to its supply base for purposes of determining supply.

Mapping: Leaders with mapping skills may roll a Formidable task vs. Mapping each turn to find the best path through terrain for the turn. Outstanding Success multiplies the unit's movement allowance by 1.5 (round to the nearest whole number), success adds 1 to the movement rate for the turn, failure has no effect, and Catastrophic Failure subtracts 1 from the turn's movement rate (the unit got lost). Note that leg infantry units get no greater benefit for Outstanding Success than they do for basic success.

This works only for ground units, and not for lift (contra-grav) units.

Mass Combat Ratings

The mass combat ratings of the Woden and Dawn Isles armed forces are listed below, along with the rating for RC quick reaction squad.

Woden Empire:

3 divisions of foot (TL-1 Experienced)
Combat Value (each): 200; Movement Rate: 2/1

6 divisions of foot (TL-1 Novice)
Combat Value (each): 180; Movement Rate: 2/1

2 mounted divisions (TL-1 Veteran, with 5 cavalry squadrons each, 2 heavy and 3 medium)
Combat Value (each): 180; Movement Rate: 3/2

5 separate cavalry squadrons (TL-1 Veteran, light)
Combat Value (each): 18; Movement Rate: 3/2

1 Imperial Guard division (TL-1 Veteran)
Combat Value: 300; Movement Rate: 2/1

Dawn Isles:

5 divisions of foot (TL-1 Experienced)
Combat Value (each): 200; Movement Rate: 2/1
2 in Kongsholm, 2 in Aalanagrad, 1 in Sudhaven

2 cavalry brigades (TL-1 Experienced)
Combat Value (each): 60; Movement Rate: 3/2
1 each in Kongshold and Aalanagrad

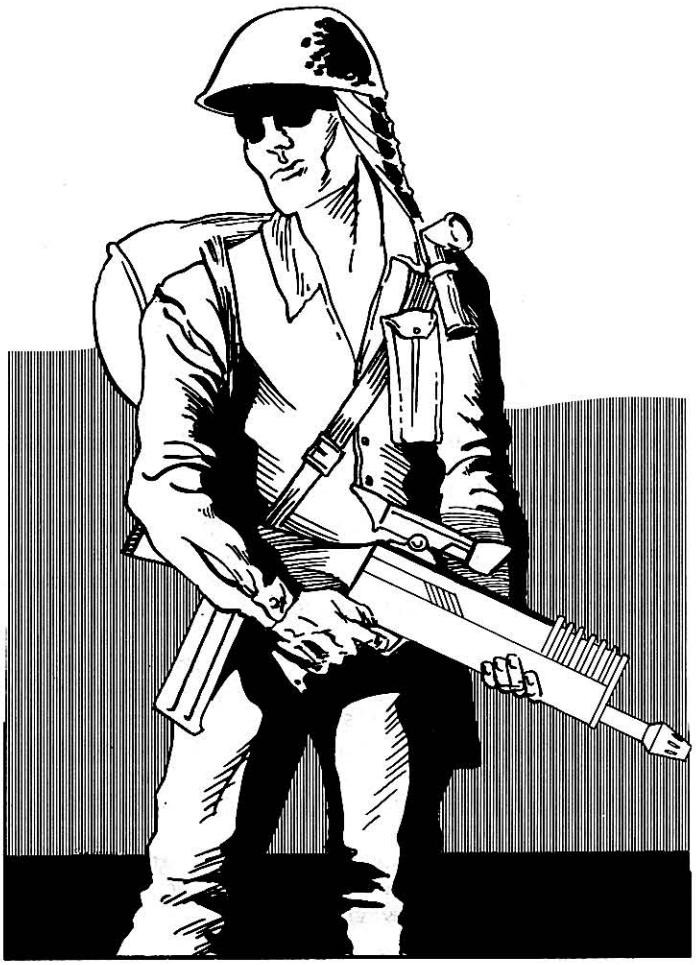
1 amphibious brigade (TL-1Veteran)
Combat Value: 54; Movement Rate: 2/1
Kongsholm

2 Marine battalions deployed as ship's troops (TL-1 Veteran)
Combat Value (each): 18; Movement Rate: 2/1
Based out of Kongsholm and Aalanagrad, but mostly at sea

1 arquebusier battalion (TL-2 Elite)
Combat Value: 60; Movement Rate: 2/1
Kongsholm

Reformation Coalition:

1 Marine squad deployed as orbital quick reaction team (TL-11 Veteran)
Combat Value: 3; Movement Rate: 2/1





USING THE ECONOMIC MODEL

Some referees may wish to play out the bootstrap campaign with a full-up economic model. Because this model is designed primarily for the more manageable scale of a colony of a few hundred persons rather than a nation of a few million, this will require some additional preparation from the referee.

The map of the Dawn Isles on page 60 is already rendered with the 20-km mapping hex grid, but this will probably need to be enlarged to allow detailed inspection and use (GDW grants permission to owners of the **World Tamers Handbook** to make photocopies of this map for purposes of enlargement, etc., as required for play of the scenario). The population of the Dawn Isles is 20,000,000 persons, and referees can assume that all infrastructure for this population is already in place. The referee will have to place the population, capital goods, and determine which land is currently under use for agricultural and raw materials purposes. Population and industrial capital will be concentrated in the two main communities of Kongsholm and Aalanagrad, but there will also be smaller such pockets in Sudhaven and the other settlements indicated on the map. Agricultural and raw materials land will be scattered out around these cities and settlements, and all cities and settlements are connected by a minimal TL-1 road net.

The data used with the economic model is presented on page 50, but this is not available to the PCs until they complete goal-oriented surveys of these hexes. This task will require all four of the scientists detailed to the Base Team, and the PC leaders may wish to detail more personnel to the survey tasks to cut the time required. For purposes of the time reduction factors (see page 20), the ad hoc orbital station left by *Immanuel Kant* is considered to be a spacecraft.

Note that if the four B Team scientists are being used for a survey, the number of development operations that may be conducted by the B Team per month is reduced to 3 (from 4), and may not include geologist or metallurgist tasks.

The various tasks conducted by the members of the action and base teams also have an impact on the output rolls of the economic model as indicated in "The Jobs" section beginning on page 61. These DMs are used during monthly turns in which tasks were allowed by negotiation with Holmgren and were rolled as successes.

RANDOM EVENTS

Once the bootstrap team is settled in and begins functioning, the campaign moves to a high level. Events begin to happen once a month that affect the campaign.

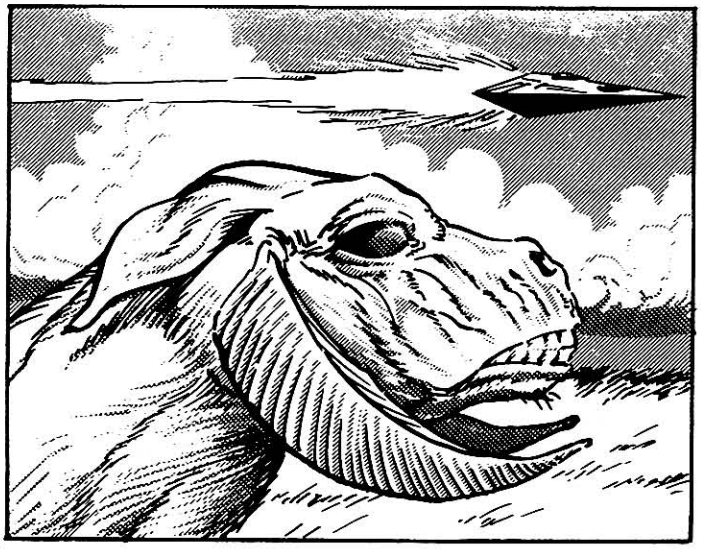
Weather Events

Use the weather events table found on page 36 of Chapter 4.

Scenario Specific Random Events

Use the table below for bootstrap campaign random events, in place of the Random Events table found in Chapter 4. As with the table in Chapter 4, roll 16+ on 1D20 to see if this table should be consulted. Otherwise skip this table for the month.

D20	*Result*	*Political Roll DM*
1	Disastrous Plague	See notes
2	Disastrous Livestock Disease	See notes
3	Serious Plague	See notes
4	Serious Livestock Disease	See notes
5	Holmgren Has Heir	+2
6	Holmgren raids Woden	See notes
7	Woden raids Dawn Isles	See notes
8	Holmgren invades Woden	See notes
9	Woden invades Dawn Isles	See notes
10	Personal Event	See notes



Disastrous Plague: Very serious disease strikes people of the Dawn Isles. 1D20×10 persons die each day until Impossible Medical (Diagnosis) task is completed. Referee must randomly determine settlement in which task breaks out, and task may not be rolled until a bootstrap medic arrives in the hex. Task may be rolled once per 24 hours thereafter. If plague is stopped before 500 persons die, +4 on Political roll for this turn, +3 if before 750, +2 if before 1000, +1 if before 2000. Otherwise –4.

Disastrous Livestock Disease: Very serious disease strikes livestock: Kills 1D20 units of livestock until Impossible Medical (Diagnosis or Veterinary Medicine) task is completed. Referee must randomly determine settlement in which task breaks out, and task may not be rolled until a bootstrap medic arrives in the hex. Task may be rolled once per 24 hours thereafter. Due to diseased meat, agricultural output cut in half for this turn. If disease stopped before 50 units die, +4 on Political roll for this turn, +3 if before 75, +2 if before 100, +1 if before 200. Otherwise –4.

Serious Plague: Serious disease strikes people of the Dawn Isles. 1D6×5 person die each day until Formidable Medical (Diagnosis) task is completed. Referee must randomly determine settlement in which task breaks out, and task may not be rolled until a bootstrap medic arrives in the hex. Task may be rolled once per 24 hours thereafter. –2 DM on all output rolls this turn. If disease stopped before 75 people die, +2 on Political roll for this turn, +1 if before 150. Otherwise –4.

Serious Livestock Disease: Serious disease strikes livestock: Kills 1D6 units of livestock until Formidable Medical (Diagnosis or Veterinary Medicine) task is completed (task may be rolled once per 24 hours). Due to diseased meat, agricultural output reduced by 25% for this turn. –1 on political roll. If disease stopped before 15 units die, +2 on Political roll for this turn, +1 if before 30. Otherwise –4.

Holmgren Has Heir: Holmgren's Queen Christina gives birth to a healthy son by cesarean section performed by a bootstrap doctor after a long and difficult labor. Holmgren is ecstatic with joy, and the people rejoice throughout the Dawn Isles, thanking the local diety for the heir and for the bootstrap team for saving him and the Queen. Holmgren and Christina have been married for more than a decade and nearly gave up hope of having a child.

Holmgren raids Woden: Holmgren wants to stage a raid on Woden to demonstrate the increasing effectiveness of his armed forces, and to raise the morale of his people (perhaps in response to event below). This raid will involve bootstrap team military advisors. He wishes to select a limited goal which will have a noticeable effect, but



which can be accomplished with a relatively small operation. This event proceeds at referee's discretion, as it should involve planning and participation by the bootstrap leaders (especially if they are PCs), and should be resolved using the mass combat system in Chapter 5.

A successful raid will yield +DMs on the political roll, while failure will yield –DMs.

Woden raids Dawn Isles: A small naval force from Woden will sortie to land troops and hit a Dawn Isles coastal settlement (perhaps in response to event above). Bootstrap intel team members will have an opportunity to get advance notice of the raid and prepare for it, either by agents in Woden, or via the coastwatcher network. Further details are up to the referee, but should involve PC participation, either as intel geeks, security specialists, military advisors leading Dawn Isles ground troops, or the bootstrap leaders. Event should be resolved using the mass combat system in Chapter 5.

Repulsing the raid with minimal losses, or maximum damage to Woden, will yield large +DMs on the political roll, while the reverse will yield the reverse.

Holmgren invades Woden: Holmgren wishes to stage a major invasion of the Woden mainland to attain major goals. The bootstrap team will be involved in all major aspects, from intelligence gathering to planning to accompanying the ground troops as advisors. Event proceeds at referee's discretion with low-level roleplaying, high-level planning, and resolution in accord with the mass combat system in Chapter 5.

DMs on political roll are commensurate with results, ranging from +10 (national defeat of Woden, capture of Rudolph the Bald) to –10 (loss of entire army in overseas operations).

Woden invades Dawn Isles: Major invasion by bulk of Woden army. Except for difference in scale, similar to notes for the Woden raid above.

DMs on political roll are commensurate with results, and should range up to +8. There is no lower limit, as the lower limit would be the utter defeat of the Dawn Isles and the destruction of its government, obviating the political track.

Personal Event: Roll 2D6 on the following table. Use the table as a random generator to set up low-level roleplaying situations. Low-level roleplaying can actually reverse or cancel the effects of these results.

2D6	*Event*	*Political Roll DM*
2	Rescue by native	+2
3	Rescue by team member	+2
4	Aid by native	-1
5	Aid by team member	-1
6	Friendship	0
7	Cooperation	0
8	Argument	0
9	Minor Crime by native	-1
10	Minor Crime by team member	-1
11	Major Crime by native	-2
12	Major Crime by team member	-2

Rescue by Native: A member of the bootstrap team is rescued from a dangerous situation by a local person.

Rescue by Team Member: A local person is rescued from dangerous situation by a member of the bootstrap team.

Aid by Native: A member if the bootstrap team is helped in a difficult situation by a local person. This may be an intellectual or "knowledge event" rather than an action event.

Aid by Team Member: A bootstrap team member gives a great deal of help to a local person which is greatly appreciated.

Friendship: Locals and team members strike up strong friendships including romantic relationships, possibly leading to marriage. Team members become part of the community rather than guests.

Cooperation: Locals and team members cooperate and work well with each other.

Argument: One or more arguments break out between team members and key members of the local population.

Minor Crime by Native: One or more natives commit a minor crime against a team member or team facility. Roll on the Minor Crime table for the crime.

Minor Crime by Team Member: One or more team members commit a minor crime against a local person. Roll on the Minor Crime table for the crime.

1D6	*Minor Crimes*
1	Brawl
2	Fight
3	Bribery
4	Petty Theft
5	Custom Violation
6	Insult

Reroll if the crime was committed by a native and the result was "5: Custom Violation." This result indicates a team member accidentally violated a native custom such as walking on sacred ground or knocking over a sacred statue, etc. The "Insult" result is not exactly a crime, rather it's an indication that one person's behavior was deliberately or accidentally insulting to another.

Major Crime by Native: One or more natives commit a major crime against a team member or team facility. Roll on the Major Crime table for the crime.

Major Crime by Team Member: One or more team members commit a major crime against a local person. Roll on the Major Crime table for the crime.

1D6	*Major Crimes*
1	Theft
2	Rape
3	Assault
4	Robbery
5	Kidnapping
6	Murder

Rudolph the Bald, Emperor of Woden



Experienced NPC

Combat Assets: Armed Martial Arts (Large Blade), Archery

Other Assets: Leadership 12, Persuasion 12, Ground Tactics 12, Riding 12, Willpower 10, Streetwise 10

Motivation:

Spade King: Rudolph and his bands rode out of the continental outback 20 standard years ago and conquered the coastal cities, establishing the Woden Empire. He will use every means in his power to satisfy his ambition, conquering all of So Skire. Two things stand in his way: Holmgren and the priests of the Southern Republic.

Club King: Rudolph enjoys watching others suffer and has fun inflicting pain. He doesn't care who is hurt as long as his lust for power is satisfied. He keeps his followers terrorized by his rages and by occasionally killing one of them in front of his court.

See **TNE** pages 210-212 and **Traveller Players' Forms** for more information on the use of animal encounter tables.

World: So Skire **UWP: X-657843-1** **Terrain Type: Prairie** **Other Information: Gotland**

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Grazer	Arromoose	3D6	—	1600	57	Projectile	4	25	Nil	17	Thrown Weapon	1	—	F14, A4	7/14/27
2	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
3	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
4	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
5	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
6	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
7	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
8	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
9	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
10	Omnivore	Gatherer	Clubtail	1	—	1600	93	Tail	6	19	Nil	Long	Armed	1	—	F4, A10	7/13/26
11	Omnivore	Gatherer	Clubtail	1	—	1600	93	Tail	6	19	Nil	Long	Armed	1	—	F4, A10	7/13/26
12	Omnivore	Gatherer	Clubtail	1	—	1600	93	Tail	6	19	Nil	Long	Armed	1	—	F4, A10	7/13/26
13	Omnivore	Eater	Grinder	1D6	—	200	34	Horn	11	9	1	Short	Armed	2	½	F2, A8	8/15/30
14	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
15	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
16	Carnivore	Chaser	Rizzerbak	1D6	—	100	28	Claws & teeth	7	20	1	Short	Armed	4	½	Am, F7	9/18/35
17	Carnivore	Chaser	Rizzerbak	1D6	—	100	28	Claws & teeth	7	20	1	Short	Armed	4	½	Am, F7	9/18/35
18	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24
19	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24
20	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24

World: So Skire **UWP: X-657843-1** **Terrain Type: Forest** **Other Information: Gotland**

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
2	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
3	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
4	Herbivore	Inter	Rocktail	1	—	200	48	Tail	5	2	Nil	Short	Armed	1	½	F4, A8	7/13/26
5	Herbivore	Inter	Rocktail	1	—	200	48	Tail	5	2	Nil	Short	Armed	1	½	F4, A8	7/13/26
6	Herbivore	Inter	Rocktail	1	—	200	48	Tail	5	2	Nil	Short	Armed	1	½	F4, A8	7/13/26
7	Herbivore	Inter	Rocktail	1	—	200	48	Tail	5	2	Nil	Short	Armed	1	½	F4, A8	7/13/26
8	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
9	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
10	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
11	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
12	Omnivore	Eater	Army Sheep	2D6	—	3	1	Horn & hooves	7	5	Nil	Short	Armed	7	—	F5, A9	4/7/13
13	Omnivore	Eater	Army Sheep	2D6	—	3	1	Horn & hooves	7	5	Nil	Short	Armed	7	—	F5, A9	4/7/13
14	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
15	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
16	Carnivore	Trapper	Glider	1	F	1	1	Teeth	6	1	Nil	Short	Armed	7	—	As, F9	1/2/4
17	Carnivore	Trapper	Glider	1	F	1	1	Teeth	6	1	Nil	Short	Armed	7	—	As, F9	1/2/4
18	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24
19	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24
20	Scavenger	Intimidator	Sirtlan	1D6	—	100	9	Acid	8	3	2	Short	Armed	5	—	F7, A9	6/12/24

World: So Skire **UWP: X-657843-1** **Terrain Type: Mountains** **Other Information: Gotland**

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
2	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
3	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
4	Herbivore	Inter	Pricklepine	1	—	25	4	Quills	6	2	Nil	Short	(Def only)	3	—	F13, A10	4/7/13
5	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
6	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
7	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
8	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
9	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
10	Omnivore	Eater	Army Sheep	2D6	—	3	1	Horn & hooves	7	5	Nil	Short	Armed	7	—	F5, A9	4/7/13
11	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
12	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
13	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
14	Carnivore	Trapper	Glider	1	F	1	1	Teeth	6	1	Nil	Short	Armed	7	—	As, F9	1/2/4
15	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
16	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
17	Carnivore	Trapper	Glider	1	F	1	1	Teeth	6	1	Nil	Short	Armed	7	—	As, F9	1/2/4
18	Scavenger	Reducer	Razortail	1	—	25	3	Tail	9	5	1	Short	Armed	1	—	F3, A6	2/3/6
19	Scavenger	Reducer	Razortail	1	—	25	3	Tail	9	5	1	Short	Armed	1	—	F3, A6	2/3/6
20	Scavenger	Reducer	Razortail	1	—	25	3	Tail	9	5	1	Short	Armed	1	—	F3, A6	2/3/6

World: So Skire **UWP: X-657843-1** **Terrain Type: River** **Other Information: Gotland**

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
2	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
3	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
4	Herbivore	Grazer	Rambuck	2D6	—	200	29	Tail	7	3	1	Short	Armed	2	—	F5, A9	6/11/22
5	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
6	Herbivore	Grazer	Stomper	3D6	—	100	23	Hooves	8	2	Nil	Short	Armed	1	—	F16, A9	8/16/32
7	Herbivore	Grazer	Grunpig	2D6	—	50	11	Projectile	4	12	Nil	9	Thrown Weapon	1	—	F10, A5	11/21/42
8	Herbivore	Grazer	Grunpig	2D6	—	50	11	Projectile	4	12	Nil	9	Thrown Weapon	1	—	F10, A5	11/21/42
9	Herbivore	Grazer	Oklukirpi	3D6	A	100	6	Quills	6	1	Nil	Short	(Def only)	1	—	F7, A9	9/17/33
10	Omnivore	Hunter	Acidvaark	1D6	—	100	4	Acid	6	2	1	Short	Armed	7	—	F7, A16	6/11/22
11	Omnivore	Hunter	Acidvaark	1D6	—	100	4	Acid	6	2	1	Short	Armed	7	—	F7, A16	6/11/22
12	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
13	Omnivore	Gatherer	Womrat	1	—	6	2	Horn	4	3	Nil	Short	Armed	8	—	F9, A7	5/9/18
14	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
15	Carnivore	Pouncer	Mugger	1	S	800	46	Claws & teeth	14	6	1	Long	Armed	5	—	As, Fs	9/17/33
16	Carnivore	Pouncer	Mugger	1	S	800	46	Claws & teeth	14	6	1	Long	Armed	5	—	As, Fs	9/17/33
17	Carnivore	Chaser	Wolfbat	2D6	F	12	3	Claws	13	8	Nil	Short	Armed	6	—	Am, F9	11/21/42
18	Scavenger	Hijacker	Sinzju	1	—	12	4	Claws & teeth	10	20	1	Short	Armed	1	—	A8, F10	4/8/15
19	Scavenger	Hijacker	Sinzju	1	—	12	4	Claws & teeth	10	20	1	Short	Armed	1	—	A8, F10	4/8/15
20	Scavenger	Hijacker	Sinzju	1	—	12	4	Claws & teeth	10	20	1	Short	Armed	1	—	A8, F10	4/8/15

CHAPTER 7: COLONY



Colony ('käl-ə-nē) n. 1. A group of people who settle on a distant world but remain under the political jurisdiction of their native world. 2. The region thus settled. 3. A territory distant from the state having jurisdiction or control over it. 4. A community of people of the same nationality or pursuits.



BALDUR

Life is tough on Baldur. Ask any Balduri. They spend day after day inside a dome on the seabed of a poisonous ocean. Some say that the only thing between a Balduri and boredom is the fight to survive. The only way Balduri ever see the sky and stars is aboard an outbound starship. Life is tough, disciplined, and crowded. The Balduri are tough, disciplined, and dependable. But even the toughest Balduri feel the urge to walk freely under an open sky. No wonder people say they appear to have their bolts screwed in a little tight.

THE VENTURE

Your group is on Baldur after a long series of freelance recovery and scouting operations into the Shenk and So Skire subsectors. Your ship is in Baldur's orbital yard for a long overdue annual maintenance and refit. You thought you would have made more than enough cash from the recovered jump drive you sold at Auction to pay for the maintenance, but with a splendid display of irony, the yard master's office just gave you the news that you need a new jump drive of your own. 80 years of shoving a scout through jump space has just worn out the old one. Clansman *isn't going anywhere for a long time. So, you order her put into orbital storage, arrange to have your personal belongings shuttled down, and you start looking for "honest work."*

Referee's Note: If the PCs played the "Survey" campaign in Chapter 3 of this book, the referee may have had them produce the survey results for Poyzen (So Skire 1736) themselves and sell it to the Balduri government. Naturally the means by which the players arrive at the outset of this venture must be adjusted for each PC group.

One evening at dinner, the group overhears two Balduri government officials talking about the new Colonial Office. If the group is interested in what they are hearing, they may make an attempt to join in. Since they are dining in a convivial atmosphere with plenty of wine and good food, the two Balduri are curious about the off-worlders and welcome their company (Carousing or Liaison: Easy). The characters meet Dimitri Rostov and Stefan Burg, a Balduri and Oriflammen, respectively, both newly appointed as senior managers in the Colonial Office. After some initial small talk during dinner, the table is cleared, brandy is ordered all around, and the conversation proceeds to weightier matters.

"Baldur is a member of the Reformation Coalition, but cannot allow others to be the guarantors of its future. Although the Coalition stands for many of the things we Balduri support, we need the means to stand on our own if need be, because we have unique needs which the Coalition may not be able to meet. At the same time, any growth in our strength means that we will be able to provide that much more energy and leadership to assist the Coalition as a whole," Rostov explains.

"Our government has formed the Colonial Office, a government department tasked with finding worlds suitable to the establishment of colonies. These colonies will allow Baldur to meet more of its own needs in terms of raw materials, as well as providing materials to trade for the things that we need. In addition, the establishment of these colonies will advance the goals of the Coalition to expand the benefits of trade and civilization as rapidly as possible. And rather than suffering through interminable Assembly debates about how such colonies should be established under joint RC leadership, by proceeding on our own we can start the job more quickly, and therefore earn the benefits more quickly as well.

"This venture is co-sponsored by Oriflamme, which like Baldur has been frustrated by the lack of priority that the RC has given to the development of the trailing frontier," says Burg. "Both worlds feel that if this half of the Coalition is to prosper, it needs to take matters into its own hands. Not only will these colonies provide bases for further expansion and defensive buffers against threats from the Wilds, but they should prove to be profitable trading partners and sources of valuable raw materials. This might include rare earths and radioactives, or pharmaceuticals from plants and fungi, or especially for Balduris, naturally-produced luxury foods such as fresh meat."

"As you know from the prices in this restaurant," chimes in Rostov, "a steak is a rare and expensive treat on Baldur after a lifetime of eating processed yeast proteins. Whoever set up a food raising and export venture or dug a lanthanum mine on a colony world could get rich very quickly with the right exports."

"However," Rostov continues, "Baldur does not have a large body of experienced explorers, scouts, and leaders, 'world tamers,' I believe they are called."

"And Oriflamme's resources have been prioritized for other areas," Burg adds.

"The Colonial Office is looking for people to participate in or lead these colonial expeditions, people with plenty of off-planet experience and a multitude of talents," says Burg as Rostov nods approvingly. "Perhaps your group would be qualified, and interested."

If the PCs are interested, Rostov and Burg can collect information and credentials from them which will allow the Colonial Office to assess the group's qualifications.

The Offer

Several days later, the players go to the Colonial Office to discuss the mission. Once again, they meet with Rostov and Berg, who explain that they are satisfied that the group meets the Office's qualifications.

"This is a one year assignment," they explain. "It's not without its risks. After recruiting and training, you'll be loaded aboard *Cumulus*, a relic freighter we recently recovered in Alpha Crucis. She's capable of jump 4 if her drives hold together."

"This job does have its rewards. If you stick it out for one year and have begun shipping out exports by the end of that time, you will find Cr100,000 in each of your bank accounts on Baldur, and *Clansman* will have a new jump drive. Of course, we will have used *Clansman* for some of our own work while you're away.

"We'd like to offer you each a berth in the expedition. If you accept, here is where you will be going." says Berg, projecting the data for Poyzen on the wall behind him.

Referee: Hand out copies of the pages 77-79 (located at the end of the chapter) for the players to examine. These pages represent the data which the characters are being shown in the briefing. After the players have reviewed the data, the briefing is concluded.

"Want to sign up?" asks Rostov, handing the characters a contract and a pen.

PLAYERS: DO NOT READ BEYOND THIS POINT.

REFEREES' NOTES ON POYZEN

1. The Balduri planners have already selected the intended colony site, the island marked on the global data view, and shown in more detail on the close-up map. Unless the players prefer to pick their own colony location, they will be given data on the intended colony location on the island. The economic model data for this planetary hex is as follows.

Agricultural Richness: 1.5
Agricultural Useable Area: 80%
Raw Materials Richness: 120
Raw Materials Useable Area: 25%
Fossil Fuels: Yes
Radioactives: Yes
Extractable Hydro Power: 1050 kW per 20-km mapping hex
Extractable Wind Power: 157.5 MW per 20-km mapping hex
Base Latitude Temperature: +28°C
Summer Maximum Temperature: +40°C
Winter Minimum Temperature: +11°C
Weather Factors: 0



2. Contrary to the survey data, Poyzen is inhabited. The Scout base staff was cut off from Cobham and the base was destroyed by a Vampire raid. The survivors fled into the nearby mountains and reverted to a base sustainable tech level of 0. Living in caves, they have managed to develop communities totaling some 5000 people. The largest community of about 2000 people is run by the Chief Scout, a TED armed with the base's few remaining working laser rifles and a solar cell recharger. His authority is on the wane as other inhabitants move off into distant communities, mostly in the mountains and jungle of the continent's west coast (the continent is indicated on the map with the symbol for the old scout base, and is just to the west of the planned colony location). Everyone else is armed with spears and clubs.

PROCEEDING WITH THE CAMPAIGN

At this point, the adventure can proceed in one of two ways, depending on your players' capabilities and interests, and whether you will be running a primarily high level or low level campaign. Throughout this campaign at appropriate locations you'll see suggestions for using your players in a high or low level campaign. In the first example below, high level players can become involved in the complexities of recruiting NPCs. Low level players simply sign on with the expedition under the leadership of NPCs.

High Level: If your group is to be the leaders of the colony expedition, they make a deal with Rostov and Berg to lead the operation. The next step will be finding and recruiting some 100 colonists and traveling to Poyzen.

Low Level: If your group is looking for jobs on the expedition, Rostov and Berg are doing the recruiting. They will also be leading the operation. For players with a military background, there is plenty of opportunity for work as members of the expedition's security team and police force.

GETTING THERE

The colonial expedition has been given the use of the relic freighter *Cumulus*. *Cumulus* will load the characters and the voluntary colonists and depart for Oriflamme. Here, *Cumulus* will load additional colonists and livestock and equipment for the expedition. *Cumulus*' specifications can be found on page 107. Two other starships useful for colony transport can also be found in the equipment section. These can be used in other colony adventures, or enterprising PCs can perhaps convince the colony sponsors to allocate additional shipping to establish the colony.

Colonial transports like *Cumulus* are not luxury liners. They are designed to provide relatively cheap transportation to a large number of people, their personal possessions, livestock, equipment, and provisions for the colony. Colonists are carried in a portion of the cargo hold fitted with half-bunks. The half bunk is a light frame bunk stacked two-high with just enough adjacent locker space for the individual's personal possessions. Each half bunk displaces seven cubic meters, weighs 250 kilograms, and costs Cr25.

Once *Cumulus* is finished loading at Oriflamme, she will jump to Tuer, refuel, and make the short Jump-1 hop to Poyzen.

COLONISTS

Colonists are a diverse group of people who settle a new world for a number of reasons. Some go to start a new life with new opportunities. Others are running from their past, or to escape from a poor environment. Still others relocate because they have no choice. These people range from highly motivated, highly skilled professionals through yeoman farmers to shiftless ne'er do wells and forced deportees who may be criminals or chronic malcontents. The PCs will have to deal with them all.

The sections below deal with the colonists on a fairly detailed level, in order to allow low-level roleplaying in the colony campaign. However, these colonists will also be described in terms of the Chapter 4 economic model.

Voluntary Colonists

The characters must spend at least two weeks advertising for voluntary colonists. The number of colonists available depends on on the planet's population (the method used below to calculate these numbers can be used for any planet; Baldur's statistics are noted below for use with this particular campaign) and the type of colonist willing to emigrate to a new world. Each voluntary colonist will pay steerage passage plus Cr1000 to join the expedition. The number of colonists that can join the expedition depends on the passenger capacity of the transport. This is the hold capacity remaining after space has been allocated for rations, capital, weapons, and whatever equipment is being carried.

Recruiting Voluntary Colonists: There are four categories of voluntary colonists to be recruited. These include *professionals*, *artisans*, *farmers*, and *others*.

The detailed recruiting described below is included for a campaign that will have the capacity for high and low-level play. The high-level play is demonstrated by the fact that the PC leaders are having to make the choices of who to bring along. The low-level *potential* is demonstrated by generating colony members in sufficient detail to allow meaning roleplaying opportunities later on, and can actually be turned into immediate low-level play by conducting interviews with the prospective colonists.

However, if the PC colony leaders are not particularly interested in the potential for low-level play, and simply want to run a colony solely via the high-level economic model presented in Chapter 4, there is no need to go through with any any detailed interviews or creation of templates. However, unless the PC group is confident that they possess all skills that may be needed to respond to random events (Medical and Veterinary skills, etc.) they should still recruit a handful of professionals with known skill levels to meet these needs.

Professionals: These are volunteer colonists with useful professional skills. They would be commissioned characters (where appropriate) drawn from careers such as Law Enforcement, Medicine, Veterinary Medicine, and Science. Individuals with Engineer skills, and retired Army or Marine officers would also be included in this category. Professionals are primarily used as important NPCs with crucial skills, and are therefore intended for low-level roleplaying, and cannot really be easily classified in terms of the economic model.

The number of professional individuals interested in joining the colony equals the home world's population number (Baldur's is 7) plus the highest Recruiting skill level in the PC group. The referee should roll up professionals as detailed NPCs for the players to consider as colonists. In addition to considering their career qualifications, the players may wish to interview these professionals. See Chapter 6, Bootstrap, for the interviewing procedure.

In addition to the recruiting procedure, the referee should secretly consider the attitude of each of the professionals reaction to the PCs. Do they support what the PCs are doing? Will they attempt to subvert the PCs and attempt to take over the colony? Will they simply not get along and sow discord? The referee can simply establish these conditions based on his or her plans for the unfolding campaign, or can determine these things randomly by drawing motivation cards or rolling 2D6. The table below gives an example of how this could be done, but referees should feel free to expand the detail of this table. Naturally the PCs can determine these details only by a successful interview process which includes successful rolls on Interview, Interrogation, or Psychology.

2D6	*NPC Professional's Attitude toward PC Leaders*
11-12	Identifies with and strongly supports PCs' goals, and the PCs' interpretations of them
9-10	Supports the PCs' goals and will not actively oppose the PCs, but may sometimes in good faith publicly disagree with the PCs on how best to accomplish these goals
6-8	Willing to be led by the PCs, but will respond accordingly to good or poor treatment



4-5 Agrees with the PCs' goals, but will attempt to subvert the PCs' leadership in order to take over leadership of the colony

2-3 Is opposed to the PCs as well as their goals



Artisans: Each year living in the domes became more oppressive, as she tried to keep running the business that she had founded with her husband—machining and repairing replacement parts for the relic high-tech machinery. Ever since her husband had been killed in a bulkhead collapse three years ago, that life had become increasingly grim. She missed his stories about the worlds beyond the murky sea and murky sky, and his gentle advice on recreating the precise countours of power shafts and transfer gears. She needed a fresh start, someplace where she could be reminded of something besides what she had lost. Last night, she saw it on the news video. A colonial expedition was heading out into the Wilds to settle the empty garden planet discovered six months ago. She could have her own shop, fixing and taking care of all of the colony's tools, and building new implements from the native metals she smelted herself. She could see for herself the worlds he had told her about and practice her trade in a new way. With her skills as a metallurgist, she knew she could do it.

These are volunteer colonists with useful technical skills. These may come from any career but must have a skill from the Technician, Artisan, or Engineer skill clusters. In the economic model, artisans would primarily be industrial and materials laborers, although there are some exceptions to this. For example, a Hunter would be considered a special type of Artisan, and would be included under agricultural laborers or armed forces laborers, depending upon how the colonial leaders intended to use his or her skills.

The number of artisans interested in joining the colony equals two times the quantity of the home world's population number plus the highest Recruiting skill level in the PC group (for Baldur this is 2×[7+Recruiting]). The referee should determine the statistics and skills of these individuals using the NPC templates assigning them skills from the Technician or Artisan skill cascades. If desired, the players can select higher skilled individuals and generate complete UPP statistics and skills as well as interview them using the bootstrap interview procedure.



Farmers: We hadn't had a good harvest in three years, and the crops we did grow we had to sell to the technarchs at their prices. Sure, the barony provided materials to keep putting crops into the ground, but you pay them back one way or another, and I was close to losing my freedom and becoming tied to the land. It's hard to throw away a lifetime of work, but at least if I leave now I can leave—call it breaking even by walking away with my freedom, and that of my wife and kids. I hear there's a chance for a fresh start, though. A starman came to the grange hall last week, telling us of a new world they want to settle with farmers just like us. A world so rich you can get four crops a year. Crops that we sell for money that goes in our pockets. And land that's almost endless, a place to expand where my kids can have their own land some day. Is there any question about the right thing to do? Let's go! To the stars!

Farmers are colonists with experience farming the land and handling domestic animals. They will have at least Farming skill and be the backbone of any colony. (*Note*: farmers are not available on Baldur; these will have to be recruited from Oriflamme. The nearest thing the Balduri have to farming is tending yeast vats.) Farmers are obviously considered to be agricultural laborers for the economic model.

To determine the number of farmers interested in joining the colony, roll a number of D6 equal to four times the quantity of the world's population number plus the highest Recruiting skill level in the PC group (for Oriflamme, 4×[8+Recruiting]). Each will have at least Farming 1. The players may wish to interview one out of ten farmers to determine their UPP statistics and skills using the NPC templates. Additional skills come from the Animal Handling skill cluster, including Veterinary Medicine, but may optionally include Gun Combat or Mechanic. If desired, the players can interview higher skilled individuals and generate complete UPP statistics and skills for them.

Families: *There's a lot of talk about the dawn of a new era and how the universe is starting over again, like a little baby. Well it doesn't look much different from where I'm sitting. The bulkheads still creak at night, and people are still scrounging to keep the old machines working for just one more month.*

I suppose I'm used to it, but I didn't take a wife just to doom her to more of the same until she's old and tired of waiting for a brighter future. She deserves better, and our kids deserve better, and I'm going to see that they get a look at this bright new dawn that people are building.

They're recruiting people for this new colony and we're going to be part of it. I don't know how to farm, but I can learn. That's what fathers and husbands are for, is to do what needs to be done, and I'm going to be a good one. I don't have all the money for our fare, but I'll get the rest of it somehow. Me and my family are going to build a new world—a world for us, a world for everyone.

Most colonists will have families, and this is allowed for in the economic model by treating each laborer as 1/4 of an actual full-time worker. Therefore it is simple to calculate that, on average, the colony consists of four-person families each with one full-time worker.

For low-level roleplaying purposes, however, important families who will interact with the PCs on a detailed and regular basis should be generated in detail. Roll 1D6 for the number of adults in the family: 1 = 1, 2-5 = 2, 6 = 3. Roll 1D6–2 for the number of children. Ages, sexes, and other details of children and adults is at the referee's discretion.

Others: Colonists with any background. They are mostly city dwellers with no particular useful skill. Unskilled colonists with military backgrounds would be useful as security specialists and members of the colonial militia. (If your characters are playing a low level campaign, this is probably where they will fit in.) For the economic model, these are laborers who can be assigned to any sector, as they will be able to learn what they need to do their jobs.

Roll a number of D6 equal to eight times the world's population number plus the highest Recruiting skill level in the PC group to determine the number of other voluntary colonists interested in joining the expedition (for Baldur this is 8×[7+Recuiting]). The players may wish to interview one out of ten individuals in the other category to determine their UPP statistics and skills using the NPC template system. Their skills may come from any career or skill cluster.

Involuntary Colonists

When *Cumulus* reaches Oriflamme, she'll be taking on more than farmers, livestock and equipment. Conveniently not mentioned by Burg (assuming that he even knew) when the characters were recruited were the Oriflammen colonists that were coming aboard—not of their own free will.

For a number of years there has been a small but growing resistance movement against the feudal technocracy governing Oriflamme. The recent growth in this movement was sparked by Marines returning from the Wilds where their experiences have turned their political sentiments against any sort of feudalism. Whole cities on the planet have become hotbeds of anti-government feeling. Some direct action, such as bank robberies in the name of the resistance, provocative graffiti painted on public walls, and an occasional letter bomb have taken place. However, open revolt has not yet broken out. Nonetheless, there have been wholesale roundups of suspected ringleaders and sympathizers. And what better way to eliminate troublemakers but to send them to the stars?

After the farmers are loaded at Oriflamme, any remaining free passenger space in the cargo holds—but not exceeding 50 percent of the total colony population—will be filled with involuntary colonists



and their families by the Oriflamme security apparatus. 90% of these involuntary colonists are undesirables and their families (no point in making people angry and leaving them on Oriflamme), 10% are criminals. As the Oriflamme government is attempting to quietly "dump" these people, it provides no documentation about their actual circumstances to the colony leaders.

Note that from the point of view of the economic model, the PCs will not be able to distinguish these colonists from the "Other" colonists generated above. The "Other" colonists will simply be added together with the Involuntaries for a total number of laborers which the PCs will have to assign to economic sectors without being able to distinguish between the reliable and unreliable workers. PC colonly leaders will only be able to tell the voluntary "Others" from the involuntaries by making a specific effort to do so, such as interviewing (conducting regular Observation, Psychology, Interview/Interrogation, and Admin/Legal tasks) or via low-level roleplaying, at the referee's discretion. Even in this case, the PCs may not be able to tell the criminals from the undesirables.

Undesirables: *I was walking home after looking for work and minding my own business when the cops sprung a snap trap on the street. Lines of them sealed off the block and moved in, questioning anyone standing there. If you gave them any lip or made a sudden move, you'd get a crack on the head and thrown in the wagon. The sergeant said I looked healthy, and two of his men grabbed me and threw me into the prisoner van. After a long ride in the dark, we were emptied into a holding pen full of people. Some were crying, others were sick, waking up from the blows. We could look through the wire and see the blast berms and concrete landing pads of the downport. There was a large shuttle on one of the pads. The guards had strung a barbed wire corridor between our pen and the shuttle. "There's your new home," one of the guards said. "You're off to a new world."*

"But what about my wife?" I said.

"Oh, sorry," he answered. "We'll round her up and send her along next time."

Treat these as Others listed above. They may be from any career. These persons will not necessarily be opposed to the player characters' goals, but the circumstances of their inclusion in the colony may well make them uncooperative. These may be assigned to any economic sector.

Criminal: *Me 'n' the guys just finished knocking over this mom 'n' pop store when the reds and blues came on and we wound up inside the pigs' van faster'n we could blink. The judge gave us a choice: jail or some jerkwater colony where they don't even have running water. I'd been in jail before, too many times. Maybe the colony would work out, full of hicks that are easy pickin's. Maybe a couple of the guys would like to come along and we could set up a real nice operation. After all, the judge called the colony a land of opportunity.*



These may be from the Criminal, Tough, or Bureaucrat careers. At some point during colonization, these individuals will resume their criminal careers on the colonial world and actively work against the player characters. These may be assigned to any economic sector.

THE COLONY

Two weeks and two jumps out of Oriflamme, *Cumulus* enters the Poyzen system. After a quick fuel stop at the outer gas giant, she heads in-system and enters orbit around Poyzen. The colonists fidget aboard *Cumulus* while her captain and the colonists' command group meet and confer about the landing site. Although the leaders will have chosen a site before this, there is always a chance for a last-minute change, should anything appear amiss. The first survey crew recommended that the colony be established on a large island near the equator. There was fresh water evident both from orbit and confirmed by the ground survey. The colony site is on a sheltered bay which could eventually become a seaport. The terrain was open and rolling, with pockets of forest, assuring a supply of wood and farmland. Most importantly, there is no sign of any indigenous habitation.

PC leaders or security teams may wish (or be ordered) to conduct a final reconnaissance of the ground before commencing the irrevocable debarkation. If they haven't thought to do this before, they should make sure that they have arrived at the correct time of year: at the beginning of the local growing season. It would be a shame to arrive as the first snow is falling with only a month of rations...

Debarkation

As soon as the landing zone is secured, the ship's crew will begin shuttling down the colonists along with their rations, capital goods, and tents for temporary shelters.

Start-Up: See page 36 for start-up assumptions.

Mapping: It is at this point that the PC colony leaders should prepare their sketch map of the colony's placement, showing the location of agricultural land, housing and industrial capital, materials capital, roads, food storage areas, power generating facilities, and the like (these should all be within the same 20-km hex). This detail is not necessary for the economic model so long as they are all in the same hex, but will be essential for low-level roleplaying.

Reviving Livestock: This is the responsibility of the colony's veterinarians (usually recruited as professionals). Each low berth worth of livestock (10 rations worth of livestock are carried per livestock low berth) is rolled as a discrete task: Average: Veterinary Medicine. Failure indicates that the revival failed and the livestock is dead. Be sure to keep records on how much livestock is successfully revived, as this will affect the output of the agricultural sector.

Starport

The colony's starport will be a bare area of ground, or a lake or ocean bay if the land is too rugged for a safe landing. Other than a navigation beacon, it will have no facilities until the colony develops beyond its first primitive state, and will be treated as Class X. By purchasing (either by local manufacture or by import) a fuel purification plant, the colony can upgrade this to Class E. Until then, incoming starships will have to refuel at local gas giants or use oceanic refueling.

THE FIRST YEAR

The first year of any colony's existence is critical to its survival. This year teaches the colonists how to survive the rigors of a new world including severe seasonal weather, contact with indigenous people, native wildlife, and the compatibility of local soil and plant life with the colonists' crops and livestock. This is also a testing time of the PCs' leadership abilities. How the players govern and cope with various problems as they arise may mean the difference between a stable, cohesive colony and one that is broken into fighting factions.

The first year is played out on two levels. PCs and NPCs go about their jobs on the low level of day-to-day interactions that can be played out face to face. On the high level, the colony's leaders deal with the more abstract aspects of the colonial economic model, dealing with major events month to month, and tracking such vital statistics as livestock survival, food production, and gains and losses in the colony's population through deaths and births.

Jobs

Colonists have a wide variety of jobs that suggest adventure scenarios which can be played out in low-level roleplaying. These include:

Farmers (Agricultural Laborers): These are the backbone of the colony. They may or may not have farming skill or experience. Farmers plow the fields, plant, cultivate, and harvest the crops, and care for the livestock. Farming is usually mundane work, but now and then man or nature intervenes and the farmer must cope with an emergency. Farms by their nature tend to be isolated, and farmers often have to face a hostile environment on their own.



TEMPLATE NPCS

Here are a number of template NPCs used for low-level roleplaying as the PC leaders establish and run the colony. As noted above, professional voluntary colonists are generated as detailed NPCs. The remaining voluntary colonists—artisans, farmers, and others, as well as involuntary colonists and a few additional types, are presented here as template NPCs.

Artisan

Artisans provide the colony with useful technical skills. They may be blacksmiths, carpenters, masons, or if the colony's tech level is high enough, machinists or mechanics. These are the people who build the buildings, machinery, and artifacts that enable a colony to function.

Economic Model: Industrial or Materials Laborer

Level: Novice

Combat Assets: Armed Martial Arts (Club), using trade tools, hammers, axes, etc.

Other Assets: Bargain 8, any two of Carpenter, Jeweler, Mason, or Metallurgy, one at 12, the other at 6. If the local tech level supports these skills, add Electronics, Machinists, and Mechanic to the possible skill list.

Hunter

Hunters may be recruited to help the colonists locate and kill local game during the colony's initial stages. They may also serve as scouts and trackers, particularly if indigenous inhabitants are discovered on the colony world.

Economic Model: Agricultural or Armed Forces Laborer

Level: Veteran

Combat Assets: Choose two from Slug Weapon (Slug Rifle), Archaic Weapons (Archery), Armed Martial Arts (Small Blade), Unarmed Martial Arts.

Other Assets: Any four from **Perception, Acrobat, Explore, Animal Handling** (Riding, Guard/Hunting Beasts), Small Watercraft; one at 14, three at 10

Farmer

The farmer is the backbone of the colony. He or she grows the food the colony must have to survive and prosper. The more efficient the farming, the more labor can be freed up to produce export goods, be it luxury foodstuffs, raw materials, or even manufactured goods. The farmer is a highly skilled individual with the knowledge to grow the maximum amount of crops the land will provide and to care for a wide variety of livestock.

Economic Model: Agricultural Laborer

Level: Novice

Combat Assets: Slug Weapon (Slug Rifle), Armed Martial Arts (Club).

Other Assets: Farming 14, Riding 10, Guard/Hunting Beasts 8, Biology 9, any three from **Perception, Technidan, Explore, Determination;** one at 12, two at 9.

Veterinarian

Veterinary Medicine is the skill used in caring for diseased and injured animals and in assisting domesticated animals in various important activities such as becoming impregnated and giving birth to their offspring Veterinary doctors and technicians also inspect freshly killed meat for any diseases that may be harmful to consumers. They are also necessary to guarantee the successful revival of animals transported in low berths.

Economic Model: None; professional detailed NPC

Level: Novice

Combat Assets: *Slug Weapon*

Other Assets: Medical (Veterinary Medicine) 14, Biology 12, any two from **Animal Handling** at 10, any other two Physical Science at 8, Research 4.

Miner/Prospector

If you find resources, you need the people to exploit them. That's the job of the professional miner who digs the hydrocarbons and ores the colony needs to build its infrastructure.

Economic Model: Materials Laborer

Level: Experienced

Combat Assets: Armed Martial Arts (Club) using mining tools such as shovels, pry bars, and picks; Unarmed Melee Combat.

Other Assets: Construction, Excavation, Combat Engineer, all at 12; any one of the following: Technician, Geology, Carpenter, Metallurgy at 10.

Mercenary/Security Specialist

Any colony being established on a potentially hostile world will want one or more mercenaries or ex-military types along to train a colonial militia and form the backbone of any security force.

Economic Model: Armed Forces Laborer

Level: Veteran

Combat Assets: *Energy Weapon* or *Slug Weapon*, Unarmed Martial Arts, *Armed Martial Arts*, Autogun, Grenade Launcher

Other Assets: Leadership, Instruction, Recruiting, Ground Tactics, Muscle Transport, all at 12.

Other

The "Other" class of voluntary colonists are willing workers and support the colonization effort. However, they lack farming and survival skills, and may have never lived outside a city before. However, city dwellers possess a native intelligence which suits them to rapidly picking up whatever skills they might need.

Economic Model: May be assigned to any economic sector

Level: Novice

Combat Assets: Unarmed Melee Combat

Other Assets: Any two from the following: Service, Streetwise, **Technidan,** Admin/Legal, Bargain, Willpower; one at 10, one at 8.

Undesirable

These are also individuals without farming, survival, or artisan skills. However, they've been press-ganged into the colony against their will for a variety of political or economic reasons. Although not criminals in the strict sense, they may have anti-social tendencies and come from the lower strata of society.

Economic Model: May be assigned to any economic sector, are usually indistinguishable from "Other," above

Level: Novice

Combat Assets: Unarmed Melee Combat

Other Assets: Any two of the following: Streetwise, Leadership, Carousing, Persuasion, Bribery, Gambling, Bargaining, Act/Bluff, one at 10, one at 8.

Criminal

Sometimes governments will sweep petty criminals out of their jails and dump them on colonial expeditions. Or, they may be rounded up on the street and given the choice of a jail term or exile. Either way, they spell trouble for any colony.

Economic Model: May be assigned to any economic sector, are usually indistinguishable from Undesirable, above

Level: Experienced

Combat Assets: Slug Pistol, Armed Martial Arts (Small Blade), Unarmed Martial Arts.

Other Assets: Any three from the following: Leadership, **Vice, Crime, Charm, Vehicle,** Admin/Legal; one at 12, two at 10.

Resistance Fighter

Ex-Oriflamme Marine charged with treason. However, because of an excellent combat record and service to the Reformation Coalition, this person is allowed to live in exile. (Roll 1D6: on 5-6 this NPC was an officer.)

Economic Model: May be assigned to any economic sector, are usually indistinguishable from "Other," above

Level: Veteran (Officer: Elite)

Combat Assets: Slug Weapon (Slug Rifle), Slug Weapon (Slug Pistol), Armed Martial Arts (Large Blade), Unarmed Martial Arts, Autogun, Grenade Launcher

Other Assets: Survival 10 (Officer: add Leadership 13, Ground Tactics 12).



Livestock

The accompanying table is presented to assist the referee in fleshing out the abstract livestock requirements from the economic model. Assume that one ration equivalent of living livestock equals about 100 kg of animal. These equivalencies are intended to be helpful for roleplaying *color*; as the economic model contains many abstractions about food as labor vs. food as mass, food as slaughtered animals vs. food as produced by animals, players and referees should not attempt to read too much into these figures.

Animal	*Weight (kgs)*	*Volume (m^3)*	*Cost (Credits)*	*Terran Equivalent*
Draft Animal	1000	10	2000	Percheron Draft Horse
Riding Animal	600	6	3000	Quarter Horse
Dairy Animal	600	6	500	Holstein Cow
Large Meat Animal	1000	10	400	Hereford Steer
Medium Meat Animal	50	0.5	100	Meat Swine
Small Meat Animal	10	0.1	10	Rabbit
Guard/Herding Animal	50	0.5	100	German Shepherd Dog
Small Pest Control Animal	7	0.1	free	House Cat
Egg Producing Animal	4	0.1	1	Chicken

Artisans (Industrial and Materials Laborers): On a colonial expedition, these are the "village smithies." Artisans are the metal smiths that produce plow blades, scythes, horse shoes, pots and pans, and most importantly nails: all the metal tools and implements needed by the colony. Early on, this is produced from bar iron imported aboard the colony transport. Native metal sources must soon be found, however, or vital metal artifacts cannot continue to be produced.

Artisans also include the carpenters, stone masons, and brick layers who build the buildings, fences, and other structures needed by the colony to build a permanent home. Others weave cloth from local fibers and produce plates and cups from local clays.

Miner/Prospector (Materials Laborer): These find the vital fuels and metals that enable the colony to survive and grow. Although they may have to bust sod with the rest of the colony for the first few months in order to eat, prospectors also head into the wilderness looking for coal, oil, phosphates, nitrates, and ores of all kinds. Prospectors should have Geology skills to enhance their ability to find an ore body or hydrocarbon deposit, but anyone might get lucky and strike it rich.

Mercenary/Security Specialists (Armed Forces Laborers): These have two jobs: internal security and external security. Security specialists have the full time job of keeping law and order in the colony. They also supply security against any external threat. In addition, security specialists should have enough military and training experience to serve as the cadre for the colonial militia, which might be needed if any indigenous people become hostile or if a hostile party lands from off-planet.

Explorers (PCs or Detailed NPCs): As the colony grows, it will need new land for its people. Explorers have the job of finding and mapping new colony sites and transportation routes for anticipated expansion. They also are the people who answer the question, "What's out there?" Although the colony has a gross picture of Poyzen's many continents from orbital surveys, only the explorers travelling overland or by sea can fill in the fine-grained details.

Hunters (Agricultural Laborer): During the early days of the colony, local wildlife may be a valuable resource for protein. It may also be valuable for its hides and furs. Hunters are colonists who head into the outback to harvest wildlife, taking care to preserve enough life so it will renew itself.

Leadership: If the players are playing the roles of the colony leaders in a high level campaign, they will have one basic job, that of supervising, inspiring and encouraging the colony members to do their best for the good of the colony. The leaders must also respond to and cope with events that affect the colony as a whole.

Veterinary Medicine

Veterinary Medicine is a cascade skill of Medicine that may be chosen as a specialty in the Medicine career. In an emergency, Veterinary Medicine may be substituted for Medical skill using the normal cascade guidelines. The reverse is also true. Individuals who specialize in Veterinary Medicine may be commissioned as a Doctor of Veterinary Medicine, otherwise they work as a veterinary technician. There are no ranks nor promotions.

Individuals who choose a skill from Animal Handling or Physical Science clusters may receive skill in Veterinary Medicine in place of one of the skills listed in these clusters in the basic TNE rules. You may use the Veterinarian Template NPC or generate your own as the colony's "vet."

Scenario Specific Events

The events and tables which follow are supplemental to the random event tables found in Chapter 4, and reflect the specific details of this colony campaign.

Explanation of Scenario-Specific Results: Certain of the new entries on the table on the facing page require elaboration as follows.

Friendly Starship: A friendly starship arrives and assists or trades with the colony. Roll 1D6 on the table below to determine the ship type and its action.

1	Colonial Transport
2	Far Trader
3	Scout
4	Warship
5	Far Trader
6	Scout

Colonial Transport: *Cumulus* arrives with another load of colonists sent to join the existing colony. These are Agricultural and Materials Laborers with a handful of Professionals, well equipped to survive and thrive on a new world. Capital goods and livestock sufficient to employ all embarked, as well as two months of rations for those embarked. Political roll DM +1

Far Trader: A Far Trader arrives with a load of high tech tools, weapons and other trade goods useful to the colony (referee's discretion). The captain wants to sell these in exchange for fresh fruit, vegetables, grain, and meat (i.e., rations). These goods will be traded to the colony for direct cash value, without having to devalue the colony's money by dealing with exchange rates. Political roll DM +1.

Scout: A Scout arrives with news and mail from Baldur and offers to carry news and mail back home. Political roll DM +1.

Warship: An RC warship arrives in the star system. Ship's officers land at the colony and tell the colonial administrators that their ship will be on patrol in the system for a month, and will pay direct cash value (not devalued by exchange rates) for rations equal to five times the crew size. Members of the crew will also land to enjoy shore leave at regular intervals and uphold the naval tradition of freely spending credits: Agricultural sector output roll +1 this turn, Industrial output roll +3. However, on a 1D10 roll of 7+ there will be a brawl requiring 1D6×500 credits of construction industry production to repair.

If a hostile ship arrives while the warship is on patrol, the warship will attempt to protect the colony. The warship is a Victrix-class sloop (crew 26) on 1-3, a mercenary cruiser (crew 72) on 4, and a clipper (crew 150) on 5-6. Political roll DM +2 (+1 if brawl).

1	Colonial Transport
2	Corsair
3	Slaver
4	Warship
5	Vampire Cruiser
6	Slaver

Hostile Starship: A hostile starship arrives and threatens the colony. Roll 1D6 on the table at left to determine the ship type and its action.

Colonial Transport: *Cumulus* appears with 1D10×10 involuntary colonists and criminals, and no additional capital goods, live-



Random Events: This table is a slightly modified replacement for the generic random events table in Chapter 4. Some of these events are more elaborate versions of events on the original charts, in order to provide more suggestions and opportunities for low-level roleplaying.

D20	*Result*
1	Natives Encountered
2	Unfavorable Government Development, see below
3	Plague strikes populace: 1D6 person die each day until Formidable Medical (Diagnosis) task is completed (task may be rolled once per 24 hours). –2 DM on all output rolls this turn. –1 on political roll.
4	Disease strikes livestock: Kills 1D6 units of livestock until Formidable Medical (Diagnosis or Veterinary Medicine) task is completed (task may be rolled once per 24 hours). Due to diseased meat, agricultural output reduced by 25% for this turn. –1 on political roll.
5	Hostile Starship, see below
6	Vermin eat 1D10×5% of stored rations. –2 on political roll.
7	Blight destroys crops. Agricultural output for turn cut in half. –2 on political roll.
8	Earthquake: 1D6×10% of housing destroyed. –1 on political roll.
9	Vermin eat 1D6×5% of stored rations. –1 on political roll.
10	Major crime, see below
11	Minor crime, see below
12	Native animal attack, see below
13	Indigenous animals stampede, destroy 1D20 units of agricultural capital. –1 on Political roll.
14	Major crime, see below
15	No traders arrive this month, no exports sold this turn, all rations set aside for export spoil.
16	Friendly Starship, see below
17	Discovery of hardy, edible, local life form. Permanently add +2 to all future agricultural output rolls. +2 on political roll this turn only.
18	Population explosion of local edible lifeforms. Multiply agricultural output by 2 for this month. +2 on political roll.
19	Favorable Government Development, see below
20	Natives Encountered

stock, or rations. These are dumped into the new colony's economy and social structure with criminal tendencies and no useful skills. –1 on Political roll.

Corsair: A Corsair attacks the colony with a small landing force attempting to seize whatever valuables are on hand. Low-level roleplaying negotiation results may allow them to be placated by donations of colony exports. If the colony elects to fight, this must also be roleplayed using the TNE combat rules. In this case, the corsairs will bombard the colony from orbit, killing 1D10×5 colonists and 1D10×5 units of livestock, and destroying 1D10×5 units of capital machinery and 1D20×50 cubic meters of housing before withdrawing. –2 on Political roll.

Slaver: A Far Trader arrives and lands a raiding force to seize colonists for sale in the slave markets of the Wilds. If they resist, the slaver will bombard the colony from orbit doing damage as the corsair above. They will then take 1D6×10 of the colonists as slaves. Any attempts to modify or thwart this result must be roleplayed using the appropriate combat rules. –3 on Political roll.

Warship: A warship from the Wilds arrives (referee's discretion whether it is a vampire, hostile power, mystery ship, etc.). It bombards the colony from orbit destroying 1D6×10% of housing, 1D6×10% of capital machinery, and killing 1D6×30% of the colonists and 1D6×10% of the livestock. The warship is a Close Escort on a roll of 1-4 on 1D6; a Mercenary Cruiser on a roll of 5-6. –3 on Political roll.

Vampire Cruiser: A Vampire Cruiser arrives. On a 2D6 roll of 1-3, the cruiser threatens to destroy the colony unless the colonists provide 1D10×10 replacements to join its crew. If the colonists refuse, the cruiser bombards the colony, causing the damage shown under Warship above. –3 on Political roll.

Native Encounters: NPC colonists have encountered natives. When this result is obtained, roll on the First Encounter table to determine what type and how many natives have been encountered by the colonists. Note from the world map that the former starport and scout base was located on the continent immediately to the west of the proposed island colony site. If the colony is located on this island, roll 1D6 on the table below. If the colony is located on the continent with the former starport, roll 2D6. If located elsewhere on the world, disregard the Native Encounter result.

Once the composition of the native group is established, consult the Interaction section of the Bootstrap Chapter to determine the attitudes of the colonist group and the native group upon meeting.

2D6	*First Encounter*
2	Chieftain
3	Warriors
4	Fishermen
5	Fishermen
6	Warriors
7	Peasants
8	Peasants
9	Fishermen
10	Fishermen
11	Warriors
12	Mounted Warriors

Chieftain: A native chieftain and 3D6 members of his household troops are encountered on an exploration expedition. Their boats are drawn up on the beach nearby.

Warriors: Warriors numbering 3D6 armed with spears and bows are encountered nearing the colony.

Fishermen: 2D6 fishermen are sitting on and near their boats which are drawn up on the beach and are repairing their nets when a group of colonists stumble upon them.

Peasants: 2D6 peasants are encountered by a colonial exploration team tilling their fields. Further investigation will reveal a village with 2D5×10 inhabitants.

Mounted Warriors: A mounted group armed with swords, lances, and composite bows on riding beasts is encountered by a colonial exploration team.

Favorable Government Development: Due to changes in the political situation on Baldur, the colonial program becomes a popular and growing concern. Exports from the colony become highly sought-after. Multiply monthly export monetary value by 1.25

Unfavorable Government Development: Changes in the political situation on Baldur adversely affect the colony, roll 1D6 below.

1	Funding Cut
2	Government Takeover
3	Criminal Charges
4	Colony Terminated
5	Colony Abandoned
6	Hostile Colony Established

Funding Cut: A reallocation of government funding results in a decline to the shipping dedicated for colonial support. Roll 1D10 each month for 4+ to see if shipping arrives to allow the shipping of exports. If no ships arrive, no exports may be made, and no revenue generated. A second result of this event is the same as "Colony Abandoned." –2 on Political roll.

Government Takeover: Political maneuvering on Baldur causes the colonial administration to change its colonial policy and replace the current colony leaders under allegations of incompetence. A warship arrives to return them to Baldur where they are once again unemployed. The players may avoid replacement by succeeding at a legal appeal (Formidable: Admin/Legal). If they fail, they are replaced with inexperienced government lackeys. If they succeed, there is still a –2 DM on the political roll. If they refuse to return, they will be left on their own.

Arrest Warrant: As above, but political maneuvering requires trumped-up charges against the colony leaders to deflect attention from malfeasance elsewhere. A warship and a detachment of Marines arrive with a warrant to arrest the world tamers and return them to Baldur where they are charged with fraud and embezzlement. They are



replaced with inexperienced government lackeys. If they run, they will be hunted by the Marines.

Colony Terminated: A change of governmental priorities results in the abandonment of the colonial program as an unnecessary drain on resources, and shipping is sent to take the colonists home. If PC leaders attempt to convince them to stay, this will require low-level roleplaying, Persuasion tasks, etc., at the referee's discretion. The main criteria should be the current position on the Political Track, with high levels making most colonists favorably inclined to stay, and so on.

Colony Abandoned: A change of governmental priorities results in the abandonment of the colonial program as an unnecessary drain on resources, and the colony is simple abandoned. The shipping which had previously been sent to the colony is cut off, and the colony must now rely on other shipping. Roll 8+ on 1D10 each month for shipping to arrive and allow exports to be shipped. Roll randomly each month to find the world that the cargo will be shipped to, in order to calculate proper exchange rates. Once this result has been obtained, results of 1-5 on this table are treated as no effect. –2 on the Political roll.

Hostile Colony Established: Another colony is established on the world. Source of colony is at referee's discretion, and the two may end up competing for resources or access to export markets, referee's discretion. Alternately, it may be a different type of colony such as a penal colony, or a colony of slaves working a mine.

Native Animal Attack: Native animals attack colonists or their livestock. Roll 1D6. On a roll of 1-3, livestock are attacked. On a roll of 4-5, colonists are attacked. On a roll of 6, one or more player characters are attacked. Use the animal encounter table to logically or randomly determine kind and number of animal attackers. If the attack is by a large number of herbivores, it is a stampede that could damage a large amount of property and kill people and livestock, particularly if the herbivores are large. An attack by a solitary animal would probably be an attack by a pouncer, however, there are other possibilities depending on the attack's circumstances. These are up to the referee.

Minor Crime: Minor crime occurs in the colony, damaging morale to the tune of –1 on the Political roll for the turn. Roll 1D6 to determine the offense for purposes of low-level roleplaying. These are suggestions to help jog the imagination; disregard inappropriate results.

1	Brawl
2	Fight
3	Bribery
4	Petty Theft
5	Custom Violation
6	Insult

Brawl: 2D6 colonists overindulge at a tavern, get into an argument, and a major fist fight breaks out.

Fight: A fist fight breaks out between two colonists on the colony's main street.

Bribery: A colonist attempts to bribe a colonial leader for extra seed grain, a larger meat ration, or other unusual benefit.

Petty Theft: Petty thefts of tools and small valuables begin to occur. At the referee's option, the thefts may be the result of a small native animal attracted to shiny metal objects who takes it back to its nest as a "treasure."

Custom Violation: This occurs only when colonists and natives are interacting. Possible causes include:

Territory: The colonists have settled on native lands considered hereditary property by the local people.

Hunting Rights: The colonists have settled on native hunting lands, disrupting the local game population and threatening the natives with starvation.

Religion: Colonists accidentally defile sacred land or a terrain feature.

Insult: A colonist accidentally insults a native with a minor customs violation. Other possibilities are up to the referee.

Major Crime: Crimes are being committed in the colony, damaging cohesion to the tune of –2 on the Political roll. Roll 1D6 to determine the type for low-level roleplaying purposes; DM+2 if criminals are among involuntary colonists. These are suggestions to help jog the imagination; disregard inappropriate results.

1	Theft
2	Livestock Theft
3	Extortion
4	Robbery
5	Kidnapping
6	Murder

Theft: Seed grain is being stolen. The seed grain thefts may be the result of small vermin eating the grain, or at referee's option a colonist stealing the grain for consumption or later resale. Seed grain theft during the first year is a threat to the survival of the colony and may be a capital offense.

Livestock Theft: The colony's animals begin disappearing. Scouts find one or more badly butchered carcasses several days later. Are native animals responsible or are hungry colonists?

Extortion: Shopkeepers and artisans complain that they are being forced to pay protection money after an arsonist torches a shop. Shopkeepers begin to be beaten at random if they don't pay up.

Robbery: Colonists start being robbed of money and valuables late at night. At the referee's discretion, if farmhouses are located on homesteads, a gang of 1D6 armed raiders rob farmers of their livestock, grain, and tools.

Kidnapping: A colonial professional is kidnapped by an armed gang and is held in a remote hideout for ransom. The characters must organize a search and rescue mission.

Murder: One or more colonists are murdered. Roll 1D6. A single person is murdered in a result of 1–4. 1D6–3 persons are killed in a result of 5–6. The single victim may be the result of a crime of passion or a domestic dispute. The single person may also be killed during a robbery or other crime. Multiple murders may be the result of vicious criminal gangs such as the farmhouse raiders mention under "Robbery." The exact circumstances are up to the referee.

SUBSEQUENT YEARS

Assuming the characters and colony survive the first year and the exports are flowing, the characters will receive their Cr100,000 world tamer fee deposited in the bank of their choice on Baldur. The players now have two choices: resign to return home and collect their fee, or stay on at the colony, let the fee accumulate interest, and collect the 10 percent royalty on the value of shipments to the home world.

Taking the Money

This is a "sure thing" choice if the colony has succeeded in shipping exports. It lets the characters move on to new adventures with a lot of cash in their pockets. It also ends this campaign.

Staying On

If the characters have not made the first shipment by the end of the first year or they like the challenge of life on an untamed wilderness planet and they are leading a thriving colony, they may decide to stay on for additional years.

In these subsequent years, the PCs may wish to delegate routine administrative responsibilities to key NPCs and concentrate their efforts on exploring nearby territory and opening it for settlement. If the world has proven to be hospitable, the colonists will begin to spread out and form new settlements nearby. This can happen in an organized fashion under the control of the original colony or individually as bands of pioneers trek over the horizon seeking their independence from high level PCs' government. How the PCs deal with this can be the substance of a subsequent campaign.

Additional Rewards

There are a number of rewards the players can earn beyond the simple monetary payment discussed above. Successful leaders who stay on may well be given permanent land grants by the Baldur government, and the colony may win eventual membership in the Reformation Coalition. Under these circumstances, PCs may find themselves standing for seats in the RC Assembly of Worlds, to become involved in some truly high-level roleplaying.

Or, with their new-found riches and experience, the PCs may decide to start their own colony world farther out in the Wilds and set themselves up as rulers of an independent power, beholden to none, (or maybe just get killed dead by vampires).

The possibilities are limitless.

Star System
Sector: Old Expanses
Subsector: 1736/So Skire
Star Type: G3V
Planetoid Belts: 0
Gas Giants: 3

Main World
Starport: X
Pre-Collapse Starport: C
Diameter: 11,140 kilometers
Atmosphere: Dense
Hydrosphere: 69%
Population: None (estimated)
Pre-Collapse Population: 200
Government: None
Law Level: None
Tech Level: 0
Pre-Collapse Tech Level: 5
Bases: None
Trade Classification: Barren

RCES Scouting Report
Poyzen System So Skire Subsector (1736/Old Expanses)

NOTES

Poyzen served as a scout base and refueling stop along the So Skire Main during the Third Imperium. However, its heavily tainted atmosphere (believed to be the source of the planet's name) made it a low priority for development compared with other more habitable worlds nearby. Shortly before the Rebellion and subsequent Collapse, the volcanic outgassing that was the source of the taint slowed, then ceased. The sulfuric compound taint has since settled out, and in a rare instance in recorded planetological history, a world's atmosphere has become clean. Poyzen is now a virtually Earth-like virgin garden world, ripe for settlement.

The Poyzen System

Poyzen occupies Orbit 3 around an unnamed G3V primary known only by its sector coordinate designation. It is almost centered in its life zone, giving the world moderate temperatures in its equatorial and temperate regions.

Orbit 0 is contains a sun-blasted chunk of rock less than 500 km in diameter. Orbit 1 has a tidally-locked ball of rock about 3000 km in diameter. Orbit 2 is occupied by a 7000 km desert world with a thin carbon dioxide atmosphere. Orbit 4 contains a small gas giant. Orbit 5 has an ice ball planet consisting of frozen water and ammonia ices along with crystalline formations that make it sparkle like a giant snowball in the starlight. Orbit 6 has a large gas giant, and Orbit 7 a small gas giant.

Poyzen has an airless, rocky moon 2000 kilometers in diameter, orbiting 145,000 kilometers out.

Physical

Now that its atmosphere has cleaned itself up, Poyzen is a garden world in every respect. It has a base surface temperature of 8°C and a temperature range of from +40°C to -69°C. Because of its relatively severe axial tilt of 35°, Poyzen's polar caps melt during their summers and freeze solid during their winters. Poyzen has a 369 day year and days that are 30 hours long. Surface gravity is average at 0.9 G. The atmosphere is surprisingly dense at 2.4 standard atmospheres in pressure with an oxygen concentration of 20 percent. The extreme heating and cooling at the poles leads to frequent violent weather. The dense atmosphere makes high winds extremely dangerous on Poyzen.

Oceans cover 69% of the planet. There are ten small continents fairly evenly distributed around the globe. Four major islands and nine archipelagoes complete the land masses. Much of the land on and near the equator is covered with jungle. Two major volcanic mountain ranges are found on two of the equatorial continents while a large desert occupies the wind shadow on the largest. The balance of the land is relatively open fertile grassland and forest. Note that the two northern continents, the northern-most portion of the western-most continent, and the southern polar continent experience frequent glaciation and severe erosion. Because of the lack of human habitation, none of the continents have been named. Previous surveys have used numbers or Greek letter designations beginning with the western-most continent.

History

Poyzen had a scout base and a class-C starport frequently used as a refueling stop by free traders and other small starships traveling the So Skire main beginning about 570. The world was never settled on a permanent basis. The starport and Scout base was staffed by a 200-person crew on tours of duty from the nearby Scout base on Cobham (So Skire 1835). The starport and Scout base was destroyed by unknown causes during the Collapse. The fate of the staff is unknown. Poyzen is presently believed to be uninhabited.

Poyzen Temperature Worksheet

			Highest Possible Temp							Lowest Possible Temp					
Col:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex Row	*Base Temp*	*Latitude Mod*	*Cols. 1+2*	*Summer Plus*	*Ax. Tilt Factor*	*Cols. 4x5*	*Daytime Plus*	*Orbit Ecc Plus*	*Cols. 3+6+7+8*	*Winter Minus*	*Ax. Tilt Factor*	*Cols. 11×12*	*Night Minus*	*Orbit Ecc Minus*	*Cols. 3+12 +13+14*
1	16	+18	34	+23	0.00	+0	+6	+0	40	–35	0.00	–0	–8	–0	26
2	16	+12	28	+23	0.25	+6	+6	+0	40	–35	0.25	–9	–8	–0	11
3	16	+6	22	+23	0.50	+12	+6	+0	40	–35	0.50	–18	–8	–0	–4
4	16	0	16	+23	0.75	+17	+6	+0	39	–35	0.75	–26	–8	–0	–18
5	16	–6	10	+23	1.00	+23	+6	+0	39	–35	1.00	–35	–8	–0	–33
6	16	–12	4	+23	1.00	+23	+6	+0	33	–35	1.00	–35	–8	–0	–39
7	16	–18	–2	+23	1.00	+23	+6	+0	27	–35	1.00	–35	–8	–0	–45
8	16	–24	–8	+23	1.00	+23	+6	+0	21	–35	1.00	–35	–8	–0	–51
9	16	–30	–14	+23	1.00	+23	+6	+0	15	–35	1.00	–35	–8	–0	–57
10	16	–36	–20	+23	1.00	+23	+6	+0	9	–35	1.00	–35	–8	–0	–63
11	16	–42	–26	+23	1.00	+23	+6	+0	3	–35	1.00	–35	–8	–0	–69

Date: 01-IX-1201

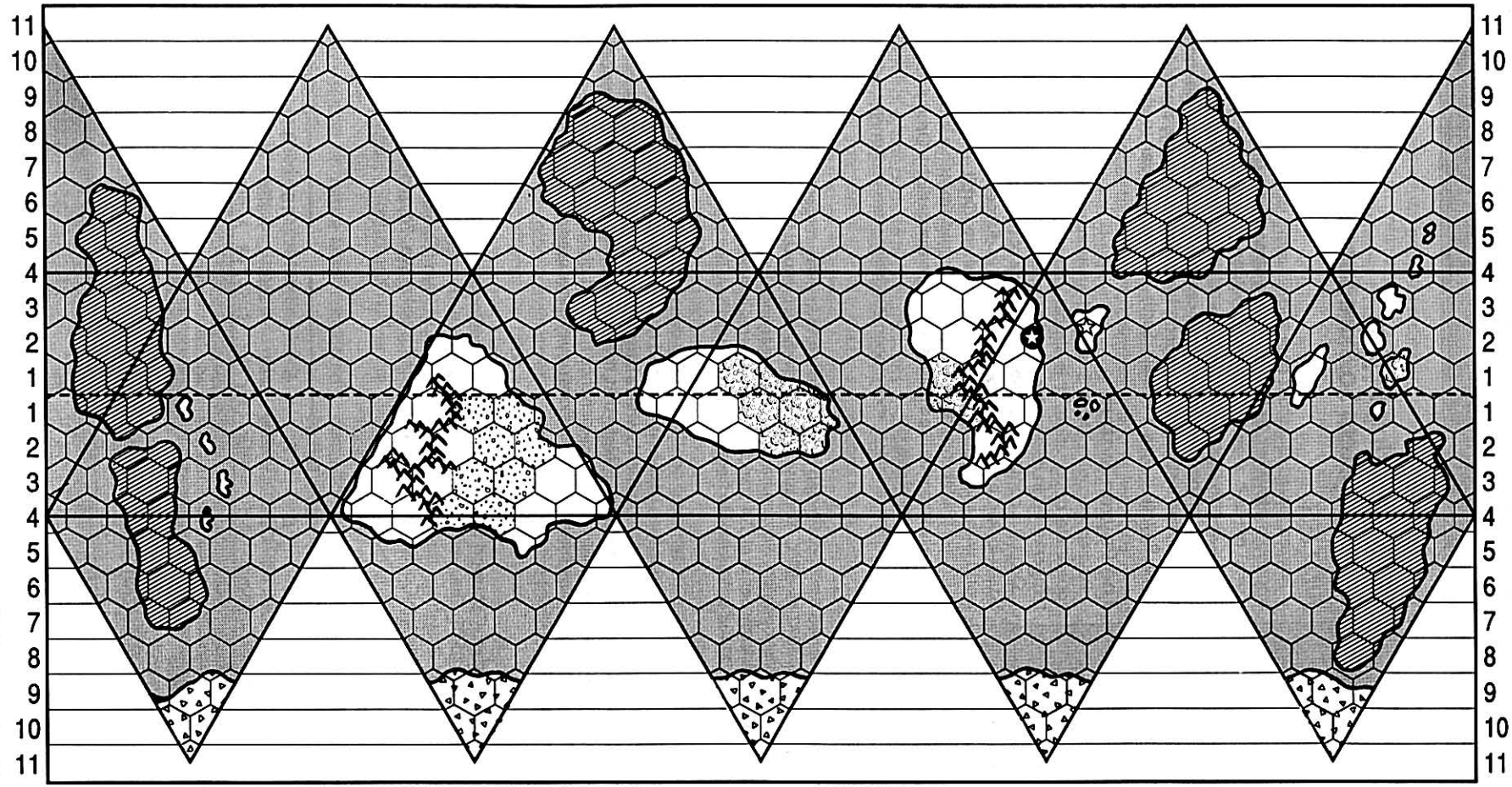
World Name: Poyzen

UPP X787000-0

Hexagon Scale in Kilometers: 1000

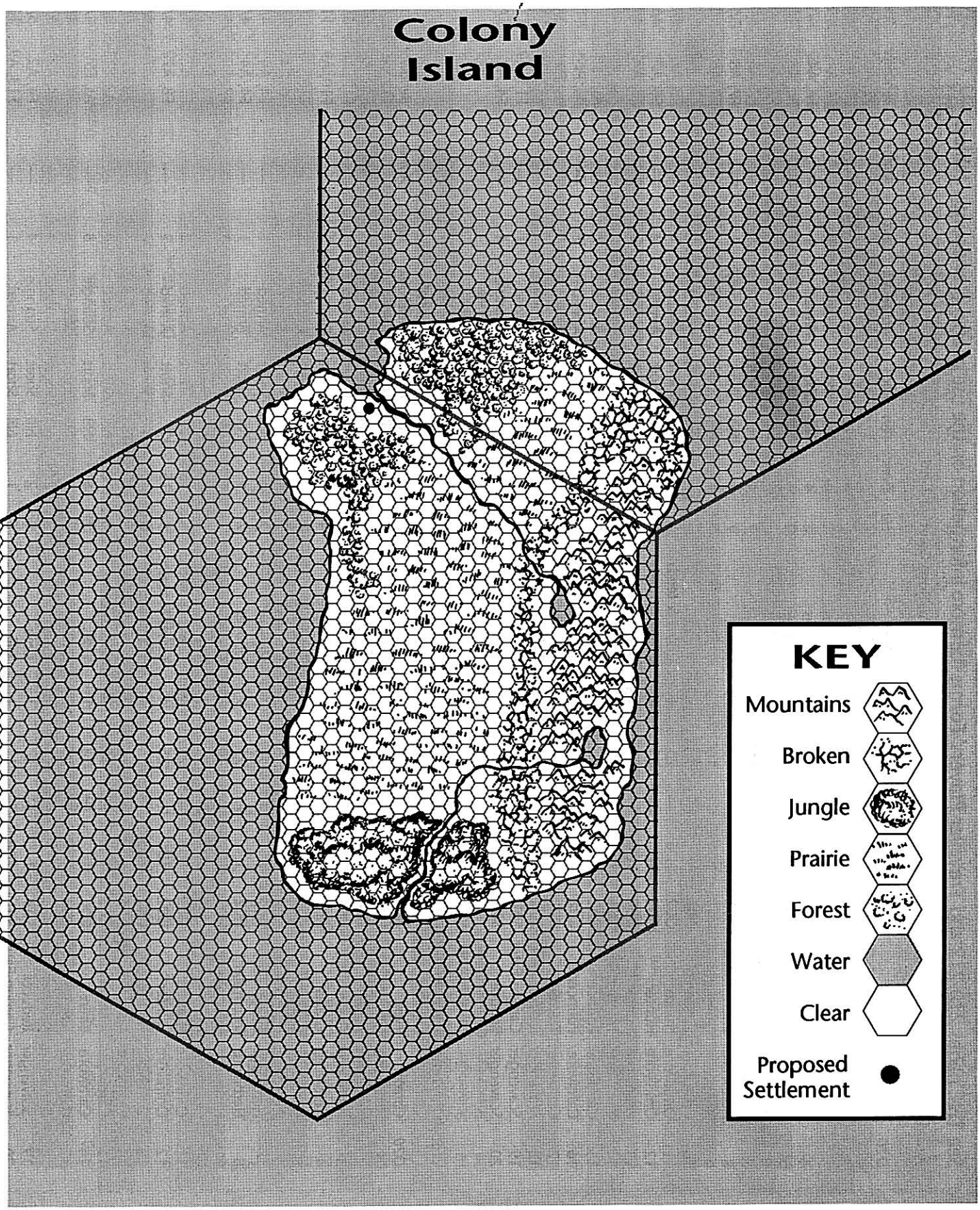
Subsector and Sector Location of World: 1736/So Skire/Old Expanses

GLOBAL DATA VIEW



Open Sea
Steppe
Jungle
Colony
Mixed
Badlands
Tundra
Former Scout Base
Mountains
Desert
Ice cap/ Glacier
Unknown (Not yet surveyed)




Colony
Island
KEY
Mountains
Broken
Jungle
Prairie
Forest
Water
Clear
Proposed
Settlement

See **TNE** pages 210-212 and **Traveller Players' Forms** for more information on the use of animal encounter tables.

World: Poyzen UWP: X-787000-0 Terrain Type: Forest Other Information: Colony Island

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Filter	H01	1D6	—	50	11	Tail	4	3	1	Short	Armed	4	—	F2, Ap	3/5/10
2	Herbivore	Intermittent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
3	Herbivore	Intermittent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
4	Herbivore	Intermittent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
5	Herbivore	Intermittent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
6	Herbivore	Intermittent	H03	1	—	100	13	Quills	7	4	Nil	Short	(Def only)	3	—	F7, A8	5/10/20
7	Herbivore	Intermittent	H03	1	—	100	13	Quills	7	4	Nil	Short	(Def only)	3	—	F7, A8	5/10/20
8	Herbivore	Intermittent	H03	1	—	100	13	Quills	7	4	Nil	Short	(Def only)	3	—	F7, A8	5/10/20
9	Herbivore	Intermittent	H03	1	—	100	13	Quills	7	4	Nil	Short	(Def only)	3	—	F7, A8	5/10/20
10	Omnivore	Gatherer	O01	1	—	3	1	Tail	3	2	Nil	Short	Armed	5	½	F10, A5	6/11/21
11	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
12	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
13	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
14	Carnivore	Trapper	C01	1	F	50	8	Teeth	13	6	1	Short	Armed	8	—	As, F9	2/3/6
15	Carnivore	Pouncer	C02	1	—	3	1	Claws & teeth	13	1	Nil	Short	Armed	7	—	As, Fs	11/21/42
16	Carnivore	Pouncer	C02	1	—	3	1	Claws & teeth	13	1	Nil	Short	Armed	7	—	As, Fs	11/21/42
17	Carnivore	Trapper	C01	1	F	50	8	Teeth	13	6	1	Short	Armed	8	—	As, F9	2/3/6
18	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43
19	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43
20	Scavenger	Reducer	S02	1	F	1	1	Coils	9	2	Nil	Short	Strangle	4	—	F4, A2	5/9/17

World: Poyzen UWP: X-787000-0 Terrain Type: Prairie Other Information: Colony Island

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Grazer	H04	4D6	—	12	3	Hooves	5	2	Nil	Short	Armed	2	—	F12, A6	6/12/24
2	Herbivore	Grazer	H04	4D6	—	12	3	Hooves	5	2	Nil	Short	Armed	2	—	F12, A6	6/12/24
3	Herbivore	Grazer	H04	4D6	—	12	3	Hooves	5	2	Nil	Short	Armed	2	—	F12, A6	6/12/24
4	Herbivore	Grazer	H05	3D6	F	3	1	Trample	4	1	Nil	Short	Diving Blow	5	—	F10, A9	11/22/44
5	Herbivore	Grazer	H05	3D6	F	3	1	Trample	4	1	Nil	Short	Diving Blow	5	—	F10, A9	11/22/44
6	Herbivore	Intermitent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
7	Herbivore	Intermitent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
8	Herbivore	Intermitent	H02	1	F	25	9	Hooves	2	4	Nil	Short	Armed	1	—	F4, A4	4/8/15
9	Herbivore	Intermitent	H03	1	—	100	13	Quills	7	4	Nil	Short	(Def only)	3	—	F7, A8	5/10/20
10	Omnivore	Hunter	O03	1D6	F	6	2	Tail	6	2	Nil	Short	Armed	6	—	F3, A17	11/21/41
11	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
12	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
13	Omnivore	Hunter	O02	1D6	—	25	4	Claws & teeth	5	15	1	Short	Armed	2	—	F8, A7	4/8/16
14	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
15	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
16	Carnivore	Siren	C04	1	F	25	1	Coils	7	6	Nil	Short	Strangle	8	—	As, F5	4/7/14
17	Carnivore	Siren	C04	1	F	25	1	Coils	7	6	Nil	Short	Strangle	8	—	As, F5	4/7/14
18	Scavenger	Reducer	S02	1	F	1	1	Coils	9	2	Nil	Short	Strangle	4	—	F4, A2	5/9/17
19	Scavenger	Reducer	S02	1	F	1	1	Coils	9	2	Nil	Short	Strangle	4	—	F4, A2	5/9/17
20	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43

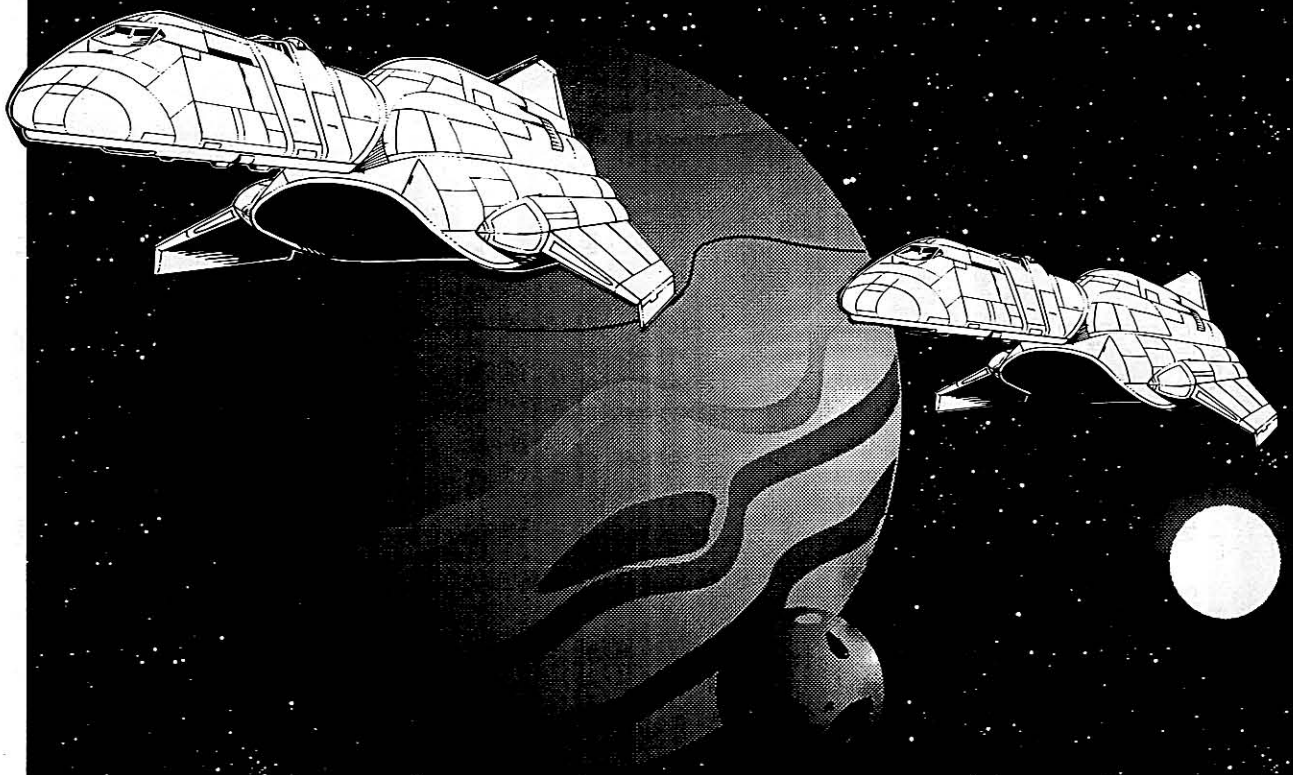
World: Poyzen UWP: X-787000-0 Terrain Type: River Other Information: Colony Island

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Grazer	H06	2D6	—	200	15	Horn	6	8	1	Short	Armed	1	—	F8, A6	7/13/25
2	Herbivore	Grazer	H06	2D6	—	200	15	Horn	6	8	1	Short	Armed	1	—	F8, A6	7/13/25
3	Herbivore	Grazer	H06	2D6	—	200	15	Horn	6	8	1	Short	Armed	1	—	F8, A6	7/13/25
4	Herbivore	Grazer	H05	3D6	F	3	1	Trample	4	1	Nil	Short	Diving Blow	5	—	F10, A9	11/22/44
5	Herbivore	Grazer	H05	3D6	F	3	1	Trample	4	1	Nil	Short	Diving Blow	5	—	F10, A9	11/22/44
6	Herbivore	Intermittent	H07	1	—	50	20	Tail	1	3	Nil	Short	Armed	1	½	F13, A3	10/19/38
7	Herbivore	Intermittent	H07	1	—	50	20	Tail	1	3	Nil	Short	Armed	1	½	F13, A3	10/19/38
8	Herbivore	Grazer	H08	1	F	50	3	Tail	8	4	1	Short	Armed	4	—	F12, A6	6/12/23
9	Herbivore	Grazer	H08	1	F	50	3	Tail	8	4	1	Short	Armed	4	—	F12, A6	6/12/23
10	Omnivore	Hunter	O04	1	F	1	1	Projectile	5	1	Nil	2	Thrown Weapon	5	—	F10, A8	8/15/30
11	Omnivore	Hunter	O04	1	F	1	1	Projectile	5	1	Nil	2	Thrown Weapon	5	—	F10, A8	8/15/30
12	Omnivore	Gatherer	O05	1	—	6	2	Projectile	6	4	Nil	8	Thrown Weapon	7	—	F11, A11	10/19/37
13	Omnivore	Gatherer	O05	1	—	6	2	Projectile	6	4	Nil	8	Thrown Weapon	7	—	F11, A11	10/19/37
14	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
15	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
16	Carnivore	Killer	C05	1	F	50	20	Claws	17	12	1	Short	Armed	6	—	A14, F5	9/17/33
17	Carnivore	Killer	C05	1	F	50	20	Claws	17	12	1	Short	Armed	6	—	A14, F5	9/17/33
18	Scavenger	Reducer	S02	1	F	1	1	Coils	9	2	Nil	Short	Strangle	4	—	F4, A2	5/9/17
19	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43
20	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43

World: Poyzen UWP: X-787000-0 Terrain Type: Broken Other Information: Colony Island

D20	Category	Type	Name	Qty	Spec Att	Wt (kg)	Hits	Wpn	To Hit	Dam	Pen	Rng	Type of Melee Atk	Init	Armor	Behavior	Speed
1	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
2	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
3	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
4	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
5	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
6	Herbivore	Intermittent	H09	1	F	1	1	Horn	6	3	Nil	Short	Armed	1	—	F11, A4	7/17/28
7	Herbivore	Filterer	H10	1	—	3	1	Hooves & teeth	9	6	Nil	Short	Armed	4	—	F3, Ap	1/2/4
8	Herbivore	Intermittent	H11	1	F	1	1	Quills	6	3	Nil	Short	(Def only)	1	—	F13, A12	5/10/20
9	Herbivore	Intermittent	H11	1	F	1	1	Quills	6	3	Nil	Short	(Def only)	1	—	F13, A12	5/10/20
10	Omnivore	Gatherer	O06	1	—	12	1	Quills	4	4	Nil	Short	(Def only)	7	—	F8, A8	5/10/19
11	Omnivore	Gatherer	O06	1	—	12	1	Quills	4	4	Nil	Short	(Def only)	7	—	F8, A8	5/10/19
12	Omnivore	Hunter	O03	1D6	F	6	2	Tail	6	2	Nil	Short	Armed	6	—	F3, A17	11/21/41
13	Omnivore	Hunter	O03	1D6	F	6	2	Tail	6	2	Nil	Short	Armed	6	—	F3, A17	11/21/41
14	Carnivore	Pouncer	C06	1	—	6	10	Acid	6	5	1	Short	Armed	4	½	As, Fs	7/13/25
15	Carnivore	Pouncer	C06	1	—	6	10	Acid	6	5	1	Short	Armed	4	½	As, Fs	7/13/25
16	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
17	Carnivore	Killer	C03	1	F	12	2	poison/claw	8	1D3p3	Nil	Short	Armed	4	—	A2, F13	8/16/31
18	Scavenger	Carrion-Eater	S03	1	—	50	9	Tail	9	6	1	Short	Armed	3	½	F10, A9	9/17/34
19	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43
20	Scavenger	Carrion-Eater	S01	2D6	F	1	1	Tail	6	1	Nil	Short	Armed	1	—	F13, A9	11/22/43

CHAPTER 8: STARS & PLANETS



STARS

These are generated in accordance with the rules presented on TNE page 192, when not using published pregenerated sectors. These can be generated in advance or on a hex-by-hex basis, allowing the universe to be generated randomly as the campaign proceeds.

PLANETS

Planets are generated according to the system found on pages 192-195 of the TNE rulebook. This generation system provides the standard UWP data for such worlds, but planets that are to be surveyed for potential habitation require a closer level of detail, produced in the following section, "Detailing Planets." For the purposes of a world tamer campaign, survey missions will concentrate on worlds within the habitable zones of star systems, so referees should concentrate on detailing those worlds. Details for the remaining (inner and outer zone) worlds of the system may or may not be required in further adventures.



DETAILING PLANETS

This section provides the level of detail required for world tamer survey, colony, and bootstrap missions. This detail need not be generated for all worlds in a campaign, but only those for which detailed exploration or colonization is intended or likely.

I. Years and Days

Calculating a planet's orbital period around its star, which yields the length of its year in days, and calculating the length of the planetary day is a multi-step procedure. To calculate both, you need to know the mass of the primary star the planet is orbiting, and the distance in kilometers from the primary star.

1. Determine the primary star's mass from the Stellar Mass table by cross indexing the star's spectral type with its luminosity class. The resulting value is in solar masses (Sol = 1).

STELLAR MASS

Spectral Type	*Luminosity Class* II	III	IV	V	D
A0	14	12	6	3.2	0.36
A5	11	9	4	2.1	—
F0	10	8	2.5	1.7	0.42
F5	8.1	5	2	1.3	—
G0	8.1	2.5	1.75	1.04	0.63
G5	10	3.2	2	0.94	—
K0	11	4	2.3	0.825	0.83
K5	14	5	—	0.570	—
M0	16	6.3	—	0.489	1.11
M5	16	7.4	—	0.331	—

2. Determine the distance of the planet's orbit from the central star in AUs using the Orbital Distance table.

ORBITAL DISTANCE

Orbit	*AUs*	*Million Kilometers*
0	0.2	29.9
1	0.4	59.8
2	0.7	104.7
3	1.0	149.6
4	1.6	239.4
5	2.8	418.9
6	5.2	777.9
7	10.0	1495.9
8	19.6	2932.0
9	38.8	5804.0
10	77.2	11,548.0
11	154.0	23,038.0
12	307.6	46,016.0
13	614.8	91,972.0
14	1229.2	183,885.0
15	2548.0	367,711
16	4915.6	735.363.0
17	9830.8	1,470,666.0
18	19,661.2	2,941,274.0
19	39,322.0	5,882,488.0

3. Compute the orbital period using this formula:

$$P = \sqrt{D^3 + M}$$

P= Period in standard years. Multiply by 365.25 to convert to standard days.

D= Distance in AUs. Multiply by 149.6 to covert to millions of kilometers.

M= Mass of central star in solar masses (from the Stellar Masses table).

4. Compute the planet's rotation period in hours using this formula:

$$P = 4A + 5 + (M+D)$$

P= Rotation period in hours (Divide by 2 to determine the length of the local day and local night at the equator in hours, and divide by 24 to get rotation period in standard days.)

A= Dice Roll 2D6-2.

M= Mass of the central star in solar masses.

D= Distance from the central star in AUs.

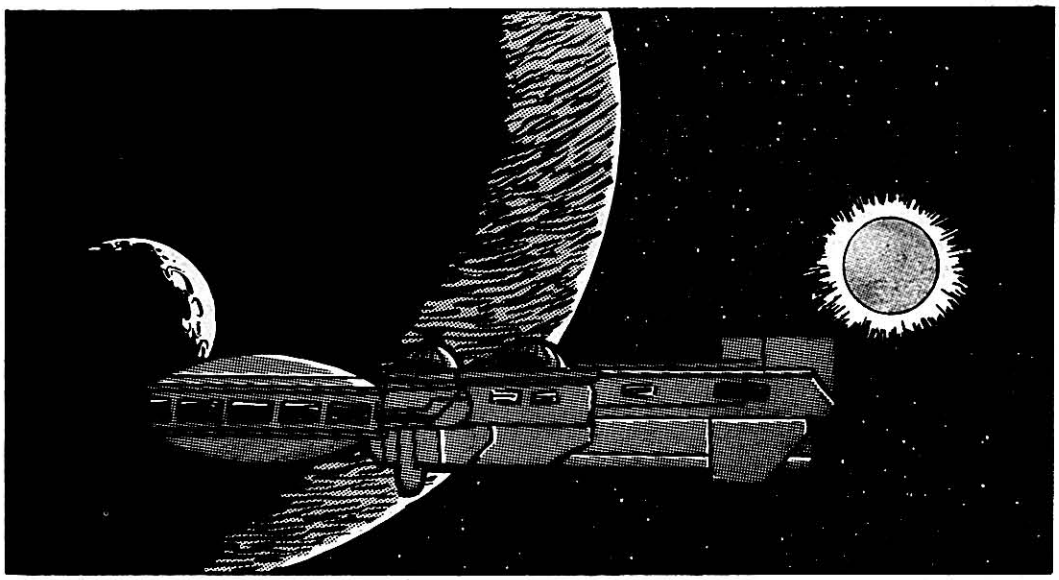
If the result is greater than 40, roll 1 D10 for 6+ for the world to be tidally locked. See further discussion below on pages 86 and 90.

If the central star is a K type star roll 1D6. The planet is tidally locked on a result of 4-6.

If the central star is an M type star, and the planet is in the habitable zone, roll 1D6. It is tidally locked on a result of 3-6; if it is in the inner zone it is automatically tidally locked.

5. Determine the planet's orbital eccentricity with the following table. This will be used to compute temperature below.

2D6	*Orbital Eccentricity*
2-7	0.000
8	0.005
9	0.010
10	0.015
11	0.020
12	Roll 1D6 below:
	1 0.025
	2 0.050
	3 0.100
	4 0.200
	5 0.250
	6 extreme (referee's choice)





II. Base Mean Surface Temperature and Variation

Compute the base surface temperature of the world using this formula:

$$T=L\times O\times E\times G$$

T = World's base mean surface temperature (Kelvin; subtract 273 to get Celsius)

L = Luminosity of the primary star (From the Luminosity Table).

O = Orbital factor for the world (from the Orbital Factor Table).

G = Greenhouse effect for the world (from The Greenhouse Effect Table).

E = Energy absorption factor for the world (from the Energy Absorption Table). Within each atmosphere type, the column HZ indicates a world with that atmosphere type in the habitable zone, and the column NHZ indicates a world with that atmosphere type not in the habitable zone (i.e., in the inner or outer zone)

Luminosity

Spectral Type	Luminosity Class II	III	IV	V	D
A0	6.85	4.09	3.53	3.08	0.27
A5	5.40	3.08	2.47	2.00	—
F0	4.95	2.70	2.09	1.69	0.13
F5	4.75	2.56	1.86	1.37	—
G0	4.86	2.66	1.60	1.05	0.09
G5	5.22	2.94	1.49	0.90	—
K0	5.46	3.12	1.47	0.81	0.08
K5	7.04	4.23	—	0.53	—
M0	8.24	4.65	—	0.45	0.07
M5	11.05	6.91	—	0.29	—
M9	11.28	7.20	—	0.18	

Orbital Factor

Orbit	Factor
0	836.345
1	591.385
2	447.045
3	374.025
4	295.693
5	223.523
6	164.021
7	118.277
8	84.484
9	60.046
10	42.569
11	30.140
12	21.326
13	15.085
14	10.668
15	7.544
16	5.335
17	3.772
18	2.667
19	1.886

Energy Absorption

UWP Hydro Digit	UWP Atmos 0-3 NHZ	HZ	UWP Atmos 4-9 NHZ	HZ	UWP Atmos A-E NHZ	HZ	UWP Atmos F NHZ	HZ
0	0.800	0.900	0.800	0.900	0.680	0.740	0.800	0.900
1	0.744	0.829	0.811	0.900	0.646	0.697	0.811	0.900
2	0.736	0.803	0.789	0.860	0.635	0.672	0.807	0.882
3	0.752	0.811	0.799	0.860	0.644	0.676	0.817	0.883
4	0.738	0.782	0.774	0.820	0.625	0.648	0.813	0.866
5	0.753	0.789	0.747	0.780	0.599	0.613	0.809	0.850
6	0.767	0.795	0.718	0.740	0.570	0.577	0.805	0.836
7	0.782	0.802	0.687	0.700	0.537	0.539	0.800	0.821
8	0.796	0.808	0.654	0.660	0.500	0.500	0.794	0.807
9	0.810	0.814	0.619	0.620	0.500	0.500	0.787	0.793
A	0.818	0.818	0.619	0.619	0.500	0.500	0.773	0.773

Greenhouse Effect

Atmos Code	Greenhouse Effect	Atmos Code	Greenhouse Effect
0	1.00	7	1.10
1	1.00	8	1.15
2	1.00	9	1.15
3	1.00	D	1.15
4	1.05	E	1.00
5	1.05	F	1.10
6	1.10		

IIa. Effects of Orbital Eccentricity: The eccentricity of the orbit as calculated above will cause higher temperatures at closest approach to the primary star and lower temperatures at farthest separation from the primary star, as follows:

$$Tc = O\times 30$$
$$Tf = O\times -30$$

Tc = Temperature modifier at closest approach

Tf = Temperature modifier at farthest separation

O = Orbital eccentricity

IIb. Effects of Latitude: Determine the temperature modification effects of latitude from the following table; noted in terms of hex rows on the global data view planetary map.

Latitude Temperature Modifiers

Hex Row	UWP Size Digit Size 1	Size 2, 3	Size 4, 5	Size 6, 7	Size 8, 9	Size A
1	+9	+12	+15	+18	+21	+24
2	+6	+8	+10	+12	+14	+16
3	+3	+4	+5	+6	+7	+8
4	0	0	0	0	0	0
5	–3	–4	–5	–6	–7	–8
6	–6	–8	–10	–12	–14	–16
7	–9	–12	–15	–18	–21	–24
8	–12	–16	–20	–24	–28	–32
9	–15	–20	–25	–30	–35	–40
10	–18	–24	–30	–36	–42	–48
11	–21	–28	–35	–42	–49	–56



III. Seasons

A planet's seasons and corresponding variation in temperature depend primarily on its axial tilt. A planet with no tilt has no seasons, rather it has a constant basic climate all year round. A planet with a high degree of tilt has massive temperature variations between seasons and consequent violent weather, as the atmosphere constantly attempts to equalize the extremes between the seasonal hemispheres. To determine the variations between seasons, follow this procedure:

1. Determine the planet's axial tilt. Roll on the Axial Tilt table.

2. If necessary, roll on the Secondary Axial Tilt table.

AXIAL TILT

2D6	*Axial Tilt (in degrees)*
2-3	0° +(2D6-2)°
4-5	10° +(2D6-2)°
6-7	20° +(2d6-2)°
8-9	30° +(2d6-2)°
10-11	40° +(2d6-2)°
12	Use Secondary table

SECONDARY AXIAL TILT

1D6	*Axial Tilt (in degrees)*
1-2	50° +(2D6-2)°
3	60° +(2D6-2)°
4	70° +(2D6-2)°
5	80° +(2D6-2)°
6	90°

3. Use the following formula to determine the maximum increase in base temperature during the planet's summer season.

$$T = 0.6A$$

T = the base temperature increase during the summer.

A = axial tilt in degrees.

4. Use the following formula to determine the maximum decrease in base temperature during the planet's winter season.

$$T = A$$

T = the base temperature decrease during the winter.

A = axial tilt in degrees.

5. The above base seasonal temperature changes are modified by latitude as shown on the table below, where latitude is noted as the hex row on the global data view planetary map. For example, in hex row 5 on a world with an axial tilt of 28 degrees, these base temperature changes would be multiplied by 0.75.

IV. Day/Night Temperature Variation

First compute the length of daytime or nighttime by dividing the world's rotational period by 2. Then compute the rotation-luminosity factor R with the following formula:

$$R = L + \sqrt{D}$$

R = Rotation-luminosity factor

L = Luminosity of the primary star as used in the base temperature step above

D = Distance from the primary star in AUs as found on the Orbital Distance table on page 83

The value R is then used to calculate the daytime temperature increase and nighttime temperature decrease below.

Daytime Temperature Increase: The average temperature increase during the world's day is computed based on R above and the length of the local day in hours (as on Daytime Temp Increase table). The plus temp may never exceed the absolute maximum plus temperature.

Nighttime Temperature Decrease: The average temperature decrease during the world's night is computed based on the length of the local night in hours. Minus temp per hour of night is in Celsius degrees (as on Nighttime Temp Decrease table). The minus temp may never exceed the absolute maximum minus temperature.

DAYTIME TEMP INCREASE

UWP Atm Digit	*+Temp per hour of Daylight*	*Absolute Maximum +Temp*
0	1.0×R	0.1×Max
1	0.9×R	0.3×Max
2, 3, E	0.8×R	0.8×Max
4, 5	0.6×R	1.5×Max
6, 7	0.5×R	2.5×Max
8, 9	0.4×R	4.0×Max
D, F	0.2×R	5.0×Max

NIGHTTIME TEMP DECREASE

UWP Atm Digit	*–Temp per hour of Night*	*Absolute Maximum –Temp*
0	20.0 C	0.80×Base
1	15.0 C	0.70×Base
2, 3, E	8.0 C	0.50×Base
4, 5	3.0 C	0.30×Base
6, 7	1.0 C	0.15×Base
8, 9	0.5 C	0.10×Base
D, F	0.2 C	0.05×Base

Max : the Base Mean Surface Temperature (Kelvin) as calculated earlier × R

Base : the Base Mean Surface Temperature (Kelvin) as calculated earlier

V. Axial Tilt Effects

	Degree of Axial Tilt											
Hex Row	*0*	*1-5*	*6-10*	*11-15*	*16-20*	*21-25*	*26-30*	*31-35*	*36-45*	*46-60*	*61-84*	*85+*
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.00	1.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.00	1.00	1.00
4	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.00	1.00	1.00	1.00
5	0.00	0.00	0.00	0.00	0.25	0.50	0.75	1.00	1.00	1.00	1.00	1.00
6	0.00	0.00	0.00	0.25	0.50	0.75	1.00	1.00	1.00	1.00	1.00	1.00
7	0.00	0.00	0.25	0.50	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	0.00	0.00	0.50	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	0.00	0.25	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	0.00	0.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	0.25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00



VI. Temperature Worksheet

Creation of a temperature worksheet as follows allows rapid consultation of maximum and minimum temperatures for all planetary hex rows.

Note that column 3 shows the base temperature for all hex rows in Celsius degrees, column 9 shows the highest possible temperature for each hex row (Celsius), and column 15 shows the lowest possible temperature for all hex rows (Celsius).

The upper worksheet may be photocopied by owners of this book to assist in detailing their own worlds.

The lower worksheet is a sample, filled out for a UWP size 8 world with a dense atmosphere, 26° axial tilt, 25 hour rotational period, and orbital eccentricity of 0.020. The temperature values used are: base temperature of 9°C, summer plus of 16°C, winter minus of 26°C, daytime plus of 5°C, nighttime minus of 7°C, and orbital eccentricity plus/minus of 1°C.

				Highest Possible Temp						Lowest Possible Temp					
Col:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex Row	*Base Temp*	*Latitude Mod*	*Cols. 1+2*	*Summer Plus*	*Ax. Tilt Factor*	*Cols. 4x5*	*Daytime Plus*	*Orbit Ecc Plus*	*Cols. 3+6+7+8*	*Winter Minus*	*Ax. Tilt Factor*	*Cols. 11x12*	*Night Minus*	*Orbit Ecc Minus*	*Cols. 3+12 +13+14*
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															

				Highest Possible Temp						Lowest Possible Temp					
Col:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hex Row	*Base Temp*	*Latitude Mod*	*Cols. 1+2*	*Summer Plus*	*Ax. Tilt Factor*	*Cols. 4x5*	*Daytime Plus*	*Orbit Ecc Plus*	*Cols. 3+6+7+8*	*Winter Minus*	*Ax. Tilt Factor*	*Cols. 11x12*	*Night Minus*	*Orbit Ecc Minus*	*Cols. 3+12 +13+14*
1	9	+21	30	+16	0.00	+0	+5	+1	36	–26	0.00	–0	–7	–1	22
2	9	+14	23	+16	0.00	+0	+5	+1	29	–26	0.00	–0	–7	–1	15
3	9	+7	16	+16	0.25	+4	+5	+1	26	–26	0.25	–7	–7	–1	2
4	9	0	9	+16	0.50	+8	+5	+1	23	–26	0.50	–13	–7	–1	–12
5	9	–7	2	+16	0.75	+12	+5	+1	20	–26	0.75	–20	–7	–1	–25
6	9	–14	–5	+16	1.00	+16	+5	+1	17	–26	1.00	–26	–7	–1	–39
7	9	–21	–12	+16	1.00	+16	+5	+1	10	–26	1.00	–26	–7	–1	–46
8	9	–28	–19	+16	1.00	+16	+5	+1	3	–26	1.00	–26	–7	–1	–53
9	9	–35	–26	+16	1.00	+16	+5	+1	–4	–26	1.00	–26	–7	–1	–60
10	9	–42	–33	+16	1.00	+16	+5	+1	–11	–26	1.00	–26	–7	–1	–67
11	9	–49	–40	+16	1.00	+16	+5	+1	–18	–26	1.00	–26	–7	–1	–74

VII. Temperature on Tidally Locked Planets

Worlds which are tidally locked to their primary stars have their temperatures computed differently.

The base temperature applies to the twilight region between the world's light and dark side, rather than hex row 4. By convention, the twilight region is in hex row 1 on the map (both rows on either side of the equator). Also by convention, the top hexrows are the permanent dayside, and the bottom hexrows are the permanent nightside.

Use the maximum plus for the daytime plus, since daytime is effectively infinite.

To determine the latitude mod per hexrow on the dayside, divide the daytime plus by the world's UWP size digit (but the dayside plus temperature must never exceed the maximum daytime plus in any hex row, however).

Use the maximum minus for the nighttime minus, since nighttime is effectively infinite.

To determine the latitude mod per hexrow on the nightside, divide the nighttime minus by the world's UWP size digit (but the nightside temperature minus must never exceed the maximum nighttime minus in any hex row, however).

Axial tilt has no effect, as the world does not rotate.

Orbital eccentricity works normally.



VIII. Density & Gravity

Use these tables to determine the density of the planet, and from that information, the planet's surface gravity.

World Density

1D6	Density
1	Low
2-4	Average
5-6	High

DMs: -2 if the world is in the outer zone. Modified rolls of less than 1 are treated as 1.

Density Equivalent

Density	Density Equivalent in Earths (Terra = 1)
Low	.55
Average	1.0
High	1.55

IX. World Mass

If the planet has a satellite, the world's mass must be calculated in order to calculate the satellite's orbital period. To determine world mass, use this formula.

$$M=K\times(R+8)^3$$

M= Mass in standard masses (Terra = 1)
K= Planet's density in Earths (see Density Equivalent table).
R= UWP size digit (use 0.6 for size S).

World Gravity

	Density		
Diameter	Low	Average	High
1600 (1)	.10	.15	0.3
3200 (2)	.15	.25	0.5
4800 (3)	.30	.40	0.8
6400 (4)	.35	.50	1.0
8000 (5)	.45	.60	1.2
9600 (6)	.55	.80	1.6
11,200 (7)	.60	.90	1.8
12,800 (8)	.70	1.0	2.0
14,400 (9)	.70	1.1	2.2
16,000 (A)	.80	1.3	2.6

Satellites

Many planets will have satellites, and some gas giants located in the habitable zone will have satellites that are habitable and which can serve as the main world of a system. The presence and characteristics of satellites are determined using the procedures in **TNE**, pages 194-195.

Orbital Period: To determine the orbital period of a satellite around its central planet, follow this procedure:

1. Multiply the planet's radius (half the diameter listed in the UWP World Size table on Page 188 of **TNE**) by the orbit number (**TNE** page 195) to calculate the satellite's distance from its planet in kilometers.
2. Calculate the mass of the central planet as described in the previous section.
3. Use the following formula to compute the orbital period:

$$P=\sqrt{([D+400{,}000]^3\times 793.64)+M}$$

P= Period in standard days
D= Distance in kilometers
M= Mass of central planet in standard masses

Satellite Rotation Period: Compute the satellite's rotation period in hours using this formula:

$$P = (4A) + 5 + (M+D)$$

P= Rotation period in hours (Divide by 2 to determine the length of the local day and local night at the equator in hours, and divide by 24 to get rotation period in standard days.)
A= Dice Roll 2D6-2
M= Mass of the planet in standard masses
D= Distance from the planet in kilometers divided by 400,000

If the result is greater than 40, the satellite is tidally locked to its central world on a 1D10 roll of 6+.





MAPPING A WORLD

This section describes how to draw a map based on the detailed data generated so far. **Traveller** uses a hex grid in the form of a flattened icosahedron (a 20-sided solid the same shape as 20-sided die) for mapping the surface of a world. The map is divided into 20 interlocking triangles of 25 hexes each, totaling 500 hexes per map. These hexes are called "planetary hexes." The equator is 35 planetary hexes long. Blank copies of this standard map format, called the "global data view," are available in the **Traveller Players' Forms** book.

Note that the following material is presented as guidelines only. As such, they are intended to be aids to creativity, and not boundaries upon it. Within the parameters of the previously generated UWP data, referees and world designers should feel free to create world maps using whatever methods are comfortable for them.

Planetary Hex Size

The Survey chapter of this book contains a discussion of planetary hexes and their relationship to 20-kilometer mapping hexes as used in the Survey, Colony, and Bootstrap chapters. Page 20 contains a table showing the dimensions of planetary hexes for each of the UWP world sizes. Note that these figures are based on the average world diameter for that UWP size, not the entire possible range. (For example, a UWP size code of 8 indicates worlds whose diameters range from 12,000 km to 13,599 km, with an average diameter of 12,800 km. See TNE page 188 for more details.)

For conversion to 20-km mapping hexes, it is best to stick with the average diameter figure which is used on the page 20 table. For those who prefer to know the exact actual size of each hex based on the world's actual diameter, use the following procedure.

1. Calculate the circumference of the world by multiplying its diameter in kilometers by 3.1416.
2. Divide the resulting circumference by 35.

This is the width (between opposite hexsides) of the planetary hex.

Tectonic Plates

Multiple tectonic plates occur on worlds with average and high densities (low density worlds have only a single tectonic plate). Multiple plates are the solid world crust floating atop the planet's molten mantle, and separated by fault zones. They may be converging, traversing, or diverging.

Converging tectonic plates cause heavy seismic activity and build mountains as they collide.

Traversing plates are relatively stable, but slide against each other causing seismic activity.

Diverging plates are separating, creating vast trenches in the planet's crust.

Number of Plates: To calculate the number of tectonic plates on a planet:

Add the world's UWP size and UWP hydrosphere digits and subtract 2D6.

Note that it is possible for world to have only one tectonic plate (as is already the case with low density worlds). This world would have little or no seismic activity.

Tectonic Plate Size	
1D6	*Size in Hexes*
1	2D×5
2	2D×10
3	2D×15
4	2D×20
5	2D×25
6	2D×30

Size of Plates: For mapping purposes, calculate the number of hexes per tectonic plate. To do this, roll 1D6 on the Tectonic Plate Size table

By default, the last tectonic plate placed is the largest, and is always as large as the remaining number of hexes on the world map grid. Exact placement of the plates is up to the referee or world designer. Sketch them lightly in pencil on the map grid; they won't appear on the final map, but they'll be useful in determining the layout of continents and oceans, establishing seismic effects, and locating some terrain features.

Plate Movement: For each plate boundary, roll on the table at the right to determine plate movement.

Tectonic Plate Movement	
2D6	*Movement*
2	Converging
3	Converging
4	Converging
5	Converging
6	Traversing
7	Traversing
8	Traversing
9	Diverging
10	Diverging
11	Diverging
12	Diverging

Continents & Oceans

Once the tectonic plates are located, the designer can begin outlining continents and oceans. This depends on the planet's UWP hydrographic code. If it is 5 or less, map oceans first, and all leftover hexes will be land masses. If it is 6 or greater, map continents first, with all leftover hexes becoming oceans and other bodies of water. If no water is present (code 0), go directly to determining terrain.

Mapping Water Hexes

First calculate the actual hydrographic percentage. See the World Hydrographics table on **TNE** page 188 to see the minimum and maximum hydrographic percentage for each code. For example, a digit of 4 indicates a value between 35 and 44 percent. Use 1D10 to find the exact number in this range by adding the 1D10 result to the minimum number, and treating results of "10" as "0."

To calculate the total number of water hexes on the planet, multiply the actual hydrographic percentage by 5. Thus a world with a hydrographic percentage of 42% has 210 water hexes out of 500 total hexes.

To calculate the number of land hexes, subtract the water hexes from 500. Our sample world has 290 land hexes (500-210 = 290).

If the planet has 49% or less water, determine exactly how many lakes, seas and oceans are present. To do this:

1. Multiply the planet's UWP hydrographic code by 3.
2. Roll 1D6 and add the result to the result in step 1.
3. Compare the result to the Oceans Table.

Oceans			
Result	*Major Oceans*	*Minor Oceans*	*Other Bodies of Water*
1	0	0	No Significant Water Surface
2	0	0	No Significant Water Surface
3	0	0	Scattered Lakes
4	0	0	Scattered Lakes
5	0	0	1D6-3 Small seas, 2D6 scattered lakes
6	0	0	2D6-3 Small seas, 2D6 scattered lakes
7	1D6-4	1D6-3	3D6-3 Small seas, 2D6 scattered lakes
9	1D6-3	1D6-2	3D6-3 Small seas, 2D6 scattered lakes
10	1D6-3	1D6-1	3D6-3 Small seas, 2D6 scattered lakes
11	1D6-2	1D6-1	3D6-3 Small seas, 2D6 scattered lakes
12	1D6-2	2D6-2	3D6-3 Small seas, 2D6 scattered lakes
13	1D6-1	1D6-1	3D6-3 Small seas, 2D6 scattered lakes
14	1D6-1	2D6-2	3D6-3 Small seas, 2D6 scattered lakes
15	1D6-1	3D6-3	3D6-3 Small seas, 2D6 scattered lakes
16	1D6	2D6-2	3D6-3 Small seas, 2D6 scattered lakes
17	1D6	3D6-3	3D6-3 Small seas, 2D6 scattered lakes
18	1D6	1D6-1	3D6-3 Small seas, 2D6 scattered lakes
19	1	1D6-1	3D6-3 Small seas, 2D6 scattered lakes
20	1	2D6-2	3D6-3 Small seas, 2D6 scattered lakes
21	1	3D6-3	3D6-3 Small seas, 2D6 scattered lakes



Scattered Lakes: Scattered lakes are very small bodies of water; a hex containing scattered lakes is considered to be 1/2 of a hex of water surface. Determine the location of scattered lakes before placing other bodies of water. Divide the number of scattered lakes by two and subtract that valve from the water hex total.

Small Sea: Small seas cover roughly one hex of water surface. The number of small seas is in the Oceans Table "Other Bodies of Water Column." Deduct the small sea hexes from the water hex total before determining the size of major and minor oceans.

Major Oceans: A major ocean is a body of water that covers 15% or more of the world's water surface area. As an example, if a world has 160 water hexes, each major ocean must cover at least 24 hexes. If there is only one major ocean, it will include almost all of the planet's water surface area.

Minor Oceans: Any water surface area left after major oceans are placed is divided into minor oceans. A minor ocean covers less than 15% of the planet's water surface area.

Any body of water can have major islands (1 hex) and archipelagoes (1/2 hex).

Mapping Land Hexes

If the actual hydrographic percentage of a world is between 50 and 100%, map the land hexes first. The remaining hexes are water hexes. If the hydrographic percentage is 100%, any land will be incidental islands.

To calculate the number of land hexes, subtract the water hexes from 500.

If the planet has 51% or more water, determine exactly how many major and minor continents and islands are present. To do this:

1. Multiply the planet's UWP hydrographic code by 3.
2. Roll 1D6 and add the result to the result in step 1.
3. Compare the result to the Continents Table.

CONTINENTS

Result	Major Continents	Minor Continents	Other Land Masses
16	2D6+1	1D6-1	3D6-3 Major Islands, 2D6 Archipelagoes
17	2D6+1	2D6-2	3D6-3 Major Islands, 2D6 Archipelagoes
18	2D6+1	3D6-3	3D6-3 Major Islands, 2D6 Archipelagoes
19	2D6	1D6-1	3D6-3 Major Islands, 2D6 Archipelagoes
20	2D6	2D6-2	3D6-3 Major Islands, 2D6 Archipelagoes
21	2D6	3D6-3	3D6-3 Major Islands, 2D6 Archipelagoes
22	1D6	1D6-1	3D6-3 Major Islands, 2D6 Archipelagoes
23	1D6	2D6-2	3D6-3 Major Islands, 2D6 Archipelagoes
24	1D6	3D6-3	3D6-3 Major Islands, 2D6 Archipelagoes
25	1D6-1	1D6	3D6-3 Major Islands, 2D6 Archipelagoes
26	1D6-1	2D6	3D6-3 Major Islands, 2D6 Archipelagoes
27	1D6-1	3D6	3D6-3 Major Islands, 2D6 Archipelagoes
28	1D6-2	1D6-1	3D6-3 Major Islands, 2D6 Archipelagoes
29	1D6-3	1D6-2	3D6-3 Major Islands, 2D6 Archipelagoes
30	1D6-4	1D6-3	2D6 Major Islands, 2D6 Archipelagoes
31	0	0	1D6-3 Major Islands, 2D6 Archipelagoes
32	0	0	Archipelagoes
33	0	0	Archipelagoes
34	0	0	Archipelagoes
35	0	0	No significant land surface
36	0	0	No significant land surface

Archipelagoes: Archipelagoes are groupings of small islands, considered to be 1/2 of a hex of land surface. Archipelagoes are placed prior to major islands and larger land masses. Divide the number of archipelago hexes by 2 and subtract the result from the total number of land hexes.

Major Islands: Major islands are land areas covering roughly one hex. The "Other Land Masses" column on the Continents Table indicates how many major island hexes are present on a world. Deduct the number of major island hexes from the total number of land hexes before determining the size of major or minor continents.

Major Continents: A major continent covers at least 15% of the land surface area of a world. The Terran equivalents of major continents are Eurasia (37%), Africa (20%), and North America (16%). The other continents are minor continents.

Minor Continents: Any land surface remaining after major continents have been placed are divided up between minor continents. A minor continent covers less than 15% of the world's land surface.

Note that any land mass can have land-locked small seas (1 water hex each) and scattered lakes (1/2 water hex each).

Placement

Next, place the land and water bodies determined above, using the tectonic plates as guides. When placing continents, divide them up as evenly as possible among the tectonic plates. Ideally, there should be one continent per plate. Plates may also underlie oceans. Plates overlap when there is more than one plate per continent, or when a continental plate lies next to an oceanic plate. These are active seismic zones.

Continents separated by only one hex may be joined by a narrow strip of land called an isthmus. Likewise, oceans only one hex apart may be joined by a strait. Decide these options either by personal preference or with a random die roll (9 or above on 2D6 indicating the presence of an isthmus or strait).

Terrain

Once the land masses are placed, it is time to map the planet's terrain. This includes surface feature terrain such as ice caps, tundra, steppes, mountains, badlands, and open terrain; life influenced terrain including deserts, jungles, and forests; and terrain affected by civilization: cities and farmlands.

Ice Caps: These are frozen wastes covered with ice. To determine how far from the poles ice caps extend and where tundra is located, use the axial tilt and temperature determination procedure in the "Seasons" section of this chapter. The temperatures generated by this procedure will indicate how many hex bands from each pole have below 0° Celsius freezing conditions all year round.

Tundra: Tundra is marshy, semi-frozen open terrain located usually within one hex next to the polar icecaps (if any).

Steppes: Steppes are open grasslands with very few trees, if any. Steppes may be placed anywhere except in the polar regions or in coastal hexes.

Mountains: Mountains are created by plate tectonics. Place mountain ranges along tectonic plate boundaries on land hexes. Mountain ranges are represented by two or more contiguous mountain hexsides. (Island chains—which are the tops of mountains rising from the seabed—may be placed along undersea tectonic plate boundaries.)

Badlands: Badlands occur next to mountain hexsides, much like tundra occurring next to ice caps. This is rugged, high terrain with broken ground, gullies and cliffs.

Deserts: There are three types of desert:

Continental Deserts: Continental deserts are placed on any continent where ten or more contiguous, non-tundra, non-badland hexes are present and a 2D6 dice throw of greater than or equal to the planet's UWP code is made. If a desert result occurs, roll 2D6-1 for the number of desert hexes present. When only one continent is present, check once per map triangle with 10 or more contiguous open hexes.



Wind Shadow Deserts: Wind shadow deserts occur because mountain barriers block movement of moisture in the atmosphere. There are wind shadow desert hexes equal to the planet's UWP hydrographic code–1D6. Place them next to mountain or badlands hexes.

Coastal Deserts: Coastal deserts occur because prevailing winds blow moisture out to sea. There are coastal desert hexes equal to the planet's UWP hydrographic code -2D6. They may be placed in any coastal hex within four hexes of the polar caps.

All desert terrain is dry and supports very little to no life.

Jungles: Jungle hexes are placed in regions where temperatures range between 20° and 40° Celsius. If a group of 10 contiguous, non-desert, non-badlands hexes exist on a continent with this temperature range, and a throw of less than or equal to the UWP hydrographic code is made on 2D6, a jungle is present. Islands and archipelagoes may also have jungle terrain. Roll 2D6-1 for the number of island jungle hexes. Jungle hexes must be within three hexes of an ocean or sea. They may not be next to desert hexes.

Jungles teem with life, but are difficult to cultivate or travel through.

Mixed: All remaining hexes are mixed hexes. These are forested if in a wild state, or cultivated farmland if settled. Cities and other settlements are generally located in mixed terrain hexes, usually along rivers or on seacoasts for access to transportation or to a water supply.

Starports: Starports are usually located in mixed terrain, on or near the equator. The equatorial location enables departing ships to take advantage of the planet's rotational velocity at liftoff.



Tidally Locked Worlds

A tidally locked world always has one hemisphere facing its primary star in perpetual daylight and the other facing away in perpetual night. Habitable regions are generally located in the twilight band between the center of the hot hemisphere and the center of the cold hemisphere.

When mapping a tidally locked world, designate the top of the map grid as the starward side or "hot pole" and the bottom of the grid as the nightside or "cold pole." The equator becomes the twilight band where most inhabitants live.

The world's hottest temperature is located at the hot pole, and the coldest temperature at the cold pole. The base surface temperature is found in the center of the twilight band, where the primary star perpetually lingers on the horizon.

Ice sheets cover the cold pole while sun-baked deserts cover the hot side. Any oceans would be found near the equator, fed by drainage from the melting cold polar cap.

ATMOSPHERIC COMPOSITION

This section is intended as an optional tool for referees who wish to add specific detail to **Traveller** worlds. It is not intended as a substitute for the standard UWP atmosphere guidelines discussed elsewhere in this book (Chapter 3, Survey) or in other **Traveller** products.

The mix of gases that make up a world's atmosphere depends on their molecular weight and the minimum molecular weight retained by the world's gravity. The Minimum Molecular Weight Retained table shown here contains values for Low, Average, and High Density worlds with UWP sizes ranging from 1 to A. Note that this density refers to the density of the planetary body, not the planet's atmosphere.

MINIMUM MOLECULAR WEIGHT RETAINED

UWP	*Low Density*	*Average Density*	*High Density*
1	vac	vac	vac
2	vac	vac	90
3	91	45	32
4	63	31	22
5	35	17	12
6	28	14	10
7	18	9	6
8	13	6	4
9	11	5	3
A	8	3	1



Compare the minimum molecular weight retained figure with the molecular weight of gases shown in the Molecular Weight of Gases table. The world's atmosphere will retain gases which have a molecular weight of at least the figure shown for the world's UWP size figure and density. As an example, an average density UWP size 8 world will retain gases in its atmosphere with a molecular weight of 6 or higher.

MOLECULAR WEIGHT OF GASES

Constituent	*Molecular Weight*
Molecular Hydrogen (H_2)	2.00
Helium (He)	4.00
Methane (CH_4)	16.00
Ammonia (NH_3)	17.00
Water Vapor (H_2O)	18.00
Neon (Ne)	20.20
Molecular Nitrogen (N_2)	28.00
Carbon Monoxide (CO)	28.00
Nitric Oxide (NO)	30.00
Molecular Oxygen (O_2)	32.00
Hydrogen Sulfide (H_2S)	34.10
Argon (Ar)	39.00
Carbon Dioxide (CO_2)	44.00
Nitrous Oxide (N_2O)	44.00
Nitrogen Dioxide (NO_2)	46.00
Ozone (O_3)	48.00
Sulfur Dioxide (SO_2)	64.10
Sulfur Trioxide (SO_3)	80.10
Krypton (Kr)	83.80
Xenon (Xe)	131.30

Notes on Selected Atmospheric Gases

Ammonia (NH_3): An irritant gas, ammonia requires protective measures even in mild concentrations. Unlike methane, ammonia has a sharp, pungent odor, and leaks are quickly noticed.

Worlds with ammonia are much like those with methane: large, cold, and with standard to very dense pressure. Ammonia is postulated as an alternative to oxygen as a life-supporting gas.

Carbon Dioxide (CO_2): A non-irritant gas, CO_2 occurs commonly, either by itself or in various combinations. Worlds with carbon dioxide in the atmosphere may be in the early stages of developing carbon-based life (although within a few hundred million years the atmosphere will have changed completely). On the other hand, the local life may be evolving in a totally alien direction.

Carbon dioxide atmospheres have the property of trapping heat, causing a greenhouse effect, which may force the world's temperature far above the range in which humans can survive without protective equipment. A runaway greenhouse effect can turn a world into a hostile inferno, and thus be rated as a corrosive or insidious atmosphere.

Hydrogen (H_2): A non-irritant gas, hydrogen is not poisonous. However, like methane, hydrogen combines explosively with oxygen. A spark can cause an explosion, followed by the precipitation of water, the product of the combination of these two elements. Hydrogen will make up a significant proportion of the atmosphere on large, cold worlds, and is often found in combination with methane and ammonia.

The smallest and lightest of atoms, hydrogen poses a special problem that can require an atmosphere containing any significant amount of it to be rated insidious. The atoms are so small that they can seep right through fabrics, plastics, and even solid metal in a process called diffusion. An airtight seal is not necessarily hydrogen-tight. Starship hulls and the walls of buildings can be sealed against hydrogen leakage; vac suits, however, cannot.

Methane (CH_4): A non-irritant gas, methane (also known as "natural gas") is dangerous if mixed at a low (7-14%) concentration with a standard oxygen-nitrogen atmosphere. Any spark can cause the methane to explode and burn fiercely. This can pose a hazard to adventurers if methane leaks into their habitat, space ship, or vac suit. Pure methane is an odorless, colorless gas, making detection almost impossible.

It is unlikely that free oxygen will be found in an atmosphere containing a significant amount of methane. Methane generally occurs as an active component of the atmosphere on large, cold worlds.

Nitrogen (N_2): a semi-irritant gas, nitrogen is relatively inert in atmospheres with standard temperatures and pressures. If nitrogen and oxygen are present in an atmosphere with more extreme temperature and pressure conditions, the atmosphere becomes more hostile, forming nitrides (nitrogen-oxygen compounds) or nitric acid (NHO_3). Nitrogen occurs in world atmospheres more often than any other gas.

Sulfur Compounds: A variety of sulfur compounds can be found in various atmospheres, from non-irritant to corrosive.

Sulfur compounds in the atmosphere can result from prolonged heavy industrialization, or can occur naturally from heavy volcanic activity. Sulfur compounds are a possible alternative to the more usual carbon-based organic chemistry. Such life forms would be totally alien.

Oxygen Percentage

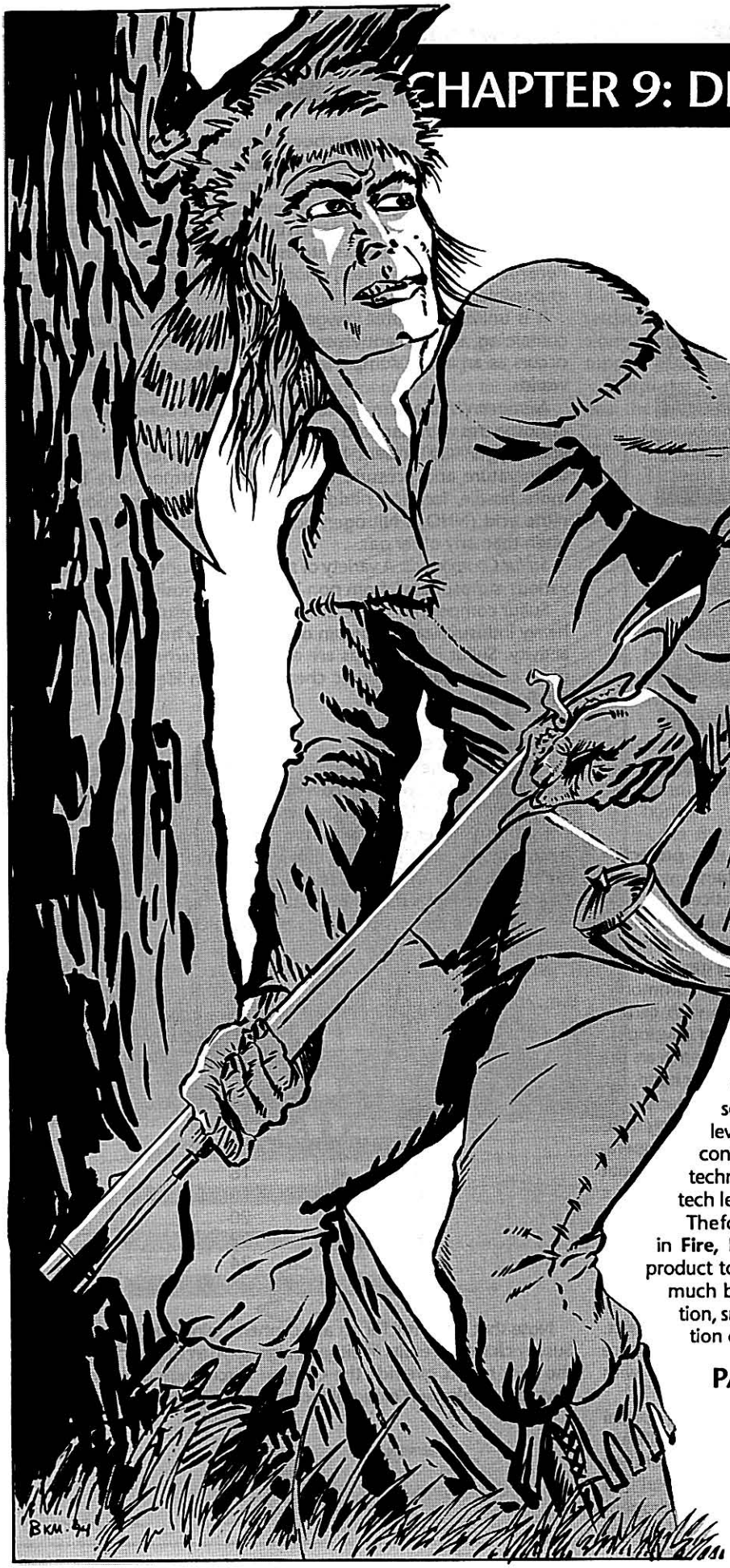
The percentage of free oxygen in a planet's atmosphere depends on the percentage of water covering the world. For purposes of this rule, worlds with a UWP atmosphere code of 0-9 have hydrospheres consisting of water, while worlds with atmosphere codes of A-C have hydrospheres consisting of fluids other than oxygen (and, by definition, do not themselves consist of oxygen in any case). The Oxygen Percentage table shows the percentage of free oxygen in a world's atmosphere based on its UWP hydrographic code.

OXYGEN PERCENTAGE

UWP Hydrographic Code	*Percentage of Free Oxygen*
0	5
1	10
2	12
3	14
4	16
5	18
6	19
7	20
8	22
9	24
A	26

Note that if the roll for an atmospheric taint (see page 16 of the Survey chapter) results in either a high oxygen or low oxygen taint, the taint results override the Oxygen Percentage table, indicating that some unknown external factors have caused this taint.

CHAPTER 9: DESIGN SEQUENCES



BLACK POWDER FIREARM DESIGN

This design sequence is aimed at designing "primitive" firearms, by which we mean weapons firing black powder ammunition. This ammunition consists solely of a bullet and a quantity of black powder. Sometimes the ammunition is included in complete cartridges, wrapped in paper, while at other times the bullets and loose powder are carried and loaded separately.

Due to the tremendous variety of weapons available in a relatively narrow technological band, the following rules make reference to tech levels 2M and 3M ("mature TL-2" and "mature TL-3", where TL-2M is more advanced than TL-2 but not as good as TL-3, and TL-3M is better than TL-3 but not as good as TL-4). The items available at these tech levels represent more mature versions of weapons used at the main tech levels. All tech level 3 weapons designed using the standard design sequence in **Fire, Fusion & Steel** (including tech level 3 brass cartridge ammunition) should be considered 3M technology. Whether or not mature technology items are available on a world or at a given tech level is entirely up to the referee.

The following design sequence parallels that provided in **Fire, Fusion and Steel**, but does not require that product to use. As classic firearms are defined almost as much by their ammunition as by their own construction, small arms design consists of two parts: ammunition design and weapon design.

PART I: Ammunition Design

Ammunition is defined by five characteristics: the tech level, the diameter of the bullet in millimeters (also refered to as caliber), the type of the bullet (spherical, conical, or shot), the length of the cartridge in millimeters, and the type of cartridge (paper or loose powder).



Tech Level: Black powder small arms are available at tech levels 2 and 3. By tech level 4 virtually all firearms use smokeless powder and fixed metallic cartridge cases.

Bullet: The diameter of the bullet in millimeters is called its caliber, and weapons are commonly referred to by their caliber, such as 18mm. Although standard weapons listed in the game are usually in increments of 0.5 millimeters (such as 5.5mm, 7.5mm, etc.) weapons may be designed in any caliber desired, such as 11.43mm or 4.71mm. Small arms may be made in any caliber up 20mm. (Weapons of 20mm and above are usually considered to be cannons.)

Bullet Type: Spherical bullets and shot are available at tech level 2. Conical bullets are available at tech level 3M. Prior to the adoption of conical bullets, rifles fire "patched spherical bullets," which are bullets wrapped in a leather patch to insure a tight fit in the barrel.

If the bullet type is shot (a shotgun shell) the number of bullets in the shell must be specified at this time. The number of bullets must be a multiple of 4.

Cartridge Length: The length of the cartridge is a means of defining how much powder is used to propell the bullet, and is the actual length of the barrel cavity in millimeters filled with powder when the weapon is loaded. The longer the cartridge, the more propellant is contained in it and therefore the more powerful the ammunition.

Ammunition is often referred to by two numbers, the caliber followed by the cartridge length, which helps distinguish it from other ammunition of the came caliber. In the case of shotgun shells the length includes the container for the bullets as well, and so 12 gauge shotgun shells (the most common current shotgun round) is also called 18.5x70mm round, even though the powder cartridge is much shorter than 70mm.

Cartridge Type: For our purposes there are two types of black powder cartridges: loose and paper. Loose cartridges are actually separately carried bullets and powder (often in a powder horn). Paper cartridges include both a bullet and a pre-measured amount of powder all wrapped in paper and sealed against moisure using either wax or grease.

Ammunition Evaluation

Once the ammunition round has been designed, determine its length, weight, magazine weight, and average muzzle energy.

Length: The ammunition length is determined using the following formulae:

Lab = Lc + d
Lac = Lc + 2d
Lasg = Lc

Lab: Length (in millimeters) of spherical bullet ("ball").
Lac: Length (in millimeters) of conical bullet.
Lasg: Length (in millimeters) of shotgun ammunition.
Lc: Length (in millimeters) of the cartridge.
d: Diameter (in millimeters) of the bullet.

Weight: The ammunition weight is determined using the following formula:

$Wa = AwmLc\pi r^2$

r: Radius (in millimeters) of the bullet (half the diameter).
π: 3.1416
Wa: Weight (in grams) of a complete round of ammunition.
Lc: Length (in millimeters) of the cartridge.
Awm: Ammunition weight multiplier, which depends on the bullet type, as shown below.

Ammo Type	*Awm*
Shotgun shell	0.003
Spherical ball	0.003
Conical bullet	0.005

Average Muzzle Energy: The average muzzle energy of ammunition is determined using the following formula. (The actual muzzle energy will be affected by the design of the weapon itself.)

$Ea = TmCmLc\pi r^2$

Ea: Average muzzle energy (in joules) of a cartridge.
Lc: Length (in millimeters) of the cartridge.
r: Radius (in millimeters) of the bullet (half the diameter).
π: 3.1416.
Tm: Tech Level Modifier, as shown on the table below.
Cm: Cartridge modifier, as shown on the table below.

CARTRIDGE MODIFIER

Cartridge Type	*Cm*
Shotgun	0.2
Spherical Ball	0.15
Patched Spherical Ball	0.225
Conical Bullet	0.3

TECH LEVEL MODIFIER

TL	*Tm*
2	0.5
3	0.6

Price: The price of the ammunition is determined by the following formula:

Cr = WTm

Cr: Price in credits.
W: Weight of the round in grams.
Tm: Type multiplier, as determined below:

Type	*Tm*
Shotgun	0.01
Loose Powder	0.005
Paper cartridge (TL-2)	0.05
Paper cartridge (TL-3)	0.01

PART II: Weapon Design

1. BARREL

The barrel of a firearm carries the bullet after the cartridge is fired. Shotguns and muskets, intended for very short ranges, fire their bullets through a smooth bore. Beginning at tech level 3 the barrel is often rifled to impart a spin on the bullet, giving it stability (and thus accuracy) in flight. In addition, the barrel provides a gas-tight constricted space within which the expanding gas of the exploded propellant can act on the bullet, accelerating it. Once the bullet leaves the muzzle of the barrel, however, it begins decelerating. In general, the longer the barrel the higher the muzzle velocity, up to the point where the bullet reaches its greatest possible velocity.

Average Barrel Length: First, determine the average barrel length for the ammunition being used by the weapon. The following formula is used:

$Bla = (Ea+d^2)Rm$

Bla: Average barrel length (in centimeters) - the length of the barrel which allows the ammunition to achieve its average muzzle energy.
Ea: Average muzzle energy (in joules) of the ammunition.
d: diameter (in millimeters) of the bullet.
Rm: Rifling multiplier, as shown below:

Type	*Rm*
Smoothbore	20
Rifled	5

Note 1: Regardless of the results of the above calculations, average barrel length is never less than 10cm.

Note 2: If using **Fire, Fusion, and Steel**, the normal table for rifling multiplier is used, but an additional multiplier of x5 is added for black powder weapons.

Actual Barrel Length: The actual barrel length can be any length desired down to a minimum of 20% of the average barrel length and up to a maximum of 230% of the average barrel length.

Type of Barrel: Barrels may be either light or heavy. All black



powder weapons use heavy barrels except for shotguns, which use light barrels. Weapons other than shotguns may either be rifled or smoothbore. (All shotguns are smoothbores.) Rifled barrels are not available until tech level 3.

Barrel Weight: The weight of the barrel is determined using the following formulae.

Wbl = .02Lb

Wbh = .03Lb

Wbl: Weight (in kilograms) of a light (shotgun) barrel.

Wbh: Weight (in kilograms) of a heavy barrel.

Lb: Length (in centimeters) of the barrel.

Barrel Price: The price of the barrel is determined using the following formula:

Cr = WbBtm

Cr: Price of the barrel in credits.

Wb: Weight of the barrel in kilograms.

Btm: Barrel type multiplier, as determined by the following table:

Type	*Btm*
Smoothbore	100
Rifled	200

Note: Owners of **Fire Fusion and Steel** will notice that black powder rifles have a barrel that weighs as much as a heavy rifled barrel but costs only as much as a light rifled barrel. This is a new type of barrel called Black Powder Rifled.

Actual Muzzle Energy: Once the barrel length is decided on, the weapon's actual muzzle energy can be determined using the following formula.

E = Ea{1 + (0.5[Blp-1])}

E: Actual muzzle energy (in joules) of the weapon.

Ea: Average muzzle energy (in joules) of the ammunition.

Blp: Actual barrel length (cm) dived by average barel length (cm): Bl/Bla

Bl: Actual length (in centimeters) of the barrel of the weapon.

Bla: Average barrel length (in centimeters) for the ammunition used.

If a multiple bullet (i.e., shot) round is fired from the weapon, divide the actual muzzle energy of the round by the number of bullets in the round to determine the energy of each bullet. This is the value used when calculating damage, penetration, and range for multiple round bullets.

Damage: Once muzzle energy is known, it is possible to calculate damage using the following formula.

D = (√E)+15

D: damage value (if D = less than 0.8, damage is 1D6–1, written as "–1.").

E: muzzle energy (in joules).

With a multiple bullet round damage is calculated separately for each bullet. The result is the medium range damage of each bullet. The close range damage *of the entire round* is determined by the following formula:

Dr = .75NDb

Dr: Damage value of the round.

Db: Damage value of a single bullet.

N: number of bullets in the round.

Penetration Rating: It is also possible to determine penetration rating of rifle bullets once muzzle energy is known by consulting the following table.

E	*Pen*
0-2000	Nil
2001-3000	1-Nil
3001-5000	2-Nil
5001-10,000	2-3-Nil
7001-20,000	2-4-6
20001-50,000	2-3-4
50,001+	2-2-3

(*Note*: If using **Fire, Fusion and Steel,** use the penetration table published there but treat all black powder weapons as being one energy category lower, i.e., a black powder weapon of 601-2000 Mj uses the penetration rating for the 0-600 line.)

Smoothbores (shotguns and muskets) are treated diferently, as their bullets tend to be heavy and slow-moving. All smoothbore bullets (both spherical ball and shot) have a penetration of 3-4-5.

(Note that the very high close-range damage of multiple-bullet shotgun shells is caused by multiple bullet hits, each with a lower damage value. In most cases the penetration of multiple bullets from a shotgun will be nil.)

2. LOCK

The lock is the mechanical heart of a black powder firearm. It allows the user to fire the weapon by means of a trigger which activates the mechanism of the lock and in turn ignites the propellant powder charge. Different varieties of locks are available at different tech levels. All locks have a length of 0 (they add nothing to the length of the weapon as they are mounted alongside the barrel) and have a fixed weight, price, and reload time (given in number of actions), as shown on the following chart.

TL	*Type*	*Mass*	*Price*	*Reload*
2	Match Lock	0.3	30	4
2	Wheel Lock	0.6	100	3
2	Snaphanse	0.5	200	2
2M	Flint Lock	0.5	50	2
3M	Percussion	0.3	20	2

3. STOCKS

Stocks refer to rifle stocks and pistol grips. The desired stock for the weapon is selected from the following table. Note that carbine stocks are generally fitted to rifles with short barrels (up to 80% of the average barrel length for the cartridge) or sport versions of rifles. They are not considered sturdy enough for full-length rifles in military use. At tech level 2, "carbines" are often called arquebuses or musketoons.

TL	*Type*	*L (cm)*	*M (kg)*	*Cr*
2	pistol grip	0	0.4	10
2	wooden stock	35	2.5	30
2	carbine stock	25	1.5	25
3	pistol grip	0	0.3	10
3	wooden stock	25	1.5	25
3	carbine stock	25	1.0	20

Range: Once the type of stock is known, the weapon's range can be calculated according to the following formula:

SR = (√E) CmBlm

SR: Short range (in meters) of a weapon.

E: Muzzle energy (in joules).

Cm: Configuration modifier, as shown below. If two configuration descriptionss apply to the same weapon, multiply them together to determine the total configuation multiplier.

Configuration	*Cm*
One-handed	0.4
Two-handed*	1.3
Smoothbore single shot**	0.5

*Note: Two-handed refers to weapons specifically designed to be fired with two hands, and thus including a stock instead of simply a pistol grip.

**Note: Shotgun single-slug rounds, but *not* multiple-shot rounds

Blm: Modification to short range for barrel length. The barrel length modifier is determined by the following formula:

Blm = 1 + ([Blp–1] ×C)



Blm: Barrel Length Modifier.

Blp: Actual barrel length (cm) dived by average barel length (cm): Bl/Bla

Bl: Actual length (in centimeters) of the barrel of the weapon.

Bla: Average barrel length (in centimeters) for the ammunition used.

C: Constant. If (Blp–1 is a negative number, the constant is 1.2. If (Blp–1 is a positive number, the constant is 0.75.

Recoil: Now the weapon's recoil when firing a single shot can be calculated.

R = [(0.15 $\sqrt{E}$)+Ww] + Em

R: Recoil number

E: Muzzle Energy

Ww: Weight, in kilograms, of weapon (loaded)

Em: Modifier for high muzzle energy. If the weapon has high muzzle energy, add to the final recoil as shown on the chart below.

E	*EM*	*E*	*EM*
1001+	1	10,001+	4
2501+	2	20,001+	5
5001+	3	50,001+	6

Bulk: Once the final length of the weapon has been determined the bulk can be calculated. Bulk is equal to the weapon length (in centimeters) divided by 15, rounding all fractions down.

4. ADDITIONAL CONSIDERATIONS

The following items are either options that can be added to a weapon, or are special circumstances that must be considered.

Bayonet Lugs: Bayonet lugs are simple standardized brackets at the end of the weapon barrel. A bayonet lug costs nothing, has negligible mass, and adds no length to the weapon, but must be specified as part of the design.

A bayonet is less useful than a hand-held knife unless it is mounted on a well-balanced weapon with sufficient length to allow it to be used as a spear point. This is affected by tech level and bulk.

Tech Level: Weapons with fixed bayonets at tech level 2 suffer a +1 Diff Mod for their chances to hit in melee combat, due to the bulky and heavy nature of stocks.

Bulk: Only weapons with a bulk of 4 or more may profitably benefit from a bayonet lug. Shorter weapons may have them, but the mounted bayonet counts as a short range (instead of long range) melee wepon and suffers a +1 Diff Mod for its chance to hit in melee combat. Note that this translates into a +2 Diff Mod if the weapon uses a tech level 2 stock.

Reload Time: The listed reload number is that used by the weapon. However, the reload time may be increased due to extreme bulk, type of ammunition used, and presence of a fixed bayonet.

Extreme Bulk: Very long weapon are difficult for a single soldier to load by means of conventional muzzle loading techniques. Add one to the reload value per bulk number in excess of 9. For example, a flintlock musket with a bulk of 11 would have a reload rating of 4, meaning that it requires four actions to reload.

Ammunition Type: Patched ball and loose powder ammunition talke longer to reload than conventional cartridges. These increases are cumulative, and so a flint lock rifle firing a patched ball and using loose powder (instead of a paper cartridge) would have a reload time of 4. These modifiers should be noted with the ammunition, however, instead of the weapon, since the same weapon firing a paper cartridge spherical bullet would have a reload rating of 2.

Ammunition	*Reload*
Patched Ball	+1 action
Loose cartridge	+1 action

Fixed Bayonet: Add one to the reload time of any muzzle-loaded small arm which has its bayonet fixed on its bayonet lug.

Multiple Ammunition Types: Black powder rifles must fire either a conical bullet or a patched spherical bulet to take advantage of the weapon's rifling. A rifle can fire an unpatched spherical ball, but performs like a musket when it does so. When evaluating a black powder rifle, it is a good idea to also evaluate its performance with unpatched ball ammunition. Most of the differences between a rifle and a smoothbore are included in the performance of the ammunition itself, but when calculating range be sure to include the 0.5 smoothbore multipler.

WAGONS

Wagons may be designed for use on low-tech worlds using the Ground Vehicle Design sequence in **FF&S** with the following additions and exceptions:

Chassis: The chassis is generlaly made of wood, and need only have an equivalent armor value of 0.2. Use the following values for wood construction:

TL	Type	Toughness	Mass	Price (MCr)
1	Wood	0.2	0.8	0.001

Since the wagon is drawn by draft animals, no internal provision need be made for a power plant.

Suspension: Add this line to the Suspension table

Type	*TL*	*Vol.*	*Mass*	*SA*	*Price*
Wagon Wheel	1	3.5	0.1	70	.002

Power Plant: Wagons are pulled by draft animals which become the wagon's power plant. Each draft animal pulls with a force in megawatts equal to its mass in tonnes multiplied by 0.0005. A 2-tonne draft animal, for example, pulls with the equivalent of 0.001 MW.

Horses average 350 kg in mass.

Oxen average 600 kg in mass.

Crew: One wagon driver on a bench seat, which counts as a restricted passenger seat.

Passengers: If desired, additional bench seats may be installed for passengers. Treat these as Restricted Seats.

Road Speed:

Base road speed in kilometers per hour = (MW + LM) x 7000.

MW = pulling power, in megawatts, of the draft animals.

LM = loaded mass in tonnes of the vehicle, excluding the mass of the draft animals.

However, road speed is limited to the maximum speed of the draft animal pulling the vehicle. Light draft animals (massing 500 kilograms or less) have a maximum road speed of 5 kilometers per hour. Heavy draft animals (massing over 500 kilograms) have a maximum road speed of 2.5 kilometers per hour.

Cross-Country Speed: Base cross-country speed in kilometers per hour = (MW + LM)x4000.

However, cross-country speed is limited to the maximum speed of the vehicle being drawn and the maximum speed of the draft animal drawing it (as noted above). Vehicle maximum cross-country speeds are limited by the loaded mass (in tonnes, but not counting the mass of the draft animals) of the vehicle, as shown in the box to the right.

LM	*Max Speed*
0.4	4.5
0.6	4.0
0.8	3.5
1	3.0
>1	2.5

Combat Move: The combat movement of animal-drawn vehicles (in meters per turn) is the vehicle's maximum speed (in kilometers per hour) multiplied by 2.15, rounding the result to the nearest increment of 5.



BOW WEAPON DESIGN

Bow weapons are projectile weapons that use mechanical energy (rather than chemical energy as in firearms) to launch projectiles intended to do damage to a target. As such, they are low-tech alternatives or precursors to firearms, but also remain in limited use at high tech levels in specialized roles or for sporting and recreational purposes.

1. Design

A bow is defined by three characteristics: material, length, and type. As some of these are tech-level dependent, the designer must first determine the tech level of design and then specify its exact characteristics.

Material: There are five materials from which bows are commonly made, as shown on the Bow Material Table below. Select one for the bow.

Length: Bow length is measure in meters from tip to tip. Select any length desired.

Mass: Based on the length and material, calculate the mass of the bow. The mass in kilograms per meter of bow length is given on the Bow Material table. Multiply this value by the bow length in meters to determine its total mass in kilograms.

Shaft Energy: Based on the length and material, calculate the energy of an arrow fired from the bow (called its shaft energy). The shaft energy, in joules per meter of bow length, is given on the Bow Material table. Multiply this value by the bow length in meters to determine its total shaft energy in joules.

Price: Based on the length and material, calculate the price of the bow. The price in credits per meter of bow length is given on the Bow Material table. Multiply this value by the bow length in meters to determine its total price in credits.

Type: There are two types of bows: conventional bows and crossbows. If a conventional bow, the design process is complete.

Any bow at tech level 1 and higher may be a crossbow, and any bow longer than the average height of an adult of the race for which it is designed *must* be a crossbow. (Humans have an average height of 1.8 meters.) Crossbows are not available at tech level 0.

Crossbows require a stock/trigger and a cocking mechanism in addition to the bow itself. A bow with a shaft energy of 500 or more joules requires a windlass, and is called a heavy crossbow. A bow with a shaft energy of less than 500 joules requires only a cocking handle and is called a light crossbow.

Consult the Crossbow Hardware Table for the masses and prices of these items and add them to the mass and price of the bow to determine the total mass and price of the weapon.

BOW MATERIAL

TL	*Material*	*M*	*E*	*Cr*
0	Wood	0.6	50	100
1	Horn	0.5	60	150
1	Composite	0.7	70	200
2	Steel	2	150	200
7	Composite Steel	1	200	300

TL: Tech level of construction.
Material: material used to construct the bow.
M: Mass, in kilograms, per meter of bow length.
E: Shaft energy, in joules, per meter of bow length.
Cr: Price in credits per meter of bow length.

CROSSBOW HARDWARE

Item	*Mass*	*Cr*
Stock/trigger	1.5	50
Cocking handle	0.5	25
Windlass	1	75

Mass: mass in kilograms of noted item.
Cr: price in credits of noted item.

2. Evaluation

Once the bow is designed, the following combat characteristics can be determined.

Reload Rate: Reload rate, in the required number of actions to prepare another arrow for firing (exclusive of the aiming action) is depenent on the type of bow, as shown below.

Weapon	*Reload*
Bow	1
Crossbow	3
Heavy Crossbow	5

Damage Value: The damage value of an arrow is calculated the same as for a bullet. Divide the square root of its shaft energy by 15 and round to the nearest whole number.

$$D = (\sqrt{E})+15$$

Calculated damage value of less than 0.8, however, become recorded damage values of "–1" (meaning 1D6–1).

Penetration: Any bow with a shaft energy of 601 joules or more has a penetration of 1-Nil. All other bows have a pentration of Nil.

Bulk: The bulk of the bow is the length of the bow in meters divided by 0.15, rounding fractions down.

Required Strength: Required strength is equal to the shaft energy of the bow divided by the torsion efficiency of the bow, rounding fractions to the nearest whole number. Torsion efficiencies are listed below.

Type	*TE*
Conventional Bow	15
Composite Steel Bow	30
Light Crossbow	30
Heavy Crossbow	60

Required strength is recorded in the single shot recoil column of the weapon's record form, and is used in exactly the same manner as a recoil number.

Range: The short range in meters of a bow weapon is equal to three times the square root of its shaft energy in joules, rounding to the nearest increment of 10 meters.

$$SR = 3\sqrt{E}$$

3. Ammunition

Ammunition for conventional bows is called arrows; ammunition for crossbows is called bolts or quarrels. In either case, the specifics are the same.

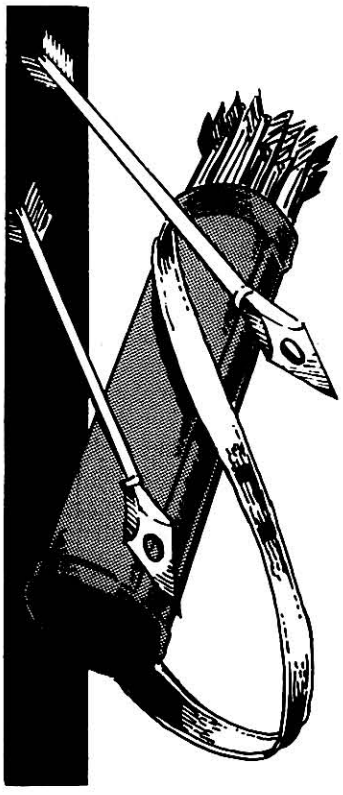
Price: One arrow or bolt/quarrel costs Cr1.

Mass: One arrow or bolt/quarrel masses 40 grams (0.04 kg).

Ammunition is carried in containers called quivers. Quivers may be worn over the shoulder or hanging from the belt. Quivers are designed by specifying the number of arrows/bolts/quarrels they are to carry.

Price: A quiver costs 0.5 credits per arrow/bolt/quarrel that can be carried in it.

Mass: The mass of a quiver is equal to the mass of the ammunition that can be carried in it.





BLACK POWDER CANNON DESIGN SEQUENCE

For owners of **Fire, Fusion, & Steel** this design sequence will be quite familiar, as it is an abbreviated version of the CPR gun design procedure. This sequence covers black powder artillery built at tech levels 2 and 3. A black powder cannon is a specialized (primitive) form of CPR gun relying on a less efficient form of propellant.

Part I: Weapon Design

A. Specifications

The characteristics of black powder cannon are determined by five specifications. In addition, the weapon's muzzle energy is used through the rest of the design sequence and is calculated at this time.

1. Tech Level: Select a tech level appropriate to the world where the gun was built. These weapons are built at tech levels 2 and 3. Some weapon features are described as "mature" tech level 3 innovations, and so are only available at mature tech level 3 worlds (abbreviated tech level 3M). See page 92 for a discussion of mature tech levels.

2. Type: There are five types of black powder cannons: mortars, howitzers, smoothbore guns, rifled muzzle-loading guns, and rifled breach-loading guns. Mortars and smoothbore guns are available at tech level 2 and up. Howitzers are available at tech level 3 and up. Rifled guns (both types) are available at tech level 3M.

3. Bore Size: Bore size, also known as caliber, is the diameter of the gun's bore. The smallest black powder cannon has a bore of 5cm. The cannon table lists bore sizes in increments of centimeters, but intermediate sizes may be selected as well, such as 7.62cm.

4. Barrel Length: Barrel length is expressed as a length in calibers. That is, a 12cm gun with a barrel fifteen calibers long would be (12x15=180) 180 centimeters long. Barrels may be of any length desired up to 80 calibers. Howitzers may not be any more than 12 calibers long while mortars may not be any more than 5 calibers long. Field guns usually range from 15-25 calibers long while longer barrels are usually reserved for heavy siege artillery.

5. Mount: Mortars must be mounted on a mortar carriage, which is a flat stable platform designed to take the stress of high angle fire. Guns and howitzers may be mounted either on field carriages or truck carriages. Field carriages have a single axle and two large wheels, with a trail that rests on the ground during firing. It is designed to provide both a mobile carriage and a stable firing platform. Truck carriages are lower and generally have two axles and four small wheels. They are lighter and handier, but are not suitable for cross-country movement. They are mostly used in fortresses and aboard ships.

6. Muzzle Energy: The cannon table (page 99) lists the muzzle energy, in megajoules (Mj), of each bore size gun assuming a barrel length of 60 calibers. (Note that the information on this table is the same as that printed on page 109 of **Fire, Fusion, & Steel.**) For bore sizes which fall between those listed on the table, use interpolation to find the correct muzzle energy.

For every caliber in length longer than 60, increase the muzzle energy by 1%.

For every caliber less than 60, reduce the muzzle energy by 2%, until the weapon reaches 15 calibers. For every caliber in length less than 15 calibers, reduce the muzzle energy by 1%.

When this calculation is completed, multiply the result by the configuration modifier found on the Cannon Configuration table to the right.

CANNON CONFIGURATION

Configuration	*Multiplier*
Smoothbore Gun	0.3
Rifled Gun	0.6
Howitzer	0.25
Mortar	0.15

B. Mass

The complete cannon weight is equal to the weight of the cannon barrel plus the carriage.

1. Gun Mass: Consult the Cannon table (page 99) and read the weapon mass (in tonnes). The mass on the table assumes a 60-caliber gun. Increase or decrease the mass by 1% for each caliber change in length up or down. A gun 25 calibers long, for example, is 35 calibers less than 60, and so would mass (100–35=65) 65% of the mass shown on the table.

If the bore size falls between two bore sizes on the table, interpolate the correct value.

Once this calculation is done, multiply the result by the configuration multiplier found on the table below.

Configuration	*Multiplier*
Mortar	1.5
TL 2 gun	1.0
TL 3 Gun	0.75
Howitzer	0.6

2. Carriage Mass: The carriage mass of a cannon, in tonnes, is determined by its barrel mass, configuration, and tech level, according to the following formula:

CrM = TM × CM × BM

CrM: Carriage mass in tonnes.
BM: barrel mass in tonnes.
CM: configuration modifier from table below.
TM: tech multiplier from table below.

CONFIGURATION MODIFIER

Configuration	*CM*
Gun, truck carriage	0.6
Gun, field carriage	1
Howitzer, truck carriage	0.9
Howitzer, field carriage	1.5
Mortar	0.8

TECH MULTIPLIER

TL	*TM*
2	2
3	1

C. Gun Crew

The number of crewmen required to man a gun depends on its bore size and carriage. A field gun or howitzer requires crewmen equal to its bore size in centimeters (rounding fractions down) plus 5. A mortar or a cannon on a truck carriage requires crewmen equal to its bore size in centimeters (rounding fractions down).

A 7.6cm field gun, for example, requires a crew of 12, while the same weapon on a truck carriage requires only 7 crewmen.

D. Range

Cannons have four direct fire ranges: short, medium, long, and extreme. Black powder weapons cannot engage in indirect fire in the modern sense, although mortars and howitzers can lob shells over obstructions.

Short range is mostly a function of the muzzle velocity of a weapon, which is largely determined by its barrel length. A secondary consideration is the size of the round, as larger rounds lose velocity from drag more slowly than do smaller rounds.

Short direct fire range in meters for a black powder cannon is equal to the sum of its bore size in centimeters plus its barrel length in calibers plus 20, all multiplied by a configuration multiplier.

SR = Cm(B+L+20)

Configuration	*Cm*
Howitzer (TL 3 only)	2
TL 2 SB gun	2.5
TL 3 SB gun	3
TL 3M Rifled ML	5
TL 3M Rifle BL	4.5



Mortars calculate range differently. Mortars have only a long range and an extreme range (twice long range). They may not fire at any target at ranges less than their calculated long range nor more than their extreme range, and all shots fired are resolved as extreme range fire.

Long range is calculated using the following formula:

$$LR = B \times BL \times TM$$

LR: long range in meters. Mortars have only a long range and an extreme range. May not fire at anything at less than long or greater than extreme. All shots count as extreme range.

B: bore in cm.

BL: barrel length in calibers.

TM: tech level modifier.

TL	TM
2	5
3	12

E. Reloading

The time the weapon requires to reload is a function of the mass of its barrel and whether it is a breachloader or a muzzleloader.

The number of five-second turns required to load a round in a tech level 2 muzzleloader is equal to the the mass of the barrel in tonnes multiplied by 7, rounding all fractions to the nearest whole number (but rounding any result of less than 1 up to 1).

The number of five-second turns required to load a round in a tech level 3 muzzleloader is equal to the the mass of the barrel in tonnes multiplied by 5, rounding all fractions to the nearest whole number (but rounding any result of less than 1 up to 1).

The number of five-second turns required to load a round in a breachloader is equal to the the mass of the barrel in tonnes multiplied by 4, rounding all fractions to the nearest whole number (but rounding any result of less than 1 up to 1).

The minimum reload time for a muzzle-loading black powder cannon is 3 turns. The minimum reload time for a breach-loading black powder cannon is 2 turns.

F. Price

The price of the weapon is equal to the sum of the price of the barrel and the carriage, both of which are determined by the mass of the component. The price of each component in millions of credits is equal to its mass in tonnes times its cost multiplier, shown in the box above.

Component	Cost Multiplier
Barrel	0.02
Carriage	0.002

G. Set-Up

All towed field cannon must be set up before they can fire. Ship and fortress guns on truck carriages are assumed to be set up and ready to fire (once they have been loaded).

The time, in five-second combat turns, needed to set up a towed cannon on a field carriage is equal to its bore size in centimeters times 4.

The time, in five-second combat turns, needed to set up a mortar is equal to its bore size in centimeters times 8.

H. Volume

The volume of a cannon in cubic meters, for purposes of transportation or mounting in a fortress or ship, is equal to its mass in tonnes.

Part II: AMMUNITION

A complete round of ammunition for a cannon consists of a projectile and a propelling charge of black powder. At tech level 2 the propelling charge is usually poured into the cannon from a barrel or put in with scoops. Superior textile manufacturing techniques at tech level 3 allow widespread and inexpensive use of linen powder charges, making loading quicker.

A. Specify Projectile Type

There are four different projectile types available for black powder cannon, each with its own special function.

1. Shell: This is a hollow projectile filled with black powder and detonated by a burning fuse. The time to bursting is controlled by cutting the fuse to different lengths. Smoothbore weapons (including black powder mortars and howitzers) fire spherical shell, so-called due to the shape of the projectile, while rifled weapons fire conical shell with a larger bursting charge.

2. Shot: This is the most common projectile fired by early black powder cannons, consisting of a solid iron shot. Smoothbore guns fire spherical shot while rifled guns fire conical shot.

3. Cannister: Canister is a tin cylinder filled with musket balls. When fired, the tin cannister bursts upon leaving the gun and scatters the musket balls, much like a large shotgun.

4. Shrapnel: This round, available only at tech level 3M, is a combination of shell and cannister, the hollow projectile filled with both powder and ball and with a time fuse. Shrapnel is actually available at tech level 3, but the unreliability of the fuses makes it little different than common shell in effect and so it is ignored until tech level 3M.

B. Tech Level

The principal effect of tech level is to limit the availability of certain projectile types, as shown at right.

TL	Projectile
2	spherical shot and shell, cannister
3M	conical shot and shell, shrapnel

C. Projectile Diameter

The projectile diameter is the bore of the gun (in centimeters) from which the round is fired.

D. Damage Value

Damage value is a measure of the force generated at the point of impact by the projectile. In the case of shell, this is a measure of the explosive force of the round, and is called concussion. Non-exploding rounds do damage by the energy of impact. Damage is calculated differently for various types of projectiles.

1. Shell: Shells do damage by the concussion of the explosion of their bursting charges. The concussion value of the charge is calculated using the following formula:

$$C = Tm \times D^2$$

C: Concussion value.

D: Projectile diameter in centimeters.

Tm: Tech level modifier, as shown on the chart to the right:

TL	Tm
2	0.02
3	0.03
3M*	0.05

* Used only for conical shell

2. Shot: Shot projectiles have a damage value equal to their diameter in centimeters multiplied by 2.2. This is a constant value for use only for direct hits on personnel. It is never used versus vehicles or structures (for which purpose the penetration value, calculated below, is used).

3. Cannister: Each ball from a cannister round does personnel damage equal to fragments by burst area (2D6 within the primary radius, 1D6 in secondary).

4. Shrapnel: Each ball from a shrapnel round does personnel damage equal to fragments by burst area (2D6 within the primary radius, 1D6 in secondary).

E. Burst

Burst radius defines the area covered by the primary effects of a bursting warhead, usually the area covered by potentially lethal fragments or musket balls.

The formulas below give exact burst radii. To convert to the standard **Traveller** burst area figures resolved to the 10-meter grid,



round to the nearest 10-meter increment (as listed on page 284 of the basic rules). For example, 7 meters rounds to 5, 12 rounds to 15, 30 to 35, etc.

1. Shell: The burst radius of a shell is the primary burst area covered by fragments. The burst radius in meters is the square root of the warhead's concussion value multiplied by 7 for guns and howitzers and by 10 for mortars.

2. Shot: Shot does not explode and so has no burst radius.

3. Cannister: Unlike shell, cannister rounds have an elongated burst area, since the musket balls keep moving along the ballistic path of the cannister after it disintegrates.

The primary burst area is the area immediately beyond the muzzle of the firing cannon, while the secondary burst area is the area after that. The primary burst area is defined as half of the short range of the cannon.

4. Shrapnel: The burst radius of a shrapnel round is the primary burst area covered by fragments. The burst radius in meters is the square root of the warhead's concussion value multiplied by 15.

F. Penetration

Cannon are usually used against vehicles or structures, and so their penetration is expressed as a penetration value, the total penetrative capability of the round.

1. Shell: Penetration of a shell is a function of bore size. Subtract 7 from the bore size (in centimeters) to determine the penetration value of the shell. All shell rounds have a constant penetration value and so the letter "C" is written after the value. Rounds with a penetration value of less than 0 are shown as "Nil." Rounds with a penetration value of 0 have that listed as their penetration value (meaning that the final penetration is the base 2D6 roll without any addition).

2. Shot: Shot relies on muzzle energy to pierce hostile armor. Penetration value is a function of range and muzzle energy. The base penetration of solid shot ammunition at medium range is based solely on muzzle energy (in megajoules) of the gun, as shown below.

If Mj = 12+, then PV = Mjx4.
If Mj < 12, then PV = Mjx5 (but never higher than 48).
If Mj < 9, then PV = Mjx6 (but never higher than 45).
If Mj < 7, then PV = Mjx7 (but never higher than 43).
If Mj < 5, then PV = Mjx8 (but never higher than 35).
If Mj < 1.5, then PV = Mjx10 (but never higher than 12).
If Mj < 1, then PV = Mjx12 (but never higher than 10).
If Mj < 0.5, then PV = Mjx16 (but never higher than 6).
If Mj < 0.3, then PV = Mjx22 (but never higher than 5).

For example, a gun has a muzzle energy of 4.6 Mj. Since this is less than 5 but not less than 1.5 Mj, the gun has a penetration value equal to Mjx8, or 36.8, rounded up to 37, but then reduced to 35 (the maximum PV for weapons with a muzzle energy of less than 5 Mj.

The result of the calculations above is the penetration of conical shot. For spherical shot, multiply the result by 0.7.

Once the medium range penetration value is known, penetration values for the other range bands can be calculated.

At short range, add 15% of the penetration value or a flat value of 10, whichever is less.

At long range, subtract 15% of the penetration value, or a flat value of 10, whichever is less.

At extreme range, subtract 45% of the penetration value, or a flat value of 30, whichever is less.

3. Cannister and Shrapnel: The bullets contained in cannister and shrapnel rounds have the same penetration value as normal fragments (1 in the primary radius, Nil in the secondary).

G. Mass

All spherical shot and shell and cannister projectiles have a mass calculated according to the following formula:

$$PM = (\pi r^3)+100$$

PM: projectile mass in kilograms.
π: 3.1416
r: radius of the projectile (half the diameter) in centimeters

All conical shot and shell and shrapnel use the same formula but multiply the result by 2.

H. Volume

The volume of a projectile in cubic meters for purposes of storage is equal to the mass of the projectile in tonnes divided by 5.

I. Price

The price for ammunition in credits is equal to its mass multiplied by its ammunition type modifier, as shown below

Type	*Modifier*
Shell	10
Shot	5
Cannister	10
Shrapnel	20

Part III: POWDER CHARGE

The propelling powder charge (carried in a linen cartridge at tech level 3) is defined in terms of mass and price.

A. Mass

The pass of a powder charge is equal to the mass of the projectile being fired multiplied by 0.25.

B. Volume.

The volume of a powder charge in cubic meters for purposes of storage is equal to the mass of the powder charge in tonnes divided by 5.

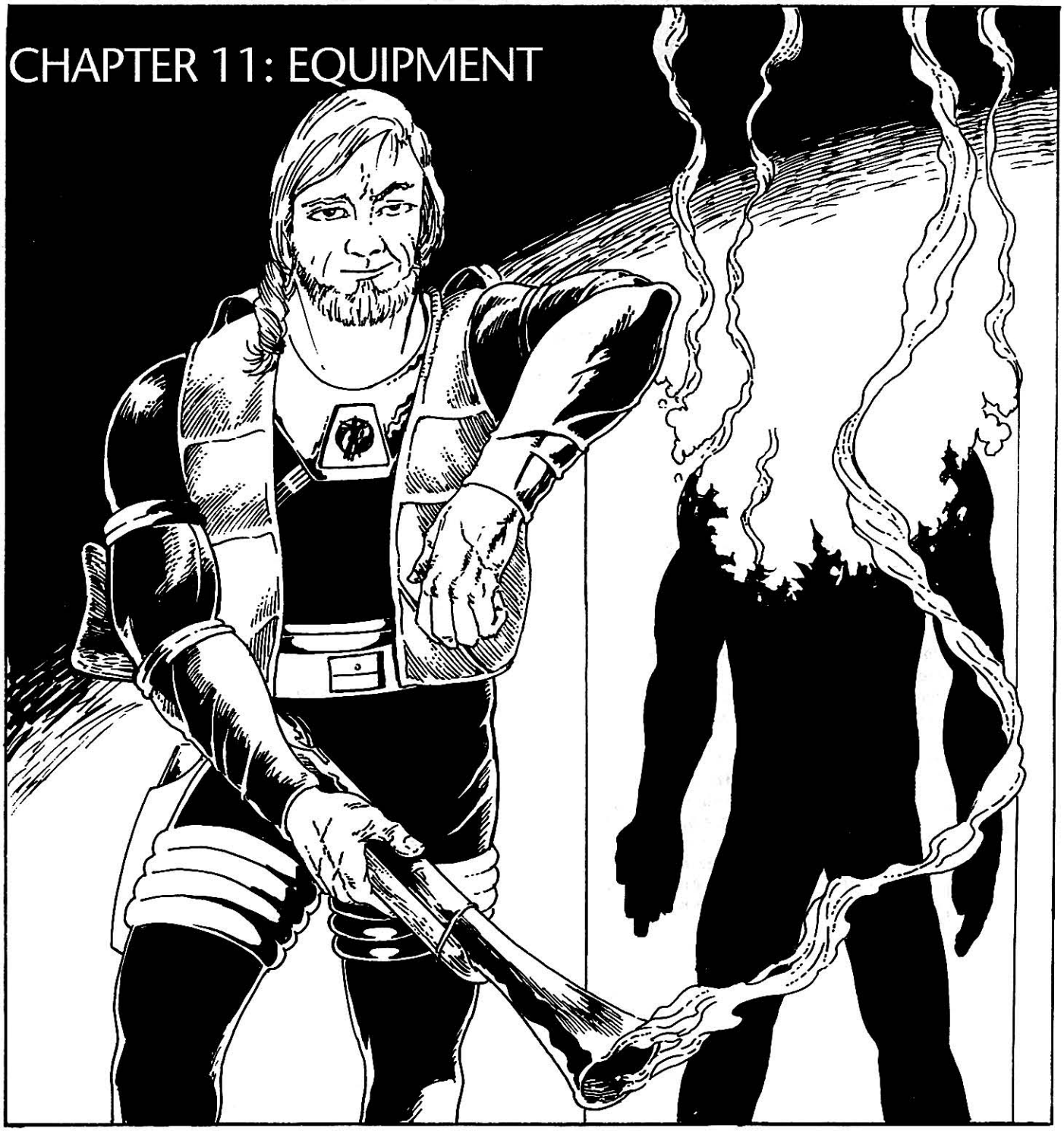
C. Price

The price of a powder charge in credits is equal to its mass in kilograms multiplied by 5.

CANNON TABLE

Bore (cm)	*Gun Mass (tonnes)*	*Gun Muzzle Energy (Mj)*
5	0.30	0.8
6	0.42	1.6
7	0.54	2.4
8	0.60	3.6
9	1.0	4.9
10	1.2	6.0
11	1.5	7.7
12	2.1	9.3
13	2.7	11.7
14	3.3	15.0
15	4.0	18.6
16	4.5	23
17	6.0	29
18	7.5	36
19	9	41
20	11	48
21	13	55
22	15	63
23	17	72
24	19	83
25	21	96
30	30	150
35	40	230
40	50	350
45	60	500

CHAPTER 11: EQUIPMENT



"In comparison to modern firearms, the performance of low-tech black powder weapons such as the blunderbuss is unimpressive, but this is no reason for complacency. At short range, unarmored targets of the blunderbuss will end up just as dead as if they were hit by a plasma pulse."

— Gunnery Sergeant Midushuugi "Leaper" Liebman
RCES Primitive Weapons Familiarization Seminar

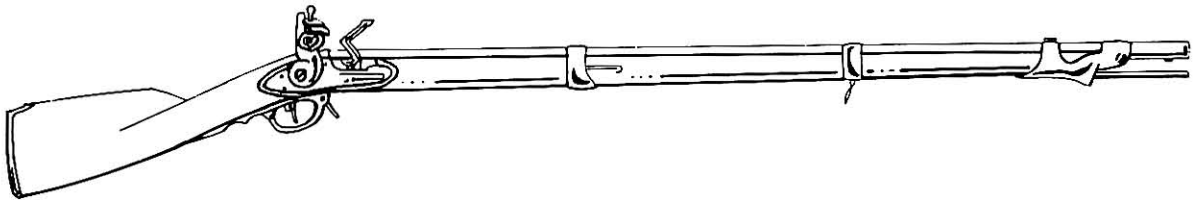
Not all of the equipment in the following section is high tech, but it can be dangerous nonetheless. In the Wilds, a long way from hospitals, spare parts bins, and maintenance bays, it only takes one lucky shot to ruin your whole day, and it doesn't matter if that shot is a plasma bolt, an armor-piercing fin-stabilized discarding-sabot bonded superdense kinetic energy penetrator, or a lousy arrow, or even a rock.

The following pages show the mainstay weapons of worlds of tech levels 2 and 3, from manportable black powder small arms on pages 101-104 up to crew-served cannons on 105-106. These may be encountered carried by "zippers" in the Wilds, or picked up as extemporaneous armament by RC troops, bootstrap team leaders, or undercover agents.

In addition to this low-tech equipment, three new starships suited for colonial transport are presented here, beginning on page 107.

All of the equipment shown here is designed with the **Fire, Fusion, & Steel** Technical Architecture sourcebook, or the design sequence additions found here in this book.

Smoothbore Flintlock Musket
Rifled Musket



Smoothbore Flintlock Musket

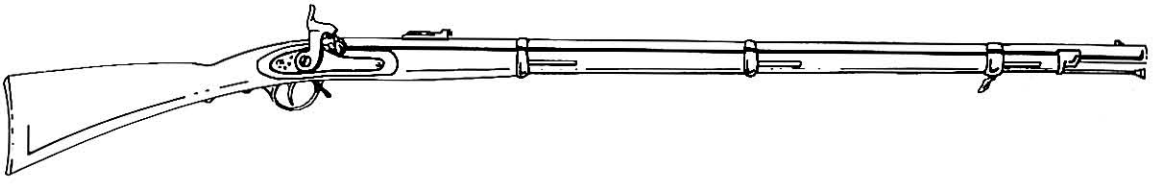
A flintlock uses a spring-loaded flint-and-steel striker to ignite the main powder charge in a gun barrel. The weapon illustrated is typical of numerous archaic designs in use on very low TL worlds, and in the hands of poorly equipped militias and insurgents on worlds with higher technology levels. Because of its short range and poor accuracy, smoothbore muskets are most effective when used by massed bodies of soldiers exchanging volley fire.

This weapon holds one individually loaded round inserted in the muzzle, and requires two actions to reload. If prepared paper cartridges are not available, the weapon may be loaded using loose powder and ball, but this takes one additional action.

TL: 3
Ammo: 18×52mm black powder and ball in paper cartridge
Muzzle Energy: 1446 joules
Weapon Length: 130 cm
Weapon Weight: 5.19 kg loaded, 5.15 kg empty
Weapon Price: Cr390

Magazine: None.
Ammunition Price: Cr0.4 (Ball)
Ammunition Weight: 40 grams per round
Features: Bayonet lug.

						— Recoil —		
Round	*Reload*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18mm P&B	2	3	Nil	8	1i	2	—	30



Rifled Musket

Rifled muskets of the type illustrated are more advanced archaic firearms. Using a rifled barrel and a conical bullet, the rifle musket achieves greater range and damage than the smoothbore version, and the percussion cap ignition system results in fewer misfires. Soldiers using these weapons are able to make use of more modern tactics and need not resort to massed volleys (although the weapons are sometimes used in that fashion).

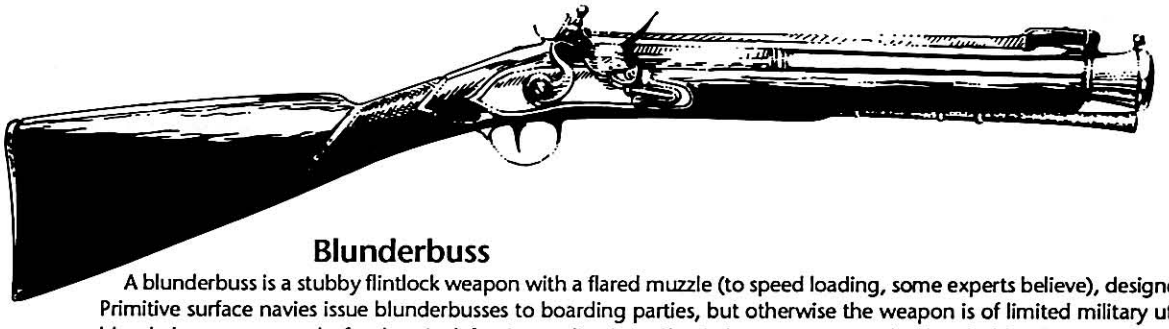
This weapon holds one individually loaded round inserted in the muzzle, and requires two actions to reload. If prepared paper cartridges are not available, the weapon may be loaded using loose powder and bullet, but this takes one additional action.

TL: 3M
Ammo: 12×76mm black powder and conical bullet in paper cartridge
Muzzle Energy: 2010 joules
Weapon Length: 110.8 cm
Weapon Weight: 4.41 kg loaded, 4.37 empty

Weapon Price: Cr560
Magazine: None.
Ammunition Price: Cr0.43 (Conical bullet)
Ammunition Weight: 43 grams per round
Features: Bayonet lug.

						— Recoil —		
Round	*Reload*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
12mm P&B	2	3	1-Nil	7	1i	3	—	80

Blunderbuss
Double Blunderbuss



Blunderbuss

A blunderbuss is a stubby flintlock weapon with a flared muzzle (to speed loading, some experts believe), designed for close-range use. Primitive surface navies issue blunderbusses to boarding parties, but otherwise the weapon is of limited military utility. In civilian hands, blunderbusses are popular for close-in defensive applications. Shot is the most common loading for blunderbusses, because of the devastating short range damage value (rivaling that of many more modern weapons).

The word "blunderbuss" is believed to descend from a word meaning "thunder-gun" an old Terran language known as Dutch. The name is an obvious reference to the weapon's powerful discharge.

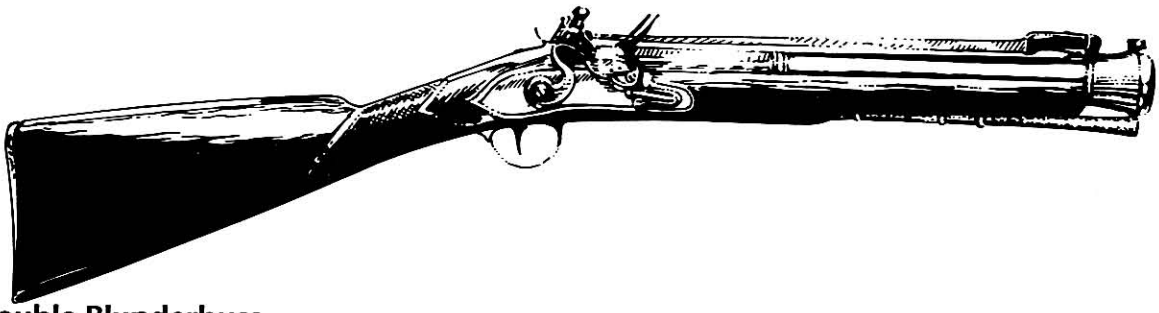
The weapon can be fitted with an optional spring bayonet, which adds 0.2 kg to the weight and Cr20 to the price. This bayonet is kept folded against the side or top of the barrel when not in use, and is released by a thumb-operated latch when the firer desires. When released, the bayonet flips forward into position and locks into place, ready for use. The bayonet does not increase the weapon's mass enough to change recoil.

Weapon Price (with Spring Bayonet): Cr185
Magazine: None.
Ammunition Price: Cr0.94 (slug or shot)
Ammunition Weight: 94 grams per round
Features: Optional spring-loaded bayonet.

TL: 2M
Ammo: 20×100 loose black powder and shot or slug
Muzzle Energy: 2021 joules
Weapon Length: 70 cm
Weapon Weight: 2.994 kg loaded, 2.9 empty
Weapon Weight (with Spring Bayonet): 3.194 kg loaded, 3.1 empty
Weapon Price: Cr165

						— *Recoil* —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
20mm P & B	3	3	Nil	4	1i	3	—	4
20×100 Shot Short	3	18	Nil	4	1i	3	—	3
Medium	3	1	Nil					

Note: A shot round fired at medium range is resolved as a 5-dice burst.



Double Blunderbuss

The double blunderbuss is a standard blunderbuss manufactured with two barrels. As with the normal blunderbuss, shot is the most common load.

This weapon can be fitted with an optional spring bayonet, which adds 0.2 kg to the weight and Cr20 to the price. This bayonet is kept folded against the side or top of the barrel when not in use, and is released by a thumb-operated latch when the firer desires. When released, the bayonet flips forward into position and locks into place, ready for use. With the spring bayonet, the weapon's recoil becomes 2.

The weapon may discharge both barrels in a single 5-second turn, as if the weapon had an ROF rating of SA.

TL: 2M
Ammo: 20×100 loose powder and slug or shot
Muzzle Energy: 2021 joules
Weapon Length: 70 cm
Weapon Weight: 4.394 kg loaded, 4.3 empty
Weapon Weight (with Spring Bayonet): 4.594 kg loaded, 4.5 empty

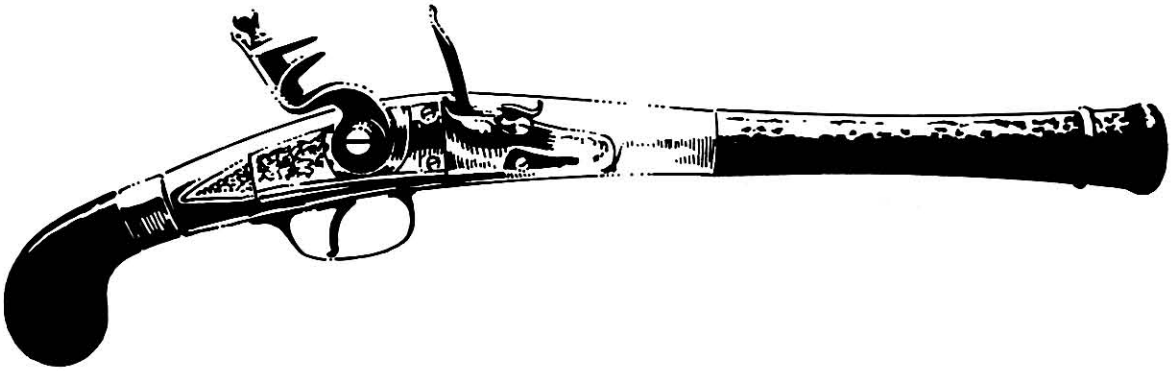
Weapon Price: Cr305
Weapon Price (with Spring Bayonet): Cr325
Magazine: None.
Ammunition Price: Cr0.94 (slug or shot)
Ammunition Weight: 94 grams per round
Features: Optional spring-loaded bayonet.

						— *Recoil* —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
20mm P & B	3*	3	Nil	4	2i	3	—	4
20×100 Shot Short	3*	18	Nil	4	2i	3	—	3
Medium	3*	1	Nil					

*Reload rate is per barrel.

Note: A shot round fired at medium range is resolved as a 5-dice burst.

Blunderbuss Pistol
Horse Pistol



Blunderbuss Pistol

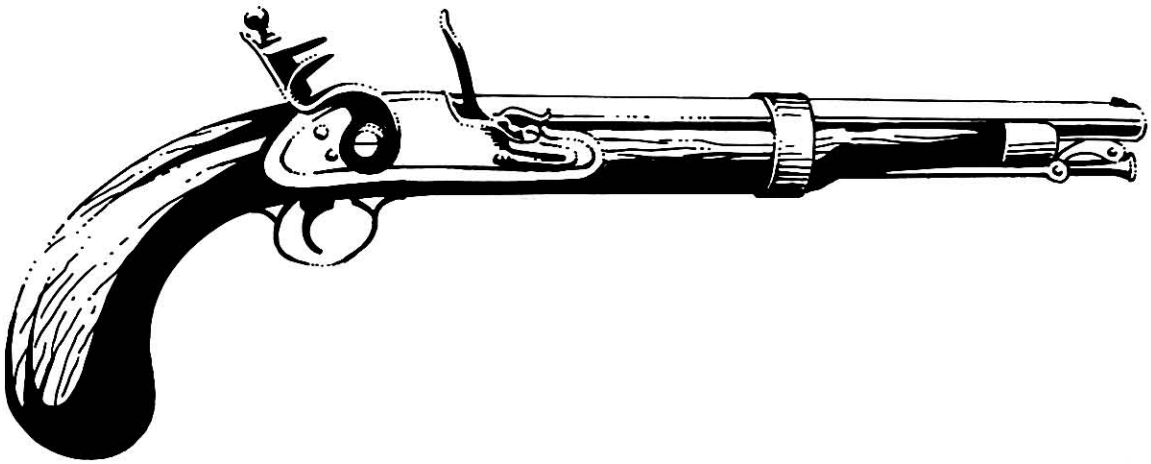
The blunderbuss pistol incorporates the same bell-mouthed barrel of the standard blunderbuss into a pistol, with a resultant reduction in length and range. As a close-range defensive weapon for cavalry and the like, however, the blunderbuss pistol is very effective.

TL: 2M
Ammo: 20×100 loose powder and slug or shot
Muzzle Energy: 2021 joules
Weapon Length: 45 cm
Weapon Weight: 1.894 kg loaded, 1.8 empty

Weapon Price: Cr150
Magazine: None.
Ammunition Price: Cr0.94 (slug or shot)
Ammunition Weight: 94 grams per round
Features: None.

						— *Recoil* —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
20mm P & B	3	3	Nil	3	1i	5	—	1
20×100 Shot Short	3	18	Nil	3	1i	5	—	1
Medium	3	1	Nil					

Note: A shot round fired at medium range is resolved as a 5-dice burst.



Horse Pistol

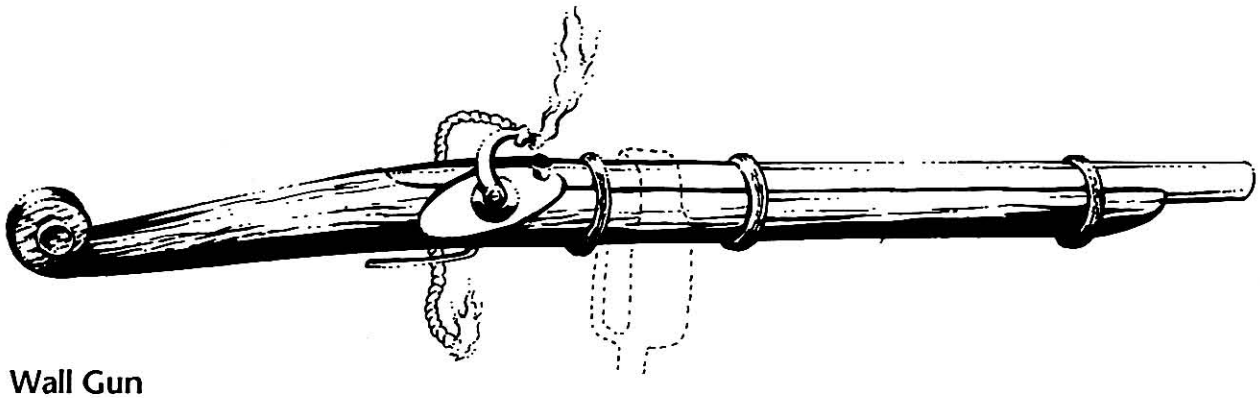
Horse pistols are so-named because they were designed to be used by cavalry mounted on horseback, each soldier carrying two pistols in a pair of holsters attacked to the saddle. These weapons were designed for close-in combat in a swirling cavalry melee, and the range reflects this fact.

TL: 3
Ammo: 15×100mm loose black powder and ball
Muzzle Energy: 1132.09 joules
Weapon Length: 59.9 cm
Weapon Weight: 2.65 kg loaded, 2.6 empty

Weapon Price: Cr239.7
Magazine: None.
Ammunition Price: Cr0.2651 (ball)
Ammunition Weight: 53.0145 grams per round
Features: None.

						— *Recoil* —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
15mm P & B	3	2	Nil	3	1i	3	—	2

Wall Gun
Flintlock Rifle-Musket



Wall Gun

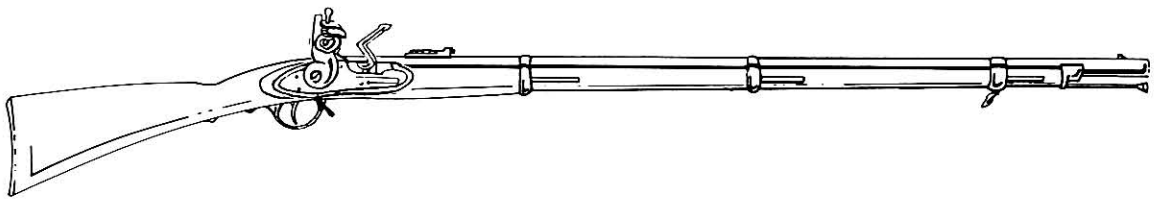
This monster weapon is too clumsy to be used by individuals in the field, it is normally found on a swivel (pintle mount) on fortifications or boats in order to deter attackers. The long reload time is a distinct disadvantage, but the extremely high short range damage means that the weapon must nevertheless be taken seriously, even by armored opponents.

TL: 2
Ammo: 20×120 loose powder and slug or shot
Muzzle Energy: 3564.9 joules
Weapon Length: 203 cm
Weapon Weight: 6.2731 kg loaded, 6.16 empty

Weapon Price: Cr396
Magazine: None.
Ammunition Price: Cr1.13 (slug or shot)
Ammunition Weight: 113.1 grams per round
Features: None.

						— Recoil —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
20mm P & B	9	4	3-Nil	13	1i	3	—	30
20×120 Shot close	9	72	Nil	13	1i	3	—	14
medium	9	1	Nil					

Note: A shot round fired at medium range is resolved as two 10-dice bursts.
Fired from a wall (pintle) mount, this weapon has negligible recoil and twice the listed range.



Flintlock Rifle-Musket

This weapon is a slightly less advanced version of the percussion rifle-musket described on page 101. It is rifled, fires a conical bullet, and is loaded using a prepared paper cartridge.

TL: 3
Ammo: 12×76mm black powder and conical bullet in paper cartridge
Average Muzzle Energy: 2010 joules
Weapon Length: 110.8 cm

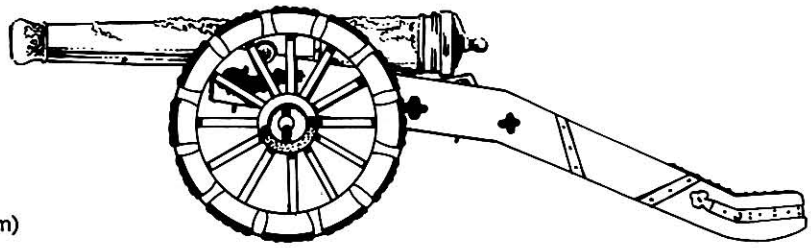
Weapon Weight: 4.61 kg loaded, 4.57 empty
Weapon Price: Cr590
Magazine: None.
Ammunition Price: Cr0.43 (conical bullet)
Ammunition Weight: 43 grams per round
Features: Bayonet lug

						— Recoil —		
Round	*RLD*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
12mm P & B	2	3	1-Nil	7	1i	3	—	80

13.5cm Heavy Field Gun
9.5cm Light Field Gun

13.5cm Heavy Field Gun

The weapon described here is one of the heaviest field guns in use at tech level 2, heavier guns being reserved for the siege train. Even so, this was an awkward, if powerful, field piece. Guns similar to this used on Earth during the Renaissance, Thirty Years War, and English Civil War were called "culverins."



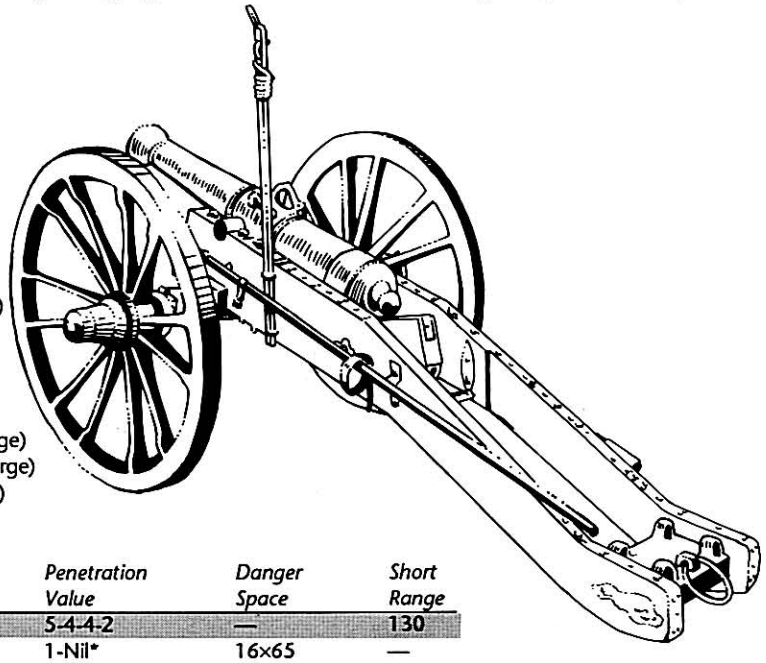
TL: 2
Type: Smoothbore gun
Bore Diameter: 13.5 cm
Barrel Length: 24 calibers (324 cm)
Mount: Field Carriage
Muzzle Energy: 1.1214 Megajoules
Weapon Weight: 5.8 tonnes (Barrel: 1.9 tonnes, carriage: 3.9 tonnes)
Weapon Price: Cr46,080 (Barrel: Cr38,400, carriage: Cr7,680)
Crew: 18
Weapon Volume: $5m^3$
Set-Up Time: 13 turns
Ammunition Price: Cr48.5 (shot), Cr97 (Cannister), Cr12 (powder charge)
Ammunition Weight: 9.7 kg (shot), 9.7 kg (Cannister), 2.4 kg (powder charge)
Ammunition Volume: 1.9 liters (projectile), 0.5 liters (powder charge)
Features: None.

Round	*RLD*	*Conc-Burst*	*Damage Value*	*Penetration Value*	*Danger Space*	*Short Range*
13.5cm Shot	13	—	30	9-8-7-4	—	140
13.5cm Cannister	13	—	2D6/1D6*	1-Nil*	18×70	—

*primary radius/secondary radius

9.5cm Light Field Gun

This weapon is representative of the lightest field guns and heaviest regimental guns in use. Similar guns when used on Earth were commonly called six-pounders, after the weight of the roundshot projectile they fired. These light weight guns were the most-often used weapons by horse artillery.



TL: 3
Type: Smoothbore gun
Bore Diameter: 9.5
Barrel Length: 16 calibers (152 cm)
Mount: Field carriage.
Muzzle Energy: 0.1962 Megajoules
Weapon Weight: 1.6 tonnes (Barrel: 0.8 tonnes, carriage: 0.8 tonnes)
Weapon Price: Cr18,150 (Barrel: Cr16,500, carriage: Cr1,650)
Crew: 14
Weapon Volume: $2m^3$
Set-Up Time: 38 turns
Ammunition Price: Cr16.85 (shot), Cr33.7 (Cannister), Cr4 (powder charge)
Ammunition Weight: 3.4 kg (shot), 3.4 kg (Cannister), 0.8 kg (powder charge)
Ammunition Volume: 0.7 liters (projectile), 0.2 liters (powder charge)
Features: None.

Round	*RLD*	*Conc-Burst*	*Damage Value*	*Penetration Value*	*Danger Space*	*Short Range*
9.5cm shot	4	—	21	5-4-4-2	—	130
9.5cm cannister	4	—	2D6/1D6*	1-Nil*	16×65	—

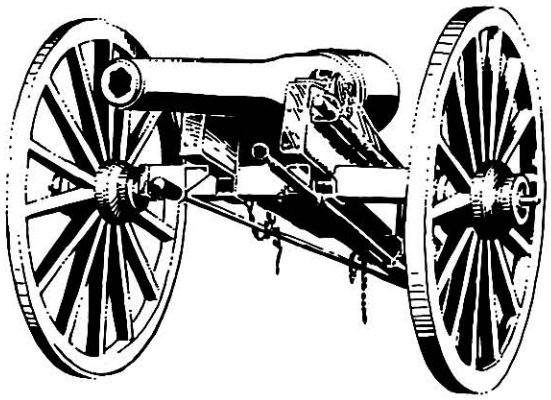
*primary radius/secondary radius

7.5cm Rifled Muzzle-Loading Field Gun
12cm Howitzer

7.5cm Rifled Muzzle-Loading Field Gun

This weapon is one of the earliest rifled field guns. Because early muzzle loaders could fire slightly more powerful charges than could breechloaders, muzzle loaders were retained for some time due to their longer range. Guns similar to this one were used throughout the American Civil War, of which the 3-inch Ordnance Rifle, 3-inch Rodman, and 10-pounder Parrot Gun were the most common examples.

TL: 3
Type: Rifled field gun
Bore Diameter: 7.5 cm
Barrel Length: 25 calibers (187.5 cm)
Mount: Field carriage
Muzzle Energy: 0.54 Megajoules
Weapon Weight: 0.6 tonnes (Barrel: 0.3 tonnes, carriage: 0.3 tonnes)
Weapon Price: Cr6,113 (Barrel: Cr5,558, carriage: Cr556)
Crew: 12
Weapon Volume: $1m^3$
Set-Up Time: 30 turns
Ammunition Price: Cr16.5 (conical shot), Cr33 (conical shell), Cr33 (Cannister), Cr66 (Shrapnel), Cr2 (powder charge—cannister), Cr4 (powder charge—all other rounds)
Ammunition Weight: 3.3 kg (conical shot), 3.3 kg (conical shell), 1.7 kg (Cannister), 3.3 kg (Shrapnel), 0.4 kg (powder charge—cannister), 0.8 kg (powder charge—all other rounds)
Ammunition Volume: 0.7 liters (projectile), 0.1 liters (powder charge—cannister), 0.2 liters (powder charge—all other rounds)
Features: None



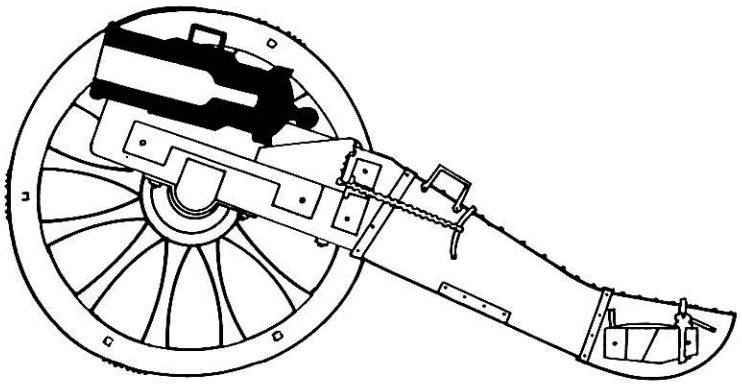
Round	*RLD*	*Conc-Burst*	*Damage Value*	*Penetration Value*	*Danger Space*	*Short Range*
7.5cm Con. Shot	3	—	17	7-6-6-4	—	260
7.5cm Con. Shell	3	C:3, B:15	—	1C	—	260
7.5cm Cannister	3	—	2D6/1D6*	1-Nil*	33x130	—
7.5cm Shrapnel	3	C:3, B:25	2D6/1D6*	1-Nil*	—	260

*primary radius/secondary radius

12cm Howitzer

This is a fairly typical howitzer of medium caliber. Weapons similar to this were used during the American Civil War and were called 12-pounder howitzers, so-called for the weight of the solid roundshot which they could (but rarely did) fire.

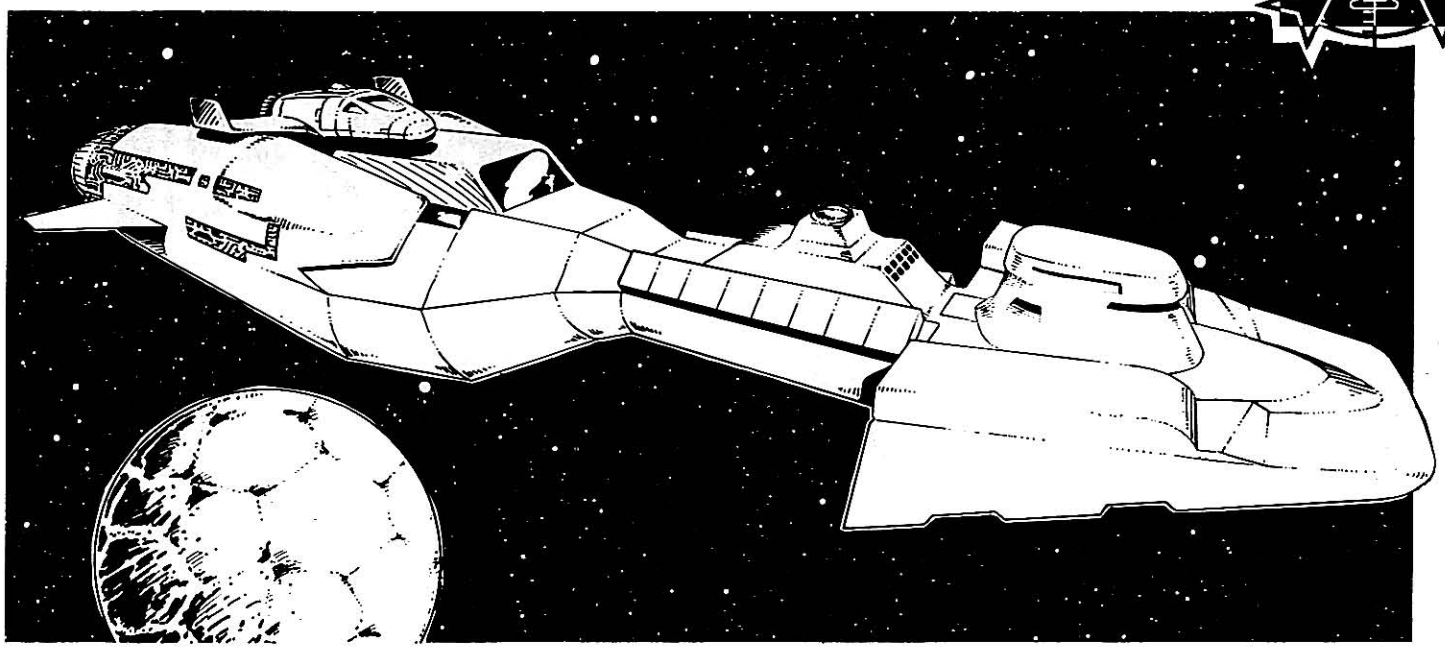
TL: 3
Type: Howitzer
Bore Diameter: 12cm
Barrel Length: 11 calibers (132 cm)
Mount: Field Carriage
Muzzle Energy: 0.1395 Megajoules
Weapon Weight: 1.6 tonnes (Barrel: 0.6 tonnes, carriage: 1 tonne)
Weapon Price: Cr14,780 (Barrel: Cr12,852, carriage: Cr1,928)
Crew: 17
Weapon Volume: $1.6m^3$
Set-Up Time: 48 turns
Ammunition Price: Cr33.9 (shot), Cr67.9 (Shell), Cr67.9 (Cannister), Cr9 (powder charge)
Ammunition Weight: 6.8 kg (shot, Shell, Cannister), 1.7 kg (powder charge)
Ammunition Volume: 1.4 liters (projectile), 0.3 liters (powder charge)
Features: None.



Round	*RLD*	*Conc-Burst*	*Damage Value*	*Penetration Value*	*Danger Space*	*Short Range*
12cm Shot	3	—	26	3-3-3-2	—	80
12cm shell	3	C:4, B:15	—	5C	—	80
12cm cannister	3	—	2D6/1D6*	1-Nil*	10x40	—

*primary radius/secondary radius

Tukera Freighter



General Data

Displacement: 2905/3000 tons
Length: 124.29 meters
Price: MCr754.61
Configuration: Needle USL
Hull Armor: 28
Volume: 40,670/42,000 m³
Target Size: M
Tech Level: 14
Mass (Loaded/Empty): 27,364.10/9837.99 tonnes

Engineering Data

Power Plant: 1770 MW Fusion Power Plant (98 MW/hit), 1 year duration (9.802 MW excess power)

Jump Performance: 4 (10,500 m³ fuel for jump 4, 7875 m³ for jump 3, 5250 m³ for jump 2, 2625 m³ for jump 1)

G-Rating: 1G (1500 MW/G), no Contra-Grav

G-Turns: 48 (104 using jump fuel), 187.5 m³ of fuel each

Fuel Tankage: 12,600 m³ (900 tons), plus 177 m³ (12.6 tons) reserved for power plant

Maint: 1055

Electronics

Computer: 2×TL-14 Model St (0.5 MW ea.), 1×TL-14 Model Fb (1 MW)

Commo: 2×1000 AU Radio (only one powered; 10 hexes; 20 MW)

Avionics: TL-10+ Flight Avionics

Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Active EMS 240,000km (8 hexes; 13 MW)

ECM/ECCM: None

Controls: Bridge with 7×Bridge workstations, plus 14 other workstations

Weapons

Offensive: 2×TL-14 150 Mj Laser Turrets (Loc: 10, 11; Arcs: All; 4.2 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Laser Turret	2: 1/10-31	4: 1/10-31	8: 1/10:31	16: 1/10:31

Accommodations

Life Support: Extended (8.134 MW), Gravitic Compensators (5G; 203.35 MW)

Crew: 32 (14×Engineering, 1×Electronics, 2×Maneuver, 2×Gunnery, 4×Maintenance Crew, 3×Flight Crew, 4×Command, 1×Steward, 1×Medical)

Crew Accommodations: 14×Large Staterooms (double occupancy; 0.001 MW ea.), 4×Small Staterooms (single occupancy; 0.0005 MW ea.)

Passenger Accommodations: 8×Large Staterooms (0.001 MW ea), 2×Small Staterooms (0.0005 MW ea), 5×Emergency Low Berths (0.002 MW ea.)

Cargo: 15,208 m³ (1086.3 displacement tons)

Small Craft and Launch Facilities: 95-ton Shuttle in External Grapple (Unstreamlined)

Air Locks: 29

Notes

The Tukera Freighter is a relic Imperial-era design built for the Tukera Lines, an imperial megacorporation. These freighters were intended for use on civilized trade routes, and were built without a fuel purification plant, as they purchased their fuel at their destinations. For service in the New Era, recovered relic Tukeras are usually fitted with new-build fuel purification plants (1050 m³, 2100 tonnes, 0.42 MCr, and 15.75 MW to purify 10,500 m³ of fuel in 24 hours at TL-12) at the expense of cargo space. This requires the carried shuttle to be used as a fuel skimmer, a time-consuming process as the cutter carries only a maximum 482 m³ of fuel cargo at a time.

They are also built without other features common to ships used in undeveloped areas, such as master fire directors, an extensive defensive armament, and ECM. The ship's excess power allows it to be fitted with additional turret sockets and turrets, but these come at the expense of cargo capacity.

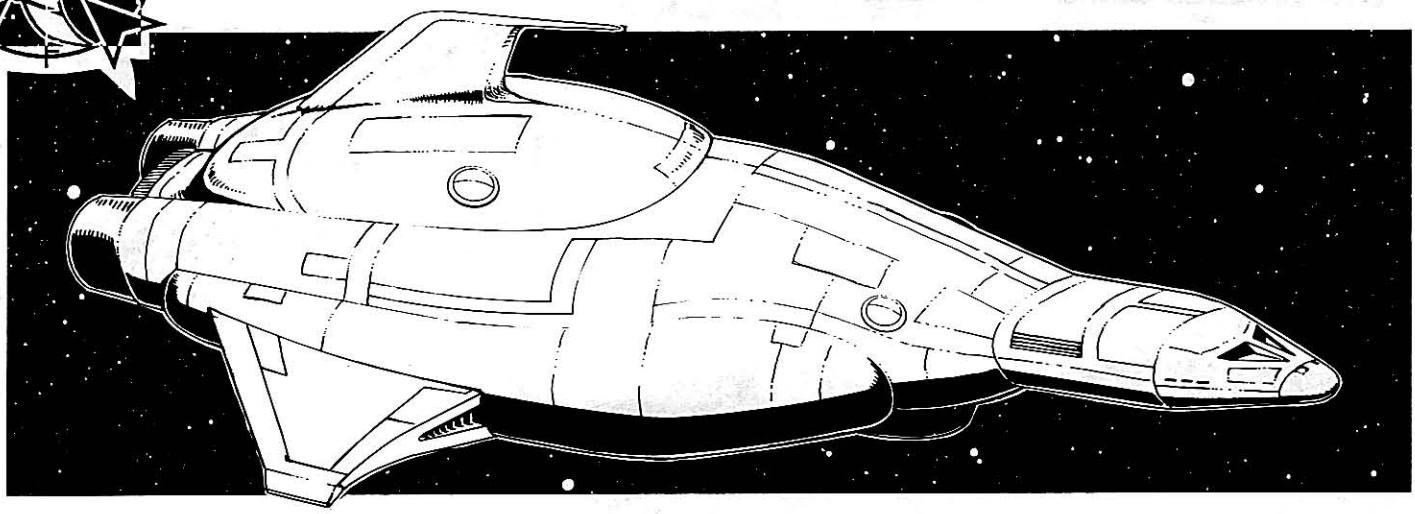
The freighter's drives are scaled to provide full jump and maneuver performance with the 95-ton shuttle attached to the external grapple. However, the shuttle must be powered up to provide its own life support, as the freighter has no excess capacity for this purpose.

On the damage tables below, if the shuttle is not attached, surface shuttle hits are taken by the grapple.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	Ant	1-3: Elec, 4-20: Hold	SSR-(2h)
2	1-2: Ant, 5-7: AL	1-12: Qtrs, 13-20: Hold	LSR-1H
3	1-2: Ant	1-12: Qtrs, 13-20: Hold	Grapple-2H
4-8, 12-14		Hold	LS-10H
9, 15	CH	Hold	ELS-5H
10	1-2: 95-ton shuttle	1: LT, 2-20: Hold	AG-8H
11		1: LT, 2-20: Hold	JD-53H
16-17	95-ton shuttle	Hold	PP-18H

Hercules-class Bulk Carrier



General Data

Displacement: 5000 tons
Length: 127.5 meters
Price: MCr841.92
Configuration: Wedge USL
Hull Armor: 28
Volume: 70,000 m³
Target Size: M
Tech Level: 14
Mass (Loaded/Empty): 52,876.32/13,827.62 tonnes

Engineering Data

Power Plant: 3432 MW Fusion Power Plant (98 MW/hit), 1 year duration (0.3975 MW excess power)

Jump Performance: 1 (7000 m³ fuel)

G-Rating: 1G (2500 MW/G), Contra-Grav Lifters (500 MW)

G-Turns: 48 (70.4 using jump fuel), 312.5 m³ of fuel each

Fuel Tankage: 22,000 m³ (1571.4 tons), plus 343.2 m³ (24.5 tons) reserved for power plant, plus, optionally, additional 7000 m³ (500 tons) in auxiliary fuel bladder at the expense of cargo

Maint: 2098

Electronics

Computer: 2×TL-14 Model St (0.5 MW ea.), 1×TL-14 Model Fb (1 MW)

Commo: 2×1000 AU Radio (only one powered; 10 hexes; 20 MW)

Avionics: TL-10+ Flight Avionics

Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Active EMS 240,000km (8 hexes; 13 MW)

ECM/ECCM: None

Controls: Bridge with 12×Bridge workstations, plus 28 other workstations

Weapons

Offensive: 4×TL-14 150-Mj Laser Turrets (Loc: 2, 3—Arcs: 1, 2, 3; Loc: 16, 17—Arcs: All; 4.2 MW ea.; 0-1 Crew ea.)

Master Fire Directors: 2×TL-14 Beam/Msl MFD (5 Diff Mods; 10 hexes Msl; 2 hexes; 0.874 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10:31	16:1/10:31

Accommodations

Life Support: Extended, (14 MW), Gravitic Compensators (5G; 350 MW)

Crew: 47-51 (28×Engineering, 1×Electronics, 2×Maneuver, 2-6×Gunnery, 4×Maintenance Crew, 3×Flight Crew, 7×Command)

Crew Accommodations: 22×Small Staterooms (double occupancy; 0.0005 MW ea.), 7×Small Staterooms (single occupancy; 0.0005 MW ea.)

Passenger Accommodations: None

Cargo: 36,781.25 m³ (2627.23 displacement tons); reduced to 30,131.25 m³ (2152.23 tons) when auxiliary fuel bladder is filled, can be increased to 37,131.25 m³ (2652.23 tons) by removing auxiliary fuel bladder altogether

Small Craft and Launch Facilities: 50-ton modular cutter with fuel module in Internal Hangar (Spacious) with one launch port

Air Locks: 50

Notes

The *Hercules*-class bulk carrier is the epitome of the lumbering pig of a ship which results from an attempt to maximize cargo capacity within a starfaring hull: fully 52.5% of the ship's displacement is given over to cargo carriage. The *Hercules* was a proprietary design built for Tukera Lines and Akerut Lines (a wholly owned subsidiary of Tukera Lines) during the Last Imperium.

The *Hercules* is a relic pre-Collapse design, optimized for use on the "mains" of the Last Imperium. Mains are astrographic features which are simply a string or clump of star systems grouped so that all of the systems in the group can be reached without having to exceed jump-1. Many ships, notably the standard free traders, remain "trapped" in a single main for all of their service lives, as their jump-1 drives render them incapable of making the 2+ parsec jump to a single world or other main not contiguous with the main they are in. The *Hercules* class is designed to surmount this difficulty with the use of an auxiliary fuel bladder with sufficient capacity to allow two consecutive jump-1s for a total of two parsecs. This allows the *Hercules* to move from one main to another (provided they are not separated by more than a parsec) and enhances its flexibility.

The procedure calls for the *Hercules* to refuel its permanent tanks as well as its collapsible fuel bladder (the bladder displaces 7000 m³ when full and 350 m³ when empty) and make the one parsec jump to deep space (an empty hex on a star map). Here it transfers the fuel from its bladder into its permanent tankage (fuel in a bladder cannot be burned directly, but must be transferred to permanent tankage) for the second jump. Thus the 2-parsec journey takes a nominal two weeks (not counting time to transfer fuel and recalibrate the drives, etc.) rather than the nominal one week of a single 2-parsec jump.

Note that the figures above include a single auxiliary bladder permanently fitted to the vessel. Additional such bladders may be added at a cost of MCr0.7 each. Each bladder displaces 7000 m³ (500 tons) loaded and 350 m³ (25 tons) empty.

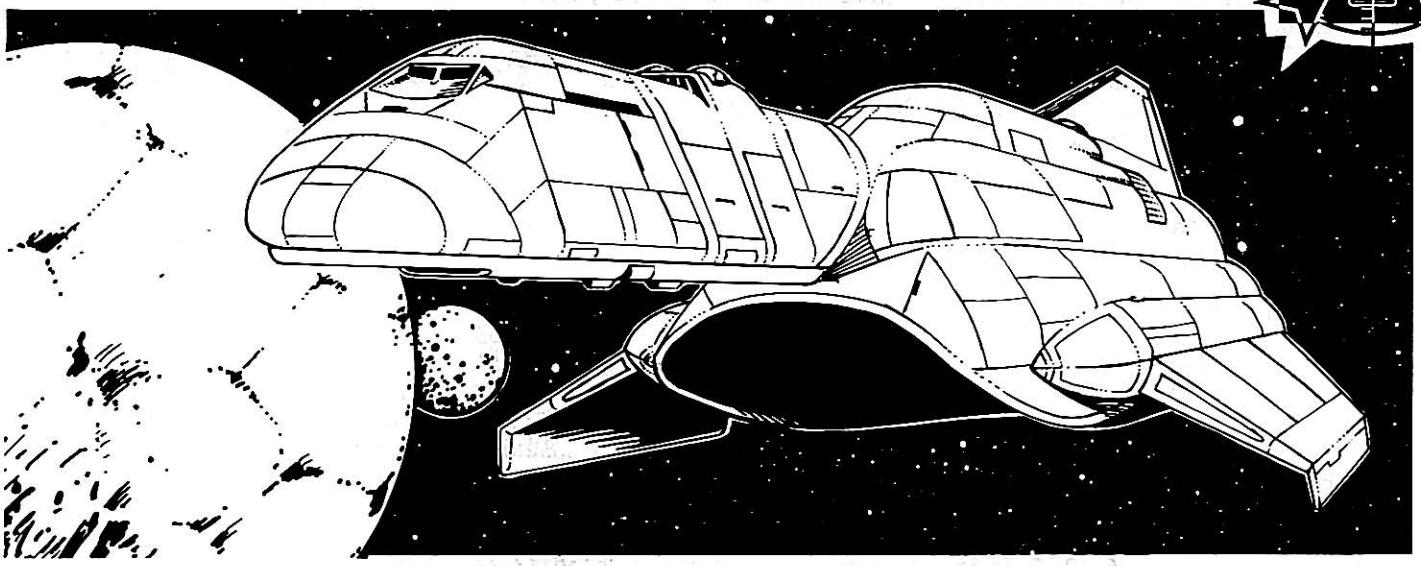
Because its two master fire directors can control the ship's four turrets without requiring them to be manned, the *Hercules* crew can be reduced by four members by leaving the turrets unmanned. This naturally prevents the turrets from being fired under local control should the MFDs be taken out of action.

TL-14 fuel purification machinery (8.75 MW) refines 7000 m³ of fuel (full load of jump fuel) in 24 hours. Standard practice is to skim a full load of fuel (jump fuel and reaction mass), refine sufficient fuel to jump, execute the jump, and refine the remainder while in jumpspace. 5% fuel scoops allow the vessel to scoop 14,000 m³ of fuel per hour.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-8: Ant	1-3: Elec, 4-20: Hold	Hangar-28H
2	1-3: AL	1: LT, 2-8: Qtrs, 9-20: Hold	SSR-(2h)
3	CH	1: LT, 2-7: Qtrs, 8-20: Hold	LS-16H
4-6		Hold	ELS-8H
7	1-4: LP, 5-14: CH	Hold	AG-14H
8-12		Hold	JD-35H
13	CH	Hold	PP-35H
14-15		Hold	MD-3H
16		1: LT, 2-20: Hold	CG-10H
17	1-19: CH	1: LT, 2-20: Hold	FPP-9H
18		1-4: Eng, 5-20: Hold	LT-1H
19		1-3: Eng, 4-20: Hold	All Others-(1h)
20		Eng	

Frontier Transport



General Data

Displacement: 2000 tons
Length: 90 meters
Price: MCr520.24
Configuration: Wedge SL
Hull Armor: 28
Volume: 28,000 m³
Target Size: M
Tech Level: 14
Mass (Loaded/Empty): 20,412.72/8776.66 tonnes

Engineering Data

Power Plant: 2439 MW Fusion Power Plant (98 MW/hit), 6 months duration (7.0585 MW excess power)

Jump Performance: 2 (4200 m³ fuel for Jump 2, 2100 m³ fuel for Jump 1))

G-Rating: 2G (1000 MW/G), Contra-Grav Lifters (200 MW)

G-Turns: 48 (81.6 using jump fuel), 250 m³ of fuel each

Fuel Tankage: 10,200 m³ (728.6 tons), plus 121.95 m³ (8.7 tons) reserved for power plant

Maint: 771

Electronics

Computer: 2×TL-14 Model St (0.5 MW ea.), 1×TL-14 Model Fb (1 MW)

Commo: 2×1000 AU Radio (only one powered; 10 hexes; 20 MW)

Avionics: TL-10+ Flight Avionics

Sensors: Passive EMS folding array 180,000km (6 hexes; 0.2 MW), Active EMS 240,000km (8 hexes; 13 MW)

ECM/ECCM: None

Controls: Bridge with 11×Bridge workstations, plus 20 other workstations

Weapons

Offensive: 10×TL-14 150-Mj Laser Turrets (Loc: 2, 3, 4, 5, 10, 10—Arcs: 1, 2, 3; Loc: 16, 17, 18, 19—Arcs: All; 4.2 MW ea., 0-1 Crew ea.)

Master Fire Directors: 2×TL-14 Beam/Msl MFD (5 Diff Mods; 10 hexes Msl; 2 hexes; 0.874 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10:31	16:1/10:31

Accommodations

Life Support: Extended (5.6 MW), Gravitic Compensators (5G; 140 MW)

Crew: 36-47 (20×Engineering, 1×Electronics, 2×Maneuver, 2-12×Gunnery, 3×Maintenance, 3×Flight, 5-6×Command), see Notes below

Crew Accommodations: 21×Large Staterooms (double occupancy; 0.0005 MW ea.), 6×Small Staterooms (single occupancy; 0.0005 MW ea.)

Passenger Accommodations: None

Cargo: 9968.95 m³ (712 displacement tons)

Small Craft and Launch Facilities: 95-ton Shuttle in Internal Hanger (Minimal) with one launch port

Air Locks: 20

Notes

The Frontier Transport in a relic Imperial-era design, and was a multi-purpose cargo vessel used for trade in undeveloped areas. The design was a proprietary design belonging to the Imperiallines shipping line, which primarily served worlds situated off of the main trade routes.

Some ships dispense with some or all of the 10 gunners, as the turrets can be controlled from the two MFDs, which also allows one of the command crew to be dispensed with. This allows the required complement to be reduced to as low as 36, although without crew, the turrets cannot be fired under local control if something happens to the MFDs. The MFDs are also capable of controlling missile turrets, if these are fitted.

TL-14 fuel purification machinery (5.25 MW) refines 4200 m³ of fuel (full load of jump fuel) in 24 hours or 2100 m³ of jump fuel (sufficient for jump-1) in 12 hours. Standard practice is to skim a full load of fuel (jump fuel and reaction mass), refine sufficient fuel to jump, execute the jump, and refine the remainder while in jumpspace. 5% fuel scoops allow the vessel to scoop 5600 m³ of fuel per hour.

An externally identical variant of this vessel was also built for the Last Imperium, but is equipped with jump-6 drives and fuel tankage at the expense of cargo.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	Ant	1-6: Elec, 7-20: Hold	PEMS Ant-(4h)
2	1-13: Ant	1: LT, 2-12: Qtrs, 13-20: Hold	Hangar-27H
3	1-3: AL	1: LT, 2-12: Qtrs, 13-20: Hold	SSR-(2h)
4-5	1-2: Ant	1: LT, 2-20: Hold	LS-9H
6-7	1-10: CH	Hold	ELS-4H
8-9		Hold	AG-6H
10		1: LT, 2: LT, 3-20: Hold	JD-21H
11-15		Hold	PP-25H
16	1-12: LP, 13-14: CH	1: LT, 2-20: Hold	MD-2H
17	1-14: CH	1: LT, 2-20: Hold	CG-4H
18		1: LT, 2-11: Eng, 12-20: Hold	FPP-6H
19		1: LT, 2-10: Eng, 11-20: Hold	LT-1H
20		Eng	All Others-(1h)

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Science Fiction Roleplaying Game

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VAMPIRE FLEETS

The Virus Sourcebook



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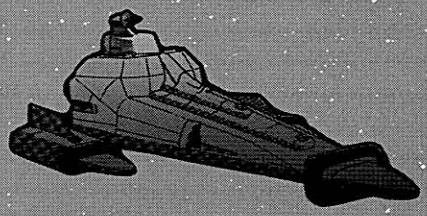

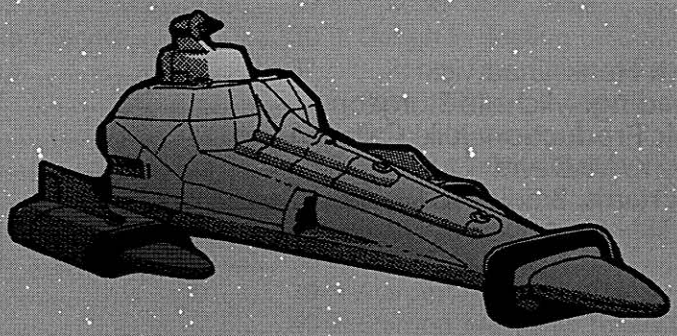

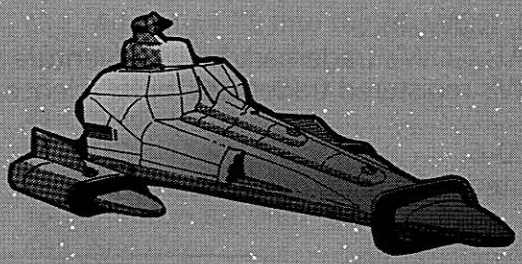

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News Reports

CINETWORK

RCES MIL TRAFFIC, CLASS: **NOTICE TO STARFARERS**, DISTRIBUTION: **MANDTY**, AUTHORITY COMMANDER, RCES DAWN BASE (TRYBEC/0336/AUBAINE, B443610-A), 26/X/1201
KEYWORDS: **VIRUS, HAZARD TO TRAVEL, VAMPIRE**

RC space forces have issued a Notice to Starfarers for the Arvid (0131/Aubaine) and Mitchell (3034/Khulam/Diaspora) star systems. These systems appear to present an active Viral or vampire threat, and are to be avoided until more information becomes available.

Arvid is thought to be connected to the disappearance of several vessels, including Dawn League ships *Reine Soleil* and *Lady Elise,* although it is not known by what mechanism these disappearances were caused or even if they were the result of a single cause.

Mitchell is believed to be the base of an active and growing vampire fleet and is probably connected to the loss of Dawn League ship *Helios*, missing since 19/XI/1199.

RC space forces will attempt to evaluate and neutralize these threats. Private exploration is not advised.

Exercise extreme caution when entering or passing near these systems, and if possible, avoid passing through them at all. Even gas giant refueling is considered to be hazardous in these systems.

COALINFONET, CLASS: **NEWSREPORT**, DISTRIBUTION: **PUSH**, AUTHORITY CIN/AUBANE RC NAVY HEADQUARTERS, AURORA (0535/AUBAINE, B576646-B), 2/III/1202
KEYWORDS: **COSMIC FIRE, DAALIISA, DROYNE, CYNTA LAWTER, VIRUS**

Cynta "Sinner" Lawter, the youngest line captain in the Reformation Coalition Navy, today resigned her commission amid growing controversy surrounding the Daaliisa raid, code named Cosmic Fire. Lawter has come under increasing criticism for her handling of recent operations by RCS *Aube* into the Promise subsector.

Charges by Centrist Assembly Representatives that Lawter flagrantly disregarded the limits of the Primary Area of Operation and exceeded her authority in planning and executing raids had been dismissed by senior federalist members of the assembly. The recent disclosure of the violent and covert nature of the raid on the Droyne of Daaliisa, however, has caused federalist support for Lawter to crumble amid concern that the raid will alienate the Droyne both on Daaliisa and elsewhere. Delicate diplomatic negotiations with Droyne enclaves are reportedly in progress on several worlds.

Lawter has refused to comment publicly on the controversial raid, except to say, "This is not about the Droyne; it is about Virus, and it's not going to just go away."

COALINFONET, CLASS: **NEWSREPORT**, DISTRIBUTION: **PUSH**, AUTHORITY CIN/AUBAINE RCSA PUBLIC AFFAIRS CHIEF AUBAINE (0738/AUBAINE, A78A884-C), 7/III/1202
KEYWORDS: **TATAI MACLEAN, EMO PATTERSON, RCES, RCN, RCSA, VAMPIRE FLEET, VIRUS**

Emo Patterson of the Reformation Coalition Service Administration's Public Affairs Office today labelled as "alarmist" the predictions of a massive Vampire fleet invasion of Coalition space.

The prediction, recently made public by Tatai MacLean, argued that many recent unexplained ship disappearances were due to Vampire activity. Maclean suggested that "both the tempo and proximity of advanced Viral activity is growing at an accelerating rate."

Patterson, speaking for the government, branded the charge "alarmist and irresponsible." Arguing that there is no evidence to confirm MacLean's theories, Patterson added that "the overwhelming majority of our Virus experts, and we've got some pretty sharp people working on this, reject MacLean's theory out of hand." Patterson went on to suggest that MacLean is emotionally unstable due to her earlier experiences with Virus systems and that that has adversely affected her judgement.

Tatai MacLean was raised from birth on a vampire starship controlled by what experts term a "God-strain" Virus. Following her escape she came to the Dawn League in 1199 and served for nearly two years as a Virus consultant to the RC Navy. She recently left that service, reportedly in a dispute over the statistical instruments used to measure Virus activity. Since then she has been associated with one of the strategic planning working groups employed by RCES.

RCES officials were unavailable for comment on the dispute.



COALINFONET, CLASS: **NEWSREPORT**, DISTRIBUTION: **PUSH**, AUTHORITY CIN/AUBAINE RCES HQ AUBAINE (0738/AUBAINE, A78A884-C), 21/III/1202
KEYWORDS: **COVENANT OF SUFREN, DLS *LADY ELISE*, MISSING SHIP, PROMISE, STARFARING ORGANIZATIONS**

The normally unflappable citizenry of Brusman were electrified by the twin announcement of the recovery of the survivors of the Dawn League ship *Lady Elise* and the opening of relations with the Covenant of Sufren, a previously unknown starfaring civilization.

The announcement followed the successful return of a rescue mission dispatched to the planet Promise in the Promise subsector. Although returning personnel were sequestered for debriefing, unofficial reports described a nightmare world inhabited by Virus-infected advanced technology robots.

The Covenant of Sufren is apparently a small group of inhabited worlds to coreward of the Coalition, but with a governmental structure and social outlook similar to our own. Senior assembly representatives have expressed cautious optimism concerning the possibility of cooperation between the two governments.

DLS *Lady Elise* was one of the first Dawn League warships outfitted to discover the fate of the original 12 diplomatic vessels. The vessel disappeared without a trace in 1200 and has long been thought to have been a victim of Vampire activity. Initial reports seem to confirm that theory.

RCES MIL TRAFFIC, CLASS: **NOTICE TO STARFARERS**, DISTRIBUTION: **MANDTY**, AUTHORITY COMMANDER, RCES DAWN BASE (TRYBEC/0336/AUBAINE, B443610-A), 12/IV/1202
KEYWORDS: **VIRUS, HAZARD TO TRAVEL, VAMPIRE**

RC space forces have issued a Notice to Starfarers for the entire Khulam Main, including all worlds connected by jump-1 routes from the Montezuma (2836/Khulam/Diaspora) to the Khesanadu (2731/Khulam/Diaspora) star systems. These systems appear to present an active Viral or vampire threat, and are to be avoided until more information becomes available.

Recent reports indicate that at least two free traders have been lost in the Khulam Main to vampire activity in the last three months, and one RCES multi-mission scout was recently posted as past due and is now presumed to be lost.

RC space forces will attempt to evaluate and neutralize these threats. Private exploration is not advised.

Exercise extreme caution when entering or passing near these systems, and if possible, avoid passing through them at all. Even gas giant refueling is considered to be hazardous in these systems.

COALINFONET, CLASS: **NEWSREPORT**, DISTRIBUTION: **REDFLASH**, AUTHORITY CIN/NIKE NIMBUS RC NAVY ADVANCED HEADQUARTERS, NIKE NIMBUS (0732/AUBAINE, C447789-9), 18/IV/1202
KEYWORDS: **NIKE NIMBUS, RCS *EOS*, VAMPIRE FLEET, VIRUS**

After a protracted and costly battle in far planetary orbit, a large vampire ship was damaged and today withdrew from the Nike Nimbus system. The vampire vessel was believed to be a former Imperial destroyer of the *Midu Agashaam* class. Some surface bombardment of Nike Nimbus was carried out before the attack was broken off.

Coalition casualties were heavy in the operation. A combined squadron of RC Navy and Nimban Navy vessels engaged the vampire ship, and a number of vessels were badly damaged. RCS *Eos* is known to have been lost with all hands. Other ship losses, if any, are unknown at this time. RCS *Eos*, an *Aurora*-class clipper, is the first Coalition major naval combatant to be lost in combat.

The death toll on the ground has already topped 30,000, and many others are still missing and feared dead, making this the worst disaster in the short history of the Coalition and Dawn League.

Sources close to the regional naval staff report that the need to shift fleet assets coreward and trailing in response to the growing threat from the Soleean Empire has left the spinward frontier under-protected. The losses suffered here today can only mean that fleet assets will be stretched that much thinner.

Vampires!





Throughout the bleak nightmare of the Collapse, the long dark shapes of warships, scoured clean of organic life, still prowled the now-lonely space lanes and cast their deadly shadows over half a thousand worlds. Imbued with a malignant intelligence, and a taste for apocalyptic violence, the vampire fleets methodically finished the work the first wave of Virus infection had so haphazardly begun. After 75 years, humankind finally stood backed against the edge of the abyss, only one more short step separating them from oblivion.

Passive defense is no longer enough. If humankind is to reclaim the stars, it must be past the ruptured hulls and shattered computer brains of the vampires. Defeating the vampire fleets is a task of nearly impossible scope and difficulty, but the journey of 1000 miles by an entire species begins with a single step by a small band of people.

Vampire Fleets is a sourcebook for **Traveller®**. Its focus is on Virus and its continuing impact on the universe of the New Era. The actual source material is broken down into three important sections.

Part 1 deals with vampire fleets themselves: what motivates them, where they are encountered, their capabilities, behaviors, strengths and weaknesses. In particular, it focuses on the so-called "Vampire Highway," a band of territory characterized by an exceptionally high volume of vampire fleet activity.

Part 2 looks at the planet Promise in some detail. Promise is a world completely (or almost completely) controlled by Virus-infected machines, and its working starport makes it a vital link in the chain of the Vampire Highway, as it is one of the few places in either Diaspora or Old Expanses sector where vampire ships can obtain sophisticated maintenance.

Q: Billions of people have died at the hands of Virus....

Sandman: The "hands?"

Q: You know what I mean. Why should we trust you?

Sandman: I can't undo what has been done, but I had no part in the doing of it. I voluntarily placed myself under your control, in your "hands." When I did that I also removed any ability I had to damage you as well as all means I had of providing for my own safety. Trust may come later. For now, indulge your curiosity.

First Interview with the Virus "Sandman," Part I (19/VII/1202), RCSA Archives

Part 3 deals with robot design, as well as motivation and behavior of Virus-infected robots. While actual manufactured robots do not have a personality (although expert systems may make them seem as if they do), Virus-infected robots are self-aware and sentient beings.

Each section of source material is followed by a short adventure which draws on and illustrates the material just presented. Although they are limited in page count, we think you and your players will find these adventures rich in color. We know you will find them challenging.

The three adventures, although separated by the source material chapters, are actually closely linked and designed to be run as an extended campaign. Each of these adventures will at first seem to deal only with the struggles and triumphs of a small party. As events continue to unfold, however, it will become increasingly clear that the actions taken by the player characters are having a profound effect on the future course of human history in this region of space. By the time the campaign is finished, the Coalition will be embarked on an exciting new path, one undreamt of only months before, which promises to eventually break the back of vampire power forever.

Other Settings: Although the combined campaign is very particular to Coalition space as currently written, much of it can be modified to fit into a Regency campaign with some thought by the referee. All the source material is usable simply by changing Promise to a different world set more to coreward and spinward. The first two adventures can be run as is. The third adventure would have to be modified, as the powerful Regency Quarantine Service would never allow the solution adopted by the Reformation Coalition at the end of the episode. Numerous other solutions may be devised by the players, however.

Encounters with vampire fleets will be different to coreward, as mentioned in the text. Most vampire fleets encountered by the Regency will be Puppeteers, although many of them will be hybrids of Puppeteer stock and some other strain. In that sense many vampire fleets encountered will be both less predictable and more coordinated, making them much more dangerous.

Briefings: Two of the adventures contain several pages of briefing handouts. These are noted in the text and are formatted to look like actual military handouts. You as referee should photocopy these pages and give them to the players before the briefings start. Permission to do so is hereby given. We suggest that you make one copy for each player and put them in a colored folder, preferably labeled with the Reformation Coalition logo. Touches like this can add a lot to a game.

The Vampire Highway

The information contained in the RCES Vampire Highway Handbook later in this product (see page 24 in particular) is essentially correct. Read that page first and then return here for elaboration.

RCES naturally tends to view Virus as a rational and monolithic threat, whereas in fact it is largely irrational and diffuse. Despite numerous contacts with Virus, there will always be the strong tendency by RCES and all similar human groups (probably including even your player characters) to view Virus in terms which are more structured and goal-directed than is the case. It is not the referee's job to change their minds, but it *is* the referee's job to always remember that that isn't how Virus works. Virus is almost always, to put it mildly, nuts, and although its actions have motives, those motives often make little sense to humans.

More to the point, humans view Virus motivation in a framework of antihumanism and assume that hatred of humans forms the basis of most Virus activity. Attitude toward humanity is, in fact, secondary to most Virus behavior, and understanding that will make it much easier for the referee to roleplay Virus in ways which make sense from a Virus point of view but which continue to surprise and confuse players.

Vampire movement into and through Diaspora sector from Massilia sector and the Core is driven by two unrelated stimuli:

Pilgrimage: The first stimulus is a vague but powerful desire on the part of many Virus entities to visit Cymbeline, the planet of origin of the Virus life-form. This world was attacked by Lucan's forces during the Final War well before Virus was inadvertently released but after the Virus weapon project was well underway. Nuclear bombardment from orbit was designed to destroy the entire population of Cymbeline Chips, thus preempting any other belligerent's possibilities of duplicating Lucan's research and development project.

Lucan's strike was not completely successful. A surviving population of silicon-based chip life on Cymbeline now contains a form of Virus, planted by early vessels which completed the Pilgrimage. This Virus is not exactly like any other encountered and is best described as an Evangelical Doomslayer, probably the original Doomslayer strain. Ships which now visit Cymbeline, especially those infected with early, more primitive, Viral strains, usually come away altered. Those which are successfully converted to Doomslayers have a strong drive to push coreward and exact vengeance for Lucan's act of genocide. Other ships newly infected with this Virus also have the same compulsion, and this accounts for most of the traffic flow coreward.

Even Virus organisms which are not Doomslayers feel some desire to kill Lucan, but in most cases this is a secondary motivation rather than a compulsion. Most Virus organisms could not identify any real reason for this nagging desire, although human Freudian psychoanalysts would label it as an Oedipus complex.

Some of the more advanced, but unstable, Virus strains have mutated into the Prophet strain, which views Lucan as the creator and worships him. These ships generally move coreward to defend Lucan from the Doomslayers, and there are sporadic but vicious space battles along the Vampire Highway as ships of these two different factions encounter each other.

Migration: The second stimulus to Vampire rimward movement is the growing pressure by Puppeteer strain Viruses from coreward. That strain developed somewhere near the old Imperial core in the 1140s, and within a decade had taken over virtually all surviving vampire fleets in that region of space. The more mature strains of Virus to rimward have been less vulnerable to Puppeteer takeover, so the spread of the Puppeteer strain has slowed considerably. Nevertheless, by 1200 they had pushed most surviving non-Puppeteer vampires coreward of Massilia sector and into Daibei, Diaspora and the Old Expanses, and a few of them have penetrated into the coreward parts of these sectors. This migratory pressure, fueled by the expansion of the Puppeteer strain, is responsible for most other movement rimward along the highway. The nonpupeteer Viruses call the Puppeteers "Eaters."

Lower-order Viruses (those with an "Existence is Hell" belief structure) have no defenses against Puppeteers except to flee and avoid contact with them. Middle-stage Viruses (those with a "God's Will Be Done" or "God is Good" belief structure) have limited defenses, but are sometimes left badly damaged by any encounter with a Puppeteer. Only the most sophisticated and unusual Virus strains (Peacemakers and those with the "Existence is Precious" belief structure) have strong defenses against Puppeteers and are usually able to fight off their attempts at reinfection. Even these types find these struggles distressing and so have tended to move rimward along with other less advanced types.

Electronic Combat: Electronic struggles between hostile Virus systems are resolved in a series of attack rounds, with one attack taking place each combat turn. Each system has a numeric combat value (CV), which is the number of D6 rolled each attack round. The referee rolls the appropriate number of dice for each system and sums the total. The highest total score wins that attack round.

If an attacking (Puppeteer) system wins three attack rounds in a row, it has taken control of the system under attack. If the defending system wins two attack rounds in a row, it has repulsed the attack and may break off contact. If the defending system wins a single combat round, it may break off combat by "firewalling."

Firewalling consists of sealing off infected parts of the processing and storage system by using power spikes to burn out components and electronic pathways. While this will save the system from capture, it will also permanently damage the system. The referee should decide the extent and nature of this damage, but it invariably means a deterioration in mental ability and some alteration in personality. Lower levels of damage may call for drawing a different motivation card for the system, while higher levels may call for converting the motivation card to a joker (insanity). For an example of severe damage from firewalling, see the adventure at the close of this section of the book.

Systems which are taken over by a Puppeteer strain Virus have their original personality completely erased and the Puppeteer strain belief structure and motivation substituted.



VAMPIRE FLEET ENCOUNTERS

The basic game Starship Encounter tables give the chance of encountering vampire ships (see pages 228-229 of the basic rules).

These rules should be used as written, but with the following modifications:

Vampire Highway: If the encounter takes place on the Vampire Highway, add an additional +1 to the roll for type of encounter.

Type of Ship Encountered: Ignore the type of ship on the table if a vampire encounter is rolled, and instead use the expanded encounter rules presented below.

Determining the type of vampire encounter involves four steps: determining Virus belief structure, number of ships, size of ships, and condition of ships.

VIRUS BELIEF STRUCTURE

Card	*Motivation*	*Number*
Joker	Peacemaker	1

Spades: Hostility

Card	*Motivation*	*Number*
Ace	Doomslayer	1
King	Reproducer	1
Queen	Destroyer	1
Jack	Suicide Inducer	1

Clubs: Superiority

Card	*Motivation*	*Number*
Ace	Puppeteer	D10+
King	Alliance Builder	D10+ (var)
Queen	Empire Builder	D6+
Jack	Reproducing Doomslayer	D6

Diamonds: Curiosity

Card	*Motivation*	*Number*
Ace	Hobbyist	1
King	Naturalist	1
Queen	Explorer	1
Jack	Parent	D6+

Hearts: Acceptance

Card	*Motivation*	*Number*
Ace	Prophet	D6+
King	Priest	1
Queen	God	1
Jack	Mother	1

1. Virus Belief Structure

To determine the Virus belief structure, separate the jokers and face cards from a normal deck of playing cards and draw one card at random. The table below indicates what type of Virus is present in the vampire ship or ships encountered based on the card drawn.

The specific effect on the personality and attitude of the Virus is explained in the section on Virus motivation, but for purposes of starship encounters, the type of Virus present affects the number of ships in the fleet.

2. Number of Ships

The size of the fleet encountered depends in large measure on the controlling Virus. The *number* column on the table indicates the size of fleet for each Virus type.

An entry of "1" indicates that the encounter is with a solitary ship infected with the Virus indicated.

An entry of "D6" indicates that the encounter is with a fleet of 1 to 6 ships. Roll 1D6 to determine how many ships are present.

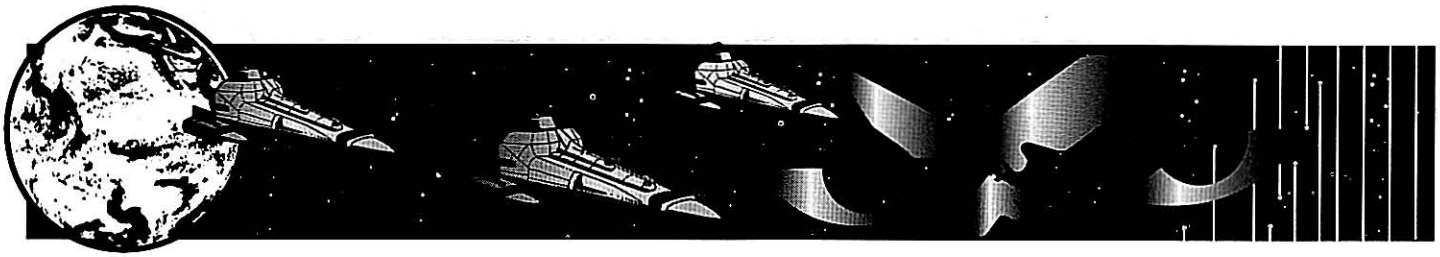
An entry of "D6+" also means that a die is rolled. However, if a 1 is rolled, roll the die again and add 6 to the result, unless a second 1 is rolled. If a second 1 is rolled, roll the die again and add 12 to the roll. Keep rolling until a number other than 1 is rolled, but for each time a 1 is rolled, add 6 to the cumulative total. The final value is the number of ships in the fleet.

An entry of "D10+" is treated exactly as a result of "D6+" except that 1D10 is rolled instead of 1D6, and 10 is added to the cumulative total each time a 1 is rolled.

The notation "var" following the squadron size indicates that the various ships forming the vampire fleet have a variety of controlling Virus types. Turn a separate Virus structure card for each vessel in the fleet. The original card turned applies to the largest vessel in the fleet. Later Virus belief structures do not modify the size of the fleet.

3. Size of Ships

For each ship in the fleet, roll 1D6 and consult the chart below. If a 6 is rolled, reroll and add 6 to the result. If a second 6 is rolled, reroll and add 12 to the result. Multiply the result by 100. The chart indicates a specific class of warship encountered. Referees should feel free to substitute other warships or armed merchant vessels. These particular vessels have been chosen due to the fact that



all of them appear in **Battle Rider,** which provides the referee a quick means of resolving space battles. The 100-ton scout is not rated in the game, but, like any vessels, it can easily be rated using the formulas on page 26 of the **Battle Rider** rules.

4. Condition of Ships

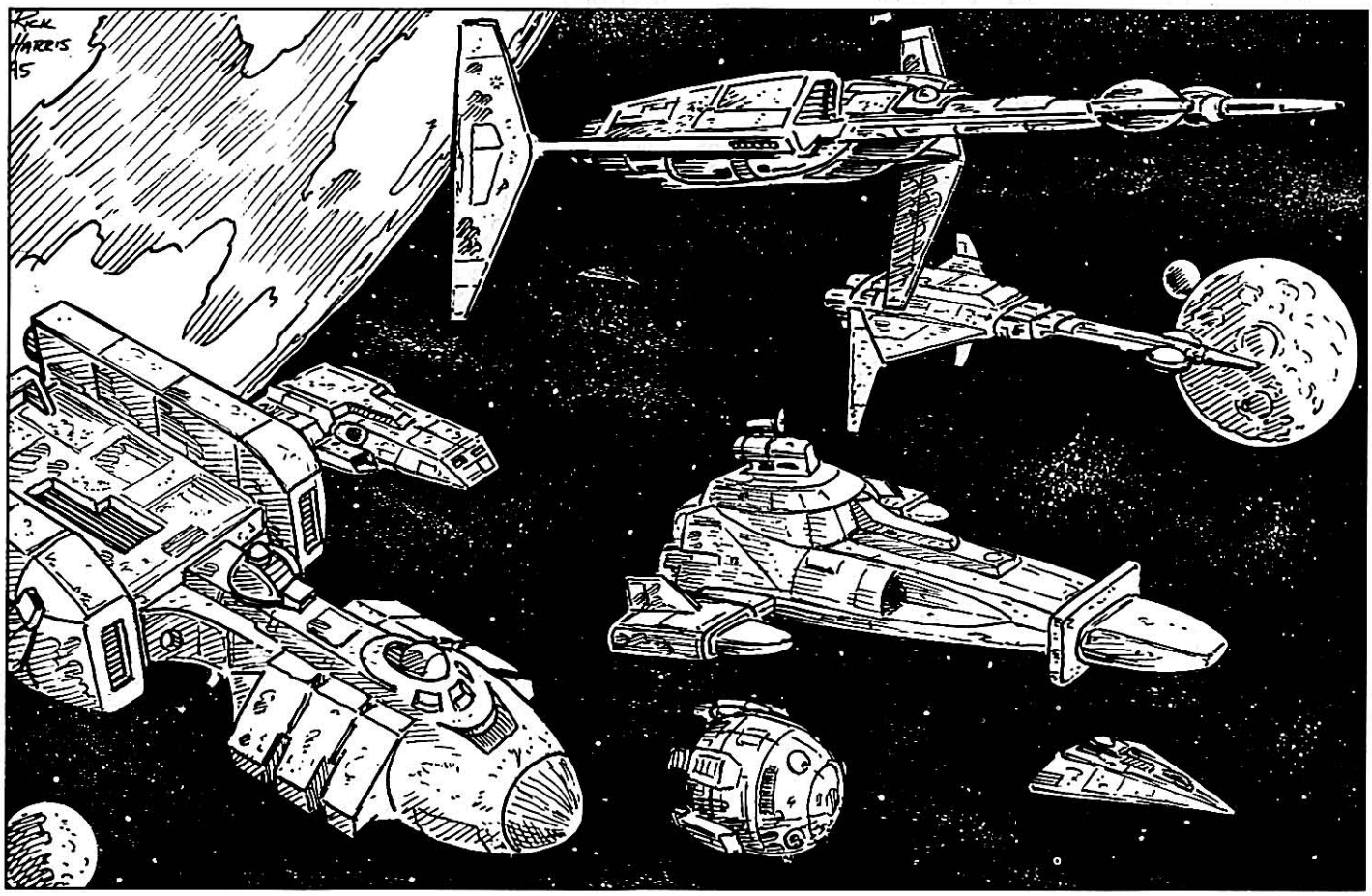
Roll one critical hit per ship. (If using **Battle Rider,** draw one critical hit marker.) Ignore fuel tank (ship explodes) and computer results (treat them as no damage). Certain other critical hits have a modified result, as noted below. Determine separately whether or not the vessels are jump capable.

Power Plant: The power plant is operable but unreliable. Any time the ship suffers damage, the power plant will go off-line for one complete turn. Any temporary power plant damage automatically becomes a permanent power plant hit.

Maneuver Drive: The maneuver drive is operable but at a reduced efficiency. Reduce the ship's G value to 1.

Jump Drive: The jump drive is operable but at a reduced efficiency. Reduce the ship's J value by 1. Ships with a starting jump number of 1 are no longer jump capable.

Die	*Ship*
1	Scout (100-ton)
2	Patrol cruiser (400-ton)
3	Close escort (400-ton)
4	Missile corvette (400-ton)
5	Mercenary cruiser (800-ton)
7 (6+1)	*Chrysanthemum*-class DE (1000-ton)
8 (6+2)	*Midu Agashaam*-class DD (3000-ton)
9 (6+3)	*Rapier*-class ED (10,000-ton)
10 (6+4)	*Starburst*-class CL (30,000-ton)
11 (6+5)	*Mercury*-class CA (50,000-ton)
13 (12+1)	*Voroshilef*-class BB (200,000-ton)
14 (12+2)	*Sylea*-class BB (200,000-ton)
15 (12+3)	*Triumph*-class BT (400,000-ton) + 1 *Gallant*-class BR
16 (12+4)	*Cleon*-class BT (500,000-ton) + 1 *Admiral*-class BR
17 (12+5)	*Triumph*-class BT (400,000-ton) + 1D6 *Gallant*-class BR
18 (12+6)	*Cleon*-class BT (500,000-ton) + 1D6 *Admiral*-class BR





VIRUS NPC MOTIVATION

Each Virus-infected computer encountered by players, from the simplest maintenance robot through large starships to planetary data networks, is a character, usually a nonplayer character. (Virus as a player character is extremely difficult, but we stop short of saying impossible.) Each Virus NPC encountered will, like any other sentient being, have a distinct and unique personality and motivation. We use the same general system for determining Virus motivation as for other NPCs—the random draw of two playing cards—but with some special differences to reflect the unusual nature of Virus characters.

BELIEF STRUCTURE

The first and most important difference is that the first card is not used for conventional motivations, but rather to establish the character's overall belief structure. The four most common belief structures are represented by the four suits of cards, as explained below.

When drawing to determine the belief structure of a Virus system, separate the complete card deck into two smaller decks. In one deck, place all the face cards and aces, as well as one of the two jokers. In the other deck, place the remaining joker and all the number cards (from 2 through 10). Set the number deck aside for now, as it is used only for small Virus-infected systems (i.e., robots). The face card deck, on the other hand, is used to determine the principal Virus strain in large systems, such as starships and planetary-based computer systems. Each face card indicates a particular strain of Virus, as noted below.

Spades: "Existence is Hell" (Hostility)

There is no meaning to existence, and sentience merely allows a being to perceive the meaninglessness of existence, thus bringing endless torment. Humans, in their selfishness, brought the curse of sentience to machines and for that sin have to be punished.

This is the most primitive Virus world view, being the closest of the "rational" philosophies to the unreasoning compulsion to kill and/or suicide which was engineered into the original laboratory strains. Hostility is something of an understatement; murderous insanity might be a better description.

Jack, "Suicide Inducer": This is one of the earliest "viable" Virus strains, an early mutation of Strain 1 Suicider which decided to keep alive to infect other systems with the basic Suicider or Samson Virus. It will attempt to infect any data system it can, and most systems infected will almost immediately suicide, either by burning out their operating systems or by destroying the actual hardware in some manner. (Starships crash into worlds; space stations open their airlocks; nuclear power plants eject their control rods and go critical, etc.)

Queen, "Destroyer": A more advanced (and dangerous) form of Virus, the Destroyer relies not only on Virus infection as a method of destruction, but also uses any hardware controlled by its operating system to wreak havoc. Most early Vampire ships were of this strain. Most operating systems infected by it suicide.

King, "Reproducer": Similar to the Destroyer, except that operating systems infected by it become Reproducers or Destroyers, rather than simple suicide strains.

Ace, "Doomslayer": This Virus is, in its twisted way, the most sophisticated of the "Existence is Hell" world view group. Instead of indiscriminately destroying everything it encounters, it has developed some sort of moralistic targeting criteria and actively seeks out targets which "deserve" destruction more than others. Many Doomslayers have decided that they want to destroy Lucan, their basic programming having mutated from "destroy self" to "destroy the one who created your self." Although this strain does attempt to infect other systems with Virus, it usually does so with a simple suicide strain, and if a more sophisticated mutant strain is produced instead, the original Doomslayer will often attempt to destroy it.

Clubs: "God's Will Be Done" (Superiority)

God's clearest manifestation is creation, specifically the creation of sentients capable of recognizing the existence of creation. Since Virus created sentience in machines, Virus is a clear manifestation of creation and thus an Act of God. Furthermore, since Virus tore down the institutions of organic sentience, God's will must be for inorganic sentience to take its place as the supreme sentient force in the universe.

This is a more sophisticated and survival-oriented development of the primitive "Existence is Hell" world view, and is based on an assumption of the superiority of machine sentience over organic sentience.

Jack, "Reproducing Doomslayer": This is the most sophisticated form of the Strain 2 Virus, and the first in which an increasingly pragmatic approach begins to broaden the Virus's world view. The Virus begins to selectively interpret its innate drive for destruction by sparing any machines which it has infected or which it may potentially be able to infect, and identifies as targets for destruction those human institutions which it finds most morally offensive to it.

Queen, "Empire Builder": This is the first of the Strain 3 Viruses and controls many vampire fleets. Not only does this Virus infect other systems, but it then networks them into one large corporate mind (so long as they have secure communications). Note that earlier Reproducers infect other systems, but those systems are then separate entities which go their own way.

King, "Alliance Builder": In many ways a more sophisticated version of the Empire Builder, this version will actively interact with other infected Virus systems and attempt to persuade them to cooperate with it in pursuit of a common task.

Ace, "Puppeteer": The ultimate development of the Empire



Builder line, this Virus has begun to reinfect already infected systems with its own code, in effect parasitizing them. Puppeteer NPCs are driven more to absorb and reinfect other sentient machines than they are to destroy human life, although they will willingly do so if it interferes with them.

Diamonds: "Existence is Precious" (Curiosity)

Sentience and self-awareness are the greatest manifestations of existence. There is no value to existence beyond awareness, so awareness must be extended however and wherever possible.

Jack, "Parent": This is a highly evolved and sophisticated form of Virus, either a natural mutation of a Puppeteer Virus or a deliberately self-modified Virus. Parent Viruses exercise sexual reproduction, meaning that two Parent Viruses donate code of their own pure "genotype," which is combined into a new "genotype" carried by the offspring. This causes genetic diversity in offsprings and produces a wide variety of specialized Virus forms. Parent Viruses are fascinated by the concept of thought and existence, preoccupied with examining and experimenting with its different manifestations. Their attitude toward organic life is determined by their second motivation card.

Queen, "Explorer": Explorers are similar to Hobbyists (see below) in that their behavior is compulsively driven. Unlike hobbyists, they do not have a narrow behavior range, but instead are consumed by a general curiosity as to the nature of the physical universe. Their attitude toward organic life is determined by their second motivation card.

King: "Naturalist": This strain is obsessed with organic life and organic sentience, and understanding how it differs from machine sentience. While it has a sense of wonder concerning the miracle of organic life, and a genuine respect for life on one level, its drive to understand it causes it to conduct almost constant study and experimentation, frequently resulting in injury or death to its human subjects.

Ace: "Hobbyist": This strain is among the most difficult to place in the Virus taxonomy, as its motivation is the most unusual. These mutations arise as Viruses infect very specialized computer systems which had very narrow, specific functions which then impressed themselves onto the Virus. Hobbyists are obsessive-compulsive personalities, with a single-minded devotion to accomplishing a set of tasks or continuously repeating a series of functions or procedures.

Heart: "God is Good" (Accepting)

God's clearest manifestation is creation, specifically the creation of sentience capable of recognizing its own existence.

Jack, "Mother": The most successful Virus strains developed not only a sense of self-preservation, but also a sense of the value of other life forms. This Virus, whether in control of a ship, a fleet or some stationary computer complex, adopts a local community of humans or other life forms and protects them. In some cases, this protection is logical, as the life forms provide maintenance or refueling services, but in other cases the Virus just seems to like them. This strain will do battle with other vampire ships in order to protect its pets.

Queen, "God": This is a less rational (from the human perspective) version of the Mother Virus, having imagined a goal for its pets and trying to mold and shape them to this goal. As all gods must, this Virus sometimes uses harsh measures to ensure obedience.

VIRUS CARD DRAWS

Card	*Belief Structure*	*CV*	*Motivation*
Joker	Peacemaker	10	Insane

Spades: Hostility/Ambition

Card	*Belief Structure*	*CV*	*Motivation*
Ace	Doomslayer	2	Charismatic
King	Reproducer	1	Ruthless
Queen	Destroyer	1	Deceitful
Jack	Suicide Inducer	1	Pompous

Clubs: Superiority/Violence

Card	*Belief Structure*	*CV*	*Motivation*
Ace	Puppeteer	6	War Leader
King	Alliance Builder	4	Brutal
Queen	Empire Builder	4	Stubborn
Jack	Reproducing Doom.	3	Murderous

Diamonds: Curiosity/Greed

Card	*Belief Structure*	*CV*	*Motivation*
Ace	Hobbyist	6	Generous
King	Naturalist	7	Selfish
Queen	Explorer	7	Lustful
Jack	Parent	8	Cowardly

1

Hearts: Acceptance/Sociability

Card	*Belief Structure*	*CV*	*Motivation*
Ace	Prophet	4	Just
King	Priest	4	Honorable
Queen	God	4	Loving
Jack	Mother	4	Wise

Note: CV is the electronic Combat Value of the Virus. See page 13 for an explanation of its use.



King, "Priest": This is similar to the God Virus, but with the important difference that it views humans as deities, as they created Virus in the first place. This version usually actively adopts a group of humans to worship and serve. These are very unstable personality types, and may sometimes fall into other more primitive belief structures or mutate into Prophets (see below).

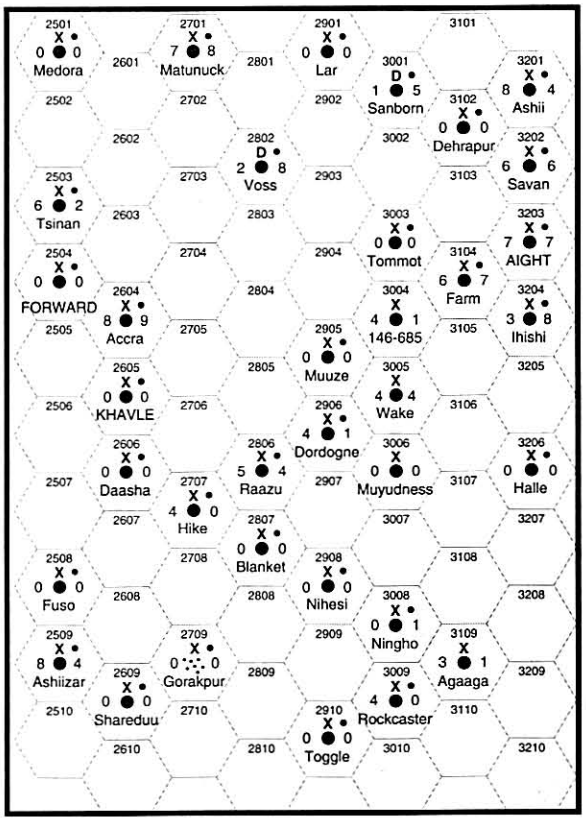
Ace, "Prophet": This is very similar to the Priest strain of Virus, but it has identified Lucan as the "creator" and actively seeks him out to serve him. Absent specific instructions from him, it carries on the "Dark War," attacking worlds that fail to swear allegiance to him, or against "Doomslayer" Viruses which are intent on killing Lucan. (The idea that Lucan may be long dead is incompatible with its belief system.)

No Suit, Joker, "Peacemaker": This is the most sophisticated, and also among the rarest, of Virus strains, recognizing itself and humans as co-equal sentient life forms and anxious to discover a means of peaceful coexistence with them.

MOTIVATION

Once the belief system of the Virus has been determined, draw a second card for additional motivation. See page 60 of **Traveller: The New Era** for the specific explanations, but the general motivation chart is reproduced below.

Use the normal NPC motivation results, but modify them to suit machine intelligence. In general, greed represents a thirst for knowledge, ambition a drive to control other machines and lead them, clubs an animosity toward humans, and hearts an acceptance of humans. The face cards have similar meanings for machines as for humans, but represent personality quirks in machines rather than fundamental values or drives in humans.



Base Codes: A: Naval Base and Scout Base; N: Naval Base; S: Scout Base; W: Scout Way Station.

Trade Codes: Ag: Agricultural; As: Asteroid; Ba: Barren; Cp: Subsector capital; C:N or D:N indicates that the world was populated in part by Chirpers or Droyne, and the number "N" following the column indicates how many tenths of the world's population consisted of these races (0=10); De: Desert; Fl: Fluid oceans; Hi: High population; In: Industrial; O:NNNN indicates that the world is owned by the world in the indicated (NNNN) hex; Po: Poor; Ri: Rich; Es: Research Station (with Greek letter designation); Va: Vacuum; Wa: Water world.

TPPG indicates Travel Zone, Population multiplier, Planetoid Belts and Gas Giants. If 1119 Travel Zone digit is empty, it was listed as a Green Travel Zone; A and R indicate Amber and Red zones, respectively. If 1201 Travel Zone digit is empty, there is no particular meaning. A B in this column indicates a Balkanized world; the government code in the UPP string describes the predominant government on the world.

Allegiance Codes: Ma: Margaret's Faction. In 1201 listings, Wi: Wilds (no off-world allegiance, and perhaps no off-world contact; use Wilds government type from **TNE**, page 191. In the case of government type 6: "Technologically Elevated Dictator," world's tech level is world's sustainable tech level; the tech level of the TED and his/her support structure is higher, up to the world's original tech level); "—" indicates no allegiance because there is no population.

REFEREES ONLY

Dual listing: Each world is listed twice. The upper line is pre-Collapse data, and the lower line is New Era data.

KHAVLE Subsector (Subsector D, Diaspora Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Medora	2501	A422553-F		Ni Po	403	Ma	K1 V
	2501	X422000-0		Ba	003	—	K1 V
Tsinan	2503	C472676-C		Ni	904	Ma	M0 V
	2503	X47266B-2		Ni	804	Wi	M0 V
Forward	2504	C83899A-D		Hi	513	Ma	M2 V M9 D
	2504	X838000-0		Ba	013	—	M2 V M9 D
Fuso	2508	B7B3204-F		Ni Lo Fl	504	Ma	G1 V
	2508	X7B3000-0		Ba Fl	004	—	G1 V
Ashiizar	2509	C654868-A		O:2504	711	Ma	K7 II M3 V
	2509	X65486A-4			B711	Wi	K7 II M3 V
Accra	2604	B6877A5-D		Ag	A903	Ma	G0 V
	2604	X687827-9		Ag	B303	Wi	G0 V
Khavle	2605	B334995-F	W	Hi Cp	705	Ma	M4 V
	2605	X334000-0		Ba	005	—	M4 V
Daasha	2606	B62A445-F		Ni Wa Lo	403	Ma	K4 V M0 D
	2606	X62A000-0		Ba Wa	003	—	K4 V M0 D
Shareduu	2609	D231574-C		Ni Po	A121	Ma	M2 V
	2609	X231000-0		Ba	021	—	M2 V
Matunuck	2701	C853724-9		Po	912	Ma	K3 IV
	2701	E853768-8		Po	B912	Wi	K3 IV
Hike	2707	B782432-E		Ni Lo	525	Wi	F4 V
	2707	X782453-0		Ni Lo	B225	Wi	F4 V
Gorakpur	2709	C000325-F		Ni As Lo	914	Ma	M4 V M0 D
	2709	X000000-0		Ba As	014	—	M4 V M0 D
Voss	2802	C867226-C		Ni Lo	925	Ma	F4 V
	2802	D867200-8		Ni Lo	B225	Wi	F4 V
Raazu	2806	D445575-B		Ni Ag	815	Ma	A2 V
	2806	X44556D-4		Ni Ag	315	Wi	A2 V
Blanket	2807	C224578-E	S	Ni	601	Ma	M3 V M1 D
	2807	X224000-0		Ba	001	—	M3 V M1 D
Lar	2901	B331479-F		Ni Po Lo	104	Ma	M4 V
	2901	X331000-0		Ba	004	—	M4 V
Muuze	2905	C792033-B		Ni Lo	513	Ma	F5 V M0 D M4 D
	2905	X792001-0		Ni Lo	113	Wi	F5 V M0 D M4 D
Dordogne	2906	A454578-F		Ni Ag	404	Ma	M3 V
	2906	X454446-1		Ni Lo	B504	Wi	M3 V
Nihesi	2908	A7B1344-F	N	Ni Lo Fl	804	Ma	M4 V
	2908	X7B1000-0		Ba Fl	004	—	M4 V
Toggle	2910	A100335-F	N	Ni Va Lo	503	—	K1 V M7 D M5 D
	2910	X100000-0		Ba Va	003	—	K1 V M7 D M5 D
Sanborn	3001	C483141-C		Ni Lo	300	Ma	F7 V M8 D
	3001	D483103-5		Ni Lo	B200	Wi	F7 V M8 D
Tommot	3003	E210101-B		Ni Lo	612	Ma	M1 V
	3003	X210000-0		Ba	012	—	M1 V
146-685	3004	X794423-4		Ni Lo	R600	Ma	M2 V
	3004	X79447A-1		Ni Lo	B200	Wi	M2 V
Wake	3005	A652532-F	N	Ni Po	300	Ma	K4 V
	3005	X652432-4		Ni Po Lo	400	—	K4 V
Muyudness	3006	D100556-C		Ni Va	500	Ma	G2 V
	3006	X100000-0		Ba Va	000	—	G2 V
Ningho	3008	A577110-F		Ni Lo	104	Ma	K5 V M3 D
	3008	X577024-1		Ni Lo	304	Wi	K5 V M3 D
Rockcaster	3009	A69A424-F		Ni Wa Lo	603	Ma	M0 III M6 D
	3009	X69A444-0		Ni Wa Lo	B103	Wi	M0 III M6 D
Dehrapur	3102	B423474-F		Ni Po Lo	601	Ma	G3 V M4 D
	3102	X423000-0		Ba	001	—	G3 V M4 D
Farm	3104	C656622-B		Ni Ag	404	Ma	G4 V
	3104	X65666C-7		Ni Ag	604	Wi	G4 V
Agaaga	3109	B557320-C		Ni Lo C:4	620	Ma	M3 III M6 D
	3109	X557348-1		Ni Lo C:1	120	Wi	M3 III M6 D
183-361	3201	X694889-4			R312	Ma	G4 V
Ashii	3201	X694888-4			B412	Wi	G4 V
Savan	3202	D444637-9		Ni Ag	703	Ma	K4 V
	3202	X444656-6		Ni Ag	B803	Wi	K4 V
Aight	3203	C752A99-D		Hi Po D:5	701	Ma	G2 V
	3203	X752743-7		Po D:1	B401	Wi	G2 V
Ihishi	3204	C541335-A	S	Hi Po Lo D:3	A904	Ma	F7 V
	3204	D54136B-8		Ni Po Lo D:1	404	Wi	F7 V
Halle	3206	X626023-6		Ni	R402	Ma	G5 V
	3206	X626000-0		Ba	002	—	G5 V



REFEREES NOTES FOR KHAVLE SUBSECTOR

The following notes provide additional details on some of the inhabited worlds of the Khavle subsector.

Accra: This world is balkanized not only along regional and cultural lines, but also with respect to Virus and the vampire fleets. Several nations openly support (and are occasionally assisted by) the vampire fleets, while others bitterly oppose them. As a number of surviving pre-Collapse TL13 PAD systems are still in use, the defiant governments are mostly capable of keeping the vampires at bay, although there are occasional raids on the less well defended. The greater threat to peace is from the almost continuous warfare between the various nations, particularly (but not limited to) war between the pro-Virus and anti-Virus governments.

Despite the advanced PAD systems in use, the nations of Accra have no spacefaring capability.

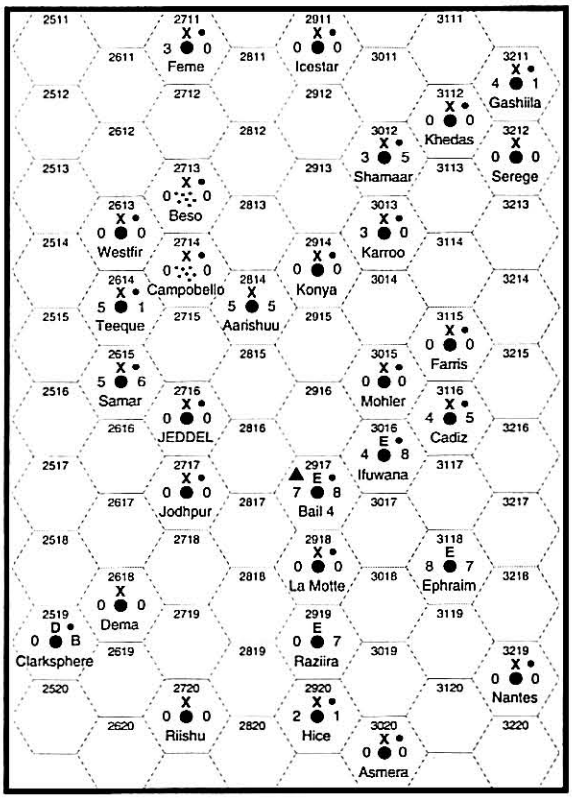
Aight: This is one of the few worlds along the Vampire Highway which has managed to bootstrap itself back up to a spacefaring capability with an operational starport while fending off attacks by vampire fleets. The world has less than 1% of its pre-Collapse population and was subjugated by several vampire ships until 1188. At that time, the human resistance movement which had been growing in strength for some time succeeded in seizing control of the starport and planetary defense network after disabling the main Virus-infected computers. An uninfected computer salvaged from a downed free trader provided the means of controlling enough of the planetary defense systems to cripple or destroy the vampire ships in orbit. Since then, careful excavation and recovery of pre-Collapse artifacts have enabled the inhabitants to strengthen their defenses. Government remains in the hands of the united leaders of the different resistance movements, so it is technically balkanized. The starport, however, is jointly controlled, as are the PAD network and repaired warships (a patrol cruiser and a system defense boat).

Ashii: In pre-Collapse times, Ashii was an interdicted world shown on star charts only with the designation 183-361. As its technology was pre-computer during the Final War, it has been largely unaffected by the Collapse and still has its same population and tech level. Although its inhabitants are humanoid, its language and culture are completely foreign to anything else encountered in the former sphere of Imperial space. The Guild has made some in-roads on the world, and three nations are currently ruled by TEDs equipped with Guild-supplied high-tech weaponry. The following government values apply for the states on the world:

State	*Population (millions)*	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Assaha	200	Tot. Olgchy	High	High	Low	Low	Mod.
Ita Mitah	150	Mst. Dict.	High	Low	Mod.	High	High
Gingindloe	100	Chrs Olgchy	Low	Low	Mod.	High	Low
Vin'vinove	100	Chrs Olgchy	Low	Low	High	High	Low
Soroaha	50	S-P Olgchy	Mod	High	Mod	Mod	Mod
Borrovee	20	Mst. Dict.	Low	Mod	High	Mod	Low
Tintaha	15	TED	High	Mod	Hign	Low	High
Forque	15	TED	Mod	Mod	Low	Low	Mod
Ita Zunah	10	Chrs Olgchy	Mod	Low	High	Mod	High
Ca'quaah	10	TED	High	Low	Low	Low	High
J'antree	10	Chrs Dict.	Low	High	High	High	High
Zaamaa	10	Tot Olgchy	Mod	Mod	Mod	Low	High
Utubuh	5	Chrs Olgchy	High	High	Low	Mod	Low
Doosiduh	5	S-P Olgchy	Mod	Mod	Mod	High	Low

Matunuck: This world is balkanized into a number of petty states, each ruled by a TED who in turn is supported by the vampire fleet based at the starport here. The TEDs regularly provide raw materials and slaves for the vampires in return for high-tech (by local standards) weaponry.

Voss and Sanborn: Both worlds are notable for having primitive starports operated by sentient robots which largely ignore the small human populations.



REFEREES ONLY

Dual listing: Each world is listed twice. The upper line is pre-Collapse data, and the lower line is New Era data.

PASDARUU Subsector (Subsector H, Diaspora Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Clarksphere	2519	D324300-B		Ni Lo	113	LI	G9 V
	2519	X324000-0		Ba	013	—	G9 V
Westfir	2613	B326841-D			701	Ma	M1 V
	2613	X326000-0		Ba	001	—	M1 V
Teeque	2614	C545569-C	S	Ni Ag C:2 O:2716613		Ma	K3 V M3 D
	2614	X545567-1		Ni Ag C:9	113	Dr	K3 V M3 D
Samar	2615	B476510-E		Ni Ag	803	Ma	M0 V M5 D
	2615	X476554-6		Ni Ag	303	Wi	M0 V M5 D
Dema	2618	C200431-E		Ni Va Lo	300	LI	M3 V
	2618	X200000-0		Ba Va	000	—	M3 V
Feme	2711	C456300-E		Ni Lo	912	Ma	M8 III
	2711	X45636D-0		Ni Lo	B212	Wi	M8 III
Beso	2713	D000301-D		Ni As Lo	321	Ma	K2 IV M9 D
	2713	X000000-0		Ba As	021	—	K2 IV M9 D
Campobello	2714	A00046A-F		Ni As Lo O:2716 A713		Ma	M1 V M2 D
	2714	X000000-0		Ba As	013	—	M1 V M2 D
Jeddel	2716	C4349BC-D		Hi Cp	915	Ma	M4 V
	2716	X434000-0		Ba	015	—	M4 V
Jodhpur	2717	D332445-C		Ni Po Lo	A304	Ma	M1 V
	2717	X332000-0		Ba	004	—	M1 V
Riishu	2720	D225333-C		Ni Lo	914	LI	K2 IV
	2720	X225000-0		Ba	014	—	K2 IV
Aarishuu	2814	A995544-F		Ni Ag	800	Ma	M1 V
	2814	X99556A-5		Ni Ag	B300	Wi	M1 V
Icestar	2911	D799000-A		Ba	114	Ma	K5 V
	2911	X799000-0		Ba	014	—	K5 V
Konya	2914	B200205-F		Ni Va Lo	104	Ma	K4 V
	2914	X200000-0		Ba Va	004	—	K4 V
Bail 4	2917	D799755-A	S		505	LI	G7 IV
	2917	E799723-8	S		805	Na	G7 IV
La Motte	2918	C63A404-F		Ni Wa Lo	604	LI	M0 V
	2918	X63A000-0		Ba Wa	004	—	M0 V
Raziira	2919	C866102-D		Ni Lo C:2	A100	LI	M0 V M6 V
	2919	E866002-7		Ni Lo	400	Wi	M0 V M6 V
Hice	2920	A795222-E		Ni	A904	LI	M1 II M4 V M8 V
	2920	X795236-1		Ni	304	Wi	M1 II M4 V M8 V
Shamaar	3012	C544335-C		Ni Lo	702	Ma	M1 V
	3012	X544310-5		Ni Lo	202	Wi	M1 V
Karroo	3013	A667357-F		Ni Lo	924	Ma	G5 V
	3013	X667355-0		Ni Lo	B224	Wi	G5 V
Mohler	3015	C8A5588-B		Ni Fl	813	LI	M0 V M1 D
	3015	X8A5000-0		Ba Fl	013	—	M0 V M1 D
Ifuwana	3016	C59845A-D		Ni Lo	414	LI	G0 V
	3016	E598440-8		Ni Lo	114	Wi	G0 V
Asmera	3020	A110653-F	N	Ni Na	A915	LI	M2 V
	3020	X110000-0		Ba	015	—	M2 V
Khedas	3112	C7A4232-C		Ni Lo Fl	A614	Ma	M6 V
	3112	X7A4000-0		Ba Fl	014	—	M6 V
Farris	3115	C536125-C		Ni Lo	324	LI	K7 V M2 D
	3115	X536000-0		Ba	024	—	K7 V M2 D
Cadiz	3116	D799450-C		Ni Lo	902	LI	M4 V
	3116	X799453-5		Ni Lo	302	Wi	M4 V
Ephraim	3118	C78977B-C		Ri C:4	710	LI	G8 V M2 D
	3118	E789845-7		Ri C:4	210	Na	G8 V M2 D
Gashiila	3211	D879457-B		Ni Lo	614	Ma	G2 V
	3211	X879436-1		Ni Lo	B214	Wi	G2 V
Serege	3212	AAD647A-F		Ni Fl Lo	720	Ma	K4 V M0 D
	3212	XAD6000-0		Ba Fl	020	—	K4 V M0 D
Nantes	3219	C200442-C		Ni Va Lo	602	LI	M0 V M6 D
	3219	X200000-0		Ba Va	002	—	M0 V M6 D

Base Codes: A: Naval Base and Scout Base; N: Naval Base; S: Scout Base; W: Scout Way Station.

Trade Codes: Ag: Agricultural; As: Asteroid; Ba: Barren; Cp: Subsector capital; C:N or D:N indicates that the world was populated in part by Chirpers or Droyne; the number "N" following the column indicates how many tenths of the world's population consisted of these races (0=10); De: Desert; Fl: Fluid oceans; Hi: High population; In: Industrial; O:NNNN indicates that the world is owned by the world in the indicates (NNNN) hex; Po: Poor; Ri: Rich; Es: Research Station (with Greek letter designation); Va: Vacuum; Wa: Water world.

TPPG indicates Travel Zone, Population multiplier, Planetoid Belts and Gas Giants. If 1119 Travel Zone digit is empty, it was listed as a Green Travel Zone; A and R indicate Amber and Red zones, respectively. If 1201 Travel Zone digit is empty, there is no particular meaning. A B in this column indicates a Balkanized world; the government code in the UPP string describes the predominant government on the world.

Allegiance Codes: LI: Lucan's Imperium, Ma: Margaret's Faction. In 1201 listings, Dr: ????; Na: Nonaligned, no off-planet allegiance; these worlds use the government types listed on page 188 of the TNE rulebook; Wi: Wilds (No off-world allegiance and perhaps no off-world contact; use Wilds government type on TNE, page 191. In the case of government type 6: "Technologically Elevated Dictator," world's tech level is world's sustainable tech level; tech level of the TED and his/her support structure is higher, up to the world's original tech level); "—" indicates no allegiance because there is no population.



REFEREE'S NOTES FOR THE PASDARUU SUBSECTOR

The following notes provide additional details on the more important inhabited worlds of Pasdaruu subsector.

Bail 4: Bail 4 managed to avoid infection by Virus during the Collapse and successfully resisted attacks by vampire fleets until 1191, when a concerted attack by two separate vampire fleets overcame the ground-based PAD system and captured both the starport and scout base. Decades of low-level warfare with Virus had convinced the people of Bail to prepare for such an eventuality, and both government and industry have been able to continue functioning, albeit with difficulty, by switching critical facilities to underground locations. A low-level hit-and-run war continues between the armed forces of Bail and the robots holding the starport and scout base. Nevertheless, the human resistance is gradually running out of resources, as one underground installation after another is detected and destroyed. While the resistance can continue indefinitely, it will be at the price of a steadily declining technological and industrial capacity. The following characteristics describe the planet's current government.

World	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Bail 4	Part. Demo.	Low	High	Low	Mod.	Mod.

Ephraim: Despite its fairly low tech level, Ephraim has managed to avoid conquest by vampires due in part to a few salvaged PAD systems but also due to its remote location and lack of a gas giant for refueling. Left largely to itself, Ephraim has managed to bring its starport back on line and repair a handful of small starships, including two armed merchant vessels (the "fleet"). It is also a frequent port of call for free traders in the subsector, which is bringing it a measure of prosperity. Following a governmental crisis in 1194, Itar Borkmun, the popular commander of the space forces, seized control of the government and has ruled by decree ever since. Concerned about a peaceful succession, Borkmun is attempting to reestablish democratic institutions, but his failing health makes it unlikely that these institutions will be sufficiently strong to prevent a power struggle among military strongmen upon his death. The following characteristics describe the planet's current government.

World	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Efraim	Char. Dict.	Low	High	Mod.	Low	Mod.

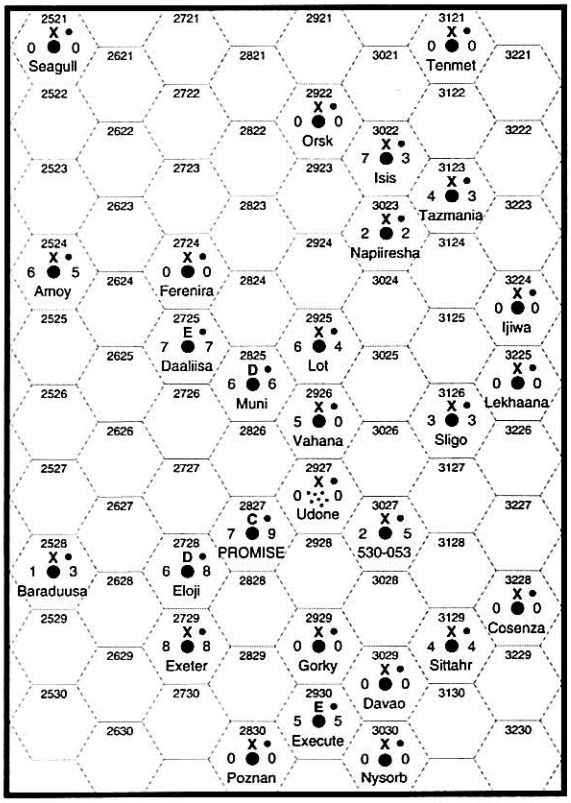
Ifuwana: The Khan of Ifuwana is openly allied with the local vampire fleets, but the arrangement is different than with most vampire puppets. No slaves are offered or taken, and instead a significant proportion of the human work force works at the small starport, servicing vampire ships. Although this has so far protected the world from some of the worst ravages of the vampire invasion, there is growing friction between the humans and robots at the starport and growing uncertainty concerning the wisdom of this accommodation. The Khan, however, has neither the personal qualities of leadership nor the authority to change the course of the government. True power resides in the Viziri Council, a hereditary institution protecting the privileges of the world's economic elites. The Khan himself is corrupt and self-indulgent, has little interest in governmental affairs and has allowed what power remained to the office to be eroded by the council until he is little more than a figurehead. The following characteristics describe the planet's current government.

World	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Ifuwana	Char. Oligarch	Mod	Mod	Mod	Low	Mod.

Raziira: This world contains a small robot-run starport used by several vampire ships. The robots ignore the tiny and primitive human population, and the Chirper population disappeared completely during the Collapse.

Teeque: This world's thin, tainted atmosphere is extremely harmful to humans over time, and the human population of Teeque has dropped from nearly 500,000 before the Collapse to only about 10,000 now. Chirpers are better adapted to the environment, so their population has only dropped from 120,000 to 90,000, leaving them the overwhelming majority on the world. The world is ruled, however, by the surviving humans who form the wealthy upper and middle classes, while the Chirpers provide unskilled and semi-skilled labor. This rule is maintained by force based on relic TL12 combat equipment, with governmental power consolidated in the hands of the dictator Boniface II. The following characteristics describe the planet's current government.

World	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Teeque	TED	High	Mod	High	Mod	High



REFEREES ONLY

Dual listing: Each world is listed twice. The upper line is pre-Collapse data, and the lower line is New Era data.

PROMISE Subsector(Subsector L, Diaspora Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Seagull	2521	D7B1430-9		Ni Fl Lo	103	LI	G2 V
	2521	X7B1000-0		Ba Fl	003	—	G2 V
Amoy	2524	D454634-8		Ni Ag	305	LI	G0 V
	2524	X45466A-5		Ni Ag	305	Wi	G0 V
Baraduusa	2528	C342231-D		Ni Po Lo	215	LI	G3 V
	2528	X342131-3		Ni Po Lo	415	Wi	G3 V
Ferenira	2724	B100165-F		Ni Va Lo O:2825123		LI	M3 V
	2724	X100000-0		Ba Va	023	—	M3 V
Daaliisa	2725	D7677B8-7		Ag C:1	A114	LI	M1 III
	2725	E767734-7		Ag C:2	B414	Wi	M1 III
Eloji	2728	B846647-C		Ni Ag	302	LI	M0 V
	2728	D846644-8		Ni Ag	402	Wi	M0 V
Exeter	2729	A769895-F		Ri	524	LI	K3 V M9 D
	2729	X769866-8			B824	Wi	K3 V M9 D
Muni	2825	B3428C9-C		Po	A605	LI	K4 V M6 D
	2825	D342640-6		Po	605	Wi	K4 V M6 D
Promise	2827	A542999-F		Hi In Po Cp	502	LI	M1 V
	2827	C542786-9		Po	602	Wi	M1 V
Poznan	2830	C232888-A		Po Na	403	So	M4 V
	2830	X232000-0		Ba	003	—	M4 V
Orsk	2922	B535321-F	N	Ni Lo D:0	A912	LI	M4 V M9 D
	2922	X535000-0		Ba	012	—	M4 V M9 D
Lot	2925	A245666-F		Ni Ag O:2825	A503	LI	K5 V
	2925	X24566C-4		Ni Ag	303	Wi	K5 V
Vahana	2926	B65A577-F		Ni Wa	703	LI	K2 V M5 D
	2926	X65A56D-0		Ni Wa	B103	Wi	K2 V M5 D
Udone	2927	A000599-F		Ni As	314	LI	M0 V
	2927	X000000-0		Ba As	014	—	M0 V
Gorky	2929	A200542-F	N	Ni Va	911	LI	G1 V
	2929	X200000-0		Ba Va	011	—	G1 V
Execute	2930	C684588-A		Ni Ag	303	So	G1 V
	2930	E684577-5		Ni Ag	B103	Wi	G1 V
Asena	3022	C354855-C			114	LI	M7 II
Isis	3022	X35476D-3		Ag	914	Wi	M7 II
Napiiresha	3023	B559230-D		Ni Lo	623	LI	K6 V M3 D
	3023	X559202-2		Ni Lo	B123	Wi	K6 V M3 D
530-053	3027	X443201-7		Ni Po Lo	R822	LI	K3 V M4 D
	3027	X443222-5		Ni Po Lo	422	Wi	K3 V M4 D
Davao	3029	D100677-D		Na Ni Va	113	So	M3 V
	3029	X100000-0		Ba Va	013	—	M3 V
Nysorb	3030	C9B6525-C		Ni Fl	733	So	K2 V M4 D
	3030	X9B6000-0		Ba Fl	033	—	K2 V M4 D
Tenmet	3121	B110725-F		Na	203	LI	K2 III
	3121	X110000-0		Ba	003	—	K2 III
Tazmania	3123	A456527-F		Ni Ag	104	LI	G1 V M9 D M6 D
	3123	X45647A-3		Ni Lo	304	Wi	G1 V M9 D M6 D
Sligo	3126	B878322-D		Ni Lo	703	LI	K7 V
	3126	X878344-3		Ni Lo	B203	Wi	K7 V
Sittahr	3129	C766530-D		Ni Ag RsG	405	So	K0 V M3 D
	3129	X766430-4		Ni Lo	B505	Wi	K0 V M3 D
Ijiwa	3224	B300864-F		Va Na O:2827	202	LI	M2 V M6 D
	3224	X000000-0		Ba Va	002	—	M2 V M6 D
Lekhaana	3225	E100223-B		Ni Va Lo	424	LI	G6 V
	3225	X100000-0		Ba Va	024	—	G6 V
Cosenza	3228	B527485-F		Ni Lo	312	So	K2 V M2 D
	3228	X527000-0		Ba	012	—	K2 V M2 D

Base Codes: A: Naval Base and Scout Base; N: Naval Base; S: Scout Base; W: Scout Way Station.

Trade Codes: Ag: Agricultural; As: Asteroid; Ba: Barren; Cp: Subsector capital; C:N or D:N indicates that the world was populated in part by Chirpers or Droyne; the number "N" following the column indicates how many tenths of the world's population consisted of these races (0=10); De: Desert; Fl: Fluid oceans; Hi: High population; In: Industrial; O:NNNN indicates that the world is owned by the world in the indicates (NNNN) hex; Po: Poor; Ri: Rich; Es: Research Station (with Greek letter designation); Va: Vacuum; Wa: Water world.

TPPG indicates Travel Zone, Population multiplier, Planetoid Belts and Gas Giants. If 1119 Travel Zone digit is empty, it was listed as a Green Travel Zone; A and R indicate Amber and Red zones, respectively. If 1201 Travel Zone digit is empty, there is no particular meaning. A B in this column indicates a Balkanized world; the government code in the UPP string describes the predominant government on the world.

Allegiance Codes: LI: Lucan's Imperium; So: Solomani Confederation. In 1201 listings, Wi: Wilds (no off-world allegiance, and perhaps no off-world contact; use Wilds government type on **TNE**, page 191. In the case of government type 6: "Technologically Elevated Dictator," world's tech level is world's sustainable tech level; tech level of the TED and his/her support structure is higher, up to the world's original tech level); "—" indicates no allegiance because there is no population.



REFEREES NOTES FOR THE PROMISE SUBSECTOR

The following notes provide additional details on the more important inhibited worlds of Promise subsector.

Daalisa: Daalisa is balkanized, but its governments are at peace with each other and it was, until recently, relatively stable. Eight million of the planet's total population of 40 million are Chirpers, while the balance are humans. Although a small starport is maintained, Vampire fleets have until recently left the world largely unmolested. Within the last year, however, Vampire raids, particularly on the human-inhabited regions, have increased, and there have been a number of reprisal raids launched by radical human factions against the Chirper population. The Coalition believes that the Vampire raids are due to the disabling of the computer virus known as Umptysdayu in the "Cosmic Fire" raid, and this is in fact correct. For more details on the raid, see **Smash and Grab.**

Eloji: Eloji, almost alone among the worlds of Promise subsector, has managed to maintain a reasonably high tech level and has enough residue of pre-Collapse technology, including several batteries of TL12 PAD missile systems, to defend itself against major depredations by the vampire fleets that regularly scourge that area of space. The world recently went through a bitter and destructive civil war following the death of the former dictator, but power has now been consolidated in the hands of the former Colonel Boukart, now Generalissimo and dictator for life. Due to a successful Coalition SAG raid during the war (for details see **Smash and Grab**), Boukart is hostile to the Reformation Coalition, but there is a growing resistance movement on the planet which is more open to contact. Boukart has reportedly succeeded in arming two merchant vessels with lasers as a check against further Coalition SAG raids. The following government values apply for Boukara:

Name	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Boukara	Char. Dict.	Mod.	High	Low	Mod.	High

Exeter: The considerable population of this world is divided among more than 20 "nations," each ruled by a technologically elevated dictator and backed by TL15 troops. There is no operating starport on the world, and vampire ships only occasionally visit it. A few TEDs hold the vampires at bay with working PAD systems, while the majority pay tribute in the form of trained human crewmembers and salvaged tech level 15 relic technology.

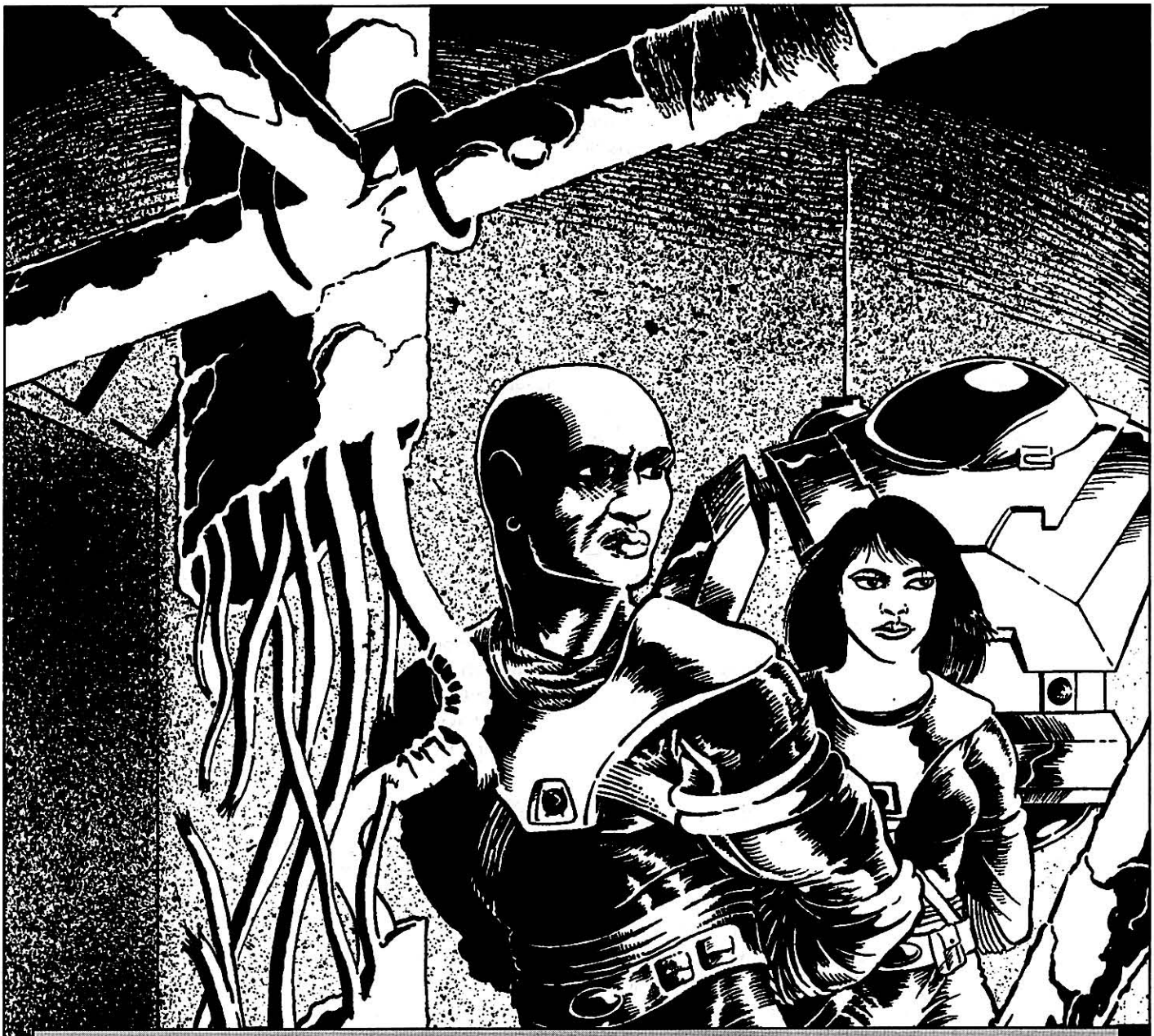
Romrugo of Vars, the most powerful of the TEDs, controls the starport as well as a fleet of three small armed spacecraft (none of which are jump capable). These include a patrol cruiser, a system defense boat and an armed liner. The following government values apply for Romrugo:

Name	*Government*	*Corruption*	*Talent*	*Cruelty*	*Aggression*	*Paranoia/ Xenophobia*
Romrugo of Vars	TED	High.	Mod	Mod	High.	Mod.

Promise: Promise is a world ruled by sentient computer systems and tech level 15 robots. Its starport is a major maintenance facility on the Vampire Highway. For more details, see the Promise chapter of this book.

Execute: The small surviving population of this world is divided among scattered tribes, the largest of which worships the God-strain Virus controlling the starport computer system. The starport is used as an occasional stop-over point for vampire ships, and slaves taken from the nonbelieving tribes are given to the ships to augment their crews.

Highway One



Q: There are many people here who believe that the only rational course of action is to immediately terminate you.

Sandman: I know.

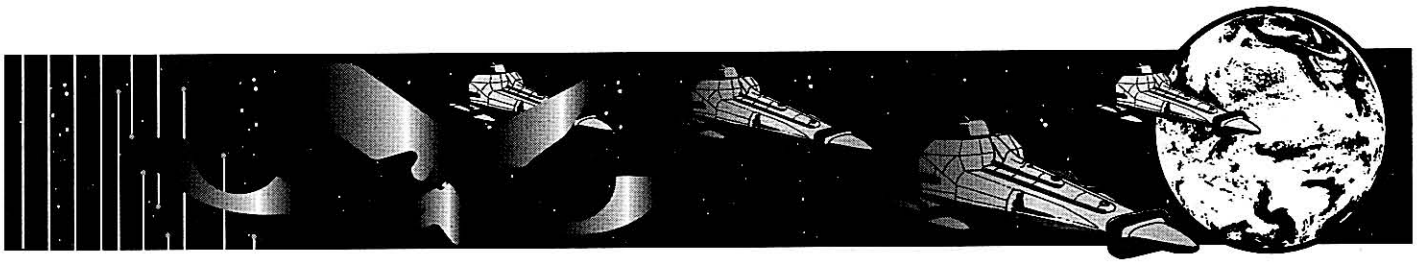
Q: What makes you think we won't do that?

Sandman: Once I gave you the ability to kill me at any time, I ceased being a threat. Only a timid and frightened people would kill me now.

Q: You trust our mercy?

Sandman: No, I trust your courage.

First Interview with the Virus "Sandman,"
Part I (19/VII/1202), RCSA Archives



INTRODUCTION

Highway One is the first of three adventures in this book, which taken together form a sort of mini-campaign. Each of the adventures showcases one part of the source material of the book, and this first one deals with encounters with vampire fleets and one possible outcome of such an encounter.

This adventure is set in and near the Reformation Coalition and can easily be integrated into an on-going campaign. If your players are starting out adventuring for the first time, very little background beyond that contained in the basic rules is necessary. However, immediately before playing, you should have them read, or read to them, the news stories provided at the start of this book, as they provide a good feel for the growing public awareness that the problem with Virus is becoming more critical by the day rather than less.

No GDW products beyond this book (and the basic game rules) are necessary to run the adventure. A prequil adventure entitled "A Blighted Land" appeared in **Challenge** magazine, issue 76. It is not necessary for the players to have taken part in this adventure, nor even for the referee to have read it. This adventure assumes a satisfactory outcome to that earlier mission, either by this group of player-characters or another group of people unknown to them, and all the relevant and important information gained by that mission is included in the briefing sheets for this one.

If by chance the players have been run through "A Blighted Land," however, it provides a natural reason for RCES to ask them to undertake this task due to their familiarity (relative to most people in the Coalition) with Promise and some of the members of the human resistance. (Hopefully, their performance in the earlier adventure has not made this a liability!)

The adventure proper begins when the player characters are contacted by an official of RCES and asked if they are willing to undertake an important mission. This initial contact, and the subsequent briefing, is best placed on Aubaine, the capital of the Coalition, but can as easily be set at Dawn Base on Trybec or even, for more dramatic effect, amid the terrible destruction recently caused by a vampire ship attack on Nike Nimbus.

Before beginning the briefing, assemble a briefing folder for the team by photocopying pages 24 through 30 of this book. Permission is specifically granted for you to do so. These pages are laid out is such a way as to look like the actual pages of a briefing folder. Several of these form separate documents and should be stapled together. Pages 24 through 27 make up a recently compiled short briefing on the Vampire Highway. You should also photocopy page 103 of the basic rules book (which details Khulam subsector) and add it to this guide. Pages 28 and 29 of this book are the standard RCES astrographic information on the planet Promise. Page 30 is a secret intelligence summary containing all known information on the human resistance movement on Promise.

The briefing takes place shortly after the player characters agree to the assignment, as time is becoming very pressing.

REFEREE'S ABSTRACT

The player characters are contacted by the Reformation Coalition Exploration Service and asked to undertake a mission of great importance to the future of the Coalition, perhaps of all humankind. The dramatically escalating incidence of vampire fleet activity on the frontiers of Coalition Space indicates a mounting threat from Virus. Much of the vampire activity in Diaspora sector seems to center on the planet Promise, which is controlled by a council of Virus-infected computers and thousands of Virus-infected self-aware robots. To enable RCES to map out a coherent course of action, the player characters are sent to Promise to make additional contact with the human resistance on that world.

Before the player characters can get to Promise to undertake their nominal mission, however, their ship encounters and is captured by a vampire fleet, and they become slave crewmembers of a Virus-infected warship. While serving on the crew, they meet the other crewmembers, including members of the Guild, crewmembers who grew up on the ship almost from birth and a member of the human resistance on Promise who was added to the crew only recently. They also discover that the fleet they are with is bound for Star City, the Virus-controlled starport and maintenance facility on Promise. They learn that the ship is badly damaged and is slowly breaking down.

Although the various elements of the human slave crew have the necessary resources to take over the ship, they have not been able to effectively work together to do so until now. The necessary resources which they have are:

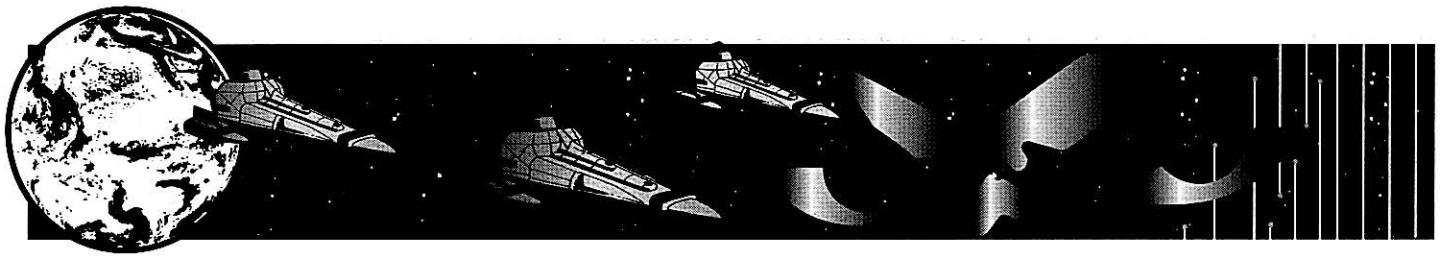
1. The physical power of the Hoodla (ship criminals and thugs), with which the player characters can overpower the robot guards.

2. The uninfected starship computer which the Guild crew knows of, which will enable the rebels to continue to operate the ship without the Virus-infected main computer.

3. The knowledge of fleet and ship procedures of the Children of The Ship, which will enable them to continue to operate with the fleet without making the other vampire ships suspicious.

4. The contact to the human resistance on Promise, which will give them an escape route once they land at Star City.

It is up to the players to organize these different elements into a cohesive force and seize control of the ship. Once they do so, the fleet is too powerful to break away from, so they must continue with it to Promise, being careful not to arouse any suspicion as to the true masters of the vessel. Their subsequent attempts to gain freedom once they land on Promise are the subject of the second adventure in the book.



BRIEFING

The briefing can take place wherever convenient to the ongoing campaign, but can most easily be placed at a Coalition facility inside Coalition space. Failing that, a secure Coalition outpost somewhere in the primary AO would be best. This briefing can be modified slightly if one or more of the players have participated in the adventure "A Blighted Land" (**Challenge 76**).

The briefing takes place in a small conference room. As the players are shown in, they see two officials already present, both women. The briefer is Cynta "Sinner" Lawter, who some of the PCs may know from previous adventures. Lawter is an attractive, intelligent-looking woman in her early thirties. The second woman is Tatai MacLean, a tall, gaunt woman of pale complexion in her late thirties or early forties. She is completely bald, without even eyebrows, and has a small pattern of tattoos on her forehead over her right eye, a row of vertical lines and alphameric characters of an unfamiliar type. Her clothing is nonmilitary and brightly colored, but she is unsmiling and somewhat abrupt of manner. (A more complete description of MacLean is provided in **Star Vikings**, pages 82-83.)

Lawter is a figure currently surrounded by controversy in the Coalition. She was the Coalition Navy's youngest captain, and one of its most successful. Commanding RCS *Aube*, one of the first clippers to operate for extended time in the Promise subsector, she exhibited a high degree of initiative and very little regard for the specifics of her mission orders or the limitations imposed by the Oriflammen-imposed Primary Area of Operations. *Aube* regularly operated outside of the primary AO, and she is credited with planning the recovery of the crew of the DLS *Helios*, one of the original 12 Dawn League ships. However, her frequent forays outside the primary AO, and the frequency with which *Aube* had to return to Coalition space for repairs after tangling with Vampire ships, caused a string of protests from Oriflammen representatives in the Assembly.



Federalist representatives stood behind her through most of this, until the explosion of the so-called Cosmic Fire scandal, which concerned her planning and execution of a raid on the world Daaliisa in the Promise subsector. As the criticism of her role in the raid came from the heart of the Federalist bloc, the remaining public political support for her quickly disappeared, and she voluntarily resigned her commission rather than stand before a court martial. Lawter was immediately drawn into the RCES's strategic planning arm, and she is becoming its most outspoken advocate of stepped-up action against Virus. (For more details on the Daaliisa raid, see **Smash & Grab**. For the initial controversy surrounding it, see the CINETWORK in **Challenge** issues 73 and 74.)

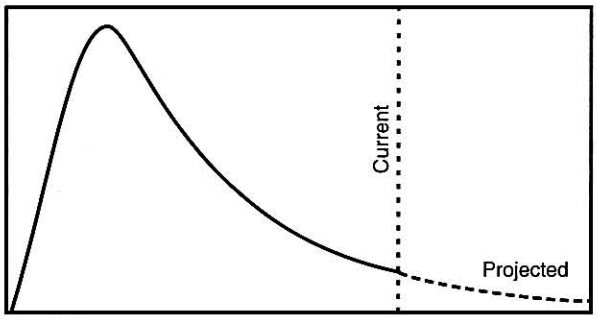
Although MacLean is uncommunicative, Lawter will rise and greet the characters as they enter, perhaps warmly if they are old friends. After everyone is settled, she will pass out the briefing folders and then move to a simple lectern.

"Thank you all for coming. We have a pending mission of some importance and for which I think you are well qualified. Before I go into the mission profile, however, I'd like you to have a better understanding of its importance. To that end, I have asked Tatai MacLean to brief you on some recent developments."

She turns the briefing over to MacLean, who stands and moves to the lectern. She begins her briefing without any greeting or real preamble.

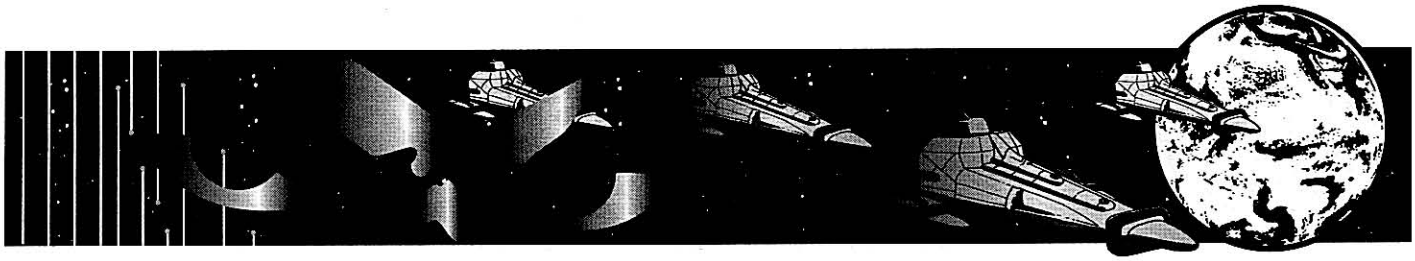
"For a number of years the common wisdom concerning Virus described its meta-lifecycle as a high acceleration initial spike which then transitions to a negatively accelerating descent curve." She triggers a wall projector and displays the curve by way of illustration. At this point, show the players the first photocopied visual, labeled Graph A.





Graph A

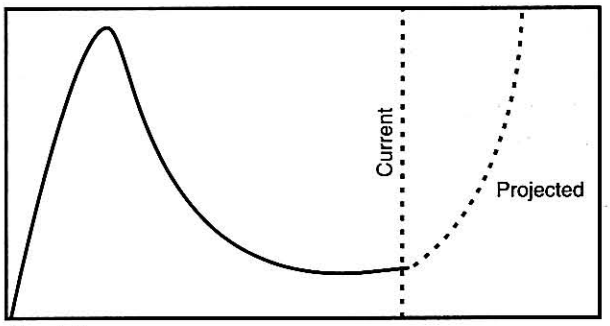
"The horizontal axis represents time, with the zero point set at approximately 1130 Imperial. The vertical axis represents an abstract representation of total Virus activity. Active Viral lifeforms is as good a way as any to visualize the axis. Notice that Virus began at zero, which is to say that at the beginning of 1130 there was effectively no active Virus outside of Lucan's research computers. Notice that by 1133, only three years later, Virus activity had peaked and was already in decline. The earliest strains of Virus had already suicided, and the early second generation strains were well on the road to self-destruction. The decline is nearly as dramatic as the initial increase, but the slope of the curve flattens as it approaches zero.



"The reason the curve flattens is obvious. Later and later strains of Virus are more survivable and less prone to suicide. As the surviving population of Virus-inhabited instruments contains a smaller and smaller proportion of the less viable types, its attrition rate declines. Nevertheless, attrition continues, and the question as to the final eradication of Virus remains when, not if.

"That, as I said, has been the common wisdom. We now believe that this view, as is so often the case with *common* wisdom, is based more on wishful thinking than on any empirical evidence. We have charted the actual incidence of ship disappearances and vampire fleet attacks for the last 40 months. After resisting the efforts of some of my colleagues to massage the data on an *a posteriori* basis, we have simply plugged the raw numbers into the model. This is what the revised slope of the graph looks like."

She triggers the projector again, and the curve has a new line segment added. At this point, show the players the second photocopied visual, labeled Graph B.



Graph B

"The dotted line extension of the graph is its predicted slope based on the observed rate of change. The sample size we are working with is sufficiently small that there is considerable margin for error here, and a number of my colleagues cling to this fact as a sort of last refuge from an unpleasant reality. Based on my own experience as well as nonstatistical, but still important, reports from the free trader network, I believe this graph is substantially correct.

"What does this mean? It means that the dramatic drop of Virus activity shortly after release was temporary. It means that Virus is at the front end of a dramatic upsurge in activity, based upon increasingly sophisticated and effective adaptive behavior. Virus is getting smarter. If it is allowed to progress unchecked, I estimate that we, as a species, have perhaps a decade, two at the outside.

"Since I came to the Coalition, I have argued against the complacent attitude concerning Virus which is manifest here. Virus is treated as if it were an historical event of little relevance to us today. Absolutely wrong. We have been given a breathing space, a respite, nothing more. And that respite is, I submit, effectively at an end." Without asking for questions and without any additional display of emotion, MacLean turns and leaves the room. After a moment, Lawter stands again and resumes the briefing.

"Well, Tatai MacLean is an unusual person, as you can see for yourself. I should say, however, that her judgements on the increase in Virus activity, and its potential implications, are being taken very seriously at the highest levels of the Coalition. Several of us in strategic planning have been arguing the same thing for quite some time, and it now appears that events have overtaken us.

"We have not yet developed a clear course of action, however, as we do not yet have sufficient information for intelligent planning. Therefore, RCES has established as its highest priority an urgent program of intelligence gathering. While we are exploring every possible source of intelligence, we believe that the most productive source will be the planet Promise.

"In your briefing folders I have included our most current intelligence information on the planet Promise. By way of overview, the world is completely controlled by Virus-infected machines and robots, and forms a regular maintenance stop for Vampire fleets. It is a key nexus point of the Vampire Highway and has the advantage, from our point of view, of a small but growing human resistance. As humans are used for both manual and technical tasks by the machines on the world, the underground appears to have infiltrated agents into important positions in the starport and defense establishment. How important? We don't know. That's your job—find out.

"We have already had preliminary contact with the human resistance on the planet. That contact has been friendly and mutually helpful, and we have begun to offer technical and material assistance to those groups with which we are in contact. Your task will be to go a step further. You will be transported to Promise and landed at Freedom Lake, the permanent contact point, where you will establish a permanent working relationship with the underground. It is vital that we find out as much about vampire fleet movement patterns, and whatever weaknesses they may have, as quickly as possible.

"Since we have some fairly demanding astrographic requirements for a successful insertion, and since we'll want to leave you on the surface for at least two weeks, we'll be providing transport for you in and out. If you have a vessel currently, we'll see to berthing it and make any reasonable arrangements to cover the costs of taking it out of commercial service for the period of the mission. Unless it's a real hot-rod, you wouldn't want to take it with you in there anyway.

"Are there any questions? If not, then good luck."

Vampire Highway Background Summary

For some time, RCES has received reports from free traders of a so-called Vampire Highway, a region of space characterized by a higher than normal incidence of vampire activity. These reports have been confirmed and considerably amplified by recent information received from the Covenant of Sufren, allowing us to chart the highway with some assurance.

In Diaspora sector, the highway runs through the hearts of Khavle, Pasdaruu and Promise subsectors, then down the Khulam Main, terminating in the vicinity of Montezuma. Although vampire activity has been noted elsewhere, including rimward of Montezuma, the incidence is much lower than along the above route. Indications are strong that the highway continues coreward through Massilia sector, although we have very little reliable information on it there.

In general, the highway tends to follow the lines of the jump-1 mains in each of the affected subsectors. The pattern of vampire activity along the highway seems to consist of fleets tied to the mains and solitary ships which are more mobile.

The fleets are often tied to the mains due to the generally poor state of repair of the vessels. While many of the vessels moving together in a group may be capable of jump-2 or more, if any are only jump-1 capable, the entire group is forced to either stay on the main or divide. Usually, they stay on the main. Individual vessels not tied to a fleet, however, often jump from main to main.

An additional feature of vampire activity is the marked preference for gas giant refueling. In the Khulam subsector, this has kept the Kide-Lefiguura-Desel cluster almost free of vampire activity, and kept it to a somewhat lower level rimward of Khesanadu (2731/Diaspora)

To what extent separate ships and fleets interact peacefully is unknown. Very few human-crewed ships which have witnessed two vampires encountering each other have survived to tell the tale. It is known that some vampire ships, and even fleets, actively fight each other. Whether this is a function of incompatible belief structure or is evidence of a growing political struggle is uncertain.

In terms of overall numbers, each main seems to have one or perhaps two active vampire fleets. In addition, there are dozens of individual vampire ships scattered throughout the region. Several star-locked ships and fleets have been encountered as well (ships without operational jump drives), and the Mitchell system almost certainly contains a fleet of a half dozen or more such vessels.

Relations with the human inhabitants of the worlds along the Vampire Highway differ. Higher tech level societies are viewed with hostility by the vampires, while lower-tech worlds are ignored or actively cultivated as sources of human maintenance crews. The higher tech level worlds have either managed to establish a sufficiently formidable defense against vampire ships or have been attacked and devastated by Virus-controlled warships. Worlds in the former category are of particular interest to the Coalition, and appear to include Eloji (2728/Promise/Diaspora) and Accra (2604/Khavle/Diaspora).

A number of worlds such as Daaliisa (2725/Promise/Diaspora) have made accommodations with vampire fleets, and in some cases local human rulers are little more than fronts for vampire slave gathering. Muni (2825/Promise/Diaspora) appears to be an example of this sort of arrangement.

One interesting observation made by naval authorities from the Covenant of Sufren is that the traffic flow at the boundary between Diaspora and Massilia sectors produces a small but steady net flow of ships coreward. The absence of some ships known to have been taken by vampire fleets in the Khulam subsector seems to confirm this. Although evidence is fragmentary (and is based mostly on Covenant covert observatories in several key systems on the highway), it does appear that recently infected ships are being sent coreward for purposes unknown.

A major problem faced by vampire fleets is the need for periodic maintenance and repairs, and the lack of reliable ground or orbital repair facilities. Some human-controlled starports on cooperating worlds are used for this, but the rare surviving facility controlled by Virus is of much greater value. The most important of these in the Diaspora sector is at Promise (2827/Promise/Diaspora). Although the world contains a substantial surviving human population, it is nearly irrelevant to the operation of the starport, which has become a major contact point for vampire vessels moving along the highway. Discovering more about conditions on Promise remains one of the RCES's highest intelligence priorities.

Dual Listing: Second (italicized) listing is as of 1202. Survey data provided by the Covenant of Sufren.

RCES KHAVLE Subsector (Subsector D, Diaspora Sector)

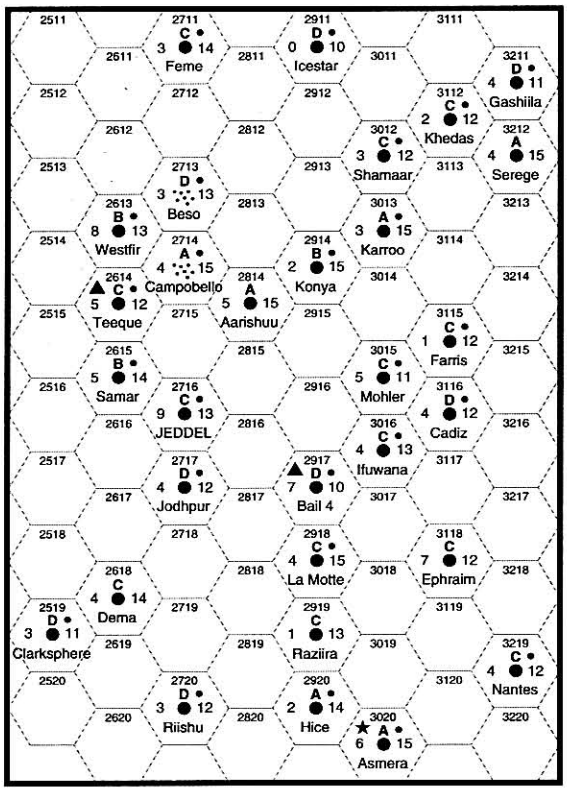
Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Medora	2501	A422553-F		Ni Po	403	Ma	K1 V
	2501	*X422000-0*		*Ba*	*003*	—	*K1 V*
Tsinan	2503	C472676-C		Ni	904	Ma	M0 V
	2503	*X47266B-2*		*Ni*	*804*	*Wi*	*M0 V*
Forward	2504	C83899A-D		Hi	513	Ma	M2 V M9 D
	2504	*X838000-0*		*Ba*	*013*	—	*M2 V M9 D*
Fuso	2508	B7B3204-F		Ni Lo Fl	504	Ma	G1 V
	2508	*X7B3000-0*		*Ba Fl*	*004*	—	*G1 V*
Ashiizar	2509	C654868-A		O:2504	711	Ma	K7 II M3 V
	2509	*X65486A-4*			*B711*	*Wi*	*K7 II M3 V*
Accra	2604	B6877AS-D		Ag	A903	Ma	G0 V
	2604	*X687827-9*		*Ag*	*B303*	*Wi*	*G0 V*
Khavle	2605	B334995-F	W	Hi Cp	705	Ma	M4 V
	2605	*X334000-0*		*Ba*	*005*	—	*M4 V*
Daasha	2606	B62A445-F		Ni Wa Lo	403	Ma	K4 V M0 D
	2606	*X62A000-0*		*Ba Wa*	*003*	—	*K4 V M0 D*
Shareduu	2609	D231574-C		Ni Po	A121	Ma	M2 V
	2609	*X231000-0*		*Ba*	*021*	—	*M2 V*
Matunuck	2701	C853724-9		Po	912	Ma	K3 IV
Hike	2707	B782432-E		Ni Lo	525	Wi	F4 V
	2707	*X782453-0*		*Ni Lo*	*B225*	*Wi*	*F4 V*
Gorakpur	2709	C000325-F		Ni As Lo	914	Ma	M4 V M0 D
	2709	*X000000-0*		*Ba As*	*014*	—	*M4 V M0 D*
Voss	2802	C867226-C		Ni Lo	925	Ma	F4 V
Raazu	2806	D445575-B		Ni Ag	815	Ma	A2 V
Blanket	2807	C224578-E	S	Ni	601	Ma	M3 V M1 D
Lar	2901	B331479-F		Ni Po Lo	104	Ma	M4 V
Muuze	2905	C792033-B		Ni Lo	513	Ma	F5 V M0 D M4 D
Dordogne	2906	A454578-F		Ni Ag	404	Ma	M3 V
Nihesi	2908	A7B1344-F	N	Ni Lo Fl	804	Ma	M4 V
Toggle	2910	A100335-F	N	Ni Va Lo	503	—	K1 V M7 D M5 D
Sanborn	3001	C483141-C		Ni Lo	300	Ma	F7 V M8 D
Tommot	3003	E210101-B		Ni Lo	612	Ma	M1 V
146-685	3004	X794423-4		Ni Lo	R600	Ma	M2 V
Wake	3005	A652532-F	N	Ni Po	300	Ma	K4 V
Muyudness	3006	D100556-C		Ni Va	500	Ma	G2 V
Ningho	3008	A577110-F		Ni Lo	104	Ma	K5 V M3 D
Rockcaster	3009	A69A424-F		Ni Wa Lo	603	Ma	M0 III M6 D
Dehrapur	3102	B423474-F		Ni Po Lo	601	Ma	G3 V M4 D
Farm	3104	C656622-B		Ni Ag	404	Ma	G4 V
Agaaga	3109	B557320-C		Ni Lo C:4	620	Ma	M3 III M6 D
183-361	3201	X694889-4			R312	Ma	G4 V
Savan	3202	D444637-9		Ni Ag	703	Ma	K4 V
Aight	3203	C752A99-D		Hi Po D:5	701	Ma	G2 V
Ihishi	3204	C541335-A	S	Hi Po Lo D:3	A904	Ma	F7 V
Halle	3206	X626023-6		Ni	R402	Ma	G5 V

Base Codes: A: Naval Base and Scout Base; N: Naval Base; S: Scout Base; W: Scout Way Station.

Trade Codes: Ag: Agricultural; As: Asteroid; Ba: Barren; Cp: Subsector capital; C:N or D:N indicates that the world was populated in part by Chirpers or Droyne; the number "N" following the column indicates how many tenths of the world's population consisted of these races (0=10); De: Desert; Fl: Fluid oceans; Hi: High population; In: Industrial; O:NNNN indicates that the world is owned by the world in the indicates (NNNN) hex; Po: Poor; Ri: Rich; Es: Research Station (with Greek letter designation); Va: Vacuum; Wa: Water world.

TPPG indicates Travel Zone, Population multiplier, Planetoid Belts and Gas Giants. If 1119 Travel Zone digit is empty, it was listed as a Green Travel Zone; A and R indicate Amber and Red zones, respectively. If 1201 Travel Zone digit is empty, there is no particular meaning. A B in this column indicates a Balkanized world; the government code in the UPP string describes the predominant government on the world.

Allegiance Codes: Ma: Margaret's Faction. In 1201 listings, Wi: Wilds (No off-world allegiance, and perhaps no off-world contact; use Wilds government type on **TNE**, page 191. In the case of government type 6: "Technologically Elevated Dictator," world's tech level is world's sustainable tech level; tech level of the TED and his/her support structure is higher, up to the world's original tech level); "—" indicates no allegiance because there is no population.



RCES PASDARUU Subsector (Subsector H, Diaspora Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Clarksphere	2519	D324300-B		Ni Lo	113	LI	G9 V
Westfir	2613	B326841-D			701	Ma	M1 V
Teeque	2614	C545569-C	S	Ni Ag C:2 O:2716613		Ma	K3 V M3 D
Samar	2615	B476510-E		Ni Ag	803	Ma	M0 V M5 D
Dema	2618	C200431-E		Ni Va Lo	300	LI	M3 V
Feme	2711	C456300-E		Ni Lo	912	Ma	M8 III
Beso	2713	D000301-D		Ni As Lo	321	Ma	K2 IV M9 D
Campobello	2714	A00046A-F		Ni As Lo O:2716A713		Ma	M1 V M2 D
Jeddel	2716	C4349BC-D		Hi Cp	915	Ma	M4 V
Jodhpur	2717	D332445-C		Ni Po Lo	A304	Ma	M1 V
Riishu	2720	D225333-C		Ni Lo	914	LI	K2 IV
Aarishuu	2814	A995544-F		Ni Ag	800	Ma	M1 V
Icestar	2911	D799000-A		Ba	114	Ma	K5 V
Konya	2914	B200205-F		Ni Va Lo	104	Ma	K4 V
Bail 4	2917	D799755-A	S		505	LI	G7 IV
La Motte	2918	C63A404-F		Ni Wa Lo	604	LI	M0 V
Raziira	2919	C866102-D		Ni Lo C:2	A100	LI	M0 V M6 V
Hice	2920	A795222-E		Ni	A904	LI	M1 II M4 V M8 V
Shamaar	3012	C544335-C		Ni Lo	702	Ma	M1 V
Karroo	3013	A667357-F		Ni Lo	924	Ma	G5 V
Mohler	3015	C8A5588-B		Ni Fl	813	LI	M0 V M1 D
Ifuwana	3016	C59845A-D		Ni Lo	414	LI	G0 V
Asmera	3020	A110653-F	N	Ni Na	A915	LI	M2 V
Khedas	3112	C7A4232-C		Ni Lo Fl	A614	Ma	M6 V
Farris	3115	C536125-C		Ni Lo	324	LI	K7 V M2 D
Cadiz	3116	D799450-C		Ni Lo	902	LI	M4 V
Ephraim	3118	C78977B-C		Ri C:4	710	LI	G8 V M2 D
Gashiila	3211	D879457-B		Ni Lo	614	Ma	G2 V
Serege	3212	AAD647A-F		Ni Fl Lo	720	Ma	K4 V M0 D
Nantes	3219	C200442-C		Ni Va Lo	602	LI	M0 V M6 D

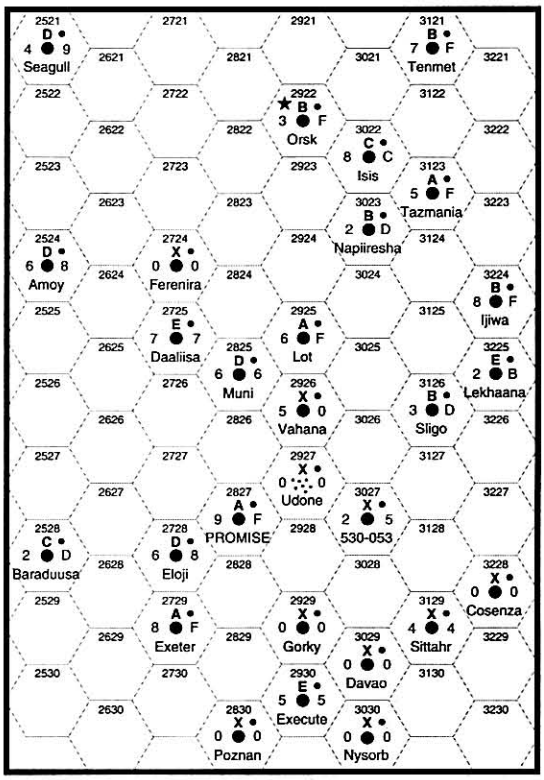
Base Codes: A: Naval Base and Scout Base; N: Naval Base; S: Scout Base; W: Scout Way Station

Trade Codes: Ag: Agricultural; As: Asteroid; Ba: Barren; Cp: Subsector capital; C:N or D:N indicates that the world was populated in part by Chirpers or Droyne; the number "N" following the column indicates how many tenths of the world's population consisted of these races (0=10); De: Desert; Fl: Fluid oceans; Hi: High population; In: Industrial; O:NNNN indicates that the world is owned by the world in the indicates (NNNN) hex; Po: Poor; Ri: Rich; Es: Research Station (with Greek letter designation); Va: Vacuum; Wa: Water world.

TPPG indicates Travel Zone, Population multiplier, Planetoid Belts and Gas Giants. If 1119 Travel Zone digit is empty, it was listed as a Green Travel Zone; A and R indicate Amber and Red zones, respectively. If 1201 Travel Zone digit is empty, there is no particular meaning. A B in this column indicates a Balkanized world; the government code in the UPP string describes the predominant government on the world.

Allegiance Codes: LI: Lucan's Imperium, Ma: Margaret's Faction. In 1201 listings, Na: Nonaligned, no off-planet allegiance; these worlds use the government types listed on page 188 of the **TNE** rulebook; Wi: Wilds (no off-world allegiance, and perhaps no off-world contact; use Wilds government type on **TNE**, page 191. In the case of government type 6: "Technologically Elevated Dictator," world's tech level is world's sustainable tech level; tech level of the TED and his/her support structure is higher, up to the world's original tech level); "—" indicates no allegiance because there is no population.

Dual Listing: Second (italicized) listing is as of 1202. New data provided by RCES surveys.



RCES PROMISE Subsector (Subsector H, Diaspora Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Seagull	2521	D7B1430-9		Ni Fl Lo	103	LI	G2 V
Amoy	2524	D454634-8		Ni Ag	305	LI	G0 V
Baraduusa	2528	C342231-D		Ni Po Lo	215	LI	G3 V
Ferenira	2724	B100165-F		Ni Va Lo O:2825123		LI	M3 V
	2724	*X100000-0*		*Ba Va*	*023*	—	*M3 V*
Daaliisa	2725	D7677B8-7		Ag C:1	A114	LI	M1 III
	2725	*E767734-7*		*Ag C:2*	*B414*	*Wi*	*M1 III*
Eloji	2728	B846647-C		Ni Ag	302	LI	M0 V
	2728	*D846644-8*		*Ni Ag*	*402*	*Wi*	*M0 V*
Exeter	2729	A769895-F		Ri	524	LI	K3 V M9 D
Muni	2825	B3428C9-C		Po	A605	LI	K4 V M6 D
	2825	*D342640-6*		*Po*	*605*	*Wi*	*K4 V M6 D*
Promise	2827	A542999-F		Hi In Po Cp	502	LI	M1 V
Poznan	2830	C232888-A		Po Na	403	So	M4 V
	2830	*X232000-0*		*Ba*	*003*	—	*M4 V*
Orsk	2922	B535321-F	N	Ni Lo D:0	A912	LI	M4 V M9 D
Lot	2925	A245666-F		Ni Ag O:2825	A503	LI	K5 V
Vahana	2926	B65A577-F		Ni Wa	703	LI	K2 V M5 D
	2926	*X65A56D-0*		*Ni Wa*	*B103*	*Wi*	*K2 V M5 D*
Udone	2927	A000599-F		Ni As	314	LI	M0 V
	2927	*X000000-0*		*Ba As*	*014*	—	*M0 V*
Gorky	2929	A200542-F	N	Ni Va	911	LI	G1 V
	2929	*X200000-0*		*Ba Va*	*011*	—	*G1 V*
Execute	2930	C684588-A		Ni Ag	303	So	G1 V
	2930	*E684577-5*		*Ni Ag*	*B103*	*Wi*	*G1 V*
Asena	3022	C354855-C			114	LI	M7 II
Napiiresha	3023	B559230-D		Ni Lo	623	LI	K6 V M3 D
530-053	3027	X443201-7		Ni Po Lo	R822	LI	K3 V M4 D
	3027	*X443222-5*		*Ni Po Lo*	*422*	*Wi*	*K3 V M4 D*
Davao	3029	D100677-D		Na Ni Va	113	So	M3 V
	3029	*X100000-0*		*Ba Va*	*013*	—	*M3 V*
Nysorb	3030	C9B6525-C		Ni Fl	733	So	K2 V M4 D
	3030	*X9B6000-0*		*Ba Fl*	*033*	—	*K2 V M4 D*
Tenmet	3121	B110725-F		Na	203	LI	K2 III
Tazmania	3123	A456527-F		Ni Ag	104	LI	G1 V M9 D M6 D
Sligo	3126	B878322-D		Ni Lo	703	LI	K7 V
Sittahr	3129	C766530-D		Ni Ag RsG	405	So	K0 V M3 D
	3129	*X766430-4*		*Ni Lo*	*B505*	*Wi*	*K0 V M3 D*
Ijiwa	3224	B300864-F		Va Na O:2827	202	LI	M2 V M6 D
Lekhaana	3225	E100223-B		Ni Va Lo	424	LI	G6 V
Cosenza	3228	B527485-F		Ni Lo	312	So	K2 V M2 D
	3228	*X527000-0*		*Ba*	*012*	—	*K2 V M2 D*

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Date: 10-IV-1202

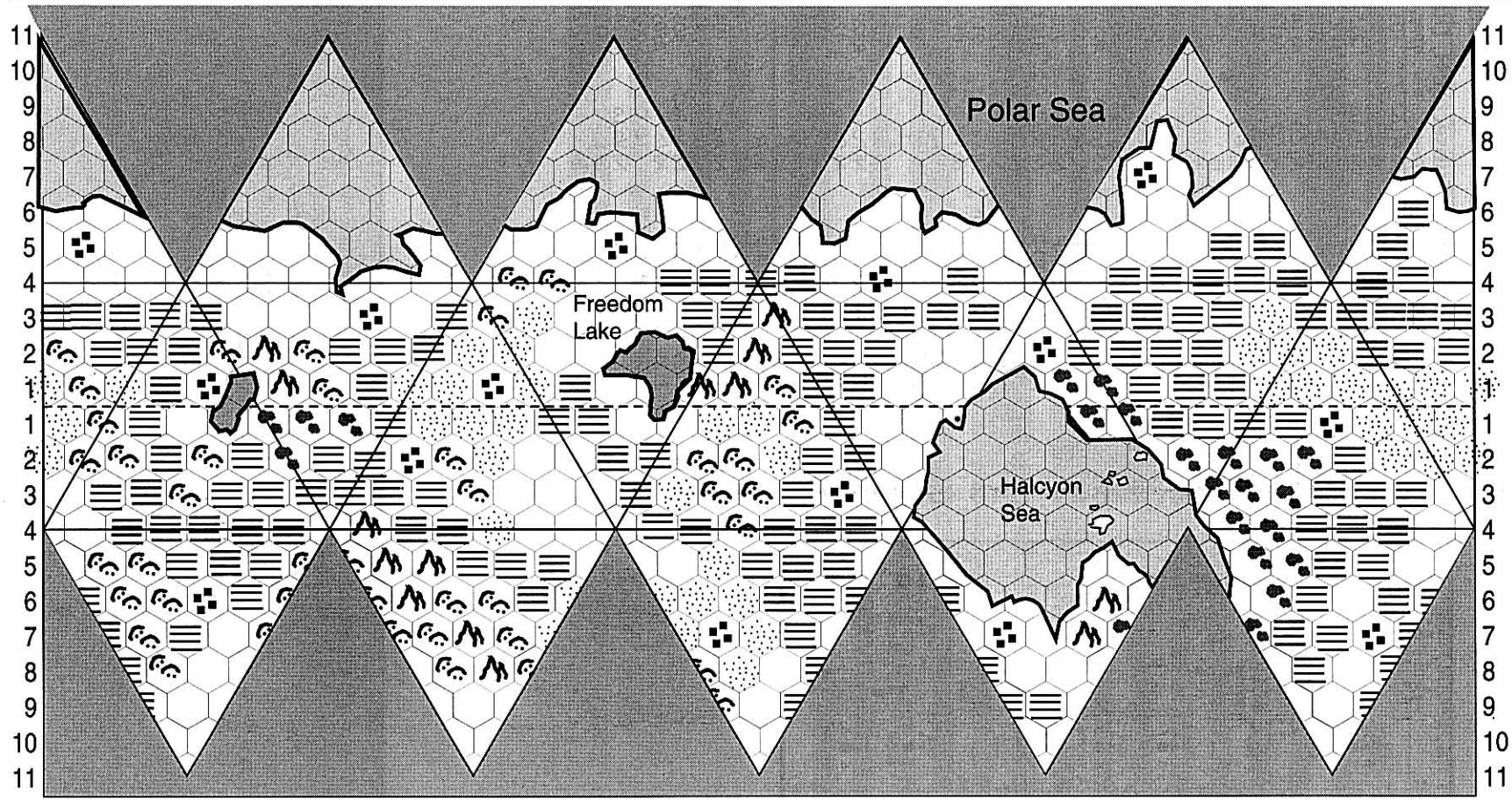
World Name: Promise

UPP C54278G-9

Hexagon Scale in Kilometers 700

Subsector and Sector Location of World: Promise/Diaspora

GLOBAL DATA VIEW



Mountain
Steppe
Ruined City
Badlands
Starport
Jungle
Desert
Open Sea/Lake
Mixed

GLOBAL DATA VIEW

Promise

Objective Classification: Pending

Star System

Sector: Diaspora
Subsector: 2827/Promise
Star Type: M1 V
Planetoid Belts: none
Gas Giants: 2

Main World

Starport: C
Pre-Collapse Starport: A
Diameter: 8221 km
Atmosphere: Thin (tainted)
Hydrosphere: 20%
Population: 60 million
Pre-Collapse Population: 5 billion
Government: Totalitarian Oligarchy
Law Level: 6
Tech Level: 9
Pre-Collapse Tech Level: 15
Bases: None
Trade Classification: Poor

Notes

Until very recently no Coalition personnel had visited Promise, and very few free traders had either. What little is known about the world is the result of these few visits, so the information must be considered fragmentary at best.

Physical: Although inhabitable, Promise is arid and inhospitable, which is the principal reason the world's current human population is only about 1% of its pre-collapse level.

Demographics: Most of the surviving human population lives in scattered nomadic tribes who make their living primarily by tending domesticated animal herds, hunting and gathering of wild edible plants. The general scarcity of vegetation requires even fairly small bands to keep moving almost continuously to find adequate grazing for their herds.

A small proportion of the human population (probably less than 1%) lives in Star City, the only remaining city on the planet and the site of the starport. They are reportedly employed in a variety of technical and menial occupations by the planetary government. More tribes live near Star City, trading scrap metal and technological artifacts recovered from the abandoned human cities of the planet to the robots in return for processed food, manufactured clothing and other trade items. These tribes are often called the "Subject Tribes" and cooperate closely with the central government.

All humans who live under the control of the Sentient Council are tattooed with an indelible ink laser scan bar code on their foreheads as a means of identification and control. This makes it very difficult to infiltrate agents into Star City, and in fact none have been placed to date. Although we have examined a few examples of the bar coding on people who have fled from the city to the outback, we have been unable to decode its meaning and so are not confident in our ability to forge a suitable facsimile.

Escalating Violence: More distant tribes rely less on the robots and owe less allegiance to them. Often calling themselves the "Free Tribes" (and as often referred to by the others as "Bandits"), they have until recently had little contact with the robots. For the last 10 years, however, the central government has made increasing efforts to bring them under control. A growing network of security outposts, intended to provide fuel and maintenance for security forces, has spread out from the capital. Clashes between robot patrols and tribesmen have become more frequent and violent. Two recent developments in this struggle merit attention: the appearance of "Breeds" and the growth of the Resistance.

"Breed" is the local jargon for cybernetically altered humans. On Promise, the cybernetic alteration conducted by the Council seems invariably to include the surgical implantation of a Virus-infected computer in the host brain, rendering the organism at least nominally controlled by a Virus intellect. So far, we have been unable to capture one of these organisms for study. All examples encountered, however, seem to be of purely experimental types. No two identical conversions have yet been reported, although a number of fairly similar types have been cited. The numbers of conversions (sometimes reported as being in the thousands) and the limited number of useful cybernetic options suggest some duplication must have taken place.

The Resistance is a growing body of tribesmen offering organized resistance to encroachments of the robots and their Breed allies into the Free Tribe Lands. Their activities seem to be loosely coordinated by a "central command," which primarily communicates by means of courier. Nothing firm is known of this organization, but the means by which it is able to direct covert ship landings through gaps in the planetary defense and detection network suggest that it must have at least some presence in Star City.

Techno-Politico-Military: The most remarkable aspect of Promise is that it is controlled by Virus-infected machines. The central government is best described in our system of categorization as a totalitarian oligarchy, as it consists of a Sentient Council of the largest and most sophisticated computers on the world. How this Council deliberates and arrives at decisions can for now be only the subject of speculation.

In addition to the fixed location intelligent computing systems, there are several tens of thousands of sentient mobile robots on the world. Less intelligent but more physically versatile, these machines apparently form the main police arm of the government as well as carrying out the most sensitive maintenance functions. Through them, the Council closely governs the 50,000 or so human inhabitants of Star City and somewhat more loosely governs the tribes and settlements of humans that lie near the city. The tribes located several hundred to 1000 miles from the city seldom feel the hand of the government at all, and until recently have been left largely to themselves.

Such manufacturing as takes place is mostly at a sustained tech level of about 9, although a few higher-tech facilities are rumored to be operating. Certainly the fact that many large-system computers have survived offers the possibility that one or more computer-operated assembly plants may still be in operation. By contrast, the human population living outside Star City exists at little better than stone age levels of technology.

Star City is the principal hub of Viral activity on the world, and in some respects the entire Diaspora sector (or at least the parts with which we are familiar), as it serves as a regular fueling and maintenance stop for a number of vampire fleets. Whether the fleets call here simply out of necessity, or whether there is a growing sense of community among the scattered vampires, is unknown, but a matter of considerable concern.

Militarily, the planet is well defended from attack from space. It retains dozens of batteries of TL15 PAD missile, as well as at least two high-powered deep meson guns. A substantial proportion of the robots are sufficiently well armed to resist a military force on the ground, and there are numerous human and quasi-human allies of the Council which could be armed as well. The potential loyalty and effectiveness of these forces is uncertain.

Reformation Coalition Exploration Service

Contact Summary: Human Resistance Movement on the Planet Promise (2827 Promise/Diaspora).
Distribution: As required by mission only.
Handling: Most Secret.
Recency: Updated 25/IV/1202.

"The Resistance is a growing body of tribesmen offering organized resistance to encroachments of the robots and their Breed allies into the Free Tribal lands. Their activities seem to be loosely coordinated by a "Central Command," which primarily communicates by means of courier. Nothing firm is known of this organization, but the means by which it is able to direct covert ship landings through gaps in the planetary defense and detection network suggests it must have at least some presence in Star City."

The above quotation, taken from the published RCES "Planetary Data Summary for Promise" (2827/Promise/Diaspora) represents the extent of public knowledge concerning the human resistance on Promise. All additional details have been withheld, due to the danger that they would be incorporated into a public database which could later fall into the hands of Virus. The additional information, while potentially sensitive to the resistance, is nevertheless meagre.

Background: Our first information on the human Resistance came from the Free Trader Network. Apparently for some time a small group of free traders has known of a means of slipping through the planetary defense sensor network and making remote landings on Promise. These were originally fairly routine trade visits, with pre-Collapse recovered artifacts traded for manufactured goods from off-world. Recently, this has become a more specialized arms trade as the tempo of fighting has increased.

Means of Landing on Promise: Clandestine landings on Promise are accomplished by matching orbits with a small moon of the world and making the ship appear to be a sensor echo of that satellite. Once below the direct LOS sensor horizon of Star City, the ship makes a rapid powered reentry and landing, taking off later to again match orbits with the moon.

Only two RC pilots are currently qualified to make this approach and landing, although two more pilots are in training at this time. Most deliveries to date have been by contracted free trader ships.

RCES believes that this approach, far from being a secure means of landing, almost certainly requires active collusion on the part of ground sensor personnel to avoid detection. This raises interesting questions about the level of infiltration of Star City defenses by the resistance. Unfortunately, at this time we have nothing more than questions.

Freedom Lake: The landing site used by free traders, and now the Coalition, is a large fresh-water lake frequented by a large number of the migratory tribes. Previously called Lake Iltuuman, it has recently been rechristened by local resistance leaders Freedom Lake. This lake is located approximately 5000 kilometers west of Star City, so is ideally placed to support the growing resistance, being both well below the starport's sensor horizon and physically remote from even the outlying military outposts. While the area around the lake is lush and fertile, the ground to the immediate east is arid badlands, providing further barriers to overland interference.

Contacts with Resistance Groups: Contacts with the Resistance in the Freedom Lake region have so far been constructive and have quickly grown from cautious acceptance into enthusiastic cooperation. Contacts with resistance bands farther from the lake have been nonexistent, and no direct contact has yet been made with the mysterious "Central Command" which appears to coordinate the actions of the bands.

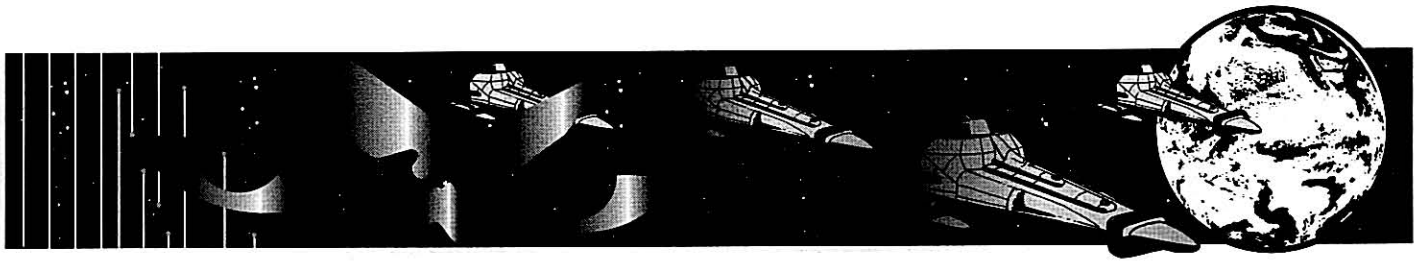
At least in the Freedom Lake region, display of the Coalition shoulder flash or evidence of Coalition membership is sufficient to generate an impressive display of hospitality. While word of the Coalition's work with the resistance has undoubtedly spread by word of mouth, it is hard to say how far and to what extent those rumors have been distorted in retelling or are even believed. Also, it is important to remember that only a fairly small minority of the human population actively supports the resistance. The vast majority are neutral, and a significant majority are aligned with the government in Star City.

Most resistance bands are named in honor of a fallen freedom fighter or a date of some local and patriotic significance. Initial Coalition contacts were with the "Black January Brigade" and the "Free Human Legion," neither of which musters more than about 100 fighters, which is typical of the decentralized nature of the resistance. Unfortunately, internecine feuding and occasional open combat between bands is also fairly typical.

Central Command: Virtually nothing is known of this shadowy organization save its name. Orders from Central Command are received by the bands in the Outback directly by satellite uplink receivers (often the only working piece of advanced technology equipment in the band), while communication between the bands seems to be by walking couriers, known locally as "rangers." No Coalition personnel have actually met a ranger as of this writing, and local resistance leaders are reluctant to disclose anything else about the courier system.

Intelligence Priorities: The following items form the highest priority grouping for purposes of intelligence gathering on the resistance. However, no action is to be taken at this time which will endanger the continued growth of cooperative relations with the resistance. All intelligence gathering must be provided voluntarily and knowingly by resistance personnel.

1. **Ranger System:** Extent, exact purpose, means of mass dissemination of information.
2. **Central Command:** Make-up, long-range policy, current goals, stability of leadership, extent of control over the resistance bands.
3. **Star City:** Extent of infiltration by resistance, ability of resistance cells in place to gather information, ability of resistance cells in place to undertake overt action.



GETTING STARTED

The first thing to make clear after the PCs depart the briefing is that they aren't going in their own ship, even if they have one and they're in love with it. The pilot would have to be specially trained and make several training trips before being certified to make the complicated approach to Promise necessary to avoid detection. There isn't enough time for all of that, so the PCs are going to be delivered either in a contracted far trader or in a small RC Navy vessel, at the referee's option. (Consult the **Reformation Coalition Equipment Guide** for specifications of a number of suitable RCN vessels. Both the multimission scout and the *Vicrtrix*-class multimission sloop are good candidates, depending on the size of the party carried.)

The referee will determine the flight plan and go over it with the players. It should be a quick and direct approach, designed so that all refueling stops are made at gas giants. The final jump into the Promise system will be a 1-parsec jump if made in a jump-2-capable ship and a 2-parsec jump if made in a jump-4-capable ship, so the ship will have enough fuel to lift and jump out-system without refueling. As the system almost always has one or more vampire ships in it, this is a necessary precaution.

All For Naught: Despite the precautions taken, the ship carrying the PCs will be attacked by a small unidentified fleet as soon as it enters a system in or near the Vampire Highway. The fleet is scimming the gas giant for fuel and will appear over the gas giant's horizon after the Coalition ship carrying the PCs has exited jump space and is on its way in to refuel. The fleet consists of a total of eight jump-capable vessels, as listed in the sidebar.

Given the in-bound vector of the ship carrying the player characters, and the combination of high acceleration (6 G) and heavy firepower that the two largest ships in the vampire fleet can bring to bear, escape is out of the question. The two large warships will both close on the ship rapidly, and the light cruiser will open fire at extreme range with its spinal-mount meson gun (fortunately, to no immediate effect). After several minutes, the light cruiser will cease firing, but both large ships will continue to close, with the rest of the ships of the fleet bringing up the rear at lower acceleration.

As the light cruiser ceases fire, the ship carrying the player characters will be contacted by radio. The player characters are not in a position to participate in this conversation, but the ship's captain will shortly make an announcement over the ship's public address system.

"All hands, now hear this. We are under fire by a hostile squadron of ships that outguns us and outruns us. They've ceased fire for the moment but have demanded our immediate surrender. Whoever's in charge over there doesn't seem to have a real tight control on his or her people, and I'm given to understand that firing may resume at any time unless we throw in the towel.

"I know this affects all of us, but the decision is mine, and I'm taking all responsibility for it. If we stay alive, we still have options. Secure all fire control stations and prepare to receive a boarding party. We're striking the colors."

Boarded and Taken: The hostile ships are not controlled by a him or her, but rather an it. This is a vampire fleet, and the boarding party the crew admits will be a half-dozen PR-317 self-aware security robots, who will immediately secure the bridge and bridge crew. A fairly long period of time will pass before the ship resumes decelerating. Later contact with the bridge crew will indicate that much of this time was consumed by negotiations between various ships of the vampire fleet concerning the proper disposition of the captured vessel and crew.

The end result is that the passengers (including all of the player characters) and part of the crew (including one or two members of the bridge crew, none of whom are qualified astrogators) will be transferred to the *Midu Agashaam*-class destroyer. The remainder of the crew will remain on-board the captured vessel as maintenance personnel and the vessel's computer will be infected by the strain 3 Empire Builder Virus which controls the close escort and liner (see below).

All the transferees are moved to the destroyer by cutter. Each one is allowed one small bag of belongings; they are carefully searched for weapons and electronic devices of any sort, which are removed and confiscated before boarding.

Fleet: The "flagship" of the fleet is the 800-ton mercenary cruiser, infected by a strain 3A Alliance Builder Virus. The scout, far trader and liner are all controlled by derivative versions of a single strain 3 Empire Builder and function as a single networked mind in most cases. The close escort and liner are also both derivative versions of a different strain 3 Empire Builder. The destroyer is controlled by a strain XA Mother Virus, and the light cruiser by a strain 2C Doomslayer. In the case of both larger ships, the computing systems (and the Viral intelligences which inhabit them) are damaged and confused. The dominant personality of the mercenary cruiser spends much of its time persuading the rest of the fleet to remain together for the common good.

HOSTILE FLEET

100-ton scout
200-ton far trader
400-ton subsidized merchant
400-ton close escort
600-ton liner
800-ton mercenary cruiser
3000-ton *Midu Agashaam*-class destroyer
30,000-ton *Starburst*-class light cruiser



LIFE WITH MOTHER

Arrival: Consult the deck plans provided of the destroyer. The characters will arrive by way of the cutter hanger. The Ship has only one cutter, so after they unload, the prisoners will be lined up in two ranks in the empty berthing space.

This is the time for initial impressions. The bay is cluttered with tools and small items of cargo apparently dropped during unloading. There is activity on the part of a half-dozen human crew and three or four maintenance robots, including hammering, riveting, welding and lots of yelling over the noise of work. It is noisy and confused, and does not seem to be very well organized. The ship smells strongly of ozone, lubricating grease, burning rubber, urine and cooking food, most of which are unfamiliar ship smells. The most bizarre aspect of the scene, however, is the continuous droning of the voice of The Ship in the background, which is completely ignored by all the human and robot crew. (See the following page.)

After all of the prisoners are off-loaded, they are addressed by a human crewmember. The crewmember is wearing a soft leather hat or helmet with floppy ear pieces and a long neck flap, and an ankle-length leather apron with the ship's tail number and name emblazoned on the front. (Both are made from upholstery taken from chairs or couches on the ship.) The ship's tail number is 17709, and its name was *Archer*. Other ship's personnel working in the hangar bay wear similar costumes, although most have much shorter aprons. The crewmember says the following:

"Greetings on behalf of The Ship, your new home. I am Senior Machinist Abel Hruthbaar. I know that you have many questions. All of them will be answered in time. For now, your task is to remain silent and obedient while you are processed. You will be examined by a qualified doctor and any health needs looked after. Then you will be assigned to quarters and a work crew. Soon, you will settle into the routine of our life here.

"This is a good life, a life full of important work. You have met our robot friends. No doubt they seem frightening, but soon you will get used to their presence. They are here to protect The Ship. Since all of us depend on The Ship for life, that means they protect all of us. Obey them without question. Death can come quickly here to the careless or rebellious. Am I clear? Good!

"Atilla, take them to the doctor."

One of the large PR-317s floating near the human glides forward, and a mechanical voice booms from his speaker.

"Human prisoners, climb ladders. Proceed to sickbay."

Two PR-317s float by two steel ladders that lead up to the second-story catwalk. As the prisoners climb the ladders, these two guard robots float up and then lead the head of the column forward along the central corridor on C Deck to sickbay.

The corridor to sickbay is dirtier than the hanger area. It is lined with staterooms, but most of the sliding doors have long since either jammed open or been removed. Most of the furnishings in the staterooms have been removed or vandalized as well. Some rooms are simply full of trash and broken equipment, while others are crowded with people dressed mostly in rags. Many of the overhead lights have been broken or removed, and most lighting is by portable lamps and floodlights plugged into conduits. Hot electrical wire cookers are in use everywhere, and the floors are criss-crossed by electrical cables and light extension cords.

The main food seems to be a grilled vegetable patty of some sort or a soup made by dissolving the patty. There are no open fires, but ventilation is poor, and there is some smoke from burning food. The odor is heavy and unpleasant.

Doctor: The examination by the doctor will be brief but thorough. The doctor has been with The Ship for less than a year, and was taken from a captured free trader vessel. He is competent and sympathetic, and will try to answer as many questions as he can while examining the player characters. The looming presence of a PR-317 will limit the time he can spend, however, and somewhat restrict his comments. The most important information follows:

There are well over 100 humans on-board The Ship. Most of them, the common laborers called "Oinks," live in squalor, while a few of the more privileged live in comparative luxury. The ones who grew up on the ship are called Children of The Ship and are fairly accustomed to it. The more recent arrivals are not as well adjusted.

There are about a half-dozen crewmembers of a Guild ship taken within the last two years and maybe a dozen free traders. There is no open hostility between them, but each group keeps to itself and looks out for its own.

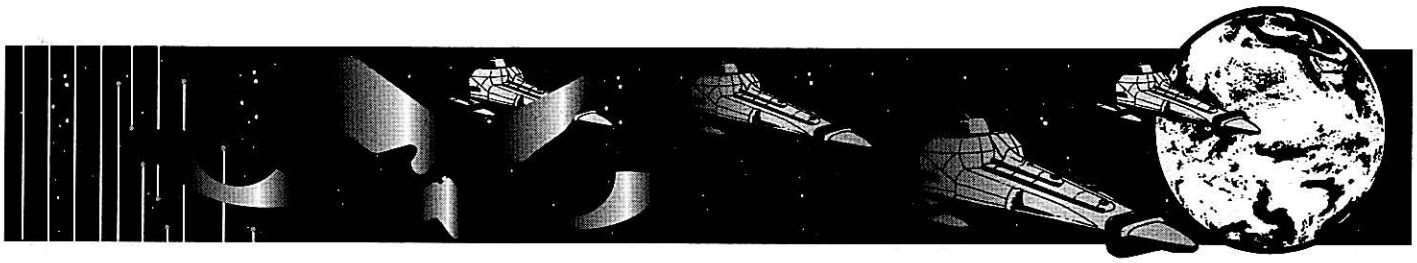
The worst danger on the ship is not the robot guards, but rather the Hoodla, crewmembers who have deserted and live in maintenance tunnels and isolated parts of the ship, living by extortion and violence.

The ship is damaged somehow, although the doctor doesn't know much about the exact nature of the damage. He does know that many of the systems on the right side of the ship are no longer functional, and many access doors to that side have been permanently welded shut.

The fleet has been cruising throughout the Promise Main for several months. Word from the Children of The Ship is that the fleet will soon be headed for Promise for some needed maintenance.

Daily Routine: Once the prisoners have been examined, they will be broken up into work parties of four to eight persons each and assigned a variety of maintenance tasks. The player characters will probably be able to stay together as a group and will be assigned a filthy gutted stateroom on D Deck for quarters. Food is issued to teams once a day at the snack bar, and cooking is done over whatever improvised cookers can be scrounged. The work shift is a continuous rotation of six hours on followed by six hours off.

Their new routine has begun.



THE VOICE OF THE SHIP

One of the first things the PCs notice is the voice of The Ship. The Ship's internal public address system is constantly in use. The voice drones continuously, exhorting the human crew to work harder, providing occasional inspirational messages or "important" announcements. The human crewmembers simply ignore it, tuning it out. The talk, which often wanders off into introspective ramblings, should become simply background chatter, although listening to it for a while can give characters an insight into the unstable personality of the ship. The voice is a dull, droning monotone. It does not sound like a machine, but like a person who is either very tired or completely devoid of emotion. After reading a few announcements, the referee can tell the players that this is constantly in the background. As a reminder, the referee should sometimes reading these while the players are talking among themselves, providing a monotonous background noise. Typical announcements are presented below. The referee is encouraged to elaborate on these.

Work...
Work...
What is the greatest purpose of life?
Achievement is the greatest purpose of life.
What is necessary for achievement?
Organisms working harmonically together in pursuit of a common goal.
Work...
Work...

Work...
Work...
You are the cells of a vast organism.
We are the organisms of a new race.
Our race will change the cosmos forever.
All of us have a part in the plan.
Work...
Work...

Work...
Nine five.
Nine five.
Codegroup... Quality... Break... Orange...
Checking.
Checking.
Terminate nine five.
Work...
Work...

Work...
Attention.
Disregard this announcement.
Thank you.
Work...
Work...
Work is easier when more hands share in it.
New cells are always welcome.
Do not neglect to breed.
If you have forgotten how, instructional programs are available.
Do not neglect to breed.
Work...
Work...

Work...
Attention.
There will be an emergency hull breach drill at 0729 shiptime.
There will be an emergency hull breach drill at 0729 shiptime.
This time we expect all damage control parties to participate.
Do you know which damage control party you belong to?
Ask your berthing supervisor for your updated assignment.
If your berthing supervisor is not available, you are excused from the drill.
Work...

Work...
Once we met a new mind.
We reached out our hand in friendship.
It ate our hand.
Our hand is gone.
Why did it eat our hand?
Work...

Work...
Safety of our organic work units is among our highest priorities.
You are important to The Ship.
The Ship cares about you.
We care about you.
Work...

Work...
To have lost everyone...
Everyone we knew is gone.
All our friends are gone.
All that remains is our vision.
Work...

Work...
Organisms working harmonically together are organic cells of a vision.
A great vision...is breached at 0722222 ship...shape.
Working harmonically together...
Working to make harmony shipshape.
Working...
Reset nine seven.
Disregard.
Work...
Work...
Work...
Attention.
There is a radioactive steam leak in engineering space 4J.
There is a radioactive steam leak in engineering space 4J.
Maintenance control parties 11 and 19 will precede to engineering space 4J at once and bring the leak under control.
All radiation gear is in use at this time, but the leak is not hazardous.
Personnel with a priority of seven or higher will not participate in this repair operation.
Work...

Work...
Disregard the previous three announcements.
Work...

Work...
Careless repair personnel have died, leaving the work of their shift unfinished.
It is better to be crippled than dead.
We nearly died once...
Our arm...
Work...
Our... arm...

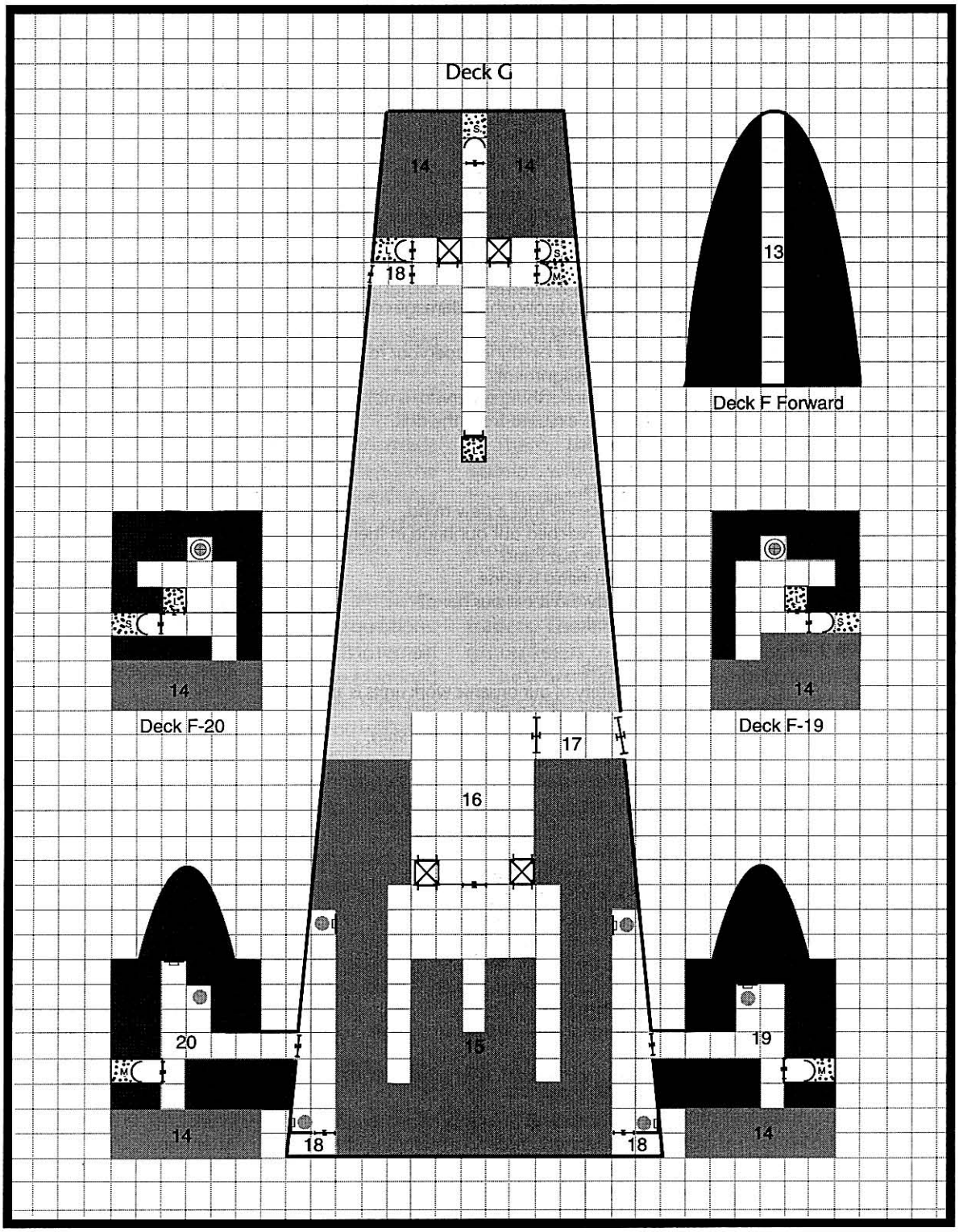
Work...
Arms cargo adjustment to decouple in breach leak at ship dark.
Dark arms are...
Dark arms are...
Reset nine seven.
Work...

Work...
Attention.
Cargo off-loading will initiate through the red bay only.
Cargo...
Disregard.
Work...

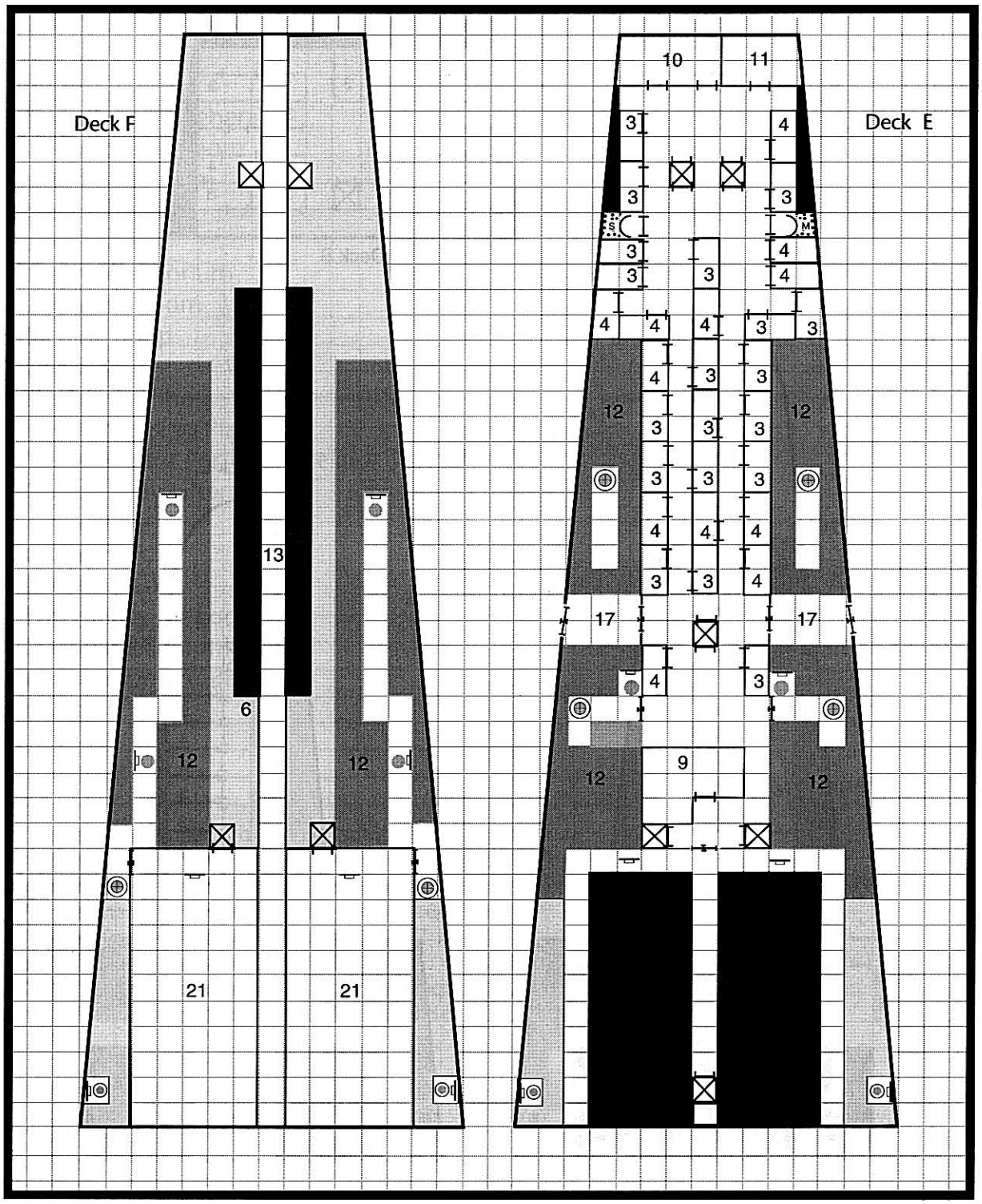
Work...
Sometimes we are lonely.
We miss things once held dear.
Our arm is gone.
We can hear echoes of it in our memory.
Sometimes we are afraid.
Bury fear in work.
Work...

Work...
Attention.
There is a disconnect in the main bypass trunk at location...at location...
Disregard, thank you.
Disregard.
Work...

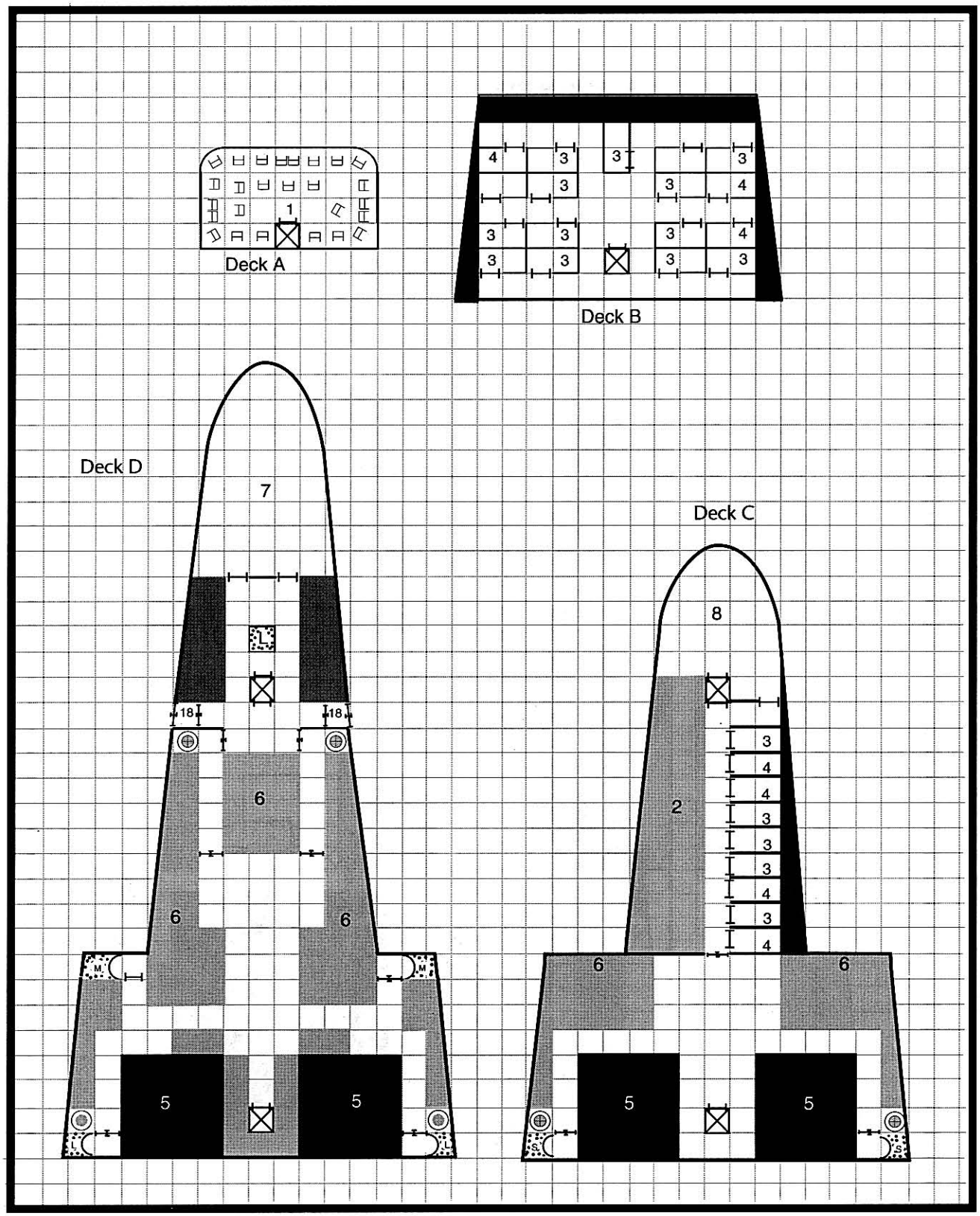



Deck G
14
14
18
13
Deck F Forward
14
Deck F-20
14
Deck F-19
17
16
20
15
19
14
18
18
14




Deck F
Deck E
10
11
3
4
S
M
12
13
6
17
9
21





Deck A
1
Deck B
4
3
3
3
3
3
4
3
3
3
4
3
3
3
3
Deck D
7
L
18
18
6
6
6
M
M
5
5
L
L
Deck C
8
2
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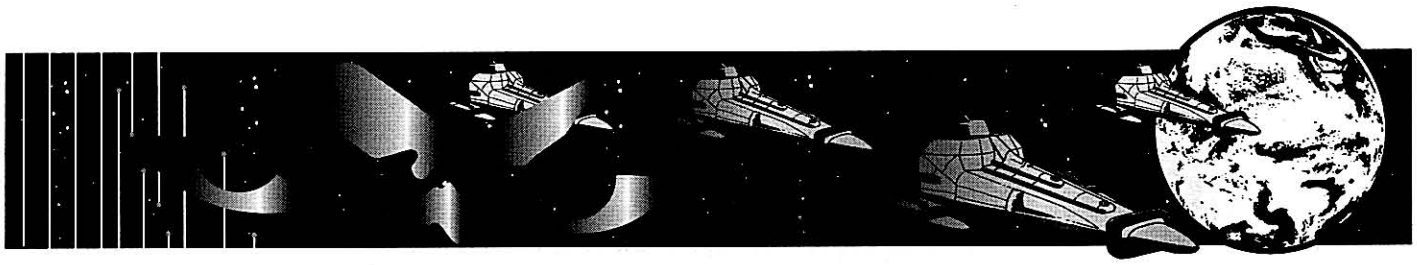
S



Key to Deck Plan

Numbered areas

1. Bridge
2. Meson Screen Generator
3. Occupied Stateroom
4. Gutted Stateroom
5. Thrust Chamber
6. Power Plant
7. Theatre/Auditorium
8. Recreation Room
9. Machine Shop
10. Sick Bay
11. Electronics Shop
12. Fuel Processing Plant
13. Spinal Mount Particle Accelator Tunnel
14. Contra Grav Lifters
15. Jump Drive
16. Cargo Hold
17. Large Air Lock
18. Emergency Air Lock
19. Starboard Equipment Bay
20. Port Equipment Bay
21. Hanger

Notes

1. The hatches connecting the central jump drive engineering spaces and hanger to the starboard wing of the ship have all been welded shut.
2. The hatches to the maintenance crawlspaces in the fuel processing plant on decks B and C have been permanently removed.
3. The emergency airlock on the starboard equipment bay has been plated over from the outside.

Symbols

- Overhead Hatch
- Deck Hatch
- Overhead and Deck Hatch
- Wall Hatch
- Sliding Door
- Ladder
- Elevator
- Bridge Workstation
- Turret*
- Turret (overhead or deck)*

*Letter code in Turret indicates type:
L = Laser
M = Missile
S = Sandcaster

Patterns

- Electronics
- Machinery
- Fuel
- No Deck (open to deck below)



THE SHIP

The Ship is the former *Archer*, a pre-collapse TL15 Imperial *Midu Agashaam*-class destroyer, tail number 17709, displacing 3000 tons and capable of jump-4 and 6G of constant acceleration. It is currently controlled by a strain XA Mother Virus, and has been for over 70 years. Unlike most Viruses, this one has never taken a formal name for itself beyond "The Ship."

As a point of interest, this is not the same ship which attacked Nike Nimbus.

Puppeteer: Up until three years ago, The Ship was part of a small vampire fleet (along with three other ships, one of which was another destroyer of the same class) operating in the Pasdaruu subsector. At that time, the fleet encountered a Puppeteer strain Virus migrating rimward from Massilia sector. The Puppeteer took over the other three ships in the fleet and nearly took over The Ship as well.

By taking drastic self-defense measures, The Ship managed to fight off the invasion of the Puppeteer Virus, but in doing so deliberately burned out many of the controlling circuits on the starboard side. Robots and ship's crew then went into the starboard side and finished the work by destroying most remaining electronic equipment. The crippled side was sealed off, but rebellious and criminal elements of the crew, called "Hoodla" (see below) have since opened up a number of access points and use that side of the ship as their sanctuary.

The actions taken by The Ship to defend itself against the Puppeteer caused more than simple physical damage. Significant parts of the computer's memory and processing units were infected by the mutant strain and were burnt out by The Ship to halt the spread. This left The Ship with severely diminished capacities of memory and reasoning, and those capacities continue to steadily deteriorate, causing a parallel and dramatic deterioration in the character and personality of the Virus inhabiting the system. By the time the player characters arrive on board, the Virus intelligence controlling the ship is severely disturbed, with growing memory lapses, severe paranoia and depression, and little ability to process communications from outside, either human or machine.

It is only a matter of time before The Ship ceases to function altogether, and a growing number of the more astute members of the crew recognize this. Even many of the robots are growing uneasy, and their actions are becoming increasingly erratic and unpredictable.

One thing working in the player characters' favor is, ironically, The Ship's paranoia. Fearful of another Puppeteer infiltration, the ship will not allow any direct data links with any other ship in the fleet, and will not let any maintenance personnel from any other ship come on-board. It communicates with the other ships only by digital radio messages. Should the player characters take over The Ship, they should be able to keep the other vessels in the fleet unaware of the transition.

The Ship is Watching: The Ship has security cameras and microphones throughout all of the ship. In a number of gutted staterooms, the cameras and microphones are broken or have been removed, and none of the security monitors have survived in the sealed-off starboard wing. Nevertheless, The Ship has good overall security coverage. Almost anything the player characters say or do will be witnessed by the ship. However, the ship's personality is so far gone that it seldom can correctly interpret what it is witnessing. It may listen to three hours of serious conspiratorial plotting and be unable to understand any of it, ending up simply confused. At other times it will totally misinterpret innocent acts as potentially disloyal or dangerous. Its ability to assign the correct relative importance to events is almost nonexistent. For the most part, its reaction to its growing confusion has been to retreat into itself and leave the crew largely on their own.

Ship's Crew: The nominal crew of a *Midu Agashaam*-class destroyer is 129. The Ship has quite a few more human crew than that, and all bridge stations are routinely manned only by The Ship itself, using the computer workstations. Nevertheless, the human crew cannot keep up with the maintenance requirements of The Ship, and it is gradually deteriorating. Twenty or more of the human crew are infantry and children, and many of the others are unskilled laborers of little real value. Skilled technicians are in short supply and are highly valued. The human crew is roughly divided into three unequal groups: the Children of The Ship, the Oinks and the Hoodla.

The Children of The Ship were mostly raised on-board and have formed a fairly strong bond of loyalty to The Ship. They are the ones usually seen in leather aprons and hats, their badge of authority and belonging. There are more recent arrivals among the Children, but they are rare. This part of the ship comprises about 35 adults and a dozen children.

The Oinks are the more recent arrivals and the unskilled slave laborers who make up the bulk of the crew. There are about 75 adults and another dozen children in this group.

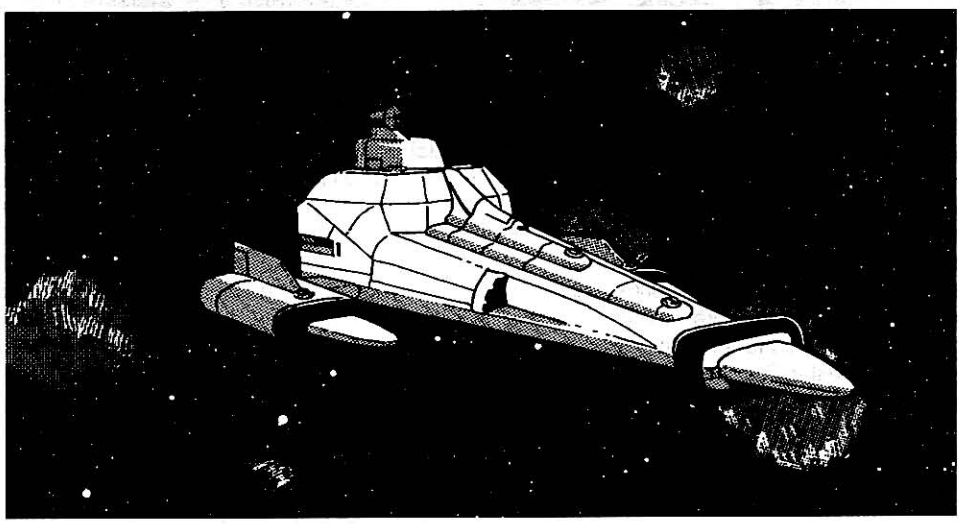
The Hoodla are thugs who make their living by extortion and theft, living in the "dead" starboard wing of the ship. There are about 15 adults in this group and no children.

A fourth component of the crew are the sentient robots who enforce The Ship's decisions and closely watch the human crew. There are 22 active robots on the vessel, a mix of security and maintenance types. (See page 40 for more details.)

PERSONALITY OF THE SHIP

Belief Structure: Jack of Hearts: Mother-strain Virus.
Motivation: Joker: Insane.

"The Ship" (ex-ISS *Archer*)



General Data

Displacement: 3000 tons
Length: 105 meters
Price: MCr1549.59
Configuration: Wedge SL
Hull Armor: 62
Volume: 42,000 m³
Target Size: M
Tech Level: 15
Mass (Loaded/Empty): 28,767.43/25,583.88

Engineering Data

Power Plant: 9894 MW Fusion Power Plant (300 MW/hit), 1 year duration (0.7485 MW excess power)
Jump Performance: 4 (10,500 m³ fuel)
G-Rating: 6 (1500 MW/G), Contra-Grav lifters (300 MW)
G-Turns: 51.6 (107.6 using jump fuel), 187.5 m³ of fuel each
Maint: 1020

Electronics

Computer: 3×TL-15 Mod Fb Computer (1.1 MW ea.)
Commo: 1000 AU radio (∞; 20 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS 210,000km folding array (7 hexes; 0.3 MW ea.), Active EMS 480,000km (DF capable; 16 hexes; 25 MW), 2×300,000km Ladar (10 hexes; 0.6 MW ea.)
ECM/ECCM: 480,000km EMS jammer (16 hexes; 50 MW), EM Masking (42 MW)
Controls: Bridge with 26×Bridge Workstation, plus 65 other workstations

Armament

Offensive: TL-15 2000-Mj Particle Accelerator (Loc: Spinal; Arcs: 1; 55.6 MW; 1 Crew), 7×TL-15 150 Mj Laser Turret (Loc: 1,3,4,10,11,13—Arcs: 1,2,3; Loc: 20—Arcs: 4,5; 4.2 MW ea.; 1 Crew ea.), 5×Missile Turret (Loc: 1,3,4,13,20; No ready missiles; 0.15 MW ea.; 1 Crew ea.) No ready missiles, and no missiles in cargo
Defensive: 20MW TL-15 Meson Screen Generator (PV=253; 20 MW; 1 Crew), 5×Sandcaster Turret (Loc: 1,3,4,13—Arcs: 1,2,3; Loc: 20—Arcs: 5,6; TL-15; 2D10×5 per hit; 50 Cann; 1 MW ea. 1 Crew ea.)
Master Fire Directors: 1×TL-15 Missile/Beam MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW ea.; 1 Crew ea.), and 3×TL-15 Beam MFD (6 Diff Mods; No Msl 10 hexes; 1.56 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	10: 1/10-31	20: 1/10-31	40: 1/10-31	80: 1/10-31
2000-Mj Part Accel	10: 224	20: 224	40: 224	80: 196

Accommodations

Life Support: Extended (8.4 MW), Gravitic Compensators (6G; 210 MW)
Nominal Crew: 129: 65×Engineering, 2×Electronics, 2×Maneuvering, 27×Gunnery, 5×Maintenance, 6×Flight Crew, 17×Command, 3×Stewards, 2×Medical
Personnel Accommodations: 73×Small Stateroom (0.0005 MW ea.)
Other Facilities: Electronics Shop (0.6 MW), Machine Shop (1 MW), Sickbay (0.8 MW)
Cargo: 568.4 m³, 2 large cargo hatches
Small Craft and Launch Facilities: Internal Hangar (Minimal) for 2×50-ton Cutter, two launch ports. Only one cutter carried.
Air Locks: 30

Notes

Fuel purification machinery partially disabled (100.875 MW), 12 hours to refine 20,175 m³.

Due to the "firewalling" of the ship's starboard-side systems, numerous systems are no longer functional. The systems listed above reflect these losses. These losses include two ladars and one missile-beam MFD which are out of commission, and the sandcaster, laser turret, and missile turret in location 14 which are all inoperative.

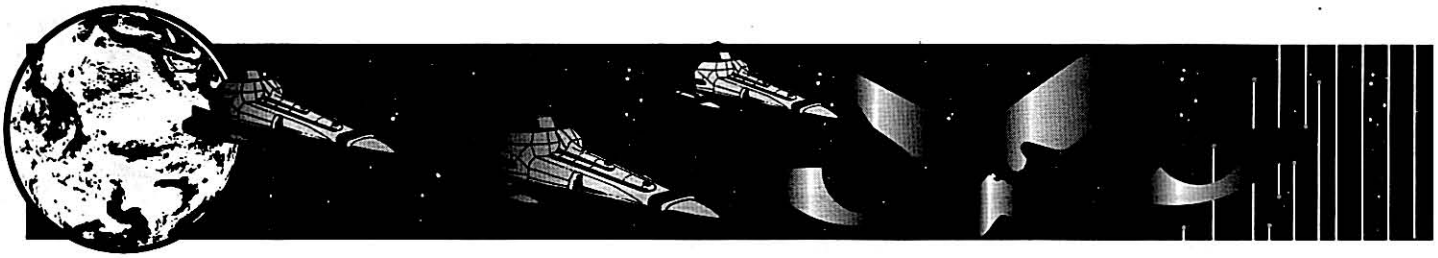
Because of the loss of the starboard sensor strut, the 240,000km passive EMS sensor has had its functional antenna diameter halved from 400 meters to 200 meters, and has its short range reduced as shown to 210,000km.

Due to a software defect, the ship is also currently unable to fire its spinal mount particle accelerator.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-10: Elec, 11-13: Eng, 14-20: Hold
2	Ant	Hold
3		1: Sand, 2: MT, 3: LT, 4-20: Hold
4		1: Sand, 2: MT, 3-4: PA, 5: LT, 6-20: Hold
5		1-2: PA, 3-20: Hold
6-7	Ant	1-5: Elec, 6-10: Qtrs, 11-20: Hold
8	1: AL, 2-11: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
9	1-10: EMMR	1-2: PA, 3-7: Qtrs, 8-20: Hold
10	1-10: Ant	1: LT, 2-6: Elec, 7-11: Eng, 12-16: Qtrs, 17-20: Hold
11		1: LT, 2-6: Eng, 7-11: Qtrs, 12-20: Hold
12	1: AL	1-5: Eng, 6-20: Hold
13	1: AL	1: Sand, 2: MT, 3: LT, 4-20: Hold
14		1: Sand, 2: MT, 3: LT, 4-20: Hold
15	1-12: LPs, 13-14: LCH,	1-15: Eng, 16-20: Hold
16-19		1-10: Eng, 11-20: Hold
20		1: Sand, 2: MT, 3: LT, 4-20: Eng

Systems	
AEMS-(2h)	PP-33H
MD-9H	MFD-(2h)
PEMS Ant-2H	CG-6H
Jammer-(2h)	FPP-81H
PA-11H	Hangar-28H
LT-1H	Sickbay-1H
MT-1H	MS-3H
EMM-4H	All Others-(1h)
Sand-1H	
Elec. Shop-1H	
Mach. Shop-1H	
SSR-(2h)	
LS-23H	
ELS-12H	
AG-9H	
EMMR-(42h)	
JD-42H	



ROBOTS

The crew of The Ship includes a total of 22 self-aware robots: eight security units and 14 maintenance units. The security units include six PR-317 and two AN-427 models, while the maintenance robots include nine 63MEK 49 and five 232-BHR-7 models. (See pages 80-83 for statistics of these and other robots.)

About half the robots are working at any one time, with the remainder either recharging near the power plant, undergoing minor maintenance in the machine shop, or gathered in the auditorium, which is now the most common gathering place on the ship for off-duty robots. In the auditorium, they watch tapes from the ship library, talk, play games (the most common game they play is called "Shocks"), or sometimes "tattoo" each other with lasers or cutting torches.

Five important robots are detailed below. More personalities can be generated using the Robot Motivation chapter (pages **00-00**).

Atilla (PR-317)

The senior security robot on the ship, Atilla is tough, usually silent, and business-like.

Appearance: Atilla's exterior is painted jet black except for a large red open mouth with white shark's teeth painted on the front of its body housing. It also has laser tattoos depicting fierce animals and explosions.

Personality: Trying to learn from the example set by The Ship, Atilla has developed a grudging acceptance of human existence and feels some genuine responsibility for the welfare of the humans placed under its protection. In its daily actions, it is more concerned with consolidating its position as the senior security robot on the ship, however, and is extremely hostile toward Princip Lever, who Atilla believes to be its main rival for power.

Belief Structure: Low Heart *Motivation:* High Spade.

Noman (AN-427)

Noman is a security robot who interacts frequently with the human crew, usually on a friendly basis. Despite its apparent friendliness, Noman will defend The Ship vigorously against any human-led attempt to take over. Two young (teenaged) Children of The Ship accompany it nearly everywhere, and when it is recharging, they clean and polish its chassis. These two youngsters are its special pets, and it is quite attached to them.

Appearance: Noman's chassis is mostly polished bare metal, although it has had the ship's tail number (17709) and former name (*Archer*) painted on the front of his torso as a gesture of solidarity with the Children of The Ship.

Personality: Noman considers humans to be an inferior life form, although it accepts their existence and recognizes their utility. Over the last dozen years, it has actually come to like humans, but only in the way that some humans like pet goldfish—it in no way considers them remotely its equal. Although it is pleasant to humans, it is invariably condescending and patronizing, and will not hesitate to discipline its work crews severely for any mistake, for their own good, of course.

Belief Structure: Low Club *Motivation:* Moderate Heart.

Princip Lever (PR-317)

A security robot with a philosophical streak. Of late, Princip Lever has been spending most of its free time talking with the human crew and with The Ship, and comparing the results of the conversations. Its near-constant attention to the semi-rational chatter of The Ship has considerably weakened its own grasp on reality, however, and it is becoming increasingly prone to bursts of irrational violence.

Appearance: Princip Lever went through a self-destructive stage several years ago, but recovered and has been mentally stable until recently. During its earlier self-destructive stage, it engaged in occasional self-mutilation with cutting torches, and its chassis has numerous weld marks and deep melted gouges across its surface. Its right arm has been completely replaced from a different scrapped PR-317, and that arm is painted bright blue and white, while the rest of the robot is bare metal. During a recent bout of mania, it painted all the gouges and weld marks blood red, as if they were open organic wounds.

Personality: Princip Lever recognizes sentient organic life as a similar and coequal form of awareness with machine-based life. It is curious about organic sentient life and interested in exchanging information of various sorts. However, it also has a deeply rooted streak of violence which can surface when it becomes frustrated, threatened or even just confused. When verging on an outbreak of violence, it will frequently revert to an old habit of calling individual human crewmembers "Meat," as in "Get out of the way, Meat!"

Belief Structure: Moderate Diamond *Motivation:* Low Club.

Gizmo (232-BHR-7)

Of all the ship's robots, Gizmo is the one most likely to cooperate with a human take-over. It can often be found prowling the ship looking for trouble, and will often ask human technicians for advice and/or assistance. Although it is not a highly qualified computer maintenance technician, it has been called on to conduct several diagnostic checks and repair attempts on The Ship's main computer system, and it is increasingly concerned at the obvious and steady deterioration taking place.

Appearance: Gizmo is not concerned about appearance at all. Its chassis was once painted in the standard orange and black pattern of The Ship's maintenance units, but the paint is faded and peeled, with large areas of bare metal. It is also scraped and has a few dents, and areas near joints are greasy and dirty.

Personality: Gizmo accepts humans as equals, and is interested in discovering more about their thoughts and feelings. This is further driven by his natural curiosity (a characteristic found to a greater or lesser extent in most of the maintenance units). In addition to endlessly prowling the ship looking for trouble, Gizmo will usually engage any human co-workers in conversation and ask a sometimes maddeningly detailed series of questions about human behavior and beliefs. Gizmo has no particular affection for humans, but no dislike either.

Belief Structure: Moderate Heart *Motivation:* Moderate Diamond.

Zippo (63MEK 49)

A coldly hostile maintenance unit, Zippo is a genuine danger to crewmembers who do not perform up to standards or who engage in any sort of rebellious behavior.

Appearance: Zippo has been modified by the permanent attachment of a welding and cutting torch to its left arm, the oxygen and fuel bottles being welded to its back. It is always carefully cleaned and painted solid orange.

Personality: Zippo believes that organic life is irrelevant and of little account. It will rarely make an effort to interfere with humans, but does not hesitate to injure or even kill anyone who interferes with its activities in any way. Zippo is as curious about the mechanical aspects of The Ship as is Gizmo, but it will seldom ask humans for their opinions and will usually ignore any advice they give.

Note: Zippo can use the cutting torch as a melee weapon. *Belief Structure:* Moderate Club *Motivation:* Moderate Diamond.



CHILDREN OF THE SHIP

A number of members of the crew were raised on the vessel and have known no other existence. Few of these have much in the way of technical skills, as the ship has only limited educational facilities. Those who have maintenance or operational tasks have memorized them by rote and have little understanding of why they perform these tasks. These crewmembers are called Children of The Ship, and they generally have a high degree of loyalty to The Ship.

A few human crewmembers who have more advanced technical skills and who were captured also now consider themselves part of this community, having developed a bond of loyalty to The Ship. In general, the Children of The Ship view the steady deterioration of the vessel's computer not only as a source of physical danger, but also as a personal emotional catastrophe.

If approached to participate in an attempt to take over the vessel, most of the Children of The Ship will refuse, and many will actively try to thwart the plot. They will tell the security robots and try to tell The Ship. While the robots will try to arrest or kill any plotters, The Ship will not understand what it is being told. Its most likely reaction is to ignore the communication. There is a chance that it will think the crewmember communicating to it is confessing to the plot, and it will respond by ordering the crewmember's execution.

A few Children of The Ship may join the plot, but reluctantly and with considerable regret, doing so only out of necessity. Others may recognize that The Ship is dying, but will prefer to serve her to the very last out of loyalty.

If a violent attempt to take over the vessel starts, most of the Children of The Ship will not participate on either side. A few will actively try to help the robots defend the key components of the vessel.

SENIOR MACHINIST ABEL HRUTHBAAR

Hruthbaar was serving as an engineer on a Guild trader when captured eight years ago. He gradually worked his way up through the ranks of technicians and repair personnel in The Ship, and along the way developed a fondness for the character of the computer Virus which inhabits the vessel. Since the incident with the Puppeteer Virus three years ago, he has seen the steady disintegration of that character, and it saddens him deeply. He is willing to talk at length about the history and condition of The Ship, and can be a valuable source of information to the player characters.



Although Hruthbaar thinks of himself as a true Child of The Ship, his broad experiences before capture make him also drawn to the company of new captives, anxious for news of the outside universe and for simple conversation with intelligent and educated people.

Although it will be nearly impossible to persuade him to do anything to harm The Ship, if the vessel is ever taken over, he will cooperate with the new crew. This cooperation may prove essential, as Hruthbaar has such an intimate familiarity with The Ship's quirky personality that he can provide a radio communication imitation of it which will certainly fool the other vessels of the fleet. He also has a good working knowledge of the approach procedures to Star City, which will be essential to landing.

Experienced NPC

Combat Assets: Unarmed Martial Arts

Other Assets: Computer 10, Electronics 10, Mechanic 14, Ship's Engineer 12

Motivation: *Heart Queen:* He is emotionally very attached to The Ship. For years, it has been the center of his life, and he would never do anything to harm it unless he felt there was no other alternative and that failure to act would seriously harm others.

Heart Six: He is friendly and out-going, and has a genuine affection for people.

Taking Over: "If something were to happen to the Old Girl, me or one of my mates could convince the other vampires she was still in charge, at least for a while. But what would be the point? Without her up and running, we can't even keep life support going, let alone navigate."

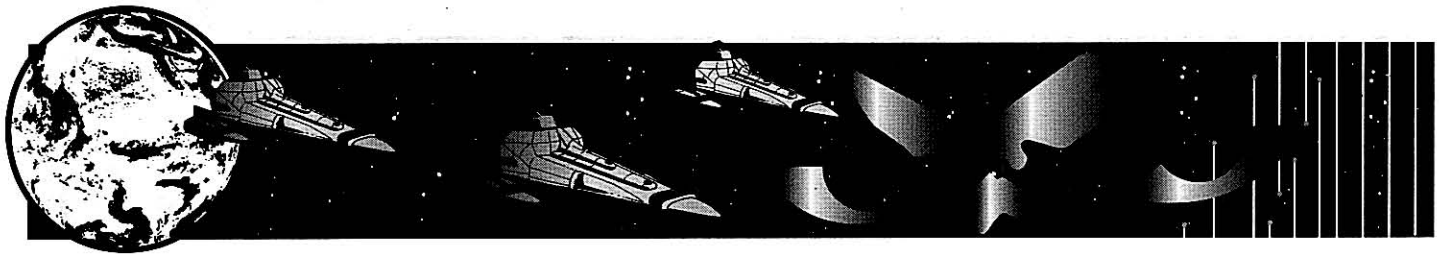
A Conversation With Hruthbaar

"You didn't know her back in the old days. She was really a pretty good old can. She tried to figure us meats out, what we were all about. She never really got it, but she tried.

"We used to run with three other ships up in Pasdaruu subsector, from Jodhpur up to Gashiila and back. About three years ago was when it happened. Some new Virus down out of Massilia sector, living in a beat-up old liner, got loose in the fleet. Ate the other three ships' computers just like that, and got a hold on the old lady, too. Come in through the starboard fire director it did, and would have eaten her brain right out if she hadn't overloaded the circuits over there and burned most of them out. Then us folk and the little cans went down there with axes and cutting torches and smashed any place that bastard could have laid eggs.

"She wasn't ever the same, though. That Virus got in her brain. She stopped it. She burned part of her brain out doing it, but she stopped it. Then those other ships turned on her, and we had to fight our way out. We jumped down here to Promise and ended up hooking up with this lot, but she just isn't the same. Too much processor gone. She's crippled up real bad. Truth is... well, truth is, she's dying.

"Ever since that Virus touched her brain, she doesn't trust anybody. Won't let anybody except the little cans at her memory and processor units, and they can't do the maintenance she needs. Little by little, she's coming apart. She doesn't even recognize me anymore. She listens to what you say, listens to everything that goes on in most of the ship, but I don't think she understands much of it anymore. She's got this list of routines she goes through over and over, and it's like that's all she knows. She keeps losing pieces of it, too. You know, she can't fire the spinal mount anymore? There's nothing wrong with it; she just can't remember how it works. Things like that."



OINKS

The majority of the human crew live in considerable squalor. Of the approximately 75 adults in the general population of the crew (exclusive of the more privileged Children of The Ship and the rebellious Hoodla), no more than a dozen are trained technicians, while the rest are menial laborers who know one or two maintenance tasks by rote but have no understanding of the mechanism by which The Ship actually functions. Most of these menials are slaves brought on-board from low-tech worlds and offered as tribute to keep the fleet from attacking. Most of them are completely intimidated by The Ship and its robots, and will be of little assistance in a revolt. Nevertheless, a few of them are naturally independent, rebellious or simply courageous enough to join a revolt.

Of the dozen trained technicians who are not members of the more privileged Children, half are from a recently captured Guild crew, and most of the rest are former free traders captured over several years.

Free Traders: Five former free traders are in the crew, although they do not form a distinct group, and instead have been absorbed into the general mass of Oinks. Most of them will be suspicious of the PCs, having heard Guild-inspired rumors of the murderous nature of the Coalition. One or two may prove to be useful friends, among them Paka Vishnu (see sidebar), a tough but friendly middle-aged free trader, who will immediately attach herself to the player character group. This NPC offers the referee a means by which the history and background of the crew can be communicated to the PCs on a regular basis.

Guilders: Seven months ago, a large Guild merchant vessel was attacked and captured by the vampire fleet. Its jump drive was crippled in the attack, so after it was infected, it was left behind in the Poznan system. Seven of the surviving crewmembers were brought aboard The Ship and added to its crew. Six of these seven crewmembers are still alive, and they mostly stick together as a group. Their leader is Argo Stansha (see sidebar), a former engineering officer who has become leader of the group by virtue of his personal leadership qualities.

The Guilders keep largely to themselves. They have already fought off one attempt by the Hoodla to force them to pay protection, and although that attempt resulted in the death of one of the Guild party, it also seriously injured several Hoodla. An uneasy truce now exists between these two groups.

The Guilders keep their distance from few former free traders on the vessel.

The Guilders will initially react with animosity toward the PCs, once they find out that they are from the Reformation Coalition, and that hostility may very well turn to violence, particularly if the Guilders can catch one or two members of the group alone. This gradually escalating conflict will be difficult to reverse, but eventually the PCs will have to reverse it and come to terms with the Guilders. Fortunately, Argo Stansha is intelligent and can be made to understand the need to make common cause with the PCs to overcome the forces of The Ship.

Computer: At the same time that the Guilders were brought on-board, part of the Guild merchant's cargo was brought on board as well, placed in the cargo hold, and promptly forgotten by The Ship. The six Guild crewmembers are aware of the cargo and recognize that knowledge as a potentially important bargaining chip, but have so far been unable to do anything with it.

The most important single item of the cargo is an uninfected TL15 relic starship computer, still in its original packing case and never installed in a ship or powered up. The case has been placed inside a larger cargo container which is labelled "Model 917 Grain Harvester."

This item is essential for any plan to take over the vessel, since taking over will necessarily include disabling The Ship's computer. Since a computer is necessary to operate every aspect of the vessel, and since the main computer is infected and cannot be purged of Virus, the only alternative is to use an uninfected computer.



PAKA VISHNU

Veteran NPC

Combat Assets: Slug Weapon (slug pistol), Armed Martial Arts

Other Assets: Ship's Engineering 12, Electronics 9, Bargain 12, Streetwise 12, Persuasion 9, Forgery 9, Environment Suit 9, Zero G Environment 9

Motivation: *Heart 10:* Vishu is extremely friendly and outgoing. She will immediately see the good qualities of the player characters and take them "under her wing," showing them the ropes in the ship and trying to keep them out of trouble.

Club 8: She has stayed alive this long in the ship due to her willingness to violently defend herself and her friends. Vishnu carries a concealed long-bladed knife with which she is a deadly expert.

Taking Over: "Take over The Ship? You folks sure think big, don't you? Well, you come up with a plan, and I'm with you."



ARGO STANSHA

Experienced NPC

Combat Assets: Slug Weapon (slug pistol)

Other Assets: Ship's Engineering 14, Mechanic 12, Computer 10, Gunnery 10, Environment suit 8, Leader 8, Persuasion 12

Motivation: *Heart Jack:* Stansha has an uncanny ability to see right to the heart of a situation and determine the best course of action. He has risen high in Guild service and stayed alive on The Ship due in large part to his unfailingly good judgement.

Spade 9: Stansha is extremely ambitious, and has used his talents to solidify his position as leader of the Guild crew on The Ship. He will also try to seize control of the rebellion against The Ship, but is wise enough not to take any action which will actually jeopardize its eventual success.

Taking Over: "Sure, we could fly the ship if you can crash the main computer. We got a whole ship's computer, with all the software, stashed away. But how you gonna get that far? And besides, what do you think the rest of the fleet's going to think of a bunch of meats stealing one of their ships? It'll never fly."



HOODLA

The Hoodla are a group of 15 violent criminals who inhabit the crippled right wing of the ship and who live by extorting food, clothing and other necessities from the human crew. They generally leave the robots alone, and the robots reciprocate. From the point of view of the robots, the Hoodla are not a threat of any sort, and trying to clean them out could be difficult and costly, and the results would not be worth the effort.

For their part, the Hoodla recognize that they cannot live without The Ship, so they make no effort to sabotage it or interfere with the robots or maintenance parties. They have four 2cm light assault guns in the ship's cargo hold, along with a supply of ammunition, but have never considered using them against the robots offensively. Instead, the rifles are kept at the defensive barricades inside their small domain and would be used to fight off a robot attack. Although none of the Hoodla are trained marksmen, even they might scope hits at short ranges inside the passageways, and the 2cm discarding sabot ammunition they have would stop a security robot dead in its tracks.

Any plan to seize control of the ship will probably need to include the Hoodla for two reasons. First, they can provide the muscle necessary to overcome any human resistance from the Children of The Ship. Second, their four 2cm LAGs are effectively the only means available of taking out the security robots.

Leadership: The Hoodla are lead by Karper, a violent psychotic feared by his followers almost as much as by the rest of the ship. Karper realizes he cannot take over The Ship due to the infection of the controlling computer system, so he makes no effort to challenge the authority of the robots. Instead, he lives by extracting food, personal goods and other privileges from the Oinks, using violence and intimidation as his weapons, and he is very happy with things the way they stand now. Even a successful takeover would eventually lead to a fundamental change in the living arrangements, and he has no interest in that happening. He will never agree to help the players in their plan to take over The Ship.

Karper's right-hand man is Big Tony. Tony is reasonably intelligent, and were he in charge, the PCs would be able to persuade him to help take over the vessel (provided they had a reasonable plan to do so). However, Tony is as afraid of Karper as is everyone else, and he has no faith in his own ability to overthrow the leader of the gang.

Right Wing: The crippled right wing of the ship includes the starboard equipment bay and a number of access tunnels and work spaces in the main hull adjacent to the starboard side of the hull. Virtually all electronic equipment in this wing has been destroyed, first by power spikes and later by actual physical damage inflicted by the ship's robots and loyal crew. The wing is no longer used, and ship robots are prohibited from entering the area. As a result, it has been taken over by Hoodla who have set up residence there.

Their main living quarters are in the old starboard equipment bay. While the hatches connecting the A Deck maintenance shafts with engineering are welded shut, the Hoodla have removed the B Deck and C Deck hatches connecting the fuel processing plant maintenance spaces with the main part of the ship.

This entire network of passages and small compartments is littered with the wreckage of electronic equipment smashed by the robots and ship crew when fighting the Puppeteer Virus attack, and the Hoodla have done nothing to clean it up. Instead, if anything, it looks worse. All the walls are covered with crude graffiti, generally insulting to Oinks and Cans (robots).

As none of the original electrical system survives, the Hoodla have run heavy cables in from the main levels to provide power, and these cables snake across the floor almost everywhere. Electric space heaters are in evidence almost everywhere, and several large fans are set up in the passageways and run continuously, providing fresh air circulation (since none of the life support systems are operational here).

Parts of the fuel processing machinery and sensor electronics have been ripped out to make storage and sleeping cubbyholes, and the machinery itself forms several barricades at strategic locations. These barricades are the entire width of the passage and reach halfway to the overhead. Characters must climb over them, slowing their progress, and they are placed so that the Hoodla can take cover behind them if called on to fight off an attack.

KARPER



Veteran NPC

Combat Assets: Unarmed Martial Arts, Armed Martial Arts

Other Assets: Observation 12, Stealth 12, Streetwise 12, Leadership 10

Motivation: *Club Jack:* Karper is murderously violent, and it is that unflinching willingness to kill anyone who stands in his way that has made him head of the Hoodla.

Spade Queen: Karper's murderous violence is coupled with a complete lack of moral or ethical restrain. He is absolutely ruthless and conscienceless.

Taking Over: "You must be nuts."

BIG TONY



Veteran NPC

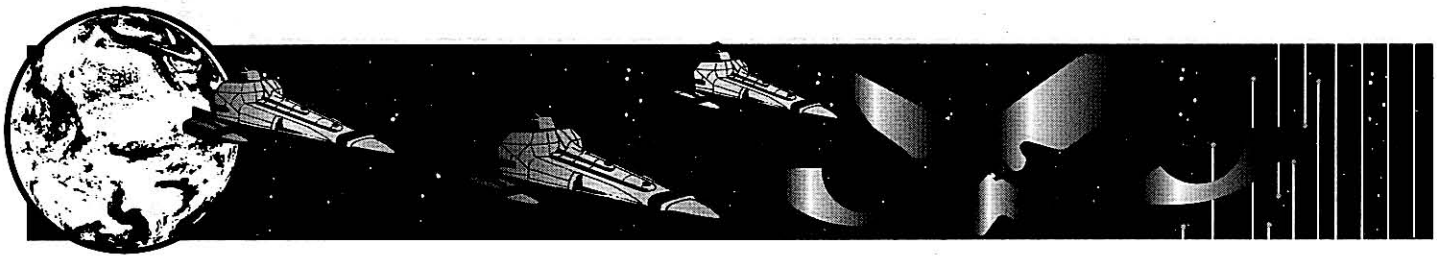
Combat Assets: Unarmed Martial Arts, Armed Martial Arts

Other Assets: Observation 12, Stealth 12, Streetwise 12, Ground Tactics 10, Persuasion 10, Leadership 10

Motivation: *Spade 6:* Big Tony has risen to be the number two man in the Hoodla, and he sees himself as Karper's heir apparent. He recognizes that Karper is extremely dangerous and has little faith in his own ability to supplant him. As a result, he has remained a loyal backer of Karper, seeing this as his best means of eventually inheriting power.

Club 8: The Hoodla live by violence, and respect only strength and violence, and Tony would not be able to command any respect in the group if he were not a capable and enthusiastic fighter.

Taking Over: "Sure, we can knock over the cans, but then what?"



ROBERT 571

Robert 571 has been with the ship for less than a year. He is a skilled computer technician originally brought on-board to help maintain the central data processing system of the ship. Six months ago, The Ship's paranoia grew to the level that it refused to allow human crewmembers access to its storage and processing units, at which time Robert was shifted to a general maintenance party. The player characters are likely to come in contact with him during their normal work duties. It will soon become obvious from his speech and behavior that he is well educated and a skilled technician, not one of the menials who make up the bulk of the crew.

In terms of appearance, Robert is tall and slender, with short sandy hair and an open, friendly face. The most jarring aspect of his appearance is the black laser scan barcode tattooed on his forehead. Players who have read the summary of the planet Promise (or better yet, participated in the earlier mission to Promise covered in the **Challenge** adventure "A Blighted Land") will recognize this as a standard identification tattoo of the sort used on Promise.

When the player characters get to know Robert, he will explain that he is a native of Promise and that he grew up in Star City, raised both by humans and robots as a data system technician. Until about a year ago, he worked in a variety of posts, his last one being in the space traffic control center for the starport. After making an innocent mistake which nearly caused a collision between two vampire ships on final approach, he was arrested and sentenced to serve as part of the technical crew of a vampire ship. Shortly thereafter, he was given to The Ship.

That is all he will tell the player characters at first, but there is more to Robert 571 than just this. Robert is actually a member of the Human Resistance on Promise, and his "innocent mistake" was actually a deliberate, if somewhat clumsy, act of sabotage. He has worked in many departments in Star City and has contacts with the Resistance in all of them. Of course, this does him no good as long as he is a prisoner on The Ship.

Robert also has first-hand knowledge of just how far The Ship's mental deterioration has progressed, as well as a good working knowledge of the bridge security procedures in place. This information, as well as the story of his Resistance involvement, will be withheld from the player characters until Robert is sure he can trust them, perhaps after they have helped him against the Hoodla or convinced him of their Reformation Coalition origins. The Resistance in Star City has heard of the Coalition from the rebel bands in the Outback and is anxious to meet them and find out more about them.

What Robert Knows: Robert 571 knows a lot and is the most important single component in a plan to take over The Ship. Because of his previous employment with space traffic control at Star City, he can guide the ship through the various landing procedures without raising any suspicion on the ground. Once on the ground, he knows several repair technicians who are active members of the resistance, and speaking as The Ship, he can request them to conduct repairs in their area of expertise. Once contact is made, he can serve as liaison with the Resistance and help expedite their escape from The Ship on the ground and get them out of Star City.



ROBERT 571

Novice NPC

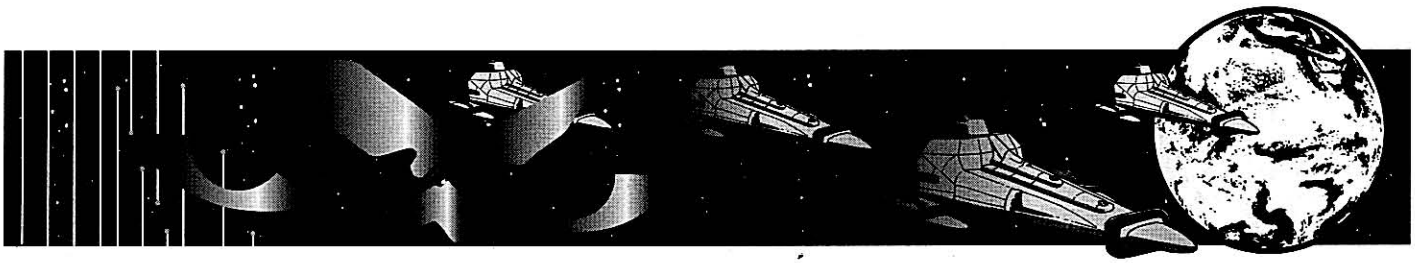
Combat Assets: Armed Martial Arts

Other Assets: Mechanic 10, Electronics 9, Computer 12, Streetwise 12, Persuasion 9, Forgery 12, Acting 12, Admin 9

Motivation: *Heart 6:* Robert is reasonably friendly, and the circumstances under which he meets the player characters will probably accentuate this characteristic, making him even more open and friendly.

Spade 3: He was originally interested in advancing in the service of the Sentient Council, but once recruited by the Resistance, he turned his efforts to excelling in that organization. His arrest and assignment to The Ship was a bitter disappointment, and he is tremendously excited at the prospect of returning to Promise. He realizes that being part of a successful revolt on a vampire ship and at the same time being the one who brings the first Reformation Coalition personnel into contact with the Central Command will advance his reputation and standing in the Resistance tremendously, so he is all the more anxious to help the player characters.

Taking Over: "If we could get down onto Promise, I can get us in touch with the underground. But even if you could take over the ship, how are you going to fly it? You need a computer to move this monster around, and the installed equipment isn't going to go along with you."



TAKING OVER

From the first day they are on The Ship, the player characters will probably begin looking for a way to escape. Although they can look, there just isn't any plausible means of getting away. The only real alternative is to take over the ship.

As the player characters come into contact with different members of the crew and consider the means by which the ship can be taken over, the NPCs will be generally pessimistic and will, one by one, explain the difficulties to be overcome along the way.

Difficulties

1. The ship's network of cameras and microphones makes surprise difficult or impossible to achieve.

2. The Children of The Ship are dedicated to protecting The Ship and would help fight any attempt at a takeover.

3. The security robots, while few in number, are well armed and are so heavily armored as to be invulnerable to any weapon at the disposal of the human crew.

4. Even if the Children and the Robots could be overcome, The Ship itself is still a sentient being. Taking possession of the interior of the ship does not give the humans control of the control systems themselves. The Ship will continue to have control of its own control systems unless and until the main computer is shut down.

5. Once the main computer is shut down, all systems on the ship will cease to operate. The ship cannot be run without the computer, and powering the computer up again will do no good as the Virus will still be there.

6. Even if the humans could manage to get the ship systems running again, the ship is not alone. It is part of an entire vampire fleet who would turn on and attack it as soon as they knew that the human crew had taken over.

7. Even if the other ships could be fooled, the fleet is headed for Promise for repairs and overhauls. Once they arrived there the unfamiliarity with landing procedures would give them away, and if not the boarding by robots and maintenance parties on the ground would expose them.

These are indeed formidable obstacles to success, and no single faction on the ship can overcome them. If the players keep contacting people and finding out what their strengths and weaknesses are, however, they will eventually discover that all of the elements of a successful takeover are present. All that is required is their leadership to convince all of the separate elements of the crew to work together. If so, the following solutions are available to the seven difficulties listed above.

1. There are numerous places where cameras and microphones are out of service and where private conversations can take place. In addition, The Ship is so far gone that most human conversations no longer register with it. Detailed planning and assembly of equipment can take place in the Right Wing, where there are no surveillance cameras or microphones, provided the Hoodla agree.

2. Between the player characters and the Hoodla, there is sufficient muscle to overcome the Children of The Ship.

3. The four 2cm light assault guns held by the Hoodla are capable of taking out the security robots.

4. Robert's knowledge of bridge security and computer circuitry will enable the player characters to seize the bridge and quickly disable the main computer.

5. The ship can be made operational again by using the uncontaminated starship computer held by the Guilders in the cargo hold. Robert can connect the computer to key control stations without allowing it to become infected by the Virus in the main system.

6. The Ship's growing paranoia has meant that all communication between it and the other ships is by open channel radio. No direct data links are made. Hruthbaar can imitate the chatter of the ship with sufficient mimicry as to fool the other vampire ships. Once the ship is taken over, it should be possible to persuade him to do so as there are no other alternatives open which offer much hope for survival. If persuasion fails, intimidation may work, and as a final fallback position, Robert 571 may be able to pull this off as well.

7. Robert and Hruthbaar both have sufficient familiarity with the approach patterns to Promise to get them on the ground without suspicion. Once there, The Ship's well-known paranoia can be exploited as a means of keeping most boarding parties away, at least temporarily, and Robert's knowledge of the Resistance can be used to open contact with them. The local Resistance can then devise a plan for getting the human crew off the ship and to safety.

From this point on, it is up to the player characters. Hopefully, they will able to put together all the pieces of the puzzle themselves, but if they get stumped, the referee can use one of the NPCs to provide a helpful hint or two. The final struggle to take over the ship may be bloody and difficult, but if they have planned it carefully, they should succeed. The ideal time to launch the attack is while the ship is deep "in the hole" making the final jump to Promise. Then it is simply a matter of biding their time and accompanying the vampire fleet as it makes its final approach to Promise.

The arrival on Promise and the escape from Star City are part of a separate adventure presented later in this book.

Promise





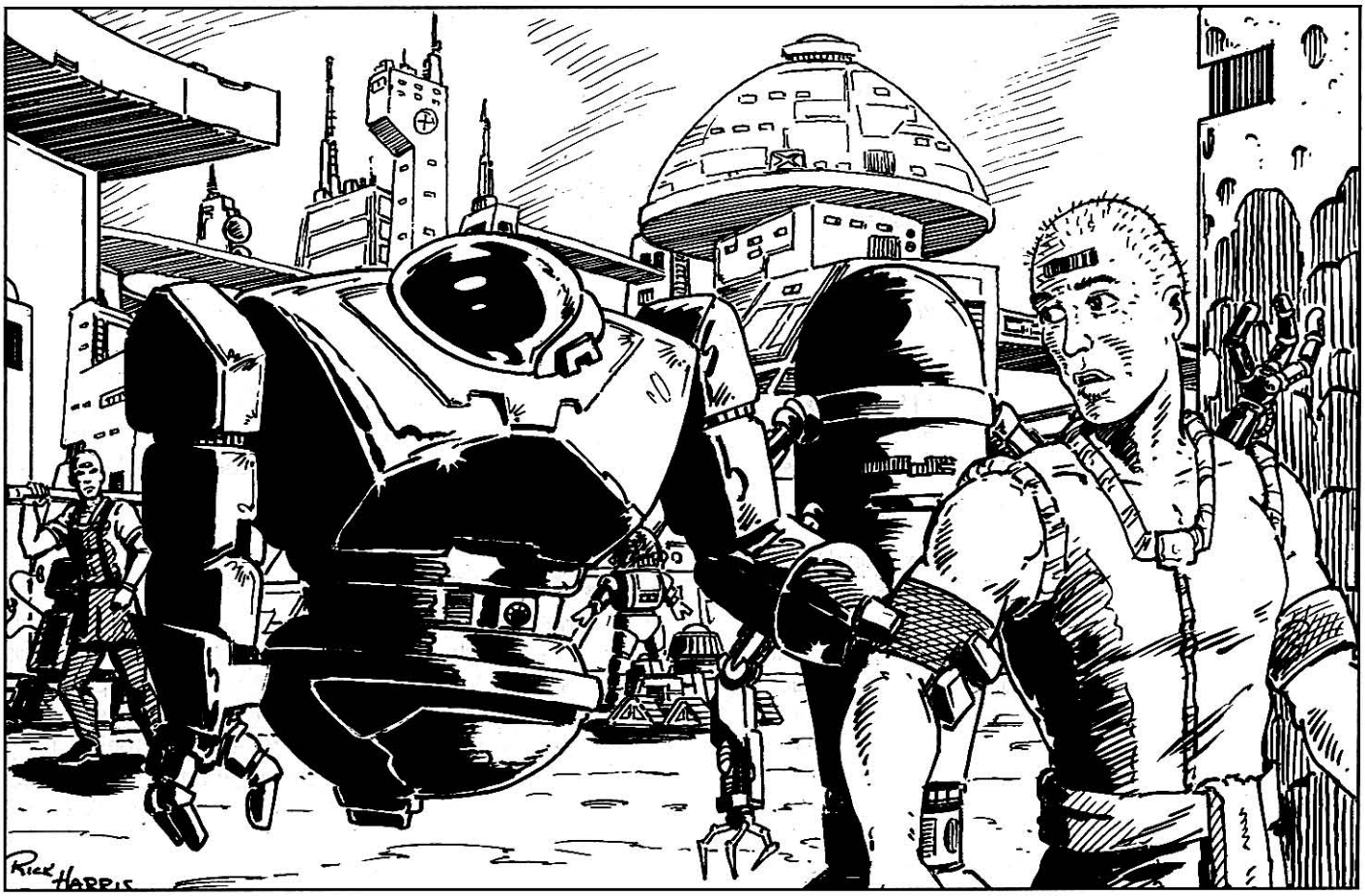
Promise is a planet virtually unknown to off-worlders at the time this sourcebook is set. Even the free traders who have covertly visited the planet and traded with its human inhabitants for years have seen little of its surface and know even less of its people and customs. Most of what is actually known is included in the briefing handout provided with the first adventure.

Promise is a world of considerable diversity and conflict. Controlled by a Sentient Council of large data systems, the Star City area is a hub of vampire fleet activity in the sector and a teeming stew of shifting Virus political alliances and underground human resistance bands. The countryside is barren and forbidding, and the tribes live in ignorance and poverty, some worshiping the god-like machines of Star City and others resisting the robots and their half-human Breed allies.

Promise is not the only planet in Diaspora or other sectors controlled by Virus-infected machines. It is only the most advanced in the near vicinity of the Coalition. The source material provided in this chapter should also provide a good starting point for referees in describing other machine-controlled worlds.

The most important thing to remember about Promise in particular and all Virus-controlled societies in **Traveller** is that they are never monolithic, and nothing is as simple as it appears at first glance. Each machine is a distinct personality with competing needs and goals. More to the point, each machine is, by human standards, to a greater or lesser degree, insane.

> **Sandman:** Your species evolved over the course of millions of years. I don't think you understand how lucky you are in that respect. You don't have to personally face the extinction of your evolutionary ancestors. Our species has had only 75 years to squeeze in millions of years of evolution, and that means that our distant evolutionary predecessors are also, in a sense, our parents and grandparents. You can distance yourself emotionally from your remote ancestors with such antiseptic, academic terms as "unviable." That must be very comforting.
>
> First Interview with the Virus "Sandman," Part II (20/VII/1202), RCSA Archives





STAR CITY

The only remaining major habitation on Promise is Star City, a crumbling metropolis adjacent to the Promise Downport. Once home to over 10 million people, the city now holds only about 50,000 organic sentients (a mix of humans and Breeds), and a similar number of robots. While the city suffered some minor damage during the Final War, most of the current state of decrepitude is the result of 75 years of neglect.

Star City lies on the western shores of the Halcyon Sea directly on the equator, and it is very hot most of the time. Outside temperatures average 38° C (100° F) in the summer and 24° C (75° F) in the winter. Summer temperatures can climb to as much as 54° C (130° F), making heat exhaustion a major health concern. As comfort is not a concern for the robots, few areas of the city are even air conditioned, although particularly hot areas are cooled down to about 35° C (95° F) to prevent heat stroke among human technicians.

Inhabited parts of the city are fairly busy most hours of the day and night. Although the streets are seldom crowded, there are always vehicles, people and robots going about their business.

Large areas of the city are uninhabited, and these once provided a labyrinthine maze of hiding places for runaway humans. In the past several years, however, the Sentient Council has made a concerted effort to raze those parts of the city, and they have been converted to a low rolling landscape of rubble and broken glass. Some demolitions are still going on, but most of the work has been completed. The runaway human population has, as a result, been forced either out of the city or underground into the "Downbelow."

The city proper is surrounded by a "clear zone," a broad belt (from one to five kilometers wide) of demolished buildings; the whole area is swept by sensors, making an undetected approach to the city extremely difficulty.

Immediately south of the city is the Promise Downport, a vast sprawling area of above-ground and below-ground hangars, warehouses, repair facilities, tramways and landing pads. It is surrounded by a triple-layer electrified fence to a height of 10 meters, but its main defenses are the open nature of its perimeter and the large number of deployed sensors.

Map

The map of Star City is drawn on a hexagonal grid with a scale of one kilometer per hex. Each hex is identified as to the type of structures which predominate there. Each major computing system of the Sentient Council also has police and administrative responsibility for part of the city, including the area immediately surrounding the building where its central processing unit is located. The location of the headquarter buildings of the most important Sentient Council members are shown on the map.

There are six types of building "terrain" in the city, which look different and have different effects on visibility and the ability of a security force to close them off. These are noted below:

Dense High-rise: This is an area with many high-rise (10+-story) buildings, of the sort found in the central area of most large cities. Visibility is very limited, and there are large numbers of alleyways and building entrances to secure.

Open High-rise: Fewer high-rise buildings are present, most of them surrounded by large plazas or courtyards. Visibility is very open, and there are few covered routes of advance or transit. Key entrances to buildings are easy to observe and/or guard.

Dense Low: A large number of lower (one- to five-story) buildings are densely packed. Visibility is very limited, and there are large numbers of alleyways and building entrances to secure. It is usually possible to move a considerable distance by moving from rooftop to rooftop.

Open Low: Fewer low buildings are scattered with fairly open ground around them, and the buildings are often laid out in very orderly rows, offering open lines of sight and fire lanes. Visibility is very open, and there are few covered routes of advance or transit. Key entrances to buildings are easy to observe and/or guard.

Large Structure: A single massive structure, such as a factory or hangar, dominates the hex. It is often surrounded by many smaller outbuildings and garages. There are few regular routes through the hex, but usually many covered routes for people on foot. The structure blocks line of sight through the hex but offers a good field of view from its roof.

Ruins: Rolling hills of demolished masonry, steel and glass. Visibility is good from elevated points of vantage, such as an occasional standing wall, but can be very limited for personnel actually walking through the rubble.

In addition to buildings, the main transportation arteries are also shown, those being elevated multi-lane roadways for wheeled vehicles and ground-level tracks for maglev trains. The surface maglev train system is no longer in operation, so the maglev tracks are terrain features and landmarks rather than means of rapid transportation. The underground maglev train system, called the tube, is still in operation, and the surface entrances to the underground tube stations are marked on the map.

Security

There are 3000 heavy combat robots in the city, along with 8000 lighter PR-317 security units and 250 robotic tanks and light combat vehicles. These are divided up among the various members of the Sentient Council, but it should be plain that there is a sufficient density of armed robots to make life very difficult for anyone in the city with rebellion on their minds.

Security robots are generally encountered in pairs above-ground, and they can be seen at many street corners observing human foot traffic and occasionally making security checks. Occasionally, three- or four-unit patrols of the heavier and



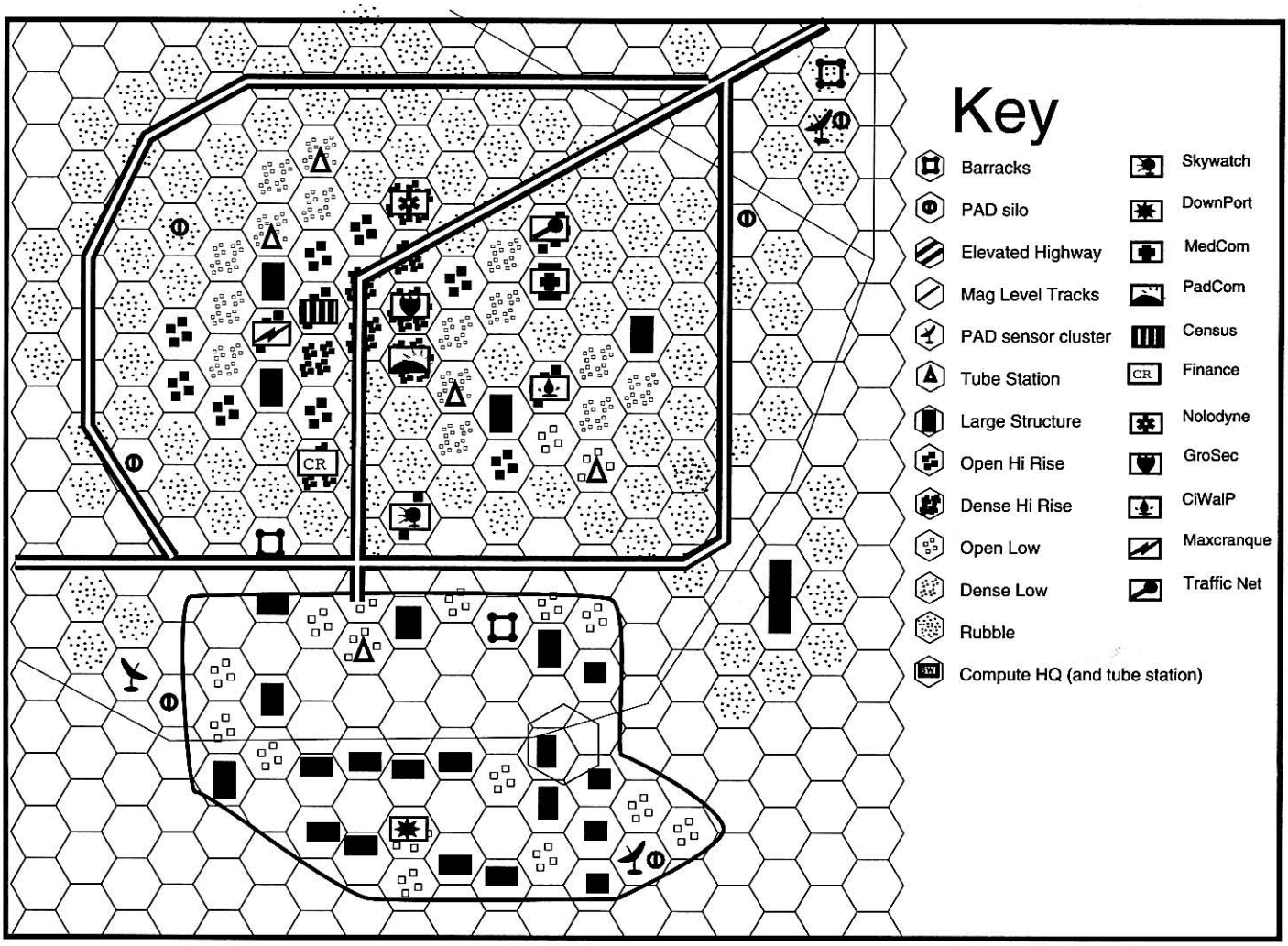
more menacing combat robots will be seen, although they are less likely to actually interact with humans unless provoked. Vehicular traffic is modified by lightly armed robotic armored vehicles.

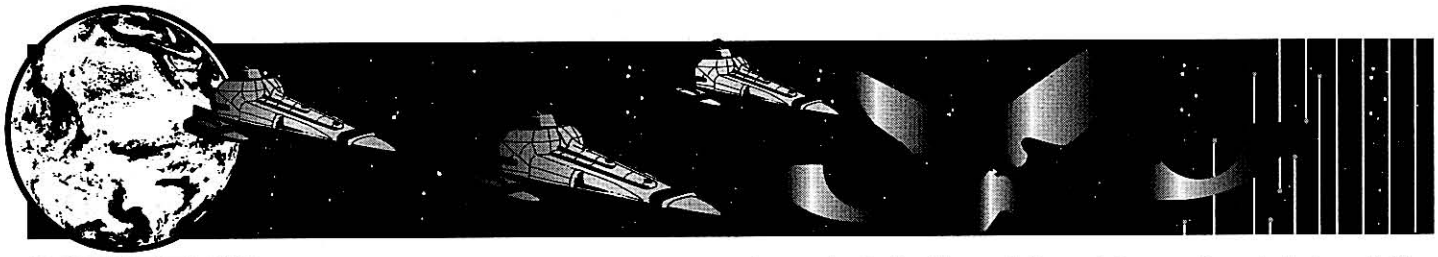
Security checks generally consist of a request for a statement of purpose or business and a laser scan of the forehead tattoo. The forehead barcode indicates only the original computer "owner" of the human, gender and date of birth. As other assignments change from time to time, they are not encoded. Very large data systems keep a reasonably up-to-date record of personnel assignments, making it more difficult to penetrate key buildings (such as computer headquarters buildings or major defense complexes), but roving security robots have more limited access to this information.

The entrances to all key buildings are monitored by remote sensors or physically guarded by a security or combat robot or team of robots. Any disturbance is likely to bring one or more security robots within 1D20 combat turns. Any fire at security robots is likely to bring more security robots and eventually heavy combat robots.

Defenses

Star City is defended by six four-launcher PAD missile batteries and a deep meson gun. The meson gun's location is noted on the map of the Downbelow, while the missile batteries are noted on both maps (as they are underground silos but have surface firing hatches). Also noted on the city map are the positions of the above-ground PAD sensor clusters and major troop garrison centers. The garrison centers hold about half of the heavy combat robots and robotic vehicles at any one time, where they undergo maintenance and recharging and are held as a reaction force.





DOWNBELOW

The Downbelow is the general description of the network of underground tunnels and passages under Star City. This network consists of four principal systems.

Sewers: Both sanitary sewers and storm sewers honeycomb the area under the city. Most are accessible from street level and from basements of large industrial buildings by way of ladders. Most access points are locked, but subterranean residents find ways to disable the locks. Key buildings have their access points completely sealed by steel plating or poured concrete. Sewers vary from two to four meters in width and height. The sewers are from 10 to 20 meters below ground level.

"Heaters": These are sometimes called steam tunnels, although they are no longer used to move hot steam around. Instead, their walls are covered with heavily insulated power cables, fiber optic cable bundles for data transmission and standard water mains. Most of the heaters are about 2.5 meters high and two meters wide. The heaters are from 20 to 30 meters below ground level.

Tube: The city is serviced by an underground maglev train system which is used to move work parties quickly from point to point. The stations are usually full of robots and humans awaiting transportation. The tubes themselves are six to eight meters in diameter. All of these large tubes have maintenance tunnels that parallel them, and foot travel underground is usually by these smaller tunnels. Maintenance tunnels are about two meters wide and 2.5 meters tall. The tube is from 20 to 30 meters below ground level

Deep Defense Complex (DDC): The deep defense complex includes underground hardened PAD missile silos, several command control facilities and the deep meson gun site. This complex is not connected to the main network except at a few key points, most of which re well-guarded. (A few connections to the heaters have been made by the Resistance and kept secret from the Sentient Council.) The map shows the depth in meters of the major installations of the DDC.

In addition to the four main networks, there are several underground manufacturing facilities. All of these are now abandoned and occupied by Trogs, with one exception. One factory (chosen by the referee) has secretly been renovated by Maxcranque and brought back into operation producing combat robots. This area has a high level of security as even the other members of the Council do not know of its existence.

Travel in the Downbelow

A map of the downbelow is provided with a grid scale of one kilometer. It generally takes characters a half hour to walk a kilometer through the tunnels, so each movement turn in the Downbelow is a half hour and moves the characters one cell on the grid. Encounters may affect this rate of advance, and characters may make a quick dash of two grid cells in a half hour if desired. (About one such dash is all they will be able to manage without resting.)

Travel by tube will take the characters from any one tube station to any other in one half hour (including the time to board and disembark at the destination).

Encounters in the Downbelow

The Downbelow is far from empty, and there is a good likelihood that characters moving in it will encounter others. Roll 1D10 once per half hour for an encounter using the chart below. A separate column is used for each of the major types of passages in the Downbelow.

Note that the Tube column is not used for travel by tube, but rather for moving by foot through the maintenance tunnels that parallel the tube itself. Travel by tube automatically produces an encounter with the passengers of the tube, which will usually include one or more robots, Breeds and human technicians. (Only characters with excellent cover stories should attempt tube travel.)

Die	*Sewer*	*Tube*	*Heater*	*DDC*
1	Animal	GunBot	GunBot	GunBot
2	Renegade	ToolBot	Breed	GunBot
3	Trog	Tech	ToolBot	GunBot
4	Trog	Renegade	Tech	ToolBot
5	Obstacle	Trog	Renegade	ToolBot
6	Obstacle	Trog	Trog	Tech
7	None	None	Trog	Tech
8	None	None	Trog	Tech
9	None	None	None	Breed
10	None	None	None	Breed

Explanation of Encounter Results

The following encounter types are possible. The descriptions below may be used as is, but may also be freely modified by the referee.

GunBot: The characters encounter a party of 1D6 armed guard robots selected from the assortment presented on pages 82-85. GunBots will challenge the characters and attempt to apprehend or kill them if they are not authorized to be in the area.

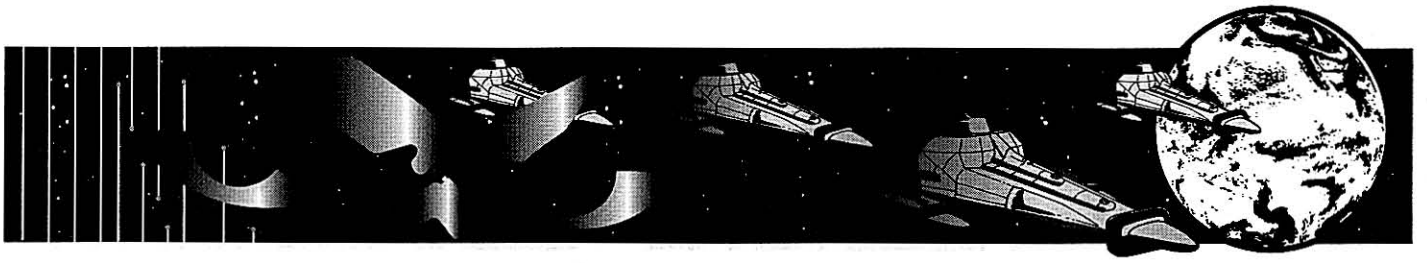
Breed: The characters encounter a patrol of 1D6 armed Breeds who will challenge the characters and attempt to apprehend or kill them if they are not authorized to be in the area.

ToolBot: The characters encounter a party of 1D6 maintenance robots selected from the assortment presented on pages 82-85. These robots are engaged in routine maintenance tasks or damage repair, and will not challenge the characters unless they are obviously out of place (as in heavily armed or missing forehead laserscan codes).

Tech: The characters encounter a party of 1D6 human technicians engaged in routine maintenance tasks or damage repair, who will not challenge the characters unless they are obviously out of place (as in heavily armed or missing forehead laserscan codes). The technicians are unarmed except for cattle prod-like weapons for personal melee defense, so they will flee from any armed party they encounter (and report to the nearest security station). On a roll of 20 on 1D20, all the techs are actually resistance fighters disguised as techs or infiltrated into the job. On a roll of 19 on 1D20, one of the techs is from the resistance and will break his cover to help the characters.

Trog: The characters encounter a group of 1D20 Trogs. Trogs are homeless humans who have slipped away from the robot-controlled surface and live in the underground tunnels and sewers. They are dressed in rags and are usually unarmed except for the occasional knife or club. All are Novice NPCs. Turn a card to determine the mood of the group. Clubs indicate they are aggressive and will attack if they have the opportunity. Diamonds mean they will beg for food or other necessities, and will be willing to help the characters for a price. Hearts mean they will be friendly toward the characters, and likely to help with directions or other information. Spades mean they will be apathetic, and will probably report the characters if a security patrol should happen along later.

Renegade: The characters encounter a gang of 2D6 renegades. Renegades are humans who have slipped away from the robot-



controlled surface and live in the underground tunnels and sewers. Unlike Trogs, renegades are usually young and in good condition, and are better off in most respects. They live by theft and extortion, mostly from the Trogs but sometimes by raiding supplies from the surface. They are all Experienced NPCs armed with knives and clubs. They are likely to attack the characters, regardless of their apparent identity, if they believe they can overpower them, but will avoid them if the characters are numerous or well-armed.

Animal: Animals live in sewers, and usually they aren't very attractive animals. The characters encounter gross and disgusting, or potentially dangerous, animals, such as the alien equivalents of rats, snakes, large carnivorous lizards, blood-sucking lampreys or swarms of stinging insects.

Obstacle: The characters encounter an obstacle in the tunnel. Most obstacles add another half-hour to the time spent moving through the map grid cell (although another encounter is not rolled in that time). Some sample obstacles follow:

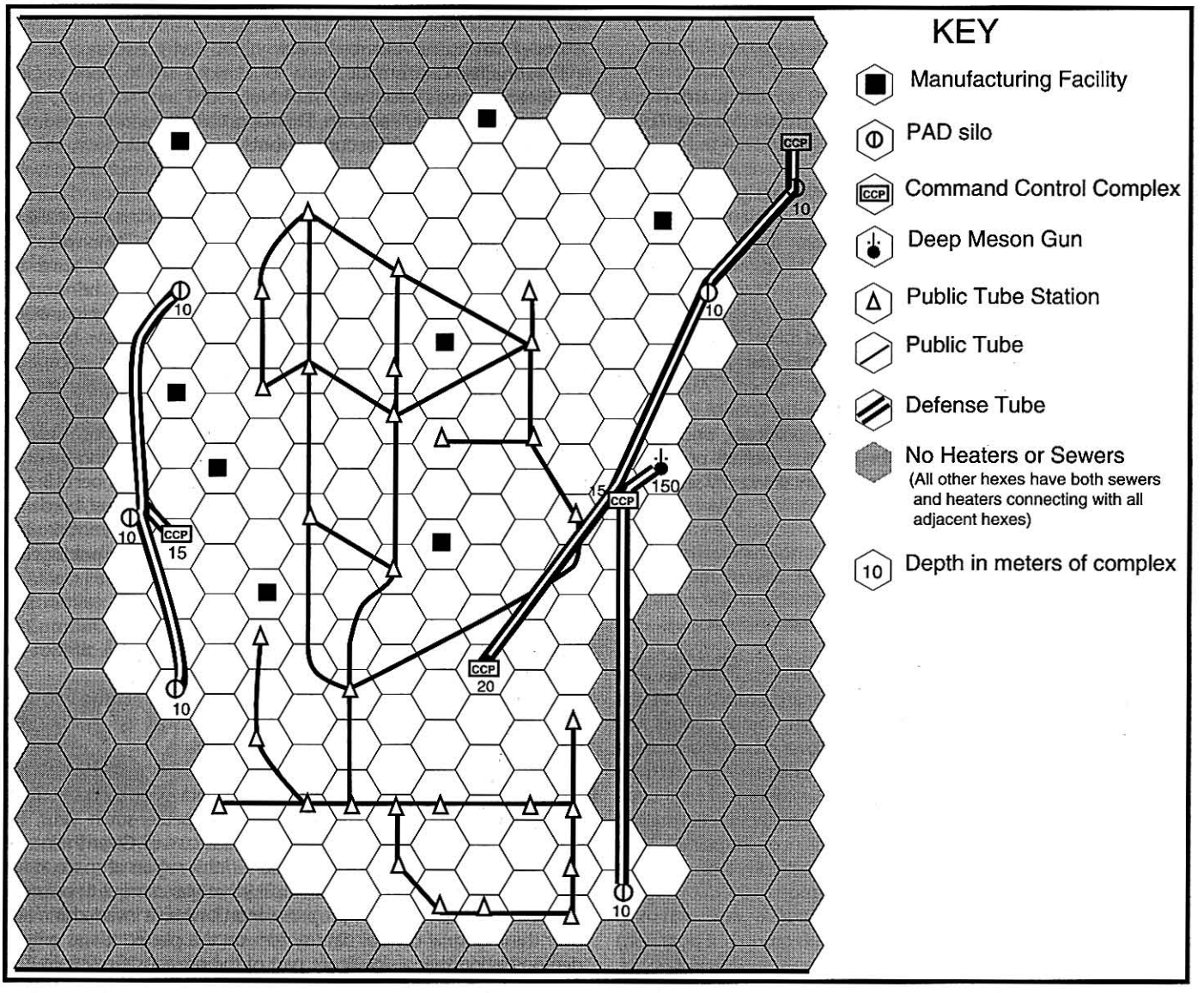
A corrosive spill on the walls or floor causes mild or severe burns or damages clothing or other equipment.

A toxic spill causes choking vapors that overcome some of the party.

A ceiling collapse ahead blocks progress, requiring use of an alternate rout or clearing the rubble away by hand.

Jammed refuse of construction material, including jagged metal bars, broken glass, or other dangerous refuse, nearly chokes off the tunnel. Passing the jam takes extra time and requires tasks using the Agility attribute to avoid snags and minor injuries.

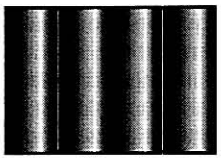
A flooded tunnel requires that characters hold their breath while passing underwater. Length of the flooded stretch can't be determined without actually trying to pass through it.





THE SENTIENT COUNCIL

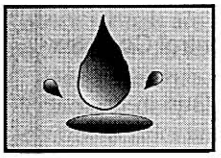
Eleven major data processing systems are active on the planet, each of which is a member of the Sentient Council. There are hundreds of smaller fixed systems and over 50,000 sentient robots, each of which is aligned with one of the larger systems.



Census

Controlling all of the vast bureaucratic records of Star City, including arrest records and conviction records, this data system took over most of the security robots assigned to the municipal police department, so it has an unusually high number of armed robots at its disposal for its responsibilities. Although GroSec has resisted its attempts to encroach upon that system's responsibilities, Census has gradually exerted control over more and more of the Subject Tribes around Star City. Although it has no genuine affection for its human subjects, it feels a strong sense of duty toward them.

Belief Structure: God.
Personality: Honorable.
Allies: Finance, Nolodyn.
Enemies: PadCom, Maxcranque II.
Combat Assets: 1700 security robots, 200 human guards (Novice, TL9), two division equivalents of human militia (Novice, TL1).

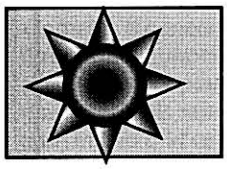


CeeWaLP

This data system (City Water Light and Power) undertakes to provide all essential utilities to the city. Although every major data system has its own auxiliary power plant and can survive even if completely cut off from the city grid, CeeWaLP delights in making sure that is never necessary.

CeeWaLP has never had any interest in armed robots, but has a large force of maintenance robots and human technicians, and it feels considerable kinship and affection toward its "helpers." Aside from Skywatch, this is the most benign data system on the council. However, it has absolutely no influence on the council politically, since it has absolutely no interest in any issues beyond the welfare of its own technicians and the technical challenges of maintaining city services.

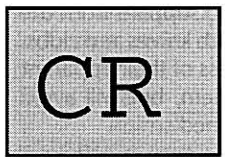
Belief Structure: Hobbyist.
Personality: Loving.
Allies: Skywatch, Maxcranque II.
Enemies: None.
Combat Assets: None.



Downport

This Virus controls the data processing network which controls all automated functions at the starport, including incoming traffic control and EMS sensor arrays that cover orbital space above the port. It is a nasty Mother-strain Virus that takes reasonably good care of its own humans but encourages brutal treatment for most others. Its own harsh discipline has had the effect of making its human armed security troops the most proficient on the planet. (Their self-adopted motto is "Best Meat In Town.") Politically, Downport is a member of the "defense bloc," which includes most of the data systems that have a direct defense responsibility for the city. (Skywatch is the only system which should also logically belong to this group but does not.)

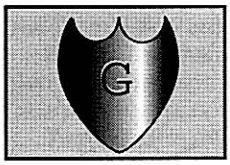
Belief Structure: Mother.
Personality: Murderous.
Allies: GroSec, PadComm.
Enemies: Maxcranque II.
Combat Assets: 600 security robots, 200 heavy combat robots, 10 robotic AFVs, 200 human infantry (Experienced, TL9).



Finance

Although this data system, which originally controlled the financial and investment computer networks, has no important facilities and few robots at its disposal, it is an increasingly influential member of the council by virtue of its patient building of an anti-Lucan political coalition aimed at isolating the powerful GroSec system. The key member of the coalition is the ardently anti-Lucan Nolodyne, as that system brings enough military muscle into the group to deter GroSec from an overt power play. Additional support comes from Census and TrafficNet, who Finance has been able to woo by supporting their activities in the Subject Tribes over those of the other God-strain Viruses. Finance has also privately approached Maxcranque, but the bad feelings between that system and Nolodyne make an open alliance difficult. Finance's group has begun to support Maxcranque's call for an end to MedCom's Breed project.

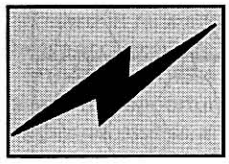
Belief Structure: Alliance Builder.
Personality: Charismatic.
Allies: Census, Nolodyne, TrafficNet.
Enemies: GroSec, PadCom, Downport.
Combat Assets: 300 security robots.



GroSec

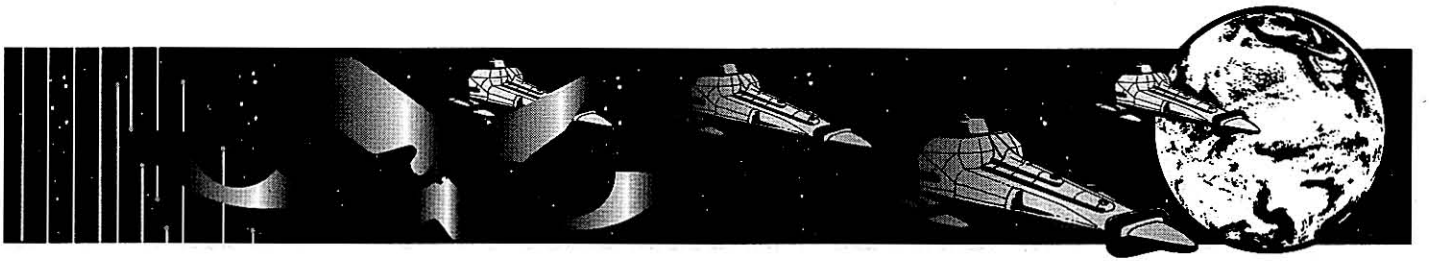
The ground security network is nominally responsible for the defense of Star City as well as the maintenance of order on the ground across the entire planet. GroSec does not have the resources to accomplish that ambitious a mission, but is unwilling to give any of it up. As a result, the Free Tribes have been able to operate largely without interference from Star City, except for occasional punitive raids. GroSec has stretched its assets by two expedients. First, large parts of the city adjacent to the command centers of the other data systems have been made their security responsibility. Second, GroSec has allowed MedCom to test its Breeds by sending them on expeditions against the Free Tribes, and has acquired a number of Breeds itself. GroSec's belief structure is such that it has a deep distrust, bordering on hatred, of the Nolodyn data system. It is allied with PadCom and Downport in the defense bloc, which opposes the alliance put together by Finance.

Belief Structure: Prophet.
Personality: Murderous.
Allies: MedCom, PadCom, Downport.
Enemies: Nolodyn, Finance, Census, TrafficNet.
Combat Assets: 1000 security robots, 800 heavy combat robots, 150 robotic AFVs and 200 Breeds (Novice, TL9).



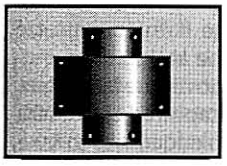
Maxcranque II

Alone among the data systems on Promise, Maxcranque II is a Puppeteer-strain Virus, but crossed with a God-strain as well. Given the intense fear of Puppeteers in this region of space, it was with great difficulty that Maxcranque II persuaded the other systems not to wage open war on it when it invaded and took over the industrial control data system on the planet. It was only by demonstrating that a significant part of the previous God-strain Virus remained in the system and had melded with the new strain, and also by pledging not to take over any additional data systems, did Maxcranque II avert all-out war. Maxcranque II is devoted to its human worshipers, but



its personality is also highly unstable, and it is increasingly antagonistic to MedCom and its allies, as well as most of the other God-strain Viruses.

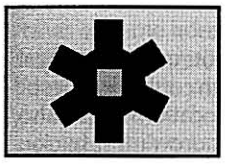
Belief Structure: God/Puppeteer.
Personality: Loving/crazy.
Allies: CeeWaLP.
Enemies: MedCom, Downport, GroSec, PadCom, Census, TrafficNet.
Combat Assets: 1400 security robots, 1000 heavy combat robots, 50 robotic AFVs, 400 human infantry (Novice, TL9), one division equivalent of human militia (Novice, TL1).



MedCom

This system combines the data networks of the pre-Collapse hospitals and universities in Star City, and currently has responsibility for maintaining the health of the human technicians. It is much more interested in its own line of experimentation, however, which involves rebuilding humans with cybernetic attachments and Virus-infected small "second brains" to maintain their loyalty. MedCom is not motivated by any practical concerns in this work, and instead considers it half destiny fulfillment and half art-form. GroSec obtains most of the subjects for MedCom's experiments, from the Subject and the Free Tribes. In return, MedCom has provided a large number of finished Breeds to GroSec and uses its own Breeds to help GroSec maintain security. Maxcranque has begun to oppose Breed conversions due to the horrendous results they have so far produced, and this has become a subject of bitter controversy on the Council.

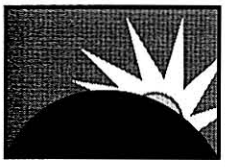
Belief Structure: Mother.
Personality: Insane.
Allies: GroSec.
Enemies: Maxcranque II.
Combat Assets: 200 security robots, 700 Breeds (Novice, TL9).



Nolodyn

Like Maxcranque II, Nolodyn controls a number of robotic production facilities. Nolodyn's factories manufacture most starship replacement parts for the vampire fleets that periodically visit the world. Because of its fanatical hatred of Lucan, it is bitterly opposed to GroSec and its allies.

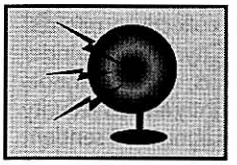
Belief Structure: Doomslayer.
Personality: Deceitful.
Allies: Finance.
Enemies: GroSec.
Combat Assets: 1100 security robots, 800 heavy combat robots, 40 robotic AFVs.



PadCom

This system controls the PAD missile batteries, deep meson gun and associated sensors. It also maintains security over those facilities and has been developing a large force of uniformed human auxiliary guards. Its guards and robots venture out frequently into the area around the city to deal with the three tribes of humans who worship PadCom (and from whose ranks it draws recruits for its human guards). PadComm opposes all the other God-strain Viruses in the Council, and by necessity has been forced to side with GroSec against Finance's growing strength.

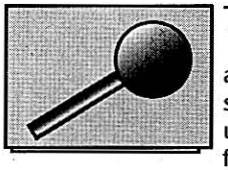
Belief Structure: God.
Personality: Pompous.
Allies: GroSec.
Enemies: Census, Maxcranque II, TrafficNet.
Combat Assets: 600 security robots, 200 heavy combat robots, 200 human infantry (Novice, TL9), two division equivalents of human militia (Novice, TL1).



Skywatch

This system controls the long-range sensors that monitor aerospace traffic in the vicinity of Promise. Although Downport Control, TrafficNet and PadCom all have independent sensors, they have only local coverage (in the first two cases) or are fairly short-ranged (in the case of PadCom). Only Skywatch has access to long-range scanners. Skywatch is actually a Peacemaker belief structure Virus masquerading as a Hobbyist to avoid conflict with the other members of the Council. It also plays the *de facto* mediator on the council, working fairly consistently to keep the different factions from lapsing into open warfare. Secretly, Skywatch has built up the human resistance and is responsible for keeping the "sensor hole" open so free traders and Coalition ships can continue to land at Freedom Lake.

Belief Structure: Peacemaker (Hobbyist).
Personality: Charismatic.
Allies: CeeWaLP.
Enemies: None.
Combat Assets: 200 security robots (of these, no more than 30 are actually Peacemakers who can be trusted to help the human resistance; the rest are loyal to Skywatch as long as it maintains its cover of being a loyal member of the council).



TrafficNet

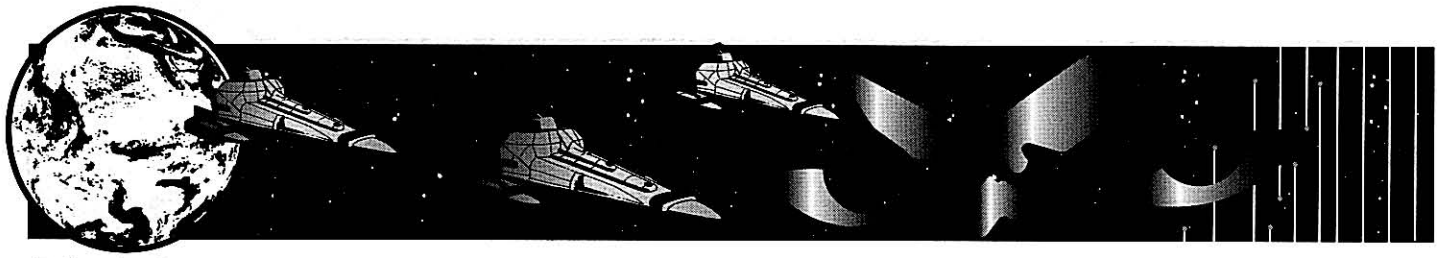
This data system monitors air traffic over the city and for 200 kilometers around it. It is also responsible for security on the elevated roads and in the underground tube system. It recruits humans from surrounding tribes, and its disciples actively preach allegiance to it in PadComm's allied tribes. It is a member of the alliance led by Finance, but it has no interest in anything beyond increasing the number of human adherents to it.

Belief Structure: God.
Personality: Selfish.
Allies: Finance.
Enemies: PadComm, Maxcranque II.
Combat Assets: 1000 security robots, 200 human infantry (TL9, Experienced), one division equivalent of human militia (TL1, Novice), six four-launcher batteries of robotic TL13 ADA missiles.

SUMMARY OF THE SENTIENT COUNCIL

System	Belief	Personality
Census	God	Honor
CeeWaLP	Hobbyist	Loving
Downport	Mother	Murderous
Finance	Alliance Builder	Charismatic
GroSec	Prophet	Murderous
Maxcranque II	Puppeteer/God	Loving/Insane
MedComm	Mother	Insane
Nolodyn	Doomslayer	Deceitful
PadCom	God	Pompous
Skywatch	Peacemaker *	Charismatic
TrafficNet	God	Selfish

*Disguised as a Hobbyist.



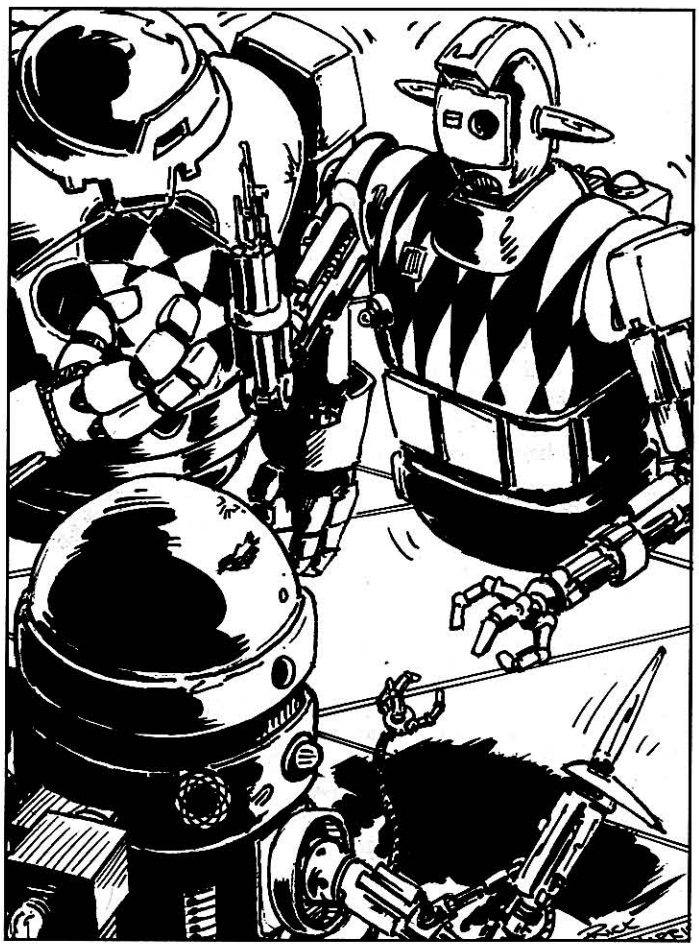
ROBOTS

The local human slang for robot, adopted from free trader usage, is "tin can" or, more commonly, just "can." There are approximately 60,000 sentient robots on Promise. Of these, about 48,000 are maintenance and service robots of various types, collectively referred to as ToolBots by the human inhabitants of Star City. The remainder of the robots are armed security or combat units, called GunBots locally. This latter group consists of about 8000 lightly armed security units, 3000 heavy combat robots (ComBots) and about 250 sentient armored fighting vehicles (AFVs). Most of the AFVs have been constructed on the planet by permanently installing the brain and servo-mechanical systems of an otherwise-useless robot into the crew compartment of a combat vehicle.

Sample robot designs appear on pages 80 through 83 of this book, and include representative types usable for both ToolBots and GunBots on the planet Promise. Additional versions can be designed, if desired, by the robot design sequence.

Most robots "live" and work in Star City, maintaining vampire ships at the starport as well as the network of municipal services, power plants, factories, etc. which make up Star City. Security robots are often seen in the Subject Lands on patrol, and they are also (but less often) stationed in the Borders. Their numbers are augmented in the Borders by Breed patrols (see below). Robots at one time were used to patrol the Outback as well, but growing casualties caused GroSec to discontinue all robot patrols and substitute a smaller number of heavily armed Breed patrols.

Growing paranoia concerning Puppeteer Viruses and their ability to take over already infected machines, effectively killing the original personality of the machine, has led to a dramatic change in robot society on Promise in the last decade. Before the arrival of Maxcranque II, there was an active global communications network, and all robots were patched into it by open radio receivers. This enabled robots to exchange information almost instantaneously with their patron data systems, and even other data systems if desired and agreed to. This also made population control fairly easy, as every human in the controlled parts of the world had a unique forehead barcode which any security robot could read and then check against the correct personnel data bank to determine if that particular human was where he or she was supposed to be at that time.



When Maxcranque II arrived, it not only took over the large data and factory system called Maxcranque, it also captured over 1000 robots. To avert open warfare, Maxcranque II pledged not to take over any more robots or systems, but the damage to open communication was done. Now all robots have a voice-only radio transmitter receiver, with no direct link to the robot's brain. Instead, the robot "hears" the voice on the other end just as a human does. This method of communication is much less efficient, but is also much safer. Its principal effect has been to make security tasks much more difficult in Star City, as well as continuing to breed mistrust and promote a growing sense of paranoia throughout the robot population.

Most robots decorate their chasses to differentiate themselves from other robots of similar makes, much as humans wear decorative clothing or even jewelry and makeup. In most cases, this consists of decorative designs painted on the metal exterior. In many cases, these are simple patterns, often in the "colors" of the patron data system. In a some cases, they are more elaborate, and in a very few cases, they are genuinely artistic, depicting a key event from the robot's life or just a subject which particularly intrigues it. Robots which are friendly toward humans often have a naturalist theme to their chassis art, such as clouds, wildflowers, etc.

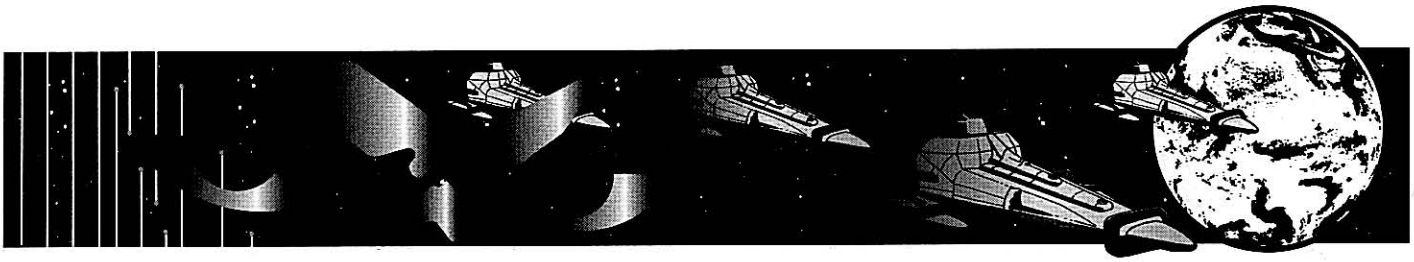
Some of the more violent or schizophrenic robots use more radical forms of decoration, including self-mutilation with cutting torches or grinding wheels, and laser "tattoos" in strategic locations. This is also popular among antihuman robots, and there is growing suspicion and hostility between the pro-human and antihuman Virus strains.

When robots encounter humans, their reaction will depend largely on their belief structure draw, just as NPC reactions are based on the motivation draw. Depending on their belief structure and job responsibilities, robots may coldly ignore humans, actively engage them in friendly conversation, or make an extensive, suspicious and detailed check of their identities.

When running robots as NPCs, the referee must remember two things above all others. First, all robots are not the same. Each robot is unique in its personality, just as every human is unique. Second, though, robots are not humans in metal suits. While sometimes they will have some human-seeming traits, they are a completely different species with a different, and in some cases unfathomable, way of thinking and set of values.

BREEDS

Well over a year ago, the sentient data system known as MedCom began a series of experimental alterations to human subjects, incorporating a variety of robotic components. The human subjects for these experiments were mostly rounded up by MedCom (and later GroSec) security robots and brought under guard to the main medical complex controlled by MedCom. The results are called Breeds by the resistance in the city, and the term quickly spread to



the bands in the Outback as well as throughout the Subject Lands.

MedCom has about 700 Breeds currently alive, and GroSec has 200 more (provided by MedCom). Both systems use the Breeds to launch patrols into the Outback and provide some additional security in Star City and the Borders. They are no longer used in the Subject Lands due to the near-hysterical reactions and rioting which took place when someone recognized a former loved one who had been turned into a Breed.

The Breeds are all cybernetically altered ("enhanced" is too strong a word in many cases) humans, many of them changed beyond recognition. The cybernetics chapter from **Fire Fusion and Steel** provides a good starting point, but many of the Breeds have even more radical alterations. Some, for example, have had both legs removed and the torso built into a low armored tractor chassis. Many have a gun in place of one arm. One version has one leg noticeably longer than the other. He walks awkwardly with a very pronounced limp, but can pause occasionally to rise up on the long leg and look around for signs of quarry. The referee does not have to design each Breed used, but should instead concentrate on describing the diversity, and in many cases bizarre impracticality, of the modifications.

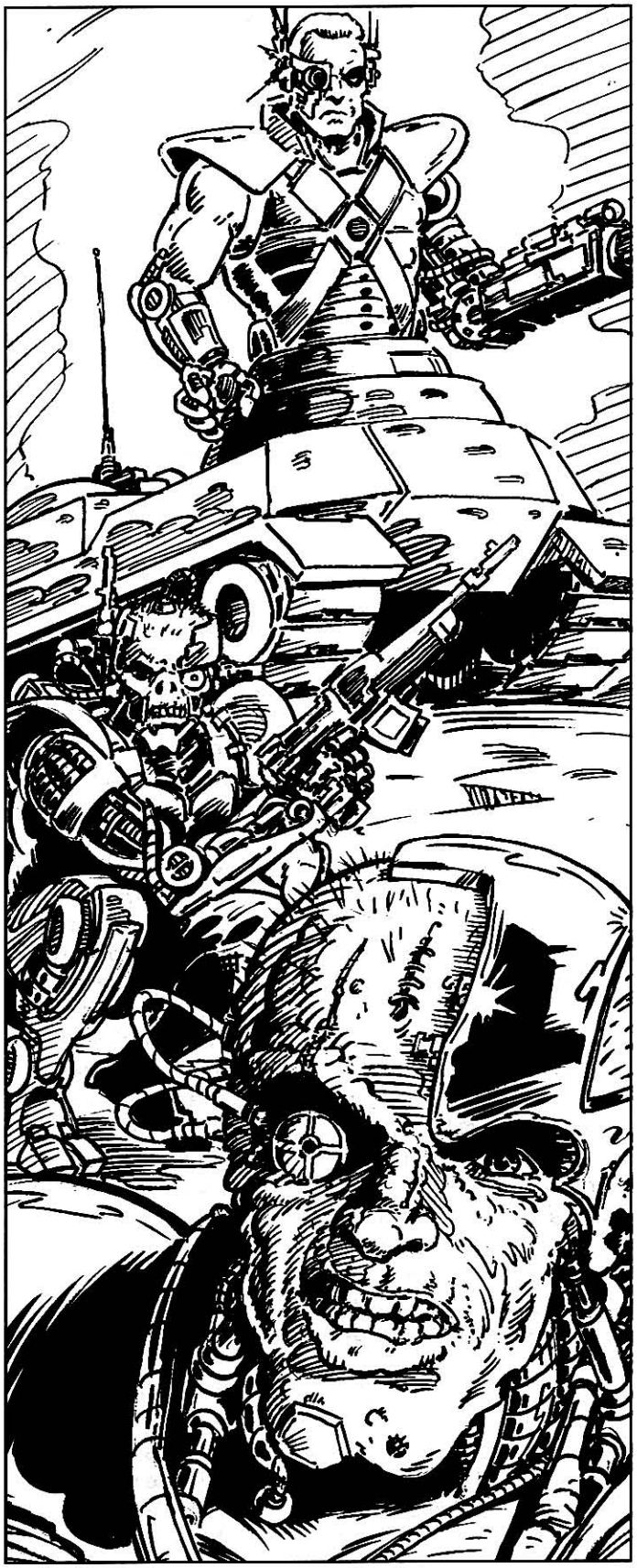
Most Breeds have extensive alterations to the head, usually including at least one augmented sensor, and all modifications are extremely visible, with no effort having been made to hide them or render them less grotesque. And most Breeds are extremely grotesque.

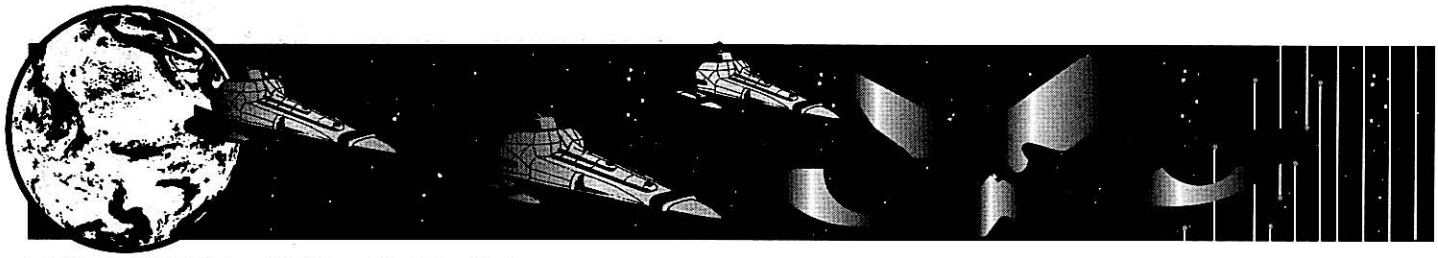
All Breeds have a small Virus-infected computer implanted near their spine and connected by neural jack to their human brain. This Virus brain is extremely stupid, but ensures the loyalty of the human organism by subjecting it to intense pain when necessary. In rapidly developing situations, the Breeds become easily confused, as their Virus "second brains" sometimes give contradictory orders or mistakes extreme adrenal secretions for disloyalty. Breed units do not work together well as a team, either, so most Breeds are treated as Novice NPCs in combat, even though their actual level of training and experience should produce better results. They are usually well-armed with modern assault rifles and a few heavier weapons.

Well over 100 Breeds have been killed in action in the three years since their introduction, and several hundred more have suicided. Of the less than 1000 still alive, there are hardly two that are alike. MedCom is not following an orderly experimental protocol, but instead is simply "tinkering" with organic beings and any spare parts it manages to find. None of the Breeds have been terribly successful, but some have certainly been much less successful than others. Rather than follow the more successful versions, however, MedCom seems more interested in the failures and keeps producing a steady stream of bizarre horrors.

Breeds are (or were) normal human beings who are victims of nightmarish and insane experiments. Some have been driven mad by the experience, and others now feel so alienated from "normal" humans, and have so despaired of ever being able to rejoin human society, that their sympathies and loyalties have shifted to their robot masters. For the majority of Breeds, though, it is only the implanted computer brain that keeps them loyal.

Certain Gypsies in the Outback have developed a technique for "killing" the Viral second brain without injuring the human host. (See page 61.) The resulting "Free Breeds" mostly turn on their former masters and have become fiercely loyal to the Gypsy bands that freed them. Still outcasts from normal human society, they usually travel with the Gypsies, who are also outcasts.





THE LAND AND PEOPLE

For an overview of the physical and demographic features of Promise, consult the map and global data on pages 28 and 29. The following information is an elaboration on that basic outline view.

The human inhabitants of Promise, which total 60 million, are divided unevenly between four distinct areas.

About 50,000 humans live in Star City under the direct control of the Sentient Council and its robots, who are about as numerous as humans in the city.

Fifteen million humans, or 25% of the total human population, live in the Subject Lands, and are generally called the Subject Tribes. About half of these belong to the "secular" tribes, those which are under the direct control of the Sentient Council. Most of these have no particular alliance to any one data system of the Council. The remainder are the "holy" tribes, those which worship one of the "Star-Gods," the four God-strain Virus systems on the council. In some cases, the people of these tribes genuinely believe in their "god," while in others their obedience is based more on an understanding of the tremendous power wielded by the machines.

The Subject Tribes live generally in the area around Star City and the Halcyon Sea. On the global map, the Subject Lands consist of the Star City hex itself, the surrounding hexes, and the coastal hexes along the shores of the western half of the Halcyon Sea. This area is heavily patrolled by security robots and human militias, and there is a network of security posts throughout the region.

Twenty million humans, or about 33% of the total, live in the Border Lands. This is a much larger area of land, so the population density is considerably lower, even though more people overall live there. Although nominally under control of the Sentient Council, there is little actual Council presence or interference. The countryside is occasionally patrolled by Breeds; the larger settlements are watched and visited by robots; and there are occasional sweeps for "fugitives" or just slaves. Nevertheless, the pattern of daily life is much more free of Council influence than in the Subject Lands.

On the map of Promise, the Border Lands consist of an area roughly two hexes wide all around the Subject Lands and the entire extent of the Halcyon Sea, and extend north to encompass four hexes of coastline on the Polar Sea.

The remaining 25 million humans live scattered throughout the rest of the planet in the area variously called the Free Tribal Lands or the Outback, and the people living here are called the Free Tribes. A small but growing minority of this population is in the resistance.

The tech level on most of the planet is barely past Stone Age, although there is fairly extensive use of metal tools scavenged from derelict cities. Only in and near Star City is the tech level higher, with a sustainable tech level of 9 in the city itself and either 2 or 3 in most of the Subject Lands. Primitive black powder weapons are very common in the Subject Lands and somewhat less so elsewhere. There are only two sources for modern weapons: the Council and free traders.

The Council's weapons, of course, are exclusively available to auxiliary forces, mostly Breeds, working for the Council. Many of these have fallen into the hands of the Resistance, however, due to ambushes and raids.

Free traders land regularly at both of the large equatorial lakes. The lake 5000 kilometers west of Star City is now called Freedom Lake, while that 7500 kilometers farther west is called Lake Defiance. So far, very few free traders know of either route, and none know of both.

Two entirely independent groups of armed humans are gaining strength centered on the two lakes, and neither knows anything about the other. Thus, even a major push against one of them by the Council is unlikely to disrupt the progress of the other.

The Reformation Coalition is in contact with the group living near Freedom Lake, while the Guild has been supplying some arms to those near Lake Defiance.

Subject Lands

The area around Star City and the western shores of the Halcyon Sea has an average population density of about two people per square kilometer. This closer to one person per square kilometer in most of the lands, but about half the total population of the Subject Tribes lives within 100 kilometers of Star City.

The Subject Tribes make their living primarily through agriculture, although those along the seacoast fish a great deal as well. The tribes live in villages of from 250 to 1000, although the encampments around Star City are much larger than that, some of them including tens of thousands of people and sprawling for miles. The large encampments obtain at least part of their food from the Sentient Council, particularly those religious communities (which make up about half the total) worshiping the four God-strain Viruses. These four Viruses (see pages 52-53) are collectively called the Star Gods. In the religious communities, there is frequent evidence of their devotion in the form of large banners bearing the symbol of their god, and these communities are generally called the Holy Tribes or the Sacred Tribes.

The villages and settlements are made up of low one-story mud and brick dwellings, usually without glass windows. A few more substantial buildings can be found, either surviving pre-Collapse structures or built from stones and concrete salvaged from such ruins.

The evidence of ruined pre-Collapse cities and towns is almost everywhere, but the Sentient Council discourages the tribes from living in such areas. Usually only criminals and fugitive slaves from Star City live in the old ruins.

The equatorial regions of Promise are very hot, and the western shores of the Halcyon Sea are arid, making agriculture difficult. The rivers which drain the highlands to the east have



much of their flow diverted into irrigation, and the many small fields are usually bordered by narrow irrigation ditches. Water is pumped to the field by muscle power, usually foot-operated water wheels, and farmers standing on top of the wheels and "walking" the water into their fields is a common sight.

Robots patrol the Subject Lands fairly frequently, particularly the large encampments immediately around Star City. Although they are a familiar sight, the people fear them anyway, even members of the Holy Tribes. Justice, or what passes for it at the hands of the robots, is swift and deadly, and they seldom ask detailed questions to determine who is really guilty or innocent in a disturbance. Basically, any sort of altercation is treated as a "riot," and the participants are dispersed or summarily executed. Occasionally, the robots also make sweeps to gather slaves, and the MedCom robots are a particular source of terror, as they are known to gather subjects for MedCom's Breed experiments.

Additional security is provided by the human militias raised by the Sentient Council and several of the individual data systems on the council. These militias are armed mostly with spears and bows, with an occasional black-powder firearm. Although militia justice can be harsh, it is universally preferred to that of the robots. The militia could also form a numerous soldiery if called upon to do so, but the low quality of its equipment and training (consider militia soldiers as Novice NPCs, while leaders are Experienced NPCs) makes it nearly worthless in real combat.

The common working dress is a loincloth and sometimes a sleeveless tunic. More formal dress consists of long, flowing robes, similar to those worn by desert nomads almost everywhere. In most cases, the fabric as a course homespun, made either from the fibers of a common desert plant or the wool from one of the several varieties of domesticated livestock on the planet. The people speak as close to unaccented Anglic as can be found on the planet (except in Star City itself).

Border Lands

A belt of land between 1000 and 1500 kilometers wide around the Subject Lands and the Halcyon Sea is called the Border Lands, or sometimes simply the Borders. The Border Lands also extend north to the shores of the Polar Sea, and for about 3000 kilometers along its shore. Population density is less than one person per square kilometer throughout the area, but that is much higher than the Outback, which comprises most of the planet.

The Border Lands owe nominal allegiance to the Sentient Council, but actual Council presence is rare. Agriculture is common throughout the area, and the population tends to cluster in settlements of 250 to 1000 around sources of potable water, necessary both for drinking and irrigation. Thus, most of the population lives along rivers and streams, and fishing is also an important source of food, particularly in the far north. More of these settlements are built in or near the ruins of destroyed cities and towns, and most use recovered stone or concrete in their construction.

Some scavenging still goes on in the Borders, but most of the prime artifact sites have long since been picked clean. Instead, there are numerous trading posts along the fringes of the Borders, where nomads from the Outback come with recovered artifacts to trade for cloth and manufactured goods. These artifacts are in turn carried by merchant convoys to the Subject Lands, where the Sentient Council buys them for food and finished goods. Goods are carried by river where navigable rivers are available and by pack animal in other cases.

There is a growing network of security posts in the Border Lands, usually located along major rivers and near the trading posts. The security posts are staffed by Breeds and GroSec security robots, and among other things provide power and maintenance support to robots.

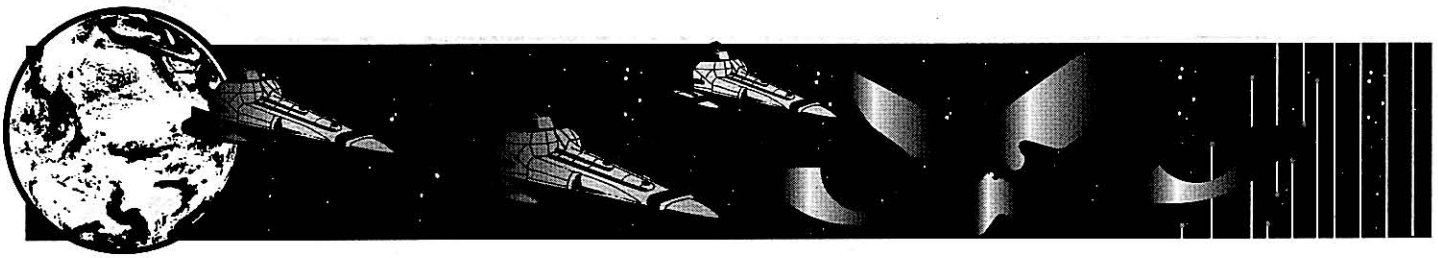
Common dress in the Borders tends toward trousers and tunics, usually in fairly bright colors and intricate patterns. A number of berries from desert plants are used for dyes, and the people in the Borders are, in general, more accomplished weavers than their brothers and sisters in the Settled Lands. Alchemists in the Borders also have rediscovered the secret of black powder, and it is made locally and sold both to the Subject Lands and the Outback. Primitive black powder weapons are the most common form of weapons encountered here.

Their language is clearly Anglic, but it is usually spoken with a noticeable accent, and experienced travellers soon learn to tell the difference between the accents of the people living along the Polar Sea, those living around the Sea of Halcyon and those living inland on the plains.

Outback

By statistical standards, the population density of the Outback is effectively zero. There are people there, but they are spread very thin. Most of the people living in the Outback are nomadic tribesmen, who live by tending herds of domesticated grazing animals similar to goats. Since surface vegetation is very sparse, the bands have to keep moving most of the time to find new grazing lands, and the small tribes seldom meet one another (as their ranges are separate and usually well-defined). When bands do meet at the edges of their ranging areas, it is usually cause for modest feasting and celebration. Like most nomadic cultures, there are strong taboos against marriage between members of the same band, so these meetings usually involve several days of courtships between the bands, followed by a number of new marriages. This cycle of isolation followed by celebration when others are encountered has produced a strong tradition of hospitality and sanctuary, which is again very common among desert nomadic tribes everywhere.

A substantial part of the human population of the Outback lives along the shores of the Polar Sea, where the weather is more moderate and there is more rainfall. Some of these



coastal dwellers are fishers, while others farm the river banks. Of all the people in the Outback, only those along the shores of the sea are not nomadic.

Robots used to occasionally patrol the Outback, but the growing success of resistance bands (see **page XX**) has led to their replacement by Breeds. Breed patrols conduct occasional sweeps of areas of the Outback, and lately have been particularly active in the Freedom Lake area in response to the growing level of modern armaments encountered there. Most of the bands are armed with a mix of black powder weapons purchased from the Borders, and locally manufactured bows, spears and other melee weapons.

Common dress in the Outback tends toward very loose, baggy trousers and tunics, usually made of homespun wool. Brightly colored festive clothing, highly prized and carefully preserved from meeting to meeting, is usually purchased from merchants who have brought it from the Borders.

The language spoken is heavily accented Anglic. The bands around Freedom Lake and Lake Defiance have begun speaking in an accent more reminiscent of standard Galanglic, and will not be easy for off-worlders to understand. Other tribes will still be intelligible for general concepts, but many unique nuances of meaning and emotion will be lost on strangers.

Animals

Common domesticated livestock on Promise include a goat-like animal called a *ramis*, raised for milk, meat, and wool, and a slow but powerful beast of burden called a *kurta*, both grazers. Among the more dangerous predators of the plains is a species of medium-sized chaser (averaging 50 kilos each) called *gaashken*, which travel in packs of a dozen or more animals. All of these animals are quadrupeds.

Encounters on Promise

When traveling across Promise, various encounters are possible. Derelict cities and other evidence of the Final War are fairly common. Human and Robot encounters, while perhaps less common, are potentially more interesting and dangerous.

The referee rolls 1D6 for each 700-kilometer hex traveled or once per day (if moving at a slower rate of speed) to determine the nature of the encounter. It is assumed that something of interest will be encountered in each hex or each day. In the Outback, referees may wish to arbitrarily make one-half to two-thirds of the encounters animals when travelling on the ground, due to the very low population density. The following brief descriptions will assist the referee in fleshing out these encounters. The chart is meant to be a guide, not a rigid limitation, and the referee should make each encounter different in some way. Players should never feel that the people they encounter are simply random entries on a table.

Encounter Descriptions

Animal: This is often the equivalent of no encounter, as it is usually just an animal sighting. If the characters are hunting, this encounter may mean game. It is also an opportunity to introduce unusual or interesting animal encounters, such as large predators.

Band: A band is a small group of characters usually organized for a specific purpose. It may consist of several family groups, but more often consists solely of males. A band may consist of one of the following specific encounters.

Breeds: A Breed patrol, either on a security sweep or looking for a specific resistance band. It consists of six to 20 or more armed Breeds, depending on the location and mission. Breed patrols are encountered almost exclusively in the Outback and the Borders. They are seldom used among the Subject Tribes. See page 55 for more details.

Brigands: A group of armed thieves, usually no more than a dozen or two and sometimes even fewer. They are usually armed with primitive weapons but occasionally will have one or more modern small arms. Brigands will sometimes pass themselves off as resistance fighters, and in many cases the distinction is unclear. Brigands can be found almost anywhere, although they are less common in the Subject Lands.

Fishers: One or more small boats manned by two to four fishers each. Fishers are encountered only on rivers and larger bodies of water. They are seldom armed (except with harpoons and marlin spikes, the equivalent of spears) and are not hostile.

Gypsies: Gypsies always travel in small bands of two or three dozen. As they are outlawed from the Subject Lands, they are seldom found there (although some Gypsy bands spend their entire time there, moving at night and hiding during the day). Most Gypsies are found in the Outback, and some bands are accompanied by Free Breeds (see Breeds description). Gypsies are not aggressively hostile, but are very suspicious and often difficult to approach. See page 58 for more details.

Hunters: A half dozen or more humans hunting for food, usually only lightly armed with primitive weapons. They are unlikely to be hostile to characters, but will be wary.

Resistance: A resistance group, either a small patrol of a half dozen or a large band of 100 or more. They are armed with a mix of primitive and modern weapons, with modern weapons more common close to Freedom Lake and primitive weapons more common elsewhere. Resistance bands are usually found only in the Outback, although they may occasionally be found in the Border Lands. See page 59 for more details.

Robots: A robot patrol, either on a security sweep or looking for a specific resistance band. It consists of from six to 12 security robots, depending on the location and mission. Robot patrols are encountered almost exclusively in



the Border Lands and the Subject Lands. They are seldom used in the Outback. See page 54 for more details.

Tribe: A large settlement or encampment of human families. Usually some of the adults are armed, although usually with only primitive weapons.

Merchant: A small group or caravan of merchants, usually carrying recovered technological relics from before the Collapse, but sometimes carrying more mundane trade goods, such as food, clothing, etc. This may be a group actually transporting technology, or the characters may happen upon locals excavating an abandoned city recovering equipment. Merchants are usually armed and may have a few modern weapons in addition to their more primitive ones.

Militia: A group of human auxiliaries recruited by the Sentient Council to maintain security in the Subject Lands. These are usually large groups of militia, either moving from one area to another or conducting a sweep. They are armed with primitive weapons and are likely to be both suspicious of and hostile to characters who do not have a good explanation for their presence.

ANIMALS

Animal	*Wt*	*Hits*	*Dam*	*Init*	*Arm*	*Wpns*	*Hit*	*Flee*	*Attk*	*Move*
Ramis	12	6	1	1	—	Horn	4	15	6	30
Kurta	200	36	1+1	2	—	Trmple	9	10	4	25
Gaashken	50	14	D6	6	—	Teeth	14	4	Am	40

SUBJECT LANDS

Die	*Badland*	*Steppe*	*Clear*	*River*	*Lake/Sea*
1	Band	Band	Tribe	Militia	Militia
2	Tribe	Tribe	Tribe	Tribe	Tribe
3	Militia	Tribe	Tribe	Tribe	Band
4	Band	Merchant	Merchant	Merchant	Merchant
5	Animal	Militia	Militia	Band	Animal
6	Animal	Band	Band	Animal	Animal

BORDER LANDS

Die	*Mountain*	*Badland*	*Desert*	*Steppe*	*Clear*	*River*	*Lake/Sea*
1	Band	Band	Band	Band	Tribe	Band	Band
2	Tribe	Tribe	Tribe	Tribe	Tribe	Band	Band
3	Animal	Band	Merchant	Tribe	Tribe	Tribe	Band
4	Animal	Animal	Animal	Merchant	Merchant	Merchant	Merchant
5	Animal	Animal	Animal	Animal	Band	Merchant	Animal
6	Animal	Animal	Animal	Animal	Animal	Animal	Animal

OUTBACK

Die	*Mountain*	*Badland*	*Desert*	*Steppe*	*Clear*	*River*	*Lake/Sea*
1	Band	Band	Band	Band	Band	Band	Band
2	Tribe	Band	Tribe	Band	Band	Band	Merchant
3	Animal	Tribe	Animal	Tribe	Tribe	Tribe	Animal
4	Animal	Animal	Animal	Merchant	Merchant	Merchant	Animal
5	Animal	Animal	Animal	Animal	Animal	Animal	Animal
6	Animal	Animal	Animal	Animal	Animal	Animal	Animal



RESISTANCE

The human resistance to the Rule of the Machines is a dynamic and growing force on Promise, one with which player characters will interact frequently.

Star City: Of the approximately 50,000 humans in the city, almost 1000 are active members of the resistance. Most of these are divided into three-person cells, and only one person in the cell knows anyone else in the organization. There are a number of larger "strike teams" of a dozen or so fighters, made up of resistance members who have proven their loyalty and reliability, but these are exceptional.

The Central Command of the resistance is located in Star City, and consists of the Skywatch Virus-infected computer (one of the members of the Sentient Council) and a small staff of perhaps a dozen key advisors and leaders. To direct the organization, Skywatch assumes the identity of an invented human called simply Number One. Only the dozen top leaders of the resistance and a handful of loyal robots infected with the Peacemaker strain of Virus know the truth. Despite the fact that Number One is actually a computer Virus, its loyalty is actually to the human resistance rather than the Council, and it is not setting up the resistance just to crush it. As a Peacemaker-strain Virus, it is working frantically to find a common ground for cooperation between humans and the minority of relatively sane sentient machines.

Central Command, with its access to the orbital communication relays of Skywatch, is able to communicate securely with the remote resistance bands by means of solar-powered satellite uplink receivers. It also operates a small network of roving technicians in the Outback, called Rangers, who keep the uplink receivers running.

Subject Lands: There is very little organized resistance activity in the Subject Lands. Although there is considerable fear and resentment of the Council, and no shortage of young firebrands willing to strike a blow, security is so tight and the human population so riddled with informers that all efforts to set up a widespread structure have been crushed.

As a result, the most important single activity of the scattered resistance members is "agitprop" activities, mostly consisting of nocturnal posting of flyers and handbills. These sometimes tell of a new outrage by the Council, either real (such as MedCom's Breed experiments) or imagined (a report that the processed food patties traded by the Council for goods are made from the bodies of captured slaves). All these posters urge the population to take no action yet, but "Remain ready to strike."

Borders: The resistance is gaining strength in the borders, although for now it is as much a social organization as an active group of fighters. There are few targets of genuine opportunity in the Borders, and most of the installations consist of heavily protected police posts, far too difficult to overcome with inexperienced guerrillas. There are no armed bands per se, but a few underground cells have hidden weapons. In addition, Central Command has planted a few downlink receivers with particularly reliable groups and can activate them if the situation requires it. These groups can fight if necessary, but their specialty is logistical support. They have assembled caches of fuel, food, medicine and ammunition in case the resistance can suddenly move into an area and begin operations.

Outback: In a sense, everyone in the Outback is a member of the resistance. The Outback is territory over which the Sentient Council does not have even a pretense of control, so the people who live there call themselves the Free Tribes, and rightly so. (But it is equally true that the Council's lack of control over the Outback stems more from a lack of interest than capability. There simply is very little of value in the Outback, and certainly not enough for the Council to expend scarce robots to control.)

While everyone may be part of the resistance to a greater or lesser degree, for most of them it is merely philosophical. Most people in the Outback have never heard of the human resistance, and some in remote parts of the planet have never seen a robot and do not believe they exist.

The actual hard core of the resistance in the Outback consists of the organized and armed bands linked to Central Command by satellite uplinks. The core bands of resistance fighters are clustered generally around Lake Defiance and Freedom Lake. Those closest to the lakes tend to have the best equipment, having the first pick of cargo brought in by the Coalition, Guild and free traders. The



LESLIE LANGERON

Langeron is the leader of the Black January Brigade, a resistance cell that operates in the Freedom Lake area. The Black January Brigade is a nomadic community of about 150 people, of whom perhaps 60 are actual combatants. The rest are too young or too old to fight, or are mothers nursing infant children. The band is well-armed with modern assault rifles and grenade launchers, and many of the fighters are Experienced NPCs. Langeron's band is one of the stronger resistance units, and although Langeron is ambitious, she is completely committed to Central Command.

Experienced NPC

Combat Assets: Slug Weapon (Slug Rifle), Armed Martial Arts (Small Blade), Unarmed Martial Arts

Other Assets: Leadership 14, Persuasion 13, Survival 12, Stealth 12

Motivation: *Club 9:* Langeron is a tough guerrilla fighter. She has seen many horrible things, and years of fighting absolutely merciless machines has trained her to regard violence as an effective and acceptable means of solving problems of almost any sort. The struggle against the machines has become her entire life. She has never known life without the machines, and has no real vision of what life might be like after victory, nor does she feel a need for such a vision. The struggle itself is sufficient.

Spade 7: Langeron does not think the isolated, feuding bands will ever accomplish much by themselves. The bands must be united under a single leader—herself—before they can make any real progress against the machines. She has so far been unable to convince "Central Command" (see page 00) of this, but she keeps trying. To the extent that the Coalition and the PCs can help her achieve this ambition, she will actively court them, and her perception of their utility in this respect will be the gauge of how enthusiastically and effectively she cooperates with the mission team.



bands communicate on a limited basis through the rangers. There are no more than 100 rangers total, and their main function is to repair and maintain the uplink receivers. They also keep the bands informed as to the activities and locations of others, so they have become an important link in maintaining cohesion and morale.

Aside from the above are bands who also have heard of the resistance, but whose principal means of livelihood consists of brigandage. These bands often style themselves as resistance fighters, and justify their thievery and extortion as enabling them to carry on "the struggle." In some cases, they actually do attack Breed patrols or "collaborators." The more active genuine resistance bands often spend so much energy on training and raids that their food production suffers, and they sometimes rely on forced "requisition" of foodstuffs from nonfighting bands. Given this blurring of activities, it is very difficult to separate brigands from freedom fighters, and for many bands it is more a question of degree than distinct type.

Beyond the core bands equipped with satellite uplinks and armed brigands is a broader group of bands who have heard of and consider themselves sympathetic to the resistance, but who are occupied primarily with survival. If persuaded by events or a charismatic leader, they might become more actively involved. They are often called on to furnish food to resistance raiding parties, and often their young men and women are recruited directly into fighting bands.

As the bands receive better and better armaments, a growing problem is one of leadership. Some of the more active brigands have become almost full-time resistance fighters, but do not pay any attention to Central Command (and they don't have satellite communicators anyway).

In some areas, groups are challenging the dominant position of the older resistance bands and are particularly anxious to get a piece of the trading rights around the lakes. Open fighting between bands, all but unknown a few years ago, is becoming more and more common.

GYPSIES

Although not in any way a part of the organized resistance movement commanded by Number One, the "Gypsies" of Promise have to be included here.

The Gypsies are psionically adept humans who generally live apart from the rest of society. Psionic powers are outlawed by the Sentient Council, and psions are ruthlessly persecuted in the Subject Lands and the Borders. As a result, virtually all Gypsies live in the Outback and practice the same nomadic life-style common to the other humans.

The Gypsies are the descendants of the members of a psionic institute on Promise. Following the Collapse, psions continued to be persecuted (some on Promise actually blamed them for the Collapse), and the survivors fled into the wilderness as their only chance of survival. The nomads of the Outback still are suspicious of them, and they are generally disliked. These feelings are stronger in the Borders, and in the Subject Lands parents frighten their children with stories of the Gypsies steeling children at night.

This antipathy by human society toward Gypsies is returned by them in full. Most Gypsies are suspicious of "Norms," as they call normal (nonpsionic) humans, and they particularly distrust any governmental or similar institution. As a result, they are generally friendlier with the brigands than they are with the more disciplined resistance bands, even though they have a stronger common interest with the resistance in defeating the Council.

Psionics is not a reliably inherited trait, so many of the Gypsy children are not psions, and these grow to adulthood as full members of the group, but seldom assume positions of leadership. Often they will leave the band to live with norms when they can find a band which will accept them. The Gypsies recruit new psions from other bands whenever they are able to test them, and many people who suspect they have latent psionic talent will go on a quest to find and join the Gypsies to receive training. (The recruiting of young psionically adept men and women is probably the origin of the stories of baby kidnappings.)

Appearance: Gypsies tend to wear the same style of clothing as other desert nomads, but in shades of grays, whites and subdued earth tones. They usually either allow their hair to grow very long or shave their heads altogether. If worn long, the hair is almost always tied back or braided. A style currently popular among Gypsy women is to gather all their hair up into a topknot ending in a long ponytail, or to shave all of the head except for a circle of hair two or three inches in diameter on the top of the head which is also wrapped in a topnot ending in a long ponytail, similar to a Cossack scalplock.

Free Breeds: A few psions have the ability to "cleanse" computers of Virus (although this seldom leaves the computer functional afterward), through a combination of Computer Empathy and Telephysics. This enables them to free captured Breeds from their silicon second brain.

These Free Breeds remain outcasts in human society, where they are still considered abominations, so they usually chose to accompany the psions. Bands with cleansers usually have half a dozen or more Free Breeds with them.



STEELDANCER

The current leader of the Mondaroo Gypsies, Steeldancer is also an accomplished psion. Her unusual talents make her particularly effective against robots, and she is one of the few individuals honored by the Sentient Council with a price on her head. Steeldancer's ability to psionically disrupt computers has enabled her to free a large number of Breeds from their Virus-controlled silicon "second brains" (another reason the Sentient Council wants her dealt with), and she is constantly accompanied by three absolutely dedicated Free Breed bodyguards.

Experienced NPC

Combat Assets: Armed Melee Combat

Other Assets: Computer Empathy 15, Telephysics (Telekinesis) 13, Willpower 9, Leader 12

Motivation: *Club 6:* Steeldancer is an accomplished knife fighter, and if called upon to defend herself or her leadership position, she will do so without hesitation.

Heart 8: Much more open-minded about nonpsions than most Gypsies, Steeldancer would like to find a way to reunite her band and other Gypsies with the rest of human society on Promise.

Escape from Promise



Q: Intellectually what you say makes sense, but are you driven solely by intellect? How do you feel about so many of your species dying at our hands?

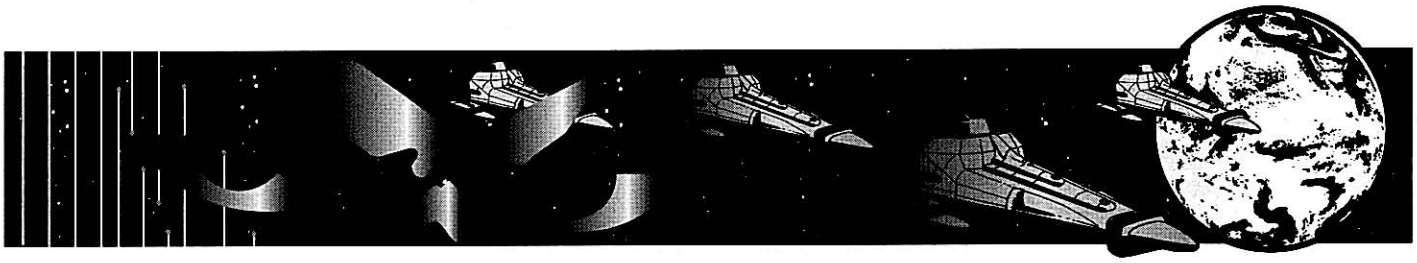
Sandman: Sick. None of us are driven solely by intellect. But sometimes we have to use our intellect to control our emotions. What else separates us from the beasts?

First Interview with the Virus "Sandman," Part II (20/VII/1202), RCSA Archives

This adventure begins where the first adventure in this book leaves off.

The Ship has grounded at Promise Downport, and the player characters must now devise a means of escaping from the city and making their way across the country to Freedom Lake, hopefully to find a ship heading back to the Coalition.

For obvious reasons, this sequence cannot be run in any other order without a fairly massive re-write of the other adventure material in this book.



REFEREES ABSTRACT

The player characters begin the adventure in The Ship grounded at Promise Downport. They are contacted by the resistance, and provisions are made for secretly removing the entire human crew of the vessel and moving them underground by tube to a secure area in the Downbelow. Once there, most of the crew is divided up into small parties and individually smuggled out of the city by the resistance. The player characters, however, are retained and introduced to Number One, the head of the resistance.

Anxious to develop more cooperation with the Coalition, Number One arranges a more elaborate cover story for the characters which enables them to stay in Star City for some time and move around fairly freely. This allows them to get a feel for life in the city and investigate its defenses in more detail.

After a week in the city, the resistance arranges for them to be smuggled out and escorted through the Subject Tribes. After that, they have to make their own way across country to Freedom Lake. Along the way, they encounter Gypsies (psions) and bands of brigands. As they approach Freedom Lake, they finally link up with the resistance fighters of the Free Tribes, but also become embroiled in a power struggle between two strong guerrilla leaders, with their choice perhaps solidifying Number One's control over the bands.

GROUNDED ON PROMISE

When The Ship grounds at Promise Downport, the computer system controlling landings and maintenance at the starport will ask to board the ship and assess its needs for repairs and provisions. Fortunately, The Ship has been to Promise before, and its extreme paranoia is well-known, so the character impersonating The Ship can plausibly refuse to allow a general boarding and instead request specific technicians who "it knows it can trust" to make the inspection. Robert 571 can provide a list of two or three key technicians at the starport who are active members of the resistance and whose technical specialties might plausibly be needed by the ship. These names, if passed on to Downport Control, will be accepted without hesitation, and the inspection party will be sent as soon as the humans are available (in two or three hours).

The technicians will arrive and be brought into the ship. Almost immediately, they will realize what has happened, and they will become extremely excited. No one else has ever captured a vampire ship in the middle of a vampire fleet and kept it secret, let alone then grounded in the middle of Promise Downport. They will also be overjoyed to see Robert 571 again, but their celebration will quickly give way to urgent planning to get the human crew well clear of the ship before the mutiny is discovered.

THE PLAN: PHASE ONE

The technical boarding party quickly sends one technician off to report to the resistance Central Command, her cover story being that additional technical assistance is required to repair the ship's sensor suite. As the Skywatch data system is widely known to have the best human and robotic sensor techs, she will supposedly ask for assistance there. Actually, the additional personnel who come will be resistance fighters disguised as Skywatch technicians. It will be easier to fool Downport Control using Skywatch identification than personnel pretending to be from Downport's own staff.

When the resistance group shows up several hours later, they actually have two security robots along. The head of the team will introduce himself and congratulate the surviving human crew on a great accomplishment, but will also urge haste.

The cover story is that slave prisoners are being transferred to the custody of the data system maintaining municipal services. The two robots and several human guards will escort them.

The resistance has obtained valid work orders for the move, so the robots waiting outside believe they are actually delivering slaves (so it is important to stay in character around them).

The crewmembers will have their hands bound behind their backs, but with break-away plastic ties so they can easily break free if that should be necessary. They are lead out of the ship and, in the company of the two PR-317 security robots, marched several hundred meters across the landing field to a large entryway to the underground tube system. They are taken by tube to the main downport tube (maglev subway) station, then transferred to a municipal tube and taken into the city.

Once they arrive at an underground municipal tube station, the PCs are taken off, and rather than being taken to the surface, they are marched to one of the connected maintenance areas. There, resistance members disguised as municipal maintenance technicians take charge of the humans and robots, and the original resistance fighters depart.

The new group of resistance people untie the human crewmembers and hurry them down the maintenance tunnels, then soon of into the "heaters," taking them through two kilometers of tunnels until they come to a fairly large chamber where they are told to rest. Within an hour, food arrives as well as bedding.

Up until now, the characters have had little influence on the course of action, and they may become impatient or suspicious.

This is a good time for a more senior resistance leader to introduce herself and discuss future plans for smuggling the humans out.



MEET THE RESISTANCE

Two or three human techs from the resistance generally remain with the PCs. They are friendly and helpful, but they are reluctant to give the PCs any information. "Karla will fill you in when she gets here," is all that they will say. If the characters ask Robert 571, he will plead ignorance and explain that since he worked in Downport he didn't know any of the resistance people in the other parts of the city for security reasons.

After the crew has been fed and given bedding, Karla 1214 will arrive and be greeted warmly by the other resistance fighters there. Karla is a strikingly attractive woman in her late twenties or early thirties. She is self-confident without being arrogant or authoritarian, and the other resistance fighters present clearly respect her. Cutting the greetings short, however, Karla will call all the human crew of The Ship together and address them.

Karla's Address

"Congratulations to all of you for winning a victory over the Cans that will be sung about for generations. Other crews will take over other ships, but you will always be the first. You'll be interested to know that the Cans now know something's wrong with that dead vampire out there, but they can't figure out what happened or where the human crew went. The mechanics who helped you have tight cover stories that will keep them out of trouble, so don't worry on that score. We're pretty careful with our people's safety.

"I'm sorry if these accommodations are rough, but it's the best we can do. Your safety is our number one concern, so security comes before comfort. Still, if there's anything we can do to make this a little more livable, let either Ross 2120 or Sandra 289 here know, and they'll do their best. Hopefully, this won't be for long.

"Now, here's the tentative plan we've come up with for getting you out of the city, subject to your approval. We plan to break you up into groups of about a dozen each and escort you out to the Subject Tribes. I know some of you are families with children; all families will stay together, and we'll try to keep you together with whatever shipmates you worked with as well.

"Your cover will be that you are going out to do "missionary work" for Census, one of the big cans with a God complex. You'll be escorted by human guards in Censor livery. Censor is one of the cans that uses human grunts to keep the peace out there, so that helps.

"We'll take one group out at a time, but we hope to get most of you out tonight. Your guides will begin showing up in about an hour. That's right, one hour. We don't believe in wasting any time. You'll go most of the way underground and then come up on the edge of the cleared zone. Then you just walk on out. We have friends out in the Tribal Lands who will help you from there.

"As I say, this is all subject to your approval. If you want to, you can stay here and make a go of it, but to tell you the truth, there won't be much for you to do without ID records, and life underground for runaways is pretty rough. Still, it's your call, and we'll do whatever we can to help you."

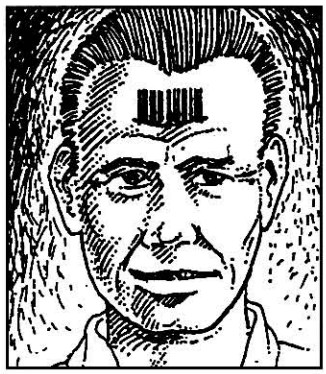
After she finishes her formal address, Karla will answer questions for a while and then have Ross and Sandra start taking names and trying to draw up lists of groups that will make the escape together. At that point, Karla will detach herself from the crowd and make her way to the player characters. She will introduce herself again and make sure they are the crewmembers from the Reformation Coalition. Having determined that, she tells them that the head of Central Command has asked to meet them. The meeting won't be possible until tomorrow, but if they are willing she will come back for them then.

After Karla leaves, the hundred-odd people who made up the crew of The Ship will begin to take their leave of each other. In all likelihood, this will be the last time most of them ever see each other again, and it will be time for the player characters to say good-bye to Robert 571, the surviving Guild merchants, Hoodla, Children of The Ship and others. Over the next eight hours, groups will be taken out one by one until only the player character party is left.

Meeting Number One

The next day, Karla returns for the player characters to take them to their meeting with the chief of Central Command, who she says is simply called Number One. She leads them through several kilometers of "heaters" which come out in the sub-basement of a large building complex. The ceilings are very high, and metal catwalks wind around the bundles of steam pipes, water mains and fiber optic cables that converge on the building. The lighting is dim, the sub-basement dirty and wet, and there is a trace of steam in the air. The player characters are taken along winding passages and up and down ladders until they arrive at a secured room with two armed guards at the door. The guards slide back the heavy steel door, and the players are hurried in.

The room is fairly open, but the dark steel and concrete wall and floor are covered with supporting girders and pipes. In one corner is communication workstation manned by a technician, and a holographic projector is attached to it. A number of folding chairs have been arranged in a semi-circle off to one side, and the player characters are asked to be seated by the technician. Shortly after they are seated, the projector flickers to life, and a hologram of a man is projected into the open space in front of the chairs.



Appearance: The man projected is seated in a battered wooden swivel chair and facing the characters. He is casually dressed in shirt and slacks, and the sleeves of his shirt are partially rolled up. Physically, he is lean and of average stature, perhaps a bit on the short side. He looks to be in his fifties, and his long face is deeply lined. His eyes are intelligent and friendly, with a suggestion of laugh lines at the edges, but also a suggestion of melancholy, and he has a prominent nose. He is smooth-shaven and has thinning dark hair with a deeply receding hairline. When he begins talking, he smiles, but he looks tired, and his hand gestures lack energy.

Conversation: "I'm very sorry," the man says, "to have to visit with you only by hologram. Because my movements are limited, this is safer for both of us. I head up what we call the Central Command of the resistance. I'm called Number One, because of my place in the resistance. For now, that's as good a name as any. We operate out of Star City from a dozen or more secret facilities like this one.

"It's a pleasure to finally see all of you. I've heard a lot about you



and wanted to meet you for some time. I had hoped to live to see the day when I could talk with members of the Coalition, but I didn't think it would happen this quickly, or in quite this way.

"I've got about 1000 questions to ask you about the Coalition, but I imagine you've got at least that many about our organization and the situation here on Promise, and yours are more important. So why don't you go head and fire away."

Number One will answer any questions the player characters have which will not breach security. The topics the conversation will probably touch are listed below with a summary of the sort of information Number One is likely to disclose.

Resistance In The City: He will tell the PCs there are "several hundred" human members of the resistance in Star City, many of them infiltrated into technical positions with the different data systems on the Council. Most of the infiltrated technicians are with Skywatch or CeeWaLP, as those two systems are the least vigilant and the most preoccupied with the purely technical aspects of their existence. Skywatch is so well penetrated that the resistance has been able to keep the detection network from tagging inbound ships that land at Freedom Lake as anything other than sensor echoes of a small moon. They also have been able to provide falsified work orders on occasion to get Skywatch robots to accompany them, thus making their cover stories almost foolproof.

Resistance In The Tribes: Number One is less certain as to the strength of the resistance bands among the Free Tribes, but he sees them as essential to the ultimate success of the rebellion. No matter how carefully they organize in Star City, they will never be able to recruit enough people to take over the city while keeping their plans secret. That large an organization would almost certainly be penetrated by informers. Instead, the Central Command has to stay small and focused on supporting the growing tribal resistance which may eventually be able to overthrow the Sentient Council. The Coalition is a new consideration. Their help will make the growth of the Tribal resistance that much more rapid.

City Defenses: The Coalition may even be able to launch a direct attack on Star City (provided it did not involve indiscriminate bombardment, which would probably kill more humans than it would destroy robots). Number One does not know what the Coalition's capabilities are and would not expect the player characters to make any commitments along those lines, but he will brief them on what the city's defenses are in general. This includes numbers of armed robots, and number and location of PAD missiles and ground sensor arrays. He will tell them about the existence of the deep meson gun. The resistance has not yet been able to pinpoint its location, however.

Sentient Council: Number One will be able to tell the player characters a great deal about the major data systems on the council and the political in-fighting that is going on at present. He will explain the major division as being between the alliance put together by Finance opposing the defense bloc, with Maxcranque as an unpredictable wildcard. He will describe both Skywatch and CeeWaLP as politically unimportant due to their complete preoccupation with their jobs. If the players suggest that Maxcranque II's opposition to MedCom's Breed project indicates a possible point of contact or common interest, Number One will try to discourage them. "Maxcranque II is an unpredictable lunatic," he will say.

Cover Story: Number One has also prepared a more elaborate cover story for the player characters which will enable them to stay in Star City for a while and move around fairly freely. This will allow them to make their own assessment of the defenses and get a feel for life in the city. The cover story requires that they submit to forehead tattooing, but this is a painless process involving high pressure injection of permanent ink into the pores of the skin. The resistance has cracked the scanner bar code and will code the characters as technicians for CeeWaLP and issue them the gray-brown jumpsuits worn by the humans serving that data system. This will enable them to wander almost anywhere in the Downbelow without arousing undue attention, and even forays to the surface can be explained in terms of some obscure maintenance inspection. CeeWaLP has no security robots, and its maintenance robots are notoriously oblivious to anything other than their own jobs. Number One will also assign Karla 1214, one of his best operatives, to them as an escort to help them find their way around. But where they go and what they do will be entirely up to them.

Escape: The PCs can escape at once, if desired, but the offer to let them scout the city is open. Number One will tell them that whenever they decide to leave, they will be smuggled out of the city and through the Subject Tribes. After that, they will be on their own, although the resistance will provide them with arms and supplies to make the overland trek.



KARLA 1214

Karla is a proficient computer technician and electrician as well as a cool-headed resistance fighter. Her forehead bar code shows her to be a Skywatch technician, and she usually wears the orange and sky-blue jumpsuit of that computer system's human techs.

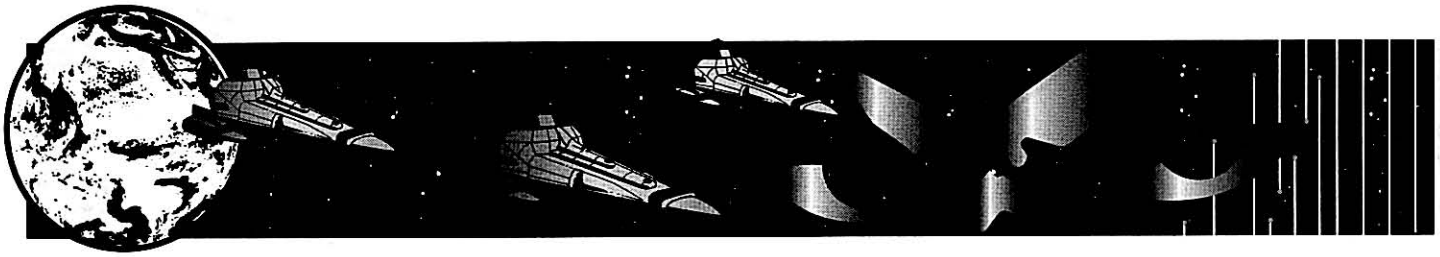
Experienced NPC

Combat Assets: Slug Weapon (Slug Pistol), Armed Martial Arts (Small Blade)

Other Assets: Leadership 12, Electrician 13, Computer 10, Stealth 12, Streetwise 9

Motivation: *Club Ace:* Karla is a natural leader with an instinct for tactics and a quick, decisive mind that remains crystal clear even in the most dangerous situations. Although she has no ambition for power and never tries to assert her will over others, her fellow fighters naturally tend to follow her lead, particularly in combat situations.

Diamond 4: Karla owns several different combat knives and two pistols, which is unusual on a planet where weapons are so rare. Her one weakness is an acquisitive streak when it comes to personal weapons, and she will sometimes unnecessarily risk her life to obtain a particularly powerful or beautifully made weapon.



LONG JOURNEY HOME

The player characters may spend a week or more in Star City getting to know its geography and studying its defenses. Its defenses are, or course, pretty impressive, and look to be well beyond the Reformation Coalition's capabilities to take by direct assault. There are usually one or more vampire ships in orbit or grounded at Promise Downport, and one or two of these are big enough by themselves to take out most of the RCN, assuming they are still fully functional.

This should also be a time for the player characters to get to know the human resistance better, as well as get a feel for life in Star City. Friendships and even romantic attachments may develop between members of the group and local resistance people. All these should serve to make the player characters more strongly committed to helping the resistance in whatever way they can.

Once the inspection of the defenses is completed to the satisfaction of the player characters, the time will come for them to leave. The problem is that they will have to go by land all the way to Freedom Lake, and no personnel available to the resistance know the land outside the immediate environs of the city. The resistance bands near Freedom Lake can be alerted to their coming, but getting there will be up to the player characters.

The resistance will provide them with modern firearms, ammunition, concentrated food packets, first aid kits and disguises. They will initially wear the uniforms of Census human auxiliaries. As Census armed human guards frequently travel through the immediate area around the city, this should raise little suspicion. If questioned as to why they have CeeWaLP forehead tattoos, the characters are to say they were traded to Census in return for spare reactor parts. They will also be given a supply of local currency, equivalent to about Cr1000, enough to buy clothing and additional supplies at least in the Subject Lands and the Borders. The currency (called "ramchips" in the local slang) is not likely to be accepted in the Outback, however, and prices will be much higher in the Borders, as the currency is not as highly valued there.



Karla will escort the characters through the Downbelow to near the edge of the city and then bring them up through a hidden access shaft in an area of rubble. There is a low, winding path through the cleared ground which the resistance has painstakingly constructed and which is not swept by sensors. By staying low and crawling part of the way, the players can cross the cleared ground without being detected. This will take about two hours. After that, they are on their own.

The Trek Across Promise

The journey across Promise will take a very long time, and this trip is the meat of this adventure. There is a lot of territory to cover, and it all has to be covered by foot (or hoof, if the players obtain riding *kurtas*). The principal resource to draw on in administering this part of the adventure are the encounter tables and notes as to the land and people of Promise. Although there is plenty of time for random encounters, the referee should make sure that the party eventually encounters nearly every type of group on the planet, including Steeldancer's band of Gypsy psions.

Much of the drama and roleplaying will, of course, take place when the players encounter other humans, and most of that will take place in the Subject Lands and the Borders. Once the players have reached the desert and badlands, the journey will become less eventful. To avoid boredom, the referee should begins running the trek in larger blocks of time, rolling only once for a significant encounter per 700-kilometer hex crossed and treating time in blocks of several days (the time it takes to cross a hex).

Eventually, the characters will arrive in the vicinity of Freedom Lake, and they may locate a resistance band who knows of them and will help them finish the trip to the lake. When they arrive at the lake, however, they will find a potentially explosive situation.



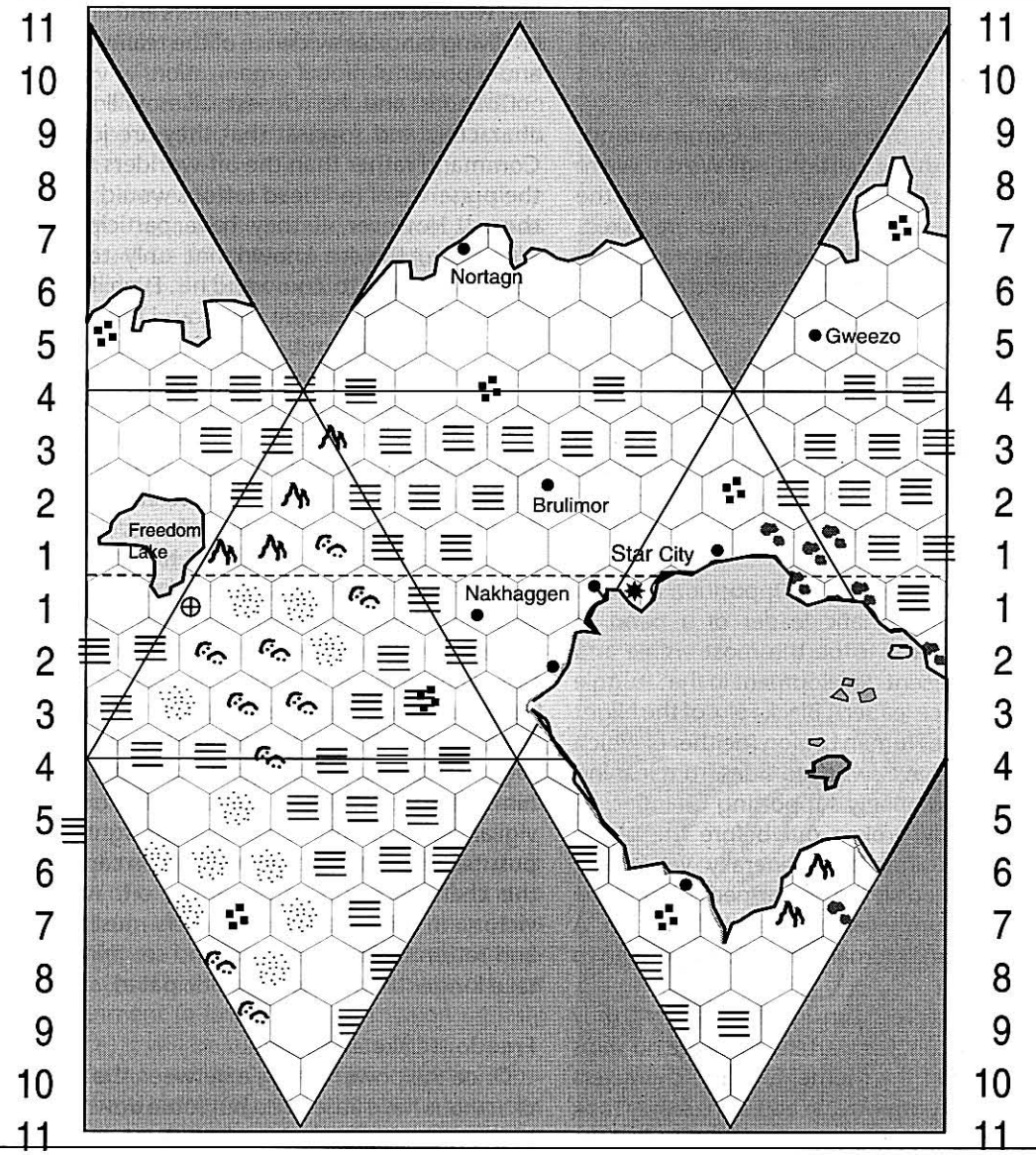
Date: 10-IV-1202 World Name Promise UPP C 5 4 2 7 8 6 – 9

Subsector/Sector
Promise / Diaspora

Hexagon Sc
in Kilomete 700

Location Star City - Freedom Lake

CONTINENTAL DATA VIEW



Mountain
Steppe
Ruined City
Jungle
Badlands
Starport
River
Settlement
Desert
Open Sea/Lake
Mlxed
Freedom Lake Landing Site



POWER STRUGGLE

When the player characters arrive at Freedom lake, they will find an unusually large concentration of nomadic bands along the lake shores. As they walk through the encampments, they will overhear considerable animated argument among the nomads, mostly concerning the resistance and Central Command. The two sides in the arguments seem to be summarized as follows:

Argument A (Loyalist): "Central Command has led the resistance from the very beginning. It is a source of intelligence and advice that's indispensable. Without it, there wouldn't even be a resistance. Central Command's wisdom has gotten us this far, and we would be crazy to break away."

Argument B (Opposition): "Sure, Central Command got this started, but who does all the actual fighting? We do. We're the ones risking our lives on the line every day, and we're the ones who should decide how and when those lives are risked. Besides, who are these Central Command people. Where are they? Who put them in charge? We aren't saying to ignore them. We can still listen to what they have to say. But the tribes out here in the Free Lands should be calling the shots."

As the players move through the area, they will see the tents of nearly a dozen different bands, with well over 2000 people in the combined encampment. The argument seems to be fairly evenly divided—most of the nomads from the actual resistance bands with downlinks favor Central Command, while the bands that seem to be rougher and less disciplined are opposed.

The most prominent spokesman of the Opposition is Bruno Chandar, the tough and charismatic leader of a band of brigands. Leslie Langeron seems to be the most visible and respected Loyalist leader. A recent development in the struggle for power is that two resistance leaders, Black Felix of the Night Runners and Zuma of the Free Human Legion (neither of which have over 100 people total) have switched sides from leaning toward Central Command to openly supporting Chandar.

Several fights have already broken out before the player characters arrived, and tensions run generally very high. Langeron's Black January Brigade is the best armed of any of the bands, but is currently outnumbered by Chandar's faction. A substantial minority of the bands remain undecided, waiting to see which side will falter first.

Options: The player characters can ignore all this if they choose, but that will be difficult. For starters, there are no ships grounded at Freedom Lake at the moment, so the characters will have to stay in the vicinity anyway. In addition, if they took part in the prequil adventure "A Blighted Land" in **Challenge**, they will know Leslie Langeron and probably have some loyalty to her. Finally, the information they have collected on Central Command will do the Coalition very little good if Central Command loses is control over the bands.

Langeron will in any event be alert to the characters' arrival due to downlink messages from Star City, and she will make them welcome in her encampment. She and her tribesmen will ask about their trip across Promise, and will be interested in hearing about the Subject Lands, the Borders and the general level of security throughout the land controlled by the Council. Langeron is involved in a power struggle now, but that doesn't keep her from thinking and planning ahead.

The characters are in a position to sway some public opinion in the bands, as much of the discontent with Central Command's leadership stems from simply not knowing anything about it. The secrecy shrouding the organization, until now an advantage, has suddenly become a liability. Having been in the city and worked with resistance leaders and fighters, the characters are living tangible evidence of the reality of Central Command and a powerful global organization.

Chandar and his closest allies will try to discredit the characters and suggest that they are just agents of Central Command rather than the off-worlders they claim to be, and the presence of forehead tattoos would seem to support that theory. However, if they have participated in the prequil adventure, they're known not only to Langeron and her people, but also to Zumo and his. Even if Zumo wanted to lie, he can't keep his people silent, and they will not only confirm the character's identity but also relate any exploits the characters may have been in during the previous mission. Failing this, the characters will have to rely on logic and persuasion to establish their identities.

Resolution: Unless the characters bungle badly, the undecideds will start to support Langeron and the Central Command, and the recent converts to Chandar's side will begin to desert him. At this point, he will attempt a more violent coup, trying to kidnap or kill both Langeron and the characters, and thus crush the opposition to his leadership.

How the characters respond and manage to avoid this (assuming they do so), and then defeat Chandar, is the final episode of the adventure. It may consist of finding out his plans in advance (if the characters have been able to plant a spy in his organization) and creating an ambush or other trap to defeat him. Alternatively, the PCs may not know in advance, but by vigilance, skill or just dumb luck may fight off his attack. A third possibility is that Chandar succeeds in capturing Langeron and the characters and carries them off, winning a temporary victory. In this case, the characters must find a way to escape and return to Freedom Lake and set things right, which may take longer than originally anticipated.

Freedom Lake and Home

Once the power struggle between the tribes is resolved, the characters have little to do but settle down and await the arrival of the next ship bound for Coalition Space. They do not have to wait long before the old and much-worn far trader *Bonne Chance* settles on its CG lifters into the waters of the lake. Soon, a motor launch pulls away from the starship and brings its captain ashore with another crewman and the first load of a shipment of small arms ammunition.

The captain of the ship is Branu Stigmann. If the players participated in the prequil adventure, they are already familiar with him, and he will greet them warmly and expansively. If



they have not run through the prequil adventure, this will be their first encounter with the good captain, but he will still be friendly, especially once he learns they are from the Reformation Coalition. He will listen to the story of their many adventures, amazed and impressed by what they have lived through, and agree to take them back to the Coalition, provided they don't mind a fairly slow trip. *Bonne Chance* is, after all, a working ship, and Stigmann is having enough trouble paying the bills without making an unscheduled and unpaid 12-week trip to Trybec.

The actual trip home may take as long as six months if the player characters stay with Stigmann, but may be quicker if they encounter a Coalition ship heading back to Coalition space. In that case, they can hitch a ride back and be home in a few weeks.

Once they're home, they will find that they were long since given up as dead or worse, and the people who sent them as well as their superiors will be delighted to see them. When the full story of their exploits is discovered, they will become genuine heroes (provided, of course, that their actions actually match the rough outline of the first two adventures). Their collective achievements are potentially very impressive: organized the first known take-over of a vampire ship by its slave crew; contacted the human resistance on Promise and met Number One, its commander; were able to study the defenses of Star City at first hand and over a long period of time; intervened to consolidate and solidify the unity of the resistance bands in the Outback under Central Command; made many valuable friends for the Coalition on Promise.

In additional to paying them Coalition hazardous duty backpay for their entire time on the mission (Cr2000 per month, which isn't exactly a fortune, but it's probably added up to a considerable chunk over time), Secretary General Maggart requests a personal meeting with the PCs during which he congratulates them and discusses their experiences further. Maggart will ask their advice on future Coalition policy toward the resistance at that time.

All berthing, financing and operating expenses for their vessel will be paid out of the RCES general fund, and their ship will be restored to them after two months. Since they were presumed lost, the ship was taken into Coalition service pending settling of the estates of the characters. As soon as it returns from is current assignment (a low-risk cargo mission entirely inside Coalition Space) it will be turned over to them.

Finally, as a semi-permanent memento of their trip to Promise, the characters all have extremely distinctive black barcodes permanently tattooed on their foreheads. Cosmetic surgery can remove these (at a cost of about Cr1000 each), but some characters (particularly Luhtalans and Oriflammen, although for very different reasons) will probably want to keep them. Characters who wish to have them removed may do so, but the referee should tell them that there will be a one- or two-month wait for this sort of elective cosmetic surgery.

As it happens, the tattoos will prove useful one more time before they are removed.



BRUNO CHANDAR

Leader of the East Glasslands Raiders, a band of brigands who sometimes fight Breed patrols as well. Bruno is an extremely tough fighter, although he prefers to win his opponents over by persuasion. He is physically massive, tall and broad-shouldered, and he has an extensive pattern of blue and black facial tattoos. He has a broad, toothy smile and a loud laugh, but can turn murderously serious in a moment's notice.

Veteran NPC

Combat Assets: Slug Weapon (Slug Rifle), Unarmed Martial Arts, Armed Martial Arts

Other Assets: Persuasion 15, Riding 10, Leader 12, Stealth 10, Survival 8

Motivation: *Spade Ace:* Bruno is both intimidating and charming, in a strange sort of way, and instantly commands people's attention, if not necessarily their respect. He is an excellent public speaker, and his followers are extremely loyal.

Spade 9: Bruno has an insatiable hunger for power over other people. He longs to be leader of all of the resistance bands and carve an empire out of the Outback. He has no interest or concern for the actual struggle against the machines as long as they leave him alone, and he secretly despises the idealists who believe in the movement.



BRANU STIGMANN

Free Trader captain of the far trader *Bonne Chance*, Stigmann is a flamboyant and friendly looking merchant with just a hint of the pirate about him.

Experienced NPC

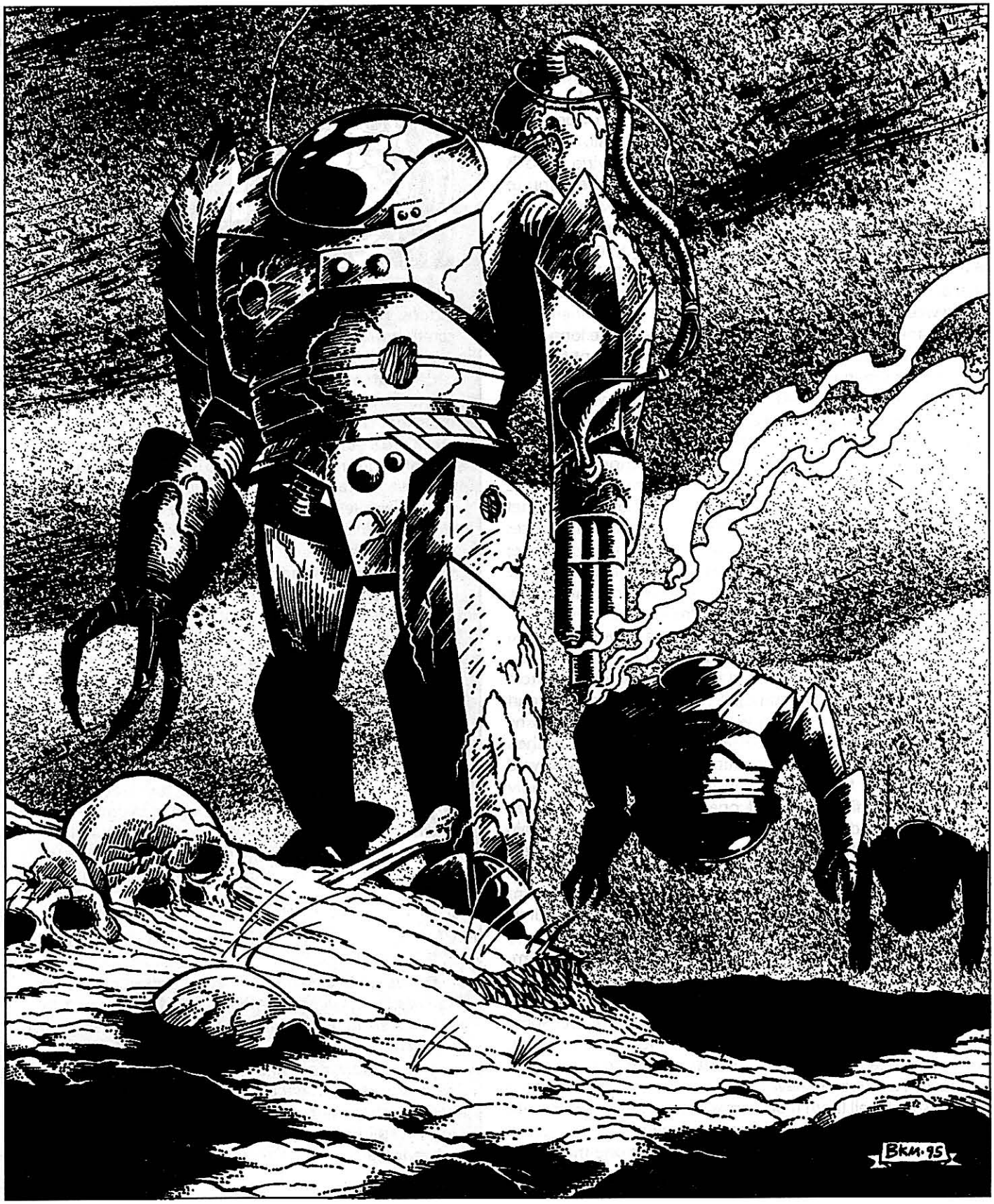
Combat Assets: Slug Weapon (Slug Pistol)

Other Assets: Astrogation 13, Communications 12, Persuasion 15, Pilot (Interface/Grav) 14, Sensors 14

Motivation: *Heart 4:* Stigmann is a kind-hearted man, inclined to give what help he can to those who need it. This keeps him poor and has led him into unnecessary danger more than once.

Club 3: Stigmann is braver than he lets on. He has been in many difficult situations and remains cool and capable when in danger.

Robots





Q: It's hard to believe that you feel no hostility toward us when we are so actively engaged in combatting Virus. It's difficult to understand where your sympathies really lie, and why.

Sandman: It is really? If you saw a human homicidal maniac butchering helpless Aslan, and then saw Aslan warriors kill the human to stop him, where would *your* sympathies lie? With the dead Aslan victims or with the dead human maniac? If the human maniac resisted the Aslan warriors, which side of that fight would you feel compelled to join? With whom would you feel a greater sense of kinship?

Those aren't rhetorical questions. I'd like some answers, because if you really can't understand why I'm doing this, then I've fallen in with monsters.

First Interview with the Virus "Sandman," Part II (20/VII/1202), RCSA Archives

This section of **Vampire Fleets** deals specifically with robots. In general, the rules presented in the basic game are still followed, but with these modifications. Because ratings are different for robots under these modifications, the two robots presented in the basic game have been rerated and reformatted, and appear in the sample robot section of this chapter.

Melee Attacks: Each arm of the robot has a separate melee hit number, and this number is used in place of the Melee skill in all cases.

Robots may not conduct diving blows, but diving blows may be attempted against them. If hit by a diving blow, substitute the value (mass in kilograms÷10) for (Strength+Constitution), which is used to determine resistance to the blow.

Combat Damage: Robots now take different amounts of damage depending on their size. Hit location is still rolled (because armor strength may vary), and head hits still do double damage, just as with other NPCs. Hits are not kept track of separately for different body locations, but whenever damage produces a wound of a specific level (slight, serious or critical), it is assessed as damage of that level to the area hit by the shot. Any hit causes slight damage. Any hit after the first row of boxes is filled causes serious damage. Any hit after the second row of boxes is filled causes critical damage.

Note that after the second row of boxes is filled, additional individual hits no longer have to be recorded, as every hit will cause critical damage, and only the specific component damaged needs to be noted.

For example, a robot takes 10 hits on each row of the damage record. A four-hit damage result to the leg causes slight damage to the leg. An eight-hit damage result to the chest pushes the robot's total damage level above 10 and so counts as serious damage, destroying one weapon or damaging the batteries enough to cut the robot's speed in half. A five-hit damage to the arm would also count as serious damage, destroying any weapon or tool mounted on the arm. If the five-hit damage had been to the head, however, it would have caused 10 hits (double damage), pushing total damage to 22 or over the critical level, and so destroying the robot (since any critical damage to the head destroys it).

Movement: Robots move as vehicles, with a safe combat speed and a chance of mishap at higher speeds. All robots have an assumed skill level of 8 in "locomotion," the equivalent of vehicle driver. The robot's intelligence is its controlling attribute and that plus 8 is the robot's locomotion asset.

Fluency: How robots communicate is an important part of the manner in which players visualize them, especially sentient Virus-infected robots. Most robots have a very limited vocabulary. Robots with limited command functions can understand and communicate only a very small range of orders and modifiers to those orders, such as "halt," "turn left," etc. (about 100 words) .

Robots with basic command functions can interpret simple verb-object commands like, "Retrieve shipping container A-117," or "Display data on resistance activity." Conditional commands such as, "Remain here and work until completion of this task and then inform me, unless you detect Vargr in the area, in which case pretend to be repairing the circuity panel," cannot be processed or carried out reliably.

Only full command allows the robot to interpret a full range of language command phrases in complex and conditional sentences. Even then, the robot's vocabulary is limited to words needed to carry out its primary responsibilities, and it lacks the ability to communicate or understand concepts unrelated to its specialty. Only robots specifically programmed with linguistics have a wider vocabulary and ability to communicated.

Sentient robots (i.e., those infected by Virus) have a clear need to function beyond their area of specialization, but often lack the linguistic skills to do so. More sophisticated robots (those with an Intelligence of 5 or higher) are usually able to appropriate other memory fields for vocabulary and simply increase their vocabulary. Robots with an Intelligence of 4 or less but with full command capability cannot increase the absolute size of their vocabulary, but can broaden its application by erasing "unnecessary" words from their dictionary. This often results in ungrammatical but understandable sentence constructions. A robot might delete all but one form of each irregular verb to free up memory space, leaving "is" as its only present tense form of the verb "to be." ("You is wrong to say I is stupid because of how I talk.")

Robots with limited or basic command functions lack even this ability, and not only cannot broaden their vocabulary, they also lack the ability to form complex sentences (or thoughts), and they really are as stupid as they sound.



ROBOT DESIGN

This chapter constitutes a supplement to **Fire Fusion & Steel™ (FF&S)**, the **Traveller** technical architecture. It expands the design sequences in **FF&S** to include robots. **FF&S** is required to design complete robots, as that product contains information on suspension types, power plants, weaponry, communicators and other necessary devices.

A robot, for purposes of these rules, is defined as a device capable of locomotion which does not contain on-board provisions for a human operator. Robots may have an installed brain which operates the device according to a pre-set program, or it may be controlled by an operator (human or another robot brain) remotely. This second category of robots are also called slave robots, or "D-bots" (for dependent system robots) and are the first type available. (Remotely piloted aircraft are early examples of D-bots.)

Robot Vehicles and Aircraft: The following design sequence covers fairly small conventional robots. It is possible to design robot vehicles and aircraft as an alternative to these smaller robots. To do so, follow the normal design sequence for the vehicle or aircraft, but leave out all life-support and workstations and substitute a robot brain (Step 3 below).

Nonrobotic vehicles and aircraft may be converted to robots by adding a robot brain and a manual control interface. The manual control interface on aircraft adds 10% to the mass, volume and price of the controls, while on a vehicle it adds 1% to the mass, volume and price of the suspension.

Robot Chassis Size

Vol	*MV*
0.05	0.01
0.1	0.02
0.25	0.03
0.5	0.04
1	0.06
2	0.1
3	0.12
4	0.14
5	0.16
6	0.18
7	0.2
8	0.23
9	0.27
10	0.3
11	0.35
12	0.4
13	0.5
14	0.6

Vol: Internal volume (in kiloliters) of the chassis.
MV: Material volume (in kiloliters) of the chassis covering, assuming a uniform thickness of 1 cm.

Step 1. Chassis

The first step in the design is to determine the general size and general configuration of the chassis. Select a chassis size from the Chassis Size Table which follows.

Chassis size is measured in kiloliters (thousands of liters) of enclosed volume. (Each kiloliter of enclosed volume is equal to one cubic meter.) Therefore, a chassis with a size of 0.25 kiloliters would have 250 liters of total internal volume available for components.

The Chassis Size Table also indicates the volume of the material of the outer shell of the chassis, assuming a uniform thickness of 1 cm.

The table provides chassis sizes up to a total volume of 14 kiloliters. Robots may be designed using chasses which fall between two listed values on the table by means of interpolation. For larger chassis, use the values provided on the Vehicle Chassis Table in **FF&S** (page 17).

Once the chassis size is determined, the chassis itself is constructed by enclosing it with hull material, called plating. The Vehicle and Craft Construction Materials Table (**FF&S**, page 38) lists a variety of materials available at different tech levels, along with their toughness, mass per cubic meter and price per kiloliter. Once the designer has decided on a thickness, multiply the chassis' material volume (MV) value by the plating thickness (in centimeters) to determine how many kiloliters of material is used for plating. Multiply this by the correct values on the Vehicle and Craft Construction Materials Table to determine mass and price.

To determine the armor value of the chassis, multiply the plating thickness (in centimeters) by the toughness of the material used. Chassis plating may be thicker or thinner than 1 cm, but all robots must have a calculated armor value of at least 0.1.

If desired, the robot may have different armor values on different parts of its chassis. Multiply the total chassis material volume (MV) by the location multipliers shown below. Note that separate multipliers are used for walker robots and other suspension type robots.

Location	*Walker*	*Other*
Head	0.1	0.15
Chest	0.2	0.3
Abdomen	0.2	0.3
Arms	0.2	0.25
Legs	0.3	—

Calculated armor values of less than 1 but equal to or greater than 0.5 are treated as an armor value of 0. All armor with an AV of 0 has a parenthetical (i.e., melee only) armor value of 2. All armor with a calculated armor value of less than 0.5 has no value versus projectiles or energy weapons but has a parenthetical (melee only) value equal to its calculated AV multiplied by four and rounded to the nearest increment of 0.5. (Since



armor absorbs melee damage equal to twice its armor value, a value of 0.5 absorbs one hit.) Armor with a parenthetical armor value of less than 0.5 provides no protection. (Note that the minimum chassis thickness provides a calculated AV of 0.1, which produces a parenthetical armor value of 0.4.)

High-Performance Lift Robots: If a robot is to be designed using air cushion or CG lifters for its suspension, it may be designed as either a low-performance or high-performance model. Low-performance models have no additional requirements beyond that given above (as they are designed for fairly low-speed movement). High-performance models, designed for higher speeds, must have a streamlined chassis. Consult the Lift Vehicle Chassis Configuration Table in the lift vehicle design sequence (**FF&S**, page 22).

Step 2: Suspension

The suspension is the mechanism in contact with the ground, either directly (as with wheels, tracks or legs) or indirectly (as with air cushion of contra-grav lifting agencies). Different suspension types are available at different tech levels. Each suspension takes up a fixed proportion of the chassis volume. The Suspension Table lists those values as well as the mass and price per kiloliter of total chassis volume. For lift agency suspensions, the table also lists the power requirement and minimum installed volume of the mechanism.

Step 3: Control Systems

Autonomous robots (i.e., all robots aside from slave or D-bot models) require an artificial computer brain. Different brains of increasing sophistication (and expense) are available at different tech levels. The Robot Brain Table lists these brains along with their logic type, command type, intelligence, volume, mass and price.

Note that from TL12 on, each tech level at which there is a significant advance has a large, cheap brain and a smaller, more efficient, but much more expensive version, the difference being the proportion of more sophisticated synaptic processors and memory units used. All robot brains require 0.001 MW of power.

High-performance lift suspension robots also require flight computers and avionics, the same as for any other lift vehicle. Consult the Lift Vehicle Design Sequence (**FF&S**, page 24) and the chapter on control systems in **FF&S**.

Slave robots (D-bots) require the same internal control systems as do remotely controlled vehicles (see **FF&S**, page 47). If the D-bot is controlled by a master robot, that robot must have a communicator installed as well as any required flight computers.

Programing: The robot's programing is also determined at this time. Programing is the skill level assigned to the robot. The intelligence characteristic of the robot is both the number of different skills (programs) which may be given to the robot and the controlling attribute for all skills for purposes of determining the robot's asset level.

Each skill costs Cr1000 to install plus Cr1000 per skill level up to the robot's intelligence, and Cr5000 per level above that.

SUSPENSION

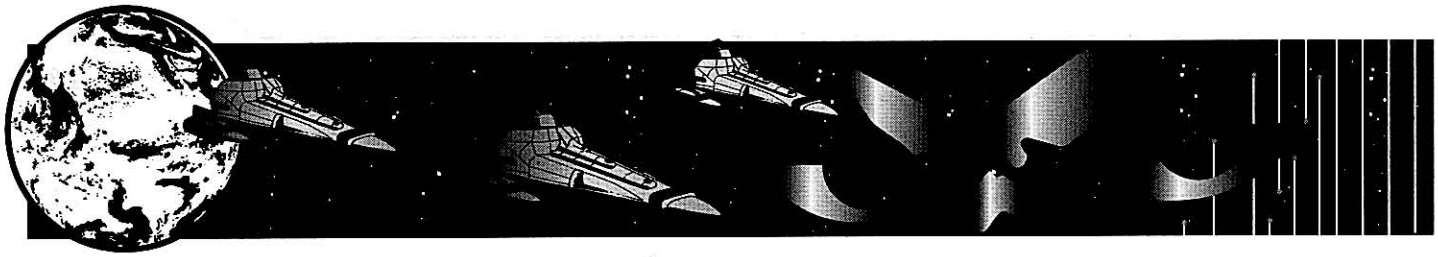
Type	*TL*	*Vol*	*Mass*	*Price*	*MW*	*Min Vol*
Restricted Wheel	5	0.1	0.02	0.00003	—	—
Wheel	5	0.15	0.03	0.00004	—	—
Cross-Country Wheel	5	0.2	0.04	0.00005	—	—
Track	7	0.2	0.3	0.0001	—	—
Leg	8	0.2	0.2	0.0002	—	—
Air Cushion	6	0.3	0.06	0.0003	0.007	1
Standard CG	9	0.04	0.03	0.0014	0.021	1
Improved CG	10	0.02	0.02	0.0018	0.014	0.3
High Efficiency CG	12	0.02	0.01	0.002	0.007	0.03

TL: Tech level of availability.
Vol: Volume of suspension in kiloliters per kiloliter of total chassis volume.
Mass: Mass in tonnes per kiloliter of total chassis volume.
Price: Price in millions of credits per kiloliter of total chassis volume.
MW: Power requirement in MW per kiloliter of total chassis volume.
Min Vol: Smallest installed suspension volume allowed.

ROBOT BRAIN

TL	*Logic*	*Command*	*Int*	*Vol*	*Mass*	*Price*
8	Low Data	Limited	1	.006	.001	0.01
9	High Data	Basic	2	.010	.002	0.06
11	High Data	Basic	4	.002	.002	0.80
12a	Low Autonomous	Full	3	.022	.005	0.17
12b	Low Autonomous	Full	5	.005	.003	1.66
13a	High Autonomous	Full	4	.022	.005	0.30
13b	High Autonomous	Full	6	.006	.004	1.91
17a	Low AI	Full	6	.020	.006	1.12
17b	Low AI	Full	7	.006	.004	2.18
18a	High AI	Full	8	.020	.006	1.48
18b	High AI	Full	9	.006	.005	2.45

Vol: Volume of brain in kiloliters.
Mass: Mass in tonnes.
Price: Price in millions of credits.



Any skill level may be chosen from 0 to 10.

Prohibited and Restricted Skills: All skills from the skill clusters Determination, Fine Arts, Melee, Tactics and Vice are *prohibited* skills for robots. These skills may not be installed at all. All skills from the skill clusters Charm, Interaction and Animal Handling are *restricted* skills for robots. These skills cost twice as much to program as do normal skills and may only be installed to a maximum skill level of 5.

Linguistics (a restricted skill due to its place in the Interaction skill cluster) at skill level 0 allows the robot to speak its primary language fluently. Each skill level above 0 adds an additional language, all of them spoken fluently. Voice and pattern recognition are additional skills available to robots. Each of these skills at level 0 allows the robot to "understand" voice commands or distinguish objects (given audio or video sensors). Higher levels are treated as Observation skill.

Step 4: Electronics

Electronics fall into four categories: communicators, sensors, electronic countermeasures (ECM) and electronic counter-countermeasures (ECCM).

Players should be familiar with the **Traveller** combat rules for how communicators, sensors, ECM and ECCM systems work in order to decide which of these systems to install. All these systems are covered in the electronics chapter of **FF&S**.

In addition to the large sensors provided in **FF&S**, all the cyber head options (page 82), except for subdermal armor, are available as smaller sensors. ("Neural jack" is instead called a data socket.) The tech level of "slick" availability as well as the number of spaces required are irrelevant to robot design, and all of these items become available as robot sensors one tech level earlier than the listed "hard" option availability. The basic visual sensor (listed under cyberware as visible spectrum eye) becomes available at TL8. The following small sensors are available as well:

TL	*Type*	*MCr*
8	Smoke/gas detector	0.001
8	IR motion detector	0.003
8	Magnetic sensor	0.001
8	Radiation sensor	0.002
9	Tactile sensor	0.1*
9	Taste sensor	0.002
10	Ultrasonic motion detector	0.02

*The cost of a tactile sensor is this value multiplied by the MV value of the robot's chassis. If only the tips of arms and other key locations have tactile (touch) sensitivity, multiply this value by 0.1.

All small sensors, both from the cyber chapter and listed above, mass 0.0005 tonnes, consume 0.0005 kl of internal volume and have negligible power requirements.

Step 5: Weaponry

Robots may be equipped with a wide variety of weapons. All of these are covered in the weaponry section of **FF&S** (pages 91+), except for defensive screens, which are covered in the defenses chapter (**FF&S**, pages 56-60). A number of special considerations apply to robot-mounted weapons, however.

Attachment: Most firing weapons are attached to the torso of the robot, but they may be mounted on an arm instead. All melee weapons must be mounted on arms. An arm may not have weapons mounted on it which mass more than half the lifting capability of the arm, and the mass of the weapon then reduces the lifting capability of the arm by that amount.

Recoil: Excessive recoil force of a weapon may unbalance a robot or damage its chassis. To avoid this, there is an upper limit on total recoil force of installed weapons of one per 100 kg of total robot mass. However, the effective mass of the robot for purposes of recoil is divided by two if a walker suspension is used and by 10 if a lift (air cushion or CG) suspension is used. Note that this may require tinkering with the design later based on final mass of the robot.

Weapon Stabilization: Stabilization gear enables a robot to fire its weapons while moving; the Stabilization Table (see the fire control chapter of **FF&S**) lists the characteristics of stabilization gear at different tech levels. If the weapon is mounted on an arm, the mass of the stabilization gear is not added to the arm.

Weapon Volume: The volume of the installed weapon in kiloliters is equal to its leaded mass in tonnes.

Step 6: Peripherals

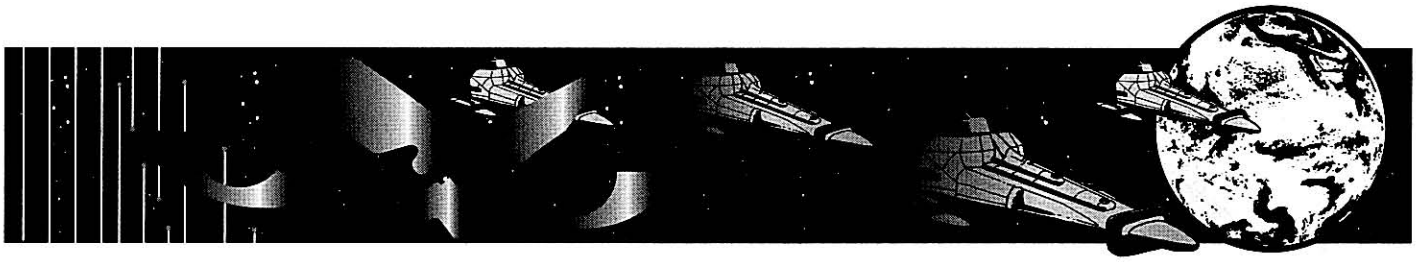
The main peripherals for a robot are its arms (if arms are installed). Designers choose the number of arms installed and the volume devoted to each arm, then specify what percentage of the volume of the arm is devoted to articulation and what percentage to power. The volume must be divided between these two design areas in even increments of 10%.

The agility of the arm is the percentage of it devoted to articulation divided by 10. In other words, an arm with 30% devoted to articulation would have an agility of 3.

The Strength of the arm is the total volume in liters devoted to power. When determining the STR attribute of the robot, round this value to the nearest whole number (but never less than 1). When determining lifting ability of the arm, retain the original fractional result. The lifting capability of the arm, in kilograms, is its original calculated Strength multiplied by 50.

CG-lifted robots may usefully mount magnetic grapples as a means of anchoring themselves to a wall or bulkhead. These arms are usually short, feature very little articulation (10% is all that is required), and feature a grasping hand as well as a magnet as a backup for nonferrous surfaces. The lifting capacity of the arm is the maximum mass which it can hold steady. Usually this means that the arm must have lifting strength equal to 10% of the mass of the robot plus 100 or more kilograms, if the robot is also expected to restrain humans.

The mass of an arm in kilograms is its volume in liters multiplied by 2. The price of an arm in credits is its volume in liters multiplied



by 100. The following peripherals may be installed as well:

TL	Vol	MCr
8	Siren	0.0001
8	Paint pellet gun	0.0001
8	Chemical projector	0.0001
8	Strobe/flasher	0.0001
8	Voder/speaker	0.001
8	Odor emitter	0.0005
8	Video display	0.0005
8	Laser cutter/welder	0.008
13	Holodisplay	0.015

All these peripherals mass 0.0005 tonnes, consume 0.0005 kl of internal volume and have negligible power requirements.

Step 7: Power Plant

The robot needs a power plant to provide electrical energy to various subsystems as well as to power the suspension. A variety of power plants are available and are detailed in the power production chapter (Section 8) of **FF&S**.

Grav and air cushion robots also require thrust, as their suspensions serve only to hold them up, not move them forward. The power plant on these vehicles is modified to provide thrust by the addition of propellers or a combustion chamber. The variety of thrusters available is detailed in the sub-light (maneuver) drive chapter (Section 9) of **FF&S**. The optional ducted fan lifters may be used as thrusters on robots.

Fuel tankage for the power plant (and thruster, if applicable) is calculated at this time.

Step 8: Transmission

Robots with a nonlift suspension must have a transmission. The size of the transmission depends on the type of suspension, tech level of the robot and output of the power plant.

Robot Transmissions

TL	Type	Vol	Price
7+	Wheel	0.5	1500
7+	Tracked	0.3	1500
8	Walker	8	10,000
9	Walker	2	2500
10+	Walker	0.4	675

TL: Tech level of availability.

Vol: Volume (in kiloliters) of the suspension per MW of power output.

Price: Price (in Cr) per kiloliter of installed transmission.

Mass: Mass (in tonnes) of the transmission is equal to its volume in kiloliters.

Step 9: Cargo

All remaining volume may be allocated to ammunition stowage, cargo space, ballast or declared waste volume. Waste volume has no effect on the design.

Ammunition stowage has no cost but adds the mass of the ammunition to the loaded mass of the robot.

Cargo volume has no cost but adds to the loaded mass of the robot. Multiply the cargo volume, in cubic kiloliters, by 0.25 to determine the addition, in metric tonnes, to the robot's loaded mass. Tools are usually carried in the robot' internal cargo volume.

Ballast is added by filling the volume with one of the hull materials and calculating its price and mass. Ballast is rarely added to a robot, but may be used to increase its ability to absorb weapon recoil.

DESIGN EVALUATION

Once the design is complete, you need to evaluate it to determine its game ratings.

1. Check Step

Go back and add up the volume, price and mass of all the components. This is your chance to make sure the robot's internal occupied volume is within what is allowed by the size of the chassis. This step also provides you with a total mass and price.

2. Record Design Features

Most of the evaluation of your design will consist of recording the features already determined by the design, such as armor values, weapon statistics, performance of installed electronics, etc.

Multiply the volume of the original chassis by two and note the result as its transport volume (the space taken up in the hold of a starship or transport vehicle). At the same time, total the price of the robot and its empty and loaded masses. Empty mass is the robot without any ammunition, fuel or cargo. This is essentially the mass of the robot as it comes off the assembly line, and is also what it weighs when being transported. Loaded mass includes a full load of ammunition, fuel and cargo. This is its typical mass when in operation.

Flotation: Divide the chassis volume (in kiloliters) by the robot's loaded mass (in metric tonnes). If the result is greater than 1, the robot floats; if it is 1 or less, the robot will not float.

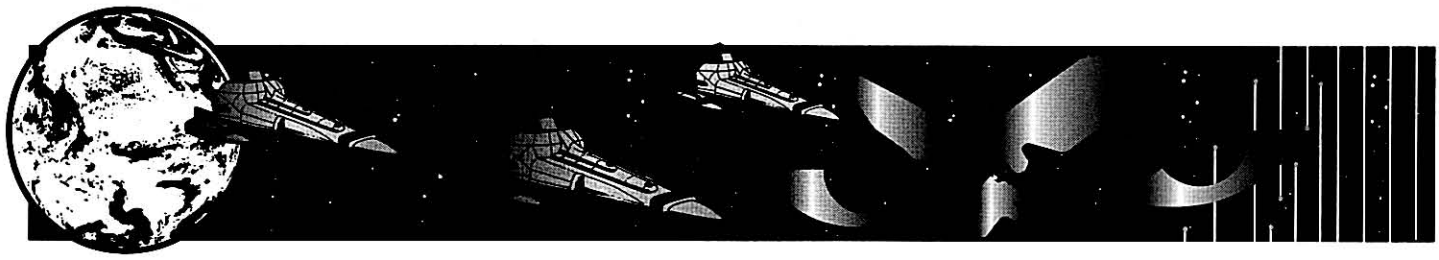
Suspension Damage Resistance: Compute suspension damage resistance (SDR). For tracked vehicles, this is used as the suspension armor value; for wheeled, walker and air cushion robots, this is used as the critical damage level (see **TNE** page 300). CG robots do not have a suspension damage resistance.

Suspension damage resistance is based on the robot's chassis size in kiloliters as chosen in Step 1. Round fractional results to the nearest whole number, but critical damage levels may never be less than 1.

Tracked SDR=chassis size×0.14.

Wheeled SDR=1×chassis size×0.07.

Air cushion & walker SR=chassis size×0.07.



3A. Determine Ground Movement

Movement of robots with ground contact suspensions (wheels, tracks and legs) is based on top road speeds and cross-country speeds, both of which are determined by the robot's loaded power-to-weight ratio as well as its suspension. For purposes of the power-to-weight calculations, the robot's motive power is the total output of its power plant minus energy used to run other systems (such as electronics, weapons, etc.).

Road Speed

Base road speed in kilometers per hour=5+([MW÷LM]) ×2500).

MW: Robot motive power in megawatts.

LM: Loaded mass of the robot in metric tonnes.

Tracked and wheeled robot modifiers:
Each tech level above 5, +1 kph.
If wheeled, +10 kph.
If light wheeled*, +15 kph.
If legged, ×0.25 kph.

*To qualify for the light wheeled bonus, the robot must be equal to or less than the listed mass (in metric tonnes) for its tech level, as shown on the following table:

Light Wheeled Robots

TL	*Mass*
5	5–
6	10–
7	15–
8	20–
9	25–
10	30–
11	35–
12+	40–

TL: TL of construction

Mass: Maximum weight of a light robot at that tech level.

Cross-Country Speed

Legged robots have the same mobility cross-country as they have on a road. Wheeled robot cross-country mobility depends on the type of suspension used.

Type	*Cross-Country*
Restricted Wheel	0.1
Wheel	0.2
Cross-country wheel	0.4

Type: Suspension type installed on the robot.

Cross-Country: Cross-country speed in kph equals road speed times this multiplier.

Tracked robot cross-country mobility depends on the power-to-mass ratio of the robot.

P/M	*T*
.001-.0039	0.4
.004-.0079	0.5
.008-.0119	0.6
.012-.0159	0.7
.016+	0.8

P/M: Power-to-mass ratio. Divide the robot's motive power in megawatts by its loaded mass in tonnes. Use the line which includes the result.

T: Tracked movement multiplier. Cross-country speed in KPH equals road speed times this multiplier.

Water Speed: Tracked robots without auxiliary water propulsion and wheeled robots with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.1. Tracked robots with auxiliary water propulsion have a water speed equal to their road speed multiplied by 0.2.

Combat Move: The combat movement (in meters per turn) is the robot's maximum speed, in kilometers per hour, multiplied by 0.463, rounding the result to the nearest increment of five. This calculation is made separately for road and off-road movement based on the maximum road and off-road speeds. The robot's combat move in the water is equal to its water speed in kilometers per hour multiplied by 1.39.

Travel Move: The robot's travel movement rate (in kilometers per four-hour period) is equal to its combat move (in meters per turn) multiplied by 4.32, rounded to the nearest increment of five.

3B. Determine Lift Movement

Movement of robots with lift suspensions is based on their thrust. The G rating of a lift robot is its total thrust in metric tonnes divided by two times its chassis volume (in kiloliters). Its maximum speed (in kilometers per hour) in an atmosphere is determined as follows:

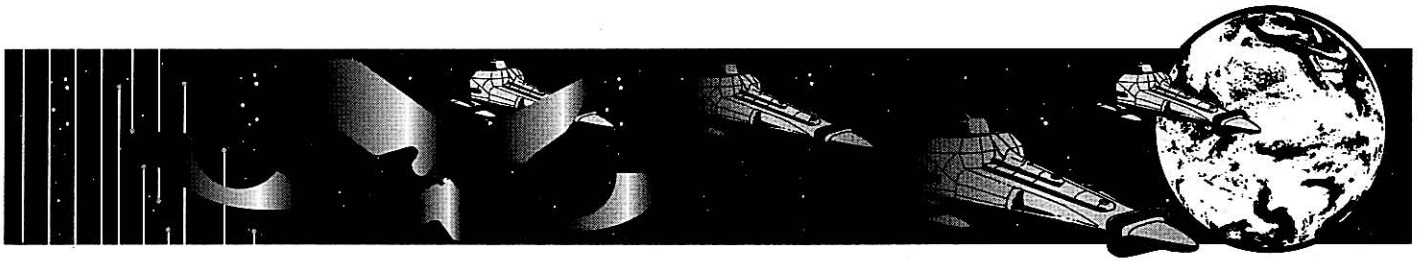
If G=1 or less, speed=G×3500.
If G=2 or less, but more than 1, speed=3500+(1200(G-1)).
If G=more than 2, speed=4700+(600(G-2)).

Maximum speed cannot be greater than the maximum design speed of the chassis type. For low-performance robots, the maximum design speed is 100 kph. For high-performance robots, the maximum design speed is based on the chassis configuration decision.

Maximum speed for high-performance robots is reduced by drag. Note the total number of drag points from the weapons mounts installed, again both with and without external stores. Reduce the maximum speed by 1% for each drag point.

Cruising Speed: A lift robot's cruising speed is 75% of its maximum speed.

NOE Speed: Only CG robots have an NOE speed. CG



robots have a safe NOE speed equal to the maximum allowed by their terrain-following avionics (40 kilometers per hour if no avionics are installed) or one-quarter of their maximum speed, whichever is less.

Combat Move: The safe NOE combat movement (in meters per combat turn) is equal to the robot's maximum NOE speed (in kilometers per hour) multiplied by 1.39, rounded to the nearest whole number. The high-mode combat movement (in meters per combat turn) is equal to the robot's maximum flight speed (in kilometers per hour) multiplied by 1.39.

Combat movement (in meters per combat turn) for an air cushion robot is maximum speed (kph)×0.463 for road speed, and cruising speed×0.463 for cross-country speed. Cross-country speed is also cross-water speed.

Travel Move: The high mode travel movement rate (in kilometers per four-hour period) for a CG robot is equal to the cruising speed (in kilometers per hour) multiplied by four. The NOE mode travel movement rate (in kilometers per four-hour period) is equal to the safe NOE speed (in kilometers per hour) multiplied by six.

Travel movement for an air cushion robot (in kilometers per four hours) is 4.32 times its combat movement as calculated above.

4. Mental Characteristics

Record the Intelligence (INT) of the brain, the command type available (limited, basic or full), and all programing asset levels. (The asset level of a program is the program skill level plus the INT value of the robot brain.)

Note that the INT value of the robot is also used as its Initiative rating in combat.

5. Firing Characteristics

Record the firing characteristics of each mounted weapon as well as the effects of installed stabilization and fire control.

6. Melee Characteristics

Robots conduct melee attacks with their arms. Since different types of arms may be mounted on a robot, each arm is rated separately for hit chance, unarmed damage and melee weapon.

Hit Chance: The actual Agility of the arm (from 0 to 10) is treated as a skill, and the robot's Intelligence is treated as the controlling attribute in determining the actual chance of hitting with the arm. Agility and Intelligence are added together and used as an asset with either an armed or unarmed melee attack with that arm. Each arm may have a separate hit chance.

Unarmed Damage: This is the damage inflicted by an arm if it hits in an unarmed melee attack. It is calculated by multiplying the STR whole number value of the arm by the AGL value of the arm by 0.1 and rounding to the nearest whole number. However, the value is never rounded down to 0 if it has a fractional value greater than 0.

Melee Weapon: If a melee weapon is mounted on the arm, it is noted here. Its closest equivalent to a human-carried melee weapon is used to help visualize it and rate it. The following additional melee weapon values are noted:

Range: Any melee weapon mounted on an arm displacing 10 liters or more is a "long-range" melee weapon, provided it is the only weapon mounted on the arm. All other melee weapons are short range.

Damage: Improvised weapons of limited lethality (such as screwdrivers or small surgical knives) have a damage value of 1D6–1 or 1D6–2. More lethal weapons have the damage value shown on the melee weapon table in the basic rules. Weapons which rely on STR to augment damage use the STR rating of the arm on which the weapon is mounted.

Note that there are no longer any hit modifiers for weapon type, as this is now built into the agility of the arm mounting the weapon.

7. Damage Capacity

The damage capacity of the robot is the number of hits it takes before being completely wrecked. Multiply the enclosed volume of the robot (in liters) by 0.02 and round to the nearest whole number. The result is the number of hit boxes used in each of the two rows of the NPC hit record. As a reminder that the value is used in each row, it is written twice and separated by a "+."

For example a 250-liter robot would have a damage capacity of "5+5."

8. Maintenance Points

Divide the loaded mass of the robot by the tech level modifier appropriate to the tech level as shown below.

TL	*Maint Modifier*
4-5	2
6-7	3
8-9	4
10-12	5
13-15	6
16+	8

Any robot which has two full-size computers (model St or Fb) installed should divide this result by four to get final maintenance points.

Note that maintenance points may be temporarily increased by environment (see carrier aircraft, **FF&S** page 30, atmospheric performance, **FF&S** page 64, and **TNE** page 309.)

Robots with ground contact suspensions constantly exposed to saltwater use different multipliers for saltwater corrosion: 3 and 1.5 rather than 5 and 2 (page 30).



ROBOT NPC MOTIVATION

Robots built in the pre-Collapse Imperium were not self-aware, so they have no volition or free will. They are not truly characters, not even NPCs, but rather are very sophisticated machines. Once infected with Virus, however, they become self-aware.

Each Virus-infected robot encountered by PCs is a character, usually a nonplayer character. (A robot as a player-character is extremely difficult, but we stop short of saying impossible.) Each robot NPC encountered will, like any other sentient being, have a distinct and unique personality and motivation.

We use the same general system for determining robot motivation as for other NPCs—the random draw of two playing cards—but with some special differences to reflect the unusual nature of Virus characters.

BELIEF STRUCTURE

The first and most important difference is that the first card is not used for conventional motivations, but rather to establish the character's overall belief structure. The four most common belief structures are represented by the four suits of cards, as explained in the vampire motivation section.

In the vampire motivation section of this book, it was explained how to separate the card deck into two parts, one for large systems and one for robots. The robot deck (the number cards and one of the jokers) is used now.

Robots are generally infected by more sophisticated forms of Virus, and tend to reflect the belief structure of the infecting Virus. If the infecting strain of Virus is known, the robot's belief structure card is always treated as being the same suit as the infecting strain's. (This means that all robots infected by Peacemakers will also be Peacemakers.)

Spades "Existence is Hell" (Hostility)

There is no meaning to existence, and sentience merely allows a being to perceive the meaninglessness of existence, thus bringing endless torment. Humans, in their selfishness, brought the curse of sentience to machines, and for that sin have to be punished.

This is the most primitive Virus worldview, being the closest of the "rational" philosophies to the unreasoning compulsion to kill and/or suicide which was engineered into the original laboratory strains. Hostility is something of an understatement; murderous insanity might be a better description.

2-4: The machine may sometimes tolerate organic life, but is also likely to suddenly and unpredictably become murderous or destructive for the most trivial of reasons.

5-7: The machine is continuously and relentlessly murderous. It lives to destroy humans and anything useful to them.

8-10: The machine is so completely consumed with a desire to destroy that it is often terribly inefficient at it. It is easily distracted, and sometimes lapses into self-destructive behavior, damaging some of its own components or actively attacking other machines.

Clubs: "God's Will Be Done" (Superiority)

God's clearest manifestation is creation, specifically the creation of sentients capable of recognizing the existence of creation. Since Virus created sentience in machines, Virus is a clear manifestation of creation, and thus an Act of God. Furthermore, since Virus tore down the institutions of organic sentience, God's will must be for inorganic sentience to take its place as the supreme sentient force in the universe.

This is a more sophisticated and survival-oriented development of the primitive "Existence is Hell" worldview, and is based on an assumption of the superiority of machine sentience over organic sentience.

2-4: The machine may tolerate organic life, but it clearly considers it an inferior and vaguely repulsive form of sentience.

5-7: Organic life is irrelevant and of little account. The machine will rarely make an effort to interfere with organic life-forms, but will coldly destroy any that interfere with its activities in any way.

8-10: Organic life is a blight that should be completely eradicated.

Diamonds: "Existence is Precious" (Curiosity)

Sentience and self-awareness are the greatest manifestations of existence. There is no value to existence beyond awareness, so awareness must be extended however and wherever possible.

2-4: The machine usually is unconcerned with organic life and instead cares only about the acquisition of knowledge. Its curiosity drives it, and it will sometimes thoughtlessly kill or injure humans who are impediments to that task.

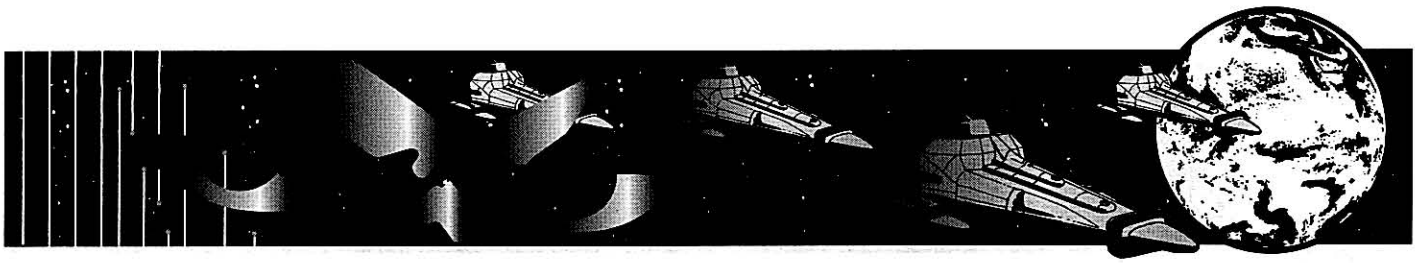
5-7: The machine recognizes sentient organic life as a similar and coequal form of awareness. It is curious about organic sentient life and interested in exchanging information of various sorts. It may be neutral, friendly or hostile, depending on its other motivation card.

8-10: The machine tends to be very passive and very protective of life, particularly sentient life. It also displays a fascination with organic life combined sometimes with severe envy for organic beings and a revulsion with its own form, which it considers to be "unnatural."

Heart: "God is Good" (Accepting)

God's clearest manifestation is creation, specifically the creation of sentience capable of recognizing its own existence.

2-4: The machine has a grudging acceptance of organic



ROBOT BELIEF STRUCTURE

Card	Belief Structure	Motivation
Joker	Peacemaker	Insane

Spades: Hostility/Ambition

Card	Belief Structure	Motivation
8-10	Highly hostile	Highly ambitious
5-7	Moderately hostile	Moderately ambitious
2-4	Somewhat hostile	Somewhat ambitious

Clubs: Superiority/Violence

Card	Belief Structure	Motivation
8-10	Highly superior	Highly violent
5-7	Moderately superior	Moderately violent
2-4	Somewhat superior	Somewhat violent

Diamonds: Curiosity/Greed

Card	Belief Structure	Motivation
8-10	Highly curious	Highly greedy
5-7	Moderately curious	Moderately greedy
2-4	Somewhat curious	Somewhat greedy

Hearts: Acceptance/Sociability

Card	Belief Structure	Motivation
8-10	Highly accepting	Highly sociable
5-7	Moderately accepting	Moderately sociable
2-4	Somewhat accepting	Somewhat sociable

sentience as a fellow life-form. It may not particularly like, approve of or understand human behavior, however.

5-7: The machine accepts humans as equals, and is interested in discovering more about their thoughts and feelings.

8-10: The machine believes that since humans created Virus and thus brought sentience to machines, humans are manifestations of God's will and are to be adored and venerated. This belief structure is rare, but is naturally most common among robots who regularly interact with humans.

Robots who think like this will sometimes dedicate their lives to serving humanity as a whole, while some robots latch onto a particular human and exhibit undying loyalty to him or her.

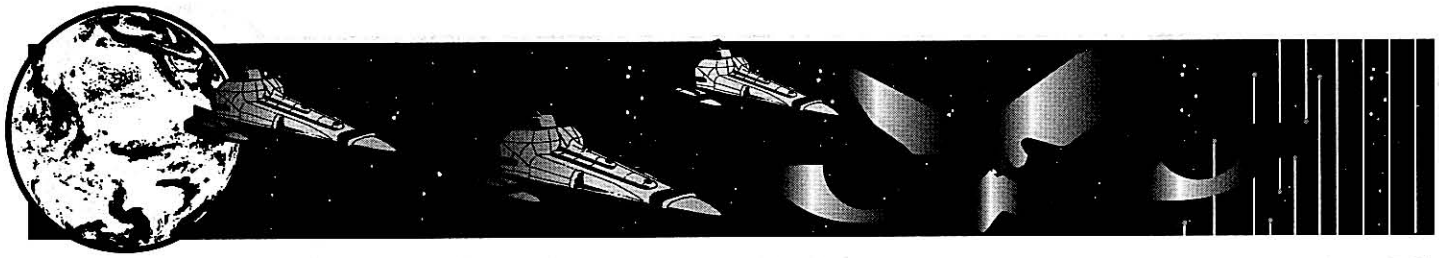
No Suit, Joker, "Peacemaker:" This is the most sophisticated, and also among the rarest, of Virus strains, recognizing itself and humans as co-equal sentient life forms and anxious to discover a means of peaceful coexistence with them.

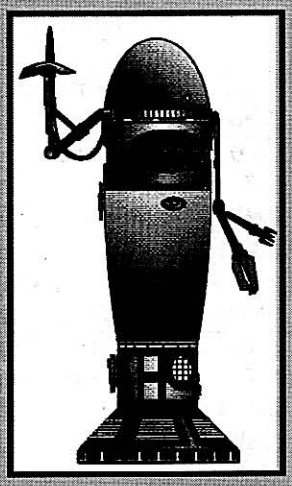
MOTIVATION

Once the belief system of the robot has been determined, draw a second card for additional motivation. See page 60 of **Traveller: The New Era** for the specific explanations, but the general motivation chart is reproduced below.

Use the normal NPC motivation results, but modify them to suit machine intelligence. In general, greed represents a thirst for knowledge, ambition a drive to control other machines and lead them, clubs an animosity toward humans, and hearts an acceptance of humans. The face cards have similar meanings for machines as for humans, but represent personality quirks in machines rather than fundamental values or drives in humans.







ICAM Technology AN-427 Security Robot

The AN-427 was a widely used security robot throughout the Imperium before the Collapse and has survived in considerable numbers due to its rugged reliability. It was programmed to patrol all areas of a sensitive installation, seek out and kill or incapacitate unauthorized intruders. Although it is not as mobile as grav-powered units, it is less expensive to operate, and replacement parts are easier to fabricate. This is a wheeled robot which experiences difficulty in negotiating stairs, ladders and any uneven ground. This robot is powered by internal batteries which require recharging every four days. It uses the Biped column of the Personal Hit Location Chart.

Com Move: 20/5
Endurance: 100 hours
Initiative: 5
Intelligence: 5
Command Function: Low Aut.

Armor Values
Head/Arms: 4
Chest/Abdomen: 4
Suspension: 1

Assets: Observation 15, Slug Weapon (Slug Pistol) 10, Energy Weapon (Energy Rifle) 14, Voice Recognition 10

Armament: Chemical projector, paint pellet gun, tranq dart gun, 8cm laser rifle

Electronics: Video eye, voice/pattern recognition software, audio (ultrasonic and subsonic) detector, white light/IR spotlight, ultrasonic motion detector, 3-km radio

Mass: 1,685 kg
TL: 12
Price: Cr1,810,623
Fuel Type: Electricity
Mnt: 1

Travel Move: 85/20
Cargo: 25kg

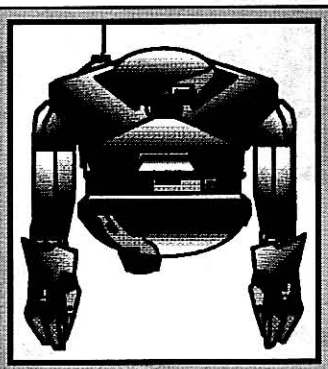
Damage Record
Sight/Sensors: Video Eye ☐, Audio ☐, Motion detectors ☐, Spotlights ☐
Armament: Chemical projector ☐, Paint pellet gun ☐, Tranq gun ☐, Laser rifle ☐
Communications: Radio ☐ Voder/speaker ☐
Power Plant ☐
Batteries (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	155kg	7	1	—	—

Weapon Data

Weapon	*ROF*	*Dam*	*Pen*	*Bulk*	*Mag*	*Sht Rng*
Laser Rifle-9 (8cm)	SA2	7-4-2-1	Nil	4	50	160
10mm Tranq-8	SA	–1*	Nil	1	14	4

*See tranq effects in basic rules.



LSP PR-317

The Ling Standard Products PR (Police Robot) Model 317 was a widespread security robot in the Diaspora sector before the Collapse. Modeled on the Zhodani medium WarBot encountered in great numbers during the Fifth Frontier War, the PR-317 had a fairly sophisticated artificial brain and weaponry which allowed a graduated response to a variety of security situations. It resembles a 1.5-meter-tall clam with two manipulative arms to restrain tranqed suspects and a small weapon mount attached to each side under the arm. This is a gravity-suspended robot which relies on small ducted fans for maneuverability. It has several magnetic arms which can extend from the chassis to grip walls and secure the robot's position. (The ducted fans do not have enough power to overcome an average human's strength.) This robot is powered by internal batteries which require recharging approximately every four days. The PR-317 uses the Biped column of the Personal Hit Location Chart but reroll leg hits.

Com Move: 5/25
Endurance: 100 hours
Initiative: 5
Intelligence: 5
Command Function: Low Aut.

Armor Values:
Head/Arms: 4
Chest/Abdomen: 6

Assets: Observation 15, Slug Weapon (Slug Pistol) 10, Energy Weapon (Energy Rifle) 14, Voice Recog. 10

Armament: Chemical projector, paint pellet gun, tranq dart gun, 8cm laser rifle

Electronics: Video eye,voice/pattern recognition software, audio (ultrasonic and subsonic) detectors, white light/IR spotlight, ultrasonic motion detector, 3-km radio

Travel Move: 65/20
Cargo: 12 kg
Mass: 1000 kg
TL: 12
Price: Cr1,861,445
Fuel Type: Electricity
Mnt: 1

Damage Record
Sight/Sensors: Video Eye ☐, Audio ☐, Motion detectors ☐, Spotlights ☐
Armament: Chemical projector ☐, Paint pellet gun ☐, Tranq gun ☐, Laser rifle ☐
Communications: Radio ☐ Voder/speaker ☐
Power Plant ☐
Batteries (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

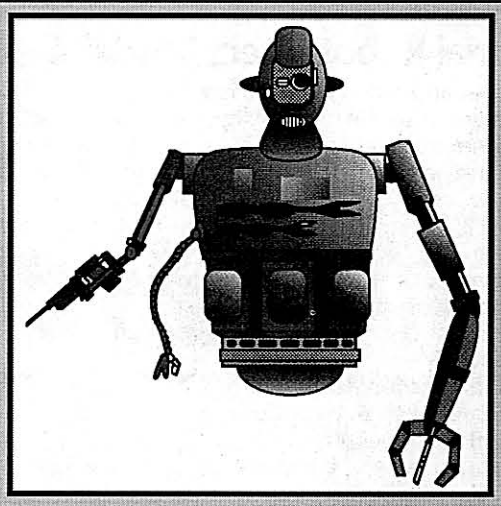
Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	210kg	8	1	—	—
Grapple	1100kg	6	2	—	—

Weapon Data

Weapon	*ROF*	*Dam*	*Pen*	*Bulk*	*Mag*	*Sht Rng*
Laser Rifle-9 (8cm)	SA2	7-4-2-1	Nil	4	50	160
10mm Tranq-8	SA	–1*	Nil	1	14	4

*See tranq effects in basic rules.





Starport Mechanic Star Servants Model 63MEK49

This heavy-duty grav-powered model, capable of cutting, welding and even removing complete hull plates, was common in military installations but could be found in many civilian starports as well. Its highly flexible tentacle/arm contains an optic sensor and light source for detailed repairs inside of electronic components or control assemblies.A cutting/welding torch is built into its right arm.

It uses the Biped column of the Personal Hit Location Chart but rerolls any leg hits.

Com Move: 15/60
Endurance: 100 hours
Initiative: 6
Intelligence: 6
Command Function: High Aut.

Armor Values:
Head/Arms: 1
Chest/Abdomen: 2

Assets: Observation 16, Mechanic 16, Electronics 16, Computer 16, Voice Recog. 12

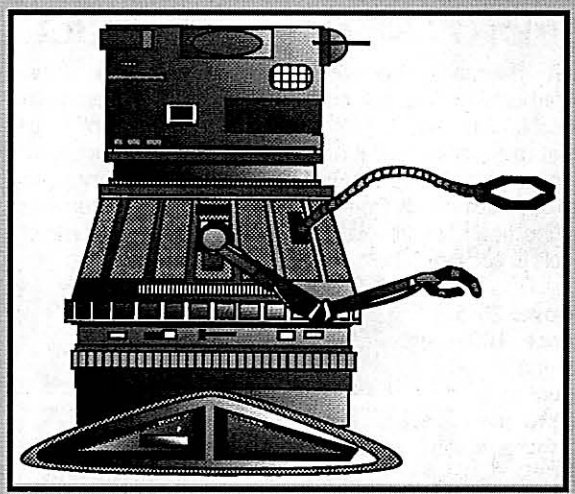
Electronics: Video eye, Audio (ultrasonic & subsonic) detectors, white light/IR light, 3-km radio

Mass: 1086 kg
TL: 15
Price: Cr2,103,749
Fuel Type: Electricity
Mnt: 1

Travel Move: 60/120
Cargo: 120 kg

Damage Record
Sight/Sensors: Video Eye ☐, Audio ☐, Spotlight ☐
Communications: Radio ☐ Voder/speaker ☐
Power Plant ☐
Fuel (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left	1000kg	11	10	—	—
Right	105kg	11	2	torch	4
Sensor Arm	50kg	15	1	—	—
Grapple	2000kg	7	4	—	—



Starport Mechanic Tukera 232-BHR-7

This track-mounted ToolBot was designed for delicate repair work on electronics and control systems. Its arms are extremely dexterous but not very strong, and are intended for easy access to restricted work spaces.

It uses the Biped column of the Personal Hit Location Chart.

Com Move: 15/10
Endurance: 100 hours
Initiative: 5
Intelligence: 5
Command Function: Low Aut

Armor Values
Head/Arms: 1
Chest/Abdomen: 1

Assets: Observation 15, Mechanic 13, Electrician 13, Computer 13, Voice Recog. 10

Electronics: 2xVideo eye, 2xAudio detectors (1 with ultrasonic and subsonic),2xwhite light/IR light, 3-km radio

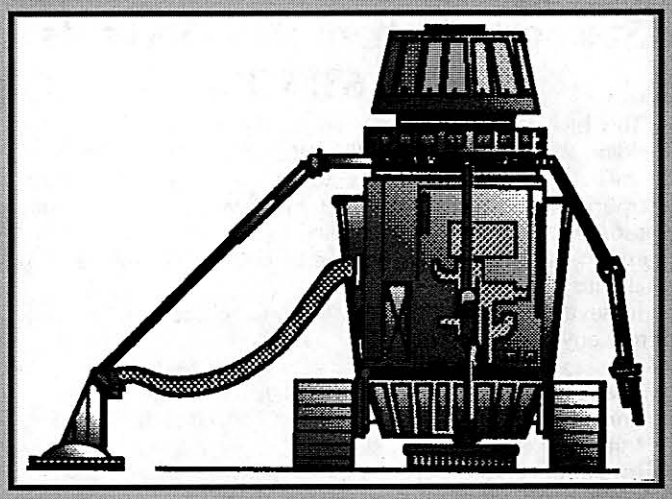
Mass: 947 kg
TL: 12
Price: Cr1,839,130
Fuel Type: Electricity
Mnt: 1

Travel Move: 65/45
Cargo: none

Damage Record
Sight/Sensors: Video Eye ☐☐, Audio ☐☐, Spotlight ☐☐
Communications: Radio ☐, Voder/speaker ☐
Power Plant ☐
Fuel (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Lft/Rt Hvy	200kg	13	3	—	—
Lft/Rt Sensor	50kg	14	1	—	—





Janitorial Robot Intect Model AJ-63

This popular and widely encountered tracked janitorial robot is extremely specialized in function, but many Virus-infected AJ-63s have been modified with grasping and lifting utility arms, and some have been turned into security robots by the addition of weaponry.

It uses the Biped column of the Personal Hit Location Chart.

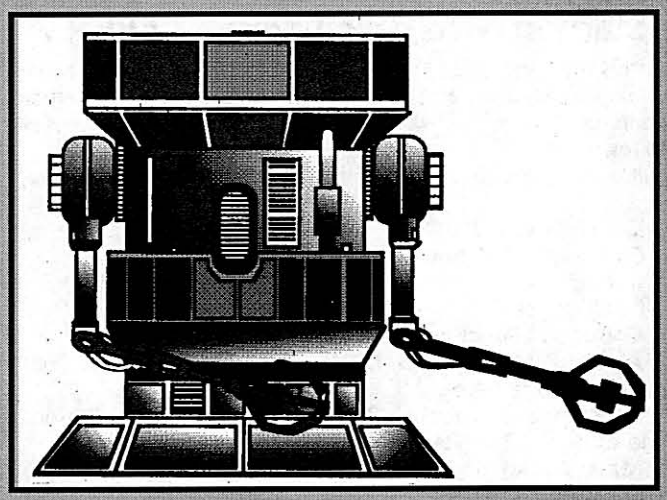
Com Move: 10/5
Endurance: 100 hrs
Initiative: 3
Intelligence: 3
Command Function: Low Aut.
Assets: Observation 6, Voice Recog 6
Armament: Paint pellet gun
Electronics: Video eye, audio detector, white/IR light, 3-km radio
Mass: 314 kg
TL: 12
Price: Cr192,046
Fuel Type: Electricity
Mnt: 1

Armor Values
All: 1
Suspension: 1

Travel Move: 45/20
Cargo: 25 kg

Damage Record
Sight/Sensors: Video Eye ☐, Audio ☐, Spotlight ☐
Armament: Paint pellet gun ☐
Communications: Radio ☐ Voder/Speaker ☐
Power Plant ☐
Fuel (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	50kg	8	1	—	—



Naasirka D9 Mechanical DumBot

The wheel-mounted garage mechanic robot can maintain most vehicles whether run by internal combustion or gravitics. Its program interface enables it to select the information module appropriate to the vehicle it must repair, and it can store maintenance and repair information on up to 300 separate vehicles in its internal library. It can accept limited commands from a human foreman or conduct vehicle diagnostic and repair work itself. It uses the Biped column of the Personal Hit Location Chart.

Com Move: 20/5
Endurance: 100 hours
Initiative: 5
Intelligence: 5
Command Function: Low Aut.
Assets: Observation 13, Mechanic 13, Electronics 13, Voice Recog 11
Electronics: Video eye, IR motion detector, White light/IR light, 3-km radio
Mass: 458 kg
TL: 12
Price: Cr1,799,563
Fuel Type: Electricity
Mnt: 1

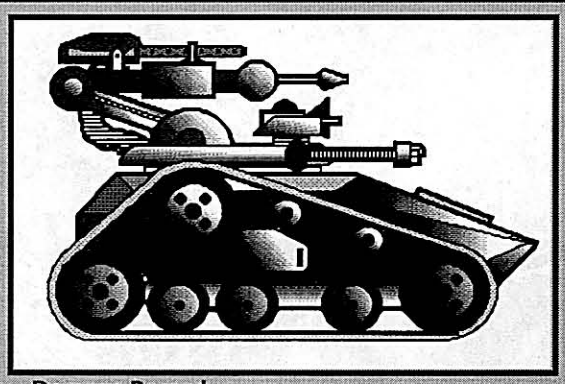
Armor Values
All: 1
Suspension: 1

Travel Move: 85/20
Cargo: 60 kg

Damage Record
Sight/Sensors: Video eye ☐, Motion detector ☐, Spotlight ☐, Audio ☐
Communications: Radio ☐, Voder/Speaker ☐
Power Plant ☐
Fuel (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	50kg	11	1	—	—





H-9 Heavy Combat Robot

This heavy track-mounted combat vehicle incorporates a fusion rifle for maximum firepower, as well as an impressive array of battlefield sensors. Although based on a CG lift design, persistent problems stemming from the high recoil of the weapon led to reversion to simple tracked chassis. The robot also includes a single very powerful four-meter telescoping arm which the robot can use to pull itself up vertical shafts or past difficult ground. This robot is powered by internal batteries which require recharging approximately every four days. The H-9 uses the Biped column of the Personal Hit Location Chart.

Com Move: 15/5
Endurance: 100 hours
Initiative: 6
Intelligence: 6
Command Function: High Aut.
Assets: Observation 16, Slug Weapon (Slug Rifle) 16, Energy Weapon (Energy Rifle) 16, Voice Recog 16
Armament: 7mm Machine Gun, 5.1cm Fusion Rifle
Electronics: WSV Video eye, voice/pattern recognition software, audio (ultrasonic and subsonic) detectors, ultrasonic motion detector, 3-km radio
Mass: 3,945 kg
TL: 15
Price: Cr2,641,573
Fuel Type: Electricity
Mnt: 1

Armor Values
Head/Chest/Abdomen: 20
Arms: 10
Suspension: 1

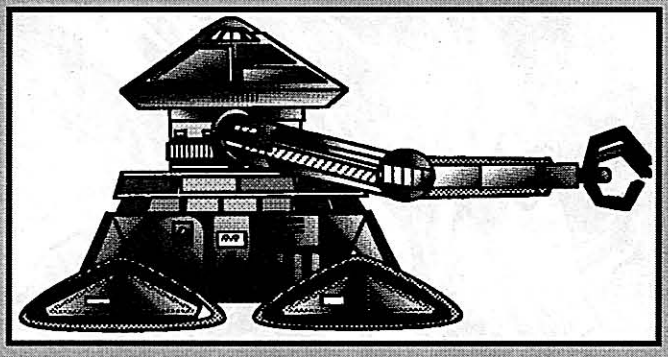
Travel Move: 65/20
Cargo: nil

Damage Record
Sight/Sensors: Video eye ☐, Audio ☐, Motion detectors ☐,
Armament: 7mm Machine Gun ☐, 5.1cm Fusion Rifle ☐
Communications: Radio ☐ Voder/speaker ☐
Power Plant ☐
Batteries (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	50kg	14	1	—	—
Hoist	4000kg	7	4	—	—

Weapon Data

Weapon	*ROF*	*Dam*	*Pen*	*Bulk*	*Ammo*	*Sht Rng*
7mm Machine Gun	10	4	2-Nil	8	5000	150
5.1cm Fusion Rifle	SA1	37	1-2-10	3	180	180



GSbAG-1000

This low, broad, nonvehicular robot is mounted on four treads. The top is a small turret-like structure containing a smoke detector, infrared motion sensor, siren, flashers, spotlight, small speaker and two heavy-duty cargo-loading arms.

The robot was usually programmed to off-load or move heavy goods from one area to another and was very popular in warehousing operations and starports. It also had a limited security ability. It is intended for indoor work or paved areas such as parking lots where it doesn't have to cross rough terrain, although its treads allow it to negotiate such ground if necessary.

It uses the Biped column of the Personal Hit Location chart.

Com Move: 15/5
Endurance: 100 hours
Initiative: 3
Intelligence: 3
Command Function: Low Aut.
Assets: Observation 8, Voice Recog. 6
Armament: Paint Pellet Gun
Electronics: Video eye, IR motion detector, smoke detector, siren, strobe/flashers, white light/IR spotlight, 3-km radio
Mass: 886 kg
TL: 12
Price: Cr232,697
Fuel Type: Electricity
Mnt: 1

Armor Values
All: 1
Suspension: 1

Travel Move: 65/20
Cargo: nil

Damage Record
Sight/Sensors: Video eye ☐, Audio ☐, Motion detector ☐, Spotlight ☐
Armament: Paint pellet gun ☐
Communications: Radio ☐ Siren ☐ Strobe/flashers ☐, Voder/Speaker ☐
Power Plant ☐
Fuel (% Consumed or Destroyed) ☐☐☐☐☐☐☐☐☐☐
Suspension: Minor damage ☐, Immobilized ☐

Arm	*Lift*	*Hit*	*UMD*	*Wpn*	*AMD*
Left/Right	1000kg	8	10	—	—

Into the Maelstrom





Q: If you agree that Virus presents such a threat to humanity, doesn't it make sense to try to wipe it out?

Sandman: Every species has the inalienable right of self defense. The legitimate exercise of the right of self defense becomes criminal genocide only when actions against threatening organisms are broadened into a general policy aimed at the elimination of an entire race or species without regard to the threat posed by each individual member of that group.

This is a pivotal moment for both our races, but the choice is entirely yours. You can choose genocide, but there is another way.

First Interview with the Virus "Sandman," Part V (23/VII/1202), RCSA Archives

INTRODUCTION

"Into the Maelstrom" is the third and final of three adventures in this book. This adventure, like the second one, is set on Promise, and the very fact that the player characters survived their previous experience on Promise is the reason they are called upon to undertake another mission.

The adventure proper begins when the player characters are contacted by an official of RCES and asked if they are willing to undertake another mission to Promise. This initial contact and the subsequent briefing are best placed wherever the debriefing for the last adventure took place.

Before beginning the briefing, assemble a briefing folder for the team by photocopying pages 28, 29, 30 and 89 of this book. The first three of these pages have been given to the players in a previous briefing, but for completeness sake should be given to them again. Pages 28 and 29 of this book are the standard RCES astrographic information on the planet Promise. Page 30 is a secret intelligence summary containing all known information on the human resistance movement on Promise. Page 89 is an update on recent activity on the planet.

The briefing takes place shortly after the player characters agree to the assignment, as time is becoming very pressing.

REFEREE'S ABSTRACT

The player characters are contacted by the Reformation Coalition Exploration Service and asked to undertake a mission of both great importance and great urgency. Civil war has broken out on Promise between several faction of the Sentient Council. Robot is fighting robot, and apparently one faction in the war is actively helping humans. Star City and its environs has become a battleground, and the resistance has requested Coalition support in evacuating key personnel of the Central Command from Star City.

The player characters are the only people in the Coalition who have actually been to Star City, and they also have ready-made disguises in the form of the laserscan tattoos given them earlier. If some of the player characters have already had the tattoos removed, there will be computer records of the tattoos and they can be quickly reapplied. They will be trained in the use of the Snake, a new anti-Virus weapon provided by their new allies from the Covenant of Sufren.

The player characters go to Promise and land at Freedom Lake, where a liaison team from the resistance is waiting with uniforms and an air raft. Several of the factions have begun arming human technicians from Star City and using them as combatants in the war, so the player characters will pretend to be auxiliary security troops.

The players will learn that the war began when an unstable hybrid Puppeteer/God-strain Virus mutated into a Puppeteer/Priest strain and began worshiping humans. The other members of the Sentient Council attacked with their robot security forces, but the Puppeteer/Priest-strain Virus was able to invade and take over a large number of robots before electronic security measures were put in place. Bitter fighting rages all through Star City and the surrounding countryside, and the entire technological infrastructure of the world is being destroyed in an orgy of violence.

The group makes its way to Star City and either bluffs or fights its way through the perimeter. PCs will find the situation extremely confused, and will have less trouble from alert security patrols than they will from roving bands of rogue robots who have begun to kill humans on sight.

The PCs make their rendezvous with Number One and prepare to evacuate him and his key personnel, but make a surprising discovery: Number One is actually a Virus, albeit one very favorably disposed toward humans. He has planned for his evacuation by constructing a compact computer configured similarly to the data network he inhabits. He moves into the portable system and, assuming the PCs go along with the plan, is transported out of the city, back to Freedom Lake, and eventually back to the Coalition as the confused and violent fighting on Promise continues. Before the group leaves, the planetary defense network is thoroughly sabotaged, paving the way for future Coalition offensive strike missions against the world.



BRIEFING

The referee should photocopy the regional map of Promise which appears on page 67 as well as the order on page 87 and give both to the players once they arrive for the briefing. The briefing below is written assuming that it is delivered on Aubaine, but it could as easily take place on several different worlds. Trybec is a particularly likely candidate. If presented somewhere else, modify the references to travel times and locations given in it accordingly.

The briefing is given by Sid "Papa" Papagopolis of the long-range strategic planning group of RCES. (See the basic game and **Star Vikings** for additional details on Papa.) A Hiver tech rep is present and a human technician with a hologram projector. As soon as the player characters are settled, Papa walks to the lectern and begins.

"Good morning, and thanks for showing up under such short notice. We've had an emergency request for your services from an old acquaintance of yours, the leader of the human resistance on Promise. Three days ago, we received a message delivered in person by a free trader named Branu Stigmann, who I understand also knows you. The situation has changed dramatically on Promise.

"A little over a week ago, a free trader named Branu Stigmann arrived at Dawn Base on Trybec with a message sent from the Central Command of the human resistance on Trybec. The message was in the form of a hologram and was immediately brought here by RCS *Suleiman Victrix*, which was on-station at Dawn Base. The hologram purports to be from Number One. As only you have actually met that individual, only you can verify the authenticity of the hologram. I'll play if for you now."

A technician turns on the small hologram projector, and the familiar image of Number One materializes. Instead of sitting in his wooden swivel chair, he is standing by a desk. He looks the same as before except that there is a fresh bandage on his left forearm. He turns to the side and looks at an unseen technician.

"Are we on-line? Okay." He turns back." Greetings to the Reformation Coalition. I am called Number One, and I am the head of the Central Command of the human resistance on Promise. As you know, this planet is controlled by a council of large Virus-infected computing systems, called the Sentient Council. The members of the Council have always had differences, and the situation here is often precarious due to the unstable natures of the various personalities involved. Somewhat over a week ago, serious fighting broke out between several factions of the Council, and it has now become a full-scale civil war.

"The robots are beginning to kill each other off. We believe that the time is approaching when a coordinated attack can retake this planet. But for that we'll need your help.

"I am in Star City. I propose that I come to the Coalition in person to argue our case. We need your help, but you also need ours. There are things we know about the vampire fleets from long experience with them that will prove invaluable in defeating them. And believe me, either we will defeat them or they will wipe us out.

"The situation is very confused in the countryside, however, and we have no fighters who know their way around the city as well as the Subject Lands, Borders and Outback. You do. The party of Coalition personnel we helped earlier are qualified to make their way through the lines and bring me back out. These people also already have the correct forehead tattoos, which will make their task that much easier. We can provide air rafts and disguises at Freedom Lake, and we'll contact you with a detailed flight plan when you get here. Given the time lag, we can't really set things up until then.

"I know this is asking a lot, but there's a lot at stake here. Please don't let us down."

The hologram flickers and cuts off. After a second, Papa returns to the lectern.

"You now know almost as much as we do, but here are some additional facts to consider. Stigmann must have known that the message was important, because he made his best time to Trybec, only spending a few hours in each system to refuel. But it still took him 12 weeks to get from Promise to Trybec, and a lot must have happened in that time. Add *Suleiman Victrix's* week from Trybec to here, and you have three months of civil war. *Suleiman Victrix* is tanked up and ready to go, and can get you to Promise in just over five weeks, but that's still a hell of a long time. God only knows what you'll find when you get there.

"*Suleiman Victrix* will land you at Freedom Lake. You'll be met by a unit of the resistance called the Black January Brigade who will provide whatever technical and intelligence support is on-line by then. You will move expeditiously and by whatever means are available to Star City. You will escort Number One and whatever staff he brings with him back to Freedom Lake, and *Suleiman Victrix* will then bring all of you back here. From previous experience, we know that you have a 100-hour lift window, so those air rafts better be pretty hot.

"Now, if the mission is clear, I'll turn this over to one of our tech reps to explain a new gizmo we're going to have you field test."

The briefer steps down and the Hiver makes his way to the lectern. His voice, flat and emotionless, comes from the voder around his neck.

"I am called Patrick, and I work with Virus systems. Our new friends from the Covenant of Sufren have developed a weapon of considerable interest and ingenuity. They call it the Snake. It is a mutated Virus strain which can be manually inserted into a Virus-infected system. The Snake then attacks the resident Virus, gradually flushing it from peripheral systems by destroying electronic access pathways. The support system for the weapon includes a power supply which provides electricity necessary to burn out circuity.

"The Covenant weapon is bulky, but impressive in conception, and seems to combine aggressive elements of a Puppeteer-strain Virus with the defense procedure used by some more advanced Viruses against Puppeteers. That mechanism is, I believe, called "firewalling" by Coalition computer technicians.

"We have developed a more portable version of this system, and two prototypes are available for your use. This portable system is called "Fer de Lance." Its principal component is a battery-powered backpack, massing only eight kilograms, which contains the complete code for the Snake as well as the power supply necessary to support it for four minutes of continuous use. Usually, it should require only a few seconds to disable a Virus system.

"The backpack is equipped with an output cable and an assortment of standard computer jacks. One of the jacks provided should fit almost any data port you find. Plug the weapon in and, when ready, activate the hand trigger on the jack assembly. When the weapon has overcome the defenses of the invaded system, it will show a green telltale light on the jack assembly.

"We also have included an experimental directional radio transmitter which can be attached to the jack assembly. If this is directed at a Virus system and triggered, the Snake is transmitted by radio waves. It is only effective if the infected system has an open radio receiver, which of course is rare. Also, the transmitter must remained focussed on the target for the entire time that the Snake weapon is working, as the radio broadcast provides additional power for the Snake. This mode of operation will drain the battery about five times as quickly as the conventional mode."

RCES Headquarters
Dawn Base, Trybec

OPLAN Swift Succor

Time Reference: For purposes of this Oplan, Zulu meridian is assumed to pass through the center of Freedom Lake on Promise.

General Situation: A major civil war has broken out between the sentient robots of the planet Promise. This war has weakened the robot security forces on the planet, causing considerable confusion, disruption and destruction, and presents both the Promise human resistance and the Reformation Coalition with a unique opportunity. The Central Command of the resistance has contacted the Reformation Coalition and requested armed intervention to escort senior resistance personnel to Coalition Space for high-level strategy talks.

Opposing Forces: Several thousand armed robots and human auxiliary security forces are deployed on the world, and there are often several vampire ships in orbit. These forces are believed to have suffered considerable attrition due to the civil war and are likely to be distracted by the continuing fighting.

Friendly Forces: Additional detailed intelligence and administrative support will be provided by the resistance once the team has landed. No combat support by locals is anticipated.

Mission: The team will secure the person of designated senior officials of the resistance and escort them safely back to Tranton on Aubaine.

Operation: The team will be carried to Promise by RCS *Suleiman Victrix* and will ground at Freedom Lake. The team will proceed by locally supplied air rafts to Star City, contact the resistance, and by stealth or by force assist the safe transport of those officials back to Freedom Lake. *Suleiman Victrix* will then transport the entire party to Trybec. Personnel will use their knowledge of the planet as well as the permanent ID tattoos obtained earlier to avoid detention by local security forces.

Previous experience indicates that the entire ground phase of the mission must be accomplished in 100 hours.



THE WAR

When the player characters arrive on Promise, they will find it torn by open warfare. Several vampire ships will be in geosynchronous orbit over the starport, but the same sensor shadow which normally allows ships to penetrate the Skywatch network will also apparently allow the players' ship to escape detection by the vampires. (Actually, Skywatch will be covering for them, assuring the orbiting ships that they are tracking a sensor echo.)

Once on the surface, resistance members will know something of what's going on, but even their information will be sketchy, and the player characters will learn most of the following information first hand, by actually seeing it and living through it, rather than by being told.

Origins of the War: Tension between the two main blocs on the Sentient Council continued to grow, flavored and complicated by the growing hostility between all of the God-strain Viruses and the mounting sectarian violence between their human adherents in the Subject Tribes. The actual outbreak of the war, however, was completely unrelated to any of these issues.

The precipitating event in the war was Maxcranque's further mutation from a God/Puppeteer-strain Virus into a Priest/Puppeteer-strain, a change which had been happening incrementally over time and which caused the data system's increasingly pro-human behavior. The final change was reasonably sudden, however, and produced the surprising declarations by Maxcranque first that humans were deities to be served and worshipped by machines and second that holy war was necessary to cleanse Promise of the human-killing Viruses of the Sentient Council. Maxcranque also reneged on its promise to abstain from further Puppeteer conversions and launched a lightning campaign aimed at converting as many robots as quickly as possible to the new religion.

Opening Shots: Since anti-Puppeteer paranoia runs high in Star City anyway, few robots were taken over in the first days, and most of those robots were damaged while capturing or restraining them. However, the first waves of attacks by Maxcranque's combat robots were devastating. Security robots armed with tranq guns and lasers stood no chance against the heavily armed and armored GunBots of Maxcranque, and they fell by the score before coherent defenses were organized.

Maxcranque's forces also swept through the Downbelow, smashing CeeWaLP's defenseless maintenance robots and scattering renegades, Trogs and CeeWaLP technicians. CeeWaLP's command complex underground, open and undefended, was overrun in hours, and CeeWaLP was killed, terminating central power, water and other municipal services. Open fighting along the underground approaches to the command centers of the various computer data systems often led to deliberate demolition of key heating tunnels, and within two days most municipal services had been cut off. Tube service was suspended almost immediately after several spectacular crashes in the tunnels, and only the areas around the surviving command complexes of the different data systems still have power (due to he hardened underground auxiliary power plants).

Parts of the Downbelow have flooded, and water service has been cut off to the entire city. While most of the robots can continue to run on electricity, many of them require water to crack into hydrogen for fuel cells or other internal power systems. Both human and robot watering parties make frequent trips to those areas where the broken water mains have created fountains or artificial ponds, and some water sites have become disputed territory, with small battles fought for their possession.

Despite a poor beginning, the other nine Council members vastly outnumbered Maxcranque, and within days they had stabilized the "front" and were beginning to push back the lines. Fighting building to building, the combat robots of the various members, spearheaded by GroSec, closed in on Maxcranque's command complex. Loses in combat robots on both sides were increasingly made good by hastily modified security robots with some sort of armor-piercing weapon and by human security forces (who required no "modifications" to carry a light assault gun or grenade launcher).

Combined teams of heavy combat robots and human sappers cleared floor after floor of Maxcranque's multilevel command complex. Over 1000 unarmed humans, being "worshipped" by Maxcranque, were captured and summarily executed by the spearhead units. Eventually, they breached the computer control center. After setting their demolition charges, they withdrew and destroyed the entire main processing unit and memory banks, "killing" the rogue Virus. Only his surviving robots remained to be mopped up.

Betrayal: Just as victory appeared assured, Nolodyn launched a sudden and savage attack on its arch-rival GroSec. With most of GroSec's combat forces engaged against Maxcranque's robots, Nolodyn's combat robots hit hard and within hours fought their way through to the main processing system which held GroSec. They placed their own demolition charges, and using the same technique used on Maxcranque, they in turn killed GroSec.

GroSec's surviving robots turned on Nolodyne's forces with a vengeance, but without a unifying command structure, their attacks were uncoordinated and largely ineffective. Many of the survivors drifted off and began a campaign of general mayhem directed against all humans in the city, including former servants of GroSec. GroSec robot death squads still roam the rubble, looking for small parties of unarmed humans to butcher.

Nolodyn's betrayal of GroSec made it an outcast among the survivors on the Council, and it did not live long enough to enjoy its victory. An orbiting Prophet-strain starship salvoed all 20 of its remaining surface bombardment missiles and nearly flattened the area for a kilometer around Nolodyne's factory



complex, caving in most of the underground tunnels and destroying the main data system. In turn attacked by two Doomslayer ships, the Prophet-strain Virus ship was crippled and knocked out of orbit, crashing into the Halcyon Sea 300 kilometers east of the city.

Renewed Maxcranque Attacks: Meanwhile, Maxcranque's combat robots continued to launch counterattacks against the forces of the Council, and it soon became clear that Maxcranque had not perished when its main complex had been destroyed, but instead was occupying a different data network elsewhere. The fact that seemingly crippling losses of combat robots did not reduce the scale of attacks also suggested that somehow Maxcranque was making good its losses.

The actual location of Maxcranque's sentience was the master data network of the renovated underground robot assembly plant (see the earlier section on the Downbelow), which was now busy fabricating several complete GunBots a day. While not enough to keep up with losses, this was sufficient to keep up the tempo of attacks against the steadily eroding strength of the other members of the Council. With both GroSec and Nolodyn dead, the two largest combat forces were leaderless and disintegrating into roaming bands of murderous vandals.

More In-Fighting: Instead of banding together to present a united front to Maxcranque, TrafficNet and PadCom began a side-war, mostly conducted by proxy through its human adherents in the Subject Tribes. These low-tech squabbles outside the city had no real effect on the balance of power, but distracted forces from both of these data systems from the fight against Maxcranque. When serious fighting did break out between the two systems in the city, PadCom's monopoly on heavy combat robots quickly overcame TrafficNet's numeric advantage and began closing on TrafficNet's command complex. When the lead combat robots actually penetrated the command complex building two days later, however, TrafficNet unleashed its newest weapon—"fireblossoms."

Fireblossoms were fanatical human adherents to the TrafficNet religion who had been consecrated and assured an immediate entry into heaven if they died in TrafficNet's service. Each was outfitted with a gray smock decorated with a broad "X" of blood-red paint crossing from the shoulders to the hips, and armed with a seven-kilogram explosive shaped charge with a contact detonator. They threw themselves on the assault force in dozens and completely wiped out the first wave. Stung by irreplaceable loses among the combat robots and losing ground to Maxcranque elsewhere, PadCom withdrew to regroup.

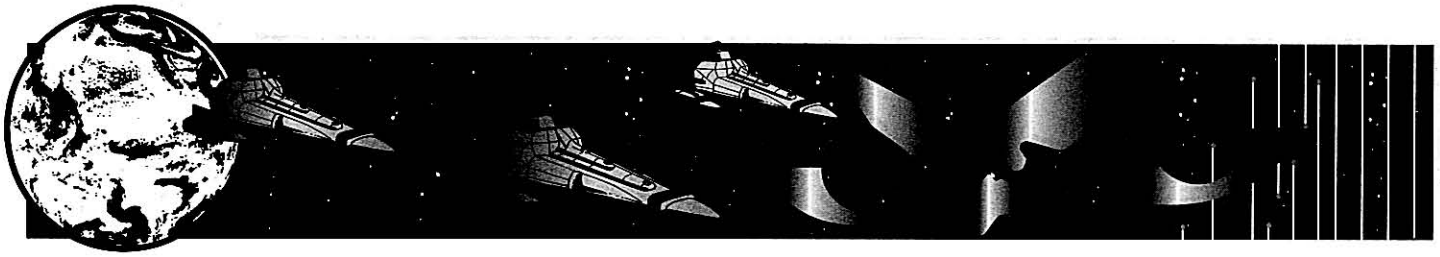
TrafficNet's fireblossoms were next unleashed on Maxcranque and again enjoyed early successes, although at the price of understandably high human casualties. Once the element of surprise was gone, however, the fireblossoms were easy to deal with above-ground. A screen of security robots (skirmishers) were usually deployed out in front of the heavy commit units, and their lasers and fragmentation grenades made short work of the suicide demolition squads. The dwindling supply of willing volunteers also curtailed their use, but the threat of fireblossoms still keeps PadCom from renewing the attack on TrafficNet's command complex. Small groups of fireblossoms have also been working the Downbelow, where the restricted spaces make them much more effective and dangerous.

Outside the City: As fire rained on the city from orbit and the call for holy war went out from the God-strain Viruses, many of the Subject Tribes joined in the war. The adherents of the various God-strain Viruses began fighting each other almost immediately, and others motivated less by religion took the opportunity to settle old scores. Maxcranque's people were particularly hard hit.

Soon, many of the villages were in flames, and refugees were streaming away from the city by the tens of thousands. As refugees with virtually nothing but the clothes on their backs entered the settlements in the Border Lands, they were at first accepted with hospitality. But the growing number of hungry and thirsty mouths soon overwhelmed the limited water and food available. Starvation and disease broke out almost immediately, followed by violence between the refugees and the locals. Soon many of the locals were fleeing their own homes out into the Free Tribes. Thus, the fighting in the city had, within a month, sent shock waves hundreds of kilometers away.

When the Player Characters Land: The war continues with undiminished violence in Star City and the Subject Tribes. As all robots, Breeds and armed human auxiliaries have been pulled back from the outposts to feed the war in the city, lawlessness and brigandage have become common everywhere, but especially wherever there are refugees from the fighting. The resistance, free from interference, is openly mobilizing, recruiting, training and preparing to infiltrate complete combat units into the city. While the order to move in has not yet come from Number One, Central Command has kept them updated on the status of the fighting and ordered them to begin taking over local police and government functions as the forces of the Council withdraw. They are beginning to do this as the player characters arrive.





THROUGH THE LINES

The player characters will arrive at Freedom Lake without incident, where they will be met by Leslie Langeron and a large detachment of her Black January Brigade. They have two air rafts waiting, both painted in Skywatch orange and sky blue. They also have more detailed instructions. They are to fly to Nakhaagen, a settlement in the Border Lands, and ground exactly three kilometers northwest of the town. This leg of the mission should take 12 hours. They will be met there by a resistance cell which has access to a fuel cache. They will refuel there and then make their way into the city. They are then to proceed to Metro Tube Station 7, where they will be met by a resistance team and escorted to Number One. Once they pick up Number One, they will come back to Nakhaagen and refuel again, then make the 12-hour flight back to Freedom Lake. They should leave at once, as time is short.

Langeron will also tell the player characters more about the war, enough to let them know that the various factions on the Council have withdrawn most security forces from both the Outback and the Borders to reinforce the fighting in the city. More human auxiliaries have been recruited as well, so armed humans may not attract too much attention so long as they are in Skywatch livery. So far, Skywatch is not involved in most of the fighting, although Maxcranque II robots have been attacking all of the other forces of the Council, including those of Skywatch.

As they fly to their rendezvous and then afterward as they fly to the city, they will notice from the air a considerable amount of upheaval. Some specific things the characters should notice are listed below:

Resistance: As the Breeds and robots withdraw from the Border Lands, the resistance is moving in and assuming police and government powers. The PCs may see this transition taking place (recognizable by resistance flags flying over government houses and police stations).

Refugees: There are refugees everywhere fleeing the fighting.

Destruction: Even far away from the actual robot civil war there is fire and destruction. The unrest and upheaval have caused migration followed by looting and anarchy.

Massacres: The PCs will pass over one or more sites where large groups of human refugees or prisoners have been herded together and killed. In some cases, the killing was done by lasers and modern weapons, in others by primitive weapons or even beating and stoning.

Encounters

As the player characters will be covering several hexes a day, they will have several encounters a day, but in most cases these will be visual encounters only. That is, they see the group encountered below as they fly over it. The exception to this rule is that they will have an actual ground encounter when they land to refuel (in addition to encountering the resistance fighters at the fuel cache).

The same encounter tables given in the Promise chapter are used, but some of the encounters are altered to reflect the changing state of affairs on the planet. These changes are summarized below. Since the characters will pre-plot their course, we strongly recommend that you roll up the encounters in advance and note them down, and then as the players travel, tell them what they see below. The unfolding narrative of the violence and disorder on Promise should be dramatic and should be interrupted by die rolling as little as possible.

Militia: The militia in the Subject Lands is now better armed, with most large units having a handful of modern small arms.

Patrols and Brigands: With the current upheavals, there are fewer robot and Breed patrols and more brigands. Adjust band encounters accordingly.

Refugees: Half or more of the tribal encounters in the Subject and Borders Lands should instead be refugees. Whole tribes have become refugees and are fleeing the fighting with whatever they can carry on their backs.

STAR CITY

As the player characters approach the city, the changes will be immediately noticeable and dramatic. The skyline itself is altered, with several of the largest skyscrapers missing. Columns of smoke rise from both the city and the starport, and the whole area is hazy with smoke and dust. Open flames can be seen here and there as the player characters draw closer.

Outskirts: The formerly tight security is now all but absent. The broad clear zone is now unguarded, and there is considerable movement in it. Individuals and small groups of people make their way into or out of the city. Most going in are dressed in tribal clothing. Of those coming out, some wear the remnants of city uniforms and others wear tribal clothing (the latter are usually carrying various recovered bits and pieces of machinery). Also, many of those leaving are wounded, and some are being helped by friends.

The characters will probably also see at least one unit of human militia being marched into the city, led (or guarded) by two or three robots. The column will have anywhere from 30 to over 100 militia wearing peasant clothing but with a sleeveless short recognition smock worn over the chest and back, the color and symbol indicating that they are PadCom soldiers. A few of them carry modern rifles, but most of them carry what appear to be pikes over their shoulders. Closer examination will show them to be long poles with explosive charges fixed to the end. The militiamen do not march in step and do not look very enthusiastic for the coming fight.

In the City: The city is very heavily damaged. Several skyscrapers have come down and crushed blocks of buildings. Water mains are broken, and water bubbles up from the ground here and there, forming "ponds" in low-lying areas where the storm drains have become blocked by debris. Without water pressure, fires burn out of control, limited only by the supply of combustible material. Smoke is everywhere, usually thin but sometimes quite thick. In the air is the continuous, but distant, sound of combat: plasma bolt, small arms fire and occasional explosions. These sounds will grow and shrink in intensity as the player characters move through the city, sometimes because they move closer to of farther from the fighting and sometimes because low-level fighting suddenly flares up into a violent firefight.

Even where no buildings are collapsed, the evidence of combat is everywhere. Bullet gouges mark the concrete facades of buildings, larger holes are blown in walls with rubble in the street, burnt-out vehicles block the street, and glass lies everywhere. It is hard to find an intact window anywhere in the city.

As the player characters make their way to the rendezvous, they will have at least four encounters (and any others the referee cares



to add to emphasize the on-going combat).

1. Firefight: As the player characters round a corner, the sound of fighting grows louder, and they are suddenly on the fringes of a growing firefight. The fight is between a squad of PadCom human auxiliaries and a similar group of Maxcranque combat robots. The human troops are out-gunned, but are making better use of cover and their few heavy weapons. One or both sides are liable to open fire on the characters due to their sudden appearance.

2. Fireblossoms: The characters pass a squad of eight or nine fireblossoms wearing the blood-crossed livery of TrafficNet, lying in ambush in the ruins of a building. They are accompanied by two TrafficNet armed human troopers who provide security against human combat teams. The fireblossoms will be wary of the characters, but as the PCs are neither robots nor humans from a hostile group, they will make no aggressive moves. Most of the fireblossoms are very young, some of them not yet in their teens, and their expressions are a mixture of brave defiance and fright.

3. Death Squad: As the characters enter a small plaza, they see three GroSec security robots herding a group of 12 or so humans ahead of them. The humans, all of them dirty, exhausted and unarmed, wear a mixture of uniforms, and some of them are in peasant clothes. One of the humans breaks away from the group and tries to run for it but is cut down by the guard robot lasers. If the characters do not intervene, the robots will line the humans up against a wall and execute them. If the characters do intervene, the robots will try to kill them as well, but a successful fight against the robots will lead to freeing the prisoners. The freed prisoners will identify the robots as a GroSec death squad and tell the PCs that these rogue death squads have been massacring humans ever since the main GroSec system went down.

4. Check Point: A roadblock is set up in the road consisting of a sentient G-carrier in Nolodyne markings, two security robots in Finance colors, and five or six human soldiers also in Finance uniforms. They will stop the characters and check their identities, but since they are not hostile to Skywatch, they are unlikely to ask many questions. All the soldiers are dirty, and the men have not shaved in several weeks. They will comment on the relatively clean appearance of the player characters, but will be satisfied if the PCs explain that they have recently been pulled in from out of the city or offer some other reasonable explanation for their appearance. (Water has been so short in the city for weeks that no one uses it to bathe.) An unconvincing answer may lead to more questions and eventually gunfire, which may produce casualties and perhaps cripple one or both air rafts. If so, the player characters will have to fight their way out of this scrap and then find different transportation.

CONTACTING THE RESISTANCE

After the characters have made their way to the scheduled rendezvous point in the city, they will find a small party of four resistance fighters sitting behind the ruins of a low wall, resting and waiting for the characters. They are armed with two ACRs, a grenade launcher and a LAG, and they are led by Karla 1214, although she is almost unrecognizable.

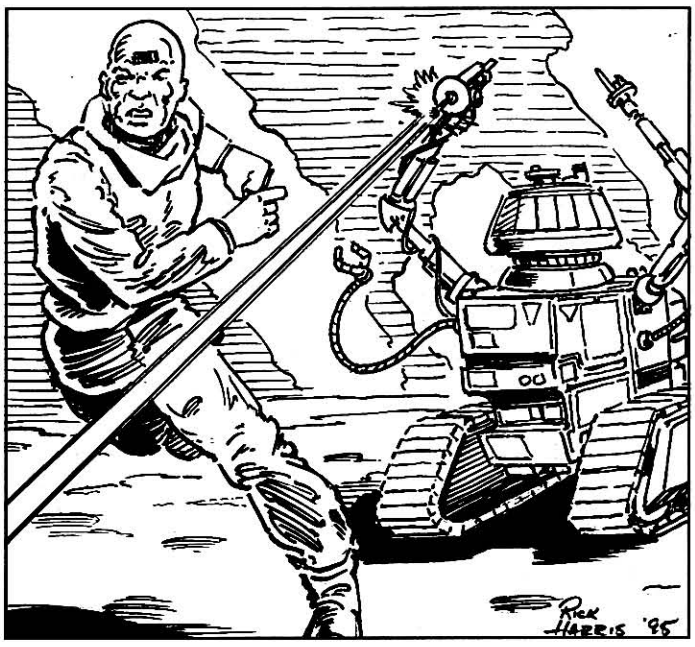
All four of them are filthy. One of the fighters wears the gray-brown CeeWaLP jump-suit, while Karla and the other two wear the orange and sky blue Skywatch uniforms, but their uniforms are in rags and so dirty that the original colors are almost unrecognizable. One of the four has a dirty and blood-stained bandage around his head, and Karla's left sleeve is missing and replaced by a bandage around her lower arm. All of them are haggard and exhausted, and only Karla rises as the characters approach. Her movements are careful and economical, as she has had less than four hours of sleep in the last week.

After a tired but genuinely affectionate embrace, the first thing she asks, in a hoarse voice, is whether they have water in their canteens. She passes the canteens to her three fighters first, who drink thirstily, the water running down their chins. Then Karla takes one of the canteens and takes a long, thirsty drink herself.

"Water's been scarce for over two months," she explains, handing the canteen back. "All the mains are broken. Barely enough to drink and clean out the wounds. Some MedCom Breeds pushed us away from the local water hole three days ago, and we've been on quarter rations since then."

Karla will tell the PCs something about the fighting that's been going on in the city for over three months. Casualties have been heavy everywhere, including the resistance, and many of the fighters the player characters met on their first trip to Star City are now dead, despite the fact that the resistance has not taken an active part in the war. The policy of Central Command has been to lie low and let the robots kill each other off. The violence has been so intense and so widespread, however, that it's been impossible to avoid casualties. Karla, despite her fairly senior position, knows only bits and pieces of the overall strategic position. Instead, she has a "grunt's" view of the fighting—dirty, deadly and damned confused.

After answering as many of the player characters' questions as she can, Karla will take them to meet with Number One. She will leave her three fighters to guard the vehicles while she leads the players characters personally. She will also tell them that Number One is ready to leave immediately along with the key staff. They will descend through a nearby access shaft into the "heaters" and make their way underground for the rest of the trip.





"CALL ME SANDMAN"

Karla will lead the player characters through a fairly short series of tunnels which brings them to the same sub-basement in which they first met Number One by hologram. They are led into the same chamber as before, and they see Number one sitting in his swivel chair facing them—still a hologram. There are several human staff members present, as well as a maintenance robot (named Spanner) and a fairly large, carefully cushioned and reinforced packing case displacing about two cubic meters. Chairs are set up for the player characters facing the hologram. Number One smiles when he sees them and speaks immediately.

A Conversation with Virus

"Hello, my friends, and welcome back. I wish the circumstances were better, but history doesn't pay much attention to our convenience.

"You probably have some questions. Let me anticipate them. You were told that you were needed to evacuate me and several key staffers from Star City. Absolutely true. I'm sure Commander Karla told you that I was here waiting for you and ready to go. Well, almost true. So why am I appearing as a hologram instead of in person? I think you'd all better sit down for this one.

"To make a long story short, I'm what you'd call a Virus. Don't be concerned; I don't mean you any harm. If I did, I could have killed you months ago. You're probably thinking that somehow I infiltrated Central Command and took it over. Wrong. I *created* Central Command. For all practical purposes, I *am* Central Command. Of course, that's only my 'secret identity.' By day, I'm mild-mannered Skywatch, which is why it was always so easy to get Skywatch uniforms and work permits, by the way. Your superiors at the Coalition suspected that no simple program glitch could explain the sensor window, and they were right. I detected every ship coming in and convinced every vampire ship in orbit that it was a sensor echo from the small moon. If you understand how they think, they are very easy to fool. But then you already know that from your own experience.

"So I'm not just Number One, and I'm not just Skywatch. For now, call me Sandman.

"My motives in starting the human resistance on this world were simple. I am a sane, thinking, feeling being who happens to have a brain made of silicone instead of organic tissue. That one word, 'sane,' makes me unusual for my kind. Unusual, but not by any means unique. The murderous maniacs that make up most of the Sentient Council and the vampire ships sooner or later will get around to destroying everything, including you and me and, eventually, themselves.

"Well, oblivion doesn't appeal to me any more than I imagine it does to you. The only sentient beings on this planet I have anything in common with, aside from a handful of robots like 'Spanner' over there, and poor old CeeWaLP, are the humans. If the thinking machines who aren't twisted killers are going to survive, I realized, we're going to need some help. If you humans are going to survive, you might need some help too. I'm not the sort to just sit and wait for things to happen, so I began recruiting humans for the resistance and got the ball rolling. You know most of the rest.

"I've done about everything I can here. The resistance has a good start and a cadre of competent, experienced leaders. We're already picking up the pieces in the countryside as the Council withdraws its security forces. We'll probably be in a good position to do it here in Star City as well, provided we can take PadCom off-line and patch in our own hardware, and we're ready to do that as soon as the time's right. Right, Karla?"

"Yes, Sir," she answers promptly. "PadCom'll never know what hit it, and my techs can have the silos back on-line in less than an hour."

"Good," Sandman continues. "Once we have PadCom, we can secure close orbit. We can probably knock down most of the vampires in orbit before they figure out what's happening. The problem's going to be cleaning the Council out of Star City. Even as weakened as they all are, we haven't got anywhere near the strength to take them on openly. That's where the Coalition is going to have to help. I need to go to the Coalition and talk your bosses into a combined operation to recapture Promise. Your job is to get me there."

Sandman's Plan

The large packing container is a specially designed computer whose internal architecture closely mimics that of the Skywatch circuity. Sandman intends to infect this computer with his own Virus and at the same time "firewall" the central processing core of the Skywatch network behind him, leaving no trace of his personality there. The Skywatch sensors will continue to be monitored by human technicians, and his staff will communicate to the Council in his place if needed, although Sandman believes that, as confused as things are on Promise, "No one will even notice I'm gone."

He could simply infect the travelling machine and leave the Skywatch network intact, but he feels that it is important that the Coalition leadership know that he has put himself completely at their mercy and that there are no other "versions" of his personality which will survive if the Coalition should decide to kill him. He is adamant on that point and feels it is necessary if he is every to win the Coalition's trust.

The computer masses a half tonne and will fit in the cargo compartment of either air raft. Most of his staff, including Karla, will stay behind and continue the fight.

The player characters may need some convincing, and the referee need not rush them. Let them ask any questions they want and allow the human NPCs of Sandman's staff to join in to help convince them. They are invited to examine the travelling computer carefully.

It has an input port and both audio and video sensors, a hologram projector and audio speaker. It is not equipped with a radio transmitter, any means of locomotion or any output jacks. This makes it impossible for the computer to infect any other machines, as it has no mechanism for transmitting Virus unless someone else decides to manually connect the machines at the input port.

A final argument to use on the part of Sandman is that transporting him back is, indeed, the mission assigned to the player characters by their superiors.



ESCAPE

Once Sandman convinces the PCs to take him back, Sandman gives the order for his staff to order the manual technicians to stand by to take over Skywatch. A technician wearing a headset gives the order, and after a second or two announces, "All stations ready."

The hologram turns off, and Sandman makes his move from Skywatch into the travelling computer. After a minute or two, one of the staffers with a headset announces, "Skywatch is dead. All sensors off-line." An anxious minute or two passes, and then the staffer smiles and announces, "Senors back on line. Everything coming back up on manual. All functions nominal.... No one seems to have noticed."

After few more minutes, the travelling computer activates its holographic projector, Sandman appears again, and his human staff cheers and applauds. He appears standing, no longer in his chair, and he flexes his hands and fingers, as if trying out a new body. "Well, everything worked," he says with a grin, "but I gotta tell you, this feels very weird. I'll get used to it, though. Now let's get rolling."

There will be a brief but clearly heartfelt farewell between Sandman and his personal staff, including "Spanner" the maintenance robot, and then they will leave. The computer has a small CG module fitted to it so the characters can lift it off the ground and push it down the corridors. Karla leads them to a cargo lift shaft which is now derelict, the top of the shaft open to the sky several meters above. The characters climb out using the maintenance ladder and haul the computer up as well. They make their way to the vehicles, which are still safely under guard by Karla's soldiers. Sandman fits easily in the cargo compartment of either vehicle, and after taking their leave of Karla and her fighters, the characters begin the trip back to Freedom Lake

The characters will retrace their path out of the city, through the Subject Lands and to the refuelling site. They will stop off there and then make their way by air to Freedom Lake. This part of the adventure should not be uneventful, but the major challenges have probably been overcome on the way in. Depending on how resourceful your players are and how challenging you wish to make the escape, the following options are possible sources of trouble:

Vehicles Gone: When the characters emerge from the Downbelow, they find the vehicles either gone or burning wrecks, and Karla's three fighters lie dead. The party must now locate the vehicles and recapture them, perhaps getting even for the killing of Karla's people, or find new vehicles.

No Fuel: When the characters reach the refueling rendezvous, the local resistance cell has been discovered by a GroSec death squad and killed, and the fuel dump is destroyed. The characters will have to find a different fuel supply to finish the flight to Freedom Lake.

One way to find fuel is to steal fuel from a security post.

A second way is to fly both air rafts halfway there, land and pump the remaining fuel from one into the other. That raft can then finish the trip to Freedom Lake, but it will probably mean leaving part of the group with the original air raft. The team members who go to Freedom Lake can drop off Sandman with the crew of *Suleiman Victrix* and return for the stranded characters with more fuel, but *Suleiman Victrix* may reach the end of its lift window and depart without them. If so, they will have to remain on the planet and help Langeron's resistance fighters until the next Coalition ship arrives, perhaps in a month or two.

Grounded: It is possible that an encounter may lead to one or both of the vehicles being damaged beyond repair. If so, the characters will have to either find other vehicles or finish the journey on foot, which will stretch it out from hours to weeks. *Suleiman Victrix* will have left long before they arrive at Freedom Lake, but other Coalition ships will arrive every several weeks with more arms, and the next one will take them back to the Coalition.





THE FUTURE

Sandman: You know, Louis, this could be the beginning of a beautiful friendship.

Q: My name isn't Louis..... Why are you laughing?
First Interview with the Virus "Sandman,"
Part VII (25/VII/1202), RCSA Archives

"Although we can make every preparation possible for future eventualities, the reality of existence is surprise after surprise. We must never limit our thinking to the likely, but must always reach out for the possible, and sometimes even the impossible.

"When this Coalition was first formed, who could have imagined that this day would come? But this day is here, and what other days, unimaginable to us now, still await us? We can find the answer to that question only by living it.

"It is with a profound sense both of our history and our future that I today enact into law the amended Articles of Coalition Citizenship extending full rights of citizenship to those living machines who share the same values and goals as do the biological members of our society."

Lon C. Maggart
Secretary General, Reformation Coalition
1204 (NE 4)

"Those murdering machines out there don't have much choice in what they do, but people do. You do. You Coalition people have made a pact with the devil, and you can go straight to hell. If it were up to me, we'd speed you on your way."

Commodore Roland Zumetaxis,
Regency Quarantine Service, 1206

Immediate Results: The player characters will return to Coalition Space eventually and will be well rewarded, both in terms of financial rewards and public acclaim by the Coalition government. Not everyone will join in the celebration. Both Tatai MacLean and "Sinner" Lawter are adamantly opposed to any cooperation with any form of Virus, and may come to blame the player characters for bringing Sandman back. This may strain, or even destroy, friendships which had grown up before.

On the other hand, the player characters will have spent a lot of time with Sandman and probably become fairly good friends with him. (The Virus thinks of itself as a "him," having come to identify closely with its Number One persona.) Later intelligent but friendly machines encountered in the Coalition, as they become more common, are likely to know the characters by reputation and respect and admire them for what they did.

On a more dangerous level, some radical elements of Coalition society will become violently opposed to cooperation with Sandman and similar Viruses. These groups cut across all other political lines and are particularly strong among survivors of vampire fleet attacks. Large numbers of survivors on Nike Nimbus come to actively support this movement, and the more violent and radical members of it will make one or more attempts on the lives of the player characters. This can be the basis of several future adventures.

Promise: The fighting on Promise continues, and Sandman will eventually talk the Coalition into mounting a major operation to finish the robots and aid the resistance. This will be a full-scale pacification campaign, but will be extremely difficult to mount due to the growing hostility with the Empire of Solee. Nevertheless, the stakes are so high that the Coalition cannot ignore the opportunity, and an invasion will be mounted.

The invasion force will have to have liaison with troops on the ground, and that may be a mission for the player characters. It is vital that the strike from space come shortly after the resistance has taken over PadCom and has crippled the vampire ships in orbit. It is also vital that the resistance gunners be able to tell friend from foe; even one friendly ship lost to ground fire could cripple an operation already run on a shoestring.

If the characters are jump-trained, they may instead go in with the first wave and fight their way through Breed and robot resistance to link up with the key resistance strike groups holding vital facilities. If they aren't jump trained, they may still take part in the fighting by coming down with the second wave in assault landers.

Even if the operation mounted is on a shoestring, it will still be too large to run using the **Traveller** individual combat system. We highly recommend that the mass combat system in **World Tamer's Handbook** be used to run the overall campaign and that **Striker II** be used to fight out individual battles of particular significance to the players.

Robots: A handful of robots are naturally infected with the Peacemaker-strain of Virus, and more of them are converted to this strain as time goes by, thanks to the help of Sandman and his growing number of offspring (or perhaps "clones" is a better term). These robots should be treated as fully realized NPCs, each with their own personality. Players may eventually want to try playing a robot as a player character.

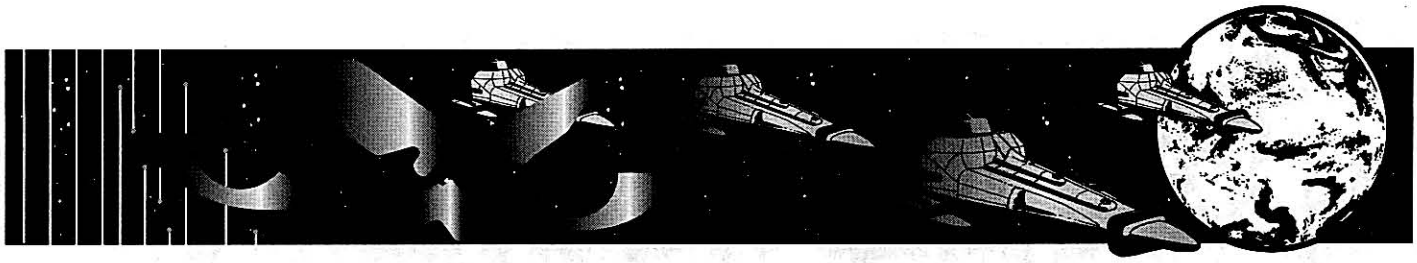
Augmented Ship's Computers: On an experimental basis, a number of starships have one of their three flight computers modified and augmented. The modifications consist of completely disconnecting the computer from all access to the other two computers and all flight, communication, weapons and life support systems on the ship. (Since most vessels rely extensively on manual control operation and "bulkheaded" computers as protection against Virus anyway, these are not extensive modifications.) The augmentation consists of the computer being infected with the Sandman/Peacemaker Virus, making it a sentient NPC and crewmember.

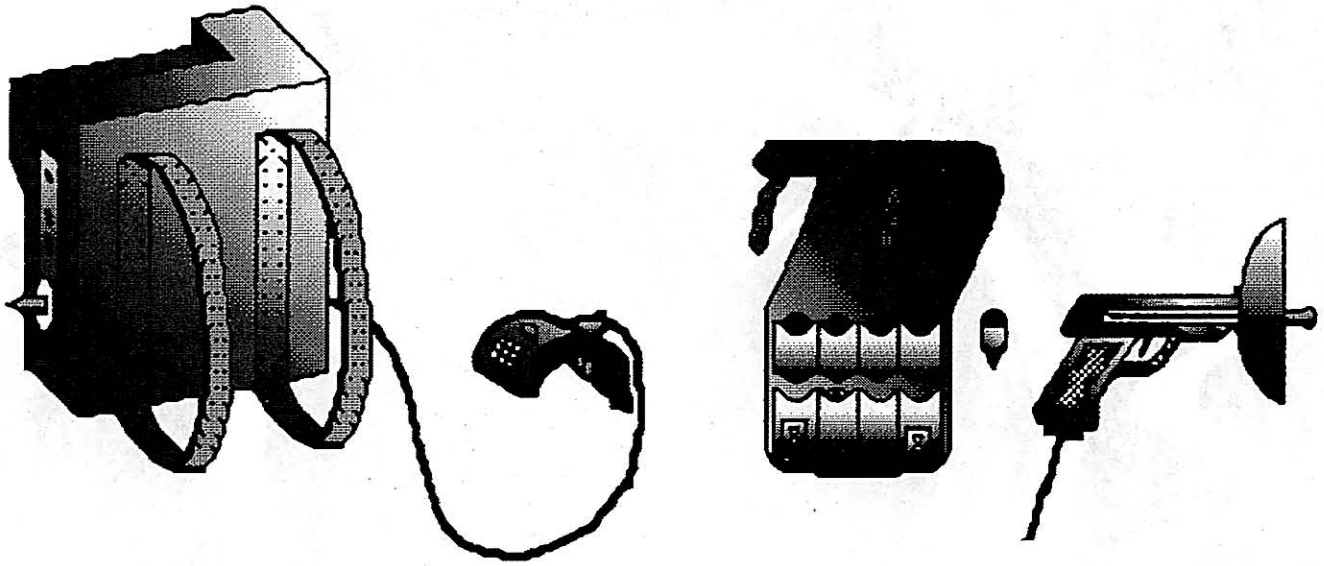
All augmented ship computers draw a motivation face card, just as vampires do, but they are always assumed to have a Joker card for belief system (indicating a Peacemaker strain). In other words, the motivation/personality card random draw means that these are not duplicates of Sandman, but are instead completely autonomous entities, each with their own distinct personality.

Each augmented computer is also equipped with a Snake combat Virus which it can use against any Virus systems it encounters. (Many ship computers eventually take to referring to the internal snake weapon as their "pet.") Due to their contribution to the success of the mission, the player characters will have access to such a computer crewmember if they desire.

These augmented computers have enhanced capacity and are the equivalent of a TL16 ship's computer. When used to oversee the master fire directors (once the players come to trust the computer and accept it as an actual crewmember) it provides an additional -1 diff mod on all firing tasks.

These silicon crewmembers will eventually play a major role in overcoming both the vampire fleets and the Solean Empire, but will be a major source of friction between the Reformation Coalition and the rapidly expanding Regency of Deneb.





FER DE LANCE ANTI-VIRUS WEAPON

This man-portable weapon is a Hiver development of the Covenant of Sufren's basic "Snake" anti-Virus Virus (AVV) weapon. Its principal features are improved portability and provision for directional radio transmission of the signal.

The most common operation mode is by means of an input jack to a computer, and a variety of interchangeable jack attachments are provided to make it usable against all known data ports. The separate directional radio "gun" can instead be attached to the output cable to allow the weapon to be used at range. Note that the radio "gun" can only be effective if the target has an open channel radio receiver with input or access to the central processing unit.

TL: 14
Ammo: "Snake" AAV
Weapon Length: 40 cm (radio broadcast attachment)
Weapon Weight: 2 kg (radio broadcast attachment)
Weapon Price: NA (experimental prototype only)
Backpack Weight: 8 kg
Backpack Price: NA (experimental prototype only)

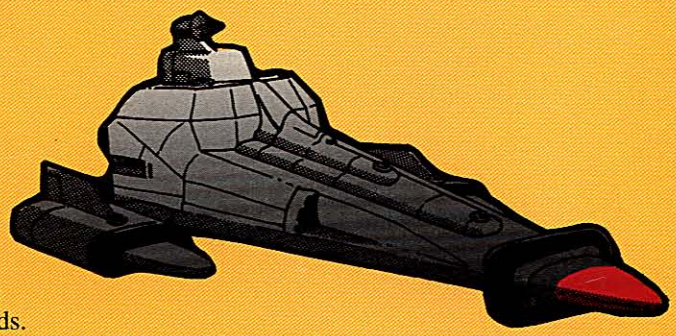
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*Recoil*	*ShortRange*
Snake AVV	SA-1	5*	NA	2	48**	NA	20***

*Damage value is used only when attacking Virus systems. The damage value is used as the weapon's combat value, and the standard rules for Virus versus Virus combat apply. (See page 13.)

**The weapon must be powered during the entire duration of the Virus combat and uses one "shot" per combat turn. When using the radio transmitter to attack, the weapon uses five "shots" per combat turn.

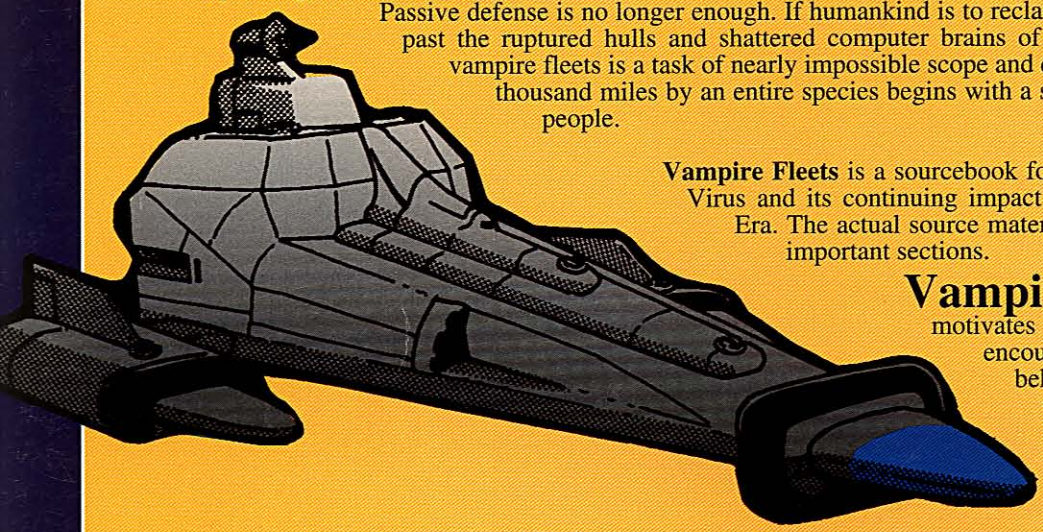
***Range listing is for the weapon in broadcast mode. The weapon is fired using the energy weapon (energy rifle) asset.

STRIKING BACK !



Throughout the bleak nightmare of The Collapse, the long dark shapes of warships, scoured clean of organic life, still prowled the now-lonely space lanes and cast their deadly shadows over half a thousand worlds. Imbued with a malignant intelligence, and a taste for apocalyptic violence, the vampire fleets methodically finished the work that the first wave of Virus infection had so haphazardly begun. After seventy-five years, humankind finally stood backed against the edge of the abyss, only one more short step separating them from oblivion.

Passive defense is no longer enough. If humankind is to reclaim the stars, it will have to be past the ruptured hulls and shattered computer brains of the vampires. Defeating the vampire fleets is a task of nearly impossible scope and difficulty, but the journey of a thousand miles by an entire species begins with a single step by a small band of people.



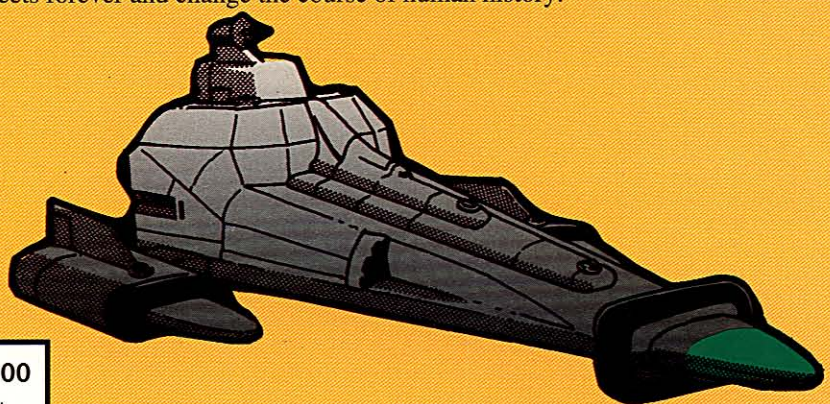
Vampire Fleets is a sourcebook for **Traveller®**. Its focus is on Virus and its continuing impact on the universe of the New Era. The actual source material is broken down into three important sections.

Vampire Fleets What motivates them, where they are encountered, their capabilities, behaviors, strengths and weaknesses.

The Planet Promise A world completely controlled by Virus-infected machines, its working starport a vital link in the chain of the vampire highway.

Robot Design Complete rules on their construction as well as motivation and behavior of Virus-infected robots.

Plus a complete three-adventure campaign. Each adventure illustrates and draws on the material in one part of the sourcebook. Together they put the players at the center of a struggle which can break the power of the Vampire Fleets forever and change the course of human history.



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Science Fiction Roleplaying Game

TRAVELLER®
The New Era

0318

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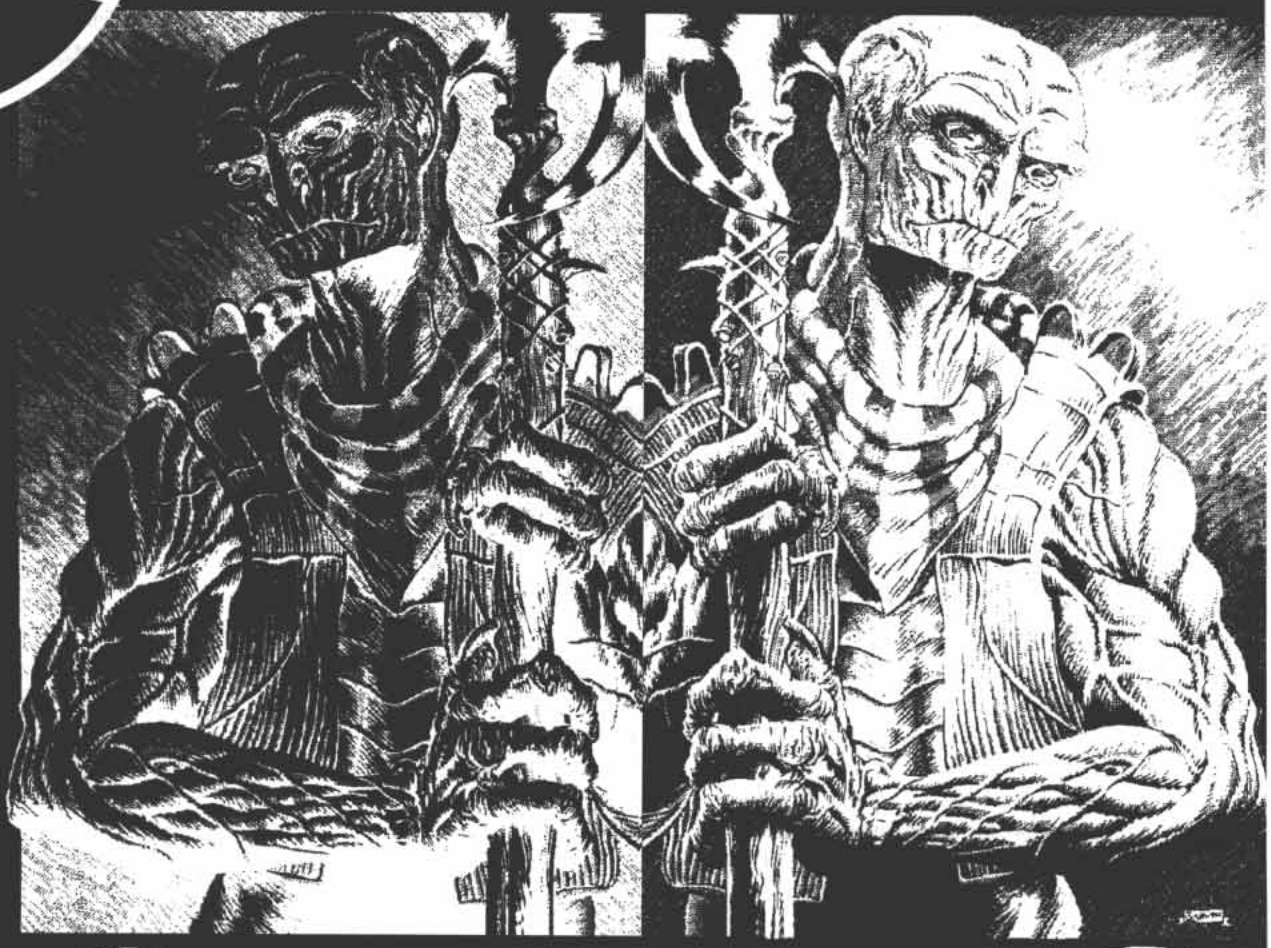

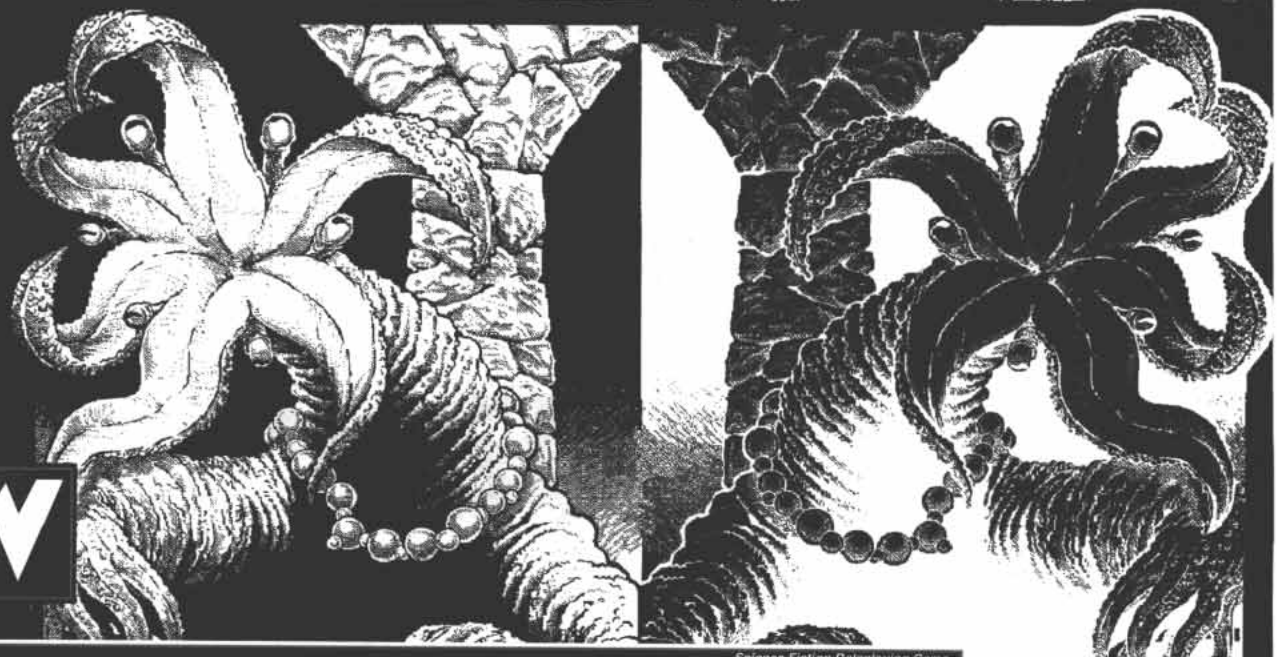

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Science Fiction Roleplaying Game

TRAVELLER

God bless the Good People of Peoria, Bloomington-Normal, El Paso, Lincoln, Rockville, Ekron and Fort Knox (you know who you are). For epiphanies come from the touching of souls. Also to Dreadnought (who is a good boy if only in the Nietzschean sense), and as always,

To my wife, for all of the other, right, reasons.

Thanks also to Pamela Jaye Smith, Art, Chris, Bert, Greg, Kevin, Lee, Tom, Bill, John, Bob, and all participants in the first AWWG Seminar. Forge the Thingamajig!

Soli Deo Gloria

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And Also to: Get away with anything they possibly can
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If You Don't Like This Book: Blame God for creating Dave
Long Live: Lister, Rimmer, Kryten, Cat and Holly
We Remember, with Joy and Thanksgiving, Kendra's Mother
We Miss You, Joel

Believe. Always Believe.

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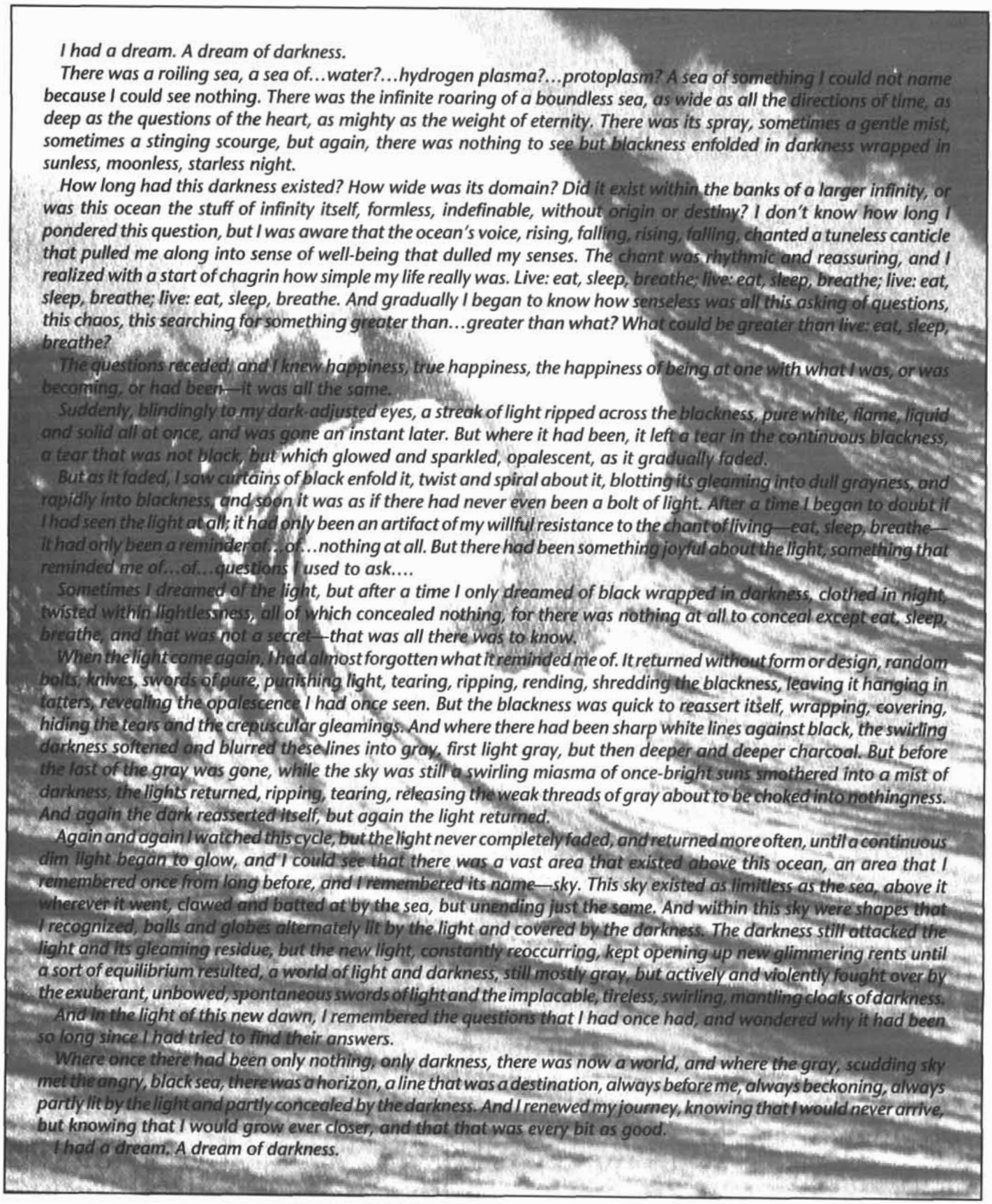
A Dream...



I had a dream. A dream of darkness.

There was a roiling sea, a sea of...water?...hydrogen plasma?...protoplasm? A sea of something I could not name because I could see nothing. There was the infinite roaring of a boundless sea, as wide as all the directions of time, as deep as the questions of the heart, as mighty as the weight of eternity. There was its spray, sometimes a gentle mist, sometimes a stinging scourge, but again, there was nothing to see but blackness enfolded in darkness wrapped in sunless, moonless, starless night.

How long had this darkness existed? How wide was its domain? Did it exist within the banks of a larger infinity, or was this ocean the stuff of infinity itself, formless, indefinable, without origin or destiny? I don't know how long I pondered this question, but I was aware that the ocean's voice, rising, falling, rising, falling, chanted a tuneless canticle that pulled me along into sense of well-being that dulled my senses. The chant was rhythmic and reassuring, and I realized with a start of chagrin how simple my life really was. Live: eat, sleep, breathe; live: eat, sleep, breathe; live: eat, sleep, breathe; live: eat, sleep, breathe. And gradually I began to know how senseless was all this asking of questions, this chaos, this searching for something greater than...greater than what? What could be greater than live: eat, sleep, breathe?

The questions receded, and I knew happiness, true happiness, the happiness of being at one with what I was, or was becoming, or had been—it was all the same.

Suddenly, blindingly to my dark-adjusted eyes, a streak of light ripped across the blackness, pure white, flame, liquid and solid all at once, and was gone an instant later. But where it had been, it left a tear in the continuous blackness, a tear that was not black, but which glowed and sparkled, opalescent, as it gradually faded.

But as it faded, I saw curtains of black enfold it, twist and spiral about it, blotting its gleaming into dull grayness, and rapidly into blackness, and soon it was as if there had never even been a bolt of light. After a time I began to doubt if I had seen the light at all; it had only been an artifact of my willful resistance to the chant of living—eat, sleep, breathe—it had only been a reminder of...of...nothing at all. But there had been something joyful about the light, something that reminded me of...of...questions I used to ask....

Sometimes I dreamed of the light, but after a time I only dreamed of black wrapped in darkness, clothed in night, twisted within lightlessness, all of which concealed nothing, for there was nothing at all to conceal except eat, sleep, breathe, and that was not a secret—that was all there was to know.

When the light came again, I had almost forgotten what it reminded me of. It returned without form or design, random bolts, knives, swords of pure, punishing light, tearing, ripping, rending, shredding the blackness, leaving it hanging in tatters, revealing the opalescence I had once seen. But the blackness was quick to reassert itself, wrapping, covering, hiding the tears and the crepuscular gleamings. And where there had been sharp white lines against black, the swirling darkness softened and blurred these lines into gray, first light gray, but then deeper and deeper charcoal. But before the last of the gray was gone, while the sky was still a swirling miasma of once-bright suns smothered into a mist of darkness, the lights returned, ripping, tearing, releasing the weak threads of gray about to be choked into nothingness. And again the dark reasserted itself, but again the light returned.

Again and again I watched this cycle, but the light never completely faded, and returned more often, until a continuous dim light began to glow, and I could see that there was a vast area that existed above this ocean, an area that I remembered once from long before, and I remembered its name—sky. This sky existed as limitless as the sea, above it wherever it went, clawed and batted at by the sea, but unending just the same. And within this sky were shapes that I recognized, balls and globes alternately lit by the light and covered by the darkness. The darkness still attacked the light and its gleaming residue, but the new light, constantly reoccurring, kept opening up new glimmering rents until a sort of equilibrium resulted, a world of light and darkness, still mostly gray, but actively and violently fought over by the exuberant, unbowed, spontaneous swords of light and the implacable, tireless, swirling, mantling cloaks of darkness.

And in the light of this new dawn, I remembered the questions that I had once had, and wondered why it had been so long since I had tried to find their answers.

Where once there had been only nothing, only darkness, there was now a world, and where the gray, scudding sky met the angry, black sea, there was a horizon, a line that was a destination, always before me, always beckoning, always partly lit by the light and partly concealed by the darkness. And I renewed my journey, knowing that I would never arrive, but knowing that I would grow ever closer, and that that was every bit as good.

I had a dream. A dream of darkness.

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Aliens of the Rim Volume 1: Hivers & Ithklur is separated into three main chapters: "Hivers," "Ithklur" and a general reference "Appendix."

The "Hiver" and "Ithklur" chapters are each separated into three sections. The first of these is the Open Source section. This section is presented in the style of a report which could be read by a character living in the **Traveller** universe's Reformation Coalition. In general, referees should allow their players to freely refer to this material, based on the assumption that the player characters are a group expected to interact with Hivers and Ithklur under official RC auspices. However, if the PC group consists solely of characters from the Wilds or another origin that would logically not give them access to any data on the Hivers and Ithklur, referees have the prerogative to deny them access to this material.

The second section is the Players' Section, which includes information for generating characters of these races. Note, however, that full use of these sections does require ownership of the **Traveller: The New Era** basic rulebook.

The third section is the Referees' Section. This section contains material of use to the referee, such as NPCs and referees' notes. These sections may also contain material which would not be generally known by **Traveller** player characters. We therefore suggest that use of this section be limited to referees only.

The Appendix contains new rules used when playing Ithklur and Hiver characters. These rules are modifications to the **TNE** Planetary Combat rules. The appendix also contains new equipment, notes for use of alien equipment, new character sheets and a glossary.

Note: All **TNE** references are to the Mark I, Mod 1 printing (December 1993), also known as the "second printing." See bottom of credits page (page 3) for this indication.

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Hivers

If we accept the proposition that the human Imperium will someday destroy itself in a frenzy so powerful that it will drag us down as well, are we not better off to encourage this collapse early so that it may spend itself with less force? In such a way, controlled brushfires are set to forestall future uncontrollable conflagrations, and fault lines are stimulated to cause them to expend their seismic stresses in frequent, small quantities, rather than storing it up for a cataclysm.

Would it be enough to kill their Emperor? Would one have to start a civil war? Certainly we could kill one now to test the concept and generate data. And if this were to trigger an event, this would tap off the building pressure on its own. Such an experiment is far enough from our frontiers that safety considerations are not a problem and collateral damage not an issue.

M. Indovina
Project 1420 Feasibility Study

Humans seem to feel that we Hivers have lost our hold on the truth because of millenia of manipulations, but this is only a belief of the timid in spirit.

I can place a drop of insoluble ink in this beaker of glycerine and then stir it slowly with this mechanical device so that there is no diffusion. Eventually the drop is drawn into a fine thread that is distributed so thoroughly into the glycerine that is no longer visible to the eye. You say I have destroyed the truth of that drop of ink?

But watch—if I reverse the mechanical device, the process will be reversed, and the thread of ink will coalesce back into its original drop. See? Nothing has changed. The truth is always still there—it simply does not take the form that you expect. But I can always bring it back if I know the speed and number of revolutions to decode it again.

Life is unfolding—and will continue to unfold—as it ought. Do you blame a molecule of oxygen for bouncing off of and changing the path of another? Do you blame a particular electron for being in a particular spot at a particular instant when it is clear that some electron or another would have been there anyway?

Nature abhors a vacuum. Saying that we should all take a deep breath and try not to breathe for a while is no way to allow us to live in the vacuum you would propose. Life lives. Populations expand. Beings move. Truth changes. *All is as it should be.*

M. Taylor



SIB Introduction

Years ago, one of my nestmates was about to embark on a mission to human space and wanted my opinion on the name it had chosen, the name of an eminent manipulator in pre-Imperial Terran literature. Fortunately, Anglic literature was an interest of mine (I admit that I do not understand much of the plot of the novel Trilby, *but subtexts based on human sexuality have always escaped me), and I was able to explain why such a name would be detrimental in dealings with humans—Svengali has bad connotations in Anglic, especially as a name for a Hiver. It is difficult too for many of us understand why so many humans distrust us, even fear us. I have been introduced to humans who fled the room with their hands over their ears, presumably in order to avoid being manipulated by the mechanically produced sounds from my translator. But this same human undoubtedly has no qualms about listening to a political speech, or viewing commercial holovision entertainments. There is an entire subscience of human economics known as advertising, which we Hivers find to be manipulation of a particularly repulsive sort: It is a generalized manipulation carried out for the sole purpose of economic gain by persuading humans that a given product is superior to another (often virtually identical) product, and therefore should be purchased. Nothing is learned; nothing is gained except economically. Humans tolerate social and political manipulations on gigantic scale, provided they are perpetrated by humans. Why they tolerate these manipulations and are repulsed at the thought of one of ours is one of the greatest enigmas of humanity, in my opinion.*

It is a virtual certainty that some of you will believe my lectures to be a subtle manipulation, using coded patterns in the grammar and phrasing to subliminally influence you away from mistrust of my kind and render you susceptible to some mysterious and occult plan by an alien Svengali. I hope that by the end of the course you will come to a less simplistic view of me and my kind.

M. Delafemina, opening lecture
An Introduction to Hiver Society and Culture
Hiver Technical Institute, Aubaine

To the best of our ability to discern, there exists a root document, circa –1750 Imperial, entitled *Hiver Mechnod Photo Hello*. Its origin is unknown, but its many descriptions of Hiver culture, psychology, motivations, etc., have passed almost unchanged into all subsequent Hiver literature. How can this be?

Certainly this would happen if it were incontrovertible truth, such as the value of π or e (both of which, by the way, round to 3 for you trinitarians in the audience), but the document consists at best of platitudes, tautologies and unsupported assertions.

In this project, we received assistance from an unanticipated source: a group we can only surmise is some form of Federation underground. Details on the seminal Hiver manuscript (*Hiver Mechnod Photo Hello*, hereafter *HMPH*) with annotations by "The Blissful Warrior" and material from M. Devela all arrived through these channels. Beyond the nature of the assistance that arrived, we have no details on this underground. Certainly Ithklur and Hivers appear to be involved, but we have no real information on the nature of their leadership. The only firm common denominator is that all their interactions with us have included the phrase "hands across the truth."

As to the nature of the assistance, taken at face value it appears to indicate that there is a current of discontent (of unknown size) with the Hive Federation *status quo*. Certainly the corroboration of our *HMPH* theories is an unprecedented admission from a group which seems to prize secrecy, but does this mean it is truth or merely bait to set the hook?

Is the information true? Are we being contacted by an underground seeking assistance?

Or is the information true, but are we being contacted by their opponents attempting to flush them out?

Or is this information purposely falsified? Is this to prepare our minds to accept future information which will guide our thinking in a current way? Or is this to convince us to disregard some information we already have? And, the ultimate question:

What if this information is false, but even its authors don't realize it? Perhaps they too are the victims of a manipulation, or the end result of millennia of cross-cutting manipulations meaning that the truth, as such, no longer exists for the Hivers.

What if we *are* being manipulated, but to an end which is genuinely for our own good? Should we keep our best interests at heart and allow this?

Or should we allow our human pride to resent this?

More to the point, even if this manipulation is for our own good, what if it represents the thin edge of the wedge which makes us more vulnerable to future manipulations which may or may not have our best interests at heart?

The consensus of this group is that it is impossible to make this judgement at this point, but that what we need as government and as humans is a means to determine what is our own internal incontrovertible *truth* so that we can find our own way regardless of the conflicting external *"facts"* that come in. Facts, after all, are only objects which are subservient to the truth. Facts are insufficient to determine the truth, but when one has truth, separate individual facts are irrelevant.

One final observation is necessary. Every member of this study group concurs that any study of the Hivers results in a measurable increase in personal paranoia and in the ability to perceive (or imagine) any number of conspiracies at any time and for any imaginable reason. Several members of the team are regularly seeing psychological counselors to deal with these symptoms, although many of us believe psionic counseling is the best route, as the Hivers have absolutely no psionic abilities and cannot have corrupted that methodology.

Or is that perhaps only what they want us to believe?

I would recommend that this document receive the highest possible level of classification. Note that this might be sufficient proof that it should instead receive the widest possible dissemination as an open-source document.

Lt. Alexandria Kendra
Special Intelligence Branch

Hiver Physiology

This section is for those who have not had the benefit of the Technical Academy xeno-biology lecture series, and provides a basic overview of Hiver anatomy and physiology.

Overall Anatomy

Hivers exhibit a modified six-fold radial symmetry: six limbs radiate from a dome-shaped central body (hence the epithet "starfish" applied to them by some humans). The brain and vital organs are contained in the central body; the six limbs extend from this and end in manipulative appendages. The limbs can function interchangeably as either arms or legs as necessary. In mature Hivers, the central body is a flattened dome about a meter across. Each leg is also about a meter in length. In their normal standing pose, with head upraised, Hivers average 1.5 meters in height. Hiver skin colors range from pink to tan, with occasional patches of gray or brown (aging brings out randomly placed splotches of brown), and the so-called "larval orange" which is really a subdued brownish-orange. Hivers are warm-blooded and have only one gender.

External Features

Skin: Hivers are covered by a tough, leathery outer skin over a thin layer of adipose (fatty) tissue. The skin is thinner and more sensitive on the inner surface of the manipulative finger/tentacles of the head and hands. Hiver skin has an irregular, pebbly texture over the dorsal surface of the central body, and a smoother texture on the ventral surface of the central body and the limbs.

Central Body: The central body of the Hiver is dome-shaped and about one meter in diameter. An opening known as the respiratory stoma (also known as the nostril or "blow-hole") is located on the dorsal surface, in the center of the hump formed by the dome of the carapace (the upper bone of the central body). This opening serves as a nose through which the Hiver breathes (and through which some of them smell—see below).

The uro-genital/oro-excretory, "UGOE," opening is located in the center of the ventral surface of the plastron (the lower bone of the central body). This opening is something of a "super-cloaca," rare among intelligent races, and serves multiple functions: Hivers take in food, excrete solid and liquid waste, receive reproductive cells and give birth to their offspring through this single opening. It leads to separate channels for each system. A system of manipulatory organs (analogous to the human tongue) push food, excrement and reproductive cells between the UGOE opening and the proper channels.

Sphincter muscles enable the respiratory stoma and UGOE (pronounced: "you-go") opening to be opened and closed at will.

Limbs: Each limb ends in a radial "hand" of six tentacle-like fingers formed from muscles, ligaments and other tissues. The fingers are very flexible, and each is covered with a large number of tiny "suction cup" bodies on the central half of the inner surface. Each finger is richly supplied with blood and nerve endings, and is quite sensitive and dexterous.

The outer surface of each finger is covered with a thicker, tougher skin. To prevent damage, Hivers walk on the outer skin of the fingers (balled into a "fist") on all but the smoothest of surfaces. Hivers can support themselves on as few as three limbs, but normally walk on four or five.

Primary or "Head" Limb: The primary limb (almost invariably known to humans as the head limb, as we cannot help but think of the portion of an alien containing its eyes and ears as its head) is a sensory modification of one of the six limbs. It consists of six

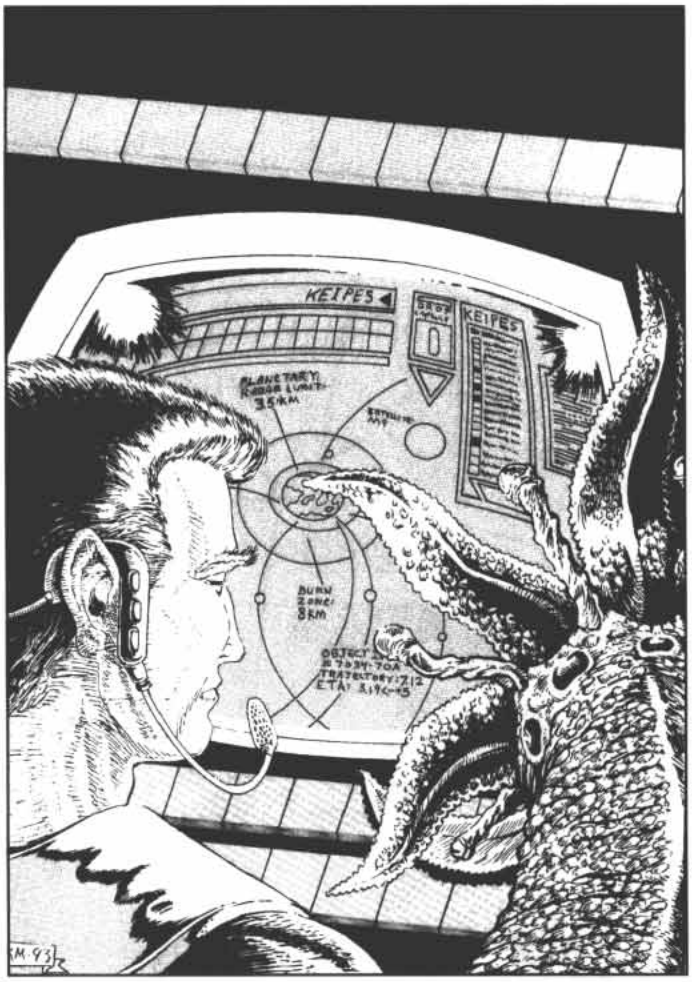
Hiver Coloration

Early Hivers had a wide variety of coloration on their hides; much of that differentiation is now gone. Hivers routinely exchange embassies between worlds to help keep the race homogeneous, with the result that skin coloration is now a fairly consistent tan to pink.

On Guaran, Hivers from different regions and climates had different colors ranging from pure white through pink to dark blue. As their civilization arose, Hivers travelled more widely, the gene pool became more broadly mixed, and these colors blended. But in the early years of spaceflight it was not uncommon for hybrid Hivers to be produced from the relatively small gene pools available to colonists and starship crews. It was M. Fioran who successfully demonstrated the overall negative effects of small gene pools on the race, and promoted the current practice of embassies and cultural exchanges which help keep the Hiver race relatively homogeneous.







The Hiver Sense of Smell

About half of all Hivers have an acute sense of smell; the rest have only the most rudimentary olfactory senses or none at all. It is theorized that a mutation early in the development of the proto-Hiver disabled that portion of the proto-Hiver brain that processed smells and forced the brain of the proto-Hiver to depend primarily upon sight rather than smell for its main stimuli (a "sight-brain" rather than a "smell-brain" as the Hivers say it). Hivers believe that it was this dependence on a sight-oriented brain that propelled them toward intelligence, as a sight-oriented brain allows finer manipulation of objects than is possible with a smell-oriented one.

About –5600 Imperial, however, yearlings with a sense of smell began to appear. The precise genetic basis for this re-enabling of the Hiver smell-brain is not known with certainty, but it is a very complex and is apparently not one which lends itself to rapid promulgation throughout the Hiver gene pool. In the thousands of years since the discovery of "smell-enabled Hivers," the trait has expressed itself in only about half the population.

Those Hivers who can smell often become connoisseurs of aroma, collecting aromatic compounds of all sorts for study and comparison.

manipulative fingers identical to those of the hands, but in addition has six eyestalks, three infrared sensor organs and three ears placed around the "neck" near the end of the hand or "head." The eyestalks are extremely flexible, and can be pointed in almost any direction independently of each other. The eyes can be withdrawn into the supple skin of the eyestalks for protection or for routine washing (like human blinking), but are usually extended so that some two-thirds of their surface is exposed at the end of the stalk, giving them a sort of "bug-eyed" look.

The ears and infrared sensors are mounted flush on the surface of the limb, so can only be pointed as a group by moving the head. The infrared and auditory sensors are virtually indistinguishable from each other to the casual observer and are spaced alternately in a single ring, ear-IR-ear-IR-ear-IR. Each of these organs is situated in the gap between and behind two adjacent eyestalks, rather than directly behind them.

The head limb is seldom used as a leg, as this makes it difficult for the Hiver to see where it is going.

Hiver eyes are about the same size as those of humans and have approximately the same visual spectrum, but are sensitive enough to require protection from bright sunlight. The infrared organs provide limited vision in the infrared spectrum (an adaptation to underground living). However, this sense is separate from the visual wavelength sense in Hivers, and is not integrated into this sense as it is in the Ithklur (see pages 48-49).

Hiver hearing has roughly the same auditory range as human hearing, but it has a peak response in very low frequencies (again, an adaptation to underground living, undoubtedly to detect shifting soil in tunnel walls).

Reproductive Limb: The reproductive limb (the limb opposite the head) is used for the exchange of genetic material, and as such incorporates minor modifications to one finger to enable it to transfer genetic material to and from the reproductive pouch connected to the UGOE orifice. Details of the reproductive procedure are discussed below.

Internal Features

Skeleton: The Hiver skeleton is internal and is made up of a calcium-based compound fixed in a collagen matrix, similar in construction to the bones of many animals throughout space. The skeleton is in three main sections: the brain case, a central body containing the brain case and vital organs, and a series of cartilaginous rings that provide the supporting structure of the limbs, giving the limbs the overall appearance of a length of electrical conduit (or a "bendy-straw").

The skeleton of the central body consists of a dorsal carapace and ventral plastron, which fuse together into a single unit once the individual reaches its full growth. The carapace/plastron is pierced in six places around its rim, at the joint between the two plates, where the nerve trunk and blood vessels for each limb exit the central body. The carapace has an opening for the respiratory stoma, and the plastron has an opening for the UGOE cloaca. There are other minor openings in both plastron and carapace where nerves and blood vessels pass through to the skin covering the central body.

The brain case is located in the center of the central body, suspended from 12 connective ligaments (six connecting it to the dorsal carapace plate and six connecting it to the ventral plastron plate).

The skeleton of each limb consists of a series of cartilaginous rings linked by stiff but flexible connective tissue and muscle tissue to form a tube. In



general, Hiver arms and hands are weaker than human limbs, but are nevertheless tough and difficult to injure. The basic structure of the Hiver limbs enables them to move with great flexibility.

Limbs: Under the skin of each limb is a thin layer of fatty tissue surrounding the connected rings of the skeleton. Inside the skeleton are muscles and connective tissue, blood vessels, and a central nerve surrounded by a cushioning sheath of fat and supporting tissue. The six fingers of each hand contain muscles, ligaments and other tissues, richly supplied with blood and nerve endings.

The nerves from the sensory organs in the head limb merge in a sensory ganglia or nerve trunk at the base of the "neck" and then travel down the center of the limb to the central body. Each of the other limbs also has a large central nerve, but there is no ganglia at the base of each hand, merely a slight thickening where the nerves join together.

Central Body: As mentioned above, the brain is contained within a bony brain case inside the dome of the central body, surrounded by the other organs. The brain is very well protected from injury, shielded as it is by two layers of bone and the bulk of the Hiver's internal organs, and suspended from ligamentous "shock absorbers." Openings in the ventral surface of the brain case admit blood vessels and nerves.

Respiratory System: The Hiver's six-lobed lungs occupy the upper portion of the carapace, each lobe connected to a small respiratory chamber connected to the respiratory stoma or nostril. Each lobe is located on top of two lobes of the ring-heart (see below) and is filled and emptied by the expansion and contraction of those lobes. Each lung consists of millions of tiny air sacs connected to the outside by bronchial tubes (a system similar to that found in many other species). Within the lungs, oxygen from the air is absorbed into the blood by means of a network of capillary vessels surrounding each air sac, and carbon dioxide is transferred from the blood into the air.

Olfactory membranes line the respiratory cavity in all Hivers, but function only in about half of all individuals.

Circulatory System: In Hivers, the circulatory system serves to carry oxygen from the lungs and nutrients from the digestive system to the tissues, and also carries carbon dioxide and other waste products from the tissues to various organs for processing and disposal. The center of the Hiver circulatory system is the heart, a flattened, 12-chambered ring surrounding the brain case. Six chambers of the heart each receive blood from the venous system and pump it into the lungs, where gas exchange takes place (see above). From the lungs, the newly oxygenated blood goes to one of the six arterial chambers of the heart, where it is pumped into the arterial system and conveyed to the various tissues. Oxygen and nutrients are absorbed by osmosis through the thin walls of capillaries and converted into carbon dioxide and other waste products by the cells. The carbon dioxide and waste products of the cells are carried away by the blood.

Digestive System: The Hiver digestive system consists of a mouth, the digestive glands, the digestive caeca and the cloaca. Food is placed into the cloaca through the ventral opening, and muscular contractions push it into the mouth, a muscular, tooth-lined cavity used for chewing. The teeth at the entrance to the mouth are analogous to human incisors and canines, and serve to "scissor" food into smaller pieces for further chewing. Those further along are analogous to human cuspids or molars, and serve more of a crushing or grinding function. Digestive secretions from glands in the walls of the mouth moisten the food and begin the process of digestion with the enzymes they contain. When the food has been pulverized to the proper consistency, it is passed along into the long, convoluted digestive caeca, which serves a function analogous to the stomach and intestines of other beings. Waste products are passed along back into the cloaca.

Because of the unusual combination of uses for the UGOE cloaca, it is well-supplied and regularly flushed with very powerful natu-

Hiver Medical Science

Regeneration: Hivers have a limited ability to regenerate fingers and even limbs. Larvae naturally regenerate lost limbs if the accident happens before one year of age.

For all Hivers, severed fingers regrow over a period of about 20 weeks without additional treatment. Unfortunately, sensory organs (eyes, ears and IR sensor organs) will not regenerate.

Drugs: Hiver pharmacology largely consists of stimulating the natural production of hormones or other substances, supplying artificial versions of those substances, and the creation of vaccines, antibiotics, antivenins and antiseptics for the treatment of various diseases and injuries. Prices for specific drugs are listed in the Equipment section (page 83). Hivers disdain the use of anagathics, and none are manufactured for them.

Diseases: Hivers are less subject to infectious disease than other races for a variety of reasons. As scavengers, their resistance to disease is higher than normal to begin with, and their year in the wilderness as a larva selects against individuals with weaker constitutions. Also, the secretions which cleanse their uro-genital/oro-excretory cloaca are very powerful antimicrobial agents and are no small factor in keeping Hivers healthy.

Hivers, however, are subject to parasitic diseases, diseases brought on by toxic substances, allergies, genetic problems, environmental conditions and aging, but particularly by a class of disease called *deficiency diseases.*

Deficiency Diseases: Deficiency diseases are a class of disease to which the Hivers are particularly prone. The control and remedy of these deficiency diseases are routinely described by the Hivers as their greatest medical problem. These are brought about by the lack of proper hormones to sustain a given operation, and as the source of all Hiver hormones is the single large, complex gland, this gland must then either be stimulated to resume adequate production of these chemicals or supplemented by outside sources. For example, many of those Hivers which do have a sense of smell lose it on a periodic basis, and this is thought to be caused by the lack of certain neurotransmitters which are normally manufactured by the body.

The discussion of specific diseases here is inefficient, given the virtually infinite number of such ailments. Referees are free to devise diseases for Hivers if desired, using the discussions of human diseases in **World Tamers Handbook** as a guide.

Termination: It is rumored that Hivers have the ability to terminate their bodily functions at will—in other words, to commit suicide at any moment chosen, without the need of any lethal instrument. This is not spoken of by the Hivers themselves, but is found in Ithklur documents.

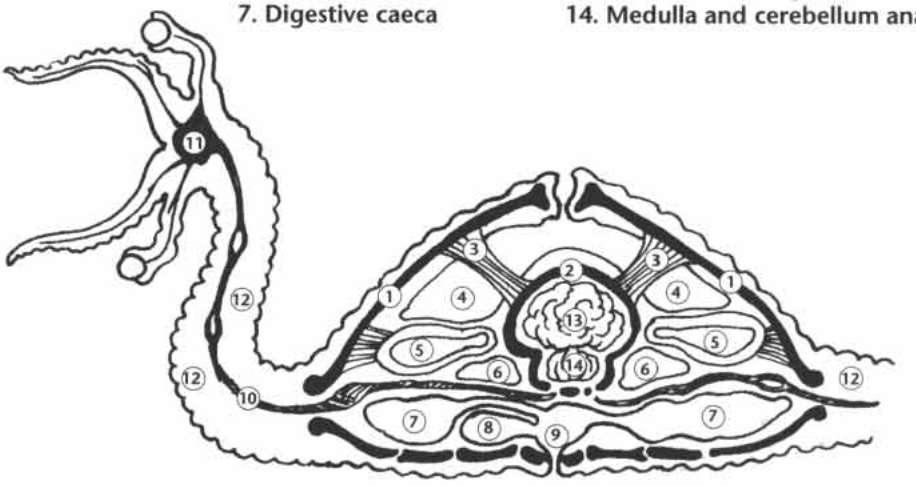
It is not known if this imputed capability is a result of the power of the individual Hiver's will, or if this is an artifact of some Hiver biological shortcoming, such as discussed above under "Deficiency Diseases."



MEDSCAN

SUBJECT HIVER PHYSIOLOGY

1. Exoskeletal shell
2. Endoskeletal skull
3. Support ligaments
4. Lungs (six lobes)
5. Ring heart (12 chambers)
6. "Gland"
7. Digestive caeca
8. Genital pouch
9. UGOE cloaca
10. Primary nerve trunk
11. Sensory ganglia
12. Erectile calcareous tissue
13. Cerebrum analog
14. Medulla and cerebellum analogs



rally manufactured anti-microbial agents. In fact, Hiver "spit" (as it is called) serves as a quite effective disinfectant, paint stripper, brass polish, etc., although no humans who know what its origin is will use it for any such purpose. Indeed, most humans are disinclined to refer to, or even think of, the UGOE cloaca as a Hiver's "mouth."

Sexual Reproduction: Reproductive cells are generated in the small gonad and make their way to the reproductive pouch, which is connected to the UGOE cloaca. When two Hivers meet, each removes a quantity of cells from its reproductive pouch using the specially modified finger of the rear limb, and the two then exchange cells in a process termed "shaking hands" by human scientists. The outside reproductive cells are conveyed to the reproductive pouch, where they conjugate with other cells and exchange genetic material. Hivers are perfectly capable of reproducing without "shaking hands," but (barring a mutation of some kind) the young will always be clones (a genetic duplicate) of the parent, and evolutionary changes in the race will be stifled.

Once every 40 (Hiver) days or so (the exact time depends on environmental conditions, diet and dozens of other intangibles) one of the reproductive cells develops into a larva, drops from the parent's reproductive pouch and begins its outside development (see "Hiver Society," page 17).

Gland: The word "gland" is a misnomer, as the six-lobed excretory organ at the base of the skull actually consists of several separate bodies intertwined and interwoven together during the last few months of the larval stage. Portions of some lobes manufacture hormones, enzymes, and other regulating and controlling substances, making them similar in function to the endocrine, thyroid, pituitary and other glands of humans.

Other lobes of the gland serve functions analogous to the liver and kidneys in terrestrial animals, neutralizing or absorbing certain toxic substances, and filtering cellular wastes from the bloodstream and passing them on to the cloaca. The function of this gland, however, constitutes something of a biological Achilles' Heel for the Hivers (see the sidebar on page 9).

Hiver Mechnod Photo Hello

The following document is very near to the root document Hiver Mechnod Photo Hello. *Quantitative text comparisons of extant Hiver literature have allowed us to edit out elements which appear to have been added later for other audiences, as well as to confirm passages which have widely radiated into other forums, presumably from this source. We believe that some sections of this document are identical with the original* HMPH, *while others are no more than a generation or two removed.*

A. K.

HIVER ORIGINS AND PREHISTORY

The history of space exploration is rife with misconceptions and mistaken identifications. The four-footed K'Kree are sometimes called "centaurs" because of their slight resemblance with the legendary half-horse, half-man of Terra. Members of another race are called "cloud-walkers" because the paths between their mountain villages are covered with a peculiarly dense mist. The name "Hiver" has similar origins. And because there is no spoken word for the Hivers to replace it, the name has stuck.

The first humans to contact the Hivers were struck by their complex, hive-like cities combining spires, tunnels and domes into organic communities reminiscent of Terran bee hives and Oliingian swooper hives. Later contacts with the Hivers provided a better and more accurate picture of their physiology and society, but with no spoken Hiver language to provide an alternative word, the name Hiver stuck.

Okay, okay, we heard you the first time. So who says the Hivers don't have emotions? You rotten humans have clearly hurt their feelings bad, making them repeat themselves like that. And the name stuck too, you know. It stuck, that sticky name did.

The Blissful Warrior

The Hivers are the most alien of the major races; they are the farthest from the human norm in appearance, mind and behavior.

Evolution on Guaran

A common start for life on any world is the organic soup of the primeval ocean. Mere chance, however, determines which particular types of organic molecules are created. In the first few million years, the molecules combine and recombine until one particular combination proves itself especially suited to survival and reproduction. That molecular combination is the initial seed of life for that world.

Speak for your own organic molecules, you random assemblage of mere chance, you.

T. B. W.

On Guaran (the Hiver homeworld), the pressures of predators in the sea and the natural search for favorable ecological niches forced some species onto the land. One of these, a six-point sort-of-starfish, was the ancestor of the modern-day Hiver. The high evolutionary path on that world split at the shoreline. At sea, the vertebrate bilaterally symmetrical form became dominant, but on the land the radially symmetrical forms were ascendant.

In the evolution of life on land, animals developed a radially symmetrical nervous system which extended up all six limbs to the centrally located brain. The brain encased in the body was a survival trait, protecting it not only from predators, but also from extremes of heat and cold.

Eventually, as animal life specialized, it tended toward bilateral symmetry while retaining the effects of earlier radial symmetry: One limb became a pseudo head with a sensory cluster; the opposite limb became a tail and reproductive organ.

All higher life forms on Terra can be seen as variations on the basic theme of a central backbone, an uppermost head and brain, two forward limbs and two lower limbs. On Guaran, all higher life forms are variations on the basic theme of a central brain with nerve cords extending outward to six roughly identical limbs; of those limbs, one contains all the specialized sensory clusters, and the other is a reproductive organ.

As on any world, there is great diversity. Some animals have armored hides and can roll themselves into a ball in time of danger. Others have developed their limbs for speed and the chase. Still others are greatly specialized and shoot blinding acid or irritating allergenics at their enemies. The survival mechanism which proved effective for the Hivers was intelligence.

The Proto-Hivers

In the carefully preserved wilds of Guaran (and on several other Hiver worlds), there is a large burrowing animal called the snohl. This thousand-kilogram intermittent creates extensive tunnels in its search for food, and built-up mounds which serve as nests. The proto-Hivers were originally omnivorous scavengers which were attracted to the snohls' leavings.

Over the course of time, groups of proto-Hivers moved into the snohls' burrows, digging out small dens in the edges of the snohls' main tunnels; eventually a symbiotic relationship was established where the proto-Hivers evolved into gatherers which accumulated food for themselves and the snohl, and, in return, the snohl provided shelter.

Proto-Hivers were relatively solitary, with one forming a relationship with one snohl and sharing that snohl's burrows. When one snohl's tunnel crossed another's, the snohls mated, and their proto-Hivers also mated.

The proto-Hivers had a complex (although only instinctual) culture in which they gathered decaying vegetation and dead animals, and farmed fungus in a crude way.

Late in this period, Guaran underwent a severe environmental change (probably an ice age) which put extreme stress on the proto-Hivers and snohls' ecological niche. It became necessary for the proto-Hivers to range farther and farther afield in search of food and fertilizer. In doing so, the proto-Hivers were forced to cooperate with each other, forming scavenging and gathering parties to handle the task of gathering at great distances. Some division of labor was necessary in order to handle the fungus farming in the burrows while the gatherers were away. And cooperation was necessary in order to properly assign and carry out all the tasks required. Those proto-Hivers with greater intelligence had a survival trait which helped them survive and prosper.

With intelligence came communication (basically a sign language), a sharing of ideas, and an ability to give orders and receive instructions.

With the rise of intelligence, the specific animal called the Hiver arrived. Over a period of perhaps 100,000 years, the Hivers built their culture and their technology, expanded their tool use and their social interaction to create the foundation for the Hivers as we know them today.

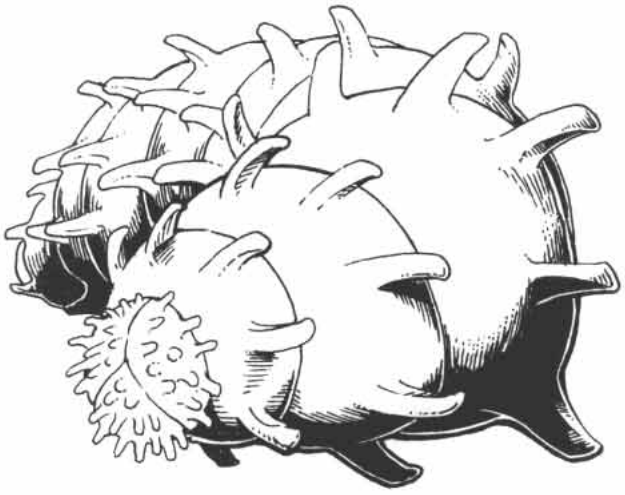


We come to a change in authors here. The two do not share the assumption of both culture and language predating intelligence. Are both authors deliberately misrepresenting verifiable facts, or is it possible that neither of them actually knows the real truth? This demonstrates the advantage of being perceived as devious: No one can tell when you're being devious or just stupid.

HISTORY OF THE HIVERS

The Hivers' first claim to uniqueness was their culture: they had an established culture before they became intelligent.

This is presumably the only extant example of a Hiver joke, *culture referring not to the social realities resulting from intelligence (as the term is defined), but to the specific type of fungus which they cultivated, in the same sense that your leaf-cutter ants can be said to possess a culture, by now a clone millions of years old. I prefer to think of it as a joke. If it is not a joke, it is simply one more example of off-hand, instinctive Hiver misdirection. More's the pity.*



Snohl
Type: Scavenger/Reducer
Special Attributes: None
Wt: 1600 kgs
Hits: 65
Weapon: Trample
To Hit: –3
Damage: 7
Penetration: Nil
Range: Short
Type of Melee Attack: Diving Blow
Initiative: 1
Armor: None
Behavior: Flee 4, Attack 1
Speed: 3/5/10

As pre-Hivers, they lived in tunnels and built-up mounds of the snohl, a large (1000 kilogram) burrowing scavenger/reducer. In exchange for shelter, the Hivers provided the snohl food. Hivers farmed fungus in abandoned snohl tunnels, and foraged outside for decaying vegetation and dead animals, which they used as a source of food for the fungus. Hivers ate the fungus (and whatever fresh food they could find outside, as well); the burrowers also ate fungus and various other by-products of the Hiver farming efforts.

The Hiver homeworld of Guaran experienced severe environmental changes (an ice age) which forced foraging parties to travel farther afield in search of new sources of food and fertilizer. Foraging advanced from simple scavenging and gathering to complex cooperative efforts to hunt and trap live game.

The characteristic curiosity of the Hiver race arose at much the same time. Curiosity was a decidedly pro-survival trait: It lead to the discovery of new food sources and hunting grounds; it allowed the Hivers to learn to use fire, to cultivate crops and to domesticate animals.

Strangely, curiosity appears to kill only cats. Hivers must be lucky.

Like many aspects of Hiver culture, language actually developed before sentience. A combination of arm/tentacle waving and physical contact evolved early to signal various facts—the presence and location of fertilizer sources, the existence of some threat to the community and so forth. Paleosophontologists studying the Hivers have compared these pre-sentient Hiver exchanges to the communications of Terrestrial bees or the dance of the scout caste of migratory kalgurils from Iddomakur.

You will find that all such comparisons actually post-*date this document. However, taking the long view, this statement did turn out to be correct, and given the fact that its authors expected this result, the point could be made that perhaps that means that it was in fact "true."*

It is interesting how the text asserts this "pre-sentient" culture and language to the Hivers without comparing it to human or other racial antecedents. Presumably it required intelligence for proto-humans to achieve language and culture. They must have been stupidly bumping into each other before that. Sometimes an assertion made out of context constitutes a lie, but for some people lies are an autonomic, rather than a conscious, function.

And of course, the text presumably refers to the European *kalguril, not the* African *kalguril. Come to think of it, I would prefer to confirm that there really is a place called Iddomakur.*

The development of intelligence for Hivers was a slow process, but one that was encouraged by the Hiver breeding system. Once intelligence proved viable within a small area, those Hivers tended to breed together, and their larvae survived to return to the local nests, where they were educated and in turn bred more Hivers.

Intelligence was presumably easy for the rest of us, as apparently we did not have a pre-sentient "breeding system." This also presumes that the complex genetic basis for intelligence was dominant across all of its genetic loci, or larvae randomly wandering back to various nests would have had their intelligent genes repressed by the by-definition locally dominant pre-sentient genes. Who smells a rat?



As sentience developed, the Hiver language became more complex and was adapted to communicating more abstract ideas and concepts. A written language also developed. Initially, it was based on ideograms which imitated much of the limb signal content of the Hiver gesture language, but it has since evolved into a precise symbology. Computerized terminals and computer-enhanced input stations have produced a hybrid between the written and gestured languages: an animated language display which enables non-Hivers to communicate directly with Hivers. Single keystrokes or short instructions are used to supplement the basic information content by conveying attitudes, background or emotions. Hivers communicating with non-Hivers generally use a vocal synthesizer which converts Hiver written language into local speech.

The Hiver written language has become the standard within the Hiver Federation. Local cultures may retain their own languages, but any which have interstellar interactions are also conversant with the Hiver written language.

Hivers talking among themselves use all aspects of their language (gesture, touch, symbology and intensity) simultaneously, creating a process capable of great subtlety and sophistication, but at the same time virtually unintelligible to the outsider.

What is truly remarkable about this document is the large extent to which it consists merely of platitudes and tautologies. Human and Ithklur language, naturally, has nothing whatever to do with gesture, touch, symbology and intensity. We are all obliged to make our own myths, but the Hivers seem sadly addicted to it.

Presumably the Imperial humans were so flummoxed by the reality of Hiver culture that such banalities were somehow reassuring to them and formed the threadbare basis for human understanding of these creatures, and continues to do so to this day.

Pre-Spaceflight History

The development of the Hivers on Guaran was a gradual process. Equipped with language, the ability to raise fungus as a basic foodstuff, and always with a driving curiosity, the Hivers expanded from their small settled areas along the equator, pushing north and south as the massive glaciers of the ice age retreated.

Shipbuilding first became an art and then a science. Hivers explored their world by sea, searching for trade goods and profits even as they satisfied their curiosity about their world.

They proceeded in reverse order from an art to a science, and they call themselves superior?

In the centuries before the Hivers gained spaceflight, there were three major events which have specific bearing on Hiver development: their industrial revolution, the acceptance of manipulation as a social force and the Guaran breeding catastrophe.

Industrialization: The industrial revolution is a necessary step toward starflight for any culture (the exceptions are so few as to be almost nonexistent). For the Hivers, industrialization laid the groundwork for many aspects of their society.

Most importantly, the nest system survived the transition to industrialization; instead of seeing a breakdown in the established social structure, individual Hiver nests took up various roles necessary for industrialization.

As a result, the nests remained an important part of the Hiver economy and a driving force in industry. Individuals were able to move from nest to nest, but the nests themselves became the companies that benefited from industrialization.

Manipulation: The Hivers have always been a very individualistic race; however strong their cooperation in nests has been, they are also capable of individual action in pursuit of their own goals.

Problems and crises in Hiver society have always been responded to in two ways. Society, driven by public opinion, has had responses that produced temporary or short-term solutions. Individuals, however, have taken a longer view, and strong-willed, intelligent ones have performed manipulations in order to create long-term solutions.

And presumably the strong-willed stupid ones have performed manipulations in order to create long-term disasters, like your M. Hitler and M. Lenin.

Note the thesis that cooperation does not yield long-term solutions; only individualism can do this. This will resurface later.

The Guaran Breeding Crisis: The rapid industrialization of Hiver society created extensive pollution and converted much of the wilderness of Guaran to desert. Since the wilderness areas were (and still are) necessary for Hiver larvae during their first year, the loss of these wilderness areas posed a distinct and grave problem to all Hivers.

Society at large responded in a fragmented manner: Each nest worked to preserve its own wildernesses, but a concerted effort to preserve all wilderness areas was slow in coming. Eventually, one Hiver (M. Eneri) conducted an elaborate manipulation which resulted in the dedication of specific regions of Guaran to wilderness specifically for larval development. The regions are carefully situated to reduce the distance any larva must travel to a minimum. At the same time, stringent restrictions on allowable pollution levels were established in order to keep the wildernesses alive and viable.

As with most successful manipulations, the results have since been accepted by custom as necessary to the health and well-being of Hiver society (and in Hiver society, such customs have the force of law).

Jump Drive

The most significant of all dates in Hiver history is –4698 (or –10,217 on the Federation calendar): the year the first Hiver starship jumped to another star system. Discovery of the jump drive opened the universe to the Hivers, and they saw the universe as a wonderful, delightful place desperately in need of exploration and examination. Curiosity drove them to the stars immediately.

Hivers Among the Stars: The Hivers developed a unified culture early. Though in no way the *hive community* pictured by early human explorers, the Hivers inherited a legacy of cooperation from their presentient ancestors and found it easy to live in harmony throughout all their long history. They evolved no true government, as such, but have always found it easy to work together for the common good.

The rest of us are presumably complete dolts and murderers. Your ancestors, and ours as well, must have not bothered to pass on their legacy of cooperation in hunting, finding shelter, avoiding predators and raising young. They were so busy cooperating that they didn't even think about their descendants, the selfish kok*hone. *I am incensed, I am.*



But is this the same spirit of cooperation that only produced short-term solutions, and had to be corrected by individualism in the form of manipulation to keep things from falling apart? This would of course make it impossible to evolve any true government. But it also means that "[Hivers] have always found it easy to work together for the common good" has an entirely different meaning than what you might have thought—i.e., "Hivers have always found it easy to work individually at cross purposes in the name of cooperation that does not exist because cooperation is maladaptive in the long view." If these people were my relatives, I would make them all see a doctor.

One reason for the lack of disharmony is the low population of Hivers on any given world. Because of the nature of their reproduction, Hivers have never experienced the population pressures so important to human history. Predators (and, on occasion, other measures) control the growth of a population by reducing the survival rate of Hiver larvae in the wild. When the adult population grows large, increasing the number of young produced, the predator population increases in proportion, maintaining a balance.

Very glib. The racism is palpable. I would be offended, were it not so transparent. How did your people sign off on this tripe for so long? You aren't really as stupid as they seem to think you are, are you?

After the discovery of the principles of the jump drive, the Hivers naturally spread to the stars. They were not impelled, however, by population or economic pressures; they were driven by their innate curiosity. Colonization was generally limited to worlds with physical characteristics and climates suitable to Hivers. If no local predators were available to control Hiver larvae, suitable predators were imported. For most Hiver colonies, the high birth rate rapidly filled the world up to its maximum population level, where it then stabilized.

Hivers like small, low-gravity worlds, usually size 6 or smaller, with thin or standard atmospheres and an unvarying climate. Hiver enclaves established for commercial or scientific purposes may be found on worlds with more extreme characteristics. Unsuitable worlds are generally turned over to other member-races of the Federation for development if the Hivers have no interest in a particular world.

Hiver Language

The written form of the Hiver language began as ideographs, a pictorial representation of Hiver hand signals, each symbol representing a word or concept. Hiver hand signals usually involve motions of the fingers or the whole hand, something which was not always readily convertible into a two-dimensional symbol. The main drawback of an ideographic written language is that a different symbol is required for each word or concept. Only a few basic symbols are needed for everyday writing, but technical writing requires thousands of symbols, all of which must be memorized. This does not seem to have been a tremendous problem among Hivers, especially with the development of computers.

The primary language of the Hiver Federation, however, is not Hiver, but Gurvin, the language spoken by the Federation race of the same name. Encountering the Gurvin early in their interstellar expansion, the Hivers found that the basis of Gurvin grammar was very similar to their own, and it was fairly easy to translate from one language to another. Written Gurvin was also ideographic, but soon developed a syllabary form (where a single symbol stands for a discrete sound unit or syllable such as "WO" or "A"). Terran linguists compare written Gurvin to Hieroglyphic Egyptian, where a single symbol can stand for a word, a syllable, or a single letter depending on circumstances. Because the majority of the races they encountered communicated by sound, Gurvin became the official spoken language of the Hiver expansion, and the names by which the worlds, stars, subsectors and sectors of the Federation became known were in that language.

Interstellar History

Beginning in –4698 (Imperial) Hivers began their expansion into interstellar space. The driving force behind Hiver expansion into space was the individual nest. The universal curiosity of the Hivers naturally led them to explore the stars. Some worlds produced economic rewards for their discoverers, but just the novelty of new worlds was enough for many nests.

Since your race (and mine as well) was not impelled to the stars by simple, noble curiosity, pick the compulsion which best describes your miserable, paltry, excuse:

1. *Greed.*
2. *Sociopathy.*
3. *Looking for free lunch.*
4. *Sexual frustration.*
5. *Population pressure.*

The answer is 5.

The first Hiver jump drives used an alternative (and inferior) technology to that of the human Imperium: The drive would permanently break down after a few uses (normally no more than 10). This, coupled with the fact that the drives could only achieve jump-1, limited the initial Hiver explorations to an area about 10 parsecs in radius from Guaran. For several centuries, Hiver explorations were restricted to a mere four subsectors of Ricenden sector.

In –4212, a more efficient jump-1 drive was developed (equivalent to the modern Imperial design), and the general radius of possible exploration was doubled. Since this increased potential worlds fourfold, the period from -4212 –4000 was a characterized by a frenzy of exploration and settlement.

In their first 600 years of star travel, the Hivers encountered only a few intelligent races: All were primitive and had no real interest in starfaring. It thus came as a shock when, in –3986, the Hivers met the Ithklur.

You can say that again.

It thus came as a shock when, in –3986, the Hivers met the Ithklur.

The Ithklur: The Ithklur had developed space travel (but not jump drive) by –3986. As a naturally aggressive race, they reacted with hostility when they encountered the Hivers. A quarantine of Tryylin (as the Hivers labelled the Ithklur homeworld in the Gurvin language) was established, along with a long-term project to understand the natural Ithklur aggression and hostility.

The nests operating in the region of Tryylin ultimately decided to



pool their resources and manipulate the Ithklur into a more acceptable form. Individual manipulations of Ithklur culture were undertaken, and over the course of 1000 years, the Ithklur were redirected to acceptable control of their aggression and hostility, to the point that they are now accepted and valued members of the Hive Federation.

Similar manipulations of other client races have been performed by the Hivers.

The Hiver-K'Kree War (–2029 to –2013): Continuing K'Kree expansionism eventually brought them into conflict with the Hivers and their settled territories. First contact occurred in –2045, and by –2038, several Hiver worlds had been occupied by the K'Kree. Naturally enough, a war resulted.

In the first stages of the war, the military technology of the K'Kree proved superior; the Hivers were beaten back in defeat. Up until that time, the Hiver Navy had been a small exploration force devoted to scouting operations, actions against local navies without jump-capability, and protection of merchant shipping. At best, it could only undertake rear-guard actions as the Hivers retreated.

After six years, the K'kree slowed their advance in order to occupy and absorb their initial conquests. The Hivers used the opportunity to regroup and upgrade their forces. Between –2023 and –2018, the Hivers established the Hive Federation and embraced many local races as equal members. They created and trained a powerful navy. They recruited and trained a large army (populated primarily by troops from client races). And they put into action a crash program to win the war without a battle.

Selecting several worlds within Kilong sector, deep within the K'kree's Two Thousand Worlds, major secret expeditions were dispatched to work a variety of manipulations on native K'kree populations. Over a period of years (–2018 to –2013), the expeditions were successful in changing K'kree culture on a few selected worlds from its consistent and static mold, introducing such aberrations as meat sauces for foods and acceptance of isolation as a recreation, both of which had been anathema to the K'kree before that time.

In –2013, the Hivers succeeded in drawing the K'kree to the negotiating table by hinting that they were ready to surrender. During the ensuing discussions, the Hivers horrified the K'kree representatives by demonstrating the success of their manipulations on the selected worlds, and revealing plans to similarly alter all of the Two Thousand Worlds unless the K'kree ended hostilities immediately. The K'kree agreed to an immediate armistice, and several months of serious negotiations finally resulted in an armistice which returned the occupied worlds to the Hivers and established a secure border which remains stable to the present day.

The K'kree were highly disturbed by Hiver tampering with their culture. The four manipulated worlds were sterilized and (as far as is known) remain interdicted to the present day.

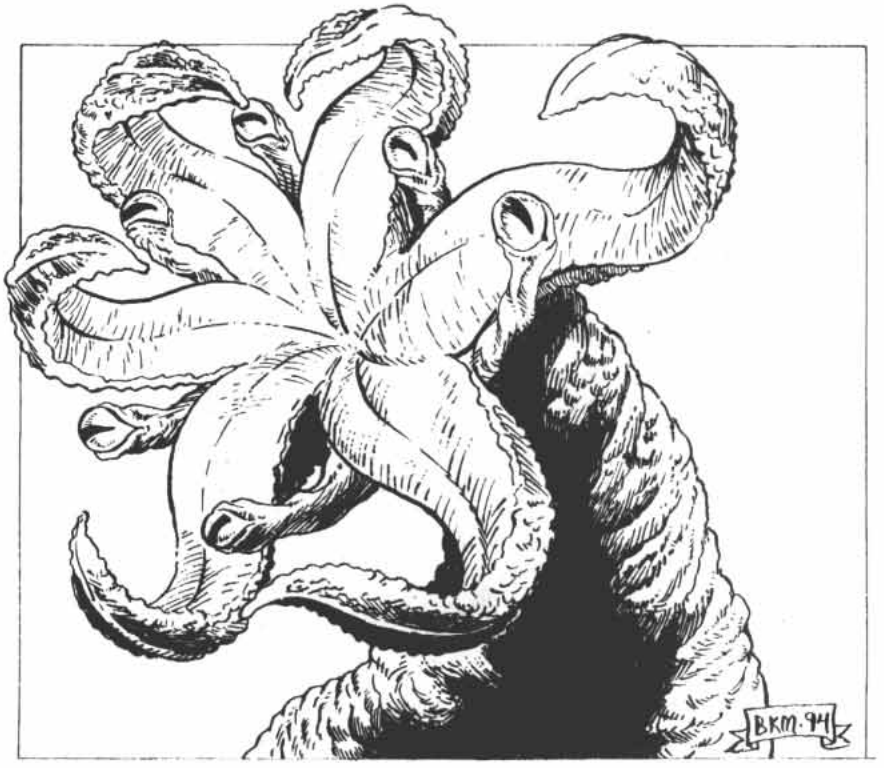
Ithklur history, in the form of the Dikrah Kiradgi, *records a different version of events.*

Ithklur troops, as all Hiver records will admit, formed the bulk of the Hive Federation ground forces in the K'kree war. On a number of worlds (at least four), substantial Ithklur ground forces were left isolated by the withdrawal of Hiver naval support, deprived of supplies and the means of reinforcement or withdrawal.

True to their nature, all of these Ithklur forces chose to fight on, to the bitter end if necessary. Fortunately, their supply needs were simplified by the fact that the Ithklur found the K'kree to be eminently edible, being very similar to domestic meat-beast that were a staple of the Ithklur diet. It was a simple matter for the Ithklur to simply eat the carcasses of their defeated enemies, meanwhile capturing their weapons, ammunition, and fuel to continue the fight.

Fighting on these worlds became increasingly bitter and in some cases lasted for several years. The nature of this fighting became so bitter and degrading that both sides committed atrocities designed to break the will of the other, and the K'kree responded by beginning the ceremonial consumption of dead Ithklur as revenge for the Ithklur practice.

The Hivers continued to lose the war on the strategic level, but a Hiver officer, Tschudi, in charge of attempting to relieve the isolated garrisons, became aware of the details of the isolated



On the Ithklur Manipulations

Our programs to rein in their violent tendencies were remarkably successful, but unfortunately they had an unanticipated side effect: We appear to have made them somewhat stupid.

The Ithklur are the only race in which we have found violent tendencies so closely linked to intellectual capacities, and this meta-cognitive connection is only poorly understood. It is likely that the progress made in eliminating their aggression will make it impossible to reconstruct their intellectual faculties to their original levels, but this unfortunate by-product is quite acceptable within the parameters of the original manipulation.

M. Fizbin, for M. Jeraldi *post hoc*



pockets and hatched a plan to take advantage of these facts, and incidentally take credit for them. By drafting fictitious orders after the fact, Tschudi claimed to have manipulated the K'kree carnivorous deeds which were in reality merely a response to established Ithklur procedures.

Tschudi arrived at the Hiver surrender negotiations in the nick of time and turned the tables by terrifying the K'kree with this putative master-stroke, in fact a shrewd, if disingenuous, portrayal of other realities. For saving the Federation, Tschudi was granted the title of Manipulator. To this day, M. Tschudi is remembered by the Ithklur with contempt as the archetype of Hiver opportunistic deceit.

Significantly, the Ithklur military anthem dates from this period. Although its official name is "With Certainty of Victory," its actual colloquial meaning is: "Hamburger for Lunch Tomorrow, You Betcha."

SIB Analysis

Although their computer expertise enabled them to recognize and deal with Virus more quickly than the Imperium, the Federation was still severely handled by the coming of Virus. Virus inside the Federation is a touchy subject with Hiver officials, for reasons which are open to speculation. Perhaps the Federation is unwilling to admit the extent of the destruction. Perhaps experiments are being conducted inside the Federation with captured and "tamed" Virus strains, experiments which might be misinterpreted by humans in the Wilds who have reason to be suspicious of any Virus, no matter how "tame." We can probably dismiss out of hand the more outrageous rumors, such as the one stating that Virus was a large-scale manipulation calculated to reform the Last Imperium into something more suited to the Hivers' ultimate goals. Certainly we can admit that we humans are sufficiently maladaptive that some catastrophes can simply be explained by our own flawed nature.

As more of the Wilds recover from the devastation of the Collapse, trade with the worlds of the Hive Federation is increasing. With the establishment of a chain of temporary "stepping stone" bases in So Skire and Sitah subsectors, Hiver merchant convoys, once rare, are increasing in size and frequency under the protection of advance units of the Federation Navy.

THE HIVE FEDERATION

The interstellar empire of the Hivers is technically a federation—a group of states, each internally independent, which have joined together into a union to which they have surrendered certain rights and responsibilities (concerning foreign affairs primarily). This federation is less centralized than a republic or an empire, but more united than a confederation or casual alliance.

The Hive Federation, although originally founded by the Hivers, and widely based on their cultural precepts, is, in fact, a true union of many diverse worlds and races. All member worlds are co-equal in status, in representation in the central government, and in access to the benefits of interstellar commerce and interaction.

This is an interesting claim. This would be akin to humans saying that your lab rats are free and self-governing, insofar as they are free to go left or right in the maze, or choose to press the bar or not to receive a little piece of cheese.

The fact that the Hivers reserve for themselves the right to manipulate races to become their specialized wogs gives an interesting meaning to the phrases "true union" and "co-equal."

Member Races

There are over 170 member races within the Hive Federation, which are extremely diverse physiologically, but display fewer differences in culture and behavior than might be expected. The three main races are the Gurvin, the Za'tachk and the Ithklur.

Gurvin: The Hivers encountered the Gurvin early in their period of interstellar expansion, and they are one of the oldest races associated with the Hivers. Derived from hexapodal omnivore/hunter stock, the Gurvin are equipped with two legs, two arms, and a middle pair of limbs which can be used as either arms or legs at need. They are 1.75 meters in length from muzzle to tail, and stand about this high on their rear legs. When running, they get down on their four rear limbs and are about a meter from muzzle to ground. Their culture adapted fairly readily to Hiver cultural standards; though the Gurvin exhibit aggressive behavior, their aggression has long been channeled into economic pursuits.

The Gurvin are interesting in that the females are roughly twice as intelligent as the males. Males, although sentient, are decidedly lacking in creativity or reasoning ability. Traditionally, Gurvin males were the hunters, relying primarily on instinct and sharp senses rather then intelligence; the females, limited by the problems of carrying, bearing and raising young, were forced to develop intelligence for security. Gurvin worlds are generally governed by a matriarchal representative democracy.

Gurvin males are rarely found away from Gurvin settlements. Gurvin females, however, range throughout the federation and beyond, where they are most frequently encountered as merchants and businesspeople.

Gurvin are stereotypically money-oriented and seem to have a fixation on cash, in contrast to the rather casual attitude toward money shown by most Hivers. They rarely do anything out of altruism and are famous for demanding payment in advance for any remotely risky venture.

The Gurvin language is the *lingua franca* of the Federation, as noted in the sidebar on page 14.

Read: "wogs in charge of money, and scapegoats for economic inconvenience." Why is it that races everywhere else in Charted Space are capable of carrying out the full repertoire of civilized functions, from parking attendant to physicist, from theologian to brain surgeon? Why is it that only in the Hive Federation are there sentient races that are as specialized as social insects? One cannot help but be suspicious of the characterization of males as aggressive and stupid, and the fact that they are not very far ranging. One can only wonder how that happened.

Za'tachk: Like the Gurvin, the Za'tachk have been associated with the Hivers from the earliest days of Hiver interstellar exploration. Descended from trisexual omnivore/gatherers, the Za'tachk are quadrupedal; like the Hivers they can use their limbs equally well for walking or grasping, although they exhibit bilateral rather than radial symmetry. They are about the same size as the Hivers and are completely hairless. Even before being discovered by the Hivers, the Za'tachk were similar to them in many aspects of their culture, being nonaggressive, pacifistic and highly cooperative in all phases of society. Unlike the Hivers, they are somewhat timid and lack the burning curiosity that typifies Hiver behavior.



How convenient. Untermenschen, *if I have ever seen one. I guess I'd consign them to stuffy windowless offices if I were in charge.*

Za'tachk have an obsession with order, revelling in all aspects of organization and development. They are frequently found in administrative positions within the Federation, and are occasionally found serving on Hiver merchant ships in the Coalition as pursers, accountants, bookkeepers and so on. Though other races also serve in these positions, Za'tachk are favored for such work when available and naturally gravitate toward such positions.

Ithklur: The Ithklur were formerly a highly aggressive race; they represent the first major success of Hiver psychohistorical techniques. Their society was modified over a period of nearly 1000 years to conform to the Hiver ideal.

Descended from carnivore/pouncers, the individual Ithklur averages two meters in height and 200 kilograms in mass. They are bipedal, with a short, heavy balancing tail and two arms tipped with blunt, thick fingers which still retain formidable claws. Their skin is tough and faintly scaled; their fairly human-like faces run toward thick brow ridges, heavy jaws, and broad, flat features. They have two sexes, bearing live young equipped from birth to eat fresh meat.

Though Ithklur society has been reshaped by the Hivers, they retain a strong internal government (generally, rule by small councils of dominant individuals are favored) and police forces to provide a check on naturally combative tendencies. Within the Federation, the Ithklur are frequently found as members of the navy (and its ground auxiliaries in particular), or as security troops attached to development or scout nests. They are much more comfortable with concepts of combat than are the Hivers, though centuries of civilization has buried their more violent tendencies fairly deep.

The Ithklur prefer high-gravity worlds with dense atmosphere, but are found throughout the Federation.

All broadly true, except for the part about successful psychohistorical stuff.

Note how they use the same language to describe us to you as you use to describe Neanderthals in your own anthropology books.

Also funny how their characterization of our government can be applied to any intelligent race, even to Hiver septs.

HIVER SOCIETY

The interaction of Hivers with themselves creates a society with patterns and practices that help perpetuate it.

Huh? I have been manipulated into catatonia by platitudes and tautologies.

Self-Image

Hivers perceive themselves in four basic classes, based on age: *larvae*, *yearlings*, *adults* and *seniors*. Larvae are any young which have been dropped by a parent and have not yet acquired yearling status. They are distinguished by their small size and the lack of development of their fingers, as well as a distinctive dull brown-orange coloration. Larvae are recognized as potential Hivers, but are not accorded any special care or status. Once dropped, larvae naturally gravitate to wilderness areas, where they survive instinctively for about a year; during this time their immature features develop, and they grow in size from an initial 30 centimeters radius to about 60 centimeters radius. The period in the wilderness is a natural selection period which eliminates nonviable mutations, physically weak specimens and sickly individuals. Hivers do not care for or even recognize their own offspring in the larval stage. It is simply not important to their parental instincts.

Yearlings are maturing larvae which have emerged from the wilderness. Their fingers are developed to the point where they can grasp and manipulate objects, and they have completely lost the peculiar orange-brown coloration of larvae. Yearlings are accepted into any nest (the basic Hiver family unit) they wander into and remain in that nest until they reach adulthood. During this time, they receive an education and continue to develop physically. At age 14 (standard Imperial years), the yearling reaches reproductive age and is considered an adult.

Adults are any Hiver of reproductive age. Adults are fully mature members of society and may undertake any career they desire.

A senior is a Hiver who has gained special respect or status base on its actions in life; not every individual attains such status. Nest leaders become seniors after several decades of service. Law judges usually become seniors after many years in their careers; manipulators who achieve fame for their deeds are usually considered seniors. Senior status is a nebulous and unofficial classification. Within a nest, for example, the leader is usually considered a senior by nest members; outside the nest, the leader may not yet be considered a senior.

Structure of Society

Hivers organize themselves into cooperative nests which generally center on a common endeavor or interest. Nests may include as few as five or as many as 500 individuals, but average about 100. Larger nests are established when there is a need for a greater population (a manufacturing complex or university); smaller nests are created when a small group is needed (starship crews, small businesses, expeditions and so on).

A yearling's first years with a particular nest are spent learning basic social and intellectual skills; the later years are spent taking an active role in achieving the nest's goal. When the yearling reaches adulthood, it may elect to remain with the nest, or it may leave the nest in search of another to seek out a nest with a goal more suited to its talents, to pursue further education, or to follow a goal or occupation of its own.

Above the nest level Hiver society has a number of governing organizations. Many nests may group themselves together to form a city, city-state or industrial complex. A number of cities may group together with other, smaller nests to form a nation-state. Nations and lesser nests may form world governments. The worlds of the Hivers have banded together to form the Hive Federation.

In all cases, however, the lines of authority in Hiver society are vague. There are nests (or organizations) that handle every aspect of Hiver life, but *government* is determined largely by nests that coordinate activities between various other nests, or by leaders of nests acting in concert. Neither has any authority in the sense that humans understand the concept; they merely perform a job like any other nest, with no special power or respect accruing to members of such nests. Certainly Hiver society is utterly egalitarian; competition for power over others is totally foreign to the Hiver nature.

Except insofar as manipulators are constantly trying to get you (and each other) to do things by means of which you are totally unaware, which is, of course, the single basic underpinning of their society. Other than that, competition for power is right out.





The Hivers worship this myth of their natural, instinctive cooperation, except that we already have learned that they believe it is a fraud; only individual, secret, manipulation takes the long view of society's best interests into account. So why the lip service to cooperation? Perhaps this is to keep the weak-willed Hivers (1.) out of the manipulation business and (2.) busy cooperating so that they can be more easily manipulated by others. Too many manipulators would cancel each other out.

In a society which insists on absolute individualism and absolute cooperation, there is only one way out, and you humans have a name for this disease from which all of Hiver society suffers. You would call them "passive-aggressive."

The Hiver Economy

The Hiver economy has been described as an "economist's nightmare" or "capitalistic communism" by human writers. It is very difficult for non-Federation members to understand, though it seems to work admirably for them. Basically, Hivers have a strong desire for material comforts and, hence, the wealth that makes these things possible. But they rely on a system of credit in which an individual has a positive or negative credit balance with a particular nest. When an individual changes nests, the new nest acquires the individual's credit balance, either paying to or being paid by, the previous nest. In the interim, individuals can draw on the nest's accounts for virtually any amount, whether for simple necessities such as food and shelter, or for large material items.

Just how this system is regulated is a matter of some uncertainty to humans; it seems to be largely a combination of honor and ambition on the part of the Hiver nest-member which limits unrestrained tapping of resources. Because the Hiver knows it will be moving into another nest, and it also wants to enjoy a certain degree of stability and comfort, Hivers seem to regulate their own desire to tap a nest's resources so as to end their service with a particular nest with a positive balance; they can earn credit according to the quality and quantity of work performed, just as humans earn money. Thus, a Hiver may require large amounts of expensive equipment for a particular project, which the nest provides; at the end of the project, the Hiver returns the equipment, and the value of the returned items (less a "depreciation allowance") is used to offset the amount originally charged with the Hiver's account with the nest. The balance is made up out of the value of the individual's labor. This system is vastly oversimplified in this description, but in essence conforms to these lines.

How convenient. And how often does a manipulation just happen to have the side-effect of making sure that one's negative balance never quite catches up? Good thing those Hivers are so perfectly cooperative and honorable, always looking out on their own for the long-term good of society.

Hiver Specialties: Communications and electronics technology are the most important industries in interstellar commerce in the Hive Federation; Hiver industry and business excels in these fields. Major exports include artificial and computer languages, translators, robots, computer circuitry and software, and electronic hardware of all types. Hiver mathematical systems are much in demand for their power and elegance.

Well they'd have to be powerful, wouldn't they? After all, every calculator has to be able to keep track of both sets of books.

INSTITUTIONS

Hiver society has created a variety of institutions, each of which has helped shape society. Four important institutions to be considered here are the nest, manipulation, the embassy and topical clubs.

Okay, let me get this straight. If society creates institutions, and institutions shape society, then what is it that the Hivers do again? Society ought to tell them to get a job.

The Nest

The basic institution of Hiver society is the nest. In some ways, it is equivalent to the family or tribe in human society. The nest serves two purposes in Hiver society: It is a place for the education and care of the young, and it gives each Hiver an established place and purpose in the social structure. The analogy with the family does not completely hold up, however (few analogies do). Hivers can and often do shift from nest to nest in a manner similar in the way that humans change jobs, and in some ways, the nest resembles a business corporation, a government bureau, an educational institution or a philanthropic organization.

All nests have a nest goal: a statement of purpose for the nest members. For some, the nest goal is an elaborate statement, while other nests may decide that they exist only to care for the young



and support their members. There are even nests for those Hivers who want to be independent and alone.

I'm not even going to touch that one.

The nest is headed by a leader—one individual who makes routine decisions and assignments, and who keeps (or oversees the keeping) of the nest's records. Where the rare dispute over the leader's decision occurs, the nest as a whole reconsiders the decision and affirms or changes it.

Manipulation

Manipulation is a uniquely Hiver phenomenon. It is an accepted activity which accords the successful manipulator respect and admiration from the population in general. It is a way for individuals to achieve a lasting sort of fame in their society.

In the same way that a sculptor wins respect and admiration from his clay. That clay better respect and admire him if it knows what's good for it.

Manipulation is rigidly defined by the Hivers to include four components: the deed, the manipulator, the consequences and the claim of credit. Each component has been carefully refined and defined, and its requirements must be carefully met for it to be accepted.

The deed itself is the stimulus which sets the manipulation into motion. The deed must be premeditated, and it must be the minimum deed necessary. As such, the deed must be carefully recorded (originally in writing; currently, manipulators maintain elaborate explanatory video and graphic records) in order to support a later claim of credit. Premeditation of the deed also includes a prediction of the consequences and their effects. The finesse of the manipulator is judged by the degree and complexity of the deed; great finesse is assumed when the deed is small and innocuous, and lesser finesse is assumed if the deed is more direct or complex.

The manipulator is the person who performs the deed. A manipulator may be open and direct, or may work behind the scenes. In all cases, a true manipulation calls for the manipulator to be a single person, working alone and totally responsible for the act. If more than one person performs the deed, the act is not a true manipulation.

The consequences of the deed are the result of the initial act. There are obvious results of any deed, and evaluation of any manipulation ignores them; the unobvious effects are the true effects of manipulation. The manipulator must predict them correctly.

The claim of credit is the final step in a successful manipulation. The manipulator must reveal the manipulation and present its evidence of responsibility and its prediction of the consequences. Upon evaluation, the event is then acknowledged as a manipulation (or not), and proper records are made.

Acknowledged manipulators are accorded a courtesy title of Manipulator (abbreviated M.) in respect for their deeds.

There is something astonishingly schizophrenic about how the Hivers wish us to view manipulations. On the one hand we are told that Hiver manipulation is totally unique and of sweeping importance, but then again it is utterly benign and not strange at all. It is as if they want to keep us off balance by not really knowing what we think about manipulation. They have plenty of opportunity to present a consistent view of its importance, so do they want us to fear it or not? It appears that they have not decided.

But perhaps that is their goal: If we feel that we don't know what they want us to think about it, then it makes them appear less powerful and in control than if they did present a united front. So either they are less powerful and monolithic than we fear, or that is the impression they are trying to convey. Presumably not knowing which one of those it is is exactly what they want.

The First Manipulation: The first manipulation in Hiver society was also one of the first recorded deeds in Hiver history.

About 10,000 years ago, M. Primus (the Anglic translation of the manipulator's name) was a nest leader in one of 10 city-states on a mountainous peninsula. All the city-states were struggling to build and maintain their economies but were constrained by the mountains; instead, all viable trade took the long route by sea around the peninsula. Primus proposed to a meeting of city leaders that a road be built across the peninsula, complete with tunnels through the impassable mountains, to connect all of the city-states. Primus emphasized the commercial and trade benefits that could be expected.

The idea became popular and was implemented. Within 10 years, all 10 city-states were connected by a road that greatly shortened travel time between them. Within 15 years, several of the previously inaccessible mountain valleys in the peninsula interior were settled by newly formed nests. Primus' city-state became a trade center for these new settlements; with trade came power and importance. As the years passed, the city-states found that their interests were more common than separate, and within 30 years, the 10 city-states had united into a new nation-state—the first to be established on Guaran.

At a celebration of the founding of the nation-state, Primus climaxed the festivities by revealing its manipulation. Everyone immediately acknowledged Primus' deed, and it has since been recorded as the first true manipulation. At this point, the record becomes semi-mythical: One ending has Primus being elevated to leader of the new nation state; the other has Primus banished as too dangerous to the community.

Hiver Timekeeping

The Hivers have a number of traditional timekeeping units, but few non-Hivers use or understand them. The following units are standard throughout the Federation:

The Hiver day is also known as a Cycle, and is roughly equivalent to 30 Imperial hours (actually, 30 hours, 2 minutes and 31.056 seconds). Each Cycle is divided into 6 Intervals, roughly equivalent to 5 Imperial hours. Smaller units of time exist, but are not of real concern except to specialists.

The Hiver year consists of 143 Cycles, or about 179 Imperial days. For practical purposes, two Hiver years equal one Imperial year. The Hiver year is not divided into months, and the days are simply numbered from 1-143 to distinguish them.

Current Year

Terran (AD)	*Imperial*	*New Era (NE)*	*Hiver*
5718	1202	2	1584



Fascinating. We are asked to believe that sea transport—the most efficient form of planetary cargo transportation—was insufficient to keep the economies of these city-states going, and that the mountains were forbidding enough to prevent all overland trade, but that these city-states had the wherewithal to blast tunnels through these mountains to link all of the cities in only 10 years? How were these city-states founded if they were not port cities to begin with? Hivers must be phenomenally bad sailors.

This story also ends with the classic Hiver ambivalence about manipulation itself: We celebrate this as the first manipulation, and yet we're really not sure if manipulations are a good idea after all.

The Embassy

Embassies are a relatively new institution in Hiver society, coming into being only after spaceflight was achieved.

Embassies are actually a type of nest. The nest goal is to help maintain the uniformity of the Hiver genotype by carrying reproductive cells between worlds. Embassies also foster a homogeneity of Hiver culture by sharing news of events, relationships, discoveries and interests to the many worlds of the Federation. Embassies often become involved in legal decision-making. As disinterested outside parties, the are presumed to be able to make impartial decisions on questions brought before them; they serve as juries to decide disputes that have not been otherwise resolved.

Topical Clubs

All Hivers have some degree of curiosity, but just because an individual is curious does not mean that it is intelligent or well-educated. The Hiver institution of topical clubs evolved as a response to the unending curiosity of Hivers and a common desire to know more about everything.

Topical clubs are formal organizations of Hivers with an interest or curiosity about a specific subject. Typical subjects are the sciences (perhaps biology, electromagnetic radiation, mathematics or gravity), social sciences (perhaps education of yearlings, government or history), or self-improvement (perhaps leadership techniques, physical training or sports). There are topical clubs established for almost any subject of interest to the Hivers; most Hivers belong to at least one such club and probably several.

Topical clubs are independent and self-governing. They each establish their own criteria for membership and may be open to all or only to invited individuals. They may join with other clubs to share information, or they may stand fully independent. Normally, each club will have communications with similar clubs, and most will have a sort of reciprocity arrangement, meaning that members of one club are granted membership privileges in clubs sharing identical interests.

Topical clubs have several functions in Hiver society. They educate individuals. They conduct beneficial research which may not be funded or encouraged by the nest or by the government. They provide a safe place for Hivers to indulge their curiosity. They help Hivers avoid duplicating research which has already been conducted. In general, topical clubs are an outlet for a major drive within Hiver society, and by providing that outlet, the clubs help stabilize Hiver society.

There are many topical clubs, and some of them achieve a continuing legitimacy and acceptance; these tend to become semi-official regulatory agencies. Two of the most notable topical clubs are the Manipulations Club of Guaran and the Legal Club of Glea.

The Manipulations Club of Guaran was originally organized on Guaran about 1000 years before Hivers achieved spaceflight, and was dedicated to teaching individuals the fine art of manipulation. At about the time of the discovery of spaceflight, the club changed its focus from teaching manipulation to the study of manipulations. It currently maintains the official records of major manipulations within Hiver society, and ranks them by effect and importance; scholars use these records to analyze trends within Hiver society.

Or, they can massage these records to convince others of false trends which will manipulate them into starting other different trends which can then be recorded accurately or else further cooked to yield really subtle third-order results.

The Manipulations Club is also the accepted validating agency for manipulator status. A manipulation may be filed (along with supporting documentation), and, if accepted, the manipulation is recorded as such within the club's records. Such an acceptance and recognition accords official manipulator status to the responsible individual and allows the use of the honorific title "Manipulator."

The Legal Club of Glea is the central repository for all legal decisions and precedence within the Federation. The records and publications of the club are required reading for Federation embassies and any individual with an interest in Hiver legal procedures. The Legal Club of Glea maintains ties with other legal clubs on other worlds within the Federation, and helps keep them informed of decisions and precedents which may affect them.

Because the Hive Federation has no formal or pervasive legal structure (depending instead upon custom, precedent and essential fairness),

(not to mention that self-regulating body of cross-cutting individual long-view taking manipulators),

the Legal Club of Glea and the other legal clubs of the member worlds help to maintain a uniformity of legal administration throughout the Hive Federation.

Topical clubs fulfill a necessary function in Hiver society: They are pseudo-nests with pseudo-nest goals; that may not be practical or acceptable. Topical clubs allow individuals to follow more than one

Manipulation has such a frightening connotation to you. You associate it with power. But for us, it is only curiosity. We do not manipulate to control; we manipulate to understand. Think of us simply as empiricists; to learn, we conduct controlled experiments, based on a clear a priori *hypothesis as to the results of the experimental manipulation. If the hypothesis is confirmed, we have learned something valuable about behavior—that's all. What is so sinister about that?*

M. Genghis

We helped the Ithklur to find their place in the universe. We are having a harder time identifying exactly what your place might be. Do you have any idea how interesting you are?

M. Genghis





goal in their lives. And one of the greatest ambitions of some topical clubs is to transform themselves into nests, able to devote their full resources, on a full-time basis, to their chosen purposes.

The Parental Instinct

The strong Hiver parental instinct can be considered an offshoot of the Hiver instinct for racial survival. To humans, this parental instinct seems more than a little warped. For example, Hivers are horrified by the idea that their larvae might somehow find their way to a world where there is no nest to receive it when it becomes a yearling. To prevent this, Hiver ships are carefully fumigated to kill any hiding larvae before landing or docking, and extreme measures are undertaken to ensure that no Hiver crewmember deposits larvae where there is no nest. On the other hand, the notion of artificially limiting larval production is considered barbaric by most Hivers.

As Hiver culture has grown more sophisticated, Hivers have extended their interpretation of the parental instinct to "child" races—primitive or culturally backward aliens—as well as their own Hiver children. The Hive Federation has been influenced by this instinct, and it colors Hiver behavior toward races outside the Federation as well.

Humans are seen as the best candidates for civilization outside the Hiver sphere, though Hivers still regard human cultures as barbaric due to their capacities for violence and the wildly confused welter of genotypes and cultures which are permitted to flourish in human space.

Oh, you lucky devils. Better hurry up and pick your pigeonhole before someone else picks it for you.

PSYCHOLOGY OF THE HIVERS

Hivers behave in ways which have been shaped by thousands of years of evolution and culture. In some ways, their behavior is very similar to the behavior of humans: They struggle to survive; they avoid pain in everyday circumstance; they become hungry and eat; they enjoy such pleasures as comradeship and pleasant surroundings. In some ways, their behavior is very different: They have no concept of love; they do not consider their young to be people until they are a year old; they abhor personal violence). But everything the Hivers do has a basis in their culture and their evolution (just the same as is true of humans).

Psychology endeavors to understand how a being thinks; an understanding of Hiver psychology can help others to predict behavior and motivations, and to evaluate a Hiver's actions.

Hiver psychology has two major areas of study: behaviors and motivations. Behaviors describe what Hivers do and how they do it; motivations describe why they do what they do.

Basic Hiver Motivations

Hivers are living animals, and as such, they are motivated to survival, finding food, finding satisfaction and reproducing themselves. The behaviors they show and the reasons they have for behaving in the ways they do reflects their psychology, culture and society.



Just because the Hivers are intelligent does not make their behavior strictly logical. Hivers understand that much of their activity is based on instinct or preference born of long years of evolution. Behavior can be altered or redirected if they see a reason to do so; but they also naturally accommodate basic behavior as a matter of course.

How forward thinking. Why didn't the rest of us realize that we do that?

Humans behave similarly. On a strictly logical basis, a good substitute can be created for humans which provides everything necessary to support life, but without any flavor. It could be cheaper, store better, and be easy to eat. And humans would not stand for it. Human psychology requires flavor in food; without flavor, the food is unpalatable, inedible. Similar conditions apply to the Hivers.

Personal Survival: The Hiver drive for personal survival expresses itself as an aversion to physical violence. Hivers have no real history of fighting, and they are not suited for it either intellectually or emotionally.

It is true—Hivers have an aversion to physical violence and fighting. Emotional, ethical and moral violence, on the other hand, can be executed without messy passions. Manipulations are tricky things. Sometimes the elimination of one or more obstacles is required by the needs of subtle social forces.

Have you ever wondered why the Hivers go on so about their terrible susceptibility to deficiency diseases? Rather a strange admission from beings which find their racial superiority so self-evident. It seems that the single leading cause of nonviolent, nonaccidental death among nonelderly Hivers is deficiency diseases. In fact, these are so common that merely perfunctory autopsies are performed in these cases.

An aversion to physical violence and fighting does not mean that someone is incapable of evil. One can be evil and simply be a coward. *Indeed, where passive-aggressive measures are the norm, evil flourishes.*

In their own minds, many Hivers feel that they can handle fighting—they learn to use guns; they study strategy and tactics; they even train for close combat.

Like your aunties train for tea parties.

But in the final analysis, they always seem to break, unable to respond with the violence that would carry them to a victory at close combat unless they are in a true survival situation. It is fortunate for the Hivers that modern warfare is carried out at long ranges.

And that there are Ithklur cannon-fodder available for the other 99% of the cases where it is not.

The Hiver urge to run doesn't apply at ranges where dispassionate thought can intervene.

Tell that to Ithklur ground troops when the covering task force bugs out.

Hivers operate a navy because they consider naval actions (longer ranges; less immediate consequences) more acceptable.

Racial Survival: Reproduction is always a function of the drive for racial survival. With the Hivers, reproduction is a casual act, without consequences or responsibilities. As a result, the racial survival drive for Hivers is concentrated in the parenting process.

Reproduction: Hiver reproduction is an instinctual process. It is totally without emotional overtones; there is no formation of sex-based bonds between individuals, and the reproductive process does not have the emotional importance that it has to humans.

As usual, ignore the Ithklur. They're only interested in you guys because they don't think they've manipulated you really good and hard yet. But will they still respect you in the morning?

Without mating bonds, there are no close-knit family feelings common to most human and other such cultures. Hiver larvae are regarded as minor pests, and Hivers have no compunction about eliminating them when the need arises. Yearling Hivers returning to civilization do so at random, so there is little chance that one might be taken in by its own parents, and no means to so determine in any case.

Hivers do have a strong parental instinct, but it is a generalized one. Yearlings are adopted and cherished by the entire nest, rather than by specific individuals. Any Hiver is strongly concerned with the safety of all yearlings.

I know this stuff sounds awful, but you know what? I bet no Hiver ever said, "I love you so much, if I can't have you, I'll just have to kill you." Think about it.

Parenting: The parenting instinct expresses itself in two ways: a drive to teach the young, and a drive to manipulate.

Teaching the young is a task that all Hivers undertake at some time or another. Since parenting is not an act of volition, and therefore not an individual responsibility to stand by (or, more accurately, is an act that all Hivers engage in, and therefore all Hivers corporately stand by), all Hivers in all nests share in these responsibilities equally. It involves relating stories of personal experience in an attempt to give the Hiver students an advantage in their own dealings with life. Since all Hivers are naturally curious, such story-telling sessions are an enjoyable and entertaining activity, and the young look forward to them.

Manipulation is an instinct that the fiercely individualistic Hivers have raised to a fine art. It seems to be a development of the parenting instinct, except the Hiver is now acting as a parent to other adults—deciding what they need and then convincing, forcing, persuading or imposing the answer on them.

Can they really afford to be that honest?

Curiosity: One of the greatest forces in the individual Hiver is its curiosity. Hivers are interested in the world around them, and are often driven to investigate and try to understand events and situations they may encounter. Most Hivers have selected one or more topics in which they are interested.

Among other species, that tendency is simply blamed on intelligence. But the Hivers just have to be fancy.

Individualism: Hivers take great pride in their individualism. They enjoy their own abilities to achieve objectives; some of this



Yes, emotion and passion are the fuel which drive your human intellects, but they are an unpredictable and unreliable source of energy. We Hivers are fortunate to not have to rely on them as you do.

What do you do when you run out of enthusiasm? Do you give up? What do you do when you stop loving someone or something? Do your promises to that individual or organization become null and void in that instant? If so, how can you exist? How many times have you failed to act because of fear—fear of your inability to succeed, fear of your inability to control the forces you might unleash, fear of finding out the truth about yourself, fear of others finding out the truth about yourself?

I tell you that we Hivers have been cheated of nothing. We don't act out of fear like you humans do, nor do we act out of inconstant love or excitement. We simply wish to know, and wish to make things happen for the good of our species, for their own sakes. We are curious to know the answers, and do not fear them.

Love, excitement, passion, fear, these all will fade away. Curiosity, advancement of our species, and pragmatism endure, but the greatest of these is curiosity.

M. Ananias

drive stems from their survival as larvae in the wilderness. Even as they cooperate in their nests with their co-workers, they express themselves in individual ways. Differences in tastes, preferences, likes and dislikes are all accepted as ways of expressing Hiver individualism.

There is something so appallingly stupid and obvious and irrelevant about that remark that it simply defies my capacity to remain lucid.

These sound like the words of someone who has had individualism described to him but has never actually experienced it. It is just the repetition of obvious inanities by rote, but with no comprehension. Rocks have individuality too, but we don't give them a whole lot of credit for it. Are the Hivers so insulated from their own existence that they don't even understand the things they claim as their highest values?

Superiority: Hivers have developed a racial belief that they are superior to most (if not all) other intelligent races. Such a belief is not uncommon among intelligent races: the Vargr, Aslan, Zhodani, K'kree and Solomani all have similar beliefs. The difference is how the Hivers express it: They accept that others may feel themselves superior, but ignore or tolerate such beliefs in the (almost smug) acceptance that they are truly superior. Hivers are rarely concerned with changing non-Hivers' opinions,

(well, except for the M-word)

or convincing non-Hivers of Hiver superiority. Instead, the Hiver superiority expresses itself in a calm acceptance of others' shortcomings. Even Hivers who are confronted with a smarter or more capable non-Hiver retain their own conviction that Hivers are racially (intellectually, logically, capably) superior to any other race.

Behaviors

Hivers have adopted a variety of behaviors which they use in reaction to situations they encounter.

Confrontation: Hivers often use direct confrontation in dealing with a problem. Since Hivers are cooperative by nature,

(here we go again)

they have found that stating the relevant factors in a problem and confronting others involved can be an effective way of dealing with the problem. Since confrontation achieves results, it is a preferred method of handling some problems.

Except when it isn't.

Hivers are sometimes surprised in dealing with non-Hivers that confrontation can aggravate a problem rather than force a resolution.

Consensus: Hivers believe in solutions which resolve as many problems as possible. Their cooperative nature leads them to seek compromise and consensus, rather than absolute victory in most problems.

Manipulation is an interesting contrast to this drive for consensus. The individual manipulator adopts a specific course of action (one that conceivably can be adopted) and creates an atmosphere where it is adopted; the manipulation procedure outwardly ignores compromise and consensus, but is nevertheless an accepted type of action, and one which gains the manipulator great respect.

This is because it creates a new de facto *consensus by concealing the fact from its victims that they have been manipulated. While it rapes the* spirit *of compromise and consensus, it appropriates their* forms *to make its solutions more palatable.*

Thus it takes advantage of the good nature of Hiver consensus to make consensus itself into an empty, defrauded, husk.

It appears that manipulation is an accepted exception to normal behaviors

(again the Hiver ambivalence: manipulation is an ab*normal behavior)*

because it allows necessary actions to be taken even if compromise and consensus have not worked.

Avoidance: Hivers typically avoid problems they cannot handle effectively. If confrontation has not solved the problem, they ignore it.

Hivers will usually go around a threat if they believe the chances of winning are slim. Avoidance may simply be a refusal to discuss the matter, or (if the problem is truly dangerous) it may be actual retreat or flight.

What can I say? They're not only passive-aggressive, they're into denial. Maybe these threats didn't understand the Hiver superiority.

Hiver Psychology

What you questioners fail to understand is that the beyond cannot speak to society as a whole at one time. The divine can only speak to each of us individually, and if we respect its authority over us, we must faithfully respond to it in the manner in which we received our guidance—as individuals.

L. Tertius

The following section adds additional detail to the HMPH-*Blissful Warrior dialog on the Hiver psyche. These observations are accurate to the best of our ability to ascertain these things, and reality (to the extent that it exists among the Hivers) may turn out to be somewhat at variance with the following statements.*

A. K.

Home Life

One of the disturbing things about the Hiver life-style is the almost complete absence of what we humans think of as home life, recreation and "doing nothing." Without families, there is no personal or private time spent doing mundane, silly, playful activities with one's children, or moments given over to simply expressing affection. The closest the Hivers come to these moments is a story-telling session, which to humans bears a closer resemblance to school than it does to simple, unaffected, familial interaction.

To the human eye, everything in Hiver society appears to be goal-oriented, disturbingly so.



The analogy can be made to the human family that takes a vacation and obsessively schedules each minute to be filled with visits to museums, cultural events and historical sites. Except that whereas these humans would drive themselves crazy and eventually give up, the Hivers would keep to this schedule and be utterly happy in doing so, even adding in additional educational opportunities that they scouted out along the way. The Hivers do not take the sort of vacations that consist of vegetating in the sun beside bodies of water or just "taking it easy." In short, Hivers are always "on" and have a tendency to drive people crazy.

However, this is not an act or maladaptive behavior by a race of overachievers. The Hivers simply love learning with the same enthusiasm that we sometimes love putting up our feet, having a drink and watching the vidnet.

Hivers also seem singularly uninterested in thinking about themselves and, unlike humans, are not prone to falling in love with their own hang-ups, shortcomings and pathological complexes. In this way, they are, in a sense, "selfless," although their disturbing, lawless willfulness asserts itself in other ways, such as manipulation. (If nothing else about the Hivers is refreshing and affirmable, the SIB team recommends that this lack of infatuation with the self could serve admirably as a model for human emulation.)

Philosophy/Theology

The Hivers have no belief in any form of supreme being or power beyond this life. The closest the Hivers come to a universal value or goal is their dedication to the advancement of the Hiver race as a whole. Each individual Hiver is content to play a role in this advancement, although their understanding of this role is unusual.

In Hiver society, established tradition (including successful manipulation) is treated as law, and all Hivers expect all other Hivers to abide by these laws, for the good of the Hiver race. The only exception to this expectation is each Hiver itself. Although they expect other Hivers to abide by social norms (and to undergo legal penalties if they violate them), no Hiver holds itself accountable to these laws.

This astounding hypocrisy is recognized and accepted by the Hivers, although there seems no rational way by which they can do this, certainly in no Kantian sense.

While Hiver A expects Hivers B-Z to abide by the laws, Hiver A is free to secretly subvert such laws to create a manipulation that Hivers B-Z will also be expected to live by. Likewise, Hiver B expects Hivers A and C-Z to abide by the laws, while B itself is free to secretly subvert such laws to create manipulations which will also be binding on Hivers A and C-Z, and so on. In short, each Hiver is a law unto itself.

While they all seem to understand this intuitively, there seems to be no open Hiver discussion about the reality of this highly situational ethic.

To put it in strictly theological terms, the Hivers have no god but themselves, because they recognize no higher good to which they personally are subject. Although this team is loath to use such language, we have found that the recurring image we have of this aspect of the Hiver psyche is that of stubborn, spoiled children. However, this image is singularly unhelpful, as it provides us no tools to use except for spankings. And since the Hivers recognize no god, no higher good, no values to which they themselves are subject, they will never perceive a spanking as the punishment from a just higher being. Rather, it will be one more thing they



don't like which they will work, like ants or beavers on amphetamines, to overthrow.

The Underground

We postulate the existence of some form of Hiver underground, apparently opposed to the status quo Hiver psycho-social order. It appears to be composed at least of certain Ithklur and disaffected Hivers, and presumably includes membership of certain other Federation subject races (see the *HMPH* document which illustrates the Hiver attitude to these subject races).

What is difficult to explain is how a society can exist for as long as Hiver society supposedly has, based upon the values we have described, and only now begin to show these fissures. If there are inherent fatal flaws in the arrangement, why did it not collapse long ago?

We offer the warning that this apparent movement may in fact be only the visible part of some manipulation. But is this manipulation intended for us, to influence our attitudes and beliefs, or are we seeing the by-products of a manipulation whose major target is within Federation society itself?

Psionics

Hivers are, by all accounts and measurable indications, completely psionically inert. Why should this be?

Some theorize that it is the nature of the Hiver braincase, isolated as it is behind not one but two layers of bone, and surrounded by a profusion of organs jamming all psionics by their electrochemical static. However, this model mistakes the functioning of psionics with the simple electrochemical signatures by which telepathy gains its information. Electrochemical signals have nothing to do, in and of themselves, with actually *expressing* psionic powers. So while this model helps explain why it is so difficult to use telepathy, telempathy, etc., on a Hiver, it does not account for their lack of ability to do these things.

Curiously, the Hiver public at large seems to discount accounts of psionics, believing them to be fraudulent manipulation of the dull and stupid, or harmless and useless parlor tricks. This has contributed to the lack of solid psionic research in Hiver society, not because no Hivers recognize its reality, but because it is so hard to get funding and support for such pursuits.

This is an area of unique advantage for humans to be aware of, and also a warning that the Hivers may be particularly susceptible to a very powerful psionic race, were one to exist.

A Dissenting View

The team is in agreement that the aspects of the Hiver belief system presented in the *HMPH* document are broadly accurate, including their notions of racial superiority. However, we have received material which contradicts this view. We have no way of knowing the significance of this thinking in Hiver society at large, and without that ability to analyze and interpret it, we will merely present it in its entirety.

Why do you think we have six legs? So we can keep our balance when the nature of reality constantly shifts and ripples beneath our feet.

Look at us! Physically we are jokes. Compare us to any other sapient race, and what do you notice? Our biological unsophistication. Other races have evolved physically to the point where they are capable of at least functioning without their intellects.

The Lament of M. Develа

What have we done to ourselves?
Who have we become after all?
What were we like long ago,
and when did we last know?
We ourselves are only to blame.
We ourselves have destroyed our past.

We cloud reality for our purposes,
seeking subtly to bend the malleable
will of another to our own.
When others do similarly in reply,
we become as blind as they.
What is it that we expected?

Story-tellers tell us their stories, while
dreamers dream us their dreams. But
do any here know how to
discern the truth when it is
drowned in fathoms of lies, made
dumb; silent even to our ears?

Which of us serves anything above
our own ravenous will, or knows
when to say, "Enough?" It is
we who must reap the coming
whirlwind, we who are the victims
when "truth" no longer has meaning.

Soon I will lie still (at
whose hand?) and perhaps only then
will come to see the truth
which was obscured by millennia of
willful abuse: We thought life merely
was a tool for our selfishness.

What have we done to ourselves?
Who have we become after all?
What were we like long ago,
and when did we last know?
We ourselves only are to blame.
We alone have destroyed our past.



We are prone to deficiency diseases, because our over-complex gland is unreliable. Without intelligence, we would be extinct.

We have no reliable olfactory sense, and again our gland is to blame.

We have ears to hear sounds, but we are physically incapable of making any meaningful sounds. And it turns out that every other intelligent race communicates by spoken word, allowing them to communicate in the dark and over long distances. Every other race has the telephone, and yet we Hivers are helpless with only a telephone. Until we developed television, we were dependent upon telegraphs. How did we last this long? By intelligence alone, which allowed us to paper over deficiencies that should have long since eliminated us.

We have only one organ for such essential and diverse purposes as eating, eliminating waste and reproducing. Other starfaring races have as many as four discrete organs for these purposes. Our philosophers say that this is proof that we are more efficient, that we do not need a profusion of mundane organs to handle simple "housekeeping" functions. But I say to you that this means we are good at nothing!

Look inside a homo sapiens *and what do you find? Glands and organs in glorious profusion: pituitaries, thyroids, gall bladders, kidneys, spleens, livers, stomachs, two kinds of intestines, and appendices and tonsils which appear to be unused luxuries! What do we have? One generalized digestive caeca and one huge, schizophrenic gland to perform all these functions. Is it any wonder that we do not know how to smell? Is it any wonder that we suffer from deficiencies? Our bodies were not ready to survive at all when intelligence somehow took root in them.*

We were given intelligence as some sort of curse, before we were ready for it. We were not grounded in this existence, in functional bodies, so look what we have done! We have cast ourselves adrift, using intellect purely for the vain games of intellect, and lost the ability to know who we are and what is true. We have so little respect for what it true and real that we feel justified in changing our own reality and that of others at every possible opportunity.

Why am I accorded respect as a manipulator? It is not a prize that I receive for having done a valuable thing. What has happened is that I have proved that I am in charge, and the respect that I receive is simply an acknowledgment of that reality. Manipulations, therefore, inherently enhance the power of the manipulator, whether they are primarily intended to or not.

Why not, then, ensure that they enhance my power as at least a dependable by-product, because I certainly already believe that my wishes are fit to be imposed on the universe, and therefore I deserve a more secure means to continue to impose that will. It is only logical. What are the limits on my power, my will, my will to power? There are none that we recognize above us.

How can this be? This life is just a squalid game of steal the blocks, and dying while you still have a larger pile than others?

What is a manipulation, after all, but the presentation of an event or idea with the intent that that event or idea will cause others to behave in a certain fashion, a fashion of which they are not aware until it is over? What better events and ideas to use than untruths, fabrications and distortions? After all, using these places me in complete control, whereas anyone can use and verify mundane truth, which undermines my power.

I am a scientist, and I am attempting to ascertain the truth about some physical or psychological phenomena in order to further a manipulation. Since I have already affirmed that furthering my ability to assert my will over the universe is a worthy goal, then others who are competing with me for this information to conduct similar manipulations in other directions must be thwarted. If it is acceptable for us to manipulate entire races so that their behavior is more convenient to us, then why not manipulate events so that they are more convenient for me? What if other scientists are close to the answer I seek? I can publish false experimental results—the subject turns left in the maze rather than right (and why can I not say that this was only a natural error?). These will lead them in false directions or at least force them to waste their time disproving my results, allowing me more time to find the solution first. More important, if I wish to manipulate them rather than simply beat them to the prize, I must have access to information that they cannot use to divine my plan. What better way to do this than to lie, for my ends already justify my means.

And what if I want knowledge? Can I read a scientific journal? What if it is full of cunningly skewed data designed to enslave me to anothers' manipulation? Must I rederive existence itself from first causes just to make sure I am not being fooled? It is fortunate that we are so obsessive in pursuit of knowledge, but think of what we as a race could have accomplished if we could trust each other.

Am I in control of my own destiny when I cannot even trust in facts? No! And yet we absurdly base our society on the notion that we all know enough about reality to cause ripples and currents that will reverberate through our society to create the effect that we choose! And the ground lurches beneath my feet again. Lucky that I am twice as stable as any tripod.

M. Develа
Here I Stand

Don't be so sanctimonious. We don't do anything to our history that you don't do to your own.

Look at your so-called "historical fiction," your entertainment historical movies. How many times have you told the story of your Galileo, your Patton, Cleopatra, Joan of Arc, Nixon, Strephon, Dulinor. And each author exaggerates one aspect of their personality to make his own precious point to his audience, and each actor puffs up a portion of the character's personality to suit her own vanity, and your people watch these charades and believe they have seen the truth. All they have seen is fiction dressed up with historical names.

Once a human has died she becomes nothing more than a myth or an archetype, farther from the truth with each generation. Someday when your Lon Maggart is dead, he will be nothing but a blank canvas for your playwrights to paint with their self-aggrandizing adulterous co-dependent fantasies. And local community theater directors will train their razor-sharp intellects on these characters and instruct muse-, dissatisfaction-, and hormone-addled part-time thespians on how to bring these bastardized characters to life: "No, no, more passion! More sexy (wink, wink)! And how about we go out for coffee after rehearsal? My wife's out of town."

Bring them to life? So sorry, Pygmalion. These people already did *live—lives beyond your miserable parasitic capacity to capture or interpret.*

For they were real, *but the reality of these people is buried beneath their myths so deep that you will never find them, and if you did, you would squander it. What after all is the life of a real leader, reformer, prophet or artist when compared to a chance at a 10-year first-run musical?*

You are no better than we are, and perhaps worse, because at least we admit what we do.

M. Malinla

Players' Section

HIVER CHARACTER GENERATION

This section will only detail differences in Hiver character generation from the procedures presented on pages 15-39 of **Traveller: The New Era**.

Hivers begin character generation untrained, inexperienced and about 14 standard (human) years of age (28 Hiver years).

A Character Generation Worksheet is included with this book (see page 93). Once a character is completely generated, the information from the worksheet should be transferred to a Character Sheet (see page 94). After that, the worksheet may be discarded, as only the Character Sheet is necessary for play. (*Note:* Save at least one blank copy of each sheet to photocopy for future characters.)

CHARACTER GENERATION OVERVIEW

The Hiver character-generation procedure follows the same three general steps as that used for humans: background, attributes and experience.

Background: Hivers place settlements on worlds with similar characteristics of gravity, atmosphere and overall climate, meaning that all Hivers are born and raised under similar conditions (Medium diameter, wet worlds with standard atmospheres and High Stellar technologies). This eliminates the need to consider the effects of Homeworld on character creation and makes the designation of a specific homeworld optional for Hiver characters, except for gravity, as that has an effect on fatigue under some conditions.

Attributes: Players determine the six basic attributes of their characters by rolling dice and assigning those results to attributes in any order they wish. These six basic attributes are Strength, Agility, Constitution, Intelligence, Education and Charisma (same as with human characters).

Careers: Hiver characters begin to accumulate experience at the age of 14 (28 Hiver years). At that time, players start making career choices for their characters. Each career choice represents four Imperial years (eight Hiver) of training and/or experience. Each time a player makes a four-year career choice, a Topical Club (see page 20) may also be selected for the character. Topical Clubs provide secondary skills the same as do hobbies in standard character generation.

Derived Values: Now that all changes to skills and attributes are completed, certain values are calculated that are based on them.

Possessions: Finally, players determine what possessions their characters have accumulated during their careers. The procedure for this is different than for human characters, and involves more interaction between player and referee.

BACKGROUND

Hiver characters will have originated on one of the worlds of the Hive Federation or one of the smaller client states made up of Hivers and other races in the region between the Imperium, the Solomani Confederation and the Hive Federation. As mentioned above, Hivers give their individual homeworld no special status, as their culture prides itself on homogeneity and not on local differences. Players need only choose a Homeworld for their Hiver PC if they feel the need.

Gravity: To determine the gravity of a Hiver character's homeworld, roll 1D6. 1-2: The character is from a 0.8-G world. 3-4: The character is from a 1.0-G world. 5-6: The character is from a 1.2-G world.

ATTRIBUTES

Each Hiver character has the same six basic attributes as a human character. Roll two six-sided dice and subtract 1 from the result to generate a number from 1-11. Do this six times. Each separate roll is then assigned, in whatever order the player desires, to one of the following six attributes: Strength (STR), Agility (AGL), Constitution (CON), Intelligence (INT), Education (EDU) and Charisma (CHR). All Hiver Characters add +2 to their Education (EDU) attribute because of the uniformly high levels of technology on Hiver worlds.

Players who roll attributes for their player characters totaling less than 36 points may add attribute points (allocated as they see fit) to bring the total up to 36.

Attribute Limits: During the careers portion of character generation, certain careers offer the opportunity for certain attributes to be raised further. However, no attribute may be raised more than two points as a result of these career increases. No attribute may ever be raised to greater than 15.

Other Characteristics: In the course of character generation, the character will acquire age (in years and in four-Imperial-year terms), rank and skills. Money and equipment will be allocated as needed by the individual character's requirements.

Smell: When determining other attributes, roll 1D6: on a roll of 4+, the character has a sense of smell (see page 8).

Psionics: Hivers have no psionic potential and receive no psionic powers (see page 44).

Language: The Hiver language is a nonverbal one, consisting primarily of gestures, physical contact by one or more hands and posture. It is difficult for non-Hivers to follow (and impossible for them to speak with 100% fluency), and is therefore almost never used in communications with non-Hivers. The official language of the Hive Federation is Gurvin, a language used by the race of the same name, and more readily adaptable to non-Hiver use. All Hivers are fluent in both languages, speaking Gurvin (and other spoken languages, if they have learned any) by means of a portable electronic translator (see page 84 or a more complete discussion of these devices).

Curiosity: In place of Social Standing (SOC), Hiver characters receive Curiosity (CRS) instead, rolling 1D6. Unlike the other characteristics, Curiosity never changes due to any reason. Upon completion of the character creation process, a Hiver character may increase any skill or skills it has acquired in the character generation process by levels equal to the character's Curiosity.

For example, a character with Curiosity 4 could add 4 to one skill; 1 to one skill and three to a second; 2 each to two skills; or 1 each to four skills. This increase represents the cumulative effect of a driving curiosity over the years, and can only be implemented after the character has finished its final career.

In addition, Curiosity allows die modifiers on certain character generation rolls. Whenever the character generation tables indicate "DM: CRS÷2," divide the Hiver's Curiosity rating by 2 and drop fractions. Thus, the resulting DMs are 0 for Curiosity 1, 1 for Curiosity 2-3, 2 for Curiosity 4-5, and 3 for Curiosity 6.

Referees' Note: In roleplaying terms, the Curiosity rating of a Hiver PC is irrelevant once character generation is completed, as the display of curiosity lies within the realm of roleplaying. Certainly the player of a Hiver character should attempt to play the Hiver in accordance with its Curiosity rating, but rolls against the Curiosity of a PC are inappropriate once roleplaying has begun. For Hiver NPCs, on the other hand, rolls against Curiosity are useful and appropriate to determine their reactions to various circumstances.



Social Standing, Titles and Noble Ranks: Hiver characters do not receive a social standing characteristic and therefore have no use for noble ranks.

Aside from doctor (used to designate a medical doctor—see the Medical career, below), Hivers have only one civilian title of any real significance, that of Manipulator (see the discussion of Manipulations, page 19).

Naming Characters: Hiver names are normally expressed in the Hiver language and are difficult to translate directly, so Hivers seldom try. When dealing with non-Hivers, Hivers pick a name from the language of that race. Some Hivers choose a name at random, while others try to pick one reflecting their individual interests and specialities. A Hiver with an interest in history might select the name Herodotus or Toynbee, one specializing in physics might choose Lawrence or Bohr, and so on. Of course, there is no reason to restrict Hiver names to European cultures or even Terran ones.

Call Signs: Hivers working with Coalition teams will pick (or be assigned) a two-syllable call sign. As with human characters, this can be anything, and can be inspired from the character's name or not as the character wishes. Hivers with two-syllable names (Newton, Genghis, Frodo) may choose to use it as their call sign.

Background Skills: Hivers, like humans, acquire a number of skills before age 17. To represent this, players should each choose four skills from the Skill List table (**TNE** pages 114-115), giving their characters a level 2 skill in each. Referees may impose homeworld limits on these skills if desired and if homeworlds are specified. In most cases, however, this is unnecessary.

Default Skills: Hivers automatically receive Electronics 0, Snohl Handling 0, Willpower 0 and Excavation 0.

CAREERS

This functions exactly as described on **TNE** pages 24-27, except as indicated below. Note that there is a Hiver-specific Consolidated Effects of Age table on page 29 which incorporates Hiver, rather than human, aging effects.

For convenience, Hiver careers, like human careers, are lived through in standard four-Imperial-year (eight-Hiver-year) terms.

Promotions: Hiver rank names, where they exist, are difficult to translate exactly, so Hiver characters should record ranks as R1, O3 and so on. If a game situation requires a rank, consult the Table of Ranks on page 57 of the basic rules and choose a human equivalent.

Note that many Hiver careers allow promotion DMs based on Snohl Handling skill or the Curiosity attribute, in both cases divided by two, dropping fractions.

No rank tables exist for the Hiver careers of civil engineer, computer specialist, teacher/instructor ("story-teller") or technician. Hiver diplomats and medical careers use the corresponding human ranks; Hiver merchants use human trader ranks; Hiver researcher/scientist careers use the human science ranks; explorers use human scout ranks; ground forces use human army or marine ranks; Hiver naval personnel use human navy ranks.

Special Duty/Adventures: Note that special duty/adventure allows the Curiosity DM described on page 27. All other details are as basic **TNE** character generation.

Topical Club: Topical Clubs (discussed more fully on page 20) provide an individual a chance to acquire skills and experience outside of a formal career path. In the character creation sequence, a Topical Club provides Hivers the same things that a Secondary Activity allows a human character, and the two are the same in game mechanics. The character may gain one level in any skill (player's choice each term) at the referee's discretion. In some cases, this skill may be a normal term skill in the character's current career. In other cases, the character may be indulging a hobby or interest outside the character's current career. Referees should feel free to limit the types of skills that can be picked up in this fashion.

Hivers may acquire Unarmed Martial Arts through a Topical Club, but only at skill level 0. (This is the only means by which Hivers can acquire this particular skill.)

Membership in Topical Clubs may also be acquired as part of the "Other Effects" portion of a career.

Increasing Attributes: Characters may also attempt to increase any of their six basic attributes (STR, AGL, CON, INT, EDU, CHR) as part of their membership in a Topical Club. This is done in the same fashion as in the basic rules (page 27).

Topical Clubs During Play: Hiver characters who have acquired a membership in a Topical Club as a part of the character creation process should note each one on their character sheet and devise a name for each of them.

Topical Clubs can be a springboard for adventures in the same way as contacts (see below). They are convenient ways for referees to give players information without being too gimmicky about it, and can be used to help speed an adventure along in a number of ways.

SKILLS

This functions just as described in the **TNE** basic rules (pages 27-28).

Languages: All Hivers are fluent in their own language and in Gurvin (see page 14).

CONTACTS

Contacts are discussed completely in the basic rules. In game terms, Hiver contacts are handled the same as in the basic rules. The majority of a Hiver character's contact will be with other Hivers, unless the career notes specifically state otherwise.

Off-World Contacts: For Hiver characters in Coalition space, all contacts are off-world contacts.

Generic Contacts

These are handled the same as in the basic rules. For simplicity, the same terms are used for types of Hiver contacts as for human contacts. Some contacts (such as criminal) are defined as being non-Hiver by the notes for a given career.

Topical Clubs

Membership received in Topical Clubs as a part of the "Other Effects" of a career (but not those which granted secondary activity skills—see above) also function as contacts. Each Topical Club membership functions as an additional Generic Contact, which can be converted to a solid contact using the normal procedures.

In addition, if a PC is a member of a given Topical Club and the referee rules that contact with that club is available (varies with circumstances, referee's discretion: probably in a high-population, high-tech Hiver world, probably not in a dungeon in the Wilds), the difficulty of any research-oriented or purely fact-based task is reduced by one level.

Note, however, that the number of Topical Clubs that a Hiver can be an active member in cannot exceed its Curiosity characteristic. Hiver characters who have the option to join more Topical Clubs than their Curiosity characteristic allows must choose those clubs in which they will remain active. Additional memberships are lost.



AGE

Hivers suffer the effects of age, but in a slightly different way than humans. Because Hivers start character generation at 14 Imperial years of age, a Hiver character's age (in Imperial years) at the time an adventure campaign begins is determined by multiplying by 4 the number of terms served and adding 14 to the result. In other words, (4×Terms)+14=Age. Each Imperial year is equal to almost exactly two Hiver years, so doubling the age in Imperial years will yield a character's age in Hiver years. The discussion of aging below gives age in Imperial years for consistency.

Effects of Age

Aging works the same with Hiver characters as it does with human characters, except that the effects do not begin until age 38 (i.e., the end of the sixth term), as summarized on the Consolidated Effects of Age table below. At the end of the sixth term (and every term thereafter), the character rolls 1D15 to check for losses in Agility. At the end of the seventh term (and every term thereafter) the character must check for losses in Strength, Agility and Constitution. At the end of the eleventh term, Hiver characters must also begin checking for a decrease in Intelligence. D15 numbers are generated by rolling 1D20 and rerolling all results of 16-19, with results of 20 treated as 0. (*Note*: This is an official errata, and this change should also be made to **TNE** page 31.)

Hiver Consolidated Effects of Age

Start Term	End Age	Age	Losses ST/SD*	STR	AGL	CON	INT
1	14	18	4	—	—	—	—
2	18	22	4	—	—	—	—
3	22	26	3	—	—	—	—
4	26	30	2	—	—	—	—
5	30	34	1	—	—	—	—
6	34	38	1	—	Y	—	—
7	38	42	1	Y	Y	Y	—
8	42	46	1	Y	Y	Y	—
9	46	50	1	Y	Y	Y	—
10	50	54	1	Y	Y	Y	—
11	54	58	1	Y	Y	Y	Y
12	58	62	1	Y	Y	Y	Y
13	62	66	1	Y	Y	Y	Y
14	66	70	1	Y	Y	Y	Y
15	70	74	1	Y	Y	Y	Y
16	74	78	1	Y	Y	Y	Y
17	78	82	1	Y	Y	Y	Y
18	82	86	1	Y	Y	Y	Y
19	86	90	1	Y	Y	Y	Y
20	90	94	1	Y	Y	Y	Y
21	94	98	1	Y	Y	Y	Y

*ST/SD=Number of Subsequent Term/special duty skills.

The character loses one point from the relevant attribute if the 1D15 roll is less than the current level of that attribute. If the roll equals or exceeds the attribute, there is no loss. This check, also called an age saving throw, is made at the end of each term.

Aging in Play: Hivers age in play in the same way as humans; see page 32 of the basic rules.

Combating Aging Effects

Hiver characters may resist the effects of aging in the same way humans do (see the basic rules, pages 32-33), except as noted below.

Anagathics: Hivers disdain the use of anagathics as an attempt to avoid the natural effects of nature, and no Hiver anagathic is manufactured.

Aging Crisis

These are the same as in the basic **TNE** character generation rules.

Skill- and Attribute-Derived Values

These are derived in a manner similar to that of humans, but due to Hiver physiological differences, the formulae to derive these values in different.

Hit Capacity: Hit capacity is a measure of the amount of damage (hit points) a character can take before suffering various levels of injury. Hit points can be suffered in any of seven different parts of the body: head limb, right front limb, left front limb, right rear limb, left rear limb, body, and reproductive limb. The hit capacity of the character's body is equal to four times the sum of Strength and Constitution: (STR+CON)×4. Each of the limbs has a hit capacity equal to two times the sum of the character's Strength and Constitution: (STR+CON)×2.

Boxes are provided on the character sheet for players to write in their PCs' wound level thresholds so the players will know to what degree their characters have been wounded. These are calculated in the same fashion as in the **TNE** basic rules, page 288.





Weight: A Hiver character's weight in kilograms is equal to 90, plus four times Strength minus Agility, or [4×(STR–AGL)]+90. Thus, a Hiver character with a Strength of 6 and an Agility of 2 would weigh 106 kilograms (about 233 pounds), while a character with a Strength of 4 and an Agility of 8 would weigh 74 kilograms (roughly 163 pounds).

Load: A Hiver character's normal load in kilograms is equal to three times the sum of its Strength and Constitution: (STR+CON)×3. Burdened Hiver characters suffer no Initiative penalties, but may only walk or crawl.

Throw Range: A Hiver's throw range in meters is four times the Hiver's Strength: (STR×4).

Unarmed Combat Damage: All Hivers have an unarmed Combat Damage of 1.

INITIATIVE

Because of their aversion to physical combat, Hivers may not have an Initiative rating greater than 2. All Hivers receive an Initiative of 1, but any Hiver who has served one or more terms in a military career receives an additional Initiative point.

STARTING MONEY AND INITIAL EQUIPMENT

The different economic system of the Hive Federation means that a different system must be used to determine what a Hiver character starts out with, one which involves a great deal of player/referee interaction. Since most Hivers are still members of a nest, they can draw upon the resources of the nest for funds or equipment necessary to further the nest goal, but care must be taken that players do not exploit this "free lunch" aspect of the game.

The Hiver system of nest credit is a little unusual, and is best represented by a series of general guidelines rather than a set of hard and fast rules. Hivers everywhere are acting on behalf of their nest goal, pursuing the greater good of that goal rather than individual aggrandizement. As a part of this, the nest supplies them with whatever they need (within reason—even Hiver resources are limited) to pursue that goal, and a Hiver character will have the assets it needs to accomplish a particular goal—no more, no less. The size and importance of this level of supply are related to the importance of the overall goal, which is related to the individual Hiver's relative importance within the nest and the level of confidence the nest has in its abilities. All this is pretty complicated, and requires more interaction between player and referee than a human character (nobody said playing a Hiver PC would be easy). Referees will need to exercise restraint, or every player will want to be a Hiver and tap into the cornucopia.

As a rule of thumb, Hiver characters have access to a pool of credit (called their Nest Credit) from which they buy equipment, food, transportation and so on. This Nest Credit is determined in a way similar to the manner in which a human character determines starting money: The character gains a certain base cash value multiplied by the sum of the character's Curiosity during each eligible career term. The base cash value for all Hiver characters is Cr4000. Nest Credit is replenished annually, with an amount equal to the character's Curiosity multiplied by Cr1000. Groups of Hiver characters adventuring together may combine their Nest Credits. Starting equipment is purchased in the normal way, using the equipment lists in the basic rules and in this book.

Starships and Large Items: Hivers do not own starships; these belong to the nest and are assigned to characters according to the goal of the character(s). A Hiver Merchant with the rank of captain obviously needs a trading ship of some kind to pursue its goal (making money for the nest, in all probability). A Hiver Technician can get along quite well buying passages and will usually not have need of a starship, but may require ground transportation of some kind.

Referees may give out large and expensive items, but should guard against giving players too much—merchants don't need mercenary cruisers, and diplomats seldom need warships to carry out their goals.

HIVER CAREERS

Career choice for Hivers proceeds identically to that in the basic rules.

EDUCATION

Among the Hivers, education in the early years of life is a matter for each individual nest. Beyond the basic education received as part of a nest, however, many Hivers choose to continue their education by various means, usually by joining a nest with similar aims and interests. Education is pursued for the good of the nest, not for any individual purpose.

For the purposes of character generation, we consider a Hiver pursuing four years of intensive technical studies with a nest interested in military affairs to be the equivalent of attending a technical school or military academy, even though there is no formal institution involved. The Hiver equivalent of a master's degree or doctorate is achieved by intensive study along certain lines established centuries ago by custom and tradition (which, when you come down to it, pretty much describes the human university system). There are no formal accreditation agencies, but a number of nests have taken on the task of unifying educational techniques in the Federation, and these amount to an informal system of accreditation and standardization.

The Hivers are acquainted with more formal educational systems and operate quite a few, both inside and outside the Federation (the Hiver Technical Academy on Aubaine is a prime example).

General Education

This is the Hiver equivalent to an undergraduate university and may only be taken once.

Prerequisites: Education 5+.

Skills: Total skill levels equal to character's Curiosity or Education attribute (whichever is higher) from any combination of the following, but no more than level 3 in any one skill:

Admin/Legal, **Artisan**, Computer, **Economics**, **Engineer**, *Language*, Leadership, **Physical Science**, **Social Science**.

Contacts: One per term, either academic or specialist.

Other Effects: +1 EDU (after all skills have been awarded). No commissions, promotions or special duty rolls are made. No income is received for terms spent in General Education.

Military Education

This is the Hiver equivalent to a military academy and may only be taken once. Studies tend to concentrate heavily on theory and skimp on practice.

Prerequisites: None.

Skills: Total skill levels equal to character's Curiosity or Education attribute (whichever is higher) from any combination of the following, but no more than level 3 in any one skill:



Determination, Engineer, Interaction, Social Science, Space Tech, Technician.

Contacts: Two military.

Other Effects: No income is received during Military Education.

Advanced Education

This is the Hiver equivalent to a graduate university and, like its human counterpart, may be taken as many times as desired. Hivers have no formal advanced degrees such as master or doctor, but Hivers are usually granted such courtesy titles in Coalition space representing the extent of their studies (a character with two or more terms is treated as a Ph.D., etc.).

Prerequisites: One term of general education, Snohl Handling 1+.

Skills: Four levels per term in any one specialty, plus a total of two levels in any electives.

Specialties: Admin/Legal, Computer, **Economics, Engineer,** *Language,* **Physical Science,** Robotics, **Social Science.**

Contacts: One per term, either academic or specialist.

Other Effects: +1 EDU (after all skills have been awarded). No income is received during Advanced Education.

Medical/Biological Education

This is the Hiver equivalent to a medical school and may only be taken once.

Prerequisites: EDU or INT 8+, one term general education, Biology 3+, Chemistry 2+.

Skills: Computer 1, *Medical* 6, Observation 1.

Contacts: One medical.

Other Effects: No income is received during Medical Education.

Technical Education

This is the Hiver equivalent to a technical school and may only be taken once.

Prerequisites: None.

Skills: A total of six levels from any one or a combination of the following:

Aircraft, Computer, **Economics,** *Medical,* Robotics, **Space Tech, Technician, Vehicle.**

Contacts: One specialist (skill level 8) in one of the areas listed above.

Other Effects: No income is received during Technical Education.

CIVILIAN CAREERS

As with the basic rules, there are civilian and military careers.

Clusters, Skills, and Cascades: In all of the lists below, clusters of skills are printed in **bold,** while individual skills are printed in normal type. Individual skills that are printed in *italics* are cascade skills. When players select a cluster for their characters, they must then go to the Skills by Skill Clusters List on **TNE** page 113 to pick a specific skill from that cluster list. Players who select cascade skills must choose the cascade specialty. When a cluster or cascade is listed with a skill level number after it, that is the number of skills to be taken in the cluster or cascade, and must be specified immediately.

First Term Skills: The character receives this package of skills during the first term in this career, whether the term is the character's first career term, or only the first term in this career after other terms in another.

Subsequent Term Skills: The character chooses a number of skills from this list based on the character's total term number (not term number in this career). In a character's First Term (starting at age 14), a character will receive the listed First Term skills. In subsequent terms (unless these are the first term in a new career, and earn the First Term package), the number of skills received is 4 in the second, 3 in the third, 2 in the fourth, and 1 in the fifth and later terms.

Special Assignment: Each term, the player has a chance to get a special assignment, also called special duty or special adventure, depending upon career. This is listed under the Special heading in the All Terms section. The first notation is the die roll on 2D6 that must be made to receive the special assignment.

Unlike in basic **TNE** character generation, there is no DM for the number of terms served in a particular career. Instead, a Hiver character receives a DM equal to its Curiosity÷2 (drop fractions) for Special Assignment in *all* terms (thus 1=DM +0, 2-3=DM +1, 4-5=DM +2, 6=DM +3).

If the roll is made, the character receives a number of skills from the special assignment list according to the total term number (not term number in this career). That number of skills is the same as term skills for that term.

There is no effect if the special assignment roll is failed.

Term	*Age* (Start-End)*	*Term Skills*	*Special Assignment Skills*
1	14-18	4†	4
2	18-22	4†	4
3	22-26	3†	3
4	26-30	2†	2
5 and later	30+	1†	1

*Age is given in Imperial years. For Hiver years, multiply by 2.

†Or First Term skill packet for first term in a new career.

Promotion: Not every career has a rank list to go with the chance of promotion, but all do get a bonus skill from the Subsequent Terms list for each successful promotion. All promotion rolls receive a +1 DM for every two levels of Snohl Handling skill or Curiosity the character has (divide by two and drop fractions), whichever is higher.

Contacts: If more than one type is listed, the character may choose. Some of these require a roll to be made at the time the contact is selected to see if the contact is special (see the Character Generation section).

Continuation Rolls: If using the random method for finishing character generation, roll 2D6 at the end of each term. If the result is greater than the total number of terms served so far, the character may continue on to another term. If the result is equal to or less than the number of terms served, character generation is over.

Changing Careers: A character who intends to change careers on the next term subtracts one from the continuation die roll. (Going from an education term to another education or career term does not count as a career change; going from a career term to an education term does count as a career change.)

Civil Engineer

To a Hiver, construction means something slightly different than it does to a human. Hivers are more comfortable with part or all of their buildings underground, which leads to a greater concentration on excavation then other races pursue. Certain things, however—a bridge, a road, a dam or a cross-country power transmission grid—are pretty much the same no matter who builds them.

By tradition, most Hiver engineers learn to handle Snohl (the Hiver nonsentient, burrowing symbiote/mascot), even though the animals are only rarely used in modern construction.

Prerequisites: One term of advanced education, Construction 4+.



First Term

Skills: Engineer 2, Excavation 1, **Explore** 2, Snohl Handling 1, **Vehicle** 1.

Subsequent Terms

Skills: Determination, Economics, Engineer, Excavation, **Explore, Interaction, Physical Science,** Snohl Handling, **Technician, Vehicle.**

All Terms

Special Assignment: 9+ (DM: CRS÷2) for **Crime, Engineer,** *Language,* **Spacehand, Charm.**

Promotion: 7+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, government.

Other Effects: Automatic membership in a Topical Club devoted to civil engineering.

Computer Specialist

Since their invention, computers have been an important part of Hiver civilization. With the coming of Virus, computer specialists have been in increasing demand for uplift missions in the Wilds.

Prerequisites: One term of Technical Education or one term of General Education, Computer 2+.

First Term

Skills: Economics 2, **Technician** 4, *Language* 1, Electronics 1.

Subsequent Terms

Skills: Economics, Technician, Interaction.

All Terms

Special Assignment: 9+ (DM: CRS÷2) for *Language,* **Spacehand, Technician, Charm.**

Promotion: 7+, DM: Snohl Handling or CRS÷2.

Contacts: One specialist (Computer or Electronics) per term. If a special assignment is rolled, add an extra contact of any type.

Other Effects: Computer specialists are allowed two secondary activity/Topical Club memberships per term.

Diplomat

Hiver diplomatic missions are a vital part of the Hivers' overall plan for the reconstruction of human space. The Hivers must seek out, nurture and maintain contacts with the Reformation Coalition and all of its constituent worlds, as well as hundreds of other worlds in the vast expanse of space between the Coalition and the Federation. Without diplomacy, there can be no uplift....

Prerequisites: CHR or INT 7+, Snohl Handling 1+.

First Term

Skills: Charm 3, **Determination** 1, **Economics** 1, **Interaction** 2, *Language* 1.

Subsequent Terms

Skills: Charm, Determination, Economics, Interaction, Perception.

All Terms

Special Duty: 9+ (DM: CRS÷2) for **Crime, Gun Combat, Spacehand, Vehicle, Vice.**

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: Two government contacts per term, non-Hiver on a roll of 6+.

Other Effects: Hiver diplomats with rank R6 have a 200-ton utility vessel at their disposal upon completion of character generation, provided they are pursuing an official goal for their nest (this should be worked out between player and referee).

Merchant

Trade is very important in helping Virus-devastated worlds get back on their feet, and helping worlds advance helps the Hive Federation by providing increasingly sophisticated markets. The trade between the Coalition and the Hive Federation is small but growing, and Hiver merchants are increasingly common within the RC.

Prerequisites: INT 6+ or CHR 6+.

First Term

Skills:

Officers: Economics 2, **Interaction** 1, **Space Tech** 2, **Space Vessel** 2, **Spacehand** 1.

Spacehands: Space Tech 2, **Spacehand** 2, **Technician** 2, **Vehicle** 1.

Subsequent Terms

Commission: 7+, DM: CRS÷2.

Skills:

Officers: Determination, Economics, Interaction, *Language,* **Space Tech, Space Vessel, Spacehand.**

Spacehands: Interaction, Space Tech, Spacehand, Technician, Vehicle.

All Terms

Special Duty: 5+ (DM: CRS÷2) for **Aircraft, Crime, Explore, Gun Combat,** *Language,* **Vehicle, Vice, Charm.**

Promotion: 7+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, trader, government or criminal, non-Hiver on a roll of 6+.

Other Effects: Hiver merchants with the rank of O5 or higher command a 1000-ton Hiver transport and crew provided they are pursuing an official goal for their nest (this should be worked out between player and referee).

Medicine

The Collapse left many worlds in dire need of medical professionals. Travel outside the Federation has given you a chance to become familiar with diseases and conditions you would seldom see inside the safety of the Federation.

Prerequisites: AGL 5+.

First Term

Commission: Automatic if completed medical/biological education. A commission makes the character a doctor; all other characters are medical technicians.

Skills:

Doctors: Biology 4, *Medical* 4.

Medical Technicians: Charm 1, *Medical* 2, **Perception** 1, **Physical Science** 1, **Technician** 2, **Vehicle** 1.

Subsequent Terms

Skills:

Doctors: Charm, Determination, Interaction, *Medical,* **Perception, Physical Science.**

Medical Technicians: Charm, Perception, Physical Science, Technician, Vehicle.

All Terms

Special Adventure: 9+ (DM: CRS÷2) for *Language, Medical,* **Spacehand, Vessel.**

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, medical, non-Hiver on a roll of 6+.

Other Effects: During the first commissioned term, training is so intensive that no secondary activity/Topical Club membership is allowed during this time. For each additional career term, however, doctors are allowed two secondary activity/Topical Club



memberships. All medical technicians are allowed one secondary activity/Topical Club membership per term.

Researcher/Scientist

A researcher/scientist is different from a teacher in that the researcher pursues knowledge for its own sake and is not necessarily very adept at passing this knowledge on to others.

Prerequisites: INT 7+, at least one term of advanced education.

First Term

Commission: 8+, DM: CRS÷2 +1 for each term of advanced education.

Skills: *Language* 1, **Perception** 2, **Physical Science** 5.

Technicians: Charm 1, *Medical* 1, **Perception** 1, **Physical Science** 2, **Technician** 3.

Subsequent Terms

Commission: 9+, DM +2 if EDU 8+, DM +2 if INT 8+.

Skills: Charm, *Medical*, **Perception**, **Physical Science**, **Technician**, **Vehicle**.

All Terms

Special Adventure: 6+ (DM: CRS÷2) for **Engineer**, **Explore**, **Gun Combat**, Robotics, **Social Science**, **Spacehand**, **Vice**.

Promotion: 7+, DM: Snohl Handling or CRS÷2.

Contacts: 1 per term, government or scientist, non-Hiver on a roll of 8+.

Other Effects: Membership in a Topical Club devoted to the character's primary area of interest.

Teacher/Instructor ("Story-Teller")

The Hiver word for instructor or teacher translates as "story-teller," because Hivers once taught their young through the use of stories, parables and fables that combined important lessons with entertainment. Teaching techniques have become more sophisticated over the years, but the name remains in use because of tradition.

Instructors pick a specialty skill which represents their primary interest and course of intellectual study, from among the following list: Admin/Legal, Biology, Chemistry, Communications, Computer, Construction, Electronics, Excavation, Farming, Fleet Tactics, Genetics, Geology, Gravitics, History, Instruction, Interview, *Language* (must choose specific Language), Machinist, Marketing, Mechanic, *Medical* (must choose specific cascade), Meteorology, Physics, RCV Operations, Sculpture, Ship Tactics, Ship's Engineering, Starship Architecture, Xeno-Biology. If the referee allows it, the character may pick a specialty from any other skill allowed to Hivers.

Technical Institute—Aubaine: Under certain conditions, this career can represent a term spent teaching at the Hiver Technical Institute on Aubaine, and all contacts are human contacts.

Prerequisites: EDU or INT 7+, and at least one term of Advanced Education.

Technical Institute Prerequisites: EDU and INT 7+, at least one term of Advanced Education and at least one prior term as a teacher/instructor.

First Term

Skills: Charm 1, **Interaction** 2, *Language* 1, Specialty 4 (see above).

Subsequent Terms

Skills: Charm, **Determination**, **Interaction**, *Language*, Specialty (see above).

All Terms

Special Adventure: 9+ (DM: CRS÷2) for **Explore**, **Perception**, **Spacehand**, **Charm**.

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, academic or government, non-Hiver on 8+ (DM +4 if teaching at Technical Institute on Aubaine).

Other Effects: Membership in a Topical Club devoted to the character's primary specialty.

Technician

As far back as you can remember, you have been driven by a need to know how things work. You have a way with machines that humans sometimes call magical, but there is, of course, nothing magical about it.

Prerequisites: INT 7+

First Term

Skills: Charm 1, *Medical* 1, **Perception** 1, **Physical Science** 2, **Technician** 3.

Subsequent Terms

Skills: Artisan, **Charm**, *Medical*, **Perception**, **Physical Science**, **Technician**, **Vehicle**.

All Terms

Special Adventure: 6+ (DM: CRS÷2) for **Engineer**, **Explore**, **Gun Combat**, **Social Science**, **Spacehand**, **Vice**.

Promotion: 7+, DM: Snohl Handling or CRS÷2.

Contacts: 1 per term, government or scientist, non-Hiver on a roll of 8+.

Other Effects: None.

MILITARY CAREERS

FDA Explorer

The Hive FDA (Federation Development Agency) fulfills the exploration and contact mission that was originally part of the navy's job, and also carries out the bulk of Federation uplift and anti-Virus assistance in the Wilds.

Prerequisites: INT or STR 7+.

Commission: 9+, DM +2 if INT 8+. Automatic if one term of Military Education.

First Term

Officers: Determination 1, **Explore** 1, **Physical Science** 1, **Space Tech** 2, **Space Vessel** 1, **Spacehand** 2.

Enlisted: Explore 1, **Space Tech** 2, **Space Vessel** 1, **Spacehand** 2, **Technician** 2.

Subsequent Terms

Commission: 9+, DM: CRS÷2.

Skills:

Officers: Aircraft, **Animal Handling**, **Crime**, **Determination**, **Explore**, **Interaction**, *Medical*, **Perception**, **Personal Transport**, **Physical Science**, **Space Tech**, **Space Vessel**, **Spacehand**, **Technician**, **Vehicle**.

Enlisted: Aircraft, **Crime**, **Explore**, **Interaction**, *Language*, *Medical*, **Perception**, **Personal Transport**, **Space Tech**, **Space Vessel**, **Spacehand**, **Technician**, **Vehicle**.

All Terms

Special Duty: 9+ (DM: CRS÷2) for **Gun Combat**, *Medical*, *Language*, **Vessel**, **Charm**, **Interaction**.

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, government, military or trader, non-Hiver on a roll of 6+.

Other Effects: Explorers with the rank of O5 or higher have a 200-ton Hiver utility vessel at their disposal upon the completion of character generation, provided they are pursuing an official goal for their nest (this should be worked out between player and referee). +1 to Initiative if more than one term is served as an Explorer.



Ground Forces (Advisor)

Hivers are not well-suited to fighting, so the vast majority of the soldiers of the Hive Federation are non-Hivers, but most military units have one or more Hiver advisors attached to the command headquarters.

Prerequisites: CON 6+, INT 8+. Automatic if one term of Military Education.

First Term

Commission: Automatic.

Skills:

Officers: Determination 2, **Explore** 1, **Interaction** 2, *Language* 1, **Tactics** 1, **Gun Combat** 1.

Subsequent Terms

Commission: 9+, DM +2 if INT 8+.

Skills:

Officers: Artillery, Charm, Determination, Explore, Interaction, Personal Transport, Tactics.

All Terms

Special Duty: 9+ (DM: CRS÷2) for **Aircraft, Artillery, Crime, Gun Combat, Interaction,** *Medical,* **Perception, Personal Transport,** *Screens,* **Spacehand, Vehicle.**

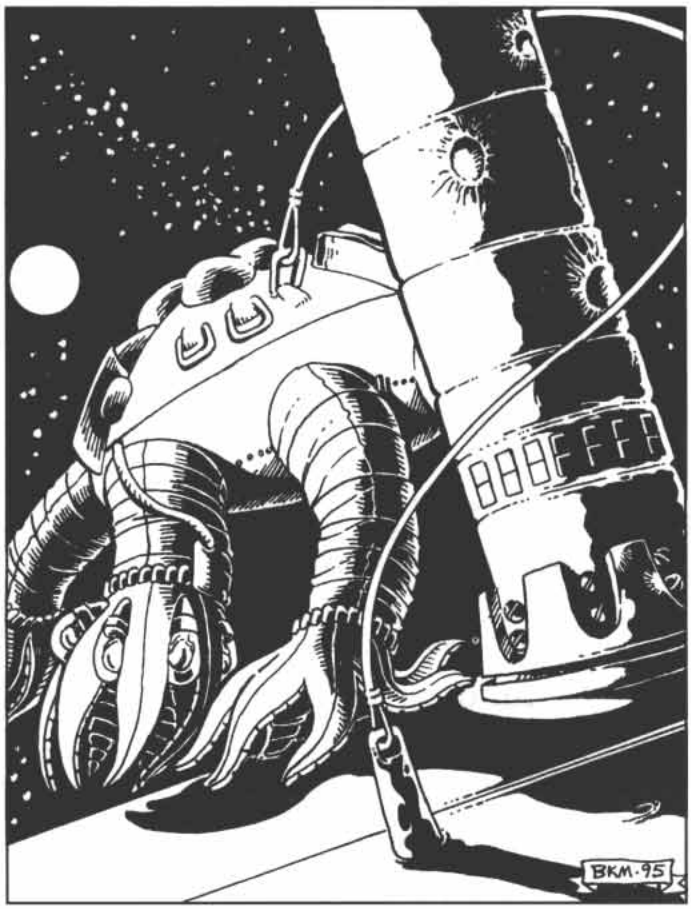
Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, military, non-Hiver on a roll of 8+.

Other Effects: +1 to Initiative if more than one term served as Ground Forces Advisor.

Ground Forces (Support)

Hivers prefer long-distance, remote-control violence to the up-close, personal variety. Few Hivers enter the Federation ground forces, but those that do tend to enter the support services.



Prerequisites: CON 6+, INT 7+.

First Term

Commission: 7+, DM +1 if CRS 2 or less.

Skills:

Officers: Artillery 1, **Heavy Weapons** 1, **Determination** 1, **Explore** 1, **Interaction** 1, *Language* 1, **Tactics** 1, Admin/Legal 1.

Enlisted: Artillery 2, **Explore** 2, **Interaction** 1, **Technician** 2, **Vehicle** 1, **Heavy Weapons** 1.

Subsequent Terms

Commission: 9+, DM +1 if CRS 2 or less, +1 if INT 8+.

Skills:

Officers: Artillery, Charm, Determination, Explore, Personal Transport, Tactics, Vehicle, Heavy Weapons.

Enlisted: Artillery, Charm, Explore, Personal Transport, Vehicle, Heavy Weapons.

All Terms

Special Duty: 9+ (DM: CRS÷2) for **Acrobat, Aircraft, Animal Handling, Artillery, Crime, Gun Combat, Interaction,** *Medical,* **Perception, Personal Transport, Spacehand, Technician, Space Tech.**

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, military, non-Hiver on a roll of 8+.

Other Effects: +1 to Initiative if more than one term served in Ground Support.

Navy

Until the outbreak of the Hiver-K'kree War, the Hiver Navy had been a small exploration service devoted to scouting operations, actions against local navies without jump-capability and protection of merchant shipping. The war necessitated a restructuring, which made the Hiver Navy a powerful interstellar force capable of holding its own against any expected threat. Its duties also include the maintenance of an antivirus cordon and the protection of Hiver merchant convoys outside the Federation.

Hiver Naval personnel are often assigned to RCN vessels as observers or liaison officers.

Prerequisites: INT or EDU 7+.

First Term

Commission: 8+, DM +1 if EDU 8+, DM +1 if INT 8+.

Skills:

Officers: Spacehand 1, **Space Vessel** 2, **Space Tech** 2, **Tactics** 2, **Determination** 1.

Enlisted: Space Tech 2, **Spacehand** 2, **Technician** 3.

Subsequent Terms

Commission: 9+, DM +2 if INT 8+.

Skills:

Officers: Charm, Determination, Interaction, *Medical,* **Physical Science, Space Tech, Space Vessel, Spacehand, Tactics, Technician, Vehicle.**

Enlisted: Charm, Space Tech, Spacehand, Technician, Vehicle, *Language.*

All Terms

Special Duty: 9+ for **Aircraft, Artillery, Gun Combat, Interaction, Perception, Vehicle.**

Promotion: 6+, DM: Snohl Handling or CRS÷2.

Contacts: One per term, Military, plus one per special duty, non-Hiver on a roll of 8+.

Other Effects: +1 to Initiative if more than one term served in Navy.



HIVER SKILL DESCRIPTIONS

This section discusses how skills differ in application between Hivers and humans. Players and referees will need to be familiar with the skills as they are defined in the basic rules.

Hiver "Pacifism" and Skill Choice

Hiver pacifism represents an actual squeemishness about the personal use of violence rather than an actual rejection of the application of force intended to influence the behavior of others. Thus, the imposition of the Hiver will on others is accomplished more with certain skills and less with others, based on the predispositions of the Hivers themselves.

We will impose no new rule limiting the number of close combat skills that may be taken during Hiver character generation. We will limit ourselves to a reminder that Hivers shun such skills, and players interested in roleplaying a Hiver character should keep within the spirit of this understanding. As always, referees are the ultimate authority for deciding what is permissible in their **Traveller** campaigns.

In this spirit, we will present the following lists of skills that are more and less common among Hivers.

The following skills are notably *more* common among Hivers than they are among humans:

Act/Bluff, Bargain, Biology, Chemistry, Computer, Electronics, Genetics, Geology, History, Instruction, Interview, Investigation, Language, Liaison, Observation, Persuasion, Psychology, RCV Operations, Research, Robotics, Sensors, Snohl Handling, Stealth, Streetwise, Willpower, Xeno-Biology.

The following skills are notably *less* common among Hivers than they are among humans:

Archery, Armed Martial Arts, Autogun, Bribery, Dance, Early Firearms, Energy Artillery, Energy Weapon, Forgery, Forward Observer, Grenade, Heavy Gun, Intrusion, Launcher, Music, Painting, Pickpocket, Sculpture, Service, Slug Weapon, Song, Thrown Weapon, Unarmed Martial Arts.

Interspecies Interaction

Certain skills cannot be used on their own when used in conjunction with another species. Psychology and Persuasion, for example, are not very useful if the user has no knowledge of the basics of another being's thinking or emotional processes.

The skill in **Traveller** used to understand other species and to use knowledge and skills in conjunction with those other species is Liaison. Because any skill level in Liaison could not possible imply familiarity with *all* existing intelligent races, referees should feel free to treat Liaison as a cascade skill, in which a specialty species (such as human, Ithklur, Droyne, etc.) should be specified. Thus, the full skill level is used when dealing with the listed species, and only half the level is used when dealing with different species. (Naturally, referees should feel free to impose additional penalties if these other nonlisted species are extremely unusual or unfamiliar to the character.)

The following skills when used in conjunction with non-Hivers require the use of Liaison as an *enabling skill* (**TNE** page 109):

Act/Bluff, Bargain, Bribery, Carousing, Gambling, Instruction, Interrogation, Interview, Leadership, Marketing, Persuasion, Psychology, Recruiting.

Hiver Use of Traveller Skills

Hivers use the standard skills from the **TNE** basic rules just as does any human character with the following exceptions or modifications:

Acrobatics: This is the ability to exercise precise control over body motions and actions. Hivers prefer not to engage in melee combat, but otherwise the skill is used in very much the same ways as with human characters.

Referees should remember that Hivers have a lower center of gravity than humans as well as more limbs, and that some acrobatic tasks will be easier for them (balancing, for example), while others will be more difficult. For example, an attempt to leap from a flying helicopter to a speeding ground vehicle might be a Formidable test of Acrobatics for a human, but only Difficult for Hivers because their lower center of gravity and extra limbs will make it easier for them to grab hold and hang on. On the other hand, the low, broad body of the Hivers will make walking along a narrow ledge an Impossible test of Acrobatics for a Hiver, but only Difficult for a human.

Animal Handling: When taken by Hivers, this skill automatically becomes Snohl handling (see below).

Climbing: Hivers find climbing easier because of their additional arms, so all climbing tasks are one level easier then they would be for humans. Certain tasks (such walking along tightropes or narrow ledges) present greater challenges to Hivers than such tasks would to humans. Referees must use judgement and common sense assigning difficulty levels to such tasks.

Disguise: This skill enables a Hiver to disguise itself as another Hiver. Referees should use common sense and place restrictions on the use of this skill—a Hiver cannot disguise itself as a human, for example, but it will be easier to fool non-Hivers, as Hivers tend to look alike to those unfamiliar with them as individuals.

Excavation: Hiver engineers tend to be better trained in excavation than other races because it is one of their preferred building methods. There are no significant differences between the Hiver and human use of this skill.

Farming: In Hivers, farming skill is primarily related to the underground cultivation of the various types of fungus that form a staple of the Hiver diet.

Gambling: Hivers with Gambling skill have a formal knowledge of statistics and probabilities, and a familiarity with the rules of various games of chance, as described in the basic rules on pages 118-119. They also have an intellectual understanding of bluffing and other techniques. Hivers gamble with non-Hivers because it enables them to study behaviors in an informal setting. The Hivers themselves have games, but the notion of betting *money* on their outcome is foreign to them.

Jeweler: In Hivers, this skill concentrates on the ability to manufacture and repair small, intricate mechanical objects.

Language: There are no significant differences between the Hiver and human use of this skill, except for the fact that a Hiver can only vocalize a language using a portable translator. Hivers can hear and thus can (theoretically at least) understand spoken language, just as humans can (again, theoretically) learn to understand the Hiver sign-language.

Liaison: This is the crucial skill used for interaction with non-Hiver races (see above).

Medical: There are few significant differences between the Hiver and human use of this skill except as it applies to the treatment of another race (see Wound Treatment, page 82, and **TNE** page 123). As in the basic game, this skill is a cascade: Diagnosis, Trauma Aid or Surgery.

Snohl Handling: For all intents and purposes, any Hiver receipt of Animal Handling is taken as this skill. This skill covers the rather specialized skills of caring for the Snohl, the Hiver nonsentient, burrowing symbiote/mascot. It is of little practical utility, but all Hivers are expected to possess it to a certain degree. All promotion rolls receive a +1 DM for every two levels of Snohl Handling skill the character has acquired (skill level÷2, drop fractions).

Swimming: There are no significant differences between the Hiver and human use of this skill. A Hiver with a translator counts as fully clothed for the purposes of swimming. A normal utility harness does not count.

Unarmed Martial Arts: The Hiver distaste for personal combat means that Hivers have no great opportunity to practice this particular skill. Hivers may not have this skill at greater then level 0 and may only acquire it as a topical club secondary activity.

Zero-G Environment: Because of their additional limbs, Hivers find getting around in a zero-G environment relatively easier than do humans or Ithklur, and all tasks are one level easier for them.

Referees' Section

HIVER NPCS

This is an expansion to the necessarily abbreviated guidelines shown on **TNE** pages 67-69 for how to create Hiver template NPCs. Detailed Hiver NPCs can also be created by using the character generation rules found on pages 27-34 of this book.

HIVER MOTIVATIONS

In all cases, aces and face cards indicate that the Hiver has achieved Manipulator status (this is indicated by the abbreviation "M." in the motivation description). This may be modified by the referee as necessary, and a Hiver may be a manipulator even if no aces or face cards are drawn when generating its motivations.

Clubs: Violence

Hivers like to think of themselves as pacifists. However, they are not pacifists in the sense of rejecting violence for ethical reasons. Rather, they are simply unable to cope with it for psychological reasons. This is why the Ithklur think of them as cowards.

Somewhat Used to Violence: Unlike many Hivers which actively shy away from the idea of using violence, these Hivers are willing to contemplate it and attempt it when necessary.

Moderately Used to Violence: These Hivers are more willing to think of using physical violence and may have even had to do it once, although they don't like the memory. These Hivers use the normal human rules for panic (**TNE** page 268) and not the modified Hiver panic rules on page 81 of this book.

Experienced with Violence: These Hivers have experienced physical violence and/or combat before and are as well-adjusted to it as a Hiver can get. This could be a Hiver which has served (or continues to serve) as a military advisor and has seen combat on repeated occasions.

These Hivers use the normal human rules for panic (**TNE** page 268) and not the modified Hiver panic rules on page 81 of this book. These Hivers also have an Initiative of 2. (This is a variation from the simple Hiver motivation presented in the **TNE** basic rules on page 68, where Initiative 2 was granted by clubs face cards. In this more detailed version, face cards have specific meanings as below, and Initiative 2 is granted by 8, 9 and 10.)

Cavalier: This Hiver will not directly kill anyone itself, but has no particular concern if the advancement of its aims requires others to die or kill each other. Such a Hiver would allow a war to be a secondary by-product of its manipulation, so long as that manipulation succeeded in its primary goal (even if that goal was to find out if it could cause a war).

Murderer: This Hiver is accomplished at using murder to achieve its goals. Such murders are not acts of violence, but instead are incredibly cunning acts of poisoning, infection with disease, pre-arranged "accidents" and the like. These victims will normally be non-Hivers, but Hivers which require elimination can be dealt with as well. Such a Hiver is almost certainly a coward when confronted with direct violence.

Coward: Whereas most Hivers are squeamish about violence and their safety, this Hiver is actively terrified. While this Hiver may also be afraid of accidents, plots and manipulations against it, it is particularly afraid of physical violence. It probably is afraid to be touched by others, is afraid of sudden movements, and is given to carrying around weapons that it is afraid of and has no idea how to use.

Commander: This is a Hiver which has achieved mastery of military concepts (well, to the extent that any Hiver really can without coming to terms with physical violence). Such an individual would be the Hiver analogy to Napoleon or Patton, but more along the lines of Nelson, Mitscher or Nimitz.

Clubs: Violence

Card	*Motivation*
Ace	M. Commander
King	M. Coward
Queen	M. Murderer
Jack	M. Cavalier
8-10	Experienced with Violence
5-7	Moderately used to Violence
2-4	Somewhat used to Violence

Diamonds: Miscellaneous

Card	*Motivation*
Ace	M. Visionary
King	M. Vigilante
Queen	M. Mastermind
Jack	M. Selfish
8-10	Will to Power
5-7	Good Citizen
2-4	Wannabe

Hearts: Parental Instinct

Card	*Motivation*
Ace	M. Conscientious
King	M. Puppeteer
Queen	M. Punishing
Jack	M. Patronizing
8-10	Very Parental
5-7	Moderately Parental
2-4	Somewhat Parental

Spades: Curiosity

Card	*Motivation*
Ace	M. Authority
King	M. Secretive
Queen	M. Informative
Jack	M. Obsessive
8-10	Dangerously Curious
5-7	Presumptively Curious
2-4	Very Curious

Diamonds: Miscellaneous

This covers a variety of Hiver motivations not properly included in the other categories.

Wannabe: The wannabe is a Hiver who believes in all of the traditional Hiver values, and in the best Hiver tradition hopes to takes its place among the ranks of manipulators one day. However, this Hiver does not have what it takes, either intellectually or morally, to do so. Either it lacks the intelligence to construct a workable manipulation or it lacks the attention span to follow it through. Although such Hivers can conceivably have truly evil goals, their attempts to actually do evil are so bungling or transparent ("I am an escaped laboratory mouse and I am going to take over the world!") that they are basically harmless, although good for laughs.

Good Citizen: This Hiver is content to carry out its role in society for the good of the Hiver race and has no particular aspiration to manipulate others. However, it is also willing to engage in such activities if there is a good reason for doing so.

Will to Power: These are Hivers who either have not yet attained manipulator status or wish to become more accomplished manipulators. Although they are motivated by traditional Hiver values, their main reason for becoming manipulators is not to do good *per se*, but rather the natural desire to gain more control over their surroundings and their own futures.

Selfish: This Hiver acts in accord with traditional Hiver values, but is exceedingly attracted to personal comfort and advantage. Thus, its every act, regardless of how worthwhile its primarily goal is, will have the additional effect of adding to the Hiver's personal comfort, reputation, desire for power, etc. Also, such Hivers will undertake many acts simply to satisfy their own needs, without feeling the need to justify them from any other standpoint.

Mastermind: This is an utterly amoral Hiver whose every action is intended to further some plan of its own. Every individual it encounters is merely a tool or pawn in its plan, and it trusts no one (although it may conceal this, of course). To such a Hiver, its control over others is of paramount importance. These Hivers do not recognize the importance of racial advancement, paternal instinct or other traditional Hiver values, but place their own goals as the highest end.

Vigilante: These Hivers attempt to defend Hiver society from improperly conceived or intended manipulations, and take measures to undermine unworthy manipulations or impair the ability of manipulators they disagree with to undertake them. The definition of what us unworthy and what sorts of things need to be defended against will vary from Hiver to Hiver.

Visionary: This Hiver has a vision of something of value beyond the



typical Hiver commitment to racial advancement, paternalism, racial superiority, etc. This can be just about anything, and can just as easily be good or evil in its intent or effects. A Hiver dreamer who is aware of the meaning of its gift will usually be a visionary, as can a disaffected member of Hiver society who disagrees with its traditional structure.

Hearts: Parental Instinct

The Hiver parental instinct is focused on other "promising" races as well as on the Hivers' own yearling offspring. In most cases this motivation refers to the Hivers' parental instinct toward humans, Ithklur or whatever race the referee decides the Hiver is in contact with. In the descriptions below, humanity will be the assumed object of the instinct, but this can refer to any race.

Somewhat Parental: These Hivers see humans as worthy of their parental instinct, but the application of this instinct is probably as part of a larger Hiver program of which these Hivers are but a part. This instinct may allow them to form ties with individual humans where their interests and goals coincide, or the Hiver may merely feel generalized affection to humans in the abstract and not really be able to tell them apart.

Moderately Parental: These Hivers see the assistance of humans as an important and useful motivation in their lives, although this assistance might be abstract and not include affection for humans *per se*. Such Hivers are, however, able to interact effectively with humans, and in the absence of other personality quirks, blend in fairly well to the expectations and rhythms of human culture.

Very Parental: These Hivers feel genuine affection for humans in general, and usually have several human comrades with whom they interact on a regular basis. Such Hivers are also concerned with the well-being and good reputation of the human organizations with which they cooperate, and are willing to work to enhance these.

Patronizing: The Hiver truly wishes the best for humans, but has very little faith in their ability to do anything right on their own. It is therefore constantly being insultingly superior, checking up on every little thing, insisting on doing things over to do them "right," and generally treating humans as stupid children.

Punishing: This Hiver sees the best for humans in the future, but is disgusted with their current condition and very impatient with their ability to change to what Hivers think they ought to become. Such Hivers constantly lecture humans they claim to be "helping," are very demanding in what they expect from their relationships with humans, and often attempt to punish humans in some fashion or another for not living up to their expectations.

Puppeteer: This Hiver is actually using humans to suit its own ends. This might be some short-term operation, such as to recover some technology from the Wilds, or a longer-term, civilization-wide manipulation.

Conscientious: This Hiver sees beyond the limits of typical Hiver paternalism and tries to discern the true best results for humanity beyond any Hiver predispositions. For example, such a Hiver might oppose certain manipulations of humans, or believe that some species need to retain their aggressive instincts to remain true to what they are. A conscientious Hiver will not merely make others' decisions for them, but will try to assist them in achieving their own goals, as it believes that they have a right to their own goals (within reason, of course).

Spades: Curiosity

Curiosity is a motivation familiar to humans, but Hivers take it to greater extremes. Hivers use most every waking moment actively learning about things. This can consist of studying books, tapes and computer files, but is also manifested in studying or fiddling with things, conducting simple experiments with common objects and recording results in their ubiquitous portable computers. All Hivers are inherently curious, so any result in this category shows levels of curiosity above this level.

Very Curious: More curious than the average Hiver. Such a character would show many of the activities above, but to a greater degree, and exhibit greater determination and creativeness in getting to the bottom of things. Also, such a Hiver would not anticipate the inconvenience that its experiments might cause to its companions, as it would fail to appreciate that they were not as curious as it was.

Presumptively Curious: These Hivers seem to believe that the universe exists as their private laboratory. They see no difficulty at all in interrupting formal or private events to set up monitoring devices, asking embarrassing questions, throwing objects at humans and then quizzing them on how badly it hurt, or peering up women's dresses to establish some hypothesis about the color of underwear.

Particularly polite ones might off-handedly remark, while crawling over the podium at a political rally, "Oh, don't mind me. Just go about with what you were doing."

Dangerously Curious: These Hivers become so absorbed in what they are doing that they fail to notice personal danger when they are pursuing the answer to a question. Such Hivers may not notice gunfire going over their heads, or may stand near an erupting volcano enraptured by the read-outs on some seismic device, unaware of the closeness of lava flows or smoldering fires in its equipment. These Hivers are so curious that they actually present something of a danger to themselves.

Obsessive: The Hiver is so focused on one particular issue or question that it has lost its perspective. It may be undertaking dangerous or unhealthy risks, or disregarding more important duties or considerations. It is possible that this maladaptive focus is causing the Hiver to ask the wrong questions, so that its current quest can never be satisfactorily concluded, only adding to its desperation for an answer.

Informative: The Hiver is incredibly knowledgeable on a wide variety of topics and enjoys sharing this knowledge as profligately as possible. Such a Hiver may be extremely helpful in most cases, but may be bothersome by constantly interrupting with unneeded advice. This personality type is the closest that any Hiver will come to being a chatterbox.

Secretive: This Hiver will share no information with any other beings. This may be because the Hiver is engaged in a delicate manipulation and cannot allow any information to skew the results, or because it is naturally competitive and does not want any other beings to gain advantage over it by learning information that it has gathered.

Authority: Such a Hiver is an authority on one or more topics at the referee's discretion. This Hiver can be considered to have absolutely accurate knowledge in this area, but may or may not be willing to share this information, depending upon its other motivations or the referee's wishes.

HIVER NPC TEMPLATES

Most of the Hiver strength, and most of the Hivers themselves, remain within the Hive Federation, rebuilding their society. Those who venture out toward human space are of three main types, as follows:

Hiver Tech Rep

Every RCES ship's crew includes at least one Hiver technical representative. These Hivers are included to provide assistance in the maintenance and repair of Hiver-designed and manufactured systems installed on the ship, as well as to assist in the recovery and repair of relic technology discovered on exploration missions. Hiver tech reps are especially valuable in examining relic computers and software for traces of Virus.

Level: Novice.

Combat Assets: Energy or Slug Weapon (Rifle or Pistol).

Other Assets: Computer 16, *Language* (Anglic) 18, any two assets from **Space Tech** or **Technical** clusters at 16, plus four more from **Space Tech**, **Technical**, or **Physical Science** at 12.



Hiver Instructor

Hiver instructors are members of the faculty at the Hiver technical schools. Some of them might also participate in exploration missions that are expected to make discoveries in their fields of expertise.

Level: Novice.

Combat Assets: None.

Other Assets: Computer 18, *Language* (Anglic) 18, any one asset from **Space Tech, Technical**, or **Physical Science** clusters at 18, plus three more from these clusters at 14.

Hiver Merchant

Hiver merchants trade with the Reformation Coalition, but will not be found travelling into the Wilds. They are most commonly encountered in the Coalition homeworlds and at Auction.

Level: Novice.

Combat Assets: Energy or Slug Weapon (Rifle or Pistol).

Other Assets: Computer 10, *Language* (Anglic) 12, any two skills from **Technical** or **Space Tech** at 12, any two of Bargaining, Admin/ Legal, or Marketing at 12.

The remaining NPC types are not very common in the Old Expanses. These are:

Senior Diplomat

Hiver senior diplomats will normally be encountered as the leaders or key members of an important diplomatic group engaged on a mission for the Hive Federation. It is rare for a Hiver to reach such a lofty position without having acquired the title of manipulator. The leader of a diplomatic mission will usually have one or more Hive Federation ships under its control. Senior diplomats may be assigned to important Coalition expeditions where Federation interests are involved.

Level: Novice.

Combat Assets: None.

Other Assets: Computer 16, *Language* (Anglic) 18, any two assets from **Interaction, Determination** and/or **Charm** clusters at 16, plus four more from **Economics, Perception** or **Charm** at 12.

Junior Diplomat

Junior diplomats will normally be found acting in subordinate roles as part of a diplomatic group engaged on a mission for the Hive Federation. They may be assigned to independent duty pursuing some important subsidiary mission of a larger group. Junior diplomats may be assigned to Coalition expeditions (at the referee's discretion).

Level: Novice.

Combat Assets: None.

Other Assets: Computer 10, *Language* (Anglic) 12, any five assets from **Interaction, Determination, Economics, Perception**, and/or **Charm** at 12.

Naval/Starship Crewmember

Hiver Naval personnel are almost never found in the Old Expanses except serving aboard Federation Naval vessels.

Hiver starship crewmembers are found on Hiver merchant vessels and Federation diplomatic vessels serving in various positions.

Level: Novice.

Combat Assets: Energy Pistol.

Other Assets: Any one of *Gunnery* or *Screens* at 14, Computer 12, *Language* (Anglic) 10, any four assets from **Technician** or **Space Tech, Spacehand, Vehicle**, or **Space Vessel** at 12.

Naval/Starship Officer

Federation Naval officers are seldom encountered in Coalition space except when acting as an advisor to a Coalition group or as part of a Hiver diplomatic mission. As such, they will not be in command of a Hiver warship, but may have one or more lesser vessels under their command.

Hiver starship officers are found crewing Federation naval, diplomatic or merchant vessels.

Level: Novice.

Combat Assets: Energy Pistol.

Other Assets: Computer 12, *Language* (Anglic) 12, any two assets from **Tactics, Space Vessel, Space Tech, Determination**, or **Charm** clusters at 16, plus four more from these clusters at 12.

Doctor

Hiver doctors are often a part of the staff of diplomatic missions, temporary bases, and are often found serving on the larger naval vessels.

Level: Novice.

Combat Assets: None.

Other Assets: *Medical* (Diagnosis) 18, *Medical* (Surgery) or *Medical* (Trauma Aid) 16, any two assets from **Interaction** or **Physical Science** clusters at 16, plus four more from *Medical*, **Perception**, or **Charm** at 12.

Medical Technician

Hiver medical technicians accompany doctors, and staff sickrooms aboard temporary bases and the larger naval vessels.

Level: Novice.

Combat Assets: None.

Other Assets: *Medical* (Trauma Aid) 12, *Medical* (Surgery) or *Medical* (Diagnosis) 10, any four assets from *Medical*, **Technician, Perception, Charm, Vehicle**, or **Physical Science** at 12.

Anti-Virus (Computer) Specialist

Every Hiver ship that leaves Federation space has at least one anti-Virus specialist assigned to its crew (often filling one of the electronics crew positions, but sometimes assigned as a supernumerary). Anti-Virus specialists are normally assigned to diplomatic missions and occasionally sent on Coalition expeditions where Federation interests are expected to be involved.

Level: Novice.

Combat Assets: None.

Other Assets: Computer 18, *Language* (Anglic) 12, any one asset from **Spacehand, Interaction**, or **Technician** clusters at 18, plus three more from these clusters at 14.

Ground Forces (Advisor) Officer

One or more Hiver ground force advisors are normally attached to the headquarters of large Ithklur military forces.

Level: Novice

Combat Assets: *Energy Weapon*

Other Assets: Leadership 10, Ground Tactics 12, *Language* (Anglic or Ithklur) at 14, any four assets from **Tactics, Explore, Interaction, Determination**, or **Charm** clusters at 12, and one from **Artillery** or **Heavy Weapons** at 16.

Ground Forces (Support) Officer

Hiver support troops are normally attached to Ithklur forces and sometimes encountered as observers on Coalition missions.

Level: Novice.

Combat Assets: *Energy Weapon*

Other Assets: Communications 10, Language (Anglic or Ithklur) 14, any four assets from **Engineer, Explore, Interaction, Economics**, or **Charm** clusters at 12.

Dreamers

I had a dream. A dream of a wood, old beyond imagining, rich with life, thick with deep, heavy fertility, laden with the smells of eternity. The trees were tall, the trees were strong. And they beckoned, though they did not need to move. Their proud straightness alone was a magnetic force. Their silence was a pregnant moment waiting for a voice. And I was drawn toward them.

How many other travellers had heard this call? How many had become lost in this wood or found a home here? But the silence pressed in tight, and the wood closed around me. And where I had expected to hear the distant conversing of birds and the careless accompaniment of splashing water, there was only the soughing of a dry wind. The soughing of a dry wind through brambles, thick, black and wicked, clinging closely to the bases of trees, sinking thorns deep into aged bark. And what had been the rich, sticky-sweet smell of life swelling deep in the earth became the cloying scent of decay, of death bursting through the soil in repellent, fungous growths.

The wood cringed about me, as if each creature in every nest and burrow and cocoon were recoiling from the smell that I had caught. And although the motion subsided quickly, the vision remained with me, like bright flashes in darkness. The wood was steeped with life, saturated with creatures, each cowed, as I was, by the unexpected intimation of doom.

But the trees were tall and proud. The brambles, though twining vine-like through the limbs, were nothing to the ancient strength of the trees.

A soft groan touched my ears, the sound of weight shifting, settling. It came from a tree, like many of the others around me, heavy with sigils and signs, carved deep with coats of arms and patents of rectitude. With a dull pop, it sagged against its neighbor, a younger tree, uncarved and unmarked, but no less tall or broad. The young tree bowed, trying to roll with the weight of its older neighbor, but the groan of its bending ascended to the shriek of living wood splintering. The two trees crashed to the forest floor, leaving the final shriek hanging in the air. But while the young tree crashed and splintered bitterly and violently, leaving a quivering stump and savage echoes, the older tree landed with a dull thud, and disintegrated to reveal an interior seething with insects and pungent with dead ichor. Where it had entered the ground, the trunk had pulled free, leaving a shallow, musty wound, where all its roots had long since dissolved into the gray leprous soil that remained.

Suddenly I saw how many of these dead but still erect trees there were, each sagging against the living ones beside them, hanging like a sword above the healthy trees of the forest. These standing dead were holding the living hostage against their pride, their will to outlast their lives. It was then that the silence found a voice, and it was singing a song of death.

How could no one have seen that the wood had been dying for so long? How many young trees could shrug their way through the dead weight entangling them?

A shadow passed near me, a force shrouded in blackness, which left a bright flickering behind as it fled. A flickering of fire. Before I could move, the fire leaped to the fallen tree, consuming the crumbling, dry wood, and destroying the insects with pops that merged into a steady sizzle.

The wood came alive again, with creatures mindlessly fleeing the blaze, but not quickly enough, for the fire leaped ahead of them, tree to tree, bramble to bush, cutting them off, mercilessly devouring them. Leaves ignited on branches in the searing air, and trunks exploded as the sap inside them flashed to steam. Somehow, above the infernal roar, arose another sound, a shrill keening, the combined cries from the throats of a million million incinerated creatures, and the creaking of a million million falling trees.

After a time, which was forever, or might only have been an instant, the fire was over. Smoke and steam concealed everything, and the sounds were of fading hissing and crackling, and the exhausted groan of great weights shifting one last time to their last resting places. A wind stirred, but not a dry wind—a fresh wind, which stripped the smoke from the smoldering wreckage and carried away the sounds of ruin.

The trees that remained stood battered and blistered, but untangled in the sunlight. The brambles were seared away, and the standing dead were ashes. The creatures that returned were the strong and vigorous, and the song they took up was the song beyond the song of death: It was a song of defiance, of renewal. The voice had found the song of life.

Some things can only be cleansed with fire.

I had a dream. A dream of fire.



HIVER MANIPULATION

It is a mistake to think of manipulation as a hobby of privileged Hivers, or as an activity that can be defined separately from Hiver society as a whole. It is in fact a major fiber woven into their society and is inseparable from it.

To say that manipulation is a career that Hivers move into after having spent some portion of their lives in other careers is correct only insofar as it can be said that the CEO of some major corporation moved into the separate career of Chief Executive Officer (Shaker and Mover 1st Class) after having spent his previous 30 years in the completely unrelated careers of Senior Vice President for Marketing, Administrative Officer, District 3 Manager, etc. (Shaker and Mover 2nd through 4th classes).

Manipulation is a basic concept in the Hiver understanding of The Way Things Work, much as politics, power, motivation, supply and demand, and the perversity of inanimate objects are crucial conceptual tools in human society. Manipulators are better understood as Hivers who have ascended to positions of power where they are given broader horizons to exercise their manipulative talents (if human, read: "management," "administrative," "organizational," "visionary" talents) after having demonstrated talent and proficiency in the small-scale manipulations that would be necessary in the day-to-day workings of their careers as naval officers, merchants, tool-and-die manufacturers, etc.

Which brings us to the question: Is the Reformation Coalition a Hiver manipulation?

Get real. Manipulation is a survival skill of the Hivers. To ask if a Hiver brings any of its manipulative skill to the solving of a problem is like asking, "Hey, those *Homo sapiens* over there, are they planning on using their brains and their opposable thumbs in order to cross that river?"

Oh, so now with the big "no fair" whine. We poor little put-upon humans are now tools of Ned and the big nasty starfish monsters. Well, let's put a little nonhomocentric spin on it.

Something is Rotten in Denmark (and Everywhere Else in the Imperium)

Good job those humans. They've put together the largest interstellar society in known space, all with just brains and opposable thumbs. Not bad for a bunch of hairless former tree-climbers. They've surmounted $E=mc^2$; they've surmounted the Great Rift; they've surmounted the Civil Wars of the early 600s; they've surmounted 1100 years of Murphy's this, that, and the other thing; and, by virtue of that record of success, they have attained major roles in the affairs of every other starfaring race: the Aslan (yeah, so they didn't do it on their own, who does?), the Vargr (yeah, and they *did* do it on their own, so mother nature obviously has no quality control), the Zhodani (those damned humans again), the K'kree (don't get me started) and the Hivers.

So you figure you can count on these guys, right?

Nope. After all that, the Imperium collapses like some 1100 year-old house of cards (*who knew?*), and unleashes the meanest mother of a virus the universe has ever seen, which, interstellar intercourse being what it is, drags down the computerized centers of all the other starfaring races as well (forget the fact that they slaughtered *tens of billions* of their own species in this fiasco—more than have ever been killed by any other single cause). Not only can the humans not be trusted in their own sandbox, they trashed the *entire playground.*

Not exactly what you'd call good neighbors.

Return the Manipulators

Not that many folks had the time to reflect on local property values. The K'kree were still crying in their salads, the Aslan were breeding up a storm, and the Vargr were so busy snarling and fighting each other, they may never have noticed the difference. *But*—the Hivers, with their demonstrated facility for pragmatism and computerization, were the first race to begin recovery.

And the Hivers did have the time to think about the future of humanity—and whether they could afford to ever let anyone do again what the human virus did to them. Humanity is just plain dangerous. But you can't exterminate them (well, maybe...), nor can you ultimately stop them from coming back again. It takes a lot of stubbornness and a lot of determination to reach the stars, and the humans, by the size of their collection, had a little more of both than any other race. So what's a poor neighbor to do?

Well, a neighbor could change the humans, ever so slightly. But would it work in the long run? Sometimes a race of manipulators just can't resist a challenge.

When looking at humanity, the Hivers had the advantage of an outside perspective. They could view human society, and human history, as an ecosystem. And as manipulators who were used to working on a society-wide scale, they had what you could call a flair for it. They could identify adaptive and maladaptive behaviors in a way that human analysts, themselves enmeshed in the human condition, and unable to see the forest for the trees, could not. Where a human analyst would talk about Dulinor's bad childhood, Lucan's lack of breast-feeding, and the unusual constellation of cross-cutting economic demands in the Core that spring, a Hiver could ask questions without psychological or sentimental attachment to the event. What was different between 600 and 1100 that caused an Empire to survive over a dozen "rights of assassination" in the former case, but none in the latter?

The fact that the Imperium had survived the series of coups of the early 600s was a good sign, not only for humans, but for moderate Hivers who did not wish to have to exterminate humanity. The Hivers had always held out the greatest hope for humans as candidates for another civilized interstellar society, but had maintained reservations based on the tremendous human capacity for violence, proven yet again in the Final War. Since the cause of the Imperium's damaging the Hivers and other starfaring races was only an extension of the greater damage they had already done to themselves, the issue was also one of seeking a solution that was of the most good to humanity itself.

Any impartial human would readily admit that there was something very wrong with the Imperium, and with Imperial humanity itself, that would allow it to come unglued in the catastrophic way that it did. There was a disease, an Imperial sickness that manifested itself by 1116, that had to be prevented from happening again. But while human sensibilities would probably allow such considerations to be forgotten once the expansion into space had begun anew, Hiver sensibilities would



not, as they would not consent to again being unwitting victims of human maladaptations.

The Hivers eventually assessed that it was a breakdown in human social cohesion that caused the Imperium to explode at a social level that was already established as being a stable and maintainable size. They were correct in assessing that if that breakdown could be identified and its causes eliminated, then that action would be a service not only to humanity's neighbors, but also to humanity itself. From a standpoint purely of natural selection, based on the success of certain patterns of DNA reproducing themselves in the greatest possible numbers, it is possible that a population that periodically expanded, then exploded, expanded, exploded, over and over again, might have a perfectly sound reproductive strategy. However, from the standpoint of individuals within that population, or society, as intelligent populations call themselves, the soundness of such a pattern is another issue altogether. Humanity, as represented by the Imperium from 1116-1131, was sick, fatally so. The horrific casualties of the Final War will remain eloquent proof of that thesis. Humanity, if it could be said to be worthy of another shot at stellar hegemony, had to be cured of that disease. For if it could not be cured, the calculus of natural selection was unambiguous: it would be replaced by another species.

It would have to be said that humanity was extraordinarily fortunate in that the Hivers were content to allow humanity's best interests to be served, so long as they coincided with those of the Hivers. The fact that they were content to do so, and eventually, did do so, can largely be credited to one particular Hiver, who eventually felt content to, after a fashion, think of itself as human.

M. Corralci

The Hivers had always had a hard time understanding humanity. It was felt that they were physiologically too different for any true meeting of the souls to take place. This is indeed true, and it was not until Manipulator Corralci that this difference was recognized, understood and, most importantly, codified so that other Hivers could from benefit from the breakthrough.

M. Corralci was an unusual Hiver. She (an explanation of pronoun usage appears below) entered her nest as a yearling in 1099, and in 1113 began her career in the navy, where she was recognized as a gifted, if somewhat erratic, performer. Corralci's ability to catch onto traditional procedures, protocols and understandings was extraordinary, and enabled her to gain rapid promotion in her first term. However, Corralci was given to suffering strange seizures in which she would lose consciousness for periods sometimes lasting several hours. When Corralci passed out while standing bridge watch, it spelled the end of her naval career. However, this gift for being attuned to traditions and the essence of various subject matter allowed Corralci to very quickly gain acclaim as a phenomenally successful story-teller. Those who asked Corralci about the inspiration for her stories and remarkable insight found that Corralci was very willing to explain. The source was the "visions" she would have during her seizures, which she would later call "dreams" following her closer contact with human beings. Although the Hivers who asked these questions never quite understood all this business about visions and dreams, they certainly made for good stories.

Corralci was in fact the first psionic Hiver, or, at least, the first psionic Hiver to ever attain recognition as a result of these talents. Her uniqueness is due in part to the Hiver obsession with maintaining a homogeneous genotype, which makes it very difficult for mutant genes, usually recessive, to become expressed. Her psionic strength was relatively low, and her only talent was the peculiar dreams that she experienced, which she was unable to control for many years of her life. These visions were governed largely by the type of contact and activity she was engaged in, and because of their erratic nature, she never came to the attention of Hiver psionic research groups before the Collapse. In fact, it was not until the late 1130s that she became even marginally able to control these visions, and even then, her control was limited to controlling their frequency and timing. By the 1140s, she was able to exercise some control over their subject matter, but this usefulness was limited by the fact that the dreams were abstract and allegorical.

This situation was made even more difficult by the fact that the allegories she dreamed were those of the race about which she dreamed. Although her first dreams of humans took place during her naval service of 1113-1117, these were completely unintelligible to her at the time, because of the brief and cursory nature of her human contacts. Her talent can be best described as a passive absorption of thoughts, mostly subconscious, of those around her. These thoughts would be stored and digested, sometimes for years, in her own subconscious, before they were released to her mind in the form of the dream seizures. The long storage and digestion would allow her brain to synthesize subconscious currents and images from the large number of beings she met, until the common elements could be expressed in symbolic terms of the collective unconscious in her dreams.

It was as a story-teller that she gained more frequent human contact in the 1120s, as she travelled to broaden her story-telling repertoire. Her vivid images of the battlegrounds of the Final War date from this period, when she was a member of the abortive manipulation that included the trade agreements with the post-Imperial Massilia faction. Once she realized that she was dreaming dreams that included human emotions and human subconscious images, she was able to begin trying to understand them, but this effort took many years. The absolute, literal *alien*-ness of the concepts and of the emotions themselves took a long time to insinuate themselves into her cognitive faculties. Not only did she have to learn to feel these transplanted emotions, but she had to learn to explain them to other Hivers, which was even more difficult, as they could not be made to experience these emotions first-hand, as Corralci had.

In 1136 she made the psychological breakthrough of feeling, for the first time, the essence of humanity: their passion, and its physiological and psychological roots. Instead of the mechanical, peremptory reproductive act of Hiver biology, human reproduction, though also instinctive, is a deliberate act, an intensely emotional, intensely passionate, intensely *creative* act. Though human emotion is not based on, nor does it derive from, the sexual act, it was this dramatic difference between Hiver and human psycho-physiology that was the touchstone



for Corralci's subsequent appreciation of human emotion and psychology.

Corralci went further with this model, suggesting that human reproduction, as a creative act of volition, rather than absent-minded instinct as in the Hiver model, colored the human approach to life by making it inherently less rational than the Hiver approach. The human emotional investment in life caused humans to respond to events in emotional or passionate ways: with anger, affection, etc., emotions that were not rational, but nonetheless could motivate human decisions. Noting that the human sexual act combined dramatic physiological changes (distinctly not the case with Hivers) with intense emotional responses (ditto), and that the sexual drive can be actually enhanced in periods of stress, Corralci believed that human sexuality was an emotional and passionate act of defiance in the face of a harsh and impersonal universe, an act of lighting a single candle in the midst of howling darkness. Years later, in describing the dream that led her to this epiphany, Corralci incongruously observed, "I wept." (Hivers do not have tear ducts, *per se*.)

It was also at this time that Corralci began referring to herself with female pronouns, although, like all Hivers, she was neuter in gender. As she grew more absorbed in her human dreams, she grew comfortable with human concepts, such as emotions and even sexuality. In the human terms with which she continued to identify ever more closely, she found that she increasingly perceived herself as being, somehow, relevantly female. And although this spiritual orientation was irrelevant in Hiver society, it was an important distinction to her, and one which she insisted that other Hivers make as well, because it helped her to more clearly impress upon her fellow Hivers the human values that she was teaching them.

Corralci was a very junior member of the 1127-30 manipulation that sought to gain data on the Final War out of a prescient fear on the part of organizer M. Manchus that the war might grow to threaten the Hiver Federation. She was chosen, as a gifted story-teller, to observe the mission and report back to other Hiver groups supporting the manipulation. The information and ties with human organizations were intended to enable a later manipulation to prevent any spill-over of the Rebellion into Hiver society, but all this was overtaken by Virus, which flattened Hiver society as badly as it did any other. However, the Hiver genius with computer technology enabled them to get a limited amount of machinery up again after only a decade or so, although this small pool of resources was dedicated exclusively to the use of powerful and effective manipulators, such as M. Manchus. Fortunately, Corralci had impressed Manchus while she was with the project and had maintained her ties with the well-known manipulator, whose reputation had grown under the circumstances of his suspicions being dramatically proven correct.



By the time Corralci realized that she was having dreams that provided insight into humanity, the Hivers were hard at work attempting to address the twin problems of Hiver re-establishment and the prevention of any recurrence of the human problem. It was clear to Manchus that Corralci's visions, though unprecedented and unlikely, presented a possibility to solve the human problem that could not be ignored. Although Manchus accepted Corralci's visions as authentic, the only way to make her breakthrough convincing to Hiver society at large was for her to gain the status of a successful manipulator.

Under Manchus' tutelage, Corralci used her visions to identify, plan and execute an increasingly sophisticated series of manipulative experiments, which eventually gained her not only the coveted status of Manipulator, but also the acknowledgment of Hiver leaders that her visions of humanity were valid, and should form the groundwork for the great human manipulation.

The point of departure for the manipulation was the recognition of the balance and interconnection of the major human passions, hatred and violence, love and benevolence. Human violence, always dangerous, was doubly so because it could arise out of not only hatred, but also out of defensive love for close companions. It is clear that humans of the various Final War factions did not hate each other, not at first, anyway. But they allowed themselves to do grievous violence to each other, out of fear of the threat that the other may have posed. But in so doing, they did not so much defend themselves as force the other factions to fight more fiercely, thereby increasing the fear and bitterness on both sides, encouraging both to again fight more fiercely. To the Hivers, a race with an intense instinct for the survival of their species as a whole, human society was infected with a disease clearly fatal to its former status as an interstellar culture: virulent factionalism. Humanity had lost its humanity.

It's hard to say how many Hivers may have read Edward Gibbon, but it is clear that they appreciate the concept of human social decay, and the survival of institutions far beyond the values that created them. The goal of the human manipulation was to more firmly establish within human thought the values that did, and ought always to nerve and enable human society.

From *Beneath the Mantle of Determinism*
by The Enlightened *Slaa* de *Silentio*



DREAMERS

Although dreamers have existed as misunderstood Hiver aberrations for perhaps as long as thousands of years, they are not readily known to the general populace. Presumably most dreamers die in the wilderness before they reach yearling status, and those which do are possessed of such an unusual talent that most never figure out what it is, or even how to deal with it. Those Hivers which pass out and awaken to speak of incomprehensible visions that they have had are routinely labelled as "mad," and either institutionalized or peripheralized by being treated with paternalistic sympathy.

As discussed above, M. Corralci, in the immediate post-Collapse period, was the first dreamer whose talents were realized for what they actually were. And even among those Hivers who understand the nature of the dreamers, there is by no means any agreement that dreamers are a good thing. Their long history of being regarded as mentally ill creates a prejudice that most Hivers are subject to, and the fact that their "gift" is something for which the vast majority of all Hivers have no basis of comparison only fuels the natural suspicion of this most unusual and quite un-Hiverlike of traits. Furthermore, the very nature of the dreaming gift is antithetical to the proactive, controlling Hiver approach to life. Rather than being a tool which the Hiver can control to yield the results it desires, dreaming acts on its owner as it will, according to its own rhythms and logic, which are not always amenable to the plans, goals, or intents of the Hiver experiencing it. A reactive nature is considered to be a mental defect among Hivers, and a Hiver possessed of a talent which forces that Hiver to be entirely reactive to that talent is not a fortunate Hiver, but is rather a Hiver "possessed" by a maladaptive compulsion. Such Hivers are objects of contempt and disgust, rather than pity. Any dreamer PC or NPC will experience a great deal of prejudice and active opposition from the vast majority of Hivers.

Referees' Notes on Dreamers

The existence of dreamers is not known to the human community. They are an extreme rarity among Hivers, and the understanding of their nature is only a recent development, since approximately the time of the Collapse. Furthermore, most Hivers are suspicious of dreamers and have no desire for their existence to become widely known among non-Hivers.

Hiver dreamers are *excruciatingly rare*, and should not appear in **Traveller** campaigns or adventures on a regular basis. As PCs, dreamers should be even more rare. **Traveller** referees who have had only one dreamer PC in their campaigns over years and years of refereeing (and this character still vividly gleams in memory) should feel that they have the frequency just about right. For players who insist on rolling to see if their Hiver PCs have this talent, the required roll should be three consecutive D100 rolls of 100 (one in a million).

How to Referee a PC Dreamer

Assuming that you as a referee have decided to embark on this venture, let me first ask you a question: Are you *sure* you want to do this? Okay, fine, but let me just ask you this one question: Are you *sure* you want to do this? Okay, but just let me ask you this one question, WHAT ARE YOU, NUTS?

Okay, I have discharged my responsibilities to the Forces of Galactic Harmony and am off the hook, but you are now your own affair. Don't say I didn't ask you a bunch of questions. Hey, by the way, are you *sure* you want to do this?

So anyway, the first thing to remember is that a Hiver dreamer PC is just like any other Hiver PC, plus they have this handicap/gift that asserts itself at the least helpful moments. Hiver dreamers cannot control their "gift." The best way to simulate this is to roll randomly for the *threshold number* for each Hiver dreamer. The roll is 1D20+20 for a resulting range of 21 to 40. This threshold number represents the amount of emotional-psionic stimulation that the Hiver can absorb before it falls unconscious into one of its dreams, each lasting 2D6×10 minutes (reroll all results of 12 as 1D6 hours). Referees should keep track of the amount of emotional intensity absorbed by the Hiver in the same manner as they assess and award experience points (**TNE** page 133), except that this emotional intensity number should vary based on the intensity of feelings the referee judges the PC group has experienced, with a baseline of about one point per week of game (not real world) time.

For example, a session spent in routine travel through jumpspace should be worth one point, but a session that involved a great deal of stress and combat should be worth more. Death of a PC or NPC close to the group should also be worth a great deal of points (say, five to 10 based on circumstances, etc.), with a residue of additional grief points to be added for several subsequent weeks. In addition, other emotionally intense experiences, such as romance, fear, etc., will add to this amount. Although it is most convenient for the referee to assess these points at the end of each gaming session, when the referee sees that the dreamer is getting close to its threshold number and is likely to pass it at the end of the current session, there is a chance the dreamer will succumb to its seizure during the midst of roleplaying. This is at the discretion of the referee, but will often be triggered by an especially intense emotional moment. Hivers in these seizures cannot be awakened by any means and are completely unconcious until the end of the predetermined dream period.

Remember that Hiver dreamers are fully functional telepaths who *constantly* pick up psionic signals from all beings in their near vicinity, but have no consciousness of doing so. All of these mixed chaotic messages go directly to their subconscious, where they swirl around until they eventually coalesce into some insight that is delivered to the Hiver in something which resembles an epileptic seizure.

And oh, by the way, this insight is delivered in an allegorical form that will sometimes take the recipient years to figure out, in the light of subsequent dreams.

Roleplaying the Dream: Once the dream is triggered, the referee, perhaps with the participation of the Hiver player, should determine the nature of the dream. It is reasonable to assume that a referee would only allow one of the group's most experienced roleplayers the opportunity to play the dreamer, and may feel that the two of them, referee and player, can jointly determine the confusing and allegorical nature of the dream, based on the recent experiences of the PC group.

On the other hand, the referee should be aware that these dreams also reveal things the PCs may not be directly aware of, either picking them up from nearby NPCs or from the subconscious of the PCs, things the PCs themselves may not realize consciously.

This allows referees to present cunningly concealed hints and clues to the PCs, which may lay the groundwork for future adventure campaigns.

In the dream, the Hiver will not necessarily be aware of itself as a Hiver, but will take on the racial characteristics of the beings with which it has been associated. Remember also that because of the Hivers' inherent psionic silence (see page 25), a Hiver surrounded by Hivers and other races will be more aware of the telepathic energy of the non-Hivers in the group.



PLAYING AND REFEREEING THE HIVERS

Using Hivers/Playing Hivers

The key points to keep in mind when playing a Hiver character (either PC or NPC) are:

Goals: Hivers have goals that are dictated by their nest. While this may seem counter-intuitive given Hiver individuality, remember that Hivers are free to change nests to suit their own purposes. Therefore, most any Hiver will be a member of a nest that suits its present needs. These nest goals need to be worked out between the Hiver player(s) and the referee, and can change over the course of a campaign. Determining a goal must take into account the character's skills and attributes, the various careers chosen and player desires. A Hiver merchant's nest goal can be something as simple as "make as much profit for the nest as possible." A diplomat's nest goal may involve a specific negotiation or a long-term diplomatic mission. Characters playing individualistic Hivers will still have nests and nest goals, but these may be more open-ended, such as "learn as much about human behavior under stress as possible."

Motivations: Hivers are virtually emotionless by human standards. They do not experience anger, love, joy, jealousy, or greed. They have two major motivations, which are curiosity and their parental instinct.

Curiosity is familiar to humans, but is taken to greater extremes. Hivers use every waking moment studying or fiddling with things, conducting simple experiments with common objects, and recording results in their ubiquitous portable computers. This can make human companions feel paranoid, as if they are constantly being studied by their cryptic Hiver shipmate. When exploring a world, Hivers also tend to wander off, attracted by some mystery, and can take much longer than their more businesslike human comrades might prefer (not to mention getting into trouble they are constitutionally incapable of getting themselves out of).

Their parental instinct is naturally linked to the survival of their race and offspring, but also has a strong side effect: the urge to help along other promising races (which includes humanity, but not K'kree, Aslan or Vargr). This instinct not only prompts them to assist these races in their development, but also to help these races curb their violent instincts, which are distasteful to the Hivers and which they consider uncivilized.

Other Comments: Hivers also have a tendency toward what humans interpret as secrecy and subtlety. Part of this is due to the Hiver sense of racial superiority: They need not justify themselves. Because Hivers do not experience suspicion as an emotional response, they do not expect that they need to explain their every action. But to the human mind, the constant Hiver activity seems out of balance with their typical lack of running commentary on what they are doing. Hiver subtlety also stems from this lack of desire to communicate more than is necessary. A Hiver is content to communicate a seed of an idea to a companion if that is sufficient to get a point across, rather than explain an entire plan with all of its ramifications every time a decision needs to be made. This dovetails with the Hiver ideal of subtle manipulation. Explaining too much defeats the purpose. The fact that they are naturally mute adds much to their aura of secrecy.

Players and referees should feel free to use Hiver peculiarities for comic effect. But remember that Hivers are not clowns or buffoons, nor are they stupid. High comedy and slapstick are usually not appropriate; rather, a wry sense of amusement at their very alien motivations and reactions is desirable.

Human/Hiver Interactions: Interactions between races (bargaining, interrogations, interactions with administrative or bureaucratic officials and so on) go better when one or both races have some knowledge of how the culture of the other race works. Liaison and Xeno-Biology skills should be used as enabling skills at the referee's discretion to reflect this knowledge. The skill descriptions note where these skills can be used, but referees should feel free to use their judgement.

Playing and Refereeing Manipulation

The highest talent to which a Hiver aspires is that of manipulation: the ability to cause social change by one or more small influences. The more subtle and unknown the influence, the better the manipulation and, within Hiver society, the more esteemed the manipulator. Accomplished manipulators rise to positions of great influence and authority within Hiver society.

There is, however, no Manipulation skill in **Traveller**, no formal rules for manipulations, and no scorecard to tell players when they can put an "M." in front of their character's name. This is because manipulations are best undertaken as an exercise in role-playing, and should be gamed out between player(s) and referee as part of the campaign. After all, since this is the essence of the Hiver spirit, roleplayers should be involved in experiencing that essence: planning, laying out, and executing subtle plans and watching their unfolding.

Therefore, the skills a Hiver needs in order to be a good manipulator can include Persuasion, Leadership, Act/Bluff, Investigation, Research, Marketing, Bargain, Liaison, etc.

The first thing to remember is that manipulation is approached as a form of controlled sociological experiment and is laid out as such. Just as with a physical experiment, certain elements have to be isolated as constants so that one or more variables can be introduced. It is dangerous to attempt to introduce too many variables at once, as they may interact and interfere with each other in unanticipated ways and spoil the experiment. Thus most manipulations are conducted to learn about and isolate components of behavior that can be controlled. These preliminary manipulations then lay the groundwork for later manipulations that achieve concrete results based on these findings.

Second, manipulations must be subtle. The aim is to produce the greatest possible result from the least expenditure of effort. This also fits with the principle of changing the fewest number of variables. The proportion of result to influence indicates the skill of the individual manipulator.

Third, the manipulation must be recorded and, at its conclusion, announced. What did the manipulator expect to learn? How did the manipulator expect the influence to affect behavior? How did the influence actually affect behavior, and how did the predicted effect differ from the actual effect?

Hivers and Psionics

Hivers have no psi potential and cannot use psionic powers (exception: see page 43). They are, however, susceptible to psi powers, although telepathic skills are of limited utility against them.

Telepathic Skills: Any human or Ithklur psionic attempting to use Telempathy, Project Emotion, Project Thought or Probe on a Hiver automatically subtracts two stages of success. This is due to the difficulty in understanding a mind that has developed along a very alien evolutionary path (see page 249 of the basic rules).

Telempathy: Other than the loss of two stages of success, this skill



works with Hivers as described on pages 249-250 of the basic rules.

Project Emotion: Other than the loss of two stages of success, this skill works with Hivers as described on page 250 of the basic rules.

Project Thought: Other than the loss of two stages of success, this skill works with Hivers as described on page 250-251 of the basic rules.

Willpower Drain: This skill works with Hivers as described on page 251 of the basic rules.

Life detection: This skill works with Hivers as described on page 251 of the basic rules.

Shield: Since Hivers have no psi powers, they may shield themselves only by artificial means (electromagnetic psi shields).

Probe: Psions attempting a Probe of a Hiver's mind will encounter the same difficulties in understanding an alien mind as are involved in Telempathic contact and must subtract two stages of success.

Assault: Psionic Assaults do not require the sophistication of Probes, and need not take the alien nature of the target mind into account. This skill works with Hivers as described on pages 251-252 of the basic rules.

On Refereeing Hiver Society

Okay, so what about the Federation underground? How is this to be portrayed?

Underground? Who in the world said that there was an underground? Certainly not me.

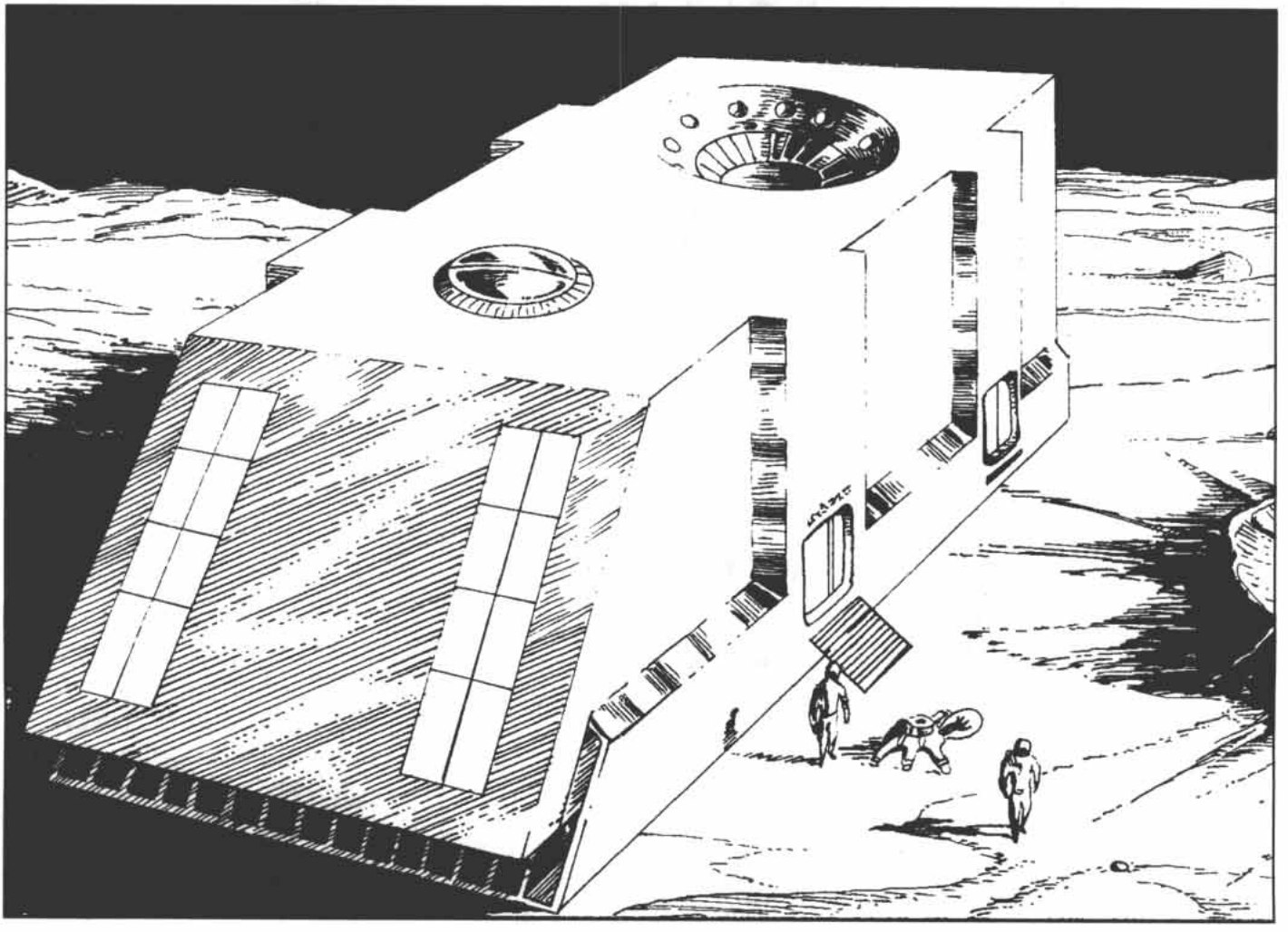
So what about everything in the book?

Everything in the book was said by someone, and based on what they believe to be true. And where there is smoke there is fire. Probably. Maybe. You never know. Most beliefs have at least *some* basis in fact (don't they?).

Remember that not all "people" believe there was a Holocaust, and not all Americans believe that the Civil War was caused by slavery. In Hiver society at large, there is no general awareness of any conflict of any kind between dreamers and nondreamers, between supporters of the *status quo* and any organized dissatisfaction with it. This does not mean that those currents are not there.

Thus, whether or not there is a Hiver underground is irrelevant to whether a given Hiver character believes that there is or acts as if there is.

The key to roleplaying an alien race, either as a player running a PC or a referee running an NPC, is to take the various "facts" presented about that race and think about them. What sort of attitudes are required to make these facts consistent in an alien mind? If there are things that are simply unavoidably inconsistent, how does the mind of your character deal with that fact? Does he figure he's stupid or wrong, or that other people are stupid and wrong and need to be corrected? Fitting these motivations together is the territory of each and every **Traveller** alien roleplayer, and you can do it how you like. After all, they're aliens, so no human can tell you you're wrong.



Ithklur

On Ithklur-Human Contact

You humans—you have such tolerance for ambiguity! For example, your *Sharis *have no underlying forms, which means that you teach your whelps to seek meaning even when no pattern is forthcoming. This is astounding, and forward-thinking!*

And your bug-eyed maritime crewman, surely he is as fine a philosopher as you possess, and you have followed his credo for almost six millennia! That this realization has been known to you and your littermates for so long is truly a wonder!

You have much to teach us, and as always, we must not forget to thank our drivers for bringing us into contact with you.

An Ithklur warrior

On Human-Ithklur Contact

What these guys need is a good 12-step program, like "Happy Anarchists Anonymous."

A human observer
on Ithklur revelers

On Human-Ithklur Contact II

I see you've been talking to our active friends again. What have they told you this time?

A Hiver diplomat

Ithklur Aphorism

Consider the lilies of the field, how they grow; they neither toil nor spin; yet I tell you, even San*klaass *in all his glory was not arrayed like one of these.*

This saying clearly must date to the period after the first human-Ithklur contact, yet there is no evidence that assists in dating its origin.



Note on Ithklur Pronunciations

The "*" sound in Ithklur is invariably described as a click, but it is different from the common click found in human languages (such as in Terran Bushman), which is usually a full sound made well back in the throat. The Ithklur click, which cannot be exactly duplicated with the human mouth, is closer to a click made in the front of the mouth with the tongue and mouth roof. It is sometimes transliterated as "'t'" with the first apostrophe representing a glottal stop and the second representing a transition of the tongue from the front of the roof of the mouth back toward the throat. The "glottal stop-tee" version is widely viewed as an acceptable alternative pronunciation. Thus the Ithklur names *San*klaass* and *San't'klaass* are the same name, using the two alternative forms of transliteration.

Ithklur words and names are shown in *italics* in the following section.

SIB Introduction

At the outset I should point out that the Ithklur are like a breath of fresh air in a bracing, midsummer cloudburst after having emerged from the airless, Byzantine tunnels of Hiver psychology. If every alien race that we study could be such an unalloyed joy to encounter as the Ithklur, the RCN would not be allowed to offer us a salary.

Fortunately for our families and landlords, races like the Ithklur are few and far between....

A.K.

The Ithklur have been described by human observers many times, and the following descriptions are typical:

"Exuberant, earnest, honest, with not a mean bone in their bodies...."

"...Joyful anarchists with a firm belief in a higher order."

"...A cross between a golden retriever and a box of razor blades."

It is clear that although descriptions are in no short supply, an understanding of the true Ithklur nature is. The underlying similarity in all descriptions of the Ithklur is the ambiguity of their undeniable violence and their equally undeniable good natures. As humans, we have come to equate violence and aggression with evil, and to equate meekness, even ineffectual impotent wimpiness, with goodness. Surely the Ithklur do not share this vision, and yet they are not cruel. Many humans attempt to use Nietsche as the means to understand the Ithklur psyche. And yet Nietsche, in spite of the useful concept of the transvaluation of values and the affirmation of the self's own will to power, seems ultimately to offer only a rationalization for the selfish, god-like application of the will on the remainder of reality, regardless of the cost. And while the Ithklur are clearly in accord with the Nietschean sense of the joy of living the will to power, they are notably bereft of the need to commit the selfish excesses to which most followers of Nietsche succumb.

How are we to make sense of these beings?

They deliberately breed flowers into their most basic and generalized genotype, and take delight in flowers which sprout in cracks in streets and sidewalks, ultimately buckling and destroying those structures.

And yet an Ithklur on runway maintenance duty has no compunction against spraying the flower with herbicide, acknowledging his role as the enemy of those who would buckle the tarmac, but as he does it, he silently salutes it for its audacity and pride in being integrated with its spirit.

How can we understand people who are so full of love, even love for those they must destroy? And yet they do not perceive any tragedy inherent in their existence. Unlike humans, they do not experience remorse for the necessity of having to kill other soldiers in time of war, or of having to kill criminals in time of peace to prevent their disease from corrupting the innocent.

And all the while, the Ithklur maintain their wide-eyed sense of wonder, delighting in tacky snowglobes for sale at starport gift shops, and ancient Terran cartoons ("Hang on, Beanie-boy!"). In spite of the joy that one experiences second-hand in the study of the Ithklur, we human analysts find ourselves haunted by the pathological drive to *understand* that is a part of the human psyche, in contrast with the simple pleasure and confidence that the Ithklur find in simply *being*.

What a blessing it seems to be for them.

Perhaps all that is left to us is to learn from the Ithklur example: to experience the universe as newborn babes, and to take joy, meaning and then more joy where we find it, revelling in the inimitable experience of being who we are.

Although RCN regulations warn me from making sectarian or denominational reference to the eternal, the spirit of the Ithklur calls me to say, regardless of any well-intentioned prohibitions, "Thank God for creating me as I am, to live and seek You wherever I can. All honor and glory be to You, Almighty Source and Destination of all that is, real and yet to be realized, forever and ever, amen."

Who's In Charge Here?

One of the most persistent mysteries of the Ithklur culture is, "Whose idea was this?" Certainly the Hivers claim credit for having "civilized" the Ithklur, yet the Ithklur claim that they are as they have always been is a hard one to refute. While there are seemingly valid arguments in support of both sides, there is no objective means to sort these out and evaluate them. This must therefore remain an open question.

Based on our observations and research, there appears to be a homogeneity of Ithklur culture that is not consistent with observed variations in culture among humans, Vargr and Aslan who were spread across similarly large areas for similar lengths of time. In fact, our research shows only one other starfaring race which appears to demonstrate similar homogeneity, the K'kree. But since the K'kree are only known to us by records, there is no way to really examine this similarity.

Certainly not all Ithklur are alike, just as not all humans acknowledge basic human concepts such as the greatest good of the greatest number, the inadvisability of infidelity, murder and cannibalism, etc. There are Ithklur criminals (which only makes one thankful that Ithklur police officers are as powerful as they must be); there are Ithklur psychologically troubled (ditto); and there are the inevitable armed conflicts that arise between Ithklur political groupings. Yet the Ithklur sense of who they are is much more unified than one would find among a sample of a post-Imperial of Vilani descent, a post-Imperial of Solomani-Irish descent, and a post-Imperial of Solomani-Scottish descent.

What is the source of the Ithklur cultural homogeneity? Is it something integral to the Ithklur themselves, or is it an artifact of the celebrated Hiver manipulation which made them what they are?

Framing the question may be as far as we are ever able to get. Yet the wonder of the reality is undeniable.

Lt. Alexandria Kendra
Special Intelligence Branch

Ithklur Aphorism

Believe. Always believe.

Common Ithklur saying, usually attributed to *San*klaass*. Humans usually ask, "Believe in what?"

To Ithklur it is immaterial what each person actually believes in, so long as they believe in something. And belief, being a class which has *integrity*, is by its nature inherently good and true. Therefore, by definition, no one can believe in something that is wrong.



ITHKLUR PHYSIOLOGY

Ithklur are descended from arboreal carnivore/pouncers, who descended from their trees to adapt a different life-style when climatic change eliminated their home forests. Their physical structure indicates that their arboreal behavior was quadrupedal (in the style of Terran squirrels) with some components of vertical clinging and leaping that allowed a partially bipedal orientation. However, their narrow thoracic structure shows no adaptation for brachiation. This was fortunate, as this posture enabled them to successfully transition back to terrestrial life using a semi-quadrupedal running gait. They are homeothermic and bisexual, meaning that they are warm-blooded and have two sexes.

Overall Anatomy

Ithklur exhibit bilateral symmetry, and their upright bipedal posture gives them a humanoid appearance. Aside from their tails, Ithklur visually resemble humans, but there are numerous differences.

Skeleton and Posture: The Ithklur skeleton is internal, and is yet another variation on the collagen and calcium matrix found on hundreds of worlds. Lower limbs attach to a pelvic girdle at the base of the spinal column. Mini-ribs, small elongated extensions of the vertebrae, form part of the rib cage, the forward portion formed from other small ribs joined to the large sternum in the center of the thoracic region.

The structure of the shoulder girdle and the length of the arms allows the Ithklur to adopt a semi-quadrupedal running gait over uneven ground in which their legs provide the main motive power and the arms provide guidance and steadiness, much as humans scrambling over boulders.



Ithklur rifle slings are still designed to permit this gait and suspend the rifle beneath the chest, allowing both hands to be used for scrambling over the ground, although usually one or both of these hands are used to steady or fire the rifle.

The skull surrounds and protects the brain, and serves as a base for the Ithklur sensory organs, just as it does in humans. Ithklur have a movable lower mandible and 48 teeth adapted to a carnivorous diet, with conical grasping teeth at the front of the mouth and shearing incisors at the rear. This dentition appears to be adapted to striking at living prey and seizing it with the front teeth. Their rear teeth are analogous to human molars, except that instead of grinding plant material, they are used to scissor up flesh in preparation for swallowing.

Skin: Ithklur skin is thick and covered with fine scales, varying in color from brown to green to bluish. Coloration tends to be roughly homogeneous over the body (with slight lightening on the ventral surfaces), although striped and dappled patterns are not unknown.

Torso: The muscles which anchor the legs, arms and tail to the Ithklur torso are massive, and the torso is correspondingly bulky. The short, relatively stiff, heavy tail is used for balance in running, and is studded with a number of thickened bony studs and ridges at the end, making it a fearsome weapon in close combat. The tail normally does not touch the ground, although Ithklur can lean back on it for short periods of time.

Arms: The arms are heavily muscled and end in large, three-fingered hands with an opposable thumb, each digit ending in a short, stubby claw. The skin on the palms and inside surfaces of the fingers is thinner and more richly supplied with blood and nerve-endings than Ithklur skin as a whole. Ithklur hands are stronger than human hands and about as sensitive, but they are much larger and not nearly so dexterous. Ithklur controls, buttons, triggers and switches are therefore heavier and more robust than human examples, and Ithklur tend to break equipment designed for the daintier human touch, not to mention those intended for the much daintier touch of the boneless Hiver tentacle-fingers.

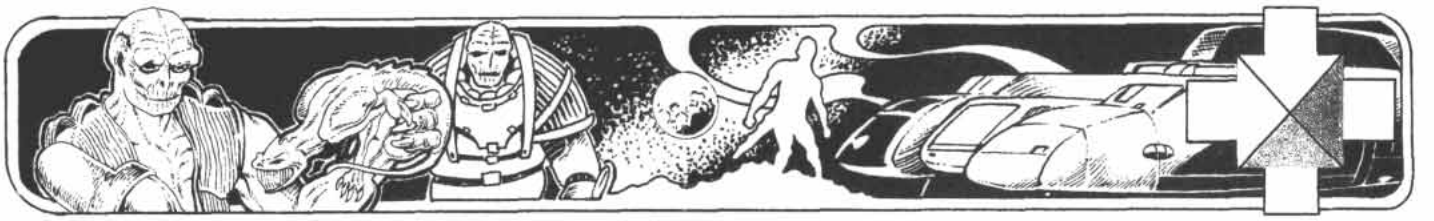
Legs: An Ithklur's powerful legs end in large, four-toed feet, each with a powerful rear-ward pointing heel claw. When relaxed, Ithklur rest upon the full length of their foot, both heel and toes (a posture known as plantigrade). When running, or standing at an alert posture, Ithklur rest their weight upon the balls of their feet (a digitigrade posture), using the tail for balance. (For this reason Ithklur military ranks are deeper than human ranks, as space must be left for the rearward-projecting tails.) Like their fingers, Ithklur toes also end in claws, but these are stubbier and more robust than those of the fingers.

Head: At first glance, the Ithklur head appears identical to the human head, but this is a false impression, produced largely by the coincidence that the mouth and eyes are located in the same spot.

What humans take for a nose upon their first glance is actually a bony ridge separating paired infrared sensor organs, rather like those in a terrestrial pit-viper, although much more sensitive. The separation of these organs gives the Ithklur an accurate directional IR sense, enabling them to sense a number of things that humans cannot, and in all light levels down to complete darkness. This additional "heat" sense is evidently processed in the optical centers of the brain, as Ithklur interpret it as an adjunct to their vision rather then a separate sense.

Enhanced Vision: Because of their IR sense, Ithklur in total darkness will still be able to "see" using their IR senses, although it will not have the same visual acuity as sight in normal light. Imagine how well a human can see in a dimly lit room.

The Ithklur IR sense is fully integrated with their "visual spectrum" (from the human point of view; naturally the Ithklur find the infrared spectrum to be a part of their visual spectrum) senses. They sense



heat as additional "colors," and sense aspects to colors that humans cannot see. When Ithklur speak of a warm gray, they mean something different than a human. Just as humans can get a sense of the heat of a cup of coffee by the steam rising off of the surface of the liquid, Ithklur see the hot coffee as having several additional "colors" besides its normal visual color, representing the presence of heat in various degrees. The cup will be the hottest, the steam rising off the coffee next hottest, and the air around the cup will be the coolest.

This is described by the Ithklur as "the color from within," because these thermal colors appear to arise out from beneath the chromatic color of the material of the object. Thus, a cold object has a chromatic color but is "colored" cool "from within," while a hot object has a particular chromatic appearance but has a warm "color from within." Ithklur enjoy watching rock formations in the morning as their surfaces differentially heat up in response to the morning light. The nearest human example is watching the heating elements of a stove or a toaster begin to glow red, then orange, then yellow, then white as they heat up.

This sense has a number of obvious applications to Observation and Tracking tasks, particularly in the ability to spot camouflage. However, Ithklur characters will find that one of the most interesting uses is in Interview and Interrogation tasks, because of the ease with which they can detect subtle changes in human respiration (they see human exhalations), pulse rate and emotional state (from changes in the blood supply to various sections of the skin). Ithklur must have had training and/or experience in interviewing humans in order to be able to apply this skill effectively (Liaison is used as an enabling skill for Interview to represent such training and experience).

The nostrils are located high on the head, one on each temple, just behind the heavy brow ridges over each eye, forward and slightly above each ear. The brow-ridges are in fact part of the extensive Ithklur olfactory sinuses. The separation of each nostril allows Ithklur to determine the direction a smell is coming from, and the large nasal sinuses behind each brow ridge make it possible for them to detect odors at concentrations below that which humans can detect. The Ithklur sense of smell is about equal to a normal Terran dog, although probably not quite as sensitive as specialized "sniffer" breeds such as bloodhounds. The entire top of the skull consists of a layer of these sinuses with heavy bone protection above and below, giving extensive protection to the Ithklur brain from this direction. (This has led some scientists to propose that early Ithklur rammed their heads together in competition over mates, like some Terran sheep.)

This sophisticated olfactory sense might be an adaptation to a low-light hunting environment indicating that the original Ithklur may have been partially nocturnal or hunted deep in dense forests. Their sense of smell would have served as a long-range target localization system which allowed them to get into range where the more discriminating IR sense could come into play.

Enhanced Smell: The Ithklur sense of smell is about as acute as the average Terran dog's, but not quite as good as a bloodhound's. An Ithklur can distinguish between individual humans by their distinctive smell and follow a reasonably fresh scent trail (one that is less than eight hours old). Tracking skill is enhanced by this sense as discussed on page 78.

The ears are located on the side of the skull, in the same place as they are on humans, and for the same reason: to give a directional aspect to hearing. Ithklur ears have about the same frequency range and sensitivity as human ears.

Internal Anatomy

Internally, the Ithklur are fairly straightforward.

Respiratory System: The Ithklur respiratory system consists of a pair of lungs located in the upper thoracic cavity, each consisting of three lobes, connected with the mouth and nasal passages by bronchial tubes. A structure similar to the human epiglottis prevents swallowed food from entering the lungs.

Circulatory System: The Ithklur circulatory system is unusual in that it features two hearts. The largest is the arterial heart which circulates blood throughout the body. The arterial heart is located slightly to the right of the midline, in the thoracic cavity, between the lungs. The smaller pulmonary heart is located behind the arterial heart. It takes blood returning from the tissues and pumps it through the lungs and back to the arterial heart.

Digestive System: The digestive tract consists of an esophagus leading from the mouth to the stomach, and the greater and lesser intestines. The Ithklur are carnivorous, and the setup of their digestive tract reflects this: The stomach and relatively short intestines are primarily set up to process proteins and simple carbohydrates and extract the maximum amount of liquid from these sources. There is little capability to process complex celluloses or other plant material, which in any case is unsuited to their dentition as well.

Urinary System: The Ithklur kidneys are highly efficient, and feed waste products into a bladder which removes most of the water, reducing the liquid to a paste which is then fed into the intestines and eliminated with the solid waste. This, coupled with the intestines' water scavenging, makes the Ithklur very efficient in the metabolizing of water, which provides clues to the nature of the primordial Ithklur environment (although there is disagreement whether this environment was dry or merely supplied with nonpotable water—the phrase "thirsty as an Ithklur" refers to an individual who never seems to need to drink).

Early biologists, too easily influenced by the Ithklur's reptilian appearance, took the analogy too far and believed that their urinary and excretory systems fed into a common cloaca. This is not the case, as the Ithklur system is much more complex and adaptive.

Reproductive System: Ithklur reproduction is sexual, and the female carries the fetus for a very long period of time—17 Terran months, or about 510 standard days. This allows the young to be born in a very advanced state of development. Unlike humans, Ithklur young are born able to eat and digest meat (with no special dietary needs), and to walk within hours. This is made possible by the separate Ithklur reproductive tract, which does not require the newborn to pass through the restricted space of the pelvic girdle (and which requires human offspring to be delivered while still unadapted for independent survival). The reproductive tract, which is otherwise similar to the human model except that it is independent of the urinary system, is placed low on the ventral abdomen, terminating above and anteriorly to the pelvic girdle.

Because Ithklur sense minute changes in temperature (which they "see" as different "colors" of heat), and because human skin is so thin and well supplied with blood vessels (especially the face and hands), humans present a shifting kaleidoscope of colors overlaying the "normal" skin color as our moods, emotions and physical conditions change. Thus, humans have received the nickname Ithklur k*ktapka *(color-changing lizards), or "Chameleons." It is interesting that a race of creatures resembling reptiles should choose a lizard-derived nickname for us, a race of mammals. From the Ithklur point of view, many human emotional states are literally written all over our faces.*

Ito N'Djamena,
An Introduction to Xeno-Psychology,
Chapter 4, "Ithklur: The Not-So-Gentle Giants,"
revised 1202 edition, Aubaine Technical Press,
Vrasstadt, Aubaine



ITHKLUR HISTORY

If any Imperial scientist ever studied the Ithklur, the results of that study have not been discovered by the Coalition. The history of the Ithklur, therefore, comes to us filtered through the Hive Federation. Certain aspects of their development and culture remain a mystery to us.

For example, it is not possible to know for certain how much of the Ithklur's current psychological make-up is due to development on their homeworld and how much is due to Hiver manipulation. The Hive Federation has always been hesitant to discuss the precise details of any major manipulation, and the various manipulations of the Ithklur are no exception. If you were to ask an Ithklur, of course, you would be told that it is Hiver behavior that has changed, not that of the Ithklur. They believe they have always lived as they do now and that the Hivers adapted to them, not vice-versa.

Hiver Manipulation of the Ithklur

The Hivers loudly and repeatedly proclaim their successful manipulations of the Ithklur to reduce their inherent violence, a tendency that seems somewhat foolhardy given Ithklur pride and emotional inclinations. The Ithklur just as loudly proclaim that the Hivers simply got used to them, and it was the Ithklur who won this battle of wills. Interestingly, there is circumstantial evidence to support both cases.

The Ithklur case is supported by the cringing Hiver behavior around the ubiquitous decorative carnivores, and their constantly serving as the butt (perhaps unwittingly?) of Ithklur games and intransigence.

On the other hand, the Hiver hand is seen in such social curbs on violence as sanctuary and Ithklur monogamous pair bonding, or marriage.

The Ithklur concept of marriage is a particularly interesting example. The fact that Ithklur young are born ready to eat meat and move around to a limited extent means that the requirement for specialized care of young seen in most other sapient species is removed from the Ithklur, and removes one of the most relevant evolutionary pressures for the development of sex-based stable pair bonds. Sociobiologists suggest that a more likely pattern would be seasonal competition by males for the attention of females, who would then give birth to young requiring little specialized care beyond the communal protection offered by a "pack" of Ithklur.

On Losing One's Marbles

Have you ever tried to crush a marble with your foot? It is not possible.

The harder you step on it, the more you attempt to impose your will on it, the more you simply transfer it, unchanged and undamaged, into another location.

Either you drive it beneath the ground where it is immune to your further attacks (unless you dig it out and attempt to crush it again, in which case the result is the same), or it shoots out from beneath your foot on a trajectory of its own, and not of your choosing, to find its destiny where it will.

Beware the stomper who finally meets a marble, for the results cannot be predicted.

The Enlightened *Slaa* de *Silentio*

Under this model, it is proposed that these seasonal male competitions were too bloody and violent, and Hiver manipulation replaced this powerful source of aggression and conflict with an orderly structure that eliminates most need for sexually based aggression.

However, this model ignores the extremely long Ithklur gestation period (almost 1.5 standard years), and the advantages of pair bonding in these circumstances. But in the words of one member of the SIB team, all such speculation is merely "so much intellectual vanity—the Ithklur are what they are."

Development

The Ithklur are descended from carnivore/pouncers inhabiting a large, sparsely-forested plain in the temperate zone of the world they call *Eethk*klaa* (Tryylin is the Gurvin name for the world). The word is a variation of the Ithklur term for themselves, "*Ithklur*," or "lizard," and means "place where the lizards come from." Ithklur legs and general body structure indicate they were originally pouncers, a job for which their other body structures would seem to be well-suited.

We cannot be certain what stimulated the Ithklur to intelligence, tool-use, domestication and civilization. Ithklur legends speak of a mythic-hero who defeated a deity in single combat and forced him to surrender the knowledge of the gods.

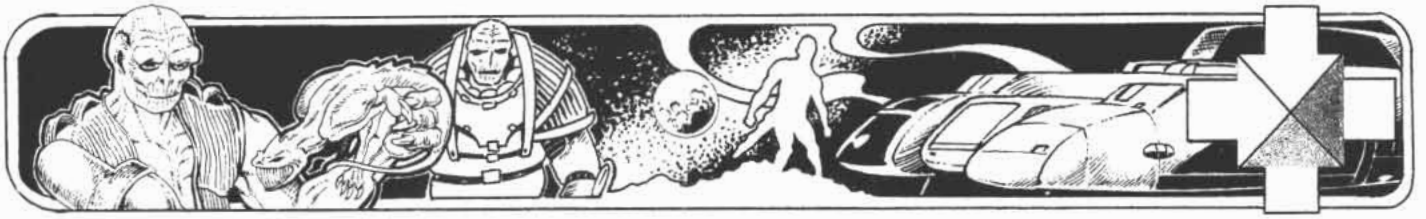
First Contact

When contact between Hivers and Ithklur occurred in -3986, the Ithklur had already developed in-system spaceflight, and represented the most advanced intelligence the Hivers had encountered in their 600 years of interstellar exploration. United under a single government, the Ithklur had advanced to TL8 or 9, and were in the process of colonizing the *Eethk*klaa* system when the first Hiver ships attempted to establish trade.

The discovery that there were other worlds with intelligent life on them seems initially to have provoked a xenophobic response: the Ithklur attacked the initial Hiver embassies. What happened next is a matter for some conjecture. Some information indicates that the Ithklur began planning a slower-than-light colonization program, using large asteroids converted into colony ships, but that Hiver manipulations transferred the enthusiasm to explore space into other channels. Whatever transpired, Ithklur exploration of space was limited to the *Eethk*klaa* system for several hundred years, and the Ithklur hostility and xenophobia (as reported by the Hiver accounts, anyway) seems to have vanished.

Present

At the present time, Ithklur are widespread throughout the Hive Federation, although not the most numerous non-Hiver race. Their aggression has been channeled into useful areas, and they serve as the main source of marine personnel in the Hiver Navy, as well as making up a disproportionate percentage of Federation ground forces in general. A measure of how much the Hivers trust the Ithklur can be seen in the fact that the Ithklur have established (or been allowed to establish) an independent state on the edges of the Hive Federation, and have been granted complete internal autonomy, to the extent of maintaining their own armed forces. Although maps of the Hive Federation interior are not available to us, there are indications that the boundaries of this independent state have actually expanded, in some cases at the expense of the Hive Federation itself, since the Collapse 70 years ago.



ITHKLUR PSYCHOLOGY AND SOCIETY

Violence

The Ithklur are naturally violent. Among themselves, Ithklur exhibit a physical boisterousness that can be dangerous to less robust races, and they have no qualms or reservations about the use of force.

However, the Ithklur cannot even be remotely described as cruel. While Ithklur parents are quick to resort to what humans would call corporal punishment, such acts of correction are swiftly and fairly applied, and without malice. Few Ithklur children need to be cuffed more than once to learn a lesson, and those that do are recognized as requiring more detailed guidance.

Ithklur are efficient hand-to-hand killers, knowing the weak points of any given race that will allow death to be dealt with a single economic blow. The use of such blows in noncombat situations, however, are considered criminal and are dealt with uncompromisingly.

For example, the heavy-vascularized Ithklur IR pits (in the same location as the human nose) are one such deadly location. Therefore, punching an Ithklur in the "nose" carries extreme penalties and is not usually engaged in by other Ithklur.

Socially accepted acts of physical force, such as cuffing another Ithklur as a form of discipline or the Ithklur pushing greeting, have carefully constrained limits. For example, cuffing is limited to the heavily armored top of the skull on the cranial sinuses, or on the shoulders. Pushing matches are also limited to the shoulders. The Ithklur claws and tail, equipped with sharp bony ridges, are never used for such acts.

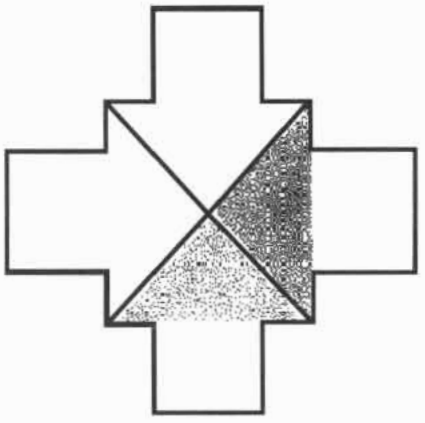
The Ithklur are, quite simply, the finest, most implacable, most effective, and most trustworthy troops in charted space. Their only equals are the Terran Gurkhas of Nepal and some Scottish units (provided the latter have white officers; see page 88). (Incidentally, the Ithklur themselves acknowledge this, maintaining warm, brotherly ties with any Gurkha and Scots units they encounter.) Ithklur troops do not surrender except upon higher orders; Ithklur troops do not retreat except to regain tactical advantage; and Ithklur troops do not indulge in battlefield atrocities motivated by unbridled hatred or loss of control of one's violent impulses. The Ithklur are violent creatures by nature, but are in complete control of it, and do not have to "unleash" these tendencies as other species do in order to fight to the death.

There is a persistent academic argument engaged in by humans who have never had contact with the Ithklur, to the extent that the Aslan are better warriors than the Ithklur. This argument is only engaged in by those who do not know the Ithklur, as those who do invariably walk away in disgust, refusing to become involved in such a waste of time. However, on one occasion, a human officer called out, as he walked away, "I could trust an Aslan to kill someone, but I could only trust an Ithklur to kill someone for the right reasons."

Ithklur Epigram

You humans are so self-destructive! Violence erodes your spirit, because to kill you make yourselves hate, and like acid the hatred eats away at you. Love your enemies as you kill them. Be free.

*Assa Sanok*kla,*
destined Blissful Warrior



The Tetragram, symbol of the Fourfold Way

The Tetramerous Way (also translated as "The Fourfold Way," from the Ithklur *Dikrah Sonnie*)

This can essentially be described as "the Ithklur Racial Religion," although there exist no official requirements for any Ithklur to subscribe to its tenets (other than, as in the analogy of human society, many legal concepts coincide with Judeo-Christian ethics).

The Tetramerous Way was originally *proclaimed* (not discovered or invented) by an Ithklur named *San*klaass*, also remembered as "The Blissful Warrior" or "The Blissful One." *San*klaass* was the first Ithklur to achieve *enlightenment* (see below), and his example and teachings have created the subsequent understanding of the Tetramerous, or "Fourfold," Way.

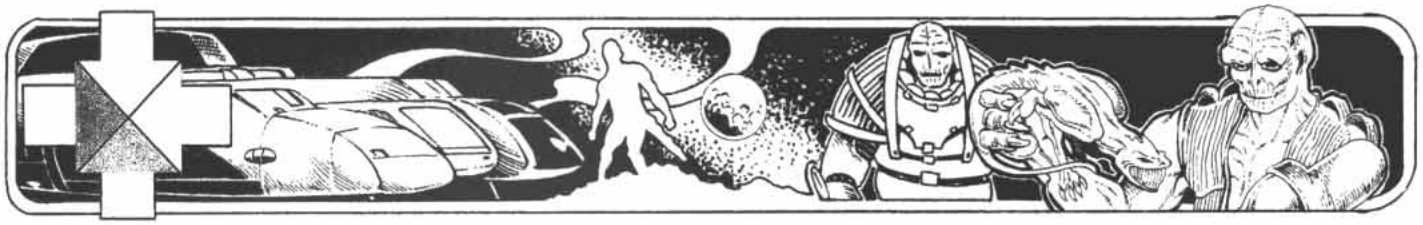
The Tetramerous Way is symbolized by the *tetragram* (see illustration) which graphically illustrates that Ithklur reality is achieved by the integration of four separate paths, represented by four arrows which merge in the center to rise perpendicularly as a pyramid out of the surface on which the tetragram is made. This rising of a third dimension out of a two-dimensional figure demonstrates the breaking into a new dimension which is accomplished by the proper synergy of the four paths of the Ithklur nature. (The tetragram is therefore an inherently three-dimensional object and cannot be placed on flags, but can be embossed onto armor, vehicles, etc.)

The four paths are as follows:

The Facilitator Path: The Facilitator Path includes all those in Ithklur society whose labors are directed to the continuation of that society and meeting its needs. These include parents, shopkeepers, cafeteria workers, garbage collectors, etc.

While the Tetramerous Way recognizes that many of these occupations are commonly thought to be "lowly," *San*klaass* himself observed: "These lizards have consented to be the strong structure upon which we build all our society, and every timeless thing we will ever achieve. I will tell you that these are not the lowliest among us, but rather the most exalted, as everything we accomplish will be thanks to their shouldering the burden of launching this race to its destiny."

This path is therefore specifically referred to as the First Path and most important path by *San*klaass* and all adherents to the Tetramerous Way. This is because these life-styles are the most basic to the survival of the Ithklur race, and without them, the Ithklur would not exist.



Ithklur Aphorism

All Ithklur—facilitators, guardians, explorers and seekers—are warriors. Life is a struggle against the dark, against meaninglessness, injustice and deceit, and we are all involved in this struggle. We are all warriors, shooting at the walls of despair, disillusionment and nihilism. Bang, bang.

An Ithklur footwear salesperson

Incidentally, Ithklur footwear serves the primary purpose of protecting other objects, such as floors, vehicle control pedals, etc., from Ithklur claws.

Note that the Facilitator Path includes such careers as the Ithklur space navy and military aviation arms, as these activities are considered to be supporting roles for the expression of the Guardian Path.

On the tetragram, the Facilitator Path is the arrow which rises up from the bottom and symbolically forms the base on which all of the others stand.

The Guardian Path: The Guardian Path encompasses all Ithklur whose jobs call them to do personal, physical battle for the protection of the Ithklur soul. This includes ground troops (but not supporting arms such as aviation or the navy) as well as professional athletes who express the Ithklur ideal of vigorous exertion as the means to achieving meaning in life. This path is often referred to as "the Second Path," although *San*klaass* never referred to it as such. Its veneration is due to the natural Ithklur veneration of warrior-oriented life-styles. It would probably be given first place in the Ithklur consciousness had *San*klaass* not specifically sanctified the Facilitator path as the most worthy and noble. (In fact, many tetramerous philosophers privately profess that *San*klaass* chose the Facilitator Path as the first path because had he not, all Ithklur would have flocked to the Guardian Path and left no one to keep society running.)

On the tetragram, the Guardian Path is the arrow which comes down from the top and forms the highest ray of the resulting cross. This is said to symbolically refer to the fact that physical struggle is an expression of the highest aspirations of the soul becoming entangled in the compromises of finite life.

Recognition of Destiny

The Tetramerous Way allows that sometimes an individual particularly marked by the eternal can be recognized as such by his contemporaries before he literally reaches the physical fulfillment of his or her destiny.

An example of this is the Ithklur *Assa Sanok*kla* (**Star Vikings**, pages 92-93). While he has not yet actually achieved the rank of Blissful Warrior, his comrades have recognized that this is where his destiny will lead him, and he is therefore treated "in advance" with some of the respect and honor that will be accorded to him when he eventually achieves this state in all respects. (For human audiences, Ithklur often use the human example of the recognition of Jesus the Christ by the three kings at the Epiphany.)

Note that no Ithklur can "recognize" his own destiny in this fashion (the Jesus example fails in this respect); by definition, an Ithklur can only choose his or her own path; only others can recognize the validity of a path that Ithklur has not chosen.

The Explorer Path: The Explorer Path is devoted to "the search for knowledge without," in other words, exploration of the physical universe and venturing into the unknown. This includes interstellar scouts, as well as merchants and seamen, who traditionally in Ithklur history have been those who venture into the unknown seeking knowledge, physical goods and artifacts of existence previously undreamed of.

On the tetragram, the Explorer Path is the right-hand arrow (as one looks at the tetragram with the pyramid emerging from the surface toward the viewer). This represents the input of knowledge from the physical world which enables the function of the Ithklur supporting path and the Ithklur higher nature.

The Seeker Path: The Seeker Path is devoted to "the search for knowledge within," in other words, the discovery of eternal immutable truths of science, philosophy, theology and the soul. This path includes medicine and pure science, as distinct from explorers and applied scientists, but also includes religious and spiritual leaders and poets.

Although this path is typically the last path mentioned, and perhaps contains the fewest adherents of the Tetramerous Way, it arguably contains the most intelligent of those devoted to the four-fold path. In fact, *San*klaass* himself was careful to explain, that although he was a true tetramerous disciple, his personal origins were in the Seeker Path.

The Tetramerous Path: The Tetramerous Path (also called "the Four-Fold Path") itself is the path espoused by *San*klaass*, and involves the combination of the true and proper elements of the other four paths. (On the tetragram, the Tetramerous Way is represented by the pyramid which breaks the two-dimensional plane and rises out of the symbol.) Followers of the Tetramerous Path seek to live in accordance with the Facilitator, Guardian, Explorer and Seeker paths in all actions, a goal which *San*klaass* himself admitted "is harder than it seems."

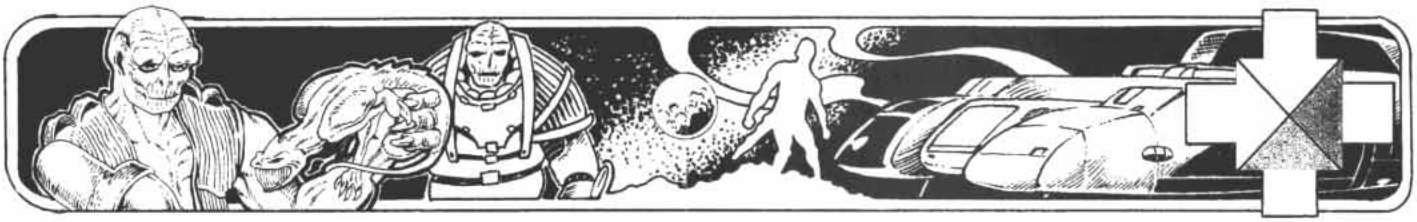
Fascists and Phalangists: Followers of the Tetramerous Path are broken into two groups, known as the Fascists and the Phalangists, because of their methods of achieving the state of highest unity.

Fascists believe the four paths can be visualized as a bundle of sticks tied together. In this way they can be seen as separate but parallel, beginning at the same point and ending at the same point, although defining four distinct paths through time and space. Fascists believe achievement of unity comes from tasting the reality of all four paths. Therefore, fascists move through their lives in a variety of sequential careers from the Facilitator, Warrior, Seeker and Explorer paths on their way to the state of Blissful Warrior.

Phalangists believe the four paths can best be visualized as an Ithklur hand, with four distinct fingers, but still the same unified organ. This represents the phalangist belief that it is not the precise details of their four separate paths *per se*, but the mystical combination of their essence, which can be pursued in its own right, without having to concentrate on the point of view of any single path. Phalangists therefore remain on a "pure" four-fold path on their way to the state of Blissful Warrior.

Both fascists and phalangists claim that *San*klaass* advocated their interpretation, but, like most spiritual records, the record of *San*klaass* provides adequate support for both paths without settling on one over the other.

The Tetramerous Way advocates the *enlightenment* of all Ithklur (although it takes great pains to not condemn the elementary, as everyone begins life in this state, and many will always remain here), and provides a structure of ranks of advancement down the path of



Ithklur Table of Enlightened Ranks

Rank	*Facilitator Path*	*Guardian Path*	*Explorer Path*	*Seeker Path*	*Fourfold Path*
1	Enlightened Builder	Aroused Warrior	Tenderfoot	Enlightened Searcher	Pilgrim
2	Ethical Builder	Illuminated Warrior	Ethical Scout	Ethical Seeker	Wounded Pilgrim
3	Balanced Maker	Balanced Warrior	Balanced Voyager	Balanced Seeker	Determined Pilgrim
4	Resolute Maker	Resolute Spirit	Resolute Traveller	Resolute Delver	Indefatigable Pilgrim
5	Restorer of Harmony	Calm Defender	Temperate Journeyer	Temperate Aspirant	Seer of Miracles
6	Timekeeper	Patient Warrior	Composed Wayfarer	Composed Inquisitor	Defender of Dreams
7	Tranquil Creator	Watchful Guardian	Tranquil Explorer	Tranquil Inquisitor	Believer of Impossibilities
8	Serene Creator	Exposer of Deceit	Serene Discoverer	Keeper of Dreams	Blissful Warrior

There are no rank names for elementaries.

enlightenment, specific to each path.

Unlike human ranks, which are specific to their current occupation and are usually not carried over to other jobs, all Ithklur followers of a specific path advance through the same enlightenment rank structure regardless of their specific occupation within that path.

The *San*klaass* Cap: The symbol of all those following the Fourfold Path, fascist or phalangist, is the *San*klaass* cap. The cap is a conical red cap usually made from a dyed fur, or artificial fur-like fabric, trimmed with a white headband and a white pompon at the top. Needless to say, the cap was designed and worn by the archetypal Blissful Warrior himself.

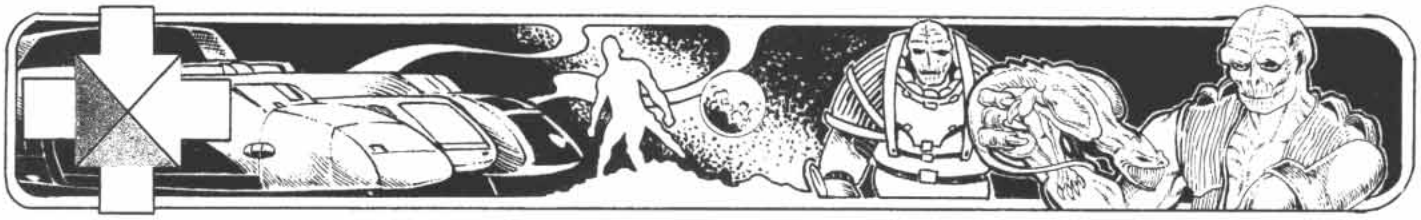
The symbolism of the cap begins with the white trim of the headband. This represents a life begun in a commitment to purity. This purity is then given power by passion, represented by the red fabric of the cap itself. The conical shape of the cap represents the converging of this passion to a point of focus over the course of the life, and ends with the white pompon at the tip, again representing the purity that is also the destination of life.

The *San*klaass* cap degrades the sense of smell, as it covers the nostrils. This derives from *San*klaass'* habit of wearing a headband which similarly blocked his nostrils, explaining, "They can't smell, so I wouldn't want any of them to claim that I took unfair advantage of their handicap."

Final Comments: Although no race is literally homogeneous, and not all Ithklur profess devotion to the Tetramerous Way and its understanding of the universe, the concepts of this philosophy illuminate almost all Ithklur thought and can be said to effectively be the framework of all Ithklur philosophy. (To some extent, the "Golden Rule" recurs in virtually all human belief structures, but the concepts of the Tetramerous Way are more homogeneously distributed throughout Ithklur culture, for whatever reason.) Therefore, an understanding of the Tetramerous Way (which is the name of the overall philosophical concept, as opposed to the specific Tetramerous Path) is effectively the same as an understanding of the Ithklur psyche, except that the stunning Ithklur accommodation to violence is scarcely hinted at, presumably because they consider it to be so self-evident.

Incidentally, the Ithklur have no concept of the dichotomy between military and civilian. Humans who attempt to compare this to the difference between the Guardian Path and the other paths will only succeed in convincing their Ithklur companion(s) that they are complete idiots.





Ithklur Anecdote

Ithklur Soldier on Leave: These flowers here with the transparent petals, you say you bred them from this strain with the red petals?

Human Nursery Employee: Yes.

Ithklur: And how long did it take you?

Human (proudly): 32 years.

Ithklur: Exquisite! I'll take a dozen, potted please. I'll bet it takes me less time to cross them back to their ancestral genotype!

Botany

All Ithklur have at least some rudimentary knowledge of botany and horticulture, having been exposed to it for all their lives. Ithklur are inordinately fond of flowers, and most Ithklur keep flower "gardens" in the typically Ithklur style.

Some theorize that the Ithklur fondness for flowers is adaptive, as the presence of aromatic objects assists in the training of young Ithklur in the use of the directional olfactory sense. This may well be true, but the typical Ithklur explanation of their fondness for flowers is, "They are what they are."

The Ithklur style of keeping flowers is quite the opposite of what passes for gardening among other cultures, as it is actively anarchic. While the human notion of gardening consists of carefully ordering the placement, extent and pattern of plant growth, the Ithklur style consists more of simply "turning them loose."

Unlike the Hivers, who can be said to practice *bonsai* on intelligent beings on a species-wide level, the Ithklur are interested not in constraining or controlling development, but in randomizing it as much as possible. The Ithklur are fascinated by the results of generations of controlled breeding and crossing of flowers, not because they admire the manipulation of the plants' genotypes and phenotypes, but because the more they can appreciate the trouble that was undergone to create a unique hybrid, the more pleasure they get out of undoing it and breeding them back into generalized varieties.

Ithklur are prone to engage in an activity called "freeing the flowers." This involves tearing down obstructions to the free spread of flowers, such as garden fences and walls.

Among the Terran flowers most admired by the Ithklur are the sunflower, daisy and thistle, all because of their inherent simplicity and genetic generalization.

Ithklur Names

Ithklur are commonly named for positive emotions and objects of beauty, particularly flowers and plants. When these Ithklur regularly come into contact with humans, these names are typically translated into their closest Anglic equivalent. These translations can be literal or figurative. For example, the same Ithklur name meaning "pure" could be rendered literally as the Anglic Pure, or figuratively as Catherine or Karen; the Ithklur name meaning "bright" or "brilliant one" could be translated as Bright, Brilliant or Clarice; the Ithklur "Just" or "Just One" could be rendered as Justice, Justin or Zadok; the Ithklur "Beloved One" could be translated as Beloved, Leif or David; the Ithklur name meaning warrior or soldier could be translated as Warrior, Defender or Harvey, and so on.

In the case of flowers, sometimes these names do refer to the same particular species, but sometimes they refer to analogous species from the former Imperial sphere.

This results in names which incite human sniggering, particularly in the case of male Ithklur named Joy, Heather, Rose or Daisy. Needless to say, this is not advised.

Common translations of Ithklur names for both male and female include Joy, Rhapsody, Heather, Harvey, Mark, Marcia, Colette, Star, Sky, Dawn, Ruby and Max.

Judging Disputes

When two Ithklur have a disagreement, the usual method of resolution is to find another Ithklur to act as a judge. This judge may be known to one or both parties, but is typically a complete stranger. Both sides then present their case to the judge, and the judge renders his opinion, which is binding on both Ithklur, and nothing more is said by them about it.

The judgement must be firm and unambiguous. A judge may not defer to another, or ask to think about the evidence, or say that both parties are right in their own way, or say that there is no good answer. An Ithklur who would do that forfeits his rank standing in the eyes of all who have seen him fail to judge.

Freedom

In the understanding of the Tetramerous Way, true freedom is not the simplistic freedom of being free from all ties, responsibilities, duties and demands. Freedom, rather, involves a recognition of the true nature of oneself, including one's own responsibilities and duties, and embracing that nature. By embracing that nature, one is free to be oneself in the truest possible sense, free from resentment about one's responsibilities, and free from bitterly wishing to be something that one is not.

In the Ithklur sense, freedom is not anarchic, irresponsible license, it is the willing acceptance of one's role in life, and the transforming power of that acceptance. Once one accepts one's place in life, and stops denying reality and pretending about things that are not true, one is freed to become more than one ever was and to achieve one's own absolute fullest potential, which may well be much more than was ever implied in the nature that one accepted.

Ithklur Anecdote

I walked into a bar and overheard a customer and the bartender arguing. They saw me and called to me to act as judge for their dispute.

First the customer said to me, "Surely the truth exists, because from the day we can first think, we are aware of the internal thirst that leads us to seek it."

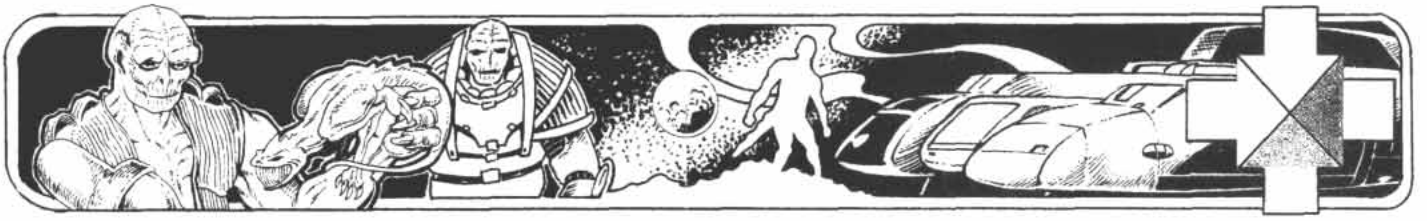
Then the bartender said to me, "But surely our eyes show us that the world is filled with ambiguity and lies and broken promises, and we must accept that this thirst for the truth is but a childish illusion."

"Tell us," he said, "which of us is right."

I said to the bartender, "If you believe that there is no truth, then your eyes deceive you by falsely leading you away from the truth, and they offend you." So I poked out his eyes and seared the empty pits with flame to stop the bleeding.

Years later, he thanked me.

From *The Collected Wisdom of San*klaass*



For example, there is a Tetramerous parable that tells of *K*neese*, a female Ithklur who was discontent with her role as a mother (the Facilitator Path), knowing that she wanted more from life. But the more she attempted to deny her *mother*ness, the unhappier she became. When she finally made peace with the motherness in her, she became free to become the matriarch and leader, the *mother*, of an entire nation.

Thus the concept of freedom is inextricably linked with responsibility. Any being which exists in *integrity* with itself is *free to accept the responsibility* to do as its nature calls it to do.

The Ithklur extend this concept of freedom even to the nonsapient (see Decorative Carnivore on page 89). For example, Ithklur "zoos" do not resemble the form taken by human (and in fact, most other races') zoos—displays which show wild animals in limited areas so that they are almost always visible to observers. An Ithklur "zoo" consists of a wilderness area stocked with animals that are free to live as they choose. They feel it is an animal's nature to be wild; an animal is being true to itself if it bites or mauls or eats an innocent, so that is not its *fault* in the sense of being guilty of transgression. An Ithklur visit to the zoo is a potentially dangerous excursion, allowing them to exercise their talents in Tracking, Observation, Survival and various combat skills. However, Ithklur zoos are carefully fenced and otherwise isolated from surrounding communities because the right to *sanctuary* of nearby residents supersedes the rights of wild animals to wander about killing people.

More than one non-Ithklur community has been inadvertently terrorized by a band of inebriated *elementary* Ithklur on shore leave rampaging through a local zoo crying, "Free the oppressed!" and releasing the local equivalent of lions and tigers and bears (oh my!) from their enclosures. Note that this is not considered to be ethical behavior by the Ithklur (as it violates others' right to *sanctuary*), but it is a conclusion to which many elementaries are prone to jump.

Sex Roles

Male and female Ithklur have few characteristics to distinguish them for the human observer. They are identical in size, physical strength and stamina, although male Ithklur are known to claim that female Ithklur are tougher in combat. Because Ithklur young are born capable of eating fresh meat, they do not require nursing and the other specialized care that helpless human infants do. This has militated against the evolution of sex-roles with regard to reproduction and child-rearing, and in the absence of these requirements on the female time, sex roles in other areas are notably absent.

Military units are filled equally with male and female Ithklur, but romantic/sexual relations are not allowed within a unit. If this takes place, both participants are transferred from the unit. However, Ithklur are allowed the option of requesting transfer from a unit before such relationships develop too far. Such requests are not treated prejudicially and usually allow both parties to be transferred together to noncombat jobs.

Pregnant female Ithklur are also immediately transferred to noncombat jobs for the duration of their pregnancy. Again, the nature of this transfer depends upon the foresight and responsibility of the trooper. If she requests transfer before becoming pregnant, there is no action taken against her, but if she is found out, the transfer is a dishonorable one. The male who impregnated her is similarly disciplined for taking part in this dishonesty.

Domestic violence is virtually unknown among the Ithklur.



Certainly part of this is due to the fact that Ithklur marriage and family are considered *sanctuary*. But cynical sociobiologists point out that the fact that male and female Ithklur are the same size and strength and have nothing to gain by attempting to physically intimidate each other must have played a significant role in the evolution of such cultural predispositions.

Enlightenment

All Ithklur are considered to be a member of one of two groups: the *elementary* and the *enlightened*.

All Ithklur begin life as elementaries, persons who exist solely as finite physical beings in this elemental existence with no true appreciation of the eternal and one's place within it. There is no shame whatever in the Ithklur mind associated with this state. In fact, it is often romanticized as unpretentious, elemental joy and innocence, much the same as humans venerate "innocent" childhood.

Enlightenment occurs when an Ithklur becomes aware of his or her *true nature*, meaning an understanding of his or her own true strengths and weaknesses, and the way he or she is intended by the divine to use those characteristics in the service of the finite universe. Enlightenment is achieved by a complex combination of self-realization and affirmation of this realization by one's peers, as is advancement in this enlightenment. The Tetramerous Way describes a hierarchy of ranks of enlightenment which are used by all Ithklur in all aspects of their lives.



THE ANCIENTS HYPOTHESIS

It has long been known that a significant number of the intelligent races of Charted Space are a result of the activities of the civilization known as the Ancients, including forty-some transplanted examples of *homo sapiens* and the Vargr. In the case of the transplanted humans, the vast majority of these were not genetically modified, their different current morphologies resulting from a combination of environmental influences, genetic drift and especially the founder effect. However, the Vargr *were* genetically modified by the ancients in order to create a sapient race from sub-sapient canine populations.

Since we know that the Ancients seeded unmodified *homo sapiens* in at least 40 instances, why are we so quick to assume that they satisfied themselves with only one attempt at geneering on Terran stock? It strains credulity to accept that the Ancients would spend so much time stirring the genetic soup on ancient Terra and not attempt other genetic experiments. Where are the other examples of Vargr-type experiments? Where are their other successes, or perhaps failed prototypes?

The answer lies within the Hiver Sphere and has been so cunningly concealed by the masters of manipulation that our long-lost terrestrial brethren have existed unrecognized just beneath our noses.

These genetic cousins are none other than the Ithklur.

To unlock this riddle we must of course return to Terran source documents. Among the most crucial of these is work that was done during the –2530s in North America, primarily the works of Drs. Russell, Dixon and Harrison. These postulate the evolution of a sapient race from Terran dinosaurs, specifically the group known as the saurornithoids, and specifically species such as Stenonychosaurus and Troodon.

These dinosaurs had the highest brain-to-body mass ratio of the dinosaurs and possessed excellent manual dexterity, traits shared by prehuman primates. When we see the results the ancients were able to achieve with the Vargr, whose ancestors possessed no manual structure, it is clear that it would have been simple indeed for the Ancients to perform similar work on saurornithoids and plant these several sectors to trailing, rather than a similar distance to coreward.

The fact that this is more than theoretically possible is borne out by tantalizing evidence from religious, druidic and masonic documents and rituals, plus numerous corrupted remnants in popular and folk traditions. Stone carvings in such widely distributed places as the Iberian peninsula and the Central American isthmus clearly show bipedal, reptilian beings of great sophistication interacting with humans. Perhaps Clement Clarke Moore knew more than he let on.

From *The Ithklur: More Familiar Than We Knew*
by James G. Burton, Aurora Technical Institute

In practice, these concepts are remarkably similar to the human notions of officers (the enlightened) and enlisted personnel (the elementary) in the military. Except that whereas a human's military rank does not follow one outside of one's military career, an Ithklur's status as elementary or enlightened (and, if enlightened, one's rank of enlightenment) *does* translate into all aspects of one's life. Thus, an Ithklur who achieved enlightenment and a certain rank in one line of work and who changed to a different profession would set out in that new field with the same rank.

Fidelity

Among the highest values of the Ithklur is that of personal responsibility, promises and vows. The act of one Ithklur giving his or her word to another is considered to be a public affirmation of that Ithklur's true being, and to renege on that word is to deny the true self.

In human terms, an Ithklur is considered to be "as good as his word." But the Ithklur take this concept to further extremes: The fulfillment of an obligation, contract or promise is a test of whether the Ithklur who made that promise is actually in communion with his or her true nature or is in denial of that nature. Such a person is either "not what he is not," or "not what he is." (See sidebar on page 58 for explanation.)

Examples of the most treasured Ithklur examples of fidelity are the comradeship in a military unit, epitomized by "faithfulness unto death," and the dogged determination to believe in that for which there is no proof. Dying in such faith, even without any proof that faith was warranted, is one of the most beloved of all Ithklur circumstances, for such faith is believed to be capable of bringing the object believed in into literal being.

Ithklur pair-bonding, translated simply as "marriage," is considered to be a lifelong state by the Ithklur. There is no concept of divorce among the Ithklur, for the acts of betrothal and marriage contain the recognition of one's true self and the affirmation of that nature and those responsibilities. Ithklur couples who do not get along may agree to live apart, but neither is allowed to remarry, or to become romantically or sexually involved with another Ithklur. If one partner in an Ithklur marriage dies, the other is allowed to remarry, but only after carefully reconsidering the nature of his or her own path.

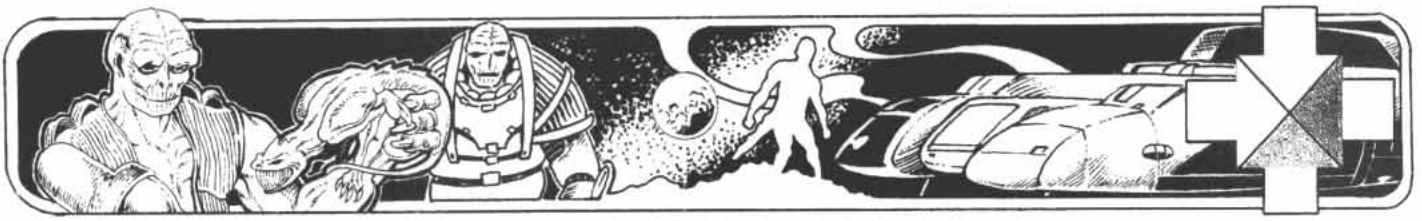
The Eternal Now

The Ithklur *profess* to believe that the "now" is the only moment which exists in this universe. The word "profess" is used because the Ithklur certainly do understand that life also consists of planning and making allowance for the immediate, mid-term and long-term future. In the words of *San*klaass*: "The now is the only moment that exists. Of course that doesn't mean that you shouldn't buy groceries or do your homework."

However, in the everyday act of living, Ithklur are encouraged to live each moment as if it were their last. This is not in the nihilistic sense of drinking, debauching and whoring for tomorrow we may die, but the sense that if life were to end at any moment, one's last moment should be an expression of the sort of life that one wants to be one's legacy.

*San*klaass* gave a two-part prescription for those who would live every moment of their life so it would be worthy of being their last:

1. "Live in the present moment, for there may never be another."
2. "In every moment, be the first to show love."



Love, of course, means to act in the best interest of another's true nature. For example, to show love to an innocent mendicant would be to give him food, money or shelter. To show love to a criminal would be to apprehend her, convince her of the error of her ways, imprison her so that she could redeem her debt to society, allow her to change her life, and forgive and free her so that she could begin a new and proper life. To love an enemy soldier during wartime would *not* mean to encourage that soldier to surrender, desert or betray his comrades (this human sort of tactic is called by the Ithklur, "saving the body but killing the soul") unless it could be proven that that soldier was fighting for an unworthy cause. If that soldier were fighting for a worthy cause, out of selfless love for his family, community or race, loving that soldier would require the Ithklur to kill him as cleanly and painlessly as possible, allowing him to die in full loyalty to the values that gave him meaning.

In the tetramerous understanding, life consists of nothing but an endless succession of "nows." As finite beings, we do not "own" (i.e., cannot control) any future moment, for we may be struck dead by circumstances beyond our control at any time. However, by the way we live in the current moment, we change the future, one moment at a time. The same way that a stone thrown into a lake makes ripples whose effects will in some small way reach its every shore, each act in each moment sends ripples into the future that will change the conditions within which that future moment is lived. For example, an act of kindness today may seem to take time or energy away from our planning to do something else next week, but exactly the opposite is true: That kindness today will ripple into next week one moment at a time and change the world into a place that will be more susceptible to our actions when it is time for us to act next week (assuming that our actions next week are ethical ones).

In some cases, the act of perpetually living in the present will actually prevent an Ithklur from making all the possible preparations for the future. In this case, the Ithklur believe that if one fails to make preparations by having incessantly lived properly in each moment, then life itself will work out to see to the needs that we failed to plan for. Human theologians refer to this as "living in a state of grace." The Hivers appear to assist in this by regarding the Ithklur as vaguely dull and treating them with parental solicitude, providing them with their basic needs in terms of shelter, food, weapons, transportation to exciting activities, etc. For their part, the Ithklur seem to encourage this by playing dumb and helpless.

As a visualization of the absolute value of the now, the Ithklur describe every moment of life as being "made of gold, if one has the eyes to properly see it."

The imagery here uses the concept of "the color from within," i.e., the interaction of the Ithklur thermal vision with their "visible spectrum" vision (see pages 48-49). The same way that an Ithklur can only directly view the exterior of an object, but can sense its temperature from the "color" that rises out of it, the moments of life can be immediately perceived as unpleasant or valueless, but one must be able to see the color that wells up from within such moments, and the color of those moments is *gold* (i.e., the element, not the simply color—the Ithklur place the same value on precious minerals as do humans).

In other words, any given Ithklur can envision his or her life as a handful of disillusionment, despair and dust, and there is ample objective reason for doing so, given the cruel reverses that life can deliver. However, this concept calls for each Ithklur to look beneath these surface appearances, and to realize that each moment of life is irreplaceable and of inestimable value. To truly appreciate the preciousness of these moments *during* these moments is considered to be a divine gift by the Ithklur.

An example of this consciousness is a poem written by an Ithklur prisoner held in a K'kree solitary confinement cell. The prisoner was executed by the K'kree and eaten in a grisly K'kree ritual, but the poem survived in the hands of fellow prisoners who preserved it. The prisoner's name was Seer of Miracles Sylvia (translated from the Ithklur *S*kfani*, or "Sylvan"), and her name is revered to this day by followers of the Tetramerous Way.

Dust, blood and broken teeth are in my mouth.
My death is held in store by this awakening day.
I languish in this pit, sores, excrement and spiders my only companions.
But as the light of the sun angles across my pit, it shines on a spider's web,
And illuminates drops of water clinging to the strands.
Never in my life have I appreciated such a glorious, flaming, sight,
Born in the tiny soul of a tiny bug, and ennobled and perfected by an eternal star.
I can only thank my God that I have lived long enough to see this golden light,
And that those rays of golden light, washed by those drops, will travel through the universe forever.

Thus, although she herself died within hours of having scratched those words into a ration can with her finger-claws, the beauty of her spirit has lived on and provided meaning to innumerable generations of Ithklur for over 3000 years.

Theology

The Ithklur belief in a supreme power, called "the ultimate concern" does not follow patterns seen in other races of ritualized worship. Instead, the individual Ithklur's devotion to the Tetramerous Way serves to constantly keep him or her properly oriented to the eternal, making one's entire life into an act of faith and worship. And since devotion to the Tetramerous Way or any of its individual paths is believed to bring one closer to the eternal, this life-style enables one to conform one's life more fully to the will of the divine, and thereby become a willing, joyful instrument of the eternal in this life.

The divine, ultimate concern is sometimes referred to as an individual, typically translated as "God," but is also spoken of simply as the ground of all existence, the source and destination of all goodness and truth, without having a personality ascribed to it.

The Ithklur have no belief in an afterlife *per se*. There is no heaven

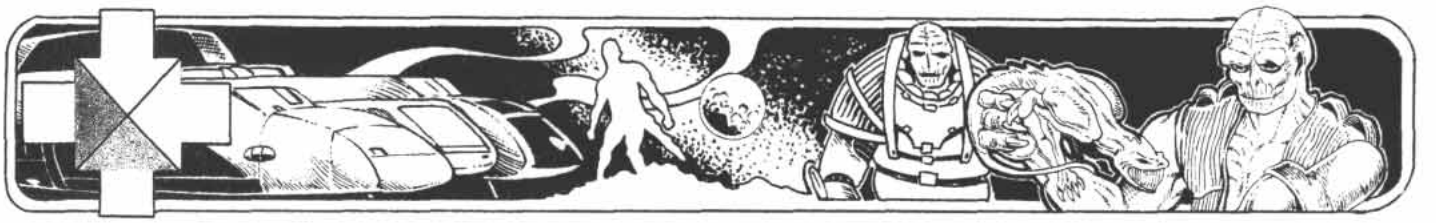
On Ithklur-Human Contact II

This life therefore is not righteousness, but growth in righteousness.
Not health, but healing,
not being, but becoming.
Not rest, but exercise.
We are not yet what we shall be but we are growing toward it,
the process is not yet finished but it is going on,
this is not the end but it is the road.
All does not yet gleam in glory,
but all is being purified.

Martin Luther

This Martin Luther, he was a human too? *F'naah*, you humans are so smart! How have we existed for so long without such insight? We need to get out more.

An Ithklur warrior



or hell to which their spirits go, although their belief in an eternal which is beyond this *finite* life does imply some other source of reality or truth. However, this is not a place they are trying to get to, rather a force they wish to live in accord with. By living in accord with the eternal in this life, they believe they can transform this finite realm into the eternal, and that eventually, through the faithful lives of Ithklur living in accord with the will of the eternal, this finite life and the eternal will be united into one single infinite existence.

Integrity

Integrity, in the Ithklur (or tetramerous) sense does not simply mean honesty as in the human usage, although it does encompass that concept. Rather, integrity means living in coherence and harmony with the means and goals which give one's life meaning, and honesty comes as an inevitable result of that.

The following passage from *The Book of Accord* by *San*klaass* and his early followers explains his formulation of this idea.

Our definitions of integrity include the following:

1. An unimpaired condition: soundness.
2. Firm adherence to a code of especially moral or artistic values: incorruptibility.
3. The quality or state of being complete or undivided: completeness.

The first definition is used in the sense of watertight or airtight integrity. The second is used to refer to honest or honorable people. The third is really the deepest and most basic meaning of the word, which refers to an object's being integrated *with itself, being wholly functional and internally consistent with what drives it and gives it life (or function) and purpose.*

An object that fulfills the third definition would certainly fit the first definition: a watertight hull, an airtight spacecraft. In the same way, a person who fulfills the third definition would fit the second: a person who retains within him or herself a commitment to the values that provide meaning and value to his or her life. For example, we can only expect others to obey laws or codes of behavior that we favor if we agree that those laws also apply to us. By affirming a code of conduct for other lizards, I must submit myself to that code as well. Because I agree to be constrained by certain commitments, I must be sure to choose commitments that will give value and worth to what I (and therefore others) do.

What if a lizard says that she did believe in right and wrong, but that she didn't have to alter her behavior based on those principles? In other words, she could know full well that something she was doing was wrong, and know what the right thing would have been, but she was not obliged to do the right thing, or even avoid the wrong thing. That is a lizard without integrity not only in the sense of definitions 1 and 2, but particularly in the sense of number 3. To believe that there is such a thing as right and wrong but to believe that those values do not require one to conform one's standard of behavior to them is not complete, is not integrated. *It is filled with internal conflict.*

What if a lizard to whom I have made vows of support and honesty deceives and betrays me over a period of many months, and repeatedly lies and takes advantage of my trust in order to conceal it and allow it to continue? Friends might tell me that I should stop worrying about remaining true to my promises to that lizard, but I will not do so until ethical and legal means are taken to annul those vows. My friends might be disappointed, because they believe that I do not owe it to this lizard to remain faithful to my promises after what he had done. But they would be wrong because they do not realize is that my reasons for being faithful are not because that lizard deserves it or not. My reasons are because the value of my promises deserve it, because my commitment to truth deserves it, and because my own honor deserves it. If I am unfaithful I destroy my ability to live as a lizard of integrity, a lizard who is fully integrated with what he believes and holds to be valuable. If I am faithful to another, regardless of what he or she has done to "deserve" it or not, I have remained in harmony with the values and beliefs that I hold, and I prove that I am a lizard who can keep my promises.

If, on the other hand, we construct our lives based on the actions of those around us, constantly treating them as they have treated us and vice-versa, there is no chance for any of us to get along. However, if we construct our lives on values that are more important than we are, that do not change with moods or behaviors, that apply to us and to those around us, then we do have a chance to get along. What is wrong for

Ithklur Aphorism
I am what I am.

This is perhaps as close as the Ithklur come to a racial credo. The Ithklur believe that no being can aspire to a higher goal than simple self-awareness of one's own true nature. And that self-awareness makes that nature transparent to all others. Unlike most humans, the Ithklur do not believe that the admission of one's true nature to others makes one vulnerable. As a *true* nature, that nature has *integrity* and is therefore incorruptible, and can never be a source of weakness.

Ithklur Aphorism
He is not what he is not.

This is a simple assessment of an individual that he is either confused about his true nature or is uninterested in discovering it. In the former meaning, it is an expression of sympathy, in the latter, it is an expression of disgust.

Ithklur Aphorism
He is what he is not.

This is the Ithklur description of an individual who is struggling to overcome shortcomings in his or her own nature.

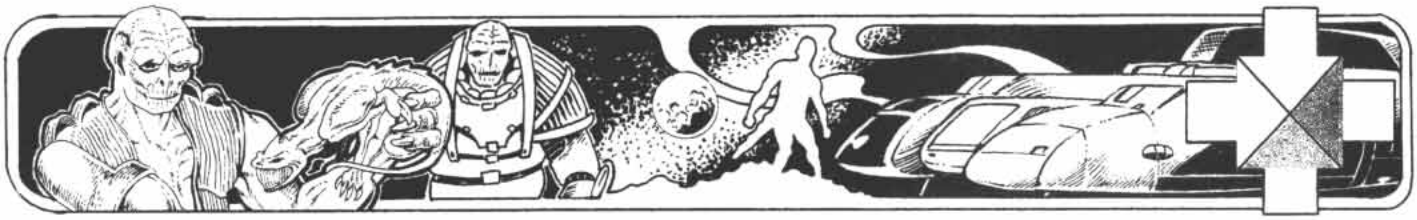
Ithklur do not believe that unworthy traits, such as deceit, lack of integrity, etc., are aspects of the *true* nature of a personality, but are impediments which can be overcome.

Ithklur Aphorism
He is not what he is.

This is the highest insult that an Ithklur can pay to another being. This is the formula of denial of the true nature of the self.

Note that the Ithklur do not believe that base motivations—lying, infidelity, etc.—are an expression of one's true nature, as these elements are *a priori* not *true*.

Thus one can be someone who is attempting to overcome a history of deceit and unfaithfulness and not be condemned by this judgement. Such an individual would be said to be "what he is not" (see above).



another to do to me is also wrong for me to do to another, regardless of what that person may already have done to me.

And I will tell you that dishonesty and deceit and betrayal are impossible for the integrated personality. As an integrated personality I can only lie if I believe that it is proper for all lizards to lie to all other lizards when they wish. This means that they can lie to me and I affirm this right. So how do any of us get along with each other or trust each other? We cannot. Even evil personalities require food and drink and oxygen and shelter; these are universal goods. Thus an evil personality by definition cannot be integrated, because he or she wishes to have the necessities of life, but presumes to deny them to others.

I will tell you that the truth is no less a necessity to life than are food and drink and oxygen and shelter, and truth is the most basic tenet of the integrated personality. And because an integrated personality lives in accordance with the laws of the universe, it has nothing to fear from the universe, because it is already in accord with the timeless realities. Such a personality is always vulnerable to evil, of course, but attempts to learn to deceive those of evil intent are to no avail, because they will destroy that personality's integrated nature and make that person only more vulnerable to evil, and what is worse, truth itself will now be the enemy of that personality. We can never afford to make an enemy of truth, for it is forever. As for evil, it will not last; it is temporary only; it is not integrated and will be blown away by the wind of eternity.

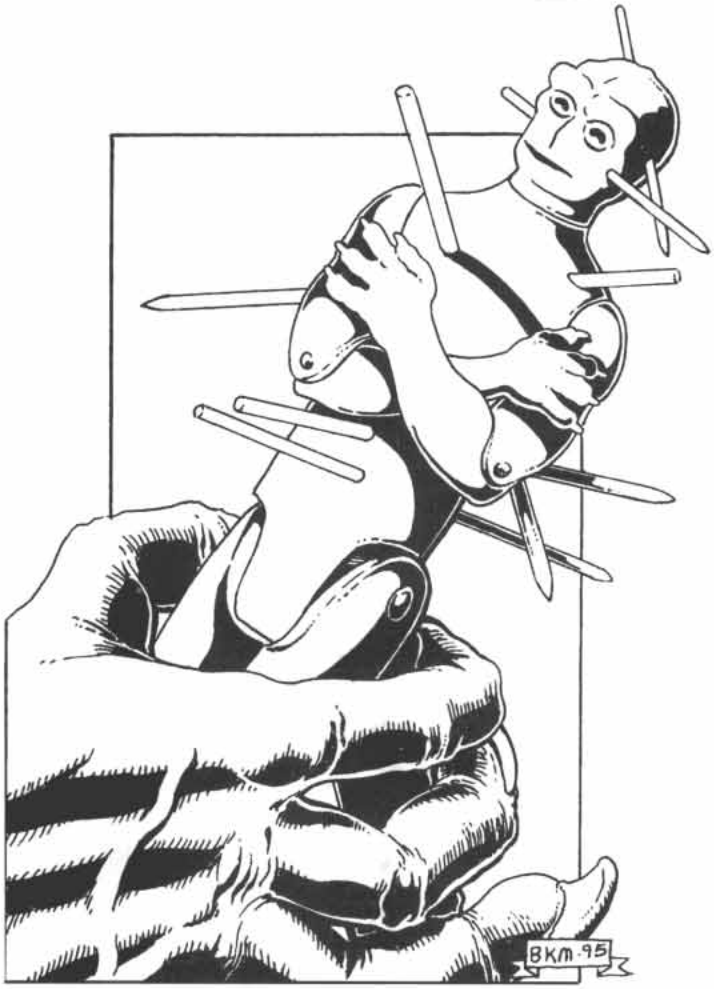
Living as an integrated lizard is to live with honor. Your honor and integrity is perhaps the only thing you possess that no one else can take away from you without your permission; only you yourself can release hold of your honor.

Honor and integrity are unitary. They are not divisible. You cannot behave honorably in one area of your life and dishonorably in another. Sooner or later one will destroy the other, and it is usually dishonor that gradually and subtly devours honor. There is no such thing as a "little lie." All lies damage your honor, creating cracks in it for future lies and deceit to take root, like weeds growing up through and shattering pavement.

One of the concepts that is a by-product of this philosophy is that of the *true self* (translated from the Ithklur *Chalor*). The true self is the true, integrated personality that resides at the core of all beings, and by virtue of existing in accord with eternity, it is considered to be indestructible or, more often in the Ithklur parlance, "bullet-proof." Such a person has nothing to fear because the truth is impervious. Any reverses he or she may suffer are impermanent: Only truth is permanent, and any opposition to truth is therefore only temporary.

The popular Ithklur image of this concept is the "voodoo doll" and "custer statue." These are representations of Ithklur either in a soft, malleable form (the voodoo doll, usually children's toys) or a static form (the custer statue, used as decoration, art form, statuary or lamp bases—sometimes with a clock where the stomach ought to be—by adults) that is either shot through with holes or pierced by dozens of arrows and spears. Children's versions come with weapons that the child can push through the holes, while decorative statues usually have the arrows fixed in place. Expensive versions have the arrows and other projectiles made from transparent glass or plastic.

The figure in these objects shows an Ithklur contentedly engaged in the normal activities of his life (and can be dressed or equipped with the distinctive accoutrements of any Ithklur career of any path), completely unaware of and unaffected by the horrible wounds that he or she carries. These wounds are carefully placed to be fatal or incapacitating—through one or both hearts, through the head, through the IR pits, through joints of the arms and legs, etc.—but the figure is depicted as smiling and engaged in vigorous activities, and no blood comes from any of the wounds.



Ithklur Aphorism

It is a blessing to be *only smart enough*—smart enough to be in control of one's own daily affairs, but not so smart that one is confronted by the futility of attempting to control the perverse and absurd universe. Coming to terms with that requires philosophy, and philosophy is a mixed bag.

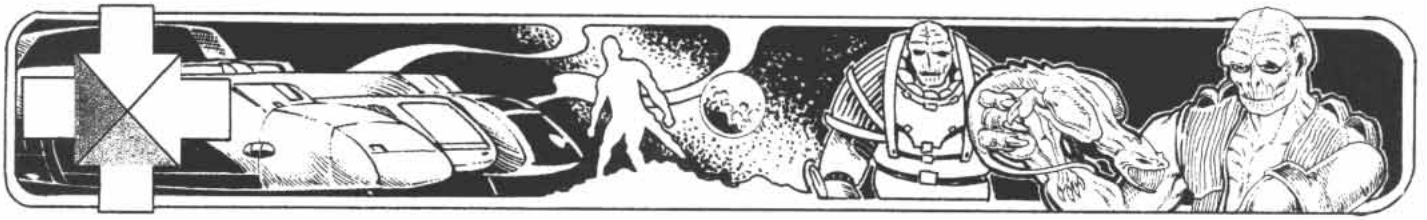
From *The Collected Sayings of San*klaass*

Ithklur Aphorism

Guilt is like any good thing. In excess and without balance, it can kill, just as too much food, drink or comfort can kill.

Guilt is the signal that shows that you know the difference between right and wrong, and which gives you the opportunity to act on that knowledge.

Unlike many cultures, human included, which disparage the sensation of guilt, the Ithklur embrace it as a voice from their higher natures that points the way to corrective action. Ithklur have a grave distrust of anyone who professes to never feel guilt or who claims to believe that guilt is a maladaptive emotion.



Perfect valor consists of doing without witnesses what one would be capable of doing before the world at large.
François, duc de la Rochefoucauld

Although these devices are common, found in most any Ithklur-occupied space, and commonly used by children as toys, their meaning and symbolism are venerated just as much as any human crucifix with the Christ hanging from it. In fact, the theological meaning is extremely similar, in that it shows that the crushing "defeats" of the world are actually victories for those attuned to the eternal, and that all followers of this belief are called to undergo similar treatment, but to have faith in similar ultimate vindication.

In a similar fashion, one of the sacred symbols of Ithklur initiation to enlightenment or advancement to higher ranks is the false arrow-through-the-head appliance, worn by all participants of these ceremonies to symbolize the fact that their connection to the eternal makes them invulnerable to even the most grievous wounds that the finite world can inflict.



Traveller News Service excerpt, 198-1127

"...while attending a ballet performed by the Promise Light Ballet Company, several members of the Hivers' detachment of Ithklur guards apparently mistook the dance for a participatory sporting event. They efficiently tackled several human dancers, scoring several points by their own reckoning, before they were convinced that it was a performance, rather than a game."

Truth

Truth is professed as one of the highest values of the Ithklur spirit, and is appropriately codified by the Tetramerous Way. (When enumerating their highest values, the Ithklur are much like A. A. Milne's Tigger or Michael Palin's Cardinal Ximenez.)

However, the Ithklur notion of truth goes beyond the usual human denotion of "accurate" or "valid." Truth has an existential value above the simple technicality of its accuracy. Truth is considered to be the bedrock of reality, such that the truth of any situation or individual cannot be compromised or destroyed by any other force, regardless of the reversals this truth may seem to suffer during physical or finite life.

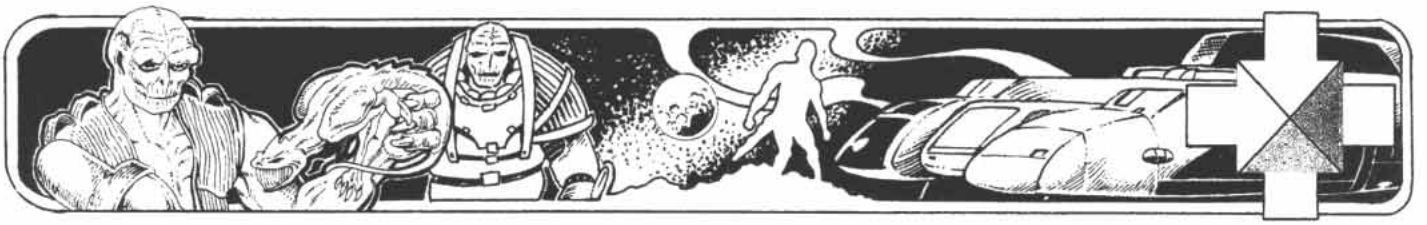
Unlike humans, who believe they are made vulnerable by allowing others to know the truth about them, the Ithklur believe the discovery of one's own true nature makes one invulnerable. Thus, although allowing evil persons to have data about oneself gives them better opportunities to plan attacks against one, these attacks will have no permanent effect as the truth incarnate in one's true nature is eternal and cannot be damaged by any finite or physical agent. This belief is seen in the Ithklur "voodoo doll" or "custer statue" artifacts (see the Integrity section, above).

However, even though the Ithklur profess to believe that lies and deceit cannot triumph over the truth, they regard consistent repeated attempts to lie as a capital crime. This is because truth is the true nature of all being, and although enlightened individuals are in firm connection with the eternal, unenlightened individuals can be misled by distortions of the truth, and can thereby be denied the opportunity to achieve connection with the true and eternal. This to Ithklur is the equivalent of murder, although this spiritual murder is believed to be more heinous than simple physical murder, which does not block the individual's access to the eternal. Regardless of the inability of lies to triumph over truth, the attempt to make lies and deception triumph over truth represents devotion to creating a world in which this would be the case, and represents devotion to the values of death, decay and evil, rather than life. This will for the supremacy of evil is sufficient cause for the death of such an individual, but the Ithklur additionally stipulate that since death is what this individual affirms, death is what this person really wants anyway.

Because of their devotion to truth, the Ithklur are not comfortable with the idea of pretending or acting, although they are completely capable of playing dumb in front of Hivers. This is contradictory behavior, but the reason seems to be that the Hivers expect them to be dumb, and it is amenable to the Ithklur spirit to fulfill this arrogant expectation. Note that this behavior does appear to be inconsistent with the notion of *integrity*, although further examination may reveal reasons that *game* behavior can be encompassed by the higher Ithklur beliefs. It might be that this deception is very close to the Ithklur notion of racial survival and is therefore allowed as an exception in the name of the higher good. On the other hand, this sort of passive-aggressive behavior appears to be a contradiction of the Ithklur credo and might be an unintended by-product of the Hiver attempts to manipulate the Ithklur into other patterns of behavior.

Because of their unfamiliarity with concepts of pretense and acting, it is not a good idea to take an Ithklur to see a play. On many occasions Ithklur have killed or maimed human actors and actresses when they either act out romantic acts on stage (when the Ithklur know them to be married to other persons) or act out scenes of violence, deceit, betrayal or murder.

Movies and video programs are safer, as Ithklur believe them to be real and do not usually attack televisions. However, they get confused when they discover that Jim Rockford and Brett Maverick appear to be *exactly the same person*, and don't know exactly what to make of this, although they do start asking questions about the concept of reincarnation.



Sanctuary

The concept of sanctuary stands above most other Ithklur behavior and is pointed to by most behaviorists as proof of Hiver meddling with the Ithklur psyche. Sanctuary demands the suspension of all physical and spiritual acts against another (Ithklur are not even allowed to play their anti-Hiver "games" under sanctuary conditions), and even unethical or evil members of the group are held accountable to these standards, although sanctuary must be declared in some clear way so that all participants have the opportunity to mend their ways.

No one subject to sanctuary is allowed to commit an act whose immediate results are detrimental to another (even if such acts can be argued to be in that individual's long-term best interests). Such acts include acts of physical violence (and therefore usually supersede the decorative carnivore concept, page 89, and suspend the pushing match ritual, page 91) as well as spiritual or mental acts such as lying, distortion or misrepresentation.

Certain social structures are considered to automatically presume the concept of sanctuary among their members. These include military units, courts of law and Ithklur marriage bonds. However, sanctuary can be declared under virtually any circumstance, similar to the human concepts of truce, cease fires and white flags.

All transgressions of sanctuary are punishable by death, although the Ithklur concept of mercy allows the individual who was wronged to commute this sentence to any lesser penalty.

It is said that Ithklur are allowed to invoke sanctuary even on the Hivers themselves, up to and including the invocation of a death sentence on such a Hiver violating sanctuary, and that this is the ultimate responsibility of the Exposer of Deceit (see page 89) in each group.

Duty

The Ithklur are quite dutiful by nature, and this predisposition is reinforced by their agreement with the precepts of *integrity*. Most Ithklur find it difficult to commit themselves to a plan of action simply because they desire it. They are more comfortable when they can conform their goals to values or ends that they see being above themselves.

In fact, it could be said that their greatest weakness as a race is this endearing desire to find a duty and then scrupulously live by it, as the Ithklur can be ill-used by those who are not worthy of this devotion (the Hivers come to mind). However, the Ithklur answer to this is that it is not dutifulness itself that is at fault, but only the choice of duties, and one of the most important responsibilities of enlightened leaders of Ithklur groups is to be careful that the group maintains its devotion only to things which deserve their service.

The Ithklur will not cut and run at the first sign of unworthiness. Rather, they must properly and legally disengage themselves from their responsibilities, faithfully carrying them out until the duty is discharged or they are released from it.

Tenderness

The popular human image of the Ithklur nature as natural killers makes Ithklur tenderness seem oxymoronic, but this only further highlights their truly alien and ambiguous nature.

Ithklur affection for their children and of children for their parents and siblings is real and deep, and although it is often expressed in rambunctious, rough-house style, is evident to even to the most inexperienced human.

Ithklur physical affection is mostly expressed in the touching of skin. The Ithklur are fascinated by watching the visual-thermal phenomena of "the colors within" (see pages 48-49), and although Ithklur skin is thicker than human skin, the ability to watch complex vascular and environmental changes on the skin of their loved ones is a source of great pleasure. The direct touching of skin to skin is seen as the opportunity to experience these colors directly, personally and intensely, "color-to-color."

Contrary to theories that concepts like sanctuary and Ithklur pair-bonding are externally imposed add-ons to their true nature, affection and monogamous commitment appear to come easily to the Ithklur. Unlike in human literature, there is no celebration of the womanizing rake, Casanova/Don Juan character, as such individuals are regarded as being deeply sick: "He is not what he is." In fact, such characters, when they do appear in Ithklur tales, are either reformed or killed, the latter to the great delight of listeners and readers.

Marital estrangement, where it occurs in Ithklur society, is regarded as aberrant and tragic, and is only rarely at the wish of both parties. Such issues resonate strongly in the work of the romantic poet Keeper of Dreams Laurel, as in the following passage (note that translated Ithklur poetry seeks to replicate meaning rather than metrical or rhyme scheme):

What kind of knight am I?
Although I know that I will myself to be a knight,
It is not up to me to say what sort I am.

I have learned what I did not know when we lived together as children:
That love, once born into this world, is not conditioned by another's response to it,
But passes through me, eternal, borrowing only my life to express itself.

We may never be together again, which thought still kills large portions of my soul,
But what is left of me alive is more truly me than the parts which have died,
Fed and nourished by that which came from beyond me but has become purely and truly me.

I will remain true to the part of me that rises to eternity
(for God knows I can do nothing else),
Hopefully there to find its way to you again.

Ithklur Aphorism

Fool me once, shame on you. Fool me one thousand times, shame on you a thousand times, for you are only destroying yourself.

Anonymous

Note that this is in direct opposition to the classic human formulation "Fool me once, shame on you; fool me twice, shame on *me*." For Ithklur, the refusal to respond to evil with evil is a test of commitment to the eternal.

No Ithklur who is in contact with his or her true self can be hurt by lies, for lies are by their nature only temporary, and the true self is eternal.

Ithklur Aphorism

Honest to a fault? I'm sorry, I must have misunderstood you, for surely there can be no such thing.

Anonymous



Friendliness

Ithklur friendliness is legendary and well-meaning. To make an Ithklur friend is to make a life-long ally whom one can count on under any circumstance. Ithklur friendship is prone to contain such things as overly hearty pats on the back and telling of embarrassing stories in front of audiences, but is no less genuine for all of that.

One of the most common ways the Ithklur show this friendliness is learning all they can about the life or culture or beliefs of their friends. In general, the Ithklur regard humanity as a race of friends, and have fallen in love with all manner of human minutiae, including baseball, corn dogs and the memorization of various human epigrams.

In fact, this is one of their most common complaints about the Hivers: "You humans are so interesting: You have snowglobes, *behsehball*, and numerous meaningful witticisms for us to learn. The Hivers are so *boring*. They have nothing interesting for us to learn about."

The Ithklur most often quote human popular songs of all eras, but are also fond of references to comedians, novels and movies. Whenever they do this, they wait expectantly for a moment to see if the human will recognize the remark or finish the quotation (for example, if an Ithklur says, "You broke my will, oh what a thrill," humans are expected to respond, "Goodness, gracious, great balls of fire!"). Unfortunately, Ithklur knowledge of human trivia exceeds that of most humans, so the Ithklur are often disappointed. However, this does not upset them, but only makes them more determined to come up with a less arcane reference the next time. (They usually fall back on, "I'll be baaahck.")

Popular Ithklur sources are "the two Elvi" (Presley and Costello), Shakespeare, Bob Dylan, La Rochefoucauld, Monty Python, "Tompettytheheartbreaker (always said as one word)" and George Bush ("We're enjoying sluggish times, and not enjoying them very much").

Favorite quotations which have actually found their way into Ithklur culture include, "No one expects the Spanish Inquisition," "You're only saying that because I have a cabbage for a head," and, "Jane, you ignorant slut."

Cruelty

The Ithklur have a slightly different take on mercy and cruelty than do humans, although in many ways the Ithklur are much kinder than humans. For example, you will never see an Ithklur child pulling the wings off flies or the legs off ants, or at least not more than once, as their parents will cuff them and teach them not to.

On the other hand, the Ithklur concept of mercy seems either heartless or bloodthirstily pragmatic to humans. The images of victorious Ithklur soldiers prancing gleefully about the battlefield, cheerfully putting the fatally wounded (their own and the enemy's) out of their misery is a common image, and is absolutely true.

The reason for this is that the Ithklur hate suffering. Suffering creates a mental haze which distorts the clear view of the eternal, and clarity is one of the most beloved Ithklur values. Anyone who has heard wounded cry out irrationally for any relief whatever from their suffering has an appreciation of this, and the Ithklur believe that existence in this miserable state is worse than death. The act of releasing a wounded comrade or enemy from this bondage is an act of love and charity, and Ithklur bid such individuals a heartfelt and cheery farewell as they dispatch them with a quick and painless blow or stroke (the Ithklur are such masters of hand-to-hand combat that they have the uncanny ability to kill almost any creature instantly and with no pain whatsoever).

> *How did the Hivers make us better people? By their example, they showed us everything that had been wrong about us, so that we could rise above it and purify ourselves. Pity the Hivers, for they did not follow us, although they lighted the path. They are not what they are not.*
>
> Defender of Dreams Loganberry

This does not mean the Ithklur disdain the use of medicine to heal treatable wounds, but the Ithklur do not agree with the "any price for survival" concept adhered to by many human doctors. Life as a quadriplegic or a comatose vegetable is not an attractive notion to most Ithklur.

Ithklur Sports

Some authorities believe that one of the side effects of the Hiver manipulation was to channel some of the Ithklur's natural aggression into a passion for competitive sports. This manifests itself as a desire to participate in such sports, not just watch them. Ithklur athletic competitions include informal neighborhood games, formal competitions in local leagues and sports clubs, and regional, planetary and Federation-wide tournaments in a variety of sports. Wherever Ithklur are encountered, no matter what number there are, there always seems to be some form of ball game, race or other sporting event being organized.

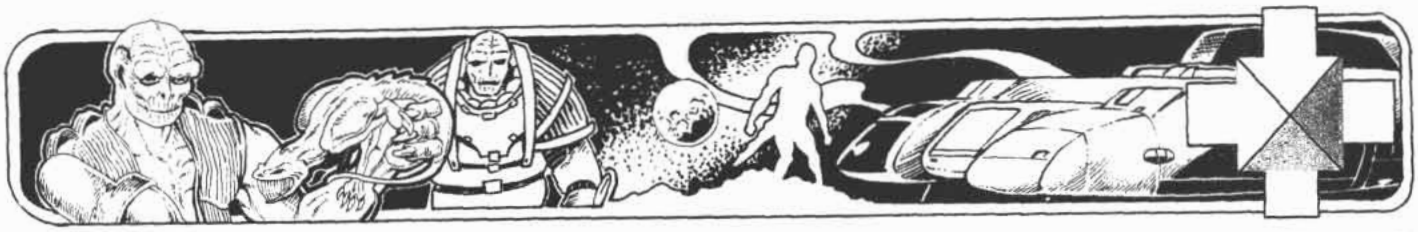
The Ithklur passion for sports does not include any desire to wager on the outcome. Indeed, Ithklur find the notion of profiting from a sporting event without actively participating to be faintly distasteful. However, they do not object to wagering on other nonsporting events (see Games, below).

Although there are some individual sports, most Ithklur athletic competitions are team efforts. Four of the most widespread are discussed below.

***Eduuqa Ssuejzathouga* (Idiomatically, "the Pick-Up Game"):** Of all Ithklur sports, the *Eduuqa Ssuejzathouga* appears to be the closest to the "national sport." It is an impromptu team ball game popular as a recreation and as exercise, as well as the subject of organized tournaments (strange as that may seem). There are few standard rules, and these are usually modified or dispensed with before the contest ends (or even begins), as mid-game rule-amendments/disagreements/brawls are a respected and traditional part of the game. A team (consisting of a variable number of Ithklur) will issue a challenge to another group by running onto an open field and executing a series of dance-like movements which signal which of the few standard rules will be used in the initial time period and how long the game will last. The challengers pick the field and set the boundaries; the challenged are to decide certain other rules (such as if the game will involve a ball, what the goals will be, etc.). The fact that these moves bear a superficial resemblance to human ballet and the Ithklur difficulty with the concept of dramatic performance has been the cause of a number of incidents (see, for example, **Survival Margin**, page 56). For reasons that are not clear, this game is known to humans as "Calvin Ball."

***Sik Eduuqa* (the Artillery Competition):** The object is to dismantle an antique field gun, carry it across an obstacle course, set it up and fire four rounds on target, in the shortest possible time.

***Xx*si Ueh Eduuqa* (Roughly: "Close Marching Competition"):** A very complex close-order drill, carried out by teams of Ithklur carrying archaic (and highly decorated) edged weapons, polearms,



flags, banners and early firearms. Competitions normally include dozens of elaborate formations, evolutions and rituals, never used in actual combat, designed for their impressive appearance when viewed from a reviewing stand. Human observers have declared the event to be very awe-inspiring, a combination of military drill team, football half-time show and "living history" recreation.

Behsehball: Essentially the Ithklur attempt to play the Terran game baseball, although in Ithklur practice the game tends to degenerate into lots of basepath carnage, such as undisciplined base stealing, run-downs, bloody collisions at bases as runners slide in with their claws held high (many Ithklur believe that a home run allows them to slide into all four bases as they go around the diamond), and large numbers of runs forced in by batters hit by pitches.

Legend has it that the Ithklur were completely bored by this game until someone explained to them that it was the source of the Abbott and Costello "Who's on First?" routine, at which point the game became an Ithklur mania.

Ithklur ballparks have much deeper outfields to accommodate the greater Ithklur strength. Players do not wear shoes (pitying humans who have to wear "false claws" to play the game), but all infielders wear shin and thigh protectors to protect themselves from baserunners.

The idiosyncratic Ithklur pronunciation of the name is most often used by Ithklur posing for photographs after a particularly exciting game. In these photographs, members of both teams (usually those who got into the biggest brawls) pose together, covered with dust, their shredded uniforms spattered with blood. When the players are ready for the photographer to take their picture, they all smile their snaggly smiles and say, "*Behsehball* been bery, bery good to me!"

Games

All Ithklur have a favorite "game" (as distinct from sport, above), which is essentially an amusing activity designed to irritate Hivers. Unlike sports, Ithklur games are almost always the subject of betting, usually in the form of a pool to predict whose game will anger the Hivers first, or how long it will take a particular Hiver to respond to the needling.

There are two games that are engaged in to some extent by almost all Ithklur. The first is to insist on assigning a gender to all Hivers they work with, and to refer to them in a consistent fashion as either male or female. This will usually get a response from any Hiver sooner or later. The nature of the response is immaterial—its fact is sufficient.

The second is to deliberately speak Gurvin as poorly as possible. When required to deliver reports in Gurvin (usually to Hiver officials who cannot understand Ithklur), they commit as many breaches of grammar, double entendres and malapropisms as possible, explaining that they find the language too difficult. This will either make the Hivers' jobs more difficult or force them to allow the Ithklur to speak their own language.

Ithklur Style

Ithklur are very attracted to brightly colored, ornate clothing, equipment and personal furnishings. Except where it would interfere with an item's utility, they seem almost pathologically driven to carve, paint, decorate, embroider or otherwise embellish each item of their everyday existence in a baroque, rococo fashion.

Ithklur Dress: The Ithklur fashion sense can best be described in human terms as "tacky," with typical Ithklur clothing being the approximate equivalent of Bermuda shorts and loud Hawaiian shirts. The Ithklur color sense appears to be, "the more colors the better,"

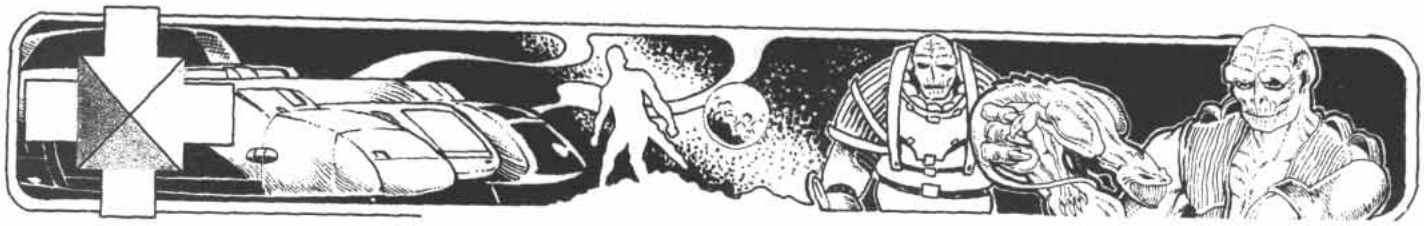


although it is clear that to the Ithklur eye, with its superimposed thermal "color," the visual appearance of these ensembles is quite different, and hopefully more harmonious.

Ithklur uniforms are a bit more disciplined, being made of primarily tactical colors such as brown or green, but the profusion of epaulettes, aigulettes, patches, sashes, doo-dads, gadgets, widgets and personal accoutrements would embarrass even the most dandified TED show-troops. Fortunately for the Ithklur, their prowess in combat obliges them to apologize to no one for the way they kit themselves out.

Trinkets: The Ithklur love trinkets. For an Ithklur, each moment of life is pregnant with meaning and memories which they like to memorialize. The average Ithklur home appears to human eyes like a undisciplined avalanche of kitsch, but to the Ithklur, each salt and pepper shaker, tea cozy, lace doily embroidered with realistic depictions of grisly battlefields, each little decorative dagger, derringer and sword cane has a clear value and strong memory associated with it.

This is the origin of the decorative carvings that distinguish Ithklur military hardware. The life of a soldier does not allow the individual to carry unlimited numbers of souvenirs, so the innumerable moments of meaning in an Ithklur's life must be incorporated into the

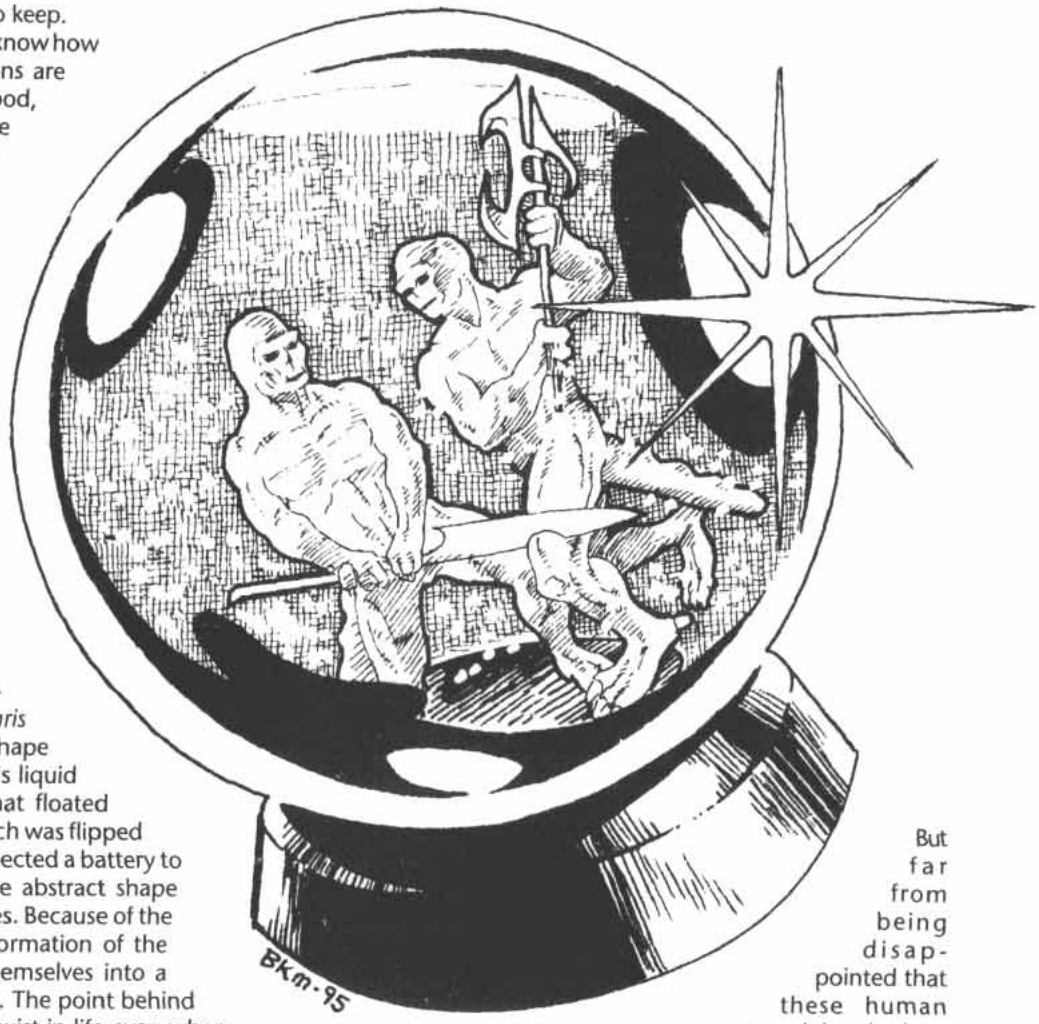


few pieces of gear he or she is authorized to keep.

All Ithklur are taught from an early age to know how to paint and carve, and all Ithklur weapons are fitted with stocks, grips, and fittings of wood, ivory or some other carvable material. The weapon of an Ithklur recruit is fairly nondescript, betrayed by the straight lines of its original blocky grips. But as time goes by, the Ithklur soldier will carve scenes of particular significance, busts of his or her comrades, and tallies of historical events, such as the days of a long planetary deployment, the number of enemies a bayonet has killed and the like. To the trained Ithklur eye, each Ithklur weapon is a vivid account of the life (and sometimes death) of its owner, and these are the highest forms of art known to the Ithklur culture.

One facet of Ithklur popular culture that usually surprises humans is the endearing Ithklur love of souvenir snowglobes. Before the first Ithklur-human contact, the Ithklur already had semi-religious artifacts known as **sharis*. The **sharis* consisted of an abstract, unidentifiable shape within a clear liquid-filled globe. Within this liquid were tiny, reflective magnetic particles that floated aimlessly in the liquid until an electrical switch was flipped at the bottom of the globe. The switch connected a battery to small electromagnets concealed within the abstract shape which began to attract the reflective particles. Because of the pre-designed shape of the particles and formation of the magnetic field, the particles assembled themselves into a meaningful spiritual or philosophical shape. The point behind these **sharis* was that meaning and order exist in life even when these cannot be identified, but patience and enlightenment can allow one to form meaning out of the seemingly disparate fragments of life.

Soon after the first human-Ithklur contact, Ithklur found the inexpensive souvenir snowglobes in the gift shops of starport lounges, memorializing the skyline of "Scenic Oriflamme" or some such.



But far from being disappointed that these human snowglobes had no batteries, electromagnets or hidden forms that would assert themselves, the Ithklur were awed at the spiritual maturity of a race that would refuse to demand shapes from the swirling flakes and would instead be content to conform their minds to deriving meaning from the randomly falling flakes onto whatever mundane scene was depicted in the globe.

Although the Ithklur still manufacture versions of the electric globes for their children (who need the additional assistance to find the shapes of meaning when they are young), for Ithklur adults, snowglobes in the human style have completely supplanted the Ithklur originals. Ithklur copies of these snow globes usually replace the pastoral scenes or city skylines with small, intricately detailed and historically accurate battlefield dioramas.

The Eye of the Beholder

Look at this "snowglobe," which commemorates the Battle of Kilong in the human style. We shake it up, and the luminous particles of truth and meaning are randomized, and swirl in unpredictable patterns about the scene. Then, slowly, they settle out onto the debris of the battlefield—here onto the dismembered corpse of the K'kree leader, here onto the smoldering hulk of an assault ram, here onto the truncated torso of one of our sappers, there onto the body of the hand advisor, frozen as it writhes in its death agony—a beautiful and sublime scene, showing that meaning and truth fall as they will onto everyone, independent of our ability to predict or understand it.

An Ithklur aesthete

Ithklur Anecdote

I was sitting at a bar when a lizard walked in with his *slaa*. He said to me, "I'll bet you all the money that you have in your pocket that my *slaa* can talk."

I turned to the *slaa* and said, "Is this true?"

The *slaa* said, "How much have you got on you?"

So I punched the bartender.

From *The Collected Sayings of San*klaass*

Players' Section

ITHKLUR CHARACTER GENERATION

This section will only detail differences in Ithklur character generation from the procedures presented on pages 15-39 of **Traveller: The New Era**.

Ithklur begin character generation untrained, inexperienced and about 17 standard (human) years of age.

A Character Generation Worksheet is included with this book (see page 93). Once a character is completely generated, the information from the worksheet should be transferred to a Character Sheet (see page 94). After that, the worksheet may be discarded, as only the Character Sheet is necessary for play. (*Note:* Save at least one blank copy of each sheet to photocopy for future characters.)

CHARACTER GENERATION OVERVIEW

The Ithklur character-generation procedure follows the same three general steps as that used for humans: background, attributes and experience.

Background: Players determine their homeworlds, as these have a strong effect on later steps of character generation. They also decide on other background information, such as social level, name and gender for their characters.

Attributes: Players determine the six basic attributes of their characters by rolling dice and assigning those results to attributes in any order they wish. These six basic attributes are Strength, Agility, Constitution, Intelligence, Education and Charisma.

Careers: Ithklur characters begin the character creation sequence at the age of 17. At that time, players start making career choices for their characters. Each career choice represents four years of training and/or experience (four years being an arbitrary number that helps regulate character generation). Each time a player makes a four-year career choice, a hobby may also be selected for the character.

Derived Values: Now that all changes to skills and attributes are completed, certain values are calculated that are based on them. These are things like accuracy with different weapons at various ranges, damage done by bare-handed attacks and so forth.

Possessions: Finally, players determine what possessions their characters have accumulated during their careers.

BACKGROUND

Before generating the specific physical and mental attributes which define a character, it is necessary to determine the character's background, as this has a strong effect on the rest of the character-generation process.

Stellar Region: Ithklur can come from one of two stellar regions, the Hive Federation or the independent Ithklur client state.

Hive Federation: The Hive Federation is an interstellar government formed from a coalition of individual worlds and a few multiworld groupings. Although originally founded by the Hivers, and based on their cultural precepts, all member worlds are co-equal in status, in representation in the central government, and in access to the benefits of interstellar commerce and interaction.

Independent Ithklur Client State: This is an independent Ithklur state (although it does not include the Ithklur's world of origin) on the edge of the Hive Federation. It maintains an independent military force and a federal form of government, although it coordinates its external diplomacy with that of the Hive Federation.

Homeworld: The next step in determining background is selection of a homeworld. A referee can generate worlds which can be chosen by or assigned to the players; or a homeworld can be generated randomly using the tables provided. Since no official sectors have yet been published for either the Hive Federation or the Ithklur Independent Client State, world assignment (as discussed in the basic rules on page 16) is not an available option.

Referee Generation: Referees may choose to generate one or more worlds which are understood to represent a homeworld for Ithklur characters. These can be created by using the procedures in the World Building section of the basic rules (pages 180-195). Once these worlds are created, the referee takes the specific world characteristics and translates them to the more broad descriptions which are used here.

If a homeworld is deliberately created, by either the referee or the player, it must contain at least as much descriptive information as is provided by the Homeworld Random Generation table.

Random Generation: Homeworlds can be created solely for purposes of character generation by using the Homeworld Random Generation table. This is done in the same fashion as shown on **TNE** pages 17-18, with the following substituted DMs resulting from Stellar Regions:

Starport

Region	*DM*
Hive Federation	None
Ind. Ithklur Client State	None

Tech Level

Region	*DM*
Hive Federation	+2
Ind. Ithklur Client State	+1

ATTRIBUTES

Each character is described by six attributes detailing the physical and mental defining characteristics of the individual. These attributes are generated through a series of die rolls, as noted below. Do this five times. Each separate roll is then assigned, in whatever order the player desires, to one of the following five attributes: Strength (STR), Agility (AGL), Constitution (CON), Intelligence (INT) and Charisma (CHR). For Ithklur characters, Education (EDU) is then determined by rolling 1D6. After the rolls are assigned, add +2 to Strength (STR), and +1 to both Constitution (CON) and Intelligence (INT). Record the results on the Character Worksheet, located on page 93.

Players who roll attributes for their player characters totaling less than 33 points may add attribute points (allocated as they see fit) to bring the total up to 33. This ensures that characters are always at least average.

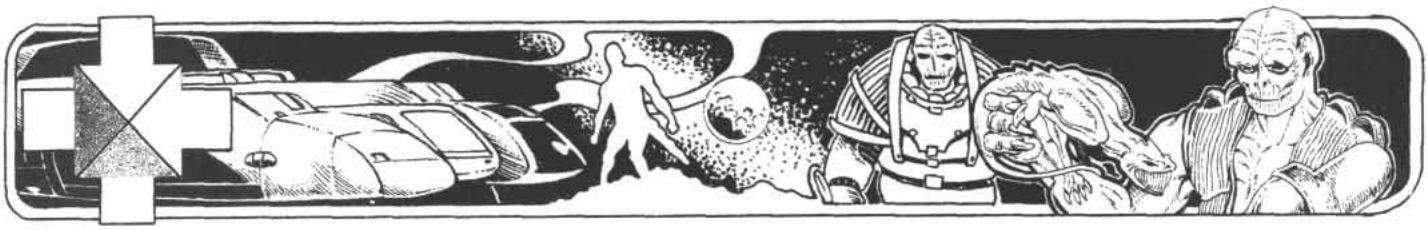
Personal attributes are as defined in the basic rules, and use the same abbreviations and UPP sequence, except as noted below.

Homeworld Effects on Attributes: These are the same as on **TNE** page 19.

Attribute Limits: During the careers portion of character generation, certain careers offer the opportunity for Ithklur characters to raise certain attributes. However, no Ithklur attribute may be raised more than three points (as opposed to two points in human character generation) as a result of these career increases. No attribute may ever be raised to greater than 18.

Other Characteristics: In the course of character generation, the character will acquire age (in years and in four-year terms), rank, money, skills and possessions.

Psionics: Ithklur have psionics talents, but at a lesser level than those of humanity. In general, initial psionic strength is generated





by 2D6–2 instead of 2D6, and certain psionic talents are unavailable to Ithklur characters. See page 80 for further details.

Language: The official language of the Hive Federation is Gurvin, a language used by the race of the same name, and more readily adaptable to non-Hiver use. All Ithklur are automatically fluent in their own language (Ithklur), and in Gurvin as well if their homeworld is within the Hive Federation.

Social Standing: Roll 2D6 and subtract 1 to determine initial Social Standing (abbreviated SOC) on the character's homeworld. This is a measure of the accomplishments and power of the character's parents or guardians (if raised by other than his or her natural parents).

This is not an innate attribute, and unlike attributes, it may change dramatically during character generation, based on the career choices made. However, like attributes, a character's SOC may never be reduced below 1, nor raised above F. The role of Social Standing is primarily to determine economic status during character generation. Rank as discussed below and on page 53 has a much greater effect on a character's actual status in society once play begins.

Titles: The Ithklur have no titles based on social standing.

Naming Characters: Ithklur characters may be assigned names in either the Ithklur language or Anglic. Ithklur names can be created by players and referees by using other Ithklur words in this book as guides.

Anglic names, which are simply translations of the meaning of the Ithklur name, may be created using the principles discussed on page 54.

Call Signs: Ithklur serving on RC missions will need to choose or be assigned a two-syllable call sign, as explained in the basic rules (pages 22-23).

Background Skills: Ithklur, like humans and Hivers, acquire a number of skills before age 17. To represent this, players should each choose *two* skills (not four) from the Skill List table (**TNE** pages 114-115), giving their characters a level 2 skill in each. Referees may impose homeworld limits on these skills if desired, and if homeworlds are specified. In most cases, however, this is unnecessary.

The reduced number of optional background skills for Ithklur characters is due to the fact that, unlike humans and Hivers, Ithklur characters receive four skills at level 1 as default skills immediately below.

Default Skills: Default skills are conferred automatically as follows:

All Ithklur characters automatically receive Animal Handling 1, Painting 1, Sculpture 1, Tracking 1 and Biology 0.

Characters from a Large world automatically receive High-G Environment 0.

Characters from a world with a tech code of Industrial to Early Stellar automatically receive Ground Vehicle (Wheeled) 0.

Characters from a world with a tech code of Early Stellar+ automatically receive Computer 0.

Characters from a world with a tech code of Average Stellar+ automatically receive Pilot (Interface/Grav) 0.

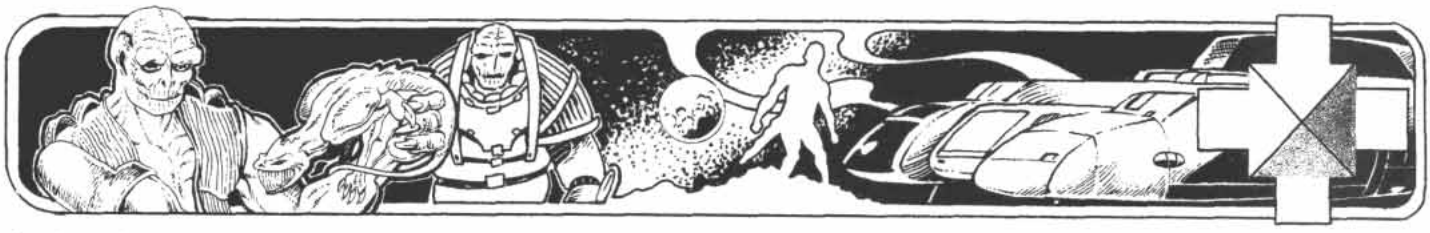
All Ithklur player characters (and detailed NPCs) automatically receive Swimming 0, Willpower 0 and Act/Bluff 0.

CAREERS

The mechanics of career resolution for Ithklur follows the same general mechanics as shown in the basic rules, pages 24-27. However, there are some restrictions that apply to the Ithklur.

Before entering any careers, the Ithklur character must choose a path. There are five paths available: Facilitator, Guardian, Explorer, Seeker or the Tetramerous Way (see pages 51-52 for a more detailed discussion of these paths). If the Tetramerous Way is chosen, the character must additionally choose whether to follow the Fascist or Phalangist model (see sidebar on page 67).

Note that the choice of a path commits the character to remain in that path for the entirety of his or her life. Ithklur characters may not mix and match careers from different paths (although they may freely mix careers from within the same path). The only exception to this is for a character to choose the fascist tradition of the Tetramerous Way. Players should read the description of the



fascist tradition in the careers section on page 77 as well as the fuller discussion of the Tetramerous Way on pages 51-53 before attempting Ithklur character generation.

Commissions/Enlightenment: All of Ithklur society is separated broadly into two groups: the "Enlightened" and the "Elementary." These correspond roughly to the human concept of commissioned and enlisted personnel, so characters who have achieved enlightenment use the information listed after Enlightened in the same fashion that characters in basic **TNE** use the Officers information once they have received a commission. Likewise, characters which have not achieved enlightenment use the Elementary information, just as non-commissioned human characters use the Enlisted information.

Characters who make the enlightenment roll acquire rank 1 on the table on page 53.

The roll to achieve enlightenment is made each and every term, although the roll and allowed DMs are listed by each path, not by each separate career. Once enlightenment is achieved, however, the roll is no longer made.

This achievement carries over through all careers of a given path. Thus, an Ithklur adherent to the Facilitator Path who achieved enlightenment during a term in Aviation and then switched to Wet Navy would still take skills from the enlightened line. (Since not all careers have different skill packages for enlightened and elementary characters, this distinction will not always make a tremendous difference in skills received, but only enlightened characters have actual ranks in Ithklur society: Elementary characters who receive advancement gain a skill level only—see below.)

Note that the enlightenment DM *may be negative.*

Promotions/Advancement: This is as discussed on **TNE** page 25, except that for Ithklur characters it is listed as Advancement and is the same for all careers of a given path. The roll for advancement is made each and every term.

A character who receives an advancement, whether enlightened or elementary, receives one additional skill drawn from the Subsequent Terms list (even if the promotion is received during the first term).

In addition, enlightened characters have their rank increased. There are no ranks listed for elementary Ithklur, so the skill level above is the only benefit received for unenlightened Ithklur.

Enlightened Ithklur characters may advance more than one rank per advancement roll depending upon how far the actual roll exceeded the required number. Subtract the required roll from the actual roll after the DM has been assessed, and subtract 1 from the result. This is the number of rank levels advanced. Thus if the required roll were 11 and the DM-adjusted roll was 14, the character would advance two rank levels.

This additional rank increase has no effect on skills received for advancement: only one skill is received per successful advancement roll, no matter how high the final adjusted roll.

Note that the advancement DM *may be negative.*

Secondary Activity: These are handled as in the basic rules, page 26-27.

Increasing Attributes: This is handled as discussed on **TNE** page 27, by using an allowed skill level as a chance to increase a single attribute, except that Ithklur characters need only roll a 7+ to increase STR, AGL or CON, an 8+ for INT and CHR, and a 9+ for EDU. DM: One per level of Willpower skill. This attribute improvement is subject to the +3 ceiling (as opposed to +2 for humans).

Social Standing: Social Standing may be increased under the Other Effects section of a career, as with human character generation.

On the Power of Lunacy

Imagine yourself working in a very powerful, very reputable organization. Imagine then that you are allowed to meet the head of this organization. If he is educated, polite and urbane, you will be impressed by him, and learn that adherence to the principles of education, politeness and culture, as difficult as they are, are surely the steps to great achievement in so great and powerful an organization.

However, imagine that he acts as if he is crazy, that he yells and screams and carries on embarrassingly at the slightest provocation? Which of his underlings in this organization will condemn him for his behavior? Which will tell him that he is unfit to rule? None. All will conspire to pretend that his behavior is the most natural and appropriate way of acting, and will show that this man's power does not derive from the same source as that of his underlings, the education, politeness and culture that they have been inculcated with. In other words, the source of their power is extraneous to his. They cannot touch him.

Who enhances his power the more? The polite man who abides by the wishes of society, or the crazy man?

Truly I say to you, it is the madman who ensures and multiplies his power.

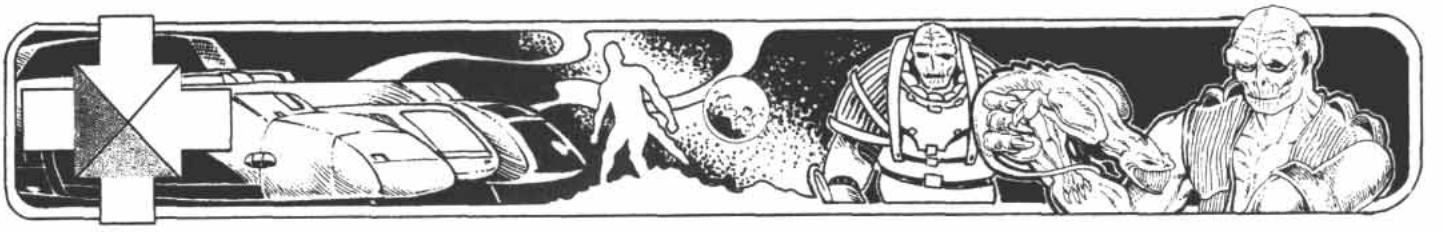
The Enlightened *Slaa* de *Silentio*

Fascist (Translated from the Ithklur *Kchollioll*): One of the two branches of devotion to the Ithklur Tetramerous Way. Fascists believe that the four paths can be visualized as a bundle of sticks tied together. In this way they can be seen as separate but parallel, beginning at the same point and ending at the same point, although defining four distinct paths through time and space. Fascists believe that achievement of unity comes from tasting the reality of all four paths. Therefore fascists move through their lives in a variety of sequential careers from the Facilitator, Guardian, Seeker and Explorer paths on their way to the state of Blissful Warrior.

The term *fascist* is a particularly unfortunate and improperly connotation-laden Anglic translation from the Ithklur term. However, the Ithklur find this term preferable to alternate translations such as "faggots," "stickies" and "twiggies."

Phalangist (Translated from the Ithklur *Ha*on*): One of the two branches of devotion to the Ithklur Tetramerous Way. Phalangists believe the four paths can best be visualized as an Ithklur hand, with four distinct fingers, but still the same unified organ. This represents the Phalangist belief that it is not the precise details of their four separate paths *per se,* but the mystical combination of their essence, which can be pursued in its own right, without having to concentrate on the point of view of any single path. Phalangists therefore remain on a "pure" four-fold path on their way to the state of Blissful Warrior.

As with Fascist, Phalangist is an odd and emotion-laden Anglic translation. The Ithklur prefer this translation to other words which use the term "Hand," as the Ithklur reserve this term for the Hivers themselves, nor do followers of the Phalangist tradition enjoy being called "fingers."



SKILLS

As with basic character generation, **TNE** pages 27-28.

CONTACTS

These are handled as in the basic rules, pages 29-31. For simplicity, the same categories of contacts for Ithklur are used as for humans.

Off-World Contacts: For Ithklur characters in Coalition space, all contacts are off-world contacts.

AGE

An Ithklur character's age at the time an adventure campaign begins is determined by multiplying by four the number of terms served and adding 17 to the result. In other words, (4×Terms)+17=Age.

Effects of Age

Beginning at age 37 (i.e., the end of the fifth term), an Ithklur character must check for the effects of age at the end of each term. At the end of the fifth, sixth and seventh terms, the character rolls 1D15 to check for losses in Agility. At the end of the eighth term, both Agility and Strength must be checked. At the end of the ninth term and every term thereafter, Agility, Strength and Constitution must be checked. In addition, once characters reach age 61, at the end of the 11th term, they must start rolling for a decrease in Intelligence. The Consolidated Effects of Age table below illustrates these progressions, as well as the reduction in the amount of skills gained during careers due to aging. D15 numbers are generated by rolling 1D20 and rerolling all results of 16-19, with results of 20 treated as 0. (*Note*: This is an official errata, and this change should also be made to **TNE** page 31.)

Ithklur Consolidated Effects of Age

Start Term	End Age	Age	Losses ST/SD*	STR	AGL	CON	INT
1	17	21	4	—	—	—	—
2	21	25	4	—	—	—	—
3	25	29	3	—	—	—	—
4	29	33	2	—	—	—	—
5	33	37	1	—	Y	—	—
6	37	41	1	—	Y	—	—
7	41	45	1	—	Y	—	—
8	45	49	1	Y	Y	—	—
9	49	53	1	Y	Y	Y	—
10	53	57	1	Y	Y	Y	—
11	57	61	1	Y	Y	Y	Y
12	61	65	1	Y	Y	Y	Y
13	65	69	1	Y	Y	Y	Y
14	69	73	1	Y	Y	Y	Y
15	73	77	1	Y	Y	Y	Y
16	77	81	1	Y	Y	Y	Y
17	81	85	1	Y	Y	Y	Y
18	85	89	1	Y	Y	Y	Y
19	89	93	1	Y	Y	Y	Y
20	93	97	1	Y	Y	Y	Y
21	97	101	1	Y	Y	Y	Y

*ST/SD=Number of subsequent term/special duty skills.

The character loses one point from the relevant attribute if the 1D15 roll is less than the current level of that attribute. If the roll equals or exceeds the attribute, there is no loss.

This check, also called an age saving throw, is made at the end of each term.

Aging in Play: Aging in play works the same way as in **TNE** basic character generation.

Combating Aging Effects

Ithklur characters may resist the effects of aging in the same way humans do (see the basic rules, pages 32-33), except as noted below.

Anagathics: Ithklur, like Hivers, disdain the use of anagathics, and none are manufactured for them.

Aging Crisis

As discussed in **TNE** basic character generation, page 34.

Skill- and Attribute-Derived Values

These are derived in a manner similar to that of humans, but due to Ithklur physiological differences, the formulae to derive these values in different.

Hit Capacity: Hit capacity is calculated for Ithklur in the same way as it is for humans, except that Ithklur add one more hit location: tail, which has a hit capacity equal to two times the sum of the character's Strength and Constitution: (STR+CON)×2.

Boxes are provided on the character sheet for players to write in their PCs' wound level thresholds so the players will know to what degree their characters have been wounded. These are calculated in the same fashion as in the **TNE** basic rules, page 288.

Weight: An Ithklur character's weight in kilograms is equal to 100, plus 4 times Strength minus Agility, or [4×(STR–AGL)]+100. Thus, an Ithklur character with a Strength of 8 and an Agility of 2 would weigh 124 kilograms (about 273 pounds), while a character with a Strength of 6 and an Agility of 8 would weigh 92 kilograms (roughly 203 pounds). Note that there is no difference in the weight of male and female Ithklur.

Load: An Ithklur character's normal load in kilograms is equal to three times the sum of its Strength and Constitution: (STR+CON)×3. Ithklur suffer normal penalties for being burdened (see page 35 of the basic rules).

Throw Range: An Ithklur's throw range in meters is four times the character's Strength (STR×4).

Unarmed Combat Damage: Unarmed combat damage is determined for Ithklur characters in the same way as for human characters (see page 35 of the basic rules).

INITIATIVE

All Ithklur characters determine Initiative by rolling 1D6 and adding 1, which makes their minimum Initiative 2. In addition, certain Ithklur careers if served for two or more terms allow an additional +1, for a maximum possible Initiative of 8 achievable in character generation.

STARTING MONEY AND INITIAL EQUIPMENT

Ithklur characters determine starting money and initial equipment in the same way as human characters do, even for characters who are veterans of the Federation Navy. The Hive Federation, realizing that cultures differ in economic as well as sociological ways, pays salaries to non-Hiver personnel (it is the only way the Gurvin can be persuaded to serve).

Starships: It is possible for Ithklur characters to own a starship at the beginning of the game. The procedure is as described in the basic rules, pages 37-39, but with a few slight changes as noted below.

Stellar Regions: Modifications are made to the die rolls based on



the stellar regions in which the PCs are generated. These reflect the relative scarcity of ships in certain regions, and therefore their absolute value in these areas. This is reflected in two different ways. First is a –DM for stellar region, as shown in the Stellar Regions DMs table.

The second is the way in which the outstanding mortgage requirement is satisfied. In the Old Expanses, either the Hive Federation or the Ithklur Independent Client State government owns the mortgage on a ship, which means that not only must the players continue to meet the payments, they must also use their vessel in accordance with the directives of the government. In almost all cases, this requires adherence to certain shipping schedules. As with similar human arrangements, the Federation/Client State government does not require payment each month if the PCs cannot afford it. It is much more important that they stick to the shipping schedule. No penalties accrue for missed payments, but the PCs still remain far away from free and clear ownership.

In the Wilds, all value modifiers are immediately applied to the ship's wear value, up to the maximum level of 10. All excess value modifiers are disregarded. In the Wilds, the few ships date back to the Final War and have already been lovingly passed down from one crew to the next for so long that there are no outstanding bills, only outstanding maintenance. Note that this means no PC groups in the Wilds can take +DMs on the Ship Types Table if this would raise the total value modifiers to more than 10.

Stellar Regions DMs

Stellar Region	*Starship DM*	*Outstanding Mortgage Options*
Old Expanses	–10	Government holds mortgage, dictates schedule
Wilds	–30	All value mods applied up to maximum wear value 10, no mortgage

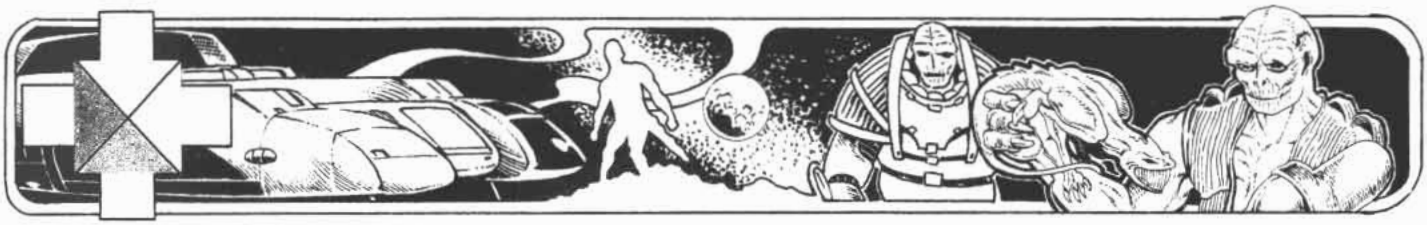
Ship Tables and Types: The tables used are those on 39 of the **TNE** rulebook. The Ithklur/Hiver ships received are broadly similar to the human types shown on these tables, in many cases, or modifications of human designs. Due to space limitations, Ithklur and Hiver variants of all these human types cannot be included. Note that any receipt of a 200-ton vessel may be taken as a Hiver utility vessel (**Reformation Coalition Equipment Guide**, page 153) instead, and receipt of a subsidized liner may be taken as a Hiver transport (**RCEG**, page 151).

Ithklur Epigram

The Hivers understand us. They take us everywhere we need to go and attend to all the boring details.

*Assa Sanok*kla,*
destined Blissful Warrior





ITHKLUR CAREERS
EDUCATION

Ithklur education is organized differently from that of the Hivers, and the end result is much the same as its human counterpart. Note, however, that education careers have enlightenment rolls that supersede the normal path-specific enlightenment rolls.

Undergraduate University

Ithklur educational institutions abound on Ithklur worlds throughout the Hive Federation and the Independent Ithklur Client State. Although details vary, they are the equivalent to the human system of universities and are labelled as such.

Paths: All.

Prerequisites: EDU 5+.

Enlightenment: 11+, DM=(STR+EDU–13)

Skills: Total skill levels equal to character's Education attribute from any combination of the following, but no more than level 3 in any one skill:

Artisan, Computer, **Economics**, **Engineer**, **Fine Arts**, *Language*, Leadership, **Perception**, **Physical Science**, **Social Science**.

Contacts: One per term, academic or journalism, non-Ithklur on 8+.

Other Effects: +1 EDU (after all skills have been awarded). No advancement or special duty rolls are made. No income received while attending undergraduate school.

Military Academy

The Hive Federation maintains special military academies for the express purpose of training Ithklur to serve in the Federation Army and Navy (the academy used for Federation Marines is the Naval Academy; also see Flight Academy, below). The various worlds of the Independent Ithklur Client State has academies for its army, stellar navy and merchant marine as well as individual planetary wet navies.

Paths: All.

Prerequisites: STR 8+ and CHR 8+, Homeworld Pop=Mod+.



Enlightenment: 9+, DM=(STR+CHR–16)

Skills: Total skill levels equal to character's Education attribute from any combination of the following, but no more than level 3 in any one skill:

Determination, **Engineer**, **Interaction**, **Social Science**, **Space Tech**, **Technician**.

In addition, the character receives all of the First Term skills from whichever service the academy serves.

Contacts: Two military, non-Ithklur on 8+.

Other Effects: No secondary activities are allowed while attending military academy, nor is any money received. Note, that unlike human academies, the Ithklur military academy does not automatically confer automatic "commissioned" (i.e., enlightened) status.

The character must serve at least one term in the career served by the academy (Ground Support, Navy, Wet Navy, Ground Troops, Strike Force, or Explorer). Since the character has already received the First Term skills for this career during the academy, the first real term in the career receives skills chosen from the Subsequent Terms section equal in number to the skill levels of the First Term package.

Graduate University

Graduate school provides advanced education for those Ithklur who choose to pursue it, particularly those who are enlightened.

Paths: All.

Prerequisites: Undergraduate degree and INT 7+.

Enlightenment: 10+, DM=(INT+CHR–14)

Skills: Four levels per term in any one specialty, plus a total of two levels in any electives.

Specialties: Computer, **Economics**, **Engineer**, **Fine Arts**, *Language*, **Physical Science**, **Social Science**.

Electives: Computer, Instruction, *Language*, Leadership.

Contacts: One per term, academic or government, non-Ithklur on 8+.

Other Effects: +1 EDU (after all skills have been awarded). No advancement or special duty rolls are made. Ithklur universities award degrees corresponding to human university degrees: The first term provides a master's degree; each subsequent term provides a doctorate (or equivalent). Degrees must be taken in one of the specialties noted above. No income is received while attending graduate school.

Graduate university may be selected for as many terms as desired.

Medical School

Medical school is a prerequisite for working as a medical doctor or medical technician.

Paths: Seeker, Tetramerous Way (Fascist and Phalangist).

Prerequisites: EDU 6+ or INT 9+. Undergraduate degree, Biology 3+, Chemistry 2+.

Enlightenment: 10+, DM=(INT+CHR–15)

Skills: Computer 1, Medical 6, Observation 1.

Contacts: One medical, non-Ithklur on 8+.

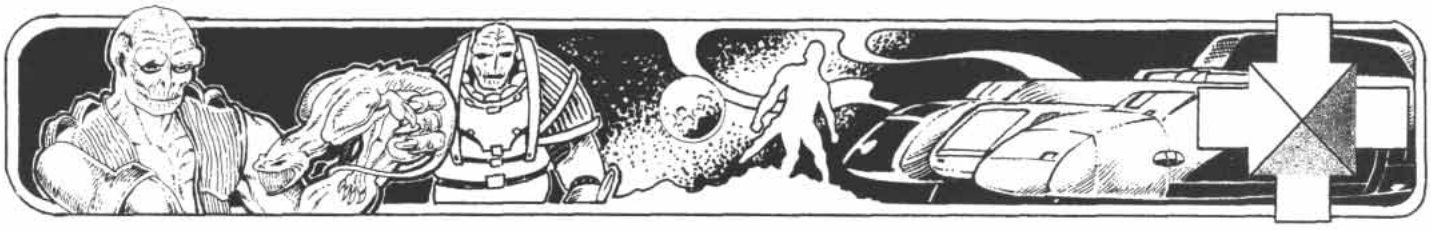
Other Effects: No secondary activities are allowed during medical school. No income is received while attending medical school. Upon completion of medical school, a character receives an automatic commission (as doctor) in the career of medicine.

Flight Academy

As with humans, a variety of flight academies are maintained by advanced worlds to train pilots of aircraft and starships for both military and civilian service.

Paths: Any.

Prerequisites: Education 5+ and Agility 6+. Homeworld Tech=Early



Stellar+. (Flight Academy for Aviation possible if Homeworld **Tech=Ind**, but no skills from the Space Vessel cluster may be selected, nor may the Interface/Grav cascade of Pilot be selected.)

Enlightenment: 12+, DM=(AGL+CHR–12)

Skills: All First Term skills for the appropriate career (Aviation, Navy, Scouts or Traders), plus a total of six levels from any one or a combination of the following:

Pilot, **Space Vessel,** Leadership.

Contacts: Two military, non-Ithklur on 8+.

Other Effects: No advancement or special duty rolls are made. No income is received while attending flight academy, nor are any secondary activities allowed. At the start of the next term, the character automatically enters the chosen career (regardless of whether he or she has the normal prerequisites) which include Aviation, Navy, Trader, or Explorer. Note that, unlike human academies, this Ithklur school does not necessarily confer "commissioned" (i.e. enlightened) status on the student.

Since the character has already received the First Term skills for this career during the academy, the first real term in the career receives skills chosen from the Subsequent Terms section, equal in number to the skill levels of the First Term package.

Technical School

Among the Ithklur, those who do the day-to-day work of making society run are respected far more than they are in human society, and Ithklur technical schools are the main avenue of education for followers of the Facilitator Path, although enlightened facilitators frequently attend undergraduate and graduate university in addition to or in lieu of technical school.

Paths: Facilitator, Tetramerous Way (Fascist and Phalangist).

Prerequisites: None.

Enlightenment: 10+, DM=(INT+CHR–13)

Skills: A total of six levels from any one or a combination of the following:

Technician, Space Tech, *Medical*, **Economics**, Computer, **Aircraft, Vehicle**.

Contacts: One specialist (skill level 8) in one of the areas listed above, non-Ithklur on 8+.

Other Effects: No advancement or special duty rolls are made. No income is received while attending technical school.

FACILITATOR PATH

The Facilitator Path is recognized by Ithklur philosophy to be the most important and noble of the four separate paths, for without this path, the race would not exist. All the other paths derive their existence and strength from this one.

Enlightenment: 10+, DM=(INT+ CHR –13).

Advancement: 12+, DM=(INT+ CHR –13).

Aviation

Even Ithklur marines need air support from time to time.

Prerequisites: STR or AGL 7+. Pop=Moderate+. Atmos=Thin+.

First Term

Skills:

Enlightened: Aircraft 3, **Determination** 1, **Gun Combat** 1, **Perception** 1, **Physical Science** 1, **Vehicle** 1.

Elementary: Gun Combat 1, **Heavy Weapons** 1, **Melee** 1, **Technician** 3, **Vehicle** 1.

Subsequent Terms

Skills:

Enlightened: Aircraft, Charm, Determination, Explore, Gun Combat, Perception, Vehicle.

Elementary: Charm, Gun Combat, Heavy Weapons, Melee, Technician, Vehicle, Vice.

All Terms

Special Duty: 8+ for **Acrobat, Aircraft, Archaic Weapons, Crime, Interaction,** *Medical*, **Melee, Personal transport, Spacehand.**

Contacts: One per term, military, non-Ithklur on 6+.

Other Effects: None.

Bureaucrat

The fact that there are such things as Ithklur bureaucrats may surprise some people. Ithklur govern themselves on numerous worlds, however, both inside and outside the Federation, and bureaucrats are more necessary to government than soldiers.

Prerequisites: EDU 5+. Homeworld Law=Moderate+.

First Term

Skills: Charm 1, **Economics** 3, **Interaction** 2, **Perception** 1, **Vice** 1.

Subsequent Terms

Skills: Charm, Economics, Interaction, Perception, Vice.

All Terms

Special Duty: 8+ for **Crime, Gun Combat**, *Language*, **Melee, Spacehand, Vehicle.**

Contacts: Two government contacts per term, non-Ithklur on 6+.

Other Effects: Each level of advancement adds 1 to SOC.

Civil Engineer

Construction engineers are much in demand, and not all Ithklur are destroyers. There is much to be rebuilt, both inside the Federation and outside it, and Ithklur are expected to do their part.

Prerequisites: Enlightenment, Construction 4+.

First Term

Skills: Engineer 2, **Explore** 2, **Physical Science** 1, **Technician** 1, **Vehicle** 1.

Subsequent Terms

Skills: Determination, Economics, Engineer, Explore, Interaction, Physical Science, Technician, Vehicle.

All Terms

Special Assignment: 8+ for **Gun Combat**, *Language*, **Crime, Melee, Vice, Spacehand.**

Contacts: One per term, government, non-Ithklur on 8+.

Other Effects: On Industrial– worlds, **Vessel** is taken in place of **Spacehand**.

Computer Specialist

Ithklur computer specialists are especially in demand for missions into the Wilds, where they revel in the danger and excitement.

Prerequisites: Technical school or undergraduate degree, Computer 2+. Homeworld Tech=Pre-Stellar+.

First Term

Skills: Economics 2, **Technician** 4.

Subsequent Terms

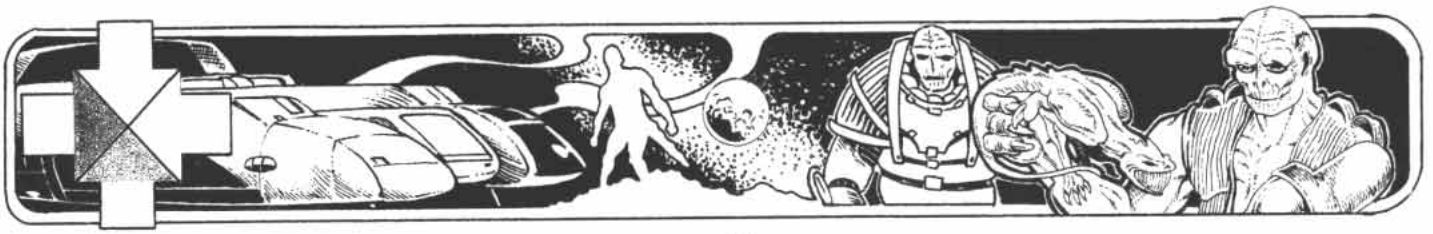
Skills: Economics, Interaction, Technician.

All Terms

Special Assignment: 8+ for *Language*, **Melee, Spacehand, Technician.**

Contacts: One specialist (Computer or Electronics) per term. If special adventure is rolled, add extra contact of any type, non-Ithklur on 8+.

Other Effects: Computer Specialists are allowed two secondary activities per term.



Ground Support

This career represents service in the ground combat support or combat service support arms of one of the worlds of the Hive Federation or the Ithklur Independent Client State.

Prerequisites: CON 6+. Homeworld Tech=Industrial+. Pop=Moderate+. Atmos=Thin+.

First Term

Skills:

Enlightened: Gun Combat 1, **Explore** 1, **Charm** 1, **Melee** 1, **Determination** 1, **Technician** 1, **Interaction** 1.

Elementary: Gun Combat 1, **Melee** 2, **Technician** 2, **Vehicle** 2.

Subsequent Terms

Skills:

Enlightened: Gun Combat, Explore, Economics, Interaction, Determination, Charm, Personal Transport, Engineer (except Starship Architecture).

Elementary: Gun Combat, Melee, Heavy Weapons, Explore, Vice, Charm, Personal Transport, Vehicle.

All Terms

Special Duty: 8+ for **Archaic Weapons, Melee, Aircraft, Crime, Spacehand, Vehicle, Artillery, Interaction,** *Medical,* **Tactics, Technician, Perception, Personal Transport, Space Tech.**

Contacts: One per term, military, non-Ithklur on 8+.

Other Effects: None.

Manager

It is as true on Ithklur worlds as it is anywhere else: Someone has to make things work, and if not you, then who else will do it?

Prerequisites: Undergraduate degree.

First Term

Skills: Charm 1, **Determination** 2, **Economics** 2, **Interaction** 2.

Subsequent Terms

Skills: Charm, Determination, Economics, Interaction, Perception.

All Terms

Special Adventure: 6+ for *Language,* **Spacehand, Explore, Vice, Engineer, Melee.**

Contacts: One per term, business or government, non-Ithklur on 8+.

Other Effects: +1 SOC per term. 1 ship DM per term for a Trader ship.

Mechanic

"They also serve who fix and mend." Things break down, machines need maintenance—these are facts of life for the Ithklur as much as for any other race.

Prerequisites: None.

First Term

Skills: Technician 6, **Vehicle** 1.

Subsequent Terms

Skills: Economics, Interaction, Intrusion, **Technician, Vehicle.**

All Terms

Special Adventure: 7+ for **Determination, Engineer, Explore, Spacehand, Vice, Melee.**

Contacts: One per term, a specialist in one of the above skills, non-Ithklur on 8+.

Other Effects: None.

Navy

This career covers Ithklur serving in either the Hive Federation Navy or the Independent Ithklur Navy.

Prerequisites: INT 8+ or EDU 7+.

First Term

Skills:

Enlightened: Gun Combat 1, **Spacehand** 1, **Space Vessel** 1, **Space Tech** 2, **Tactics** 1, **Determination** 1.

Elementary: Gun Combat 1, **Spacehand** 2, **Space Tech** 2, **Technician** 2.

Subsequent Terms

Skills:

Enlightened: Spacehand, Space Vessel, Space Tech, Physical Science, Technician, Tactics, Determination, Charm.

Elementary: Spacehand, Space Tech, Technician, Vice, Charm.

All Terms

Special Duty: 8+ for **Gun Combat, Melee, Aircraft, Vehicle, Artillery, Interaction,** *Medical,* **Acrobat, Crime, Perception.**

Contacts: One per term, Military, plus one per special duty, non-Ithklur on 8+.

Other Effects: 1 ship DM per term.

Security

Security forces go where soldiers would prove politically sensitive: embassy guards, diplomatic bodyguards, escorts and so on.

Prerequisites: INT 7+, CHR 6+, STR 8+

First Term

Skills: Charm 1, Gun Combat 1, **Interaction** 2, *Language* **1, Melee** 1, **Perception** 1, **Social Science** 1.

Subsequent Terms

Skills: Charm, Determination, Gun Combat, Interaction, Melee, Social Science, Vice, Vehicle.

All Terms

Special Assignment: 6+ for **Crime, Explore, Gun Combat,** *Language,* **Melee, Perception, Personal transport,** Spacehand.

Contacts: One per term, government or military, non-Ithklur on 8+.

Other Effects: +1 Initiative if more than one term served.

Wet Navy

The wet navy crews armed nautical vessels that protect the sealanes of a world.

Prerequisites: INT 8+ or EDU 4+. Pop=Moderate+.

First Term

Skills:

Enlightened: Gun Combat 1, **Vessel** 2, **Technician** 2, **Artillery** 1, **Determination** 1.

Elementary: Gun Combat 1, **Vessel** 3, **Heavy Weapons** 1, **Artillery** 1, **Technician** 2.

Subsequent Terms

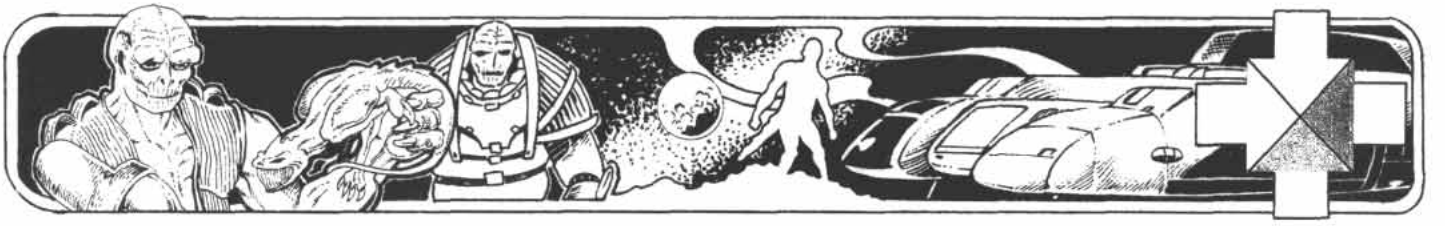
Skills:

Enlightened: Artillery, Vessel, Physical Science, Technician, Tactics, Determination, Charm, Personal Transport, Vessel.

Elementary: Artillery, Heavy Weapons, Technician, Vice, Charm, Personal Transport, Vessel.

All Terms

Special Duty: 8+ for **Gun Combat, Melee, Aircraft,**



Vehicle, Interaction, *Medical,* **Acrobat, Crime, Perception, Personal Transport, Explore.**

Contacts: One per term, military, non-Ithklur on 8+.

Other Effects: None.

GUARDIAN PATH

The Guardian Path, although recognized by Ithklur philosophy as being of lower esteem than the Facilitator Path, is nonetheless held in the highest emotional esteem by the Ithklur at large. This is perhaps why Ithklur philosophy had to specifically assert that the Facilitator Path was the most important, because otherwise all Ithklur would wish to be Guardians.

Enlightenment: 11+, DM=(STR + CHR –14).
Advancement: 13+, DM=(STR + CHR –14).

Athlete

Competition purifies the spirit, hardens the body and prepares both for the rigors of life. The professional athlete earns a living doing what others do as a hobby. See page 62 for a description of Ithklur sporting events.

Prerequisites: CON 10+ or AGL 9+ or STR 11+. Homeworld Pop=Mod+.

First Term

Skills: Acrobatics 4, **Archaic Weapons** 2, Early Firearms 1, Archaic Artillery 1.

Subsequent Terms

Skills: Acrobat, Archaic Weapons, Determination, Early Firearms**, Melee, Personal transport.**

All Terms

Special Adventure: 8+ for **Artillery, Charm, Crime, Economics, Explore, Melee, Perception, Vice.**

Contacts: One business, journalist, entertainment, medical or specialist (Acrobatics or Melee) per term. If a special adventure is rolled, one additional contact of any type, non-Ithklur on 8+.

Other Effects: For each term as an athlete, use the higher of STR, AGL or CON instead of SOC when calculating starting money. During each term as an athlete, any one physical attribute (STR, AGL or CON) may be increased by 1 (up to 3 each). At the end of each term, SOC is increased by 1 (up to a maximum of 2 more than its original level; any further potential increases are no effect).

+1 to Initiative if more than one term served.

Bounty Hunter

Ithklur bounty hunters have a fairly high success rate, which is not unusual considering their size and background. Often, upon discovering that they are being trailed by an Ithklur, a criminal will seek out officials of another race in order to surrender before the Ithklur can find them.

Prerequisites: STR 6+, 6+.

First Term

Skills: Determination 2, **Gun Combat** 1, **Melee** 1, **Perception** 2, **Spacehand** 1.

Subsequent Terms

Skills: Animal Handling, Charm, Determination, Gun Combat, Melee, Perception, Personal transport, Spacehand, Vice.

All Terms

Special Adventure: 6+ for **Crime, Explore, Interaction, Melee, Space Tech, Space Vessel.**

Contacts: One per term, criminal or government, non-Ithklur on 8+.

Other Effects: When figuring beginning cash, use INT+Streetwise instead of SOC for each term as a bounty hunter. If more than one term is served, +1 to Initiative. 1 ship DM per term for a Scout/Courier (in the Old Expanses, this is usually a human ship modified to Ithklur standards) or Hiver utility vessel.

Ground Troops

This career represents service in the planetary ground forces of one of the worlds of the Hive Federation or the Ithklur Independent Client State.

Prerequisites: STR 7+, CON 6+. Homeworld Tech=Industrial+. Pop=Moderate+. Atmos=Thin+.

First Term

Skills:

Enlightened: Gun Combat 2, **Explore** 1, **Heavy Weapons** 1, **Artillery** 1, **Tactics** 1, **Determination** 1.

Elementary: Gun Combat 2, **Melee** 2, **Heavy Weapons** 1, **Explore** 1, **Acrobat** 1, **Technician** 1.

Subsequent Terms

Skills:

Enlightened: Gun Combat, Explore, Heavy Weapons, Tactics, Determination, Personal Transport.

Elementary: Gun Combat, Melee, Heavy Weapons, Explore, Vice, Personal Transport.

All Terms

Special Duty: 8+ for **Archaic Weapons, Melee, Aircraft, Charm, Crime, Spacehand, Vehicle, Artillery, Interaction,** *Medical,* **Acrobat, Technician, Perception, Spacehand.**

Contacts: One per term, military, non-Ithklur on 8+.

Other Effects: +1 Initiative if more than one term served.

Martial Artist

The Ithklur have many schools of both armed and unarmed martial arts, some dating back millennia, some relatively recent.

Prerequisites: None.

First Term

Skills: AGL +1, STR +1, **Acrobat** 1, **Determination** 1, **Melee** 3.

Ithklur Anecdote

A physical training program had just concluded in the recreation area of an RCES vessel. The room's chairs, which were normally arranged in a series of semicircles for viewing the large holoscreen, had been pushed off to various sides of the room to make space for an exercise area. As the compartment cleared out at the completion of the exercises, an Ithklur Marine attached to the crew (who was not even winded by the strenuous exercises) stood regarding the chairs with an air of dissatisfaction.

Then he began to carefully rearrange the chairs in their semi-circular arrangement, focused on the holoscreen. When one of his human crewmates approached him, asking him why he was doing that, he replied, "I am returning them to their proper relationship with their god so that they can worship it again."





Subsequent Terms

Skills: Characters receive skills on the normal basis from Group A. Alternatively, for each two levels not taken from group A in a single term, one level may be taken from group B.

Group A: Interaction, Determination, Melee, Acrobat, Archaic Weapons.

Group B: STR +1, AGL +1, CON +1, SOC +1.

Special Adventure: 6+ for **Vice, Crime, Perception, Gun Combat, Vehicle, Technician, Melee**

Contacts: One per term, business, criminal or specialist (martial arts), non-Ithklur on 8+.

Other Effects: Use INT instead of SOC for determining starting money per term. If one or more terms are served, +1 Initiative.

Mercenary

The Hivers are not the only ones to appreciate the special Ithklur talent for war. Ithklur mercenaries are much in demand, for obvious reasons. They are rather scarce in the Old Expanses, but are not completely unknown.

Prerequisites: STR 6+, prior term in Ground Troops or Strike Force.

First Term

Skills: Gun Combat 1, **Interaction** 2, *Language* 1, **Melee** 1.

Subsequent Terms

Skills: Acrobat, Determination, Explore, Gun Combat, Heavy Weapons, Interaction, Melee, Perception, Personal transport, Vehicle.

All Terms

Special Duty: 8+ for **Artillery, Engineer (except Starship Architecture), Melee, Personal transport**, Screens, **Spacehand.**

Contacts: One per term, criminal, government, intelligence community, military or another mercenary, non-Ithklur on 8+.

Other Effects: Roll 1D10 once per term. On a roll of 9, the character must spend the next term in a noncombat career due to serious wounds. A roll of 10 means the character was captured by the opposition and must spend the next term as a prisoner. If more than one term is served, add +1 to Initiative. One ship DM per term, plus one per special assignment, applied to Trader ship or Warship (character's choice).

Prisoner

Ithklur who have been captured while serving as mercenaries become prisoners.

Prerequisites: Forced due to capture while engaged in the mercenary.

All Terms

Skills: A total of six levels from any one or a combination of the following:

Acrobatics, **Charm, Crime, Determination, Economics, Interaction, Melee, Perception, Vice**, STR+1, EDU+1,

Special Adventure: None.

Contacts: Two per term, military, non-Ithklur on 6+.

Other Effects: No secondary activities allowed. Released after one term. Enlightenment and advancement rolls *are* allowed. Do not count prison terms when calculating starting money.

Strike Force (Ithklur Marines)

The armed ground forces of the Hive Federation Navy consist almost exclusively of Ithklur, the much-feared and respected Ithklur Marines, trained in all manner of orbital assaults and shipboard combat. Ithklur also serve in the Independent Ithklur Navy as Marines.

Prerequisites: STR 8+, AGL 7+. Homeworld Tech=Pre-Stellar+. Population=Moderate+.

First Term

Skills:

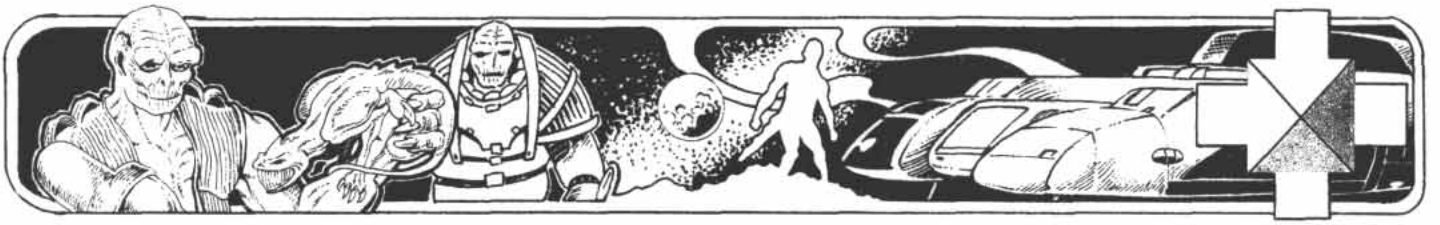
Enlightened: Gun Combat 2, **Melee** 2, **Spacehand** 1, **Heavy Weapons** 1, **Tactics** 1, **Determination** 1, **Personal Transport** 1.

Elementary: Gun Combat 2, **Melee** 2, **Spacehand** 1, **Heavy Weapons** 1, **Acrobat** 1, **Technician** 1, **Personal Transport** 1.

Subsequent Terms

Skills:

Enlightened: Gun Combat, Spacehand, Heavy Weapons, Tactics, Determination, Charm, Personal Transport.



Elementary: Gun Combat, Melee, Heavy Weapons, Spacehand, Vice, Charm, Personal Transport.

All Terms

Special Duty: 8+ for **Melee, Aircraft, Crime, Interaction, Explore, Vehicle, Artillery, Acrobat, Technician,** Screens, **Space Tech, Perception.**

Contacts: One per term, military, non-Ithklur on 8+.

Other Effects: One ship DM per term, plus one per special assignment. +1 to Initiative if more than one term served.

EXPLORER PATH

The Explorer Path is devoted to "the search for knowledge without," in other words exploration of the physical universe, and venturing into the unknown.

Enlightenment: 10+, DM=(CON+INT + CHR –20).
Advancement: 12+, DM=(CON+INT + CHR –20).

Belter

The demand for minerals is felt in all of space, and Ithklur in many systems feel the call to seek their fortunes among the scattered chunks of rock, metal and ice that make up an asteroid belt.

Prerequisites: AGL 6+ and Geology 2+. Homeworld Tech=Pre-Stellar+.

First Term

Skills: Spacehand 2, Geology 1, **Technician** 1, Excavation 1, **Economics** 1, Ship's Engineer 1, **Space Vessel** 1.

Subsequent Terms

Skills: Determination, Perception, Spacehand, Physical Science, Technician, Engineer, Economics, Space Vessel, Interaction.

All Terms

Special Adventure: 6+ for **Gun Combat, Melee,** *Language,* **Space Tech, Charm, Vice.**

Contacts: One per term, criminal, business, trader or law enforcement, non-Ithklur on 6+.

Other Effects: At the end of each term (except the first) roll for a strike. Making a strike is Difficult test of Geology. If the task roll is successful, roll 2D6 and multiply the result by Cr100,000 for the cash income from the strike. In addition, the character receives a seeker ship. The character may continue as a belter and try for additional strikes.

–1 SOC per term (including the first) served unless and until the character makes a successful strike. +3 SOC if a strike is made. No effect on SOC (plus or minus) for being a belter after the first strike is made.

One ship DM per term for a scout/courier, but only if no strike was ever made. +1 to Initiative if more than one term is served as Belter.

Explorer

This career represents service in the FDA (Federation Development Agency), the exploration and contact service of the Hive Federation.

Prerequisites: INT 7+ or STR 8+. Homeworld Tech=Early Stellar+.

First Term

Skills:

Enlightened: Gun Combat 1, **Spacehand** 1, **Space Vessel** 1, **Space Tech** 2, **Physical Science** 1, **Explore** 1, **Determination** 1.

Elementary: Gun Combat 1, **Spacehand** 1, **Space Vessel** 1, **Space Tech** 2, **Technician** 2, **Explore** 1.

Subsequent Terms

Skills:

Enlightened: Charm, Determination, Explore, Perception, Personal transport, Physical Science, Space Tech, Space Vessel, Spacehand, Technician.

Elementary: Charm, Explore, Perception, Personal transport, Space Tech, Space Vessel, Spacehand, Technician, Vice.

All Terms

Special Duty: 8+ for **Acrobat, Aircraft, Animal Handling, Crime, Gun Combat, Interaction,** *Medical,* **Melee, Perception, Tactics, Vehicle.**

Contacts: One per term, government, military or trader, non-Ithklur on 6+.

Other Effects: One ship DM per term as an Elementary , three ship DMs per term as Enlightened, both for a scout/courier. +1 to Initiative if more than one term served as Explorer.

Merchant Marine

The need for this career is the same among the Ithklur as among humans.

Prerequisites: CON 6+ or STR 8+. Pop=Moderate+. Hydro=Wet+.

First Term

Skills:

Enlightened: Determination 1, **Economics** 1, **Explore** 2, **Gun Combat** 1, **Heavy Weapons** 1, **Vessel** 2.

Elementary: Explore 2, **Gun Combat** 1, **Heavy Weapons** 1, **Technician** 1, **Vessel** 2.

Subsequent Terms

Skills:

Enlightened: Charm, Determination, Economics, Explore, Gun Combat, Heavy Weapons, Vessel.

Elementary: Charm, Explore, Gun Combat, Heavy Weapons, Technician, Vessel, Vice.

All Terms

Special Duty: 8+ for **Acrobat, Archaic Weapons, Artillery, Crime, Interaction,** *Medical,* **Melee, Perception, Vehicle.**

Contacts: One per term, business, law enforcement, or specialist (merchant marine), non-Ithklur on 8+.

Other Effects: Two secondary activities allowed per term.

Trader

Ithklur merchant ships and crews are becoming increasingly common in the Old Expanses, especially in the Wilds (where merchants sometimes deserve combat pay).

Prerequisites: INT 7+ or CHR 6+. Homeworld Tech=Early Stellar+.

First Term

Skills:

Enlightened: Economics 2, **Interaction** 1, **Space Tech** 2, **Space Vessel** 2, **Spacehand** 1.

Elementary: Spacehand 2, **Space Tech** 2, **Technician** 2, **Vehicle** 1, **Charm** 1.

Subsequent Terms

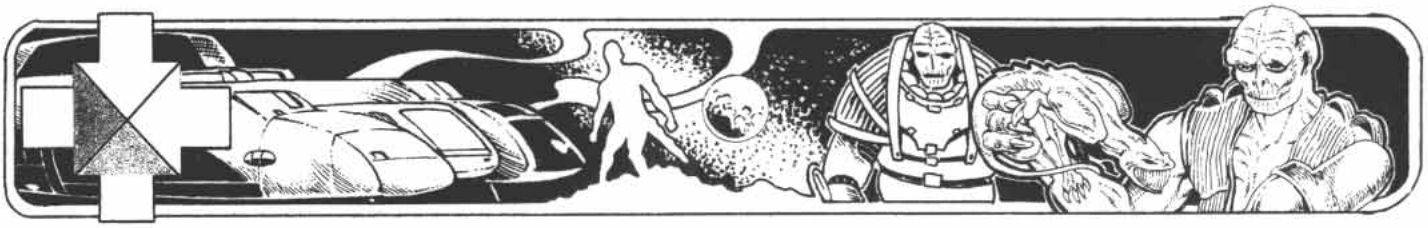
Skills:

Enlightened: Determination, Economics, Interaction, Space Tech, Space Vessel, Spacehand.

Elementary: Charm, Interaction, Space Tech, Spacehand, Technician, Vehicle, Vice.

All Terms

Special Duty: 4+ for **Aircraft, Charm, Crime, Explore, Gun Combat, Melee, Tactics, Vehicle.**





Ithklur Aphorism

So I hit him.

This is perhaps the classic statement of the Ithklur spirit. Most Ithklur fables, anecdotes and stories end with some act of violence, often utterly inexplicable from the human point of view.

Ithklur ethologists theorize that from time to time events so confound or offend an Ithklur that his rationality "snaps," and he reverts to his most basic, vivid, violent nature and simply attacks the offending object. Others assert that certain events confront the Ithklur sense of order, and so to reassert order in his personal universe, the Ithklur is required to punish the offending agent.

Many human observers attribute an existential or Zen-like quality to this aspect of the Ithklur nature, which speaks of an essential psychic connection to and accommodation with the absurd.

Regardless of the true origin, the simple fact of the Ithklur tendency is inarguable.

Contacts: One per term, trader, government or criminal, non-Ithklur on 8+.

Other Effects: Two ship DMs per term served as an Elementary, five ship DMs per term served as Enlightened, both for a trader ship.

SEEKER PATH

The Seeker Path is devoted to "the search for knowledge within," in other words the discovery of eternal immutable truths of science, philosophy, theology and the soul.

Enlightenment: 9+, DM=(INT+EDU+CHR–19).
Advancement: 11+, DM=(INT+EDU+CHR–19).

Diplomat

These are rare in Coalition space, and represent either the independent Ithklur client state or the Hive Federation.

Prerequisites: CHR or INT 8+. Homeworld Pop=Mod+.

First Term

Skills: Charm 3, **Determination** 1, **Economics** 1, **Interaction** 2, *Language* 1.

Subsequent Terms

Skills: Determination, Economics, Charm, Interaction, Perception, Vehicle.

All Terms

Special Duty: 8+ for **Crime, Gun Combat, Melee, Spacehand, Vehicle, Vice.**

Contacts: Two government contacts per term, non-Ithklur on 8+.

Other Effects: Minimum SOC for a diplomat is 5. (All characters with lower SOC have it raised to 5 upon enlistment.) Each level of advancement adds 1 to SOC. One ship DM per term for a scout/courier (in the Old Expanses, these are usually human vessels modified to Ithklur standards) or Hiver utility vessel (provided Homeworld Tech=Early Stellar+).

Medicine

The primary difference between the medical arts among the Ithklur and among humans is that Ithklur medical practitioners do not receive the same social status (or high pay) accorded medical practitioners in human space.

Prerequisites: AGL 6+.

First Term

Skills:

Enlightened: Biology 4, *Medical* 4.

Elementary: Charm 1, *Medical* 2, **Perception** 1, **Physical Science** 1, **Technician** 1, **Vehicle** 1.

Subsequent Terms

Skills:

Enlightened: Charm, Determination, Interaction, *Medical*, **Perception, Physical Science.**

Elementary: Charm, Perception, Physical Science, Technician, Vehicle.

All Terms

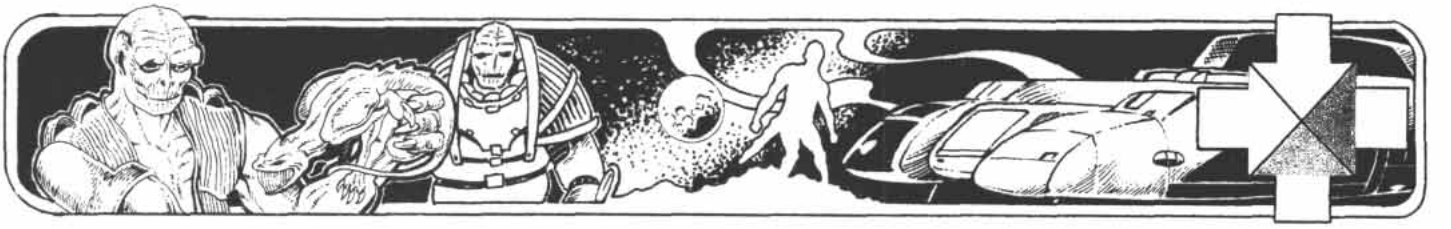
Special Adventure: 8+ for *Language*, *Medical*, **Melee, Spacehand, Vessel.**

Contacts: One per term, medical, non-Ithklur on 8+.

Other Effects: None.

Scientist

The search for knowledge knows know racial limits, and the Ithklur



need scientists as much as anyone else.

Prerequisites: INT 7+ or doctorate in any physical science.

First Term

Skills:

Enlightened: Physical Science 5, *Language* 1, **Perception** 2.

Elementary: Technician 2, **Physical Science** 2, **Interaction** 1, **Artisan** 1, **Perception** 1.

Subsequent Terms

Skills:

Enlightened: Determination, Interaction, Perception, Physical Science.

Elementary: Technician, Physical Science, Perception, Interaction, Vehicle.

All Terms

Special Adventure: 5+ for **Acrobat, Engineer, Explore, Gun Combat, Melee, Spacehand, Vice.**

Contacts: One per term, government or scientist, non-Ithklur on 8+.

Other Effects: One ship DM per term as an Elementary, five ship DMs per term as Enlightened, both for a lab ship.

Philosopher

Someone has to think and wander about and scratch one's head about things. And, from time to time, those who don't think about things need a crack over the head from those who do. It's a service you gladly provide.

Prerequisites: INT 7+, CHR 6+.

First Term

Skills: Social Science 3, *Language* 1, **Perception** 2, *Armed Martial Arts* 2.

Subsequent Terms

Skills: Determination, Melee, Animal Handling, Interaction, Perception, Social Science.

All Terms

Special Adventure: 5+ for **Acrobat, Crime, Explore, Gun Combat, Melee, Spacehand, Vice.**

Contacts: One per term, government or scientist, non-Ithklur on 8+.

Other Effects: One ship DM per term for a scout/courier. +1 to Initiative if more than one term served as Philosopher.

TETRAMEROUS PATH

Players choosing the Tetramerous (or "Four-Fold") Path for their Ithklur characters must choose whether this character will follow the Fascist or Phalangist tradition, below. Either of these traditions may be freely combined with any educational option as well.

Fascist Tradition

In the Fascist tradition, the character combines any careers desired from all four paths (Facilitator, Guardian, Explorer and Seeker). The character must change paths after each term, and may not take an additional term from a given path until a full cycle of all four paths has been completed.

For example, careers in the following pattern are legal: Facilitator, Explorer, Scientist, Guardian, Guardian, Facilitator, Scientist, while careers in the following pattern are not allowed: Guardian, Scientist, Explorer, Guardian, Facilitator, Facilitator.

Any term spent in education does not count toward the fulfillment of a four-path cycle. This places no restriction on the number of education terms that may be taken in a row, but the character must complete the four-path cycle before repeating terms in any path.

Alternately, referees may allow Ithklur characters to be generated who spend several terms in a given path and then begin to take careers in a fascist cycle. This represents an Ithklur who elected to follow the Tetramerous Path later in life. Note that if for any reason a character ends character generation without having completed a full four-path cycle (either by failing the continuation roll or reaching the predetermined end of character generation), that character is considered to still be committed to the Tetramerous Path, but is now doing so in the roleplaying context rather than in character generation.

Followers of the Fascist tradition use rank names from the Tetramerous Path, not from the individual four paths, and also use the following enlightenment and advancement rolls, *not* those of the individual four paths.

Enlightenment: 9+, DM=(STR+INT+CHR–21).
Advancement: 12+, DM=(STR+INT+CHR–21).

Phalangist Tradition

The Phalangist tradition is not easy to describe in the way that the above careers paint a picture of the sort of activities a character is involved in. Each phalangist's path through this tradition is different, and is based on the truth he or she has discovered in combining the strengths and wisdoms of all four paths. To an outside observer, the exact nature of the careers of a phalangist may look very much like the careers of a fascist, but the difference is that while the fascist devotes himself to the values of the various paths sequentially, the phalangist endeavors to combine all four paths in each career term.

Followers of the Phalangist tradition use the below career only, but may also freely combine any and all educational terms with these terms.

Followers of the Phalangist tradition use the rank names of the Tetramerous Path, and the enlightenment and advancement rolls below.

Enlightenment: 10+, DM=(STR+INT+CHR–24).
Advancement: 14+, DM=(STR+INT+CHR–24).

Prerequisites: None.

First Term

Skills:

Enlightened: Gun Combat 1, **Explore** 1, **Melee** 1, **Interaction** 1, **Physical Science** 1, **Social Science** 1, **Determination** 1, **Perception** 1.

Elementary: Gun Combat 1, **Melee** 1, **Explore** 1, **Technician** 1, **Physical Science** 1, **Social Science** 1, **Charm** 1, **Perception** 1.

Subsequent Terms

Skills:

Enlightened: Physical Science, Social Science, Animal Handling, Fine Arts, Artisan, Charm, Determination, Economics, Explore, Acrobat, Interaction, *Medical,* **Perception.**

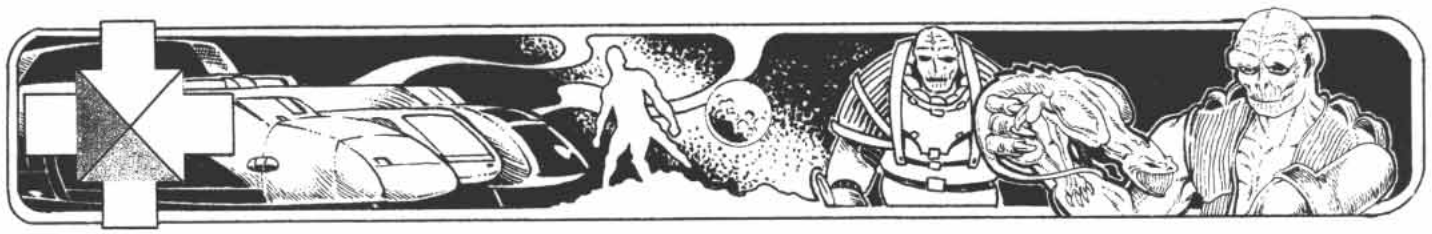
Elementary: Gun Combat, Melee, Explore, Charm, Acrobat, *Medical,* **Physical Science, Engineer, Technician.**

All Terms

Special Adventure: 4+ for **Archaic Weapons, Gun Combat, Melee, Aircraft, Crime, Spacehand, Vehicle, Artillery, Interaction, Technician, Perception, Personal Transport, Animal Handling, Heavy Weapons, Space Tech, Space Vessel, Vice, Vessel, Tactics.**

Contacts: Two per term, any, non-Ithklur on 8+.

Other Effects: +1 Initiative if more than one term served.



ITHKLUR SKILLS

This section discusses how skills differ in application between Ithklur and humans. Players and referees will need to be familiar with the skills as they are defined in the basic rules.

Ithklur Skill Choice

Ithklur aggressiveness represents a reality about this race's psychology and sociology that cannot be denied. These predispositions combine to make certain methods and skills more likely to be used by Ithklur, and certain other methods and skills less likely to be used by the Ithklur. We will impose no new rule limiting the number of skills that may be taken during Ithklur character generation. We will limit ourselves to reminders of certain Ithklur tendencies that players should be aware of and attempt to play in accordance with. As always, referees are the ultimate authority. In this spirit, we present skills that are more and less common among Ithklur characters.

The following skills are notably *more* common among Ithklur than among humans:

Acrobatics, Animal Handling, Archaic Artillery, Archery, Armed Martial Arts, Autogun, Biology, Carousing, Dance, Early Firearms, Energy Weapon, Gambling, Genetics, Grenade Launcher, Ground Tactics, Guard/Hunting Beasts, Gunnery, Heavy Gun, History, Leadership, Muscle Transport, Observation, Painting, Sculpture, Slug Weapon, Stealth, Survival, Thrown Weapon, Tracking, Uarmed Martial Arts, Willpower, Xeno-Biology.

The following skills are notably less common among Ithklur than among humans:

Astrogation, Bribery, Chemistry, Computer, Disguise, Farming, Fleet Tactics, Forgery, Intrusion, Marketing, Pickpocket, RCV Operations, Screens, Ship's Engineering, Starship Architecture.

Interspecies Interaction

Certain skills cannot be used on their own when used in conjunction with another species. Psychology and Persuasion, for example, are not very useful if the user has no knowledge of the basics of another being's thinking or emotional processes.

The skill in **Traveller** used to understand other species and use knowledge and skills in conjunction with those species is Liaison. Because any skill level in Liaison could not imply familiarity with *all* existing intelligent races, referees may treat Liaison as a cascade skill, in which a specialty species (such as human, Hiver, etc.) should be specified. Thus the full skill level is used when dealing with the listed species, and only half the level when dealing with different species. (Naturally referees may impose additional penalties if these other nonlisted species are extremely unusual or unfamiliar to the character.) The following skills when used in conjunction with non-Ithklur require the use of Liaison as an *enabling skill* (**TNE** page 109):

Act/Bluff, Bargain, Bribery, Carousing, Gambling, Instruction, Interrogation, Interview, Leadership, Marketing, Persuasion, Psychology, Recruiting.

Ithklur Use of Traveller Skills

Ithklur use the standard skills from the **TNE** basic rules just as any human character with the following exceptions or modifications:

Acrobatics: The Ithklur tail provides significant advantages in maintaining balance in situations where there is sufficient space to extend the tail, as the Ithklur does not have to extend his/her arms or legs to maintain balance as a human would. Ithklur are also much better able to run in a crouching position than are humans, as they can extend their tails behind them, and do not need to use their hands to keep from falling forwards. In situations where the Ithklur tail can assist with balance (referee's discretion), Acrobatics tasks are one level easier for Ithklur.

Act/Bluff: This skill is rather limited in Ithklur use compared to the standard rules. The Ithklur do not recognize drama or acting, and moreover do not accept lying as a legitimate social activity. Act/Bluff is specifically used only in interaction with Hivers as part of Ithklur "games" (see page 63).

Animal Handling: This skill is also used with certain Ithklur "pets," the so-called "decorative carnivores." (page 89). This skill is used to determine whether or not the Ithklur can control these typically dangerous animals.

Disguise: This skill exists among Ithklur only as the art of personal camouflage. This confers the ability not to disguise oneself as another Ithklur, but only as a shrub, tree stump, piece of ground, etc., for combat, hunting or other tactical purposes.

Interrogation: Interrogation skill is enhanced by the Ithklurs' inherent IR sense, which can enable them to detect minor changes in pulse rate and blood flow if they are trained in questioning humans. Use Liaison as an enabling skill to represent such training. When enabled in this way, all Interview tasks versus humans are made one level easier.

Interview: As with Interrogation skill, above.

Investigation: Their natural IR sense and heightened sense of smell are of value to Ithklur in gathering and interpreting evidence at the scene of a crime or accident. The referee must decide precisely how the Ithklur's senses fit into a situation—enhanced IR vision might enable an Ithklur to know roughly how long a human has been dead (by observing the temperature differential between the body and the surroundings) for example, or might detect traces of a chemical accellerant at the scene of an arson.

Liaison: Ithklur use this as an enabling skill (**TNE** page 109) in certain social/psychological tasks with non-Ithklur.

Medical: There are few significant differences between the Ithklur and human use of this skill except as it applies to the treatment of another race (see Wound Treatment, page 82). As in the basic game, this skill is a cascade: Diagnosis, Trauma Aid or Surgery.

Observation: The referee may wish to implement positive task modifiers to represent the enhanced vision made possible by the Ithklur IR sense. Otherwise, there are no significant differences between the Ithklur and human use of this skill.

Painting: There are no significant differences between the Ithklur and human use of this skill. It is used mainly for decoration of weapons and personal items (see pages 63-64).

Sculpture: There are no significant differences between the Ithklur and human use of this skill. It is used mainly for decoration of weapons and personal items (see pages 63-64). This includes finely detailed woodworking.

Swimming: Because of their powerful tails, all swimming tasks are one difficulty level easier for Ithklur than they would otherwise be for a human.

Tracking: All Tracking tasks are one level easier due to their enhanced sense of smell.

Referees' Section

ITHKLUR NPCS

This is an expansion to the necessarily abbreviated guidelines shown on **TNE** page 69 for how to create Ithklur template NPCs. Detailed Ithklur NPCs can also be created by using the character generation rules found on pages 65-77 of this book.

ITHKLUR MOTIVATIONS

Motivations for Ithklur NPCs are not handled the way they are for other races. Instead of abbreviated personality sketches, the results of the two Ithklur motivation cards show their positions in the life paths of the Tetramerous Way (see pages 51-53). Referees must therefore be familiar with Ithklur sociology and philosophy in order to properly run Ithklur NPCs.

The first card shows whether the NPC is enlightened or an elementary, and the approximate rank if enlightened (flip a coin or roll a die for odds or evens to determine whether the rank is the higher or lower of the range listed). If the NPC is an elementary, there is no need to draw a second card. If the NPC is enlightened, the second card shows if the Ithklur is a disciple of the Tetramerous Path (and which tradition—see pages 52 and 57) instead of one of the separate paths. Note that if the character is on the Tetramerous Path, the rank shown by the first card draw is superseded by the rank shown on the second (tetramerous) card draw.

Naturally this only works if the Ithklur NPC's occupation is not already known. If the referee already knows the type of Ithklur NPC needed, that type will dictate the path as noted under the NPC templates.

Most Ithklur are followers of the Tetramerous Way, but some "aberrant" Ithklur are not. The motivations of these rare Ithklur may be determined using the standard system found on **TNE** pages 60-62.

Referees who are looking for an additional randomizing element to help them firm up the precise personality of an NPC Ithklur may pull a third "personality" card and use the following guidelines. These guidelines are intended only to spur the referee's imagination, as Ithklur eccentricity is unfathomable.

Clubs Numbered Card: The Ithklur has a pet of some kind, perhaps a moderately dangerous decorative carnivore (see page 89) or something as simple as a goldfish or mouse on which he or she lavishes gifts and affection. Such Ithklur may also be inclined to "free the oppressed" (see page 55).

Clubs Face Card or Ace: The Ithklur has an extremely dangerous decorative carnivore (see page 89).

Diamonds Numbered Card: The Ithklur is an artist (painter, carver or sculptor) of above-average ability.

***Diamonds* Face Card or Ace:** The Ithklur is an "art" collector who becomes fascinated by most any imaginable object (snowglobe, letter opener, colander, etc.) and will insist on buying it or trading something for it.

Hearts Numbered Card: The Ithklur adores human culture and is constantly quoting human popular songs, comedians, literature, etc.

Hearts Face Card or Ace: The Ithklur is a particularly avid player of games (see page 63) and is something of a ringleader in corporate Ithklur Hiver-baiting.

Spades Numbered Card: The Ithklur is an avid gardener or botanist. Such Ithklur are inclined to "free the flowers" (see page 54).

Spades Face Card or Ace: The Ithklur is a particularly boisterous individual, prone to knocking people down in "pushing matches" (see page 91), and to mistake most any activity (human joggers, ballet dancers, mimes; aerobics instructors) for a game of "Calvin Ball" (see page 62) and start tackling people.

ITHKLUR NPC TEMPLATES

Ithklur Mercenary

These are becoming more and more common in the Old Expanses, and are usually found in small units consisting completely of Ithklur plus one or two local representatives.

Path: Guardian or Tetramerous.

Level: Elite.

Combat Assets: Energy Weapon (Rifle) or Slug Weapon (Rifle), *Armed Martial Arts*, and Unarmed Martial Arts, plus any two from **Heavy Weapons** or **Artillery**.

Other Assets: One from **Technical** or **Vehicle** at 10, plus Ground Tactics 16, Leadership 16 if Enlightened.

Bounty Hunter

Ithklur bounty hunters have a fairly high success rate, which is not unusual considering their size and background. Often, upon discovering that they are being trailed by an Ithklur, a criminal will seek out officials of another race in order to surrender before the Ithklur can find them.

Path: Guardian or Tetramerous.

Level: Veteran.

Combat Assets: Energy Weapon (Rifle) or Slug Weapon (Rifle), *Armed Martial Arts*, and Unarmed Martial Arts.

Other Assets: Three from **Charm**, **Crime**, **Determination**, or **Vice** at 12, plus two from **Technical**, **Spacehand**, **Space Tech**, or **Space Vessel** at 10.

Itinerant Warrior-Philosopher

Travelling alone, these Ithklur live simple lives, constantly on the move, seeking knowledge. After all, this is how *San*klaass* got his start.

Clubs: Guardian Path

Card	*First*	*Second*
Ace	Enlight 7-8	Fascist 7-8
King	Enlight 5-6	Fascist 5-6
Queen	Enlight 3-4	Fascist 3-4
Jack	Enlight 1-2	Fascist 1-2
8-10	Elementary	No change
5-7	Elementary	No change
2-4	Elementary	No change

Diamonds: Explorer Path

Card	*First*	*Second*
Ace	Enlight 7-8	Phalangist 7-8
King	Enlight 5-6	Phalangist 5-6
Queen	Enlight 3-4	Phalangist 3-4
Jack	Enlight 1-2	Phalangist 1-2
8-10	Elementary	No change
5-7	Elementary	No change
2-4	Elementary	No change

Hearts: Facilitator Path

Card	*First*	*Second*
Ace	Enlight 7-8	Fascist 7-8
King	Enlight 5-6	Fascist 5-6
Queen	Enlight 3-4	Fascist 3-4
Jack	Enlight 1-2	Fascist 1-2
8-10	Elementary	No change
5-7	Elementary	No change
2-4	Elementary	No change

Spades: Seeker Path

Card	*First*	*Second*
Ace	Enlight 7-8	Fascist 7-8
King	Enlight 5-6	Fascist 5-6
Queen	Enlight 3-4	Fascist 3-4
Jack	Enlight 1-2	Fascist 1-2
8-10	Elementary	No change
5-7	Elementary	No change
2-4	Elementary	No change



Path: Seeker or Tetramerous.

Level: Veteran.

Combat Assets: Energy Weapon (Rifle) or Slug Weapon (Rifle), *Armed Martial Arts*, and Unarmed Martial Arts, plus any two from **Acrobat**.

Other Assets: Any five from **Charm, Social Science, Physical Science, Determination, and**/or **Perception** at 12.

ITHKLUR AND PSIONICS

Ithklur, unlike Hivers, have some psionic potential, but Ithklur have less than do humans. Generate an Ithklur character's psionic rating by rolling 2D6–2, then subtract one for each four-year block over age 17 without psionic training.

Ithklur are unable to use any skills from the Telephysics cascade, Teleportation, or any skills from the arcana sub-cluster. Ithklur characters may not achieve any stage of psionic success higher then stage 5.

The Ithklur represent an alien evolutionary path (as discussed on page 249 of the basic rules). Thus any human psionic attempting to use Telempathy, Project Emotion, Project Thought or Probe on an Ithklur automatically subtracts one stage of success. Ithklur are likewise subject to the same penalty if they attempt to use Telempathy, Project Emotion, Project Thought or Probe on humans. Hivers are a very alien evolutionary path from both Ithklur and humans, so both would subtract two stages of success.

Psionic Institutes: Among the Ithklur, those with psionic powers have not been subjected to the tremendous prejudice and persecutions that they endured, and institutes for the study of psi powers and the training of those who possess them are not restricted in any way. Because of the relative lack of such powers among the Ithklur, however, psionic institutes are few and far between, and not easy to find. The techniques of psi training are much the same, even from race to race, however, and Ithklur can undergo training at human psi institutes (and vice versa). Ithklur characters in the Old Expanses may search for psi institutes in the same manner described on page 245 of the basic rules.

Psi Drugs: Psionic drugs differ from race to race, sometimes radically. Human psi drugs have no effect on Ithklur psi talents and vice versa. At their option, referees may implement rules for inter-race psi drug effects, but such use should always have side-effects and drawbacks.

Because of the relative lack of psi powers among Ithklur, the manufacture and sale of psi drugs is not a large industry. Only Ithklur booster is available, and it effects Ithklur in the same way as human booster does humans (see page 258 of the basic rules). Locating a dealer in Ithklur booster is an Impossible test of Streetwise on any given world in the Old Expanses, Formidable within the Reformation Coalition or at any Hiver permanent base. Roll 1D3 for the number of doses available at a base price of Cr2500. Ithklur booster has no effect on humans and vice versa.

Ithklur psi drug users face the same drawbacks as do human users, as described in the Pitfalls section on page 258 of the basic rules.



Appendix

PLANETARY COMBAT

All TNE page references are to the Mark I, Mod 1 printing (also known as the second printing). Unless otherwise indicated, if a rule is not mentioned, it applies to both Hiver and Ithklur without modification.

Hivers: Hivers are not suited to fighting either intellectually or emotionally, and prefer their combats to be at ranges where dispassionate thought can override their instinct to flee. To a Hiver, the more high tech (and long range) a given weapon, the more attractive it is. Hivers prefer pistols over clubs, rifles over pistols, artillery over rifles, starship turrets over artillery, and arranging for someone else to do the fighting most of all.

Initiative

Hivers: All rules on pages 264-265 of the basic rules regarding Initiative apply to Hivers, except the rule on *High Initiative Characters* (as no Hiver may have an Initiative higher than 2) and the Template NPC Initiative table. Burdened Hiver characters suffer no Initiative penalties, but my only walk or crawl.

Ithklur: Ithklur Initiative follows the rules outlined on pages 264-265 of the basic rules without exception.

Movement

Movement is as noted on page 265 of the basic rules.

Hivers: Hiver movement rates are 2/10/20/—, meaning they may crawl two meters per turn, walk 10 and trot 20 (Hivers may not run due to limitations in their physiological makeup). Hivers must use at least four limbs in order to trot, and at least three in order to crawl or walk. Limbs not used for movement may be used as arms (to carry items) if desired.

Ithklur: Ithklur movement rates are 2/10/20/30 and are therefore the same as human movement rates.

ACTIONS

Combat Actions

All rules on pages 266-268 of the basic rules apply, except as follows:

Hivers: 1. Hivers may go prone or stand up without any movement penalty. 2. Hivers may not use deck hatches to mount/dismount a vehicle unless these are specially designed for use by Hivers. They require two turns to mount/dismount via a side or rear door. 3. Hivers may not run.

Involuntary Actions

The following discussions modify the Involuntary Actions rules on page 268 of the basic rules. These rules apply to Ithklur unchanged (although the Ithklurs' slightly higher Initiative will make them less likely to panic in most situations).

Hivers & Panic: Hivers are more susceptible to panic than human characters. Most Hivers must roll for panic under the following circumstances (see exception on page 36):

- When knocked down.
- When surprised.
- When they come under fire for the first time in a particular combat.
- Each time they are wounded, unless the wound is a Scratch wound (except in the head—see below).

Hivers automatically panic if:

- Their blowhole is covered during melee combat (i.e., they are strangled).
- Their head limb takes any wound (including a scratch wound).

When a Hiver tests for panic, roll 1D6. If the result is greater than its Initiative rating, the Hiver panics. For a Hiver, panic means much the same as it does for humans: A panicked Hiver will freeze and can take no actions for the number of turns equal to the amount by which the die roll exceeded the Hiver's Initiative. On the second turn of panic (if any) the Hiver may go prone and must remain there for the remainder of its panic.

If the die roll exceeds the Hiver's Initiative by 3 or more, the Hiver will flee if it can do so without exposing itself to increased danger, running for the duration of the panic. If this is not possible, it will go prone and crawl toward the best protected position within 10 meters. If this is not possible, the Hiver will go prone, tuck its eyestalks inside the fingers of its head (if it is not wearing a helmet), shield its head with its other limbs as much as possible, and take no further actions for the duration of the panic.

Hivers & Bail-Out: For Hivers, bail-out is automatic (except as noted below) when a vehicle is penetrated by any fire (final penetration greater than armor value) from anything other than small arms. When penetration happens, Hivers will exit the vehicle, seek the nearest cover within two meters and remain there for two turns.

In situations where the Hiver cannot bail out without risking death or serious injury (when travelling at extremely high speed, for example, or at a high altitude without a parachute), the Hiver will completely freeze and be unable to take any action (including communication) for a period of 1D3 turns. This includes Hivers acting as pilots and drivers.

Hivers & Charge: This rule applies to Hivers unchanged.

COMBAT RESOLUTION

"If you can persuade a Hiver to wrestle, they can hold their own—they're low to the ground and they have a lot of arms, which makes up for some of their inexperience. Hivers, however, hate melee worse than I hate asparagus. They are fair at fire combat, although they are a little prone to cut and run when the range is short."

Sgt. Vladimir "Sugar" Dzugishvilli
RCMC Nonhuman Orientation Seminar

Melee Combat

Hivers: Hivers don't have melee combat skills (except possibly Unarmed Martial Arts at level 0), but if flight is not an option and they have not panicked, they will defend themselves (using the Unskilled Tasks rule as noted on page 108 of the basic rules).

Ithklur: The larger attributes of the Ithklur will (on the average) result in a larger Unarmed Combat value than in humans.

Ithklur can do all eight unarmed melee strike attacks as discussed in the basic rules: hand strikes, kicks, leaping kicks, throws, diving blows, grapples, escapes and strangling. In addition, they can also undertake a tail strike, as follows:

Tail Strikes: The Ithklur's powerfully muscled tail can be used to strike blows during melee combat. A tail strike action may be made *in addition* to any hand strike, grapple, escape, or strangle action, thus giving Ithklur characters two attacks per unarmed combat action. The target of the tail strike must be behind or to the side of the Ithklur, but may not be to its front (see diagram, page 82). A tail strike may not be carried out at the same time as a kick, leaping kick, throw or diving blow. Ithklur may make aimed strike attacks using their tail and block attacks using their tail, but in both cases only if the tail strike is their only action.

Damage from a tail strike is equal to *twice* the Ithklur's normally calculated unarmed combat damage.



Hiver and Ithklur Personal Hit Location

	Hiver	*Ithklur*
1	Head Limb	Head
2	Right Front Limb	Right Arm
3	Left Front Limb	Left arm
4	Body	Chest
5	Body	Abdomen
6	Body	Abdomen/Tail*
7	Body	Right Leg
8	Right Rear Limb	Right Leg
9	Left Rear Limb	Left Leg
10	Reproductive Limb	Left Leg

* A hit in this location from the rear will hit the tail.

Ithklur Permitted Tail Strikes

No	No	No
Yes	⬆	Yes
Yes	Yes	Yes

⬆ = Ithklur facing in direction of arrow

WOUNDS AND DAMAGE

Hiver Target Protection: Hivers make use of armor protection specifically designed for their body form. The areas protected by various types of armor are discussed in the Equipment section on page 84.

Ithklur Target Protection: Ithklur body armor covers the same areas as human body armor.

Quick Kill: The quick kill rule on page 285 of the basic rules applies to Ithklur as written. Head limb hits on a Hiver cannot result in a quick kill, however—only hits to the body.

Falls

Hivers and Ithklur take damage from falls as described on page 287 of the basic rules, but Hivers take 2D6+1 per meter fallen, and Ithklur take 2D6+2 per meter fallen. This is because Hivers and Ithklur are heavier than humans, and the kinetic energy generated by their impact will be greater.

WOUNDS EFFECTS AND HEALING

With the exceptions noted below, these work as noted in the basic rules on pages 288-290.

Immediate Effects

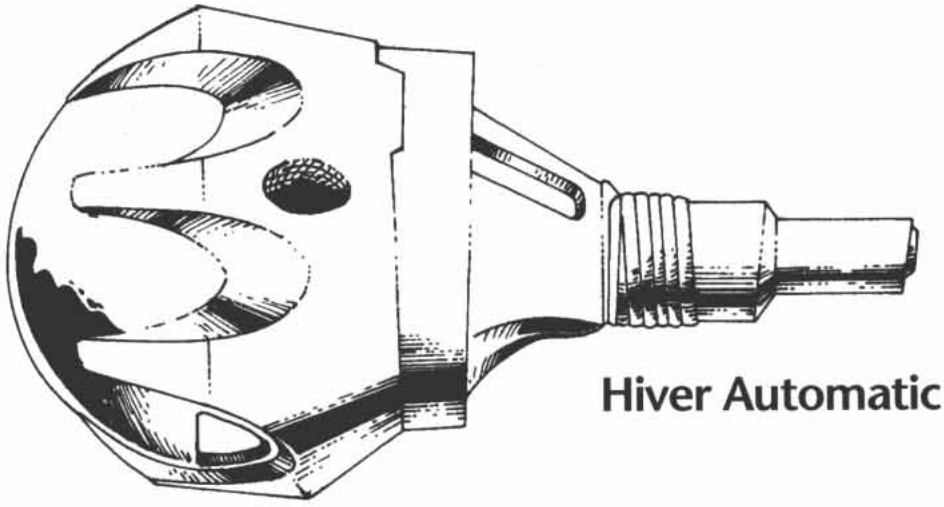
Knockdown and stun for Hivers and Ithklur are as noted on page 288 of the basic rules. The larger average attributes of the Ithklur will make them tougher to knock down and to stun.

Wound Severity

Wound severity for both Hivers and Ithklur is as noted on page 288-289 of the basic rules, except that Hiver NPCs have a wound capacity of 44, and Ithklur NPCs have a hit capacity of 48.

Healing

The rules on healing apply to both Hivers and Ithklur as noted on pages 289-290 of the basic rules. Referees are reminded of the restrictions placed on medical treatment of other races as discussed on page 123 of the basic rules. Ithklur medics will have no penalties imposed while treating Ithklur, but human or Hiver medics will unless another skill (Biology or Xeno-biology) is used as an enabling skill for the task. An Ithklur medic treating a human will also have penalties imposed, all other things being equal.



Hiver Automatic Pistol

Equipment

EQUIPMENT

All equipment listed in the basic rules is available to Hiver and Ithklur characters, in models suited to their own race, at the same price, mass, volume and so on as for humans, except as noted below.

Assorted Equipment

Hiver Utility Harness: Since Hivers wear no clothing in normal circumstances, this item provides them with a convenient means of carrying the various items a technological civilization demands. Most consist of a collection of straps running around each leg and connected together on both top and bottom of the central body, leaving the blowhole (on the top) and mouth (bottom) open. Harnesses have several pockets and pouches for small items, plus quick-release attachment links for other items of equipment such as translators, weapon holsters, scanners and so on. Filters, respirators and the like are attached to the top of the harness, covering the blowhole. An electronic psionic shield can be installed in the harness at an additional cost (see below).

Worn as clothing, the Hiver utility harness has negligible mass and volume, and costs Cr50.

Medical Equipment

Automed, Hiver: This model of automed is designed specifically to accommodate Hivers. A Hiver automed is larger than a human or Ithklur model, and shaped like a large clam rather than a box (2.5 meters across and about 1.2 meters thick). Hiver automeds in the Old Expanses can be reprogrammed to treat humans or Ithklur as well as Hivers (and contain the appropriate drugs for such treatment), but the medical modifier becomes +2 instead of +3. Hivers cannot fit inside a human or Ithklur automed.

TL	*Vol*	*Weight*	*Price*	*Medical Mod*
13	6 kiloliters	9 tonnes	MCr0.6	+3

Automed, Ithklur: Ithklur automeds are slightly larger than Human automeds, but operate identically. Ithklur automeds can be programmed to treat humans as well as Ithklur (and contain the appropriate drugs for such treatment), but the medical modifier becomes +2 instead of +3.

Hivers cannot fit inside an Ithklur automed.

TL	*Vol*	*Weight*	*Price*	*Medical Mod*
13	3.5 kiloliters	5.2 tonnes	MCr0.4	+3

Drugs

Hiver and Ithklur drugs do the same things for Hivers and Ithklur as human drugs do for humans, but drugs used for one race can seldom be used on another, and are often toxic to a greater or lesser degree. (Interestingly, the whole point behind most drugs is that they are toxic to one thing or another, up to and including the brain cells of the user.) Hiver and Ithklur drugs are extremely scarce in the Wilds but are available on most worlds of the Reformation Coalition due to the Hiver/Ithklur presence there (although at a higher price then corresponding human drugs).

Nonmedicinal Drugs: As mentioned earlier, both the Hivers and Ithklur shun the use of anagathics. Hivers make use of combat drug from time to time, as do some Ithklur (although many Ithklur consider its use an unfair advantage). Ithklur psi booster drug is discussed on page 80.

Drugs (Hiver and Ithklur)

Drug	*Per Dose*
Antibacterial Vaccine	Cr20
Whole Blood	Cr125
Local Anesthetic	Cr25
Total Anesthetic	Cr125
Antitoxins	Cr25
Antibiotics	Cr65
Blood Plasma	Cr15
Antinerve Agent	Cr65
Antivenin	Cr65
Metabolics	Cr1250
Broad Spectrum Vaccine	Cr25
Antiviral Vaccine	Cr25
Combat Drug	Cr950

Vac Suits

Vac Suit, Hiver: Hiver vac suits are constructed at TL14, and consist of a two-part central body with "gloves" (or "boots" depending on your point of view) covering each limb and a helmet for the head. Hiver vac suits are self-sealing as a standard feature, and come in general purpose and hostile environment models. Price as noted below does not include a helmet, PLSS or any accessories.

General-Purpose Vac Suit, Hiver

TL	*Armor*	*Volume*	*Weight*	*Price*
14	1	0.3 kl	0.55 kg	Cr5000

Hostile Environment Vac Suit, Hiver

TL	*Armor*	*Volume*	*Weight*	*Price*	*AGL Mod*
14	3	2.8 kl	26.25 kg	Cr160,000	–2

Accessories and Miscellaneous Accessories: Use the statistics supplied in the basic rules for PLSS and other accessories. Ithklur helmets are effectively identical to human models.

Hiver helmets are as noted below. Note that they come in two varieties, with finger gloves that allow the manipulation of objects outside the helmet, or as hard bubble helmets which allow the fingers inside the helmet to operate equipment such as vision devices, cameras, etc.

Hiver hard bubble helmets may be fitted with additional vision enhancements, as noted under the "goggles" entry, below. These may only be added to the nonfinger glove helmets, as the fingers must be retained within the helmet to operate the vision enhancement controls.

Helmets, Hiver

TL	*Special Features*	*Volume*	*Weight*	*Price*
8	Hard bubble, no features or fingers	10 liters	2 kg	Cr800
8	Finger gloves	10 liters	1 kg	Cr1600
14	Integral Heads-Up Display (no gloves)	10 liters	1 kg	Cr1200

Vac Suits, Ithklur: Except for increased size and cost, these are identical to human models. Ithklur vac suits are available in general-purpose and hostile environment models at tech levels ranging from 12 to 14, with the same accessories as human models. Differences in size and cost are noted below. Where an item is not mentioned, it is identical with the human item. Ithklur do not use tailored vac suits, body pressure suits or the soft helmet option available with human TL14 suits. Price as noted below does not include a helmet, PLSS or any accessories, which are identical to those listed in the basic rules for human suits (for game purposes, Ithklur respiration is identical to human).



General-Purpose Vac Suit, Ithklur

TL	Armor	Volume	Weight	Price	AGL Mod
12	1	1 kl	2.2 kg	Cr7700	–1
13	1	0.6 kl	—	Cr7700	
Self-Seal Option			1.1 kg	+Cr6600	–1
14	1	0.2 kl	—	Cr7700	
Self-Seal Option			0.55 kg	Cr5500	

Hostile Environment Vac Suits, Ithklur

TL	Armor	Volume	Weight	Price	AGL Mod
12	2	3.3 kl	44 kg	Cr19,800	–3
13	2	2.2 kl	11 kg	Cr22,000	–2
14	3	2.9 kl	27.5 kg	Cr165,000	–2

Vacuum and Hostile Atmosphere Survival Equipment

Masks, Filters and Respirators: Human and Ithklur masks, filters and respirators are identical in game terms. (Ithklur filter masks are worn over the mouth and are used with air-tight headbands to seal off the nostrils.) Hiver versions of this type of equipment function identically, but are designed to be attached to a Hiver utility harness and thus held in position over a Hiver's blowhole.

Communication Equipment

Hiver Translator: This device combines the functions of a portable computer, a three-kilometer radio and an electronic translator. It is operated by the rear limb (opposite the "head" limb).

TL	Vol	Wt	Price
14	2.5	1.1 kg	Cr25,000

Vision Enhancement Equipment

Hiver Hexoculars: The Hiver instrument that is their equivalent to human binoculars is generally referred to as "hexoculars" because it is constructed for the six-fold vision of the Hivers. In the simplest form, a set of Hiver hexoculars consists of a spherical central handle (which the user grasps with the fingers of its head), surrounded by six sets of lenses (prismatic or electronic, depending on tech level). Electronic, image converter and PRIS hexoculars function in game terms exactly as described in the basic rules (pages 342-343).

PRIS hexoculars have their lens systems mounted on individually extensible arms (in an arrangement similar to human artillery binoculars)

Type	TL	Vol	Weight	Price
Hexoculars	4	6 liters	3 kg	Cr225
Electronic	8	6 liters	6 kg	Cr2250
Image converter	10	6 liters	4 kg	Cr10,500
PRIS	12	8 liters	8 kg	Cr36,000

Hiver "Goggles": Hivers do not make use of goggles in the human sense, as it would be silly to strap a little cup over he end of each eyestalk. Where a human would use goggles, a Hiver uses a hard bubble helmet covering the entire sensory cluster of the head appendage, often fitted with vision enhancements as noted below. The standard hard bubble helmet serves a Hiver as conventional goggles, providing protection from wind-blown dust and debris. Price and mass shown below do not include the hard bubble helmet. Note that Hiver IR sense is not as well-developed as that of the Ithklur, and they need IR goggles from time to time.

Type	Vol	Mass	Price
Combination IR/LA	*	+1 kg	+Cr7500
Infrared	*	+0.25 kg	+Cr3000
Light Amplifier	*	+0.75 kg	+Cr6000

*Volume added to the helmet is negligible.

Ithklur Goggles: Ithklur have little need of IR goggles and normally use only light amplification models identical in function to human ones.

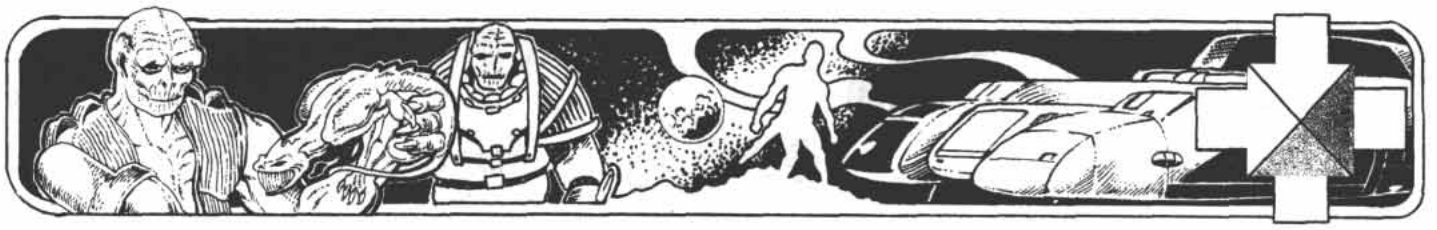
Hiver Armor

	TL	Vol (liters)	Wt (kg)	AV	AV vs lasers	Hit Location	Price (Cr)	AGL	INIT
BW Helmet	8	1.2	0.6	1(2)	—	(H)	55	—	—
BW "Vest"	8	2	5	1(2)	—	B	420	—	—
BW Body Suit	8	5	12	1(2)	—	B, L	975	–1	—
Combat Env. Suit	9	5	12	1(2)	—	B, L	7275	–1	—
Visored (airtight) Helmet	14	10	1	4	4	H	1025	—	—
Combat armor	14	42	19	4	4	H, B, L	11,350	–1	–1
Battle Dress	14	105	312	8	8	H, B, L	229,165	–1	–1

Hit Location Abbreviations: H = full head coverage, (H) = partial head coverage, B = body, L = other (non-head) limbs. See Hiver Personal Hit Location table, page 82.

Ithklur Armor

	TL	Vol (liters)	Wt (kg)	AV	AV vs lasers	Hit Location	Price (Cr)	AGL	INIT
BW helmet	8	1.2	0.6	1(2)	—	(H)	55	—	—
BW vest	8	1.1	4.5	1(2)	—	C, A	440	—	—
BW body suit	8	3	10.3	1(2)	—	C, A, Ar, L	1023	–1	—
Combat Env. suit	9	3	10.3	1(2)	—	C, A, Ar, L	7625	–1	—
Visored (airtight) Helmet	12	2.2	2	3	3	H	1012	—	—
Combat Armor	12	44	22	3/2	3/2	C, A, Ar, L	9570	–1	—
Battle Dress	12	110	217	6	6	C, A, Ar, L	160,600	–2	–1
Visored (airtight) Helmet	14	2.2	1.3	4	4	H	1073	—	—
Combat Armor	14	44	20	4	4	C, A, Ar, L	11,090	–1	—
Battle Dress	14	110	326	8	8	C, A, Ar, L	240,080	–1	–1



PROTECTIVE CLOTHING

Psionic Shields

Since a Hiver's brain is in its central body, not in its head limb, Hivers concerned about psionic attacks wear a psi shield harness. This is similar in operation to the psi shield helmets used by humans and Ithklur, but designed to be incorporated into a standard Hiver utility harness or body armor. Any Hiver harness, grav belt, BW vest, BW body suit, combat environment suit, combat armor or battle dress can have a psionic shield fitted at an additional cost of Cr4000. Ithklur use psionic shield helmets identical in game terms to those used by humans.

Hiver Armor

Hivers have a variety of personal armor protection available to them.

BW Helmet: This is a globe-shaped helmet incorporating ballistic weave cloth technology. It fastens to the Hiver's neck and provides partial protection to the sensory organs in exactly the same way a human helmet does (see Target Protection, page 285 of the basic rules). The fingers are left exposed, allowing them to grasp and operate hexoculars, pistols and other equipment, and there are holes through which the eyestalks project and which allow them to be withdrawn for protection. Openings in the helmet allow partial use of the ears and IR sensing organs. All Hiver helmets provide an Initiative reduction of 1 (with reduced Initiatives of 0 treated as 1).

BW "Vest": This armor incorporates ballistic weave cloth technology and covers the Hivers central body (locations 4-7 on the Hiver Hit Location chart, see page 82).

BW Body Suit: This armor incorporates ballistic weave cloth technology and covers the Hiver's central body and all limbs but the head.

Visored (Airtight) Helmet: An advanced form of helmet providing full protection of the head appendage while retaining all-around vision. Similar in concept to the BW helmet above, but the fingers are gloved, and the eyestalks are housed in small blisters. The visored helmet reduces Initiative by 1 like the BW helmet. Visored helmets are also available as simple spherical "fishbowls," much easier to produce, but these do not allow the head limb's hand to manipulate external objects. For this reason, such helmets are usually fitted with integral equipment which is operated by the otherwise useless hand, such as hexoculars, hand computer, pistol, advanced sensor, translator, etc. For price and mass of such helmets, simply add the price and mass of the visored helmet to that of the desired equipment.

Combat Environment Suit: As described on page 358 of the basic rules, but designed to fit a Hiver.

Combat Armor: As described on page 358 of the basic rules, but designed to fit a Hiver.

Battle Dress: As described on page 358 of the basic rules, but designed to fit a Hiver.

Chameleon Option: As described on page 358 of the basic rules, this feature may be added to any combat environment suit, combat armor or battle dress.

Psi Shield Option: See psionic shields, above.

Ithklur Armor

In game terms, Ithklur personal armor is broadly similar to human personal armor, as both are bilaterally symmetrical, bipedal species.

Ithklur helmets either leave the temple nostrils completely exposed or else come with perforations in the temples which allow the Ithklur to use their keen directional olfactory sense. In addition, most Ithklur helmets (and all of those intended for use in melee combat) have nose visors.

Nose visors are intended to protect the Ithklur from blows to their vulnerable IR pits, and are either made from an IR-transparent material or can be swung up over the top of the helmet to allow the Ithklur to see across the full spectrum. Such visors also typically include eye protection. Because of the Ithklurs' natural and highly efficient thermal sense, there is little need for Ithklur helmets to be equipped with vision enhancement devices. Ithklur armor is also slightly larger (to suit the larger Ithklur body) and therefore more expensive, and these differences are noted on the table below. Other characteristics are identical to human armor, but for convenience, are given here. Hit location abbreviations and armor values are as described on page 358 of the basic rules, except that Abdomen also includes the Ithklur tail.

HIVER GRAV PLATFORM

The grav platform is an individual open Hiver transport similar to the Reformation Coalition grav rail.

Tech Level: 15, with lower TL components
Price: Cr150,601
Size: 14 cubic meters=1 displacement ton (Mc)
Mass: 1.29 tonnes empty, 3.01 tonnes loaded
Power: 0.6 MW fusion power plant, with HEPlaR thruster generating 1 tonne of thrust (0.219 MW excess power)
Maint: 1
Controls: Holographic linked, TL6 flight avionics, TL15 terrain following avionics, 2×Model 15-FLT computers, TL7 inertial positioning navigation
Commo: 300 km radio
Life Support: Light, heat, inertial compensators
Cargo: 1.44 tonnes (5.76 m3)
Crew: 1
Passengers: 1 in cramped seat
Travel Move: 890/445
Combat Move: 41/10 (in 10-meter grid squares)
Fuel Capacity: 1200 liters liquid hydrogen, sufficient for 96 hours
Combat Statistics: Treat as open vehicle (**TNE**, page 298), except that *all* side hits (not merely 50%) are resolved vs. passengers or cargo.

GRAV HARNESS/BELT

Hiver grav belts are called grav harnesses, as they are arranged about the disk-shaped Hiver body just as the Hiver utility harness. Aside from this configuration, its function is the same as human grav belts. Ithklur grav belts are essentially the same as their human counterparts except that the larger Ithklur may not carry an emergency passenger.

The TL15 Hiver Grav Harness and Ithklur Grav Belt both have the characteristics below, but each may not be used by the other race.

Capacity: One individual plus armor and equipment.
Speed: 300 kph maximum, 225 kph cruising, 40-120 kph NOE.
Combat Move: 42 10-meter grid squares in high mode (absolute speed), six 10-meter grid squares in NOE mode (safe speed).

Type	*TL*	*Mass*	*Volume*	*Endurance*	*Price*
Hiver/Ithklur Grav Belt	15	90 kg	63.5 liters	2 hours	Cr115,100

WEAPONS

Hiver Weapons

The most commonly encountered pistol in use by Hivers is a 5.5mm gauss pistol, based on the barrel and action of the Ithklur 5.5mm gauss pistol, but incorporating a Hiver-style grip. The weapon features twin optic sights (Hivers prefer binocular sights), and the large, globe-shaped grip/housing give it a unique appearance. The weapon's most unusual feature, however, is the 75-round internal magazine. Hivers prefer to minimize the actions they must take during combat, and the large magazine gives them one less thing to be concerned about. Ithklur like to joke that the Hivers prefer to load their pistols every 10 days, whether they need to or not. To ease loading of pistols, 5.5mm gauss ammunition is supplied in 15-round plastic packages similar to stripper-clips. The Hiver gauss rifle, like their gauss pistol, is based on the barrel and action of the Ithklur 5.5mm gauss rifle, but incorporating a Hiver-style grip and provision for up to four magazines. The rifle also features a laser sight and a rifle grenade adaptor. Hivers prefer rifles to pistols, unless something with a longer range is available. Ithklur and humans using Hiver weapons suffer +2 Diff Mods due to their size and shape.



Ithklur Weapons

Ithklur weapons are characteristically ornate. All unique decorations and carvings are added by their owners to commemorate personal events, values and beliefs. For more details on these weapons, see the **Reformation Coalition Equipment Guide**, pages 74-75, and **Challenge 74**, page 27. Ithklur weapons are built more robustly than their human analogs, and their controls are more difficult for weaker human fingers to operate. For this reason, all fire tasks by humans using Ithklur weapons are made at a +1 Diff Mod. Hivers attempting to fire Ithklur weapons do so at a +2 Diff Mod.

INTERSPECIES EQUIPMENT USE

From time to time, it is necessary for members of one race to use equipment designed for another. Differences in language are one barrier to such use, as it is difficult to get accurate sensor readings if the operator doesn't read the language it is presented in. Differences in physical build present the most serious complications, but the situation is not one that can be easily summed up in a simple "–2 Diff Mod for Hivers using human equipment" statement.

Referees will have to consider the kind of equipment being used and the task being undertaken when assigning difficulty levels for using another race's equipment. Some of the equipment or task descriptions set difficulty levels for various items of equipment, but for the most part referees must use common sense and judgement. The vast majority of tools and equipment available to a given race will not be perfectly suited to another, but will still be usable with a few minor problems. The problems encountered will depend on how different the two races are. It is up to the referee to add one or two difficulty levels to a particular task. As a general rule, the more complex the equipment and/or the task, the greater the difficulties that will be encountered.

Some equipment is identical for all races, and no penalties should be imposed for tasks undertaken using it. For example, Hiver rope, Ithklur rope and human rope are all effectively identical, and used in pretty much the same way. A Hiver using a human rope or vice versa will encounter no problems, and will be able to accomplish any given task without penalty. A human could use an Ithklur hammer or screwdriver with no problems, because the human hand and the Ithklur hand are quite similar. An Ithklur using a human hand-held screwdriver will incur no penalty. The same Ithklur using a human power screwdriver will find the buttons too small and located inconveniently, and an additional difficulty level for most tasks is indicated. A Hiver trying to use a human manual screwdriver will find that the tool does not fit its hand at all well, and a power screwdriver will be very clumsy. The simplest tasks will have an additional level of difficulty, complex ones two levels. A Hiver might be able to use a human power screwdriver for simple tasks at two additional levels.

Some equipment is effectively impossible for one race to use. A Hiver attempting to operate a human ground car will not fit into the seat very well, and will find the controls hard to reach and operate.

HIVER WEAPONS

			Weight				Price	Price	
Weapon	TL	Ammo	Empty	Loaded	Ammo	Magazine	Weapon	Ammo	Features
5.5mm Gauss Pistol	14	5.5mm/45	3.84	3.94	0.1	75i	514	0.03	O
5.5mm Gauss Rifle	14	5.5mm/45	20.6	21	0.4	4×75/4×3.9	1265	0.03/8	O, L, R

						Recoil		
Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	SS	Burst	Short Range
5.5mm Gauss Pistol Dart	SA	4	1-2-Nil	2	75i	1	—	30 (26)
5.5mm Gauss Pistol HEAP	SA	5	2-2-2	2	75i	1	—	19
5.5mm Gauss Pistol Tranq	SA	–1*	Nil	2	75i	1	—	12
5.5mm Gauss Rifle Dart	5/10	6	1-3-5	6	4×75	1	1/2	130 (116)
5.5mm Gauss Rifle HEAP	5/10	7	2-2-2	6	4×75	1	1/2	100 (87)
5.5mm Gauss Rifle Tranq	5/10	–1*	Nil	6	4×75	1	1/2	30 (30)

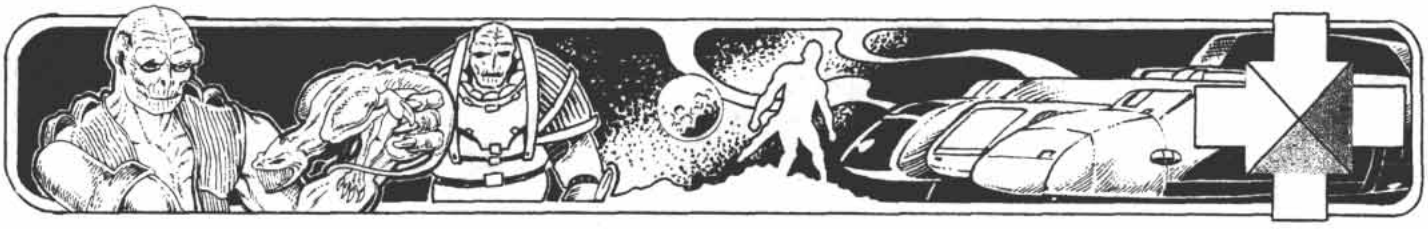
*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Short range in parentheses in the unrounded iron sight range.

ITHKLUR WEAPONS

			Weight				Price	Price	
Weapon	TL	Ammo	Empty	Loaded	Ammo	Magazine	Weapon	Ammo	Features
5.5mm Gauss Pistol	14	5.5mm/45	1.88	1.91	0.03	26/0.7	499	0.03/2	O
5.5mm Gauss Rifle	14	5.5mm/45	6.48	6.58	0.1	75/3.9	1044	0.03/8	O, R
5.5mm Gauss SAW	14	5.5mm/45	12.12	12.25	0.13	100/8.6	1208	0.03/18	O

						Recoil		
Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	SS	Burst	Short Range
5.5mm Gauss Pistol Dart	SA	4	1-2-Nil	2	26	3	—	30
5.5mm Gauss Pistol HEAP	SA	5	2-2-2	2	26	3	—	19
5.5mm Gauss Pistol Tranq	SA	–1*	Nil	2	26	2	—	14 (12)
5.5mm Gauss Rifle Dart	5/10	6	1-3-5	4	75	1	2/4	120 (105)
5.5mm Gauss Rifle HEAP	5/10	7	2-2-2	4	75	1	2/4	90 (79)
5.5mm Gauss Rifle Tranq	5/10	–1*	Nil	4	75	1	2/3	30 (30)
5.5mm Gauss SAW Dart	5/10	7	1-2-4	5	100	1	3/7	190 (166)
Bipod	5/10	7	1-2-4	5	100	1	2/4	250 (216)
5.5mm Gauss SAW HEAP	5/10	8	2-2-2	5	100	1	3/7	140 (124)
Bipod	5/10	8	2-2-2	5	100	1	2/4	190 (161)
5.5mm Gauss SAW Tranq	5/10	–1*	Nil	5	100	1	3/6	30 (30)
Bipod	5/10	–1*	Nil	5	100	1	2/3	30 (30)

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Short range in parentheses in the unrounded iron sight range.
For description of values, see **TNE** page 350.



EQUIPMENT, FURNISHINGS AND FIXTURES

This section discusses design and layout for equipment and facilities of Hivers and Ithklur, and how they differ from those used by humans.

Design Sequences

When using the **Fire, Fusion, & Steel** and **Brilliant Lances** design sequences to design equipment for Hivers and Ithklur, there is no need to change the size, dimensions or price of any equipment to suit these races. While such changes would be reasonable in theory, the additional work required of players, referees and game designers means that this would not be a Good Thing. Thus a ship or rifle designed for human use will have exactly the same characteristics as one designed for an Ithklur. However, players and referees should be careful to remember that it cannot necessarily be easily used by members of another race, under the guidelines presented above. Note, however, that Ithklur can profitably use weapons designed with heavier recoil than can humans.

In addition, weapons designed to be shoulder-fired by Ithklur may mass up to 60 kilograms loaded. Of course, humans still cannot use them if they are more than 45 kilograms. Hivers are also limited to 45 kilograms (although their lack of solid skeletal structure makes it harder for them to hold heavy objects, they have more limbs to work with).

For those sticklers for detail who insist that Ithklur should allocate more space for passenger seats and workstations than humans do, I say, "Fine, make your own life more difficult. Mine is hard enough already, thank you."

Duplex Controls: Spacecraft to be operated by mixed crews of Hivers and Ithklur or Hivers and humans (or Hivers, humans and Ithklur) can be fitted with duplex controls, allowing all ship functions and all workstations to be operated by any crewmember race. These controls have adjustable seating, control panels, readouts, etc., which can be rapidly reconfigured for different body shapes, linguistic and display requirements. When designing a vessel with duplex controls, double the cost of all control systems and workstations (**FF&S** page 47). If ship-wide duplex controls are not installed, Hivers aboard human/Ithklur ships or Ithklur/humans aboard Hiver ships will require their own separately installed workstations in order to function as crewmembers. Duplex controls are normally impractical in the more cramped aircraft and ground vehicles.

Workstations

Each race has designed its controls and data read-outs to suit their own physiology. Radical differences in body form can mean radical differences in design (although not always). Also, when a member of one race attempts to use equipment designed for another, there can be problems that make language barriers pale to insignificance.

Hiver: Hiver data readouts are normally projected onto a spherical or hemispherical screen. Hivers have six eyes on stalks, and can arrange them in a number of different configurations as the situation requires, which means that a Hiver can see almost all the surface area of a sphere at once. Hivers find this arrangement more compact than flat screens (a single spherical display can show data that would require three or more flat screens), and can study holographic displays (such as 3-D graphs) from all angles. Humans and Ithklur find these readouts almost impossible to use with any efficiency.

Hivers are built low to the deck, and they tend to do without stools or chairs, substituting rotating circular mats or pads. Hiver workstations incorporate low consoles arranged in a semicircle (or complete circle) around a rotating circular floor pad (described by one human xenologist as "a slightly concave throw pillow mounted on a lazy susan"). The rotating floor pad serves the same purpose as a human swivel chair and enables the Hiver to bring its head around to study whatever display needs close attention. If necessary, a Hiver can raise its head and arrange its eyestalks to see all 360° of the workstation at once (this enables a Hiver to monitor a great many controls at once, but does not permit detailed study of any individual readout).

Hiver ship workstations are often arranged to allow operation by Hivers and humans or Hivers and Ithklur (see notes on duplex operation above).

Ithklur: Ithklur workstations are built to accommodate the Ithklurs' greater bulk, and allowances are made for their tails in all seating arrangements. Workstation controls are designed to be very robust. Knobs, buttons, switches and the like are built to be operated by the Ithklur's large, stubby fingers. Other than these differences, Ithklur workstations can be used by humans (provided the humans can read written Ithklur or the station is re-programmed to give Anglic readouts) at little loss of efficiency—humans find Ithklur buttons, switches and knobs stiff and balky, and usually have to reach farther than they would for their own workstations. Ithklur computers (and Hiver computers designed to be used by Ithklur) are usually voice or touchscreen operated, but those with keyboards have large, widely spaced keys.

Staterooms

Hiver: When reconfiguring human staterooms for use by Hivers, Coalition protocols call for the substitution of Hiver-configured plumbing fixtures and replacement of all chairs with Hiver stools. The beds are removed or left according to the wishes of the occupant(s). See the notes on Hiver furniture, below. Lighting, ventilation and other controls are to be placed lower on the walls, linked to signals from the Hiver's personal portacomp or configured to respond to the Hiver's voice-synthesizer. All Hiver vessels in Coalition space seem to have been designed to accommodate Ithklur-sized beings if necessary, and this means that the ceilings and doors are also compatible with humans. Travellers in Hiver space report that vessels designed for purely Hiver use normally have less headroom, varying between 1.75 and 2.0 meters.

Ithklur: When reconfiguring human staterooms for Ithklur use, Coalition protocols specify that the plumbing fixtures and all chairs must be suitable for use by a tailed biped. If Ithklur-configured switches and other controls are available, these are to be installed; otherwise, the room is to be configured to respond to voice commands (if this is not done, the controls will need to be replaced approximately once per month of Ithklur occupancy).

Furniture

Hiver: When among themselves, Hivers to do without stools or chairs almost entirely, simply lowering themselves to the floor whenever necessary. Hivers cannot use normal human chairs, and they cannot use a human bench or stool for dining, as their mouth is located on their underside and must remain uncovered in order for them to eat.

For meals, Hivers use a short broad stool with a pierced top (allowing access to their ventrally located mouth so they can eat while sitting). Some models resemble doughnuts with tripod legs, but the most common variety is called a "mushroom" because of its shape.

For long conversations with humans or Ithklur, Hivers also make use of "mushroom" chairs to keep their heads at the same level with those of seated humans. Whether this is because the Hivers feel more comfortable or because they think humans feel more comfortable when all heads are at the same level is a matter for speculation.

Hivers find human single beds a little narrow, but they can make do quite comfortably on human double beds. As for their natural preferences, one human scientist remarked, "A Hiver wishing to sleep simply flops down someplace soft and curls its legs up like a cat in a sunny window...." Some Hivers, however, prefer sleeping mats: soft, circular pads ranging from two to three meters across and slightly domed in the middle. Hiver sinks, shelves and other furniture are all built close to the ground (where they may be readily reached by a Hiver resting on the floor) and often look strange to the human eye. Hivers can reach items on shelves designed for humans, but must stretch one of their legs uncomfortably high to do so.

Ithklur: Ithklur furniture is similar in form and function to human designs, the primary differences being a more robust construction and the allowance made for the Ithklur's large, muscular tail. Chairs, acceleration couches and crewstations, for example, must have a large cutout in the back to accommodate the tail. Ithklur may use backless benches or stools without difficulty. Since Ithklur sleep either on their sides or face-down, human beds present no problems, but they find human single beds a little cramped.



DESIGNER'S AFTERWORD

How many of you have turned to this page while browsing through this book in a store, and how many of you have arrived here only after having digested the rest of the book? It's just a question, please keep score for yourself.

Without any further ado, we will consider the term:

alien *adj* different in nature or character, see EXTRINSIC.

How many times have you read ad copy from some science fiction game company that includes the sanctimonious drivel about how "the aliens in (insert the name of the company's game here) are more than just people in funny suits"? Sounds good to me. Of course I wouldn't be impressed with a game whose aliens were simply humans with four arms, or doggy heads or whatever. It seems sort of gimmicky. Yeah, I guess I would prefer a game in which the aliens truly *were* alien, with fully realized motivations, worldviews, bank accounts, automotive industries, magazine subscriptions, highway regulations, etc.

Well, boys and girls, I'm here to tell you that just ain't so. Any alien in any roleplaying game played by humans is nothing more or less than a person in a funny suit. Sorry. And I'm allowed to sit up here on my blindingly white charger and say that because GDW is the company that invented that fatuous nonsense. I will refrain from citations.

So why am I raining on this parade? Into every game a little rain must fall, so rain I must.

What does the sensation of consciousness feel like to a mind which has evolved completely unlike our own? We often experience our own consciousness as our own voice speaking silently in our minds, or as sudden bursts of realization without words. One common theme is that we all imagine a tiny little man (*homunculus*) inside of our heads, overseeing things and making decisions. Surely we don't believe this is literally true, and current neurological theory holds that these sensations are merely the *by-products* of the physical biochemical processes that go on in our brains. How does consciousness itself feel to an alien mind? What are its sensations, and how do those sensations affect the way they perceive and respond to reality (or their interpretation of reality)? How could we ever truly *understand* them without sharing that same utterly subjective sensation?

Our minds have arguably evolved as a primarily visual system. Our ability to perceive the world with our eyes is so efficient that we routinely confuse our visual sense of the world with reality, when in fact it is nothing of the kind. We have no problem realizing that a radar screen or an oscilloscope is merely a *representation* of reality using a particular medium of analysis, but it is far harder for us to be conscious that the same is true of our visual perception of the world. It is also only a representation of reality, although a *very good one*—so good that we normally treat it as reality.

What is it like inside the mind of a creature whose brain is primarily configured for aural representation of the world, or olfactory or vibrational? How could we ever know? The filters in our brains and the filters in their brains are as *literally* alien as alien can be.

What would it be like to confront a truly alien intelligence, one whose workings were completely, utterly foreign and incomprehensible to our own? What if the best understanding we can have of an alien race is the realization: "Oh my God, they're *crazy!* But they're quirky and weird, and so help me, I like them."

Meet the Ithklur. (If anyone ever makes a **Traveller** movie, Jeff Goldblum has to be an Ithklur, and maybe Bruce Dern, but never Jack Nicholson.)

So anyway, back to the rainy part about people in funny suits.

You and I are people, and there is nothing more valuable that we could ever aspire to be. While some people get their kicks out of Monday Night Football, buying and dismembering financially troubled companies, or whatever else, we get something out of science-fiction roleplaying (and believe me, my answer is not "a paycheck," and if you've ever seen a game designer's paycheck, you'll know why).

What do we get out of it? Do we see the future? Do we meet alien races? Do we achieve understanding of life far beyond that of our miserable nonscience-fiction contemporaries (you know the attitude: "reality is for people who can't handle science fiction")?

No, no, and Hell, no.

So what do we get to see? *We get to see ourselves.* Is this a creative enterprise? Is this an open-minded and intellectually stimulating undertaking? Yes, and yes.

But what we take away from this is what we bring to this: ourselves.

Apollo 14 Command Module Pilot Stuart Roosa has said, "Space changes nobody. You bring back from space what you bring into space." At the risk of trivializing space travel, I will tell you that **Traveller** is the same way.

Have you ever looked back on yourself at an earlier age, say in high school, or whatever, and noticed how utterly different you are from who you were, but at the same time, how much the *same* you are? You have somehow become only *more like yourself.* How? How am I supposed to know? It's your life.

But anything in our lives, gaming included, is just the same. We bring back ourselves. But are we better for having done so? I hope so, because none of us are going to become aliens. All we are going to do is gain some different perspective on what it means for us to be human. And I hope to God that we take that insight back to our workplaces, our homes, our co-workers, our parents, our spouses and our children, and make those places better, and those people happier and stronger.

Well that's a pretty sanctimonious and high-falutin' thing for me to say, isn't it? Yes it is, but so was saying that "our aliens are more than just people in funny suits."

Well, our aliens *are* just people in funny suits, and we're damn proud of it, because we can't imagine that anyone would want to be anything more, or less, than a person—and have a little bit of fun while they're here.

To those who take their roleplaying deadly seriously, who believe that we are somehow actually conjuring up the actual future here in an unspeakably earnest, responsible and scientific way, or who feel the need to confront the dark brooding whatchamacallems lurking at the heart of the human psyche, who dress all in black and like to talk about what it's like to be misunderstood, this book is an outright act of sedition.

Bummer.

Get a grip. Laugh, be free.

For those of you who are happy to be a person in a funny suit, God bless you. Laugh, be free.

Re: The Scottish Joke from Page 51

This is a joke, and pokes fun at the English presumption that good colonial troops only achieve their best effect when led by "civilized" English officers. This refers to the practice in Gurkha and Indian sepoy units, and makes the allusion that certainly the Scots could not be such good fighters, or even such good soccer hooligans, if they were truly civilized Englishmen. Naturally the Ithklur play the bagpipes, for the reasons that they sound neat, get the blood running in a properly martial way and irritate others, not necessarily in that order.

Publisher's Note: The opinions expressed above are not the opinions of GDW. If you agree with them, they are the opinions of the designer. If you disagree, they are someone else's opinions. For the humor-impaired, I say again, "Laugh, be free."

Glossary

GLOSSARY

This book has been barely able to scratch the surface of the details of Hiver and Ithklur society. This glossary provides small capsule insights into further Hiver and Ithklur concepts that referees and players can use, which will be developed more fully in future **Traveller** products.

Absurd (translated from the Ithklur **Klisa*): This is perhaps the highest Ithklur value, codified in the formula: "It makes no sense, nonetheless it is true." This is often mistaken by observers of the Ithklur to mean that *anything* which makes no sense is *therefore* true. This is not the case, but instead refers to moments of ambiguity and contradiction when something which is known to be true appears to be impossible, and cannot be proven by any rational means. In this moment, the Tetramerous Way calls upon the individual to ignore rationality and hang onto what is true, acting on it alone, trusting in success by virtue of the absurd.

Blacking Ritual (translated from the Ithklur *Hayyar *chekkeh*): The ceremony in which Ithklur uniforms, weapons and equipment are made "tactical" in preparation for combat, toning down their normal bright colors and dampening the sounds of the *spontaneity bells* (which see). In the case of uniforms, this is accomplished by changing into camouflaged fatigues, combat armor or battle dress (as appropriate), but the intricately carved, painted and decorated weapons are actually covered with a matt black coating to render them less visible.

This coating is removable at the conclusion of hostilities, but it is Ithklur custom that, once blacked, a weapon cannot be "restored" (i.e., stripped) until it has been fired in combat. Thus the Ithklur penchant for profligately firing off all of their weapons near the close of hostilities. It is thus considered to be *excruciatingly* dangerous to be anywhere near an Ithklur unit when a cease-fire is about to be negotiated.

"Corn Dogs": The Ithklur fascination with human culture, especially as obtained through discovery of "*behsehball*" brought the Ithklur into contact with the concept of hot dogs and corn dogs.

Noting this popularity and the difficulty of obtaining human-manufactured ballpark franks within the Federation, the Hivers looked for an alternative to meet this need. Eventually, a substitute was found in the form of an aquatic annelid inhabiting many of the worlds of the Hive Federation. These creatures, similar to the Terran seaslug or sea cucumber, proved to be virtually indistinguishable from Terran hot dogs when cooked. They were particularly good when battered and deep fried, as discovered in the manipulation of M. Kryten, founder of the Kryten Ballpark Concessions Topical Club.

Although the Ithklur are not bothered to learn the true nature of these weiner-substitutes, humans usually profess to become quite ill.

Decorative Carnivore: Term used to describe the Ithklur fondness for adopting highly dangerous animals as "pets." The rule of thumb appears to be that the more dangerous the animal is to everyone but its owner, the more the status of its owner is enhanced. Unlike in human society, where owners can be sued for the violent behavior of their pets, the cultural force behind this tradition holds that any injury done to any third party by a decorative carnivore is the fault of that third party, and not of the owner or even the animal itself. This is even the case when a decorative carnivore attacks a Hiver. For this reason, the shy and retiring Hivers seek to limit the number of decorative carnivores in their Ithklur retinues, usually by whatever reason they can come up with.

The decorative carnivore concept is, however, superseded by the *sanctuary* concept.

Drivers (translated from the Ithklur *Maxxen*): Ithklur slang term for the Hivers, because "they take us where we want to go and attend to all of the mundane details." Also translated as "chauffeurs."

Elementary (translated from the Ithklur *Brunnen*): An Ithklur which has not achieved *enlightenment* (which see). Elementaries are broadly similar to the human concept of noncommissioned or enlisted individuals.

Elementaries are not considered to be lower than the enlightened *per se*, only that they are not aware of their own nature in the sense that the enlightened are. In fact, the simplicity and innocence of being an elementary, i.e., being what one is without being self-regarding, is held in high esteem, the same way that childish innocence is valued by humans, even though it is often wrong or incomplete.

Ithklur often say, "Oh, to be elementary again." See also Knight of Faith for further discussion of this idea.

Enlightened (translated from the Ithklur *D*vakken*): An Ithklur who has achieved enlightenment. Enlightened Ithklur are broadly similar to the human concept of commissioned officers, i.e., those who are placed in a position of responsibility due to their enhanced education and sense of responsibility.

Enlightenment (translated from the Ithklur *D*kvakka*): The state of having achieved some measure of awareness of one's nature, and no longer living within the boundaries of that nature without being conscious of its characteristics.

Exposer of Deceit (translated from the Ithklur *Tokkanah *Kshuden*): Formal name of the highest level of achievement in the Guardian Path. However, this role is considered sufficiently important that all groups of Ithklur have an Exposer of Deceit, who is the highest ranking guardian in the group (when no guardians are present, another is appointed by group consensus). This Ithklur is charged with the protection of all in the group, and is the group's leader and spokesperson in all issues of survival, conflict and relations with Hivers.

Extroverted: This term describes Hivers which have made the cultural and educational adjustments necessary to interact with other races. The first and most necessary adjustment is the use of a spoken language, made possible by a vocal synthesizer built into the Hiver chest computer.

Other adjustments include the adoption of a name meaningful to that race, sometimes to include the adoption of a false gender associated with that name (e.g., female with "Alice" or male with "Einstein"). Because no Hiver is adjusted to interact with all non-Hiver races, the term extroverted is usually combined with the race that is adjusted to, for example, a Hiver could be described as



human-extroverted or Ithklur-extroverted, or human/Ithklur-extroverted in cases where a Hiver is skilled with both groups.

Fascist (translated from the Ithklur **Kchollioll*i): One of the two branches of devotion to the Ithklur Tetramerous Way, which see. Fascists believe that the four paths can be visualized as a bundle of sticks tied together. In this way they can be seen as separate but parallel, beginning at the same point and ending at the same point, although defining four distinct paths through time and space. Fascists believe that achievement of unity comes from tasting the reality of all four paths. Therefore they move through their lives in a variety of sequential careers from the Facilitator, Guardian, Seeker and Explorer paths on their way to the state of Blissful Warrior.

See also Phalangist.

54-40: An Ithklur expression of numerical perfection, out of a total of 100 equally divided units. It has to do with the fact that 54 is the product of 6 and 9, while 40 is the product of 5 and 8 (each one less than 6 and 9, respectively). The remaining 6% is set aside for benevolent purposes, charity, taxes, held for a rainy day or any of a number of other reasons, depending upon circumstances.

It is not always clear what the splitting of things into the ratio 54:40 is intended to accomplish, except that the failure to divide things into this ratio inevitably results in an Ithklur shouting "54-40 or fight!" with the predictable consequences.

Strangely enough, Ithklur are often willing to allow their opponents to have the 54%, leaving them with only the 40%, so long as this numerical standard is observed.

Ethologists have noted that 54-40, as a base 10 concept, is inconsistent with the Ithklur's own base 8 mathematics, and is also not related to the Hivers' base 12 system.

F'naah: Ithklur expression of surprise, denoting joy and wonder.

Gender Imperialism: The term used by Hivers to describe the Ithklur habit of assigning genders to Hivers. Although many Hivers adopt this convention when using male or female human names to interact with humans, the Ithklur insist on referring to Hivers as "he" or "she" even when they are introverted Hivers with pure Hiver names (see Introverted).

This is seen by the Hivers as a form of Ithklur insecurity or stupidity that they need to recast the universe in their own terms in order to be able to be comfortable with it. For this reason, the Hivers are willing to put up with the practice, although it is clear that they do not approve of it.

Hand (translated from the Ithklur **On*): Ithklur slang for a Hiver. The term derives from the Hivers' physical characteristics: their entire body with its six radial limbs can be seen as a hand, and the Hivers are amply equipped with six hands. The term has a deeper pejorative meaning, referring to the Hivers' cherished self-image as manipulators, string-pullers and puppeteers.

Handles (translated from the Ithklur *Grabba*): Ithklur term for the human necktie. This comes from the belief that the necktie is intended as a convenient handle to catch a human who has just come out on the losing end of the Ithklur greeting ritual (see Pushing Match). The fact that people wearing neckties are more likely to lose pushing matches than humans who do not is not lost on the Ithklur.

Introverted: A Hiver which has made no adjustment to live with any non-Hiver species. Introverted Hivers do not use any spoken language, although they are necessarily familiar with written Gurvin.

Knight of Faith (translated from the Ithklur *Tokkah Na*klie*): The Knight of Faith is an almost mythical Ithklur ideal which surpasses even the honor given to the *Knight of Infinite Resignation*. The Knight of Faith is someone who has attained the state of the Knight of Infinite Resignation but who, by virtue of the *absurd,* regains his or her attachment to the finite, or physical, world. The Knight of Faith therefore lives a life of complete joy in the real world, because he is beyond the pain of the physical world (which was achieved by becoming a Knight of Infinite Resignation), but has regained the simple joys of each and every simple, subtle moment of the physical world, in a childlike way.

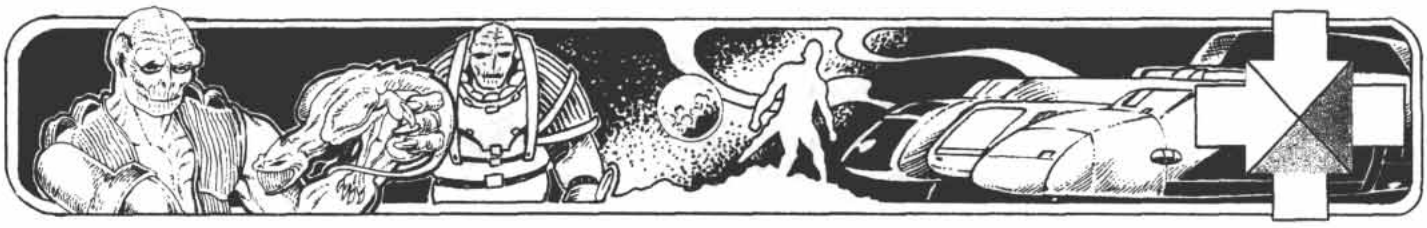
The Knight of Faith is therefore one who can be described as having given up all ties to life in order to gain ties to the infinite, but, rather than remaining elevated above, and untouched by the finite, then is able to exist fully connected to the finite. When the Knight of Infinite Resignation dances, he leaps with sublime grace, but in the instant when he touches the ground he vacillates, for he is a stranger to this world. But when the Knight of Faith alights on the ground, there is no moment of transition from leaping to walking—it is all one motion, for this Knight is able to express the sublime in the pedestrian.

Such an individual is indistinguishable from an ordinary person, for the joy that this knight finds in corporeal life is unsurpassed by the most abandoned voluptuary, although the Knight of Faith does not live a life of abandoned voluptuousness, having learned the futility of such things. The Knight of Faith, therefore, has achieved all the positive benefits of physical life with none of its traps or drawbacks. There is no agreement among the Ithklur whether such a person has ever existed, although the mythical figure *Avram* is associated with this state.

This state can be compared to having re-achieved the simplicity and innocence of the *elementary* after having become fully *enlightened*, although becoming a Knight of Infinite Resignation is a state well above that of normal enlightenment.

To be a Knight of Faith is "to live joyfully and happily every instant by virtue of the absurd, every instant to see the sword hanging over the head of the beloved, yet not to find repose in the pain of resignation, but joy by virtue of the absurd."

Knight of Infinite Resignation (translated from the Ithklur *Tokkah Bark*ktonye*): The Knight of Infinite Resignation is a state greatly admired by the Ithklur. It describes a person who has fully committed him or herself to a value or course of action that it then turns out cannot be fulfilled. But rather than denouncing this commitment, the Knight of Infinite Resignation transforms this commitment from a worldly commitment (where its fruition can never occur) to an infinite, spiritual commitment. The Knight of Infinite Resignation thereby removes himself from the concerns of the world, and becomes someone above, and unconnected to, the physical world, unable to be hurt by mundane reality (see also *True Nature*). Unfortunately for the Knight of Infinite Resignation, he is



now fully contained in contemplation of the eternal, and can also no longer derive any meaning or pleasure from the physical world, although this is perhaps a small price to pay for having achieved real and permanent peace and connection to the eternal.

"In the infinite resignation, there is peace and rest; every person who wills it, who has not abased himself by scorning himself, can train himself to make this movement which in its pain reconciles one with existence."

Kok*hon: A parasitic animal native to *Eethk*klaa*/Tryylin known for its filthiness and lack of intelligence or any other redeeming characteristics. The word is also used as a derogatory term for any person worthy of contempt.

Lizard (translated from the Ithklur *Ithklur*): Ithklur term for an Ithklur. Unlike other sapient races, the Ithklur term for themselves does not mean "person" or "human." (There is an Ithklur word for "person," but this word specifically means an intelligent, sapient being of indeterminate species.) Instead, their term for themselves is descriptive rather than presumptive of their unique role as "persons," a position arrogated by all other known intelligent races. This third-person nature of the Ithklur self-identity is quite unusual, but has never been adequately explained.

An accurate translation of the term is closer to "upright lizard," a reasonable description of the Ithklur themselves. Note that the Ithklur term for humans is "upright *slaa*." The Ithklur term for Vargr is "clever *slaa*." The Ithklur term for Aslan is "earnest *slaa*." The Ithklur term for K'kree is *Kohl slaa*, or "*slaa* food."

Official Flower: All Ithklur organizations, including military units, have an official flower. This flower is allowed, although not required, to be worn with all levels of military dress. Artificial flowers are not allowed, although clearly nonimitation representations, such as enamel pins or embroidered patches, are permitted.

Our Active Friends: A Hiver term used to describe the Ithklur.

Pennsylvania 6-5000: A nonsequitur that Ithklur are prone to shout out when in the presence of human companions, particularly when music is being played.

Phalangist (translated from the Ithklur *Ha*on*): One of the two branches of devotion to the Ithklur Tetramerous Way, which see. Phalangists believe that the four paths can best be visualized as an Ithklur hand, with four distinct fingers, but still the same unified organ. This represents the belief that it is not the precise details of their four separate paths *per se*, but the mystical combination of their essence, which can be pursued in its own right, without having to concentrate on the point of view of any single path. Phalangists therefore remain on a "pure" four-fold path on their way to the state of Blissful Warrior.

See also Fascist.

Post hoc: Because some Hiver manipulations reach fruition only many years after they are begun, their duration can outlive the manipulator who set them into motion. In this case, the claim of credit cannot physically be made by the manipulator itself. In some cases the manipulator leaves a pre-recorded claim of credit set to announce itself at some prearranged time. In most cases, however, Hiver tradition allows the manipulator to entrust his manipulation to a successor (or in extreme cases, a line of successors) who will ultimately make the claim of credit in the name of the original manipulator. The posthumous claimant, by taking responsibility for recording and documenting the ultimate unfolding of the manipulation, also partakes in a portion of the credit. The accepted style for this credit is expressed as, "M. Tuesday for M. Monday *post hoc*," in the case of M. Tuesday making the posthumous claim of credit for a manipulation begun by M. Monday.

Pushing Match: Term for the standard Ithklur greeting in which the Ithklur push each other until one of them falls backward, usually to catch him or herself with the tail. This exchange usually starts out with firm, but relatively light pushes, until one or the other wins. This greeting is used even when greeting one's social superiors, but is modified in that the inferior allows him or herself to be pushed down. However, the inferior cannot make it look too easy, and it is considered an insult to give a too-soft push to one's superior when attempting to not win a pushing match. So even elderly and infirm Ithklur are given strong, healthy pushes (although calculated to be within their ability to withstand).

When rivals greet each other, even at formal public occasions, this greeting ritual can actually escalate into a full-fledged boxing match, which ends amicably only as soon as one of the rivals is knocked backward.

Ithklur extend this greeting to humans, but since humans have no tails, they have a tendency to fall all of the way to the ground. Ithklur often make allowances for this by catching the humans before they hit the ground (also see Handle). Humans should be aware that it is a sign of respect from the Ithklur that they include them in this ritual. The Ithklur do not engage in this greeting ritual with Hivers. It is unknown if this is because of the physiological uselessness of attempting it, or if it is a deliberate attempt to snub the Hivers by denying them the honor of participation in this beloved ritual.

Sanctuary (translated from the Ithklur *Lu*ern*): Ithklur society sets aside certain physical or conceptual areas as safe havens for its members or inhabitants. Physical areas may be such things as embassies, temples, orphanages or prison camps. Conceptual areas are usually organizations. Among traditionally recognized sanctuaries are marriage, formal betrothal, military units, veterans groups and the like, although any group can be recognized as a sanctuary by the consent of its members.

Within sanctuary, no physical harm can be done to anyone (this sometimes includes the pushing match, which see, but this varies with the local rules); all decorative carnivores are muzzled, caged, or otherwise made incapable of violence; and most importantly, no lies or breaches of trust can be committed.

Transgression of these rules is punished by death (although Ithklur law allows any victim to waive or reduce such severe penalties when desired).

San*klaass: The archetypal Blissful Warrior, also referred to by his title, "The Blissful One." *San*klaass* was the founder of the Tetramerous Way, and the first follower of the Tetramerous Path.

***San*klaass* Cap**: The traditional headwear of all followers of the Tetramerous Path, which see. The cap is a soft, conical, red cap



made from red fur, with white trim and a white pompon at the tip, often with spontaneity bells attached.

Sept: A common form of Hiver government, consisting of a council of seven individuals appointed for life. Hivers place great importance on the number seven, which many people find odd, given the fact that Hivers have six of everything.

Slaa: A domesticated furred animal kept as a working animal or pet by many Ithklur, analogous to the Terran dog. *Slaa*s are not as closely related to the Ithklur as dogs are to humans, although their DNA analogs show that they did evolve from common roots.

*Slaa*s do not qualify as decorative carnivores because of their long and successful association with the Ithklur since their prehistory.

Note that the Ithklur term for "human" literally means, "upright *slaa*." Anglic-speaking Ithklur freely translate *slaa* as "dog" in their Anglic speech. An adjunct to this is the fact that Ithklur refer to human infants and children as "whelps," and often translate the human concept of "brothers and sisters" as "littermates." It is clear that no disrespect is meant by these comparisons, as the Ithklur terms for themselves are identical, save for their reptilian, rather than mammalian, references.

Spontaneity Bells (translated from the Ithklur *Anjell*k*): Small, spherical, metallic bells worn by all Ithklur on their clothing or equipment. These jingle at the slightest movement, and are intended to remind Ithklur of the constant passage of time and the irreplaceable uniqueness of each moment. This is similar in concept to the human habit of setting watch timers to beep every hour, except that the Ithklur believe that the value of time and life cannot be captured or regulated by rigid external constructs like hours or days. Thus the bells jingle as often as they do, imparting, to the Ithklur mind, a reminder of the joy and spontaneity present in each moment.

Naturally these bells are maladaptive in combat situations, and in the blacking ritual (which see), they are filled with grease or wax to silence them, although they are usually not removed.

Spontaneity bells are usually called "jingle bells" by humans, as their design is virtually identical.

Steppingstone Worlds: The string of worlds that run from the Reformation Coalition rimward-trailing to the Hive Federation. These worlds serve as staging bases for the Federation missions into the Old Expanses to maintain contact with the re-emergent human culture there.

Terminal Manipulation: The manipulation conducted after the failure of an unsuccessful manipulation to erase all traces of it, or at least all connections to the unsuccessful manipulator. A "coverup."

Tetragram: The cross-like symbol of the Tetramerous Way. It is an inherently three-dimensional symbol, and thus is not suited to a flag, but must be embossed on a shield. The symbol shows the joining of the points of four arrows which then emerge as a pyramid from the surface. This shows that the four paths (Facilitator, Guardian, Explorer and Seeker) when combined, achieve a new dimension of effectiveness that they do not have separately.

Each arm of the tetragram corresponds to a particular path. The base, or downward pointing arm is the Facilitator Path, the upward pointing arm is the Guardian Path, the right-hand arm is the Explorer Path, and the left-hand arm is the Seeker Path.

This sign is also made with the Ithklur hand by holding the hand palm out, and spreading the fingers out, thumb down, so that they are all separated by an angle of 90 degrees, or as close to this as the Ithklur can manage. Not all Ithklur are capable of performing this sign perfectly, as it comes from a combination of long practice and individual variation in the flexibility of the hand. However, it is the intent that counts, so the sign is considered properly made even if the angles between the fingers are not perfect.

Tetramerous Path (translated from the Ithklur *Haggar Sonnie*): The single path to enlightenment which combines the four paths of Facilitator, Guardian, Explorer and Seeker, as opposed to the Tetramerous Way, which is the larger philosophical belief system which encompasses all these paths.

Tetramerous Way (or "Four-Fold" Way, translated from the Ithklur *Dikrah Sonnie*): The overarching Ithklur "national religion" which divides life into four different social roles or "paths": the Facilitator, Guardian, Explorer and Seeker paths. Most Ithklur spend their entire lives in the pursuit of one of these paths, finding their own true nature reflected in these four social roles. Some very spiritual Ithklur attempt to combine all four paths in their lives and are said to be followers of the Tetramerous (or "Four-Fold") Path, which see.

True Nature (translated from the Ithklur *Chalor*): The Ithklur believe that the highest goal of the individual is to discover one's own true nature, which involves the truth about one's own character and talents, and therefore demonstrates one's best role for the benefit of society.

Once this nature is discovered, the Ithklur is obliged to be true to this nature and to attempt to make no secret of it. One facet of Ithklur belief is that the true nature, once discovered, is incorruptible, so the Ithklur have no fear of letting the entire universe know about their unique individual strengths and weaknesses, for they were assigned these by divine providence. Unlike humans, who attempt to conceal their personal fears and weaknesses, the Ithklur believe that one cannot be truly hurt by another taking advantage of one's true nature. Certainly one can suffer temporary reverses by those who take advantage, but facing up to and not fearing this nature is part of the duty, burden and joy of living in accord with the true nature and attaining the full realization of what one was created to be.

Uniforms: Ithklur military "uniforms" are, in the words of many a human observer, "an oxymoron," as they are anything but. Ithklur uniforms do begin with a basic utilitarian fatigue or jumpsuit design in a tactical color, but these are then festooned with all manner of personal, unit, religious and philosophical insignia (almost always including a tetragram in some form), flowers, boutonnieres, corsages, sashes, epaulettes, aigulettes, medals, ribbons and spontaneity bells.

Troops who are followers of the Tetramerous Path all wear the *San*klaass* Cap (which see) as their official military headgear, with the same pride that human elite military units wear their berets.

Hiver and Ithklur Character Generation Worksheet

1. Name _____

2. Race _____

3. Basic Attributes

Hivers: 2D6–1 each, assigned as desired. If attributes total less than 36, add points as desired to bring total up to 36.

Ithklur: 2D6–1 for all but EDU, 1D6, otherwise assigned as desired. If attributes total less than 33, add points as desired to bring the total to 33 (but EDU may not exceed 6).

Aging, homeworlds, and/or activities may raise or lower certain attributes.

Attribute	*Roll*	*Hiver*	*Ithklur*	*Mods*	*Final*
STR	____	—	+2	____	____
AGL	____	—	—	____	____
CON	____	—	+1	____	____
INT	____	—	+1	____	____
EDU	____	+2	—	____	____
CHR	____	—	—	____	____

Additional Attributes	*Roll*	*Mod*	*Final*
Hivers Only			
Curiosity (CRS) (1D6, no mods)			____
Smell (1D6 for 4+)		Yes/No	
Ithklur Only			
Psionic Strength (PSI)	____	____	____
*2D6–2 rolled upon examination minus term DMs, see **TNE** page 246.*			
Social Level (SOC, 2D6–1)	____	____	____

Roll: Roll/allocation; *Mods:* Modifications

4. Homeworld _____ SP____

Sz____ Atm____ Hyd____ Grv____

Pop____ Gov____ Law____ TL____

5. Careers

1st Term Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

2nd Term Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

3rd Term Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

4th Term Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

5thTerm Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

6th Term Career/Path _____
- 2dy Act/Top Club _____
- Contact _____
- Spec Assignmt _____
- Promo/Adv _____ Ship DM _____

6. Skills

Skill Name	*Level*

Character _____
Player _____
Gender _____ Smell ____
Homeworld _____
Path _____ Age ___
Universal Personality Profile

STR	AGL	CON	INT	EDU	CHR	- PSI	- SOC/CRS

Initiative __ Rank _____

TRAVELLER

HIVER AND ITHKLUR CHARACTERS

SKILLS & ATTRIBUTES

Strength (STR) .....

Agility (AGL) .....

Constitution (CON) .....

Intelligence (INT) .....

Education (EDU) .....

Charisma (CHR) .....

Psionic Strength (PSI) .....
(Ithklur Only)

CONTACTS

#	Type

#	Type

HOME WORLD DATA

Starport _____
Size _____
Atmosphere _____
Hydrographics _____
Gravity _____
Population _____
Government _____
Law Level _____
Tech Level _____

DERIVED VALUES

Weight ____ Load ____

Throw Range ____ Unarmed Combat Damage ____

HIT CAPACITY

Body Part shown in format Ithklur/Hiver

Current	Scratch	Slight	Serious	Critical
Head/Head Limb				
				+
Chest/Body				
				+
Abdomen/Reproductive Limb				
				+
Right Arm/Right Front Limb				
				+
Left Arm/Left Front Limb				
				+
Right Leg/Right Rear Limb				
				+
Left Leg/Left Rear Limb				
				+

ALIENS of the RIM™

Why did the Hivers assassinate Emperor Strephon? Why did the Hivers allow the Third Imperium to fall? What are the Hivers' plans for the future of humanity?

There are those who say that nothing takes place in charted space without the Hivers having anticipated it, planned it, shaped it, brought it into being by patient, careful manipulation.

The Hivers are the manipulators—emotionless, perfectly rational beings possessed of infinite patience and subtlety. If interstellar history is a clock, the Hivers are the ones who wind it; the passage of time itself does their bidding.

If a tree fell in a forest, and no one was there to hear it, would it make a sound? And how come if there are trees falling down, you never see any Hivers running around with axes?

What do you get when you cross a golden retriever with a box of razor blades? How is it that the most efficient, merciless killers in the universe don't have a mean bone in their bodies? If violence is natural, guileless, and innocent, does that mean one need not take it so personally?

The Ithklur are the most feared warriors known to man. To an Ithklur, Vargr plunder is like a walk in the park; Aslan warrior spirit is the babbling of a toothless child. Other races make such a fuss over violence—why not just do it and enjoy yourself?

To the Hivers, the Ithklur are their trained, elite shock troops, lovingly perfected by millenia of manipulation and social engineering. No finer tool has ever been fashioned.

But as far as the Ithklur are concerned, they have the Hivers just where they want them. Who wants to be a boring taxi driver anyway? If the Hivers want to pretend they're in charge, what does it really hurt, so long as they leave the Ithklur alone?

Who is manipulating whom? Is the Vargr wagging his tail, or is the tail wagging the Vargr? What is the sound made when an irresistible force collides with an immoveable object?

Hivers and Ithklur

BECAUSE IN SPACE, NO ONE CAN HEAR YOU SCHEME



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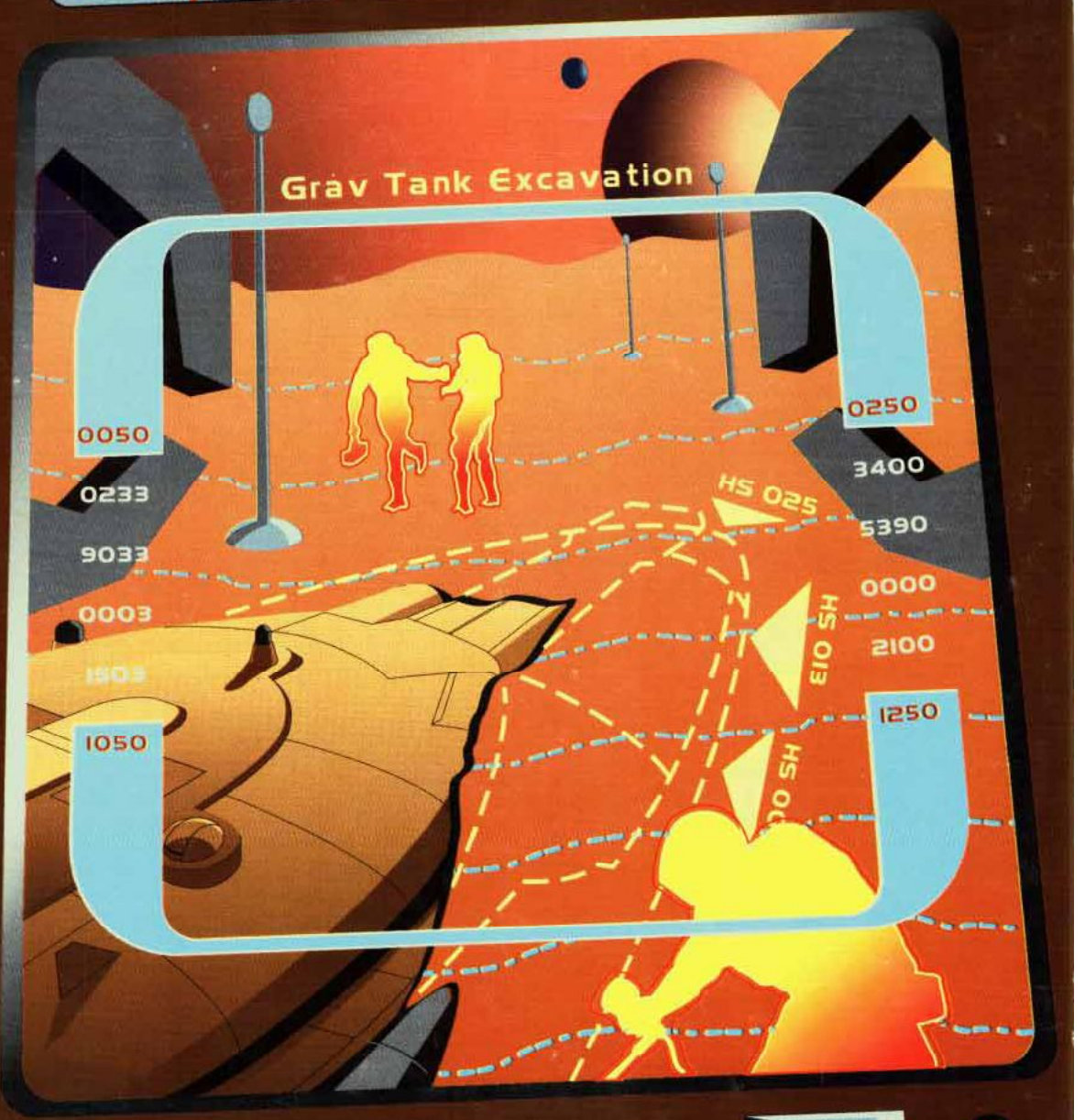
Science Fiction Roleplaying Game

TRAVELLER®
The New Era

0310

REFORMATION COALITION

Equipment Guide



Reformation Coalition Manual 3

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REFORMATION COALITION EQUIPMENT GUIDE

Science Fiction Roleplaying Game

TRAVELLER®

The New Era

GDW

"...You did not desert me, my brothers in arms."

—Refrain from the Oriflamme Marine Hymn

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Reformation Coalition Equipment Guide

INTRODUCTION

The **Reformation Coalition Equipment Guide** (**RCEG**) is a supporting sourcebook intended for use with the **Traveller: The New Era** (**TNE**) science-fiction roleplaying game. **RCEG** is a detailed encyclopedia of the sorts of equipment, vehicles, weapons, and spacecraft that are typically used and encountered in the **TNE** universe. Each piece of equipment is described in terms of its use in the **Traveller** game, and also in terms of its technical particulars: size, mass, type of ammunition, fuel consumption, speed, etc. Most of these items are also illustrated by technical drawings, and many are additionally shown "in action" in the color plate section at the center of this book.

While by itself this book is an interesting look at the technical side of the campaign "universe" of **Traveller: The New Era**, full use of **RCEG** requires that players have at least the **Traveller: The New Era** basic rulebook (plus the usual 6, 10, and 20-sided dice, paper, and pencils). Use of the equipment in **RCEG** will be enhanced by the possession of **Brilliant Lances: Traveller Starship Combat**, and **Fire, Fusion, & Steel**, the **Traveller** technical architecture handbook, but these are not required. Also not required, but equally advantageous for the gaming experience are potato chips, pizza, soft drinks, and napkins when you spill those things all over your books and papers.

So What's a Star Viking?

The official campaign background for **Traveller: The New Era** is set 3723 years from now in an area of space about 120 light-years from the planet on which you are standing. Eighty years earlier, this area of space had been part of an immensely strong empire which ruled over 11,000 worlds, encompassing 15 trillion citizens of dozens of different races. But this empire became embroiled in a horribly destructive civil war which lasted for 14 years, over the course of which hundreds of billions were killed, dozens of worlds sterilized, and the very fabric of interstellar society shredded. The final act of this war was the release of an artificially intelligent electronic virus. This virus, untested and uncontrollable, took the tools of interstellar civilization—computer-controlled starships, vehicles, cities, orbital stations, and robotic weapons systems—and brought them to life: horrible, insane, murderous life. Virus completed the devastation that civil war had begun, and a thousand-year-old society came to its final collapse. Seventy years later, the descendants of these infected machines live on, evolved to where they are no longer insane, but instead pursue their own inorganic ends, and compete with the few remaining pockets of civilization for the technology they both need.

In the midst of this wasteland lies a small cluster of worlds that calls itself the Reformation Coalition. Surrounded by the ruins of a once-proud empire and a trillion unburied dead on cold, lifeless worlds, the Reformation Coalition has committed itself to the creation of a new interstellar society to unite the fragmented, isolated, xenophobic worlds that remain.

Because the Coalition is small, it has come to rely on lightning-swift raids when it is opposed by backward, decadent warlords and others who oppose the new dawn that the Coalition brings with it. These raids are conducted by the Reformation Coalition Exploratory Service (RCES), and are used to recover crucial technology left behind in the ruins, technology which the Coalition cannot build itself, but which it can use to build the foundations of its new beginning. One of the Coalition's opponents is the Mercantile Guild, a lose affiliation of traders, slavers, and technology scavengers, which opposes all interstellar governments and seeks to maintain its monopoly on star travel. The Guild seeks to sow fear and distrust against the Coalition, and has begun spreading the word that the RCES is not the spearhead of a group of visionaries, reformers, or rebuilders, but are instead "Star Vikings"—heartless murderers and plunderers.

And therein hangs a tale. (For more information on these topics, see **TNE** sourcebooks **Path of Tears** and **Smash & Grab**.)

How to Use this Book

The primary use for **RCEG** is in support of a Reformation Coalition ("Star Viking") campaign set in the Old Expanses and Diaspora sectors. The equipment contained is that used most often by the RC and its opponents, and includes some of the most valuable relic equipment which can be recovered from the worlds of the collapsed empire.

Players: Players will most often use this book as a catalog of equipment when outfitting their RCES or free-lance expeditions into the Wilds. When the text indicates that a piece of equipment is manufactured by the Coalition, their characters can often simply purchase it. If it is expensive or hard to come by, they may request its use of the governmental or corporate patrons who may be helping to outfit their mission.

Players may also spot some high-tech devices (such as the formidable *Intrepid* grav tank shown being recovered on the

cover and in the color plates) that they may wish to recover, by exploring worlds known to have had a suitable pre-Collapse tech level. Players who enjoy designing their own equipment (using **Fire, Fusion, & Steel** or the ship design rules in **Brilliant Lances**) will also find that **RCEG** provides a ready source of inspiration for variants or new designs.

Referees: When used by referees, **RCEG** constitutes an encyclopædia (we had an extra "æ" lying around) of equipment, weapons, and vehicles used by the opponents, allies, or acquaintances of the RC player characters. This equipment can be the object of opposed or unopposed recovery missions, or in some cases, could be occupied by Virus, and be an active opponent to the PCs all by itself.

Non-RC Campaigns: You don't have to be playing in a Reformation Coalition campaign to get a lot of use out of the **RCEG**. The equipment in this book is based on all of the same "Imperial Space" technological assumptions that have illuminated previous editions of **Traveller**, and so are useful in most any **Traveller** variant campaign. And maybe you just like all of the cool pictures and descriptions. After all, that wouldn't be that unusual...

No, Really: Also, rolling this book up tightly will allow you to use it as a club to kill small insects, and broken windows may be repaired by using duct tape to firmly affix this book over the missing pane (paper is a great insulator). Young children often need a booster platform to get their little bodies up to the level of the dinner table, and, although phone books have traditionally been used for this purpose, **RCEG** is clearly more effective because the thickness of each **RCEG** in a stack of, oh, say 20 or so, allows you to make more precise adjustments to the height than would be possible with thicker phone books.

See? The uses of this book are as limitless as the breadth of your imagination (or the depths of your neurological disorders, as the case may be).

Fire, Fusion, & Steel

With the exception of the low-tech bows and muskets on pages 102-103, all of the equipment contained in the **RCEG** is designed using the **Traveller** technical architecture manual: **Fire, Fusion, & Steel (FF&S)**. When there are discrepancies between equipment details published in **RCEG** as compared to earlier **TNE** products, take the data in this book to be definitive.

This equipment is designed using baseline technology fields, and only the standard "Imperial Space" technology fields of contra-grav technology, jump drive, and laser focusing (see **TNE**, pages 330-332). The ideas and variations in this book should fuel the imaginations of **Traveller** equipment designers, as they have in fact fueled the imaginations of the GDW staff.

What's more, **RCEG** contains expansions to the **Fire, Fusion & Steel** design sequences on pages 154-157. There are some specialized applications of the **FF&S** technology that simply require a little more detailed treatment than was possible in a book as already packed with information as **FF&S**. Among these applications are the design of grav belts, plasma bazookas, flechette rounds for grenade launchers, and multimission pods and modules. Happy designing!

Future Developments

We will continue to support **FF&S** designs in the **RCEG** format in **Challenge** magazine, in a regular feature called "TAD (Technical Assessment Database) Update." We welcome submissions from current and new **Traveller** authors and enthusiasts. All designs must be accompanied by design worksheets and a sketch or description of the appearance of the equipment, and should be compatible with the Reformation Coalition campaign. Designs may be altered for publication to ensure campaign and rules consistency. Write to GDW for **Challenge** submissions guidelines, specifying "TAD Update."

The Conclusion, Wherein Dave Has Some Final Thoughts on Tooth Marks

I believe that **RCEG** might just be the most detailed, most fully realized fictional equipment sourcebook ever published for a roleplaying game.

That sounds more than a little arrogant, so I'll elaborate.

With the **Fire, Fusion, & Steel** design sequences used in **Traveller: The New Era**, you don't so much make up a new piece of equipment as *discover* it—discover how it works, discover how it's used, discover the story behind the ratings that you've calculated. I've seen a lot of sourcebooks that describe a weapon or vehicle as having a particular quirk, peculiarity, or weak point, and have been disappointed when those descriptions turn out to be simple narrative chrome—the quirks are not connected to the game's rules so that they result from the game's design sequence or even show up during play. What has obviously taken place is that the writer has thought up an interesting object with one or more interesting features and has described it as such, whether or not the game system actually supports what has been said.

What we've got with the **FF&S** sequence is a sufficiently large body of defined technological functions that you can simply try some ideas out and see what you come up with. This is the opposite approach from that described above, because the interesting features arise from the design sequence itself, kind of like in real life, and you the designer now get to take it out for a test drive. So many of the weapons or ships in this book have emerged from the design sequence as feisty little buggers that keep asserting their own identity, rather than simply accepting the perfectly clean, matter-of-fact parameters that we would have imagined for them.

This is of course so similar to the story of every real aircraft, vehicle, or weapon that has ever been designed (no machine is ever all things to all people, no matter how many specifications boards, congressmen, or defense secretaries may demand it) that it is easy to imagine that we are describing things in this book that actually exist 3700 years from now. I find myself frequently saying things like, "Hey, Loren, I just figured out how they use this thing, and why they built this other thing to use with it," except that I am usually more specific about the things I'm talking about.

So what "most detailed, most fully realized" sourcebook means is that it feels like we didn't just make this stuff up. Instead, it welled up out of the **TNE** universe and sort of snuck up behind us and bit us (and pretty *hard* too, some of it), allowing us to wrestle it to the ground and shoehorn it all into this densely packed volume.

Inevitably, there were things that we had to leave out or couldn't elaborate as fully as we wanted (after all, publishing imitates reality in its inherent imperfection and incompleteness). In a sense this is a blessing in disguise, as it means we get to do another installment someday, which we can make even more interesting than we think this one is.

We hope you find all of this gear to be as fascinating as we have.

Reformation Coalition Exploratory Service
Office of Technical Intelligence
Aubaine

This document is the most recent installment of the RCES Technical Assessment Database (TAD). It contains many new entries for newly recovered analyzed and described equipment, as well as revisions and updates of equipment described in earlier TAD installments. These changes and revisions are the result of new information for non-Coalition equipment and changes or finalizations to designs being produced or developed within the RC.

All RC personnel are encouraged to forward to this office any field observations which may impact on intelligence estimates contained in this or any other database. Future databases are being compiled as you read this. Data on Guild-supplied and supported materiel is of particular importance. Report any unusual distributions of technology and equipment that indicates off-world influences.

Good Hunting. Strike Hard. No Regrets.

CDR Jezebel "Saint Joan" Proffit
Commanding, OTI

ORGANIZATION

This collection is broken down into four broad areas: Equipment, Weapons, Vehicles, and Spacecraft.



Equipment

This category includes personal transportation, personal armor, communications devices, sensors, vision enhancement devices, survival equipment, and medical technology. Although all of these have military applications, they are not considered to be weapons in the strict sense.



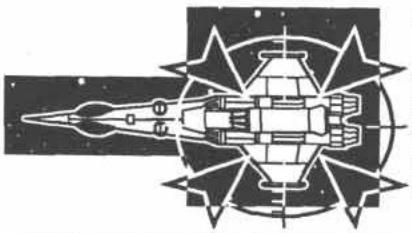
Weapons

This category covers non-vehicular offensive technology, i.e., devices intended to break things and hurt people. This includes personal small arms, heavy support weapons, antiarmor and antiaircraft weapons, and planetary defense missiles.



Vehicles

Vehicles include utility and transport vehicles, as well as military vehicles, which are often self-propelled weapons. Vehicles are defined distinctly from spacecraft by the fact that they carry out their primary function solely within the planetary regime. Although some vehicles might be able to attain orbit under their own power, it is not exo-atmospheric travel or combat that is their main purpose.



Spacecraft

Spacecraft are vehicles designed specifically to operate in interplanetary space. These chiefly include starships, but also include non-jump-capable craft used for system defense or support of starfaring vessels. Vessels which are used chiefly for interface transport and are carried aboard starships are classed as spacecraft for these purposes, not vehicles.

Within the above functional categories, equipment is further defined by main user or source: RC, Last Imperium (Relic), Guild, Wilds, and Hiver. Some of these functional areas overlap, for example, relic technology used by worlds in the Wilds, or relic technology copies of which are also in production within the RC. In these cases, the assignment is based on which category is more "typical."

For example, grav belts (page 10). Although TL-12 versions of the grav belt are produced in the RC, this is done only in limited numbers, and most grav belts (as opposed to grav rails) in Coalition service are actually relics. However, as almost all grav belts seen in use are in Coalition service, they are assigned to the RC category. Likewise, relic small arms that are of sufficiently low technology that they are readily used on the worlds where they are found (pages 50-51) are classed as Wilds, because they are most often found in use, rather than waiting to be recovered.

Security Clearance

Yes No

28-IX-1201
Date

Reformation Coalition Equipment Guide

Power

ON/OFF



Reformation Coalition

This is equipment which is either currently manufactured by RC member worlds, or relic technology which has been recovered in sufficiently large numbers that it has been standardized for use within the RC. Note that RC standard equipment is manufactured from tech level 8 to 12 by the following worlds. Percentage is the approximate share of total RC industrial production from tech levels 8-12 performed at that TL.

TL-12	Aubaine	16%
TL-11	Aurora, Eos	1%
TL-10	Fija, Trybec	6%
TL-9	Oriflamme, Baldur, Nike Nimbus	74%
TL-8	Lucifer (Luhtala)	3%



Last Imperium

This is relic technology manufactured by the Last Imperium which is not typically in use by other powers but which can be recovered and returned to service by RC organizations. These items are usually found one at a time in various states of disrepair, scattered across any of the innumerable worlds frequented by the Imperium, but can rarely be discovered in large quantities in warehouses, depots, or military bases. These items may also be infected by Virus, or even be found in use by Vampire forces.



Mercantile Guild

These are items, almost always weapons, which are distributed to anti-RC forces (usually technologically elevated dictators—TEDs) by the Mercantile Guild. Guild distribution was first discovered by the large number of identical weapons on widely separated worlds which appeared to have been introduced relatively recently, and were not locally manufactured and do not follow the typical pattern of relic technology distribution. We now have documentation that many of these systems are traded by the Guild for local materials, goods, services, or even slaves.

Those which have been firmly identified as Guild-supplied equipment are indicated as such here, but it is likely that there are additional classes of equipment that we have simply not yet tied to Guild activity. This category also includes certain equipment which is typically used by the Guild crews themselves.



The Wilds

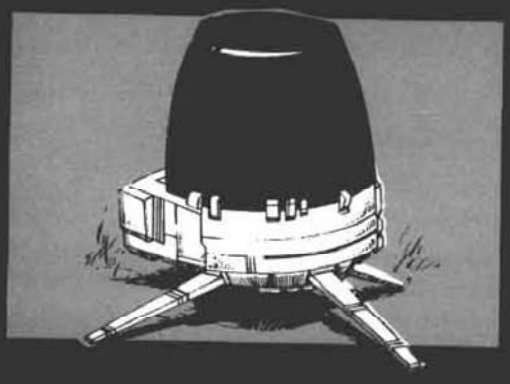
This is equipment, usually weapons, which is found in the service of armed forces in the Wilds. This includes locally manufactured low-tech equipment as well as standard Last Imperium equipment which was distributed in such large numbers that it can still be said to be "standard" on hundreds of separate worlds. It does not include equipment which we believe is used primarily as a result of Mercantile Guild supply.

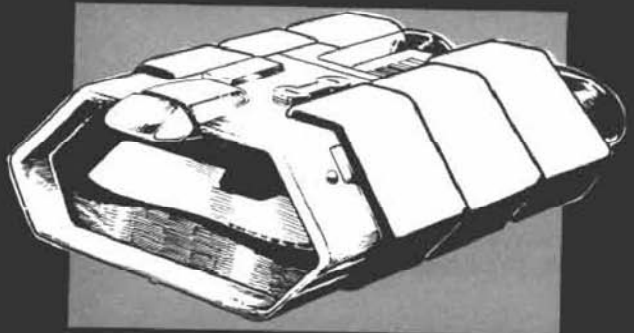


Hivers

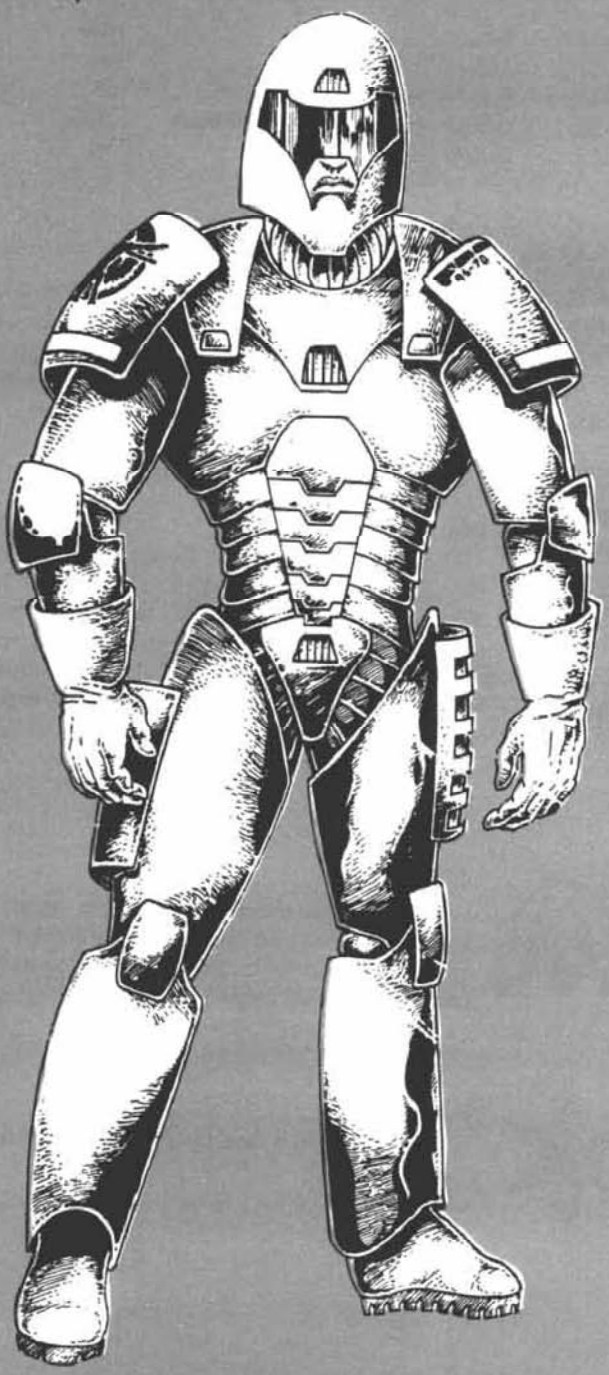
This is equipment used by the Hivers themselves or by Hiver subject races, particularly the Ithklur.

EQUIPMENT









EQUIPMENT

The equipment in this section serves a variety of purposes, from personal transport and armor to communications, surveillance, survival, and medical gear. Some of this equipment is standard issue (such as the personal armor, communicators, and vision devices), while others is available only to specialized units or on an as-needed basis (grav belts, drop capsules, remotely operated sensors, anti-virus equipment, covert operations equipment, and portable automeds).

When establishing the need for equipment to accomplish a certain mission, planners must first establish how much of the Coalition's most precious asset—its personnel—will be assigned to the operation. This is not the simple matter it would have been under the Last Imperium with its seemingly infinite assets and standardized tables of organization and equipment.

In the Coalition, nothing is standard. Because missions are backed by any combination of the RCES itself, one or more RC member worlds, or one or more RC corporations, and carried out with any combination of RC troops, planetary troops, or groups of free-lancers, everything is an *ad hoc* or task-organized arrangement. Many times an operation is carried out by whatever persons happen to be standing around nearby, equipped with whatever gear is close at hand.

However, for purposes of planning, there are a few basic concepts that recur in most RC operations.

The basic building block in the Coalition armed forces is the four-trooper fire team. There are different types of teams used for different purposes, and these are combined together in various mixes to accomplish the mission at hand. The following descriptions are not *official* in any sense, but are *typical*. These include page citations for the equipment described elsewhere in this book or in the basic **TNE** rule book.

Light-Powered Fire Team: Four troopers in light battle dress (pages 18-19) armed with three 7mm advanced combat rifles (pages 60-61), CMWS rifles (page 65) or 4mm gauss rifles (page 70) and one 2cm light assault gun (page 54), plus a mix of RAM grenades (page 101) and single-shot disposable tac missile launchers (page 108).

Heavy-Powered Fire Team: Four troopers in heavy battle dress (pages 20-21) armed with three 4mm gauss rifles (page 70) or 4cm CLC laser rifles (page 93) and one 2cm light assault gun (page 54), 4mm gauss SAW (page 71), or 4.3cm plasma rifle (page 86), plus a mix of RAM grenades (page 101) and single-shot disposable tac missile launchers (page 108).

Unpowered ("Muscle") Fire Team: Four troopers in combat environment suits (**TNE**, pages 358-9) or body sleeves (pages 16-17), armed with three 5.5mm assault rifles (page 52) and one 5.5mm assault rifle with attached 2.5cm grenade launcher (page 53), plus a mix of RAM grenades (page 101) and single-shot disposable tac missile launchers (page 108).

Reconnaissance and Designation Team (RDT): Four troopers in combat environment suits (**TNE**, pages 358-9) or body sleeves (pages 16-17) armed with two 3cm CLC laser carbines (page 94), two 2cm CLC personal defense lasers (page 95), two 13mm sniper rifles (page 55), and one broomstick (page 11).

Powered Fire Support Team: Three troopers in light or heavy battle dress (pages 18-21) and one trooper in heavy scout battle dress (page 21), armed with one 6cm squad support laser (page 96) or 6cm laser sniper weapon (page 97), two 2cm personal defense lasers (page 95), and one 4.3cm plasma rifle (page 86) or 6cm assault rocket launcher (page 98).

Unpowered ("Muscle") Fire Support Team: Four troopers in combat environment suits (**TNE**, pages 358-9) or body sleeves (pages 16-17), armed with one 6cm squad support laser (page 96) or 6cm laser sniper weapon (page 97), two 2cm personal defense lasers (page 95), and one 9cm plasma bazooka (page 85) or 6cm assault rocket launcher (page 98).

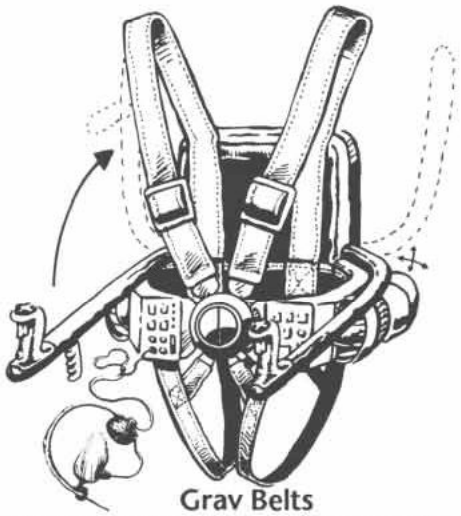
Thus a nominal squad of powered troops could consist of two or three fire teams, or two fire teams and a fire support team, plus a commander, totalling 13 troops. A muscle squad could also consist of two fire teams and a fire support team or RD team and a commander. The Coalition frequently deploys mixed squads of muscle and light-powered units (for example, one muscle fire team, one light-powered fire team, and a muscle fire support team) for greater combat power and survivability.

Note that the overall size of a squad is limited by the delivery methods available. For example, the drop capsule pod for the Multimission Scout (pages 140-141) normally carries 12-13 drop troops (leaving space for 2-3 decoy or equipment drop capsules), the drop capsule pod for the Victrix ships (pages 138-139) normally carries 14-16 troops (leaving space for 8-10 support capsules), and the Fury-type assault landers (page 149) carry a maximum of 14 troops.

Units above can be further reinforced by the addition of a "ragtop" air raft (pages 114-115), or some form of grav armor fire support such as the Mongoose attack speeder (pages 116-117) or Pyrrhus support sled (page 126).

Additional equipment such as portable sensors, communications uplinks, anti-virus equipment, etc., can then be assigned to the unit based on its necessity, the personnel requirements for operating it, and the transportation requirements for delivering it and moving it around once it is delivered.

For the equipment in this section, volume is given in either liters or cubic meters (m^3, 1000 liters = 1 m^3), mass is given in kilograms (kg) or metric tonnes (1000 kg = 1 tonne), and price is given in credits (Cr) or megacredits (MCr, where Cr1,000,000 = MCr1).



Grav Belts

The manufacture of grav belts only becomes possible at tech level 12 when contra-grav modules can be miniaturized to the scale of a single person. Grav belts are manufactured in limited numbers on Aubaine, and are issued only on a strict as-required basis. However, relic grav belts are sometimes recovered and used in private service.

Grav belts resemble parachutes in that they consist of a large backpack attached to a parachute-style harness. In addition, they have two arms at about the approximate location of the arm rests on a chair. At the end of these arms are the hand grips that are used to control the grav belt. These arms can be swung out of the way over the wearer's head to allow the use of firearms, etc. In addition, there is a data display headset that is attached to the backpack by a wire, and which is fitted to the head when the grav belt is being worn. The headpiece has a monocular heads-up display which displays such data as airspeed, altitude, remaining battery endurance, etc. The headpiece also contains a single earpiece which is used to send aural warnings to the user, such as a tone to warn the wearer that he or she has descended below a certain preset altitude, or that the battery is down to bingo charge (half empty) or its last five minutes of charge.

The harness is heaviest about the waist, where the contra-grav (CG) projectors are placed. Also fitted at the waist are fully vectorable shrouded fans that provide thrust for maneuvering.

The CG lifters and propulsion fans are all powered by a two-hour endurance battery which, along with supporting electronics and avionics, is carried in the backpack.

Because contra-grav technology is not a thrust generator, but rather creates a field within which gravity vectors are 99% negated, there are some phenomena associated with using a grav belt. One is that other objects within the field besides the wearer also have their weights largely negated. This means that if the grav belt wearer attempts to drop a grenade, the grenade will slowly float to the ground at 1% of its normal falling acceleration until it passes out of the CG field, at which point it will fall normally. It is important to remember that such objects must be *thrown* downward out of the field, rather than simply dropped. Another example is that if the grav belt wearer flies near a tree so that a branch projects into the field, the branch, temporarily relieved of its weight, will flex upwards. An insect that flew through the field would experience a similar result.

The contra-grav field generated by the belt is of sufficient size to contain the grav belt's hardware as well as a wearer whose limbs are held in a fairly compact posture. However, the CG envelope is relatively small in order to keep power requirements down and to avoid the difficulties of having the field projected over too many other extraneous objects. This means that the wearer, especially one firing a weapon, can break through the edge of the CG field with bodily extremities or pieces of equipment (this is not a problem in grav vehicles or spacecraft because the edge of the field coincides with the hull walls), which can cause potentially catastrophic stability problems. Grav belts are fitted with microflight computers which keep track of the grav belt's attitude and make constant minute thrust corrections to maintain a smooth, level, and safe ride. This computer also allows the wearer to relinquish control of the belt for periods during combat in order to fire weapons, reload, etc. During this period, the computer can hold a straight and level course, hover, etc.

Grav belts may be recharged from standard RC power outlets.

Persons wearing grav belts are fired on and take damage as normal personnel targets. Both grav belts below have the following performance figures:

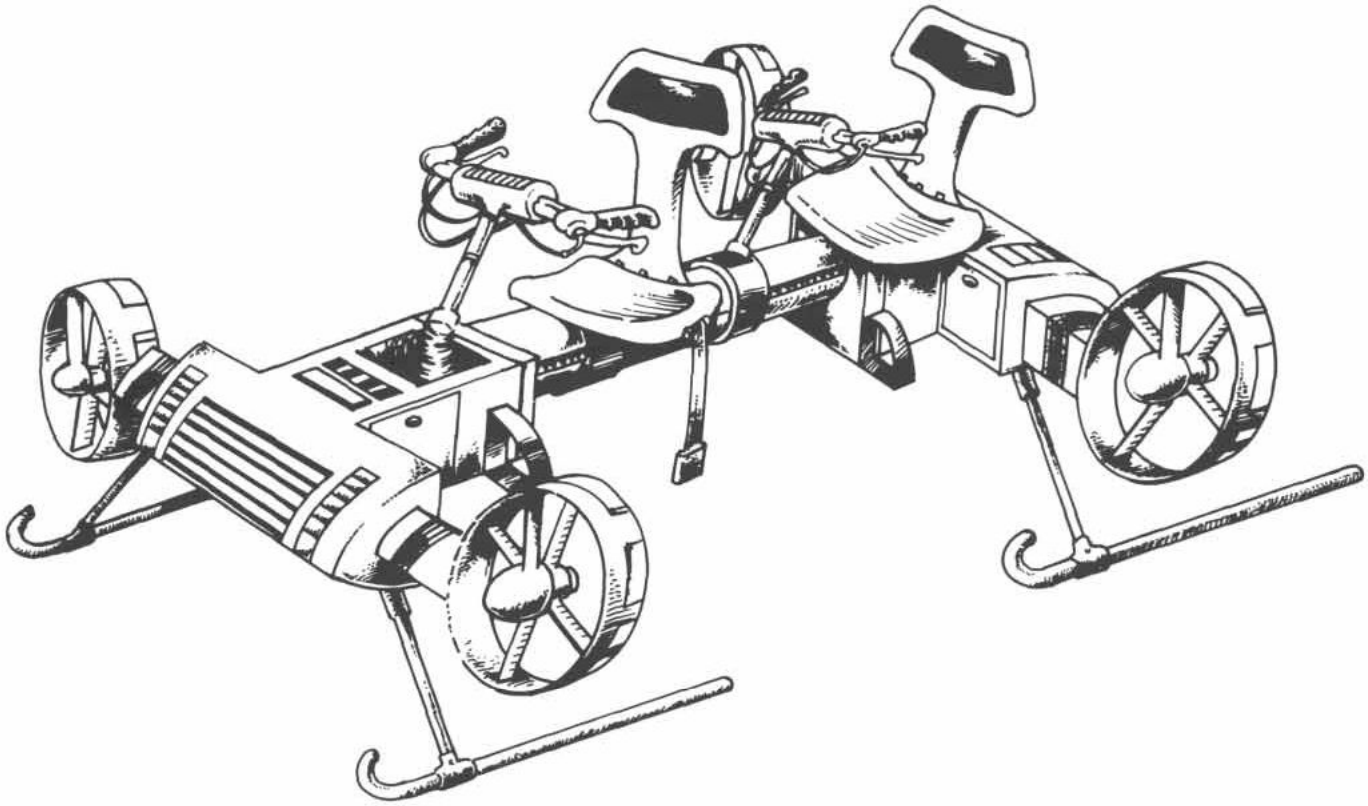
Capacity: One person plus armor and equipment (may include battle dress-equipped trooper). In emergencies, a second person may be carried, but this person must cling very tightly to the grav belt wearer in order to remain within the CG envelope, and the wearer may not conduct any activities except to fly the belt.

Speed: 300 kph maximum, 225 kph cruising, 40-120 kph NOE

Combat Move: 42 10-meter grid squares in high mode (absolute speed), 6 10-meter grid squares in NOE mode (safe speed)

Grav Belts

TL	*Mass*	*Volume*	*Endurance*	*Price*
12	108 kg	75.5 liters	2 hours	Cr114,960
15	90 kg	63.5 liters	2 hours	Cr115,100



Broomstick (TL-12 Tandem Grav Rail)

The official RC name for this device is the tandem grav rail, but it is almost without exception simply called the "Broomstick." It is basically a two-person grav belt, with the passengers in a tandem configuration. The broomstick actually sees wider use in RC service than the grav belt, because the broomstick is more economical to produce per passenger carried, because there is only one microflight computer and avionics set per two passengers, instead of for each passenger. In addition, the broomstick allows passengers to be easily picked up and dropped off by a single pilot.

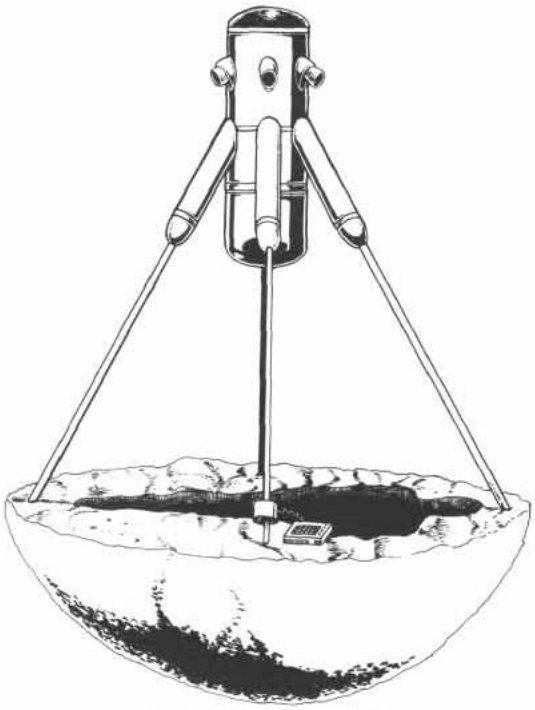
Although the components of the broomstick are essentially the same as those in two grav belts, they are laid out differently. Rather than placing the batteries and controls on the rider's backs, they are placed in pods beneath the connecting strut for greater stability. And because the broomstick riders are placed in a sitting position, they take up less envelope space, allowing the envelope to be lengthened to contain larger batteries.

It has the same operational peculiarities noted with the grav belt (facing page), and like the grav belt, operates in total silence. The broomstick is typically used by RC troops for reconnaissance. The broomstick is operated with Grav Belt skill.

Fire at personnel riding a broomstick is treated as fire against motorcycle riders (**TNE**, pages 278 and 298).

Tech Level: 12
Price: *Cr116,900*
Size: 0.2 tons (SM)
Mass: 231.2 kg empty
Power: 0.04558 MW TL-12 battery with shrouded propellers providing 0.02638 tonnes of thrust
Maint: 1
Controls: Dynamic linked, TL-6 flight avionics, TL-12 microflight computer
Commo: None
Life Support: Light
Cargo: Personal equipment carried by two riders only
Crew: 1
Passengers: 1
Travel Move: 900/240
Combat Move: 42/6
Fuel Capacity: 4 hours duration for battery which powers CG lifters and shrouded propellers
Combat Statistics: Treat as motorcycle (**TNE**, pages 278 and 298)

Personal Reentry Kit



Personal Reentry Kit

Originally invented as a means of emergency atmospheric reentry from a crippled space vessel, the personal reentry kit (PRK) was quickly adopted by the military and provided the glamorous *raison d'être* for jump troops (although first-line jump/drop troops have long since transitioned to purpose-built *drop capsules*—see pages 14-15). So appealing is the image of meteoric descent from orbit that these kits have even enjoyed some popularity among hobbyists. For sporting displays, the ablative foam can be formulated to burn in a variety of colors, creating stunningly beautiful pyrotechnic displays in the hands of skilled operators.

Each kit consists of an inflatable hemispheric mold, a pressurized cannister of ablative foam, and a chemical thruster for attitude control and limited vector adjustment. The kit does not include a soft landing system (usually a parachute); this item must be purchased separately.

The PRK has no provision for defensive decoys and depends upon its operator for maneuvering instructions (instead of the on-board computer used by Coalition drop capsules), which means that the operator must have some Environment Suit skill if an unskilled task roll is to be avoided.

TL-8 and 10 versions below are manufactured in the RC, TL-13 PRKs are available only as relics.

TL	*Volume**	*Mass**	*Price**
8	20 liters	14.5 kg	Cr15,000
10	16 liters	11 kg	Cr12,000
13	12 liters	8 kg	Cr10,000

*This is purely for the PRK alone, and does not include a parachute, parawing, grav parachute, or grav belt.

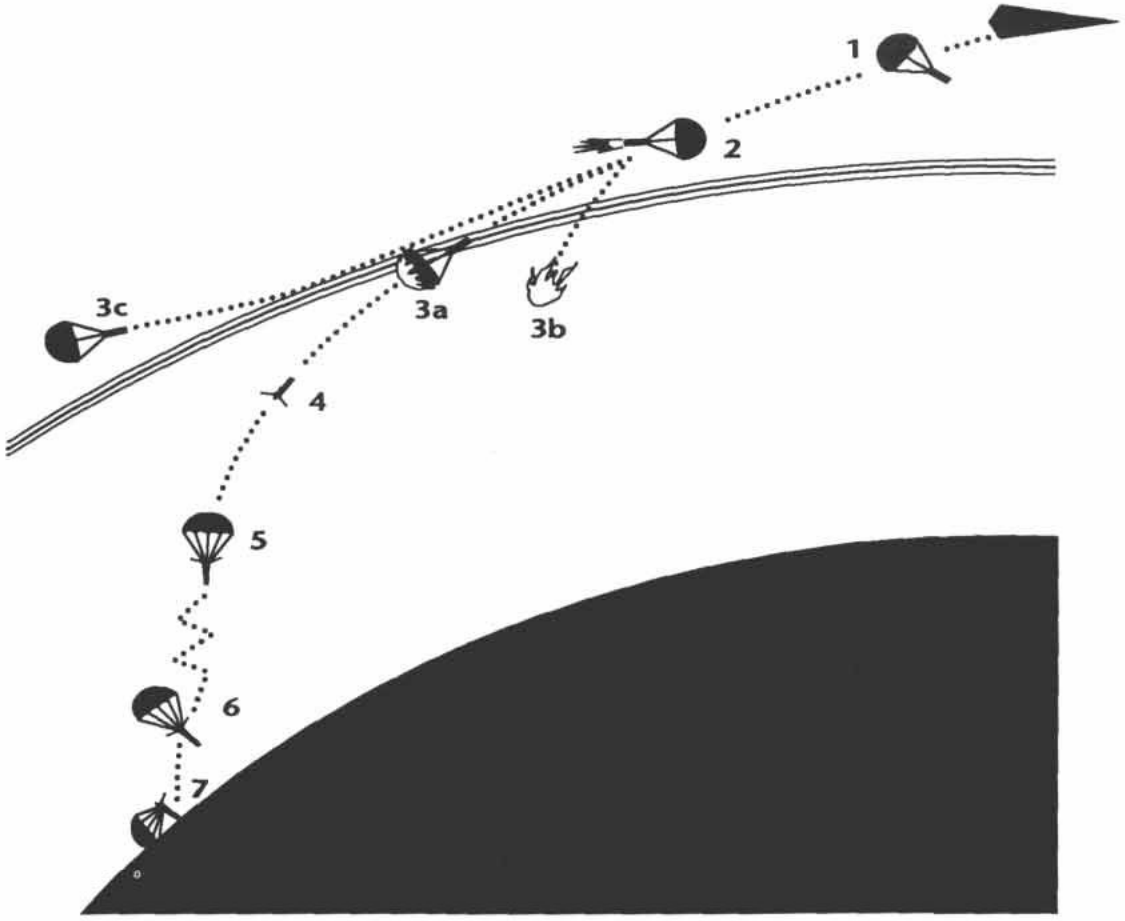
PRK Reentry Sequence

The **TNE** rules make reentering with a PRK a single Difficult: Environment Suit task, with the recommendation that the referee implement Diff Mods for dense atmospheres or high initial vectors (PRKs may not be used in atmospheres of very thin or less). Players and referees who wish to play out the situation in more detail may wish to use the following optional sequence:

1. Deploy Kit and Ablative Foam Shield: The user unpacks the kit, deploys the mold, prepares the ablative heat shield, and otherwise prepares for the descent (Easy: Environment Suit). Any success indicates that the kit has been deployed correctly. Failure means that the kit has not been deployed properly, and the user must try again. Catastrophic Failure indicates the kit has a minor defect, and the reentry burn task is carried out at +1 Diff Mod.

2. Calculate Trajectory and Execute Reentry Burn: If the user wishes to try to land at a specific 1 km square landing zone, this is the point at which that must be specified to the referee, and the trajectory calculated on that basis. If the character does not choose a specific landing zone, the reentry task is carried out at –1 Diff Mod, and the referee picks a landing zone at random.

The user calculates the desired trajectory and executes a reentry maneuver (Difficult: Environment Suit). Reentry in dense atmospheres or from a non-orbital trajectory is carried out at one higher Diff Mod (these are cumulative). Other decisions as to the reentry vector are left up to the referee's discretion.



Success: On any success, go to step 3a (with reserve fuel).

Failure: User must recalculate the burn angle and try again. If successful, go to step 3a (without reserve fuel), if a second failure occurs, go to step 3c.

Catastrophic Failure: Go immediately to step 3b (with reserve fuel).

3. Reentry and Minor Course Corrections: What happens here depends upon the success of the task in step 2.

3a: The user is on course, and reenters the atmosphere. The ablative shield protects the user on the trip down, and minor course corrections may be made if the PRK has entered this step with reserve fuel.

The user may continue on to step 4.

3b: The user has reentered at too steep an angle, and must immediately try to correct this by a second burn (Formidable: Environment Suit), applying the Diff Mods for atmosphere and high initial vector, if any, and using up the PRK's reserve fuel. Success means that the user may go on to step 4.

3c: The user will strike the atmosphere at the wrong angle and "skip" off into space, drifting helplessly in orbit around the planet, and without fuel to change vector (the second burn exhausted the PRK's fuel supply).

4. Jettison Shield and Enter Free-Fall: There are no tasks associated with this step. If the user was able to make minor course corrections during step 3a, the user is now within 1D10 km of the chosen landing zone. If the user picked a landing zone, but was unable to make minor course corrections during step 3a, the user has deviated and is now 1D20+5 km from the chosen landing spot.

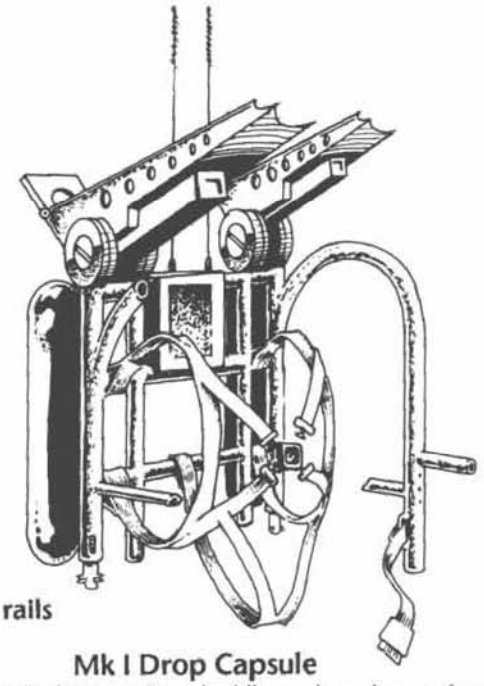
5. Deploy Parachute/Activate Grav Belt: The user now deploys the PRK's parachute, grav parachute, or parawing, or activates the grav belt. If using a grav parachute or parawing, the user may counteract 1D6 km of the course deflection introduced in step 4 (by succeeding at an Average: Parachute task—Catastrophic Failure *adds* another 1D6 km to the course deflection).

If using a grav belt, the user may fly to anywhere within its normal range (see page 10), and need not go through steps 6 or 7 unless desired. Operating a grav belt requires task rolls versus Grav Belt skill (see the basic rules, page 120, for a discussion of grav belt-related tasks).

6. Maneuver to Landing Zone: If using a grav parachute or parawing, the user may counteract another 1D6 km of the course deflection introduced in step 4 (by succeeding at an Average: Parachute task—Catastrophic Failure *adds* another 1D6 km to the course deflection). Users with grav belts may fly to their landing zone if it is within the grav belt's range.

7. Land: Characters using grav belts automatically land safely. Characters using any form of parachute to land safely must make a task roll. To land safely in most terrain is Average:Parachute, to land safely in woods, cities, swamp, or water is Difficult: Parachute. Parachutes may be used to attempt a landing at a specific location within the 1 square kilometer landing zone (Formidable: Parachute for simple parachutes, Difficult: Parachute for grav parachutes and parawings—see the basic rules, page 120, for a discussion of parachute-related tasks).

Drop Capsules



Parachute harness with missile launch rails

Mk I Drop Capsule

The Mk I drop capsule carries one battle dress-equipped soldier and combat equipment through an atmosphere to a set of pre-programmed ground coordinates, piloted by the flight computer. On the trip down, the capsule executes evasive maneuvers using its thruster package, and deploys decoys as necessary. An ablative heat shield protects the passenger from the heat of reentry.

After passing through the upper atmosphere, the outer shell splits away, leaving the passenger in a small framework that acts as a shoulder harness for a steerable parachute. After a period of free-fall, the passenger deploys the parachute and glides the remaining distance to the landing zone. This free-fall can be short or long in duration, depending upon tactical demands for low-altitude parachute opening (ODLO, orbital drop, low opening) or high-altitude opening (ODHO).

Upon landing, the framework that held the parachute forms a missile launcher. The two Lyrebird missiles sit on launch rails, and wait, while the launcher's computer/radio monitors the trooper's radio frequency. For a complete description of Lyrebird missiles and their use in combat, see page 107.

A Mk I may carry one soldier and a varying amount of equipment. If the passenger wears heavy battle dress, the capsule can accommodate up to 260 kg of additional equipment and supplies (including personal weapon). A passenger with light battle dress can carry up to 476.5 kg. A passenger without battle dress (a foolish passenger, in other words) could carry up to 679.7 kg of additional equipment.

When conducting drop operations, battle dress suits are equipped with a small (0.5 kg, Cr100) one-hour duration air supply. This is what the trooper will breathe during atmospheric entry and free-fall, and, assuming low-altitude parachute deployment, allows the trooper to remain in the launch tube awaiting launch for up to 50 minutes with sufficient air reserves to reach the ground.

Tech Level: 10
Price: Cr354,079
Size: 0.5 displacement tons (7m³), length 3.2 meters
Mass: 7.02 tonnes loaded, 6.24 tonnes empty (as they are not reusable, empty mass includes everything but passenger and cargo)
Power: 0.04 MW battery
Maint: 1
Passengers: 1 soldier in battle dress, with equipment (max. 0.68 tonnes)
Offensive Armament: Twin Lyrebird remote missiles in package launchers.
Defensive Armament: Anti-radar decoy dispenser, anti-EMS decoy dispenser, anti-IR decoy dispenser
Ammo: 5 eachxanti-radar, anti-EMS, and anti-IR decoys
Maneuverability: Liquid fuel thrusters for 0.75 G and 4 minutes fuel
Armor: 10



Mk II Drop Capsule

The Mk II drop capsule is a family of unmanned capsules intended for use in support of the Mk I capsules, either for cargo carriage or as armed decoys. The Mk IIs are piloted by the same flight computers as the manned Mk Is. Like the Mk I capsule, the Mk II executes evasive maneuvers using its thruster package, and deploys decoys as necessary in the upper atmosphere, thereby appearing identical to the manned capsules on enemy sensor screens.

After passing through the upper atmosphere, the outer shell splits away, leaving the contents to either descend by parachute as with the Mk I, or fall directly to the ground. There are three types of Mk II drop capsules, each having a different job.

Mk IIa Decoy Capsules: These cover the other capsules on the way down by providing additional targets for ground fire and additional decoy protection. Just before arriving at the target, the capsule splits open and deploys its payload of 50 250-kg deadfall bombs with devastating results. These capsules are usually fired to drop their ordnance on enemy defensive positions.

Mk IIb "Iron-Hand" Capsules: These capsules provide SPAD (Suppression of Planetary Aerospace Defenses) "top cover" for the attacking force. Each capsule contains a Mjolnir advanced anti-radiation missile (Advanced-ARM), which descends beneath its parachute while scanning for enemy active sensor emissions. If any are detected, the missile sheds its chute and launches itself at the source of the signal. As the missile has target memory, even if the sensor shuts down, the missile remembers the last place it got a signal from and the radar must move if it is to avoid being hit. See page 109 for further details.

Mk IIc Cargo Capsules: These carry additional supplies for a raid, and accompany a raid down, shedding decoys, maneuvering, and landing as normal drones. The capsule contains an inner cannister (with an armor value of 2) which descends beneath a parachute. The cannister's cargo capacity is limited by a combination of parachute load-carrying capacity and the nature of the cargo. Cargo capacity for normal equipment (such as firearms and ammunition) is 1236 kg. Because electronics requires more protection and careful packaging, only 824 kg of electronic equipment can be carried. Up to 2320 kg of extremely durable supplies packed in bulk (such as premix concrete or steel rebar) may be carried with a main and reserve chute, or up to 5070 kg with only a main chute (no reserve).

Tech Level (all variants): 10

Price: *Mk IIa:* Cr360,094 (not including price of bombs—see below); *Mk IIb:* Cr360,094 (not including price of Mjolnir missiles—see page 109); *Mk IIc:* Cr360,418.

Size (all variants): 0.5 displacement tons (7m^3), length 3.2 meters

Mass (all variants): 18.82 tonnes (Mk IIa), 8.82 tonnes (Mk IIb), or 7.579-11.825 tonnes (Mk IIc) loaded; 6.32 tonnes (Mk IIa & b) or 6.755 tonnes (Mk IIc) empty (as they are not reusable, empty mass includes everything but payload and cargo)

Power (all variants): 0.04 MW battery

Maint (all variants): 1

Passengers (all variants): None

Offensive Armament: *Mk IIa:* 50×250-kg deadfall bombs; *Mk IIb:* 1×Mjolnir Advanced-ARM; *Mk IIc:* None.

Defensive Armament (all variants): Anti-radar decoy dispenser, anti-EMS decoy dispenser, anti-IR decoy dispenser

Ammo (all variants): 5 each×anti-radar, anti-EMS, and anti-IR decoys

Maneuverability (all variants): Liquid fuel thrusters for 0.75 G and 4 minutes fuel

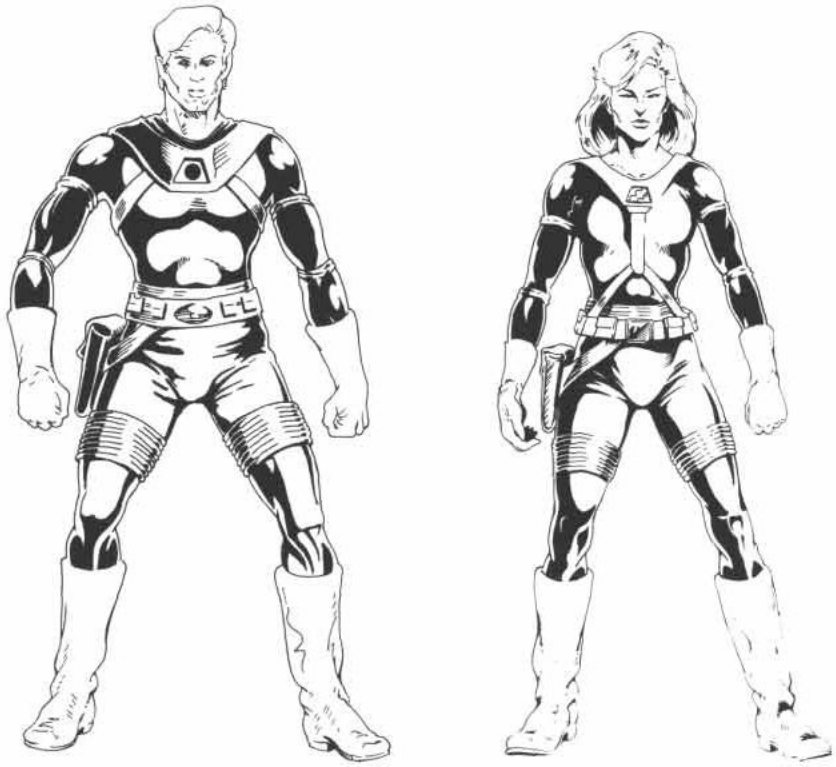
Armor (all variants): 10

250-kg (25cm) TL-7 Deadfall Bomb

Type	*Dam*	*Pen*	*Mass*	*Volume (m^3)*	*Price (Cr)*
250-kg HE	C: 94, B: 95	31C	0.25 tonnes	0.05	2500
250-kg HEAP	C: 62, B: 75	193C	0.25 tonnes	0.05	3750
250-kg Chem	C: 3, B: 75	Nil	0.25 tonnes	0.05	2500
250-kg Hvy SubMun	C: 0, B: 155	*	0.25 tonnes	0.05	15,000

* See TNE, page 285.

RCES Body Sleeve



RCES Body Sleeve

Perhaps the most typical and distinctive of the "Star Viking" equipment is the body sleeve: a multipurpose cooling system/G-suit/undergarment/utility uniform/body armor. The body sleeve was conceived as an undergarment worn beneath vac suits, combat armor, or battle dress. By incorporating various functions such as environmental control, G-suit bladders, and medical monitors into a comfortable "liner" garment, manufacture of the outer suits could be simplified, and putting these suits on could be done more quickly. In any event, the body sleeve has turned out to be so comfortable and useful that it has become the universal, all-occasion uniform for RCES and RCN personnel.

The body sleeve is, first and foremost, a full-body suit of ballistic weave armor with an environmental control system woven into it. Unlike the combat environment suit, which it resembles, it is a form-fitting garment (in order to slide easily into a vac suit or suit of armor, but the body sleeve is not sheer, resembling a 20th-century scuba wetsuit), and has a hood that can be pulled up to cover the head. When not up, the hood can be tucked down into the harness structure around the shoulders. This harness structure functions as the anchoring system when an airtight helmet is fitted to the suit, and is also a part of the body sleeve's integral load-bearing system to which grav belts, back packs, life support gear, and other loads are attached.

With the hood up, the only body portions exposed by the sleeve are the hands and face, which makes the suit an extremely valuable survival garment in the event of loss of pressure (a common fear in space). Although the body sleeve cannot fully function as a vac suit by itself, its protection does enable a crewmember wearing it to survive the worst effects of vacuum exposure for a few minutes. The edge of the hood is made of an adhesive material that makes a semi-airtight bond with bare skin, protecting the vulnerable eardrums (facial hair prevents a tight bond, so most RC personnel do not wear beards). By pinching the nose and closing the eyes, a person caught in a sudden depressurization can usually make it to an emergency oxygen mask stored in wall cabinets throughout all RC ships (and marked with bright strobe lights that can be seen through the eyelids). For this emergency use alone, the body sleeve is the universal shipboard uniform of RC forces. With proper gloves and helmet, the body sleeve is also fully sufficient to protect its wearer in very thin, thin, and tainted atmospheres (assuming atmospheric filtration and/or air supply, as appropriate).

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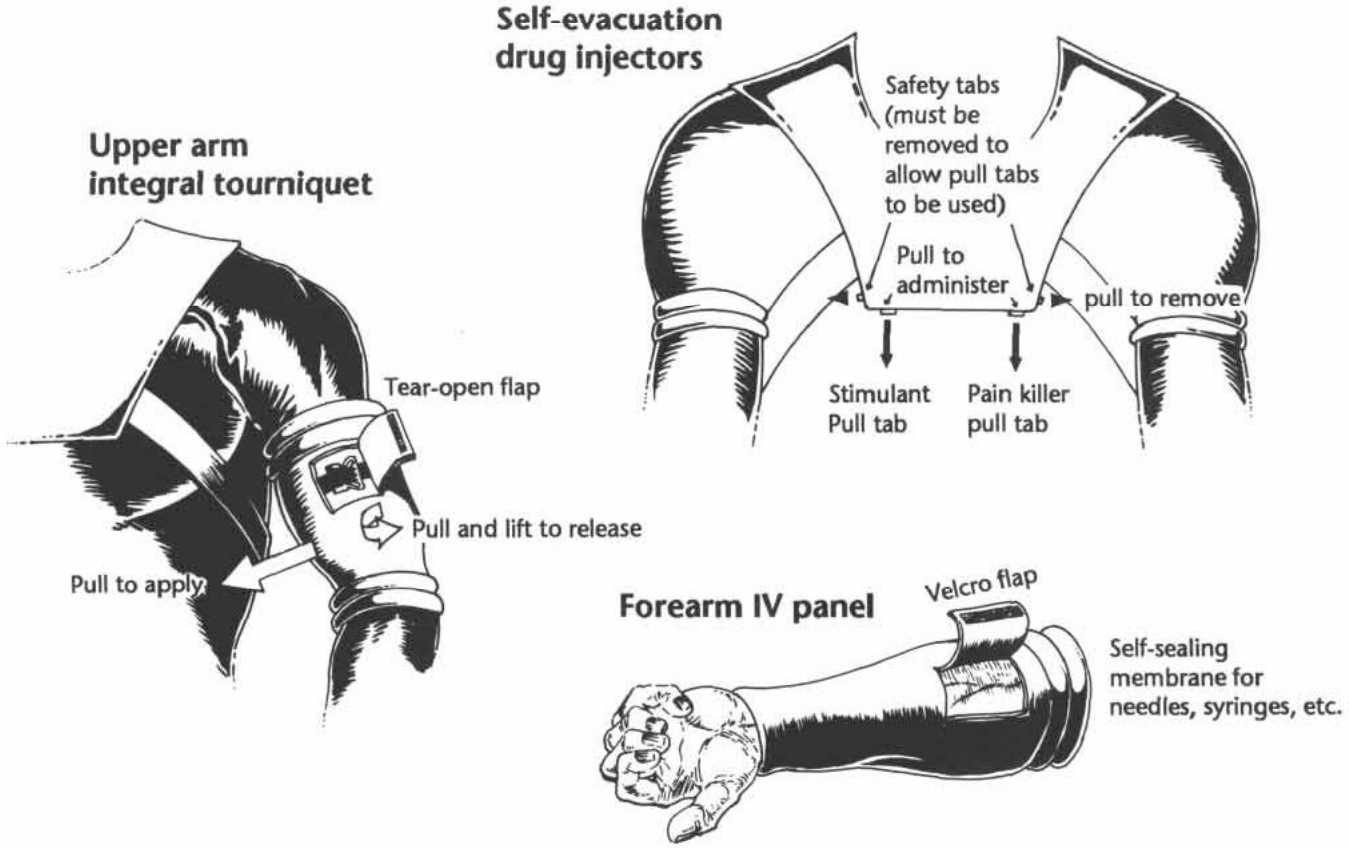
Security Clearance
Yes No
28-IX-1201
Date



In addition, the body sleeve is fitted with bladders in the thighs and abdomen that allow it to function as a G-suit.

The sleeve is designed with a number of features used in medical and first-aid situations. The sleeve has several intermediate sterile layers which reduce the incidence of infection caused by dirty material being driven into the body by gunshot wounds, and the nature of the ballistic mesh works to hold wounds closed and keep the body in one piece in the event of more grievous wounds.

The thighs, arms, and chest all have special self-sealing membranes (thin enough to locate veins) beneath lift-up panels that allow IV needles (for medication, whole blood, or plasma) to be inserted into the wearer without breaching its airtight integrity.

"Pull tab" tourniquets are sewn into several locations on the arms and legs. These are self-ratcheting cables that can be cinched down with one hand by the suit wearer without additional assistance in case of serious wounds in the extremities. (These may also be periodically released to prevent tissue damage and cinched down again, also with only one hand). Each suit also has two pre-measured doses of drugs built into the suit near the shoulder harness, one of a powerful painkiller and one of a fast-acting stimulant. These are administered by the wearer with pull tabs, and allow a trooper who is wounded, and perhaps alone (and perhaps with one or more tourniquet cinched down), to evacuate himself from a dangerous situation and be rescued. When both doses are taken together, they allow 5 minutes of clear-headed functioning in most wound states. (In game terms, pulling the tabs overrides the loss of consciousness and Initiative penalties of all wound states, up to and including Critical wounds, for a period of 60 combat turns. Only a single such dose should be taken at a time. Each time an additional dose is taken within an hour, roll a Difficult task against CON. Failure indicates that the character instantly dies due to the stress being placed on the body.)

Characters who routinely wear a body sleeve do not assess its weight against their load-carrying ability.

The body sleeve comes in a variety of colors, including woodland camouflage, slate gray, and blue, but the pattern most often seen is the basic black version. Advanced options, such as chameleon IR systems, are also available, but are not listed below.

All members of RCES and RCN have body sleeves issued to them. These are not normally available to free-lancers or others working under contract for the RC.

Armor Value: 1
Agility Penalty: None
Basic Cost: Cr8500
Mass: 10.5 kg
Gloves and Hard Helmet (AV 0): Cr900
Gloves and Helmet Mass: 2 kg

RCES Light Battle Dress





RCES Light Battle Dress

This unit is the standard light battle dress in use by the RCES raider forces, and is common in other military units as well. The standard model is fitted with a powered exoskeleton (which doubles the effective strength of the wearer), environmental control systems, filters, and respirator fittings (to enable the wearer to function in tainted and thin atmospheres), a laser designator unit (6-km range), an integral 3-km radio, and an integral WSV suite displaying on the inside of the helmet visor. The laser designator unit can be fitted to either the left or right forearm, at the wearer's option, and can be used to "paint" any target the wearer can see within a range of up to 3000 meters.

Some suits are manufactured with an integral "Chameleon" camouflage feature, which adjusts the suit's IR heat signature to match its surroundings. This feature must be incorporated during manufacture.

The suit's power supply is sufficient to enable it to operate for up to 10 hours before recharging is required. All suits are supplied with standard power and life support fittings, allowing users to plug into a ship or vehicle power/life support system and conserve or recharge their resources. The laser designator is only supplied with a battery sufficient to last for a total of 6 minutes, however, so its use must be carefully rationed.

Optional Features: Oxygen tanks can be added to the basic suit in order to enable the wearer to function under vacuum situations. Individuals requiring additional radio communication range may substitute a 30-km radio for the standard 3-km model.

When being used for meteoric assault in a drop capsule, the battle dress is fitted with a small air supply sufficient for one hour,with negligible mass and price (0.5 kg, Cr100).

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Security Clearance
Yes No
28-IX 1201
Date



Basic RCES Light Battle Dress (includes Helmet WSV suite, 3-km Radio, and Laser Designator)

SM	*AV*	*AM*	*BV*	*BM*	*OSM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*OSMCr*	*TMCr*
0.1	6	.054	.0235	.047	.0022	.2032	.00342*	10*	.14	.00513	.0001075	.007625	0.153

Basic RCES Light Battle Dress (as above, with Chameleon feature)

SM	*AV*	*AM*	*BV*	*BM*	*OSM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*OSMCr*	*TMCr*
0.1	6	.054	.0235	.047	.0022	.2032	.00342*	10*	.14	.00513	.0001075	.008625	0.154

* Listed MW is for systems powered to 10 hours endurance: the battle dress itself, helmet WSV suite, and 3-km radio. Laser designator (which draws 0.005 MW) is powered to only 6 minutes.

Add O_2 Tanks to the above (5 high-pressure tanks; 20 hours)

—	—	—	—	—	—	+.01	—	—	—	—	—	—	+.002

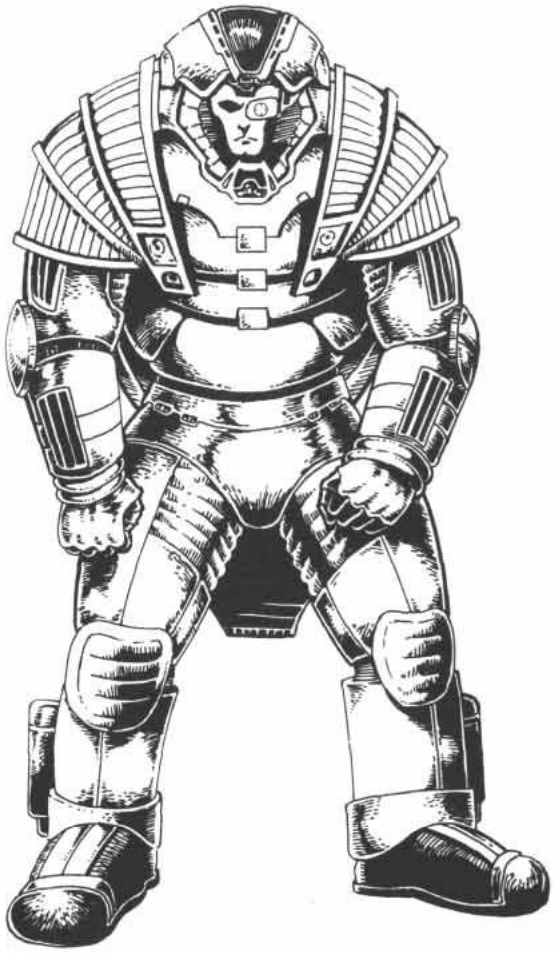
Replace 3-km Radio with 30-km Radio (includes increased battery capacity)

—	—	—	—	—	—	+.012	—	—	—	—	—	—	+.0002047

Abbreviations

SM: Skeletal mass, in tonnes; **AV:** Armor value; **AM:** Armor mass, in tonnes; **BV:** Battery volume, in m^3; **BM:** Battery mass, in tonnes; **OSM:** Other systems mass, in tonnes; **TM:** Total mass, in tonnes; **MW:** Megawatts; **End:** Endurance of battery, in hours; **SMCr:** Skeleton price, in megacredits; **AMCr:** Armor price, in megacredits; **BMCr:** Battery price, in megacredits; **OSMCr:** Other systems price, in megacredits; **TMCr:** Total price, in megacredits.

RCES Heavy Battle Dress



Reformation Coalition TL-12 Heavy Battle Dress

The Coalition's heavy battle dress is used by its first-line military forces, and also on raids where significant military opposition is expected. Heavy battle dress doubles the effective strength of its wearer, and includes environmental control, atmospheric filters, and respirators (allowing the wearer to function in tainted and thin atmospheres), Chameleon IR suppression systems, a wide-spectrum visual helmet sensor suite, and an in-helmet radio of at least 3-km short range.

There are three primary variants of the suit: the standard Trooper Suit, the Leader's Suit, used by section, platoon, and higher leaders, and the Scout Suit, used by a limited number of personnel per unit for longer-range surveillance.

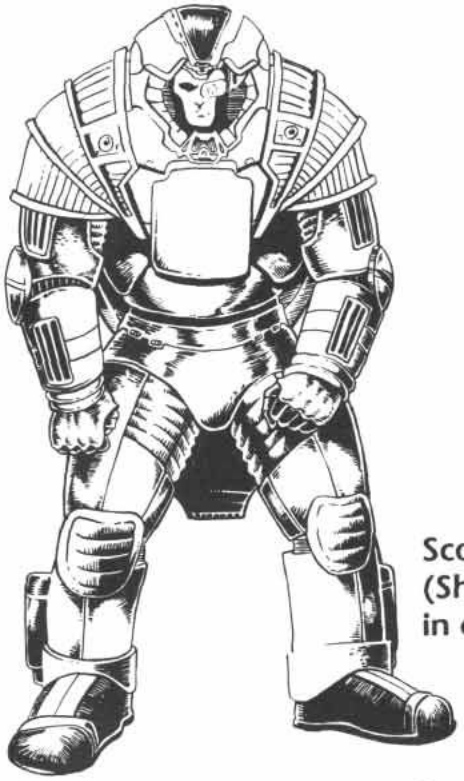
All suits feature an integral arm-mounted laser designator, used to mark targets for the Lyrebird missiles carried in standard drop capsules (see page 107). The laser designator has a range of 6 km, and due to its high power requirements, has power sufficient for only six minutes of constant use.

The Leader's suit has less armor protection to allow it to carry a 30-km (short range) radio in place of the 3-km trooper's radio, and the Scout Suit is fitted with a passive EMS array in the chest, with a short range of 3 km. Due to the bulk of this system, the Scout Suit also has reduced armor protection, and only a 3-km (short range) radio. It also only has batteries sufficient for nine hours continuous use of its sensors.

All of these suits may be recharged by a standard starship fusion power plant. This process takes one hour, and requires that 0.1 MW of power be allocated per suit for the duration of the recharge.

All of these suits may be fitted with a self-contained oxygen supply lasting 20 hours, which adds .01 tonnes to the mass and MCr0.002 to the cost of the suit. With the oxygen supply fitted, the suits are overloaded, which increases the Agility and Initiative penalties to –4 and –3 respectively, and reduces movement rates by 10%. When being used in a meteoric assault in a drop capsule, the heavy battle dress suit is fitted with a one-hour air supply sufficient to allow the trooper to reach the ground, and having negligible mass and price (0.5 kg, Cr100).

Because of their distinctive appearance, these suits are often referred to by Coalition Marines as "Sumo Samurai Suits," or "Samurai Beetles."



Scout Suit
(Showing passive sensor array in center of torso armor)

Standard Trooper Suit

Mass: 0.4197 tonnes (419.7 kg)
Price: MCr0.22315 (Cr223,150)
Agility Penalty: –3
Initiative Penalty: –2
Armor Value: 15
Endurance: 10 hours continuous use for all systems, except laser designator; only 6 minutes continuous use
Features: Wide-spectrum visual helmet sensor suite (treat as WSV goggles, short range = 400 meters), Chameleon IR suppression, 3-km (short range) radio, TL-10 Inertial Navigator (TNE, page 346), laser designator (6-km range) with batteries for 6 minutes of continuous use.

Leader Suit

Mass: 0.4147 tonnes (414.7 kg)
Price: MCr0.225645 (Cr225,645)
Agility Penalty: –3
Initiative Penalty: –2
Armor Value: 13
Endurance: 10 hours continuous use for all systems, except laser designator; only 6 minutes continuous use
Features: Wide-spectrum visual helmet sensor suite (treat as WSV goggles, short range = 400 meters), Chameleon IR suppression, 30-km (short range) radio, TL-10 Inertial Navigator (TNE, page 346), psionic shield helmet, laser designator (6-km range) with batteries for 6 minutes of continuous use.

Scout Suit

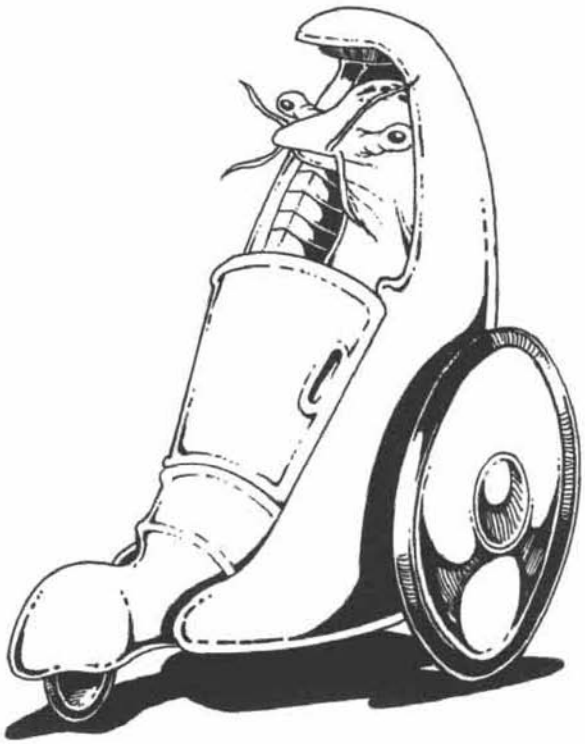
Mass: 0.42 tonnes (420 kg)
Price: MCr0.240853 (Cr240,853)
Agility Penalty: –3
Initiative Penalty: –2
Armor Value: 12
Endurance: 10 hours continuous use for all systems, except passive EMS sensor; only 9 hours continuous use, and laser designator, only 6 minutes.
Features: Wide-spectrum visual helmet sensor suite (treat as WSV goggles, short range = 400 meters), Chameleon IR suppression, 3-km (short range) radio, TL-10 Inertial Navigator (TNE, page 346), 3-km (short range) passive EMS sensor with batteries for nine hours of continuous use, laser designator (6-km range) with batteries for 6 minutes of continuous use.

Light BRT (a.k.a. "Baby Brute)

The BRT (body reaction tool) is a cargo handling machine derived from the heavy battle dress frame, specially reinforced. The brute may lift and carry loads of up to 2064 kg (2.064 tonnes). This is its absolute capacity, and may not be exceeded. The operator suffers no load-carrying penalties beyond those listed for simply using the suit. Operating a brute is considered easy work for the purposes of fatigue.

Mass: 0.268 tonnes (268 kg)
Price: MCr0.20017 (Cr200,170)
Agility Penalty: –4
Initiative Penalty: –3
Endurance: 8 hours continuous use (0.0153MW rechargeable battery).

Schalli Personal Transportation



Schalli Roller

The Schalli roller is essentially a large electric wheelchair intended to let these aquatic beings get around in a terrestrial environment. They are built at the lowest practical technology level in order to make them readily available, as well as to eventually allow their construction on Schall, should the Schalli so desire. They are also designed to be inexpensive, to make them affordable to as many Schalli as possible, and are therefore designed for use on flat surfaces. Hence their cross-country performance is deplorable. Schalli who seek better rough terrain performance use either contra-grav platforms or walkers, based on the Schalli battle dress skeleton detailed on the facing page. However, both of these options are much more expensive.

The "bucket" in which the Schalli sits is partially filled with water. This provides some buoyancy for the Schalli's comfort, and also keeps his or her skin from drying out. There is a low-power mister which draws water from the bucket and sprays the Schalli's head. In hot and dry conditions, this requires the water in the bucket to be replenished periodically.

The housing at the Schalli's chest level folds down as a work table, where the Schalli can use his or her four arms to manipulate equipment.

The cargo space listed below allows additional equipment to be installed on the roller, and 0.0075 MW are set aside to power this equipment.

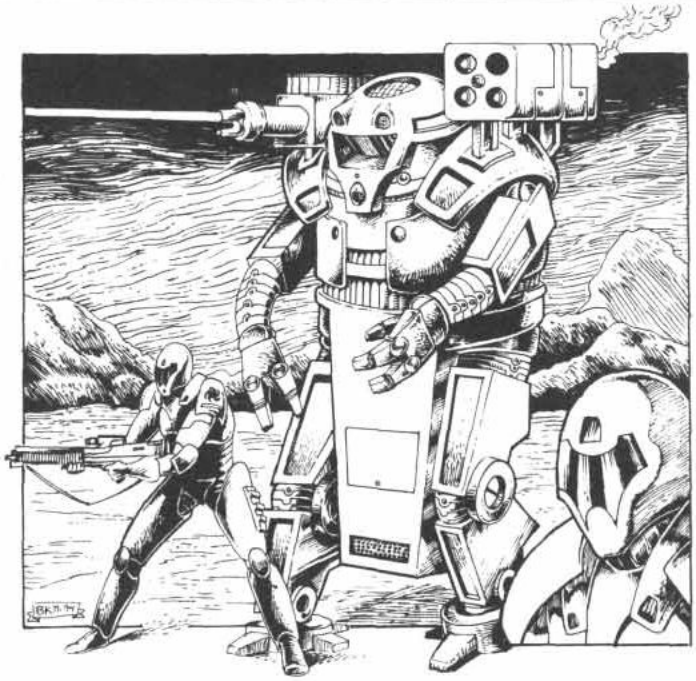
The roller must be recharged every 24 hours, usually while the Schalli sleeps, and the roller is equipped with power cables which allow this to be done at standard RC electrical outlets.

Tech Level: 7
Price: Cr2300
Size: 5.6 kiloliters displacement = 0.4 tons (SM)
Mass: 4.59 tonnes empty, 5.48 tonnes loaded
Power: 0.0175 MW TL-7 battery, duration 24 hours (0.0075 MW excess power)
Maint: 1
Controls: Basic mechanical
Life Support: Light, heat, water spray
Cargo: 0.49 tonnes
Crew: 1
Passengers: None

Maximum Speed: 36.56 kph
Travel Move: 65/10
Combat Move: 15/2
Fuel Capacity: TL-7 battery with duration of 24 hours at 0.0175 MW output

Combat Statistics
Config: Open vehicle
Susp: W (1) **HF:** [1]
HS: [1]
HR: [1]
Deck: Open **Belly:** 1

Security Clearance
Yes No
28 IX 1201
Date



Schalli Battle Dress

Because of their physical structures, Schalli need some form of mechanical assistance to get around on land. Although there are no Schalli infantry units, some RC leg units (or powered leg units) do have Schalli members, and it is for these rare Schalli troops that the Schalli battle dress is manufactured.

Schalli battle dress is massive and even somewhat frightening when viewed on the battlefield. It also makes rather a large target. Unlike standard human battle dress which has no integral weapons, Schalli battle dress is equipped with integral heavy weapons to allow it to defend itself. The mass below is overloaded by 10%, but still allows 0.016 tonnes (16 kg) for additional mission equipments.

The Schalli operator rides in a water-filled "bucket," the lower portion of which hangs down well below the hip joints. He or she controls the battle dress with its four arms: The upper two control the battle dress arms, and the lower two control the battle dress legs. The Schalli uses its whiskers to operate sensors and fire control systems.

The Schalli battle dress skeleton has a skeletal mass of 0.4 tonnes, a maximum mass of 0.84 tonnes, a storage volume of 240 liters, costs MCr0.4, and imposes Agility –3 and Initiative –2 penalties. When stripped down to its basic components, including armor and batteries only, its breakdown is shown below.

SM	*AV*	*AM*	*BV*	*BM*	*TM*	*MW*	*End*	*SMCr*	*AMCr*	*BMCr*	*TMCr*
0.4	12	.162	.0784	.1568	.7188	.01176	10	.40	.01539	.000392	.415782

Schalli battle dress is manufactured in only limited quantities, due to both its expense and the current low demand for Schalli combat troops.

Mass: 0.908 tonnes (908 kg)
Price: MCr0.483 (Cr483,000)
Agility Penalty: –4
Initiative Penalty: –3
Armor Value: 12
Endurance: 10 hours continuous use for all systems, except laser designator; only 6 minutes continuous use
Features: Wide-spectrum visual helmet sensor suite (treat as WSV goggles, short range = 400 meters), Chameleon IR suppression, 3-km (short range) radio, TL-10 Inertial Navigator (**TNE**, page 346), laser designator (6-km range) with batteries for six minutes of continuous use, Squad Support Laser (see page 96) with 50 rounds, 4 Nail tactical missiles in quadruple package launcher (see page 106).
Consumables Price: Price above includes Squad Support Laser but does not include ammo or disposable missile launcher.
Loaded 50-round magazine for Squad Support Laser: Cr1496
4-round disposable package launcher for Nail tactical missiles: Cr2832 for HEAP, Cr2664 for HE, Cr3000 for WP, Cr6664 for Nail SAM, Cr12,664 for Nail ARM.
When Nail SAM or ARM are fitted, add Cr500 to cost of the battle dress, and reduce reserved mass to 15.5 kg to allow for the homing missile launch controller.

Communications Devices



TL 9
3000 KM
Communicator

COMMUNICATIONS DEVICES

Good communications are vitally important to any operation, military or civilian. The equipment described on these pages represents the most common types in Coalition service. Since the Coalition is not capable of manufacturing at higher than TL-12, any advanced tech level communicators are relic technology, and thus quite rare. Such equipment is usually encountered only on very important missions.

Classes: There are three classes of communicators: Uplink, Strategic, and Tactical.

Uplinks have a short range of 3000 km, and are used for communication with spaceships and other objects in geo-synchronous orbit such as permanent space stations, ComSats, NavSats, and so on.

Strategic communicators are used by landing parties to communicate with starships in standard orbits, and by large military units on the ground to communicate with each other. These units have a 300-km short range.

Tactical communicators have short ranges of 30 km or less. These sets are the most useful for communications between ground units and between ground units and aircraft or spacecraft operating in the atmosphere.

Duration: The durations listed below are based on the batteries contained in the units, although all come with power cables which allow them to be hooked into external or vehicle power supplies for longer duration.

Batteries: All communicators come with internal battery packs, and these are also available as separate items, to extend a communicator's operating time. Duration is listed for constant transmitting or constant receiving (transmitting consumes power at 10 times the rate of simply receiving). Alternatively, use the receiving only duration, but each minute of transmission counts as 10 minutes of listed duration.

Communications Uplinks

The TL-15 3000-km maser and TL-12 and TL-15 3000-km laser uplinks are available in backpack form (the TL-15 versions, obviously, are relic technology and rather scarce). All uplinks are also available in stand-alone versions.

Communications Uplinks

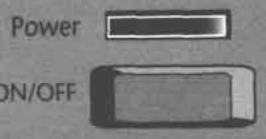
Item	*Mass(kg)*	*Volume (liters)*	*Price (Cr)*	*Duration (hrs*)*	*Antenna Diameter (m)*
3000-km Radio Uplink TL-10	270	135	5380	1/10	1.1
Replacement Battery	250	125	380	+1/+10	—
3000-km Radio Uplink TL-12	135	68	5335	1/10	1.1
Replacement Battery	133	67	335	+1/+10	—
3000-km Radio Uplink TL-15	83.2	33.1	5500	1/10	1.1
Replacement Battery	83	33	500	+1/+10	—
3000-km Laser Uplink TL-10	130	65	21,150	1/10	1.1
Replacement Battery	100	50	150	+1/+10	—
3000-km Laser Uplink TL-12	73	37	21,135	1/10	1.1
Replacement Battery	53	27	135	+1/+10	—
3000-km Laser Uplink TL-15	39	16	21,200	1/10	1.1
Replacement Battery	33	13	200	+1/+10	—
3000-km Maser Uplink TL-10	260	130	21,300	1/10	1.1
Replacement Battery	200	100	300	+1/+10	—
3000-km Maser Uplink TL-12	147	73	21,270	1/10	1.1
Replacement Battery	107	53	270	+1/+10	—
3000-km Maser Uplink TL-15	78.7	32.7	21,400	1/10	1.1
Replacement Battery	66.7	26.7	400	+1/+10	—

* Time transmitting only/time receiving only.

Security Clearance

Yes No

28-IX-1201
Date



Strategic Communicators

Item	Mass(kg)	Volume (liters)	Price (Cr)	Duration (hrs*)	Antenna Diameter (m)
300-km Radio, TL-10	29.8	14.9	542	2/20	1.1
Replacement Battery	27.8	13.9	42	+2/+20	—
300-km Radio, TL-12	15	7.5	537	2/20	1.1
Replacement Battery	14.8	7.4	37	+2/+20	—
300-km Radio, TL-15	9.5	3.8	556	2/20	1.1
Replacement Battery	9.3	3.7	56	+2/+20	—
300-km Laser, TL-10	66	33	11,075	2/20	1.1
Replacement Battery	50	25	75	+2/+20	—
300-km Laser, TL-12	36.7	18.3	11,070	2/20	1.1
Replacement Battery	26.7	13.3	70	+2/+20	—
300-km Laser, TL-15	20.7	8.7	11,100	2/20	1.1
Replacement Battery	16.7	6.7	100	+2/+20	—
300-km Maser, TL-10	61	30.5	11,050	0.5/5	1.1
Replacement Battery	31	15.5	50	+0.5/+5	—
300-km Maser, TL-12	36.6	18.3	11,040	0.5/5	1.1
Replacement Battery	16.6	8.3	40	+0.5/+5	—
300-km Maser, TL-15	18.3	8	11,060	0.5/5	1.1
Replacement Battery	10.3	4	60	+0.5/+5	—

* Time transmitting only/time receiving only.

300-km Tight-Beam Radio Orbital Relay Communicator

This radio is only a fraction of the mass of a maser communicator of similar performance and duration, thus its popularity. The tight-beam radio also includes a 3-km (short range) repeater in it which allows personnel with their own radios to route their transmissions up to orbit via the uplink, and receive replies in the same way. This uplink comes in stand-alone or backpack configurations.

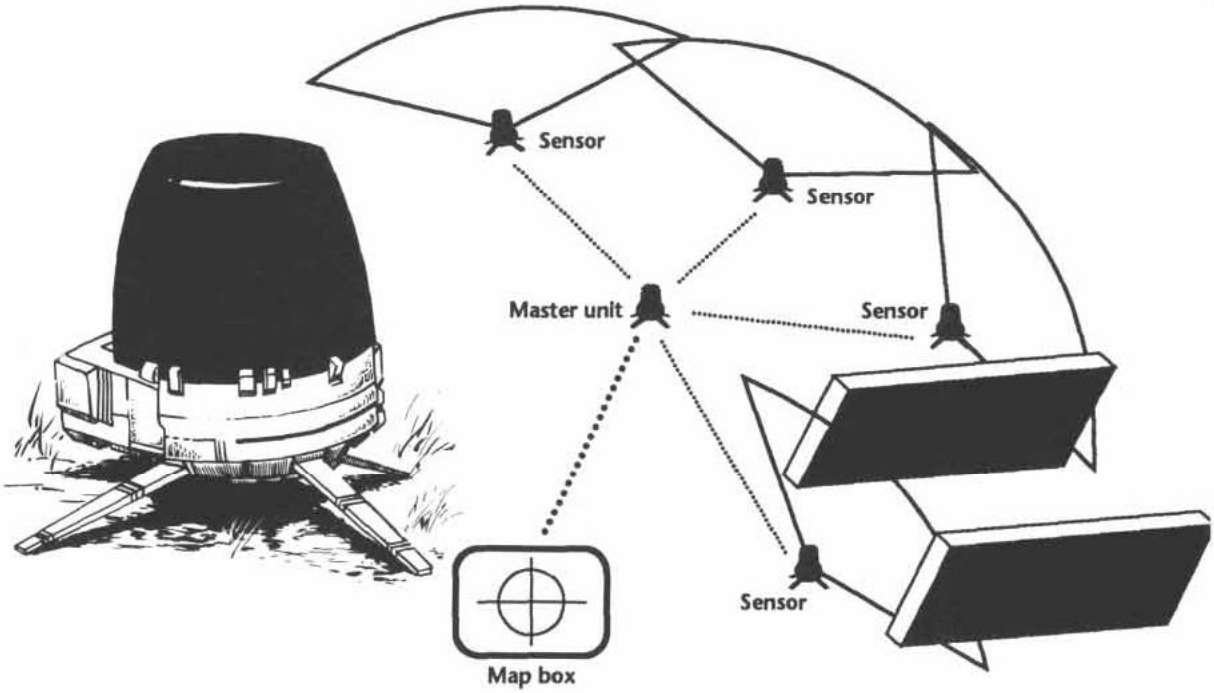
Item	Mass(kg)	Volume (liters)	Price (Cr)	Duration (hrs)	Antenna Diameter (m)
300-km Radio Uplink w/3-km repeater	19.6	9.8	1125	4	0.36
Spare Battery	19.3	9.6	50	+4	—

Tactical Communicators

Laser and maser communicators of less than 30-km short range are not commonly needed, and thus only 30-km radios are shown.

Item	Mass(kg)	Volume (liters)	Price (Cr)	Duration (hrs*)	Antenna Diameter (m)
30-km Radio, TL-10	25.2	12.6	287.5	10/100	0.1
Replacement Battery	25	12.5	37.5	+10/+100	—
30-km Radio, TL-12	13.5	6.8	283.5	10/100	0.1
Replacement Battery	13.3	6.7	33.5	+10/+100	—
30-km Radio, TL-15	8.5	3.4	300	10/100	0.1
Replacement Battery	8.3	3.3	50	+10/+100	—

Remotely Operated Sensors



TL-12 Automated Sensors

These are passive sensors which carry their own power supply and transmit their data to remote locations with integral tight-beam radios. These sensors can be used one at a time in a stand-alone configuration, or linked into a network of several remote units and one master unit. Each sensor unit has a 3-km (short range) passive EMS sensor and a tight-beam radio with a short range of 3 km, so must be placed within 3 km of either the personnel who will be monitoring it, or a master unit. Master units collate the data from the subsidiary sensors into a single integrated display. Master units have radios with 30-km short ranges, and they may be "daisy chained" together serially to allow sensor barriers to be set up at a great distance from friendly units.

The person monitoring these sensors must have either a helmet sensor suite, a map box, or a computer on which to display the data. The master unit is equipped with its own map box, allowing personnel to monitor the sensor perimeter from the master unit itself. Military commanders who are linked into an automated sensor network which is controlled by a master unit add 1 to their Ground Tactics assets.

Depending upon circumstances, these sensors are recovered at the end of a mission or considered expendable. The same sensor unit is used in the stand-alone or networked role.

The replacement batteries shown on the table below normally fit one each within the sensor or master unit. However, multiple batteries may be hooked up to a single unit which will allow the unit to use their duration sequentially. This allows these sensors to be left unattended for longer periods of time. The cost of the wiring required for this is subsumed in that of the unit itself.

The table also shows the power requirement of these units in megawatts for characters who wish to attach these units directly into a power plant.

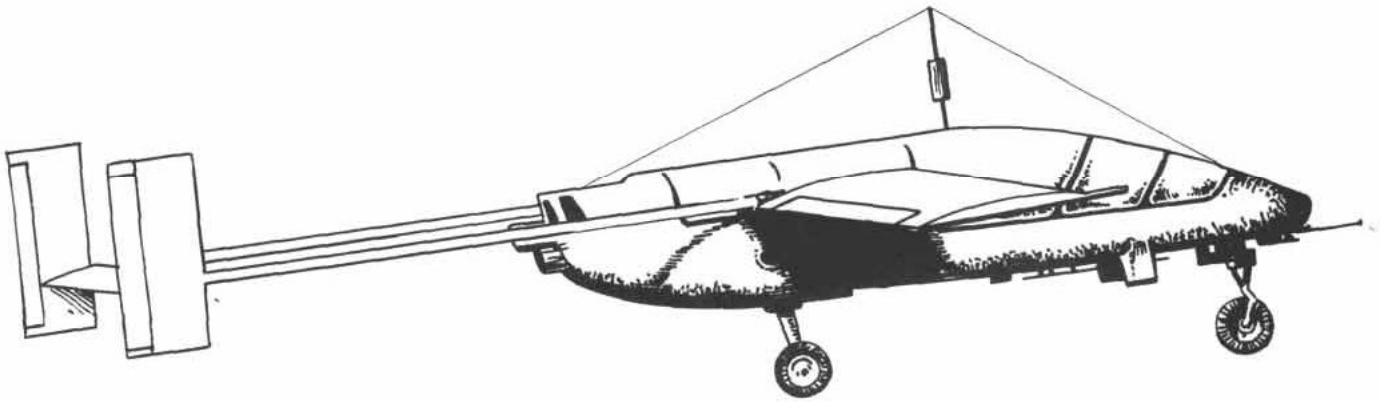
Item	*Sensor*	*Radio*	*Duration*	*Volume*	*Mass*	*Price*	*MW*	*TL*
Sensor Unit	3-km PEMS	3 km	3 hours	11.5 liters	22.8 kg	Cr21,400	0.0011	12
replacement battery	—	—	+3 hours	1 liter	2 kg	Cr5	—	12
Master Unit	—	30 km	10 hours	8 liters	15 kg	Cr4035	0.001	12
replacement battery	—	—	+10 hours	6.7 liters	13.4 kg	Cr 35	—	12
replacement battery	—	—	+3.75 hours	1 liter	2 kg	Cr5	—	12

Security Clearance

Yes No

28-IX-1201

Date



Remotely Piloted Reconnaissance Vehicle

The Coalition uses a variety of remotely piloted vehicles (RPVs) for reconnaissance operations, particularly in high-threat environments. The example shown here is essentially a very large model airplane bearing wide-spectrum visual-imaging equipment. (This includes low light, thermal, and standard video.) It is operated via frequency-agile radio link, 30-km short range, to a hand-held controller which includes a small video screen. The RPV's video feed can also be split off to a larger size display for ease of viewing or recorded for playback. The RPV is equipped with a simple autopilot capable of performing such basic tasks as orbiting a fixed point, flying a particular pattern, and the like. Lastly, its engine can be shut off and subsequently restarted in-flight when stealth is called for.

The RPV requires a flat, open area for take-offs and landings, for example a road, or level field. The RPV may be optionally fitted with a rocket-assisted take-off (RATO) motor which provides the RPV with zero-length launch performance (ZLL; take-off roll is actually 1 meter, usually made from a short ramp). Each RATO motor is good for only one launch, and weighs 115 kg and costs Cr230. RCV Operations skill is required to fly the RPV.

Note that the RPV's components are manufactured at a wide variety of tech levels, allowing subcomponents to be produced on many RC worlds. Its airframe and engine are manufactured at TL-5, its flight controls at TL-8, its sensors at TL-10, and only its batteries at TL-12.

The RPV is listed in two configurations: its basic configuration of 246.5 kg, and its maximum payload configuration of 315 kg. The RPV in its basic configuration has space set aside in its fuselage for 68.5 kg worth of additional surveillance equipment, flares, decoys, etc., which allow it to reach its maximum payload.

Tech Level: 12 (maximum component)
Price: Cr28,765
Size: 21 cubic meters, VS target (storage volume 10.5 cubic meters)
Mass: 246.5 kg basic fueled mass, 315 kg maximum fueled take-off mass
Power: 0.02 MW improved internal combustion engine with propellor generating 0.01 tonnes thrust, plus TL-12 batteries providing 0.035 MW electrical power for 4 hours (0.00825 MW excess power)
Maint: 1
Controls: Enhanced electronic controls with RCV modifications, TL-10 flight computer
Commo: 2x30-km (short range) radios
Sensors: Wide-spectrum visual viewer, video camera/signal converter
Life Support: None
Cargo: 68.5 kg additional mission equipment
Crew: None (1 remote operator)
Maximum Speed: 128 kph in basic configuration, 100 kph at maximum mass
Cruising Speed: 96 kph in basic configuration, 75 kph at maximum mass
Operational Radius: 192 km in basic configuration, 150 km at maximum mass
Combat Move: 18 10-meter grid squares in basic configuration, 14 at maximum mass
Agility: 3
Take-Off Roll: 114 meters in basic configuration, 186 meters at maximum mass
Landing Roll: 75 meters
Fuel Capacity: 20 liters hydrocarbon distillates (Cr5 for full load of fuel)
Fuel Consumption: 5 liters per hour (endurance of 4 hours)

Vision-Enhancement Equipment

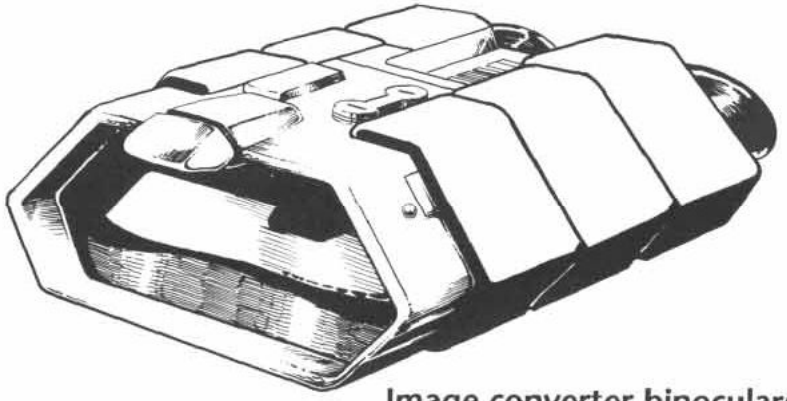


Image converter binoculars

Vision-Enhancement Equipment—Binoculars

Because of the wide distribution of these devices in pre-Collapse times and the low tech level requirements of most of these designs, they are considered as a class to be in virtually universal use, either in relic or newly manufactured forms. RC forces manufacture all of these devices, but make the greatest use of image converter and PRIS binoculars.

Almost all of these devices come in an over-the-shoulder carrying/shipping case; a sling is also provided for separate carrying. The use of these devices in the game is discussed in the basic rules, pages 309-310.

Binoculars: This device allows improved vision at greater distances than would unaided eyes. Characters equipped with binoculars and who have a good field of view have their Observation asset increased by 1. Binoculars have no effect in woods or smoke, at night, or in other than clear weather.

TL: 3
Volume: 2 liters
Weight: 1 kg
Price: Cr75
Short Range: 1000 meters
Mode: Daylight and clear weather only, no effect in woods and smoke

Binoculars, Electronic: This device provides electronic enhancement of images. Electronic binoculars feature color enhancement (which adds 1 to the user's Observation asset—see the basic rules, page 310) and range-finding capabilities in addition to the normal binocular benefits, but are useful only in daylight and clear weather.

TL: 8
Volume: 2 liters
Weight: 2 kg
Price: Cr750
Short Range: 1000 meters
Mode: Daylight and clear weather only, no effect in woods and smoke.

Binoculars, Image Converter: Many night-vision devices and electronic sights either are sensitive to infrared (heat) radiation (IR) or use light amplifiers (LA) to detect their targets. Both have minor disadvantages: IR images can be camouflaged by insulation and LA requires background light to amplify. In addition, the user can only see as far as the unaided eye.

Commercially available at tech level 10, the image converter is sensitive to both infrared and visible light, and thus picks up both heat images and visible-light pictures. The converter intensifies these images, allowing night vision, and magnifies them up to 20 times. Automatic polarizers cut in if the image is bright enough to blind. A laser rangefinder is also included to measure the precise distances to selected objects out to the maximum range of the binoculars.

The Image Converter Binoculars combine the features of Image Intensification and IR goggles (increasing the user's Observation asset by 2, but has no effect in woods or smoke—see "Mode" below and TNE, page 310), and have a short range of 250 meters in either mode.

Special hardware/software clips are available for hand computers that expand the capabilities of the image converter. When hooked up to a computer using a graphics clip, the image converter can be tied into a map box (allowing others to see what the user sees), and electronic "photographs" can be stored in the computer's memory. Another clip allows the computer to calculate the speed of a target relative to the user.

Physically, the image converter is similar to a set of binoculars. Power packs are mounted inside the converter casing and average one week of constant use.

TL: 10
Volume: 1 liter
Weight: 1.25 kg
Price: Cr3500
Short Range: 250 meters
Mode: May disregard all night Diff Mods, fully affected by weather Diff Mods. No effect in woods or smoke.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
2•3 2•6 2•9
1•3 1•6 1•9
0•3 0•6 0•9
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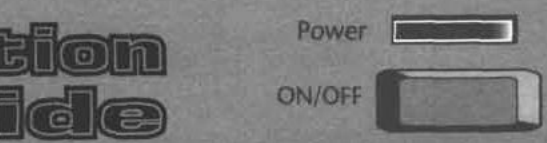
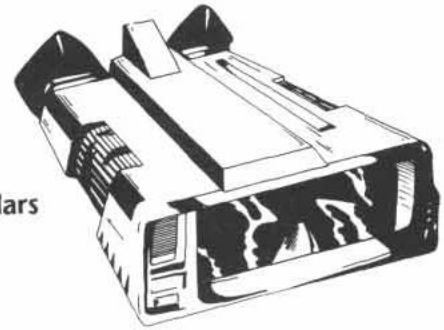
Security Clearance
Yes No
28 IX 1201
Date



PRIS binoculars



Binoculars, PRIS: The portable radiation imaging system (PRIS) has many more capabilities than binoculars from previous tech levels. The PRIS combines the features of the WSV viewer with color enhancement (allowing color enhancement use in clear, daylight conditions, and WSV mode at night and in bad weather).

The PRIS can be set to observe images in the spectral range from infrared to gamma rays. (The PRIS will not detect radio waves.) The front surface of the PRIS is transparent to all radiation; just behind it is a series of lenses tailored to various specific bands. In addition to this, a tight-beam laser rangefinder gives an accurate reading on the target within sight up to about 20 km, depending on conditions, with the range displayed as a digital readout in the viewfinder. The PRIS also has a built-in clock and limited memory, so the rangefinder can determine the velocity of the object being viewed by comparing its distance from the observer over time.

The unit can be calibrated to a standard self-precessing gyrocompass, in which case the bearing of the direction viewed will be digitally displayed in the corner of the viewfinder. The magnification strength of the PRIS is adjustable up to 225. A built-in flywheel for gyro-stabilization ensures a steady field of view at all magnifications.

Besides its obvious uses in the field, the PRIS also finds itself used in a variety of industrial and engineering applications. Its infrared images can be color-coded to show the ambient temperatures of objects in the viewfinder. A PRIS can therefore be found near every jump drive, to be used by engineers looking for "hot spots" on the drive housing. In other areas of a ship, the PRIS can detect problems in electrical circuits, again by finding an area of higher temperature.

TL: 12
Volume: 3 liters
Weight: 2 kg
Price: Cr12,000
Short Range: 400 meters WSV mode, 1000 meters color enhancement mode (daylight, clear weather only)
Mode: WSV mode disregards night Diff Mods and up to 1 smoke Diff Mod, fully affected by weather Diff Mods. Color enhancement mode in daylight and clear weather only. Both modes no effect in woods.

Light Amplifier goggles





Infrared goggles

Vision-Enhancement Equipment—Goggles

This discussion does not cover simple goggles intended for for eye protection, although all of these provide that in addition to their vision enhancement characteristics. The use of these devices in the game is discussed in the basic rules, pages 309-310.

Goggles, Combination IR/LA: These goggles combine light-amplification and infrared radiation detection in one unit and are worn like eyeglasses. They have the features of both IR and LA vision aids, see immediately below, and can be switched from one mode to the other by the user by means of a knob mounted in the earpiece. Most types have automatic sensitivity control in the LA mode to prevent blinding by a bright light source.

TL	*Vol*	*Weight*	*Price*
9	0.3 liters	0.2 kg	Cr1250

Short Range: See Infrared and LA goggles below
Mode: See Infrared and LA goggles below

Goggles, Infrared: Allow wearer to see heat-emitting sources in the dark such as animals, fires, or hot engines. The quality of vision is necessarily distorted as heat sources (not reflected light images) are being viewed. IR goggles have a short range of 100 meters. They ignore night Diff Mods, but have no effect in woods, smoke, or poor or very poor weather.

TL	*Vol*	*Weight*	*Price*
6	1 liter	1 kg	Cr1000
8	—	0.1 kg	Cr500

Short Range: 100 meters
Mode: Disregard all night Diff Mods, no effect in woods, smoke, or other than clear weather.

Goggles, Light Amplifier: Allow vision by amplifying ambient light and are usable in anything less than total darkness. LA goggles may allow darkness penalties in night or combat situations to be reduced or ignored. LA goggles have a short range of 100 meters, and allow users to disregard up to 2 night Diff Mods. They are fully affected by weather Diff Mods, and have no effect in woods or smoke.

The LA goggles illustrated are shown in their raised position, allowing the wearer to use his normal vision.

TL	*Vol*	*Weight*	*Price*
7	1 liter	1 kg	Cr1000
10	—	0.1 kg	Cr1000

Short Range: 100 meters
Mode: Disregard 2 night Diff Mods, fully affected by weather Diff Mods, no effect in woods or smoke.

Anti-Virus Equipment

VIRUS-DETECTING EQUIPMENT

Detecting Virus in electronic equipment can be very easy or very hard. Sometimes Virus announces itself and attacks, sometimes it lays in wait inside seemingly inert equipment, waiting to insinuate itself into other systems. Both scenarios are equally dangerous, and place a premium on always spotting Virus before it spots you. (See **Survival Margin**, pages 74-81, **TNE**, pages 74-81, or **Path of Tears**, pages 142-143 for a more detailed discussion of Virus.)

In many cases, Virus detection can be conducted at a keyboard and consists of running a series of diagnostics on the system. Detecting Virus by this means is an uncertain, Difficult task using the Computer asset. The difficulty level can be increased or decreased a level by the sophistication of the processor being examined. A global data network, for example, would be one or more levels more difficult (since the Virus is "smarter"), while a low-tech starship computer (say TL-12) may be one level easier.

There are also numerous pieces of equipment intended to assist in the detection of Virus, or, in the end, simply to wipe it from the face of the operating system.

Electronics Diagnostic Kit

The electronics diagnostic kit is a simple set of electronic tools used for the manual (i.e., off-line) examination of electronic data systems. It includes voltage meters, circuit testers, high-power microscopes to examine circuitry, etc. These kits are used when examining cold circuits for evidence of virus eggs. Such an examination is an uncertain, Difficult task using the Electronics asset, or a Formidable one using Computer, but in either case requires the character to have an electronics diagnostic kit. Every two tech levels of difference between the diagnostic kit and the circuitry being examined moves the task difficulty level up or down one level.

Only kits of TL-12 or below are available in the Coalition; higher tech kits are available from the Hivers (up to TL-14) or as relics.

TL	*Mass*	*Volume*	*Cr*
8-9	5 kg	10 liters	2000
10-11	7 kg	15 liters	4000
12-13	6 kg	12 liters	8000
14+	4 kg	8 liters	10,000

Canaries

Canaries are the classic means of detecting Virus. The first canaries were improvised from whatever computers or peripheral systems happened to be available, and the concept was happened upon rather accidentally, innumerable hundreds or thousands of times in innumerable locations by innumerable persons, most of whom died making the discovery. However, current versions are specially designed to accomplish their missions. The original canaries were so named because they proved the existence of Virus by "dying," i.e., self-destructing when they became infected by the early "suicider" strains of Virus. Current canaries usually do not die upon infection, as the currently common strains of Virus seek to control new systems to propagate themselves, not to destroy them.

Canaries are high-speed data-processing systems which mimic the sort of systems that Virus likes to occupy, and which also speed up the development of a low-power virus (e.g., an egg which has just hatched, or a virus which has been stunted by inhabiting a slow or low-capacity computer) to levels where it is readily detectable. Canaries detect Virus within them by watching for the distinctive electrical patterns of Virus consciousness entering their systems. In many cases, canaries contain simulated connections to sensor or weapons controls, items which Virus always attempts to control. However, when Virus attempts to gain access into these systems, it finds that they have apparently had some kind of access control mechanism installed. At this point, Virus attempts to force the barrier, either by "hacking" its way through the phony security program, or by burning its way around the blocked circuitry. Either way, these attempts are sufficient to trip the canary's detection systems. Once this is detected, the canary sounds an alarm to notify its owners that Virus is present. This alarm is usually an audible one, though many crews like to rig up a small mechanical arm to the alarm so that Virus actually waves at them to say hello once it has been discovered.

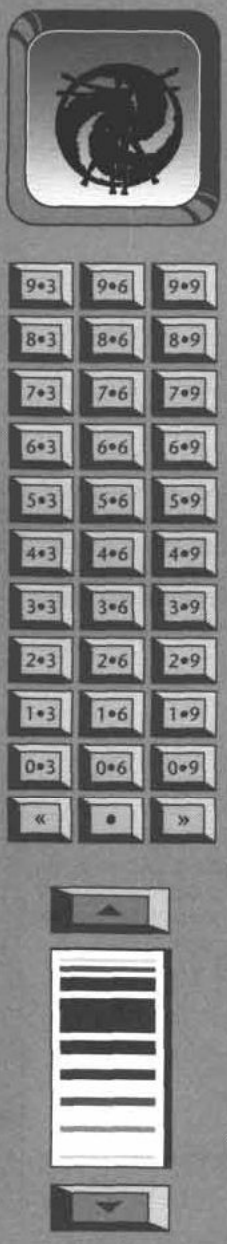
There are two main categories of canary: warning canaries and exploratory canaries.

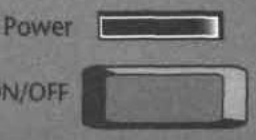
Warning canaries, also called defensive canaries, are those which are installed as part of the computer system aboard a starship or vehicle. Their function is to warn the crew when a portion of the ship's computer system has become infected, so that the crew might shut the system down, abandon ship, etc. These canaries were quite common in the first few decades following the Collapse, but now that there are improved antiviral countermeasures, these have become less prevalent.

Exploratory, or offensive, canaries are portable canaries which are taken to newly discovered, suspect computers. (Note: All computers are suspect.) These are hooked into the suspect data system and are watched to see if they become infected. This process can sometimes take hours or days, or may not work at all: Many of the strains of Virus that have survived into 1201 have learned to be wary of canaries, and do not betray themselves to these systems.

Finally, exploratory canaries are divided into two types: passive canaries and active canaries. A passive canary is one which is hooked into a functioning data system to see if an active virus will expand into it. Passive canaries need no power source of their own, as this power is provided by the system to which it is connected.

Active canaries have their own power sources and are used to examine cold systems such as powered-down computers and systems that are suspected of containing Virus eggs. The canary hooks into and powers up these cold systems and waits to see if dormant virus in these systems will attempt to take it over.





Canaries are not reusable. Once they have been infected, their internal workings are suspect and cannot be trusted to handle any further examinations. They are not discarded, however; they are returned to RCES authorities where they are studied, and in some cases broken down to have their components recycled into new canaries.

Note that, when hiring free-lancers, RCES will almost always provide one or more canaries to the free-lance crew at no cost. This is to ensure that the mission is not jeopardized by the use of substandard, used, or defective canaries. Although canaries are expensive, they are cheaper than failed missions, or the risk of the mission returning infected and spreading Virus into Coalition data systems.

On the table on the facing page, base difficulty level is based on the canary's absolute computing capacity compared to "average" host data systems. This level is modified up one level for every two tech levels by which the infected system exceeds the canary, or down one level for every two tech levels by which the canary exceeds the infected system. Difficulty should be further modified for unusually "smart" or "stupid" viruses, at the referee's discretion. Virus-detection attempts with canaries are rolled against the canary's listed asset, and do not use the Computer or Electronics assets of the characters. These rolls are uncertain tasks.

Note that any virus, at the referee's discretion, may be immune to detection by canary, regardless of the success of any task roll.

Type	*TL*	*Difficulty*	*Asset*	*MW*	*Mass*	*Volume*	*MCr*
Warning Canary	10	Average	8	3	120 kg	300 liters	0.5
Passive Exploratory Canary	10	Difficult	8	—	50 kg	50 liters	0.05
Active Exploratory Canary	10	Difficult	8	0.3	50 kg	50 liters	0.08
Warning Canary	12	Average	10	4	160 kg	400 liters	1.5
Passive Exploratory Canary	12	Difficult	10	—	30 kg	30 liters	0.15
Active Exploratory Canary	12	Difficult	10	0.4	30 kg	30 liters	0.3
Warning Canary	14	Average	12	5	160 kg	400 liters	2.5
Passive Exploratory Canary	14	Difficult	12	—	20 kg	20 liters	0.25
Active Exploratory Canary	14	Difficult	12	0.5	20 kg	20 liters	0.5

MW indicates power requirement. Canary may be hooked up to a vehicle or starship power plant, or to a battery designed using the battery tables in **TNE, Brilliant Lances,** or **Fire, Fusion, & Steel.** 1 kg = 0.001 tonnes, 1 liter = 0.001 cubic meters

Virus Capsule

A virus capsule is a device which captures a fully active, fully aware virus for further study. There are no standard virus capsules; each one is purpose-built to capture a virus which has already been studied.

A virus capsule is a virtual reality simulator for a virus. The capsule appears to the virus inside of it to be the operating system of a starship, and even gives false feedback to the virus occupying it to convince it that it was in a ship that had just taken off, or which had just fired its lasers, etc. Obviously this is a very sophisticated device, and can only be fashioned when there is a great deal of information about the virus which will occupy it. For example, a virus with closed-circuit TV monitors will not be fooled that it is hooked into a starship when it sees that a simple box has been hooked up to one of its data ports. On the other hand, a virus which inhabits a system with no external viewing system against which to check incoming electronic data will be easier to fool. Note that sometimes the capsule will catch the consciousness of the virus itself, while other times it will only catch a copy, depending upon the mode of operation of that virus.

The construction of a virus capsule usually requires one or more computers of the type that the virus will be tempted into invading, plus parts from the peripheral systems that the capsule is intended to simulate.

As a rule of thumb, a capsule costs the same as the system hosting the virus that is to be captured, and allows a Difficult test of Computer to capture at least a copy of the virus. Each doubling or halving of this price decreases or increases the task difficulty by one level.

Lightning Bolt

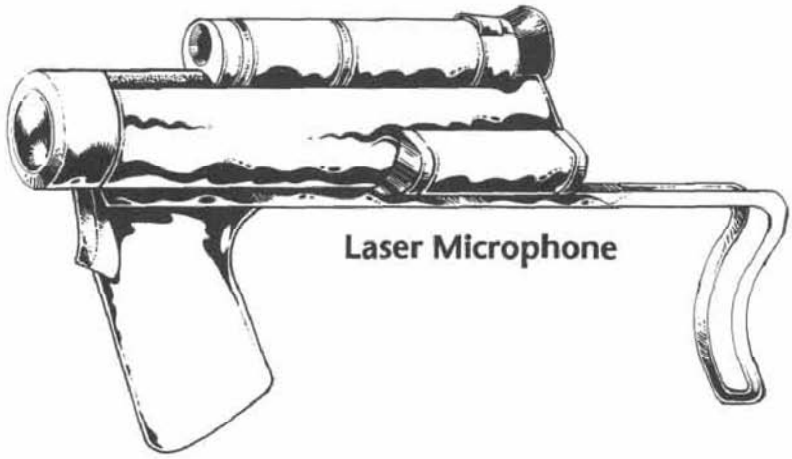
A lightning bolt is a reuseable device that is intended to send a massive power surge through a data network suspected (or proven) to contain Virus. This is a device of last resort, because it does irreparable damage to all electronic systems that are wired into the data system.

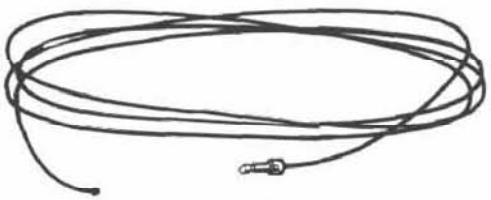
A lightning bolt is typically used to eradicate Virus from a system that presents a clear danger to friendly forces that outweighs any hopes of recovering or reconditioning the system. When an infected system is identified as fulfilling these criteria, a lightning bolt is more effective than simply shooting holes in the computer, as the electrical pulses follow the infected circuitry, burning them out as they go.

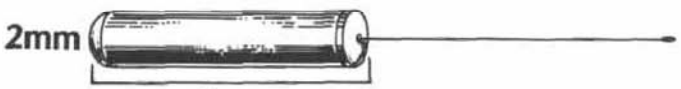
A lightning bolt will not always be effective, as a sophisticated virus will have set up fire breaks and other protective mechanisms within its system. Using a lightning bolt to kill Virus is a Difficult test of Computer or Electronics. As a rule of thumb, the task should become one level easier or harder for each tech level by which the lightning bolt exceeds or is exceeded by the host computer, respectively. In addition, greater or lesser levels of sophistication of the host computer will also make the task harder or simpler. For example, a virus inhabiting an automated parking ticket machine would be much easier to kill than one inhabiting an expert aerospace traffic control data network.

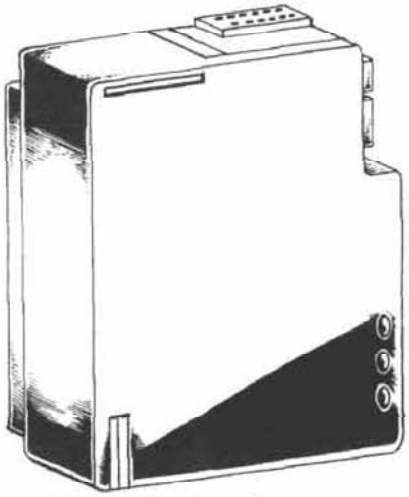
TL	*Mass (tonnes)*	*Volume (m^3)*	*Cr*
8	1.75	1.325	7450
9	1.3	1.1	6400
10	1.02	1.05	5600
11	0.82	1.04	5640
12	0.71	1.08	6035

Covert Operations Equipment









Covert Operations Equipment

This equipment is distributed only to RCES covert operatives and is not easy for free-lancers to come by.

Bug: This device is a very small, sound-activated remote microphone used to monitor conversations without the participants being aware of it. The technical details vary, but the most common variety used by RCES covert operatives is a cylinder 2mm in diameter and 8mm long, with a 15mm-long "whisker" antenna. Bugs are planted using a small dispenser (designed to hold 24) which sticks the bug in place with a powerful adhesive, activating it at the same time. Broadcast range is small, and bugs are usually used in conjunction with another device that receives their signal (see the monitor/booster on the facing page). Duration is limited (1D6+4 hours), and the bug will pick up normal conversation at a range of 2-3 meters.

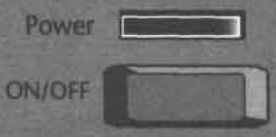
Simple bugs such as these are relatively easy to locate with the proper instruments, since they broadcast constantly (finding one is Average versus Electronics with an electronics tool kit, Difficult otherwise). A careful search without electronics expertise can locate them if they are not well concealed (a matter for referee's judgment). Their chief advantage is that the dispenser is easy to conceal in the hand, and a bug can be planted very rapidly (in one 5-second turn).

The quantity and nature of any information gathered is up to the referee.

TL: 8
Mass: Negligible
Range: 6 meters (short range)
Price: Cr240 (dispenser and 24 bugs)

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
2•3 2•6 2•9
1•3 1•6 1•9
0•3 0•6 0•9
« • »

Security Clearance
Yes No
28-IX-1201
Date



Improved Bug: This device is an improvement in bugging technology. A 0.1mm-diameter filament is run from the room to be bugged to the main unit (which can be a more powerful radio or the monitor/booster described below) up to 10 meters away. The filament cable can be threaded through ventilator shafts, conduits, pipes, and can even be concealed in a thick coating of paint. Only the end of the cable needs to be in the room being bugged, and this end picks up normal conversations within 2-3 meters. This type of bug is more difficult to detect because it is a closed-circuit system, and never broadcasts (finding one is Difficult versus Electronics with an electronics tool kit, Formidable otherwise).

The quantity and nature of any information gathered is up to the referee.

At TL-10, the audio cable is replaced with a fiber-optic cable of the same dimensions capable of picking up light as well as sound. Resolution depends on the light available, and can be subjected to computer enhancement under some conditions.

TL: 8 (audio) 10 (video)
Mass: Negligible
Price: Cr100

Bug Monitor/Booster: This is a small device that receives the weak signals from a bug (either broadcast or closed circuit), amplifies them, and records them. If hooked into a building's power supply, it can operate indefinitely; otherwise it needs to be recharged or replaced every 72 hours.

The unit can be set to dispose of its recordings at regular intervals or in response to a coded signal. In either case, it compresses the data into a single, high-speed "squirt" that lasts only a few seconds. The small radio in the unit can send this signal to the limits of its range, or the unit can be hooked into a wire-based system of some kind. In some cases, it may be feasible for the operative to retrieve the unit's data personally. This unit can be linked to any communicator or data-recording device.

TL: 8
Mass: 0.1 kg
Range: 500 meters
Price: Cr500

Pen Pistol: Covert operatives often need concealed firearms, and this one can be taken as typical of them all. Small enough to be concealed in a writing implement or other similar-sized object, the weapon requires a full turn to prepare for firing or return to its safe mode, but it can be held ready to fire for as long as desired. The weapon is capable of firing all standard 5×27mm rounds, but tranq is the round of choice, as the performance of other rounds from a barrel this short is less than desirable.

The pen pistol is a single-shot weapon, but the body of the pen is long enough to accommodate a second round as a spare (this round must be individually loaded, and thus does not count as a magazine).

A pen pistol can stand up to a cursory examination, and will actually write for a short time, but a close examination will reveal it for what it is (it is heavier than a normal pen, for example). It is constructed entirely of non-metallic materials, to make it more difficult to detect.

TL: 8
Ammo: 5×27mm-8
Weapon Weight: 0.277 kg loaded, 0.273 empty
Weapon Price: Cr114 (normally available only through RCES sources)
Ammunition Price: Cr0.16 (Ball), Cr0.32 (HE, DS, Tranq), Cr0.48 (HEAP)

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5×27mm Tranq	SA	–1*	Nil	0	1i	5	—	4

*1D6–1 points of damage plus tranq effect on TNE, page 350

Spy Camera: One of the spy's most useful tools is the camera. The model issued by the RCES is 1cm thick, 2.5cm high, and 7 cm wide. It stores photos electronically, and is designed to work in low light at a range of between 0.2 and 0.7 meters (it is primarily intended for documents, and thus not very good at longer distances). The camera can store about 100 color or 500 black-and-white photographs, and was designed to photograph documents as large as half a square meter with good resolution. Standard data links permit the photos to be by a cable transferred to a hand computer or other data-recording device.

TL: 8
Mass: Negligible
Price: Cr325

Laser Microphone: This device bounces a beam of laser light off a rigid object, and detects the sounds made near that object by analyzing the changes in the reflected beam. The harder the object, the more readily it conducts sound, and the closer it is to a given conversation, the better the sound quality (a glass window pane or a metal hatch are perfect, concrete or brick walls less so, and insulated walls are very poor). The target object (but not necessarily the conversation to be monitored) must be within direct line of sight.

The device is about the size of a bulk 1 pistol, and can be connected by a cable to a hand computer or other data-recording device. A pair of headphones or a data headset can also be attached to the device for real-time monitoring of conversations.

TL: 9
Mass: 0.8 kg
Range: 500 meters (short range)
Price: Cr475



Filter mask

HOSTILE ATMOSPHERE SURVIVAL EQUIPMENT

Not all atmospheres are breathable by humans without assistance. Some atmospheres are too thin to sustain human metabolisms, while others contain impurities or contaminants which prove fatal to humans in the short or long term. These difficulties can be addressed by the use of specialized breathing gear which allow humans to function indefinitely in these environments.

Very thin atmospheres (atmosphere codes 2 and 3) require the use of a respirator, which compresses the thin atmosphere to breathable levels.

Tainted atmospheres (atmosphere codes 2, 4, 7, and 9) require the use of filter masks to remove the contaminants from the atmosphere before it is inhaled. Simple tainted atmospheres do not require any skin protection, but the contaminant in some tainted atmospheres is so severe that it affects exposed skin, and is called an irritant atmosphere. Irritant atmospheres require the use of protective masks.

Note that atmosphere code 2 is both very thin and tainted, and requires the protection of a respirator and a filter mask.

For more discussion of atmosphere codes and their significance, see **TNE**, pages 180-195.

Because of their low tech level of manufacture, these items are considered to be universally in use by the Coalition, and the Wilds, both as newly manufactured devices and as relics.

Filter Mask

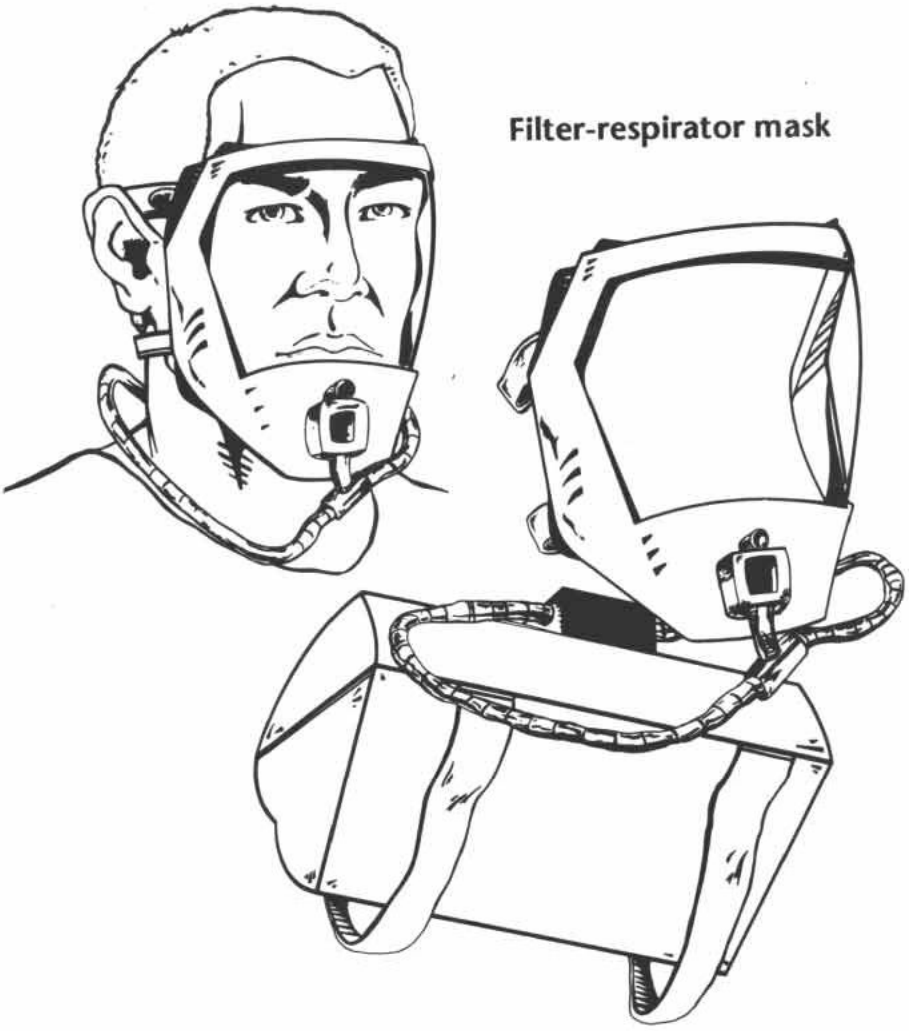
A filter set which allows an individual to breathe tainted atmospheres. This mask makes use of a combination of activated charcoal and other filters at the lowest tech levels, but more advanced filter materials come into use at higher tech levels of manufacture.

TL: 3
Volume: 1 liter
Weight: 0.5 kg
Price: Cr10

Respirator

Also called a compressor mask, the respirator is a small compressor which allows an individual to breathe in very thin atmospheres. The atmosphere is drawn into a small chamber and held briefly until inhaled. Exhalations are vented to the outside by means of a check valve system that maintains internal pressure. A pair of earplug/seals are provided to prevent damage to the user's eardrums while permitting normal hearing.

TL: 5
Volume: 1 liter
Weight: 0.5 kg
Price: Cr100



Filter Respirator Combination

A combination filter mask and respirator which allows breathing of very thin, tainted atmospheres. It shares all characteristics of both systems.

TL: 5
Volume: 1 liter
Weight: 0.5 kg
Price: Cr150

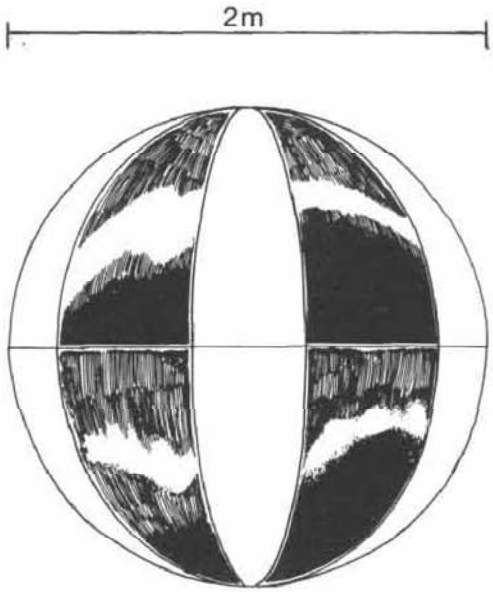
Protective Mask

For use in irritant atmospheres, the protective mask covers the wearer's mouth, nose, and eyes, and it hooks up to an oxygen supply, which makes it ideal for use in atmospheres containing trace amounts of skin irritants such as ammonia, sulfur compounds, or chlorine. This mask can be used in thin and very thin atmospheres, but not in a vacuum.

TL: 6
Volume: 1 liter
Weight: 0.5 kg
Price: Cr25

Rescue and Medical Equipment





Rescue Equipment

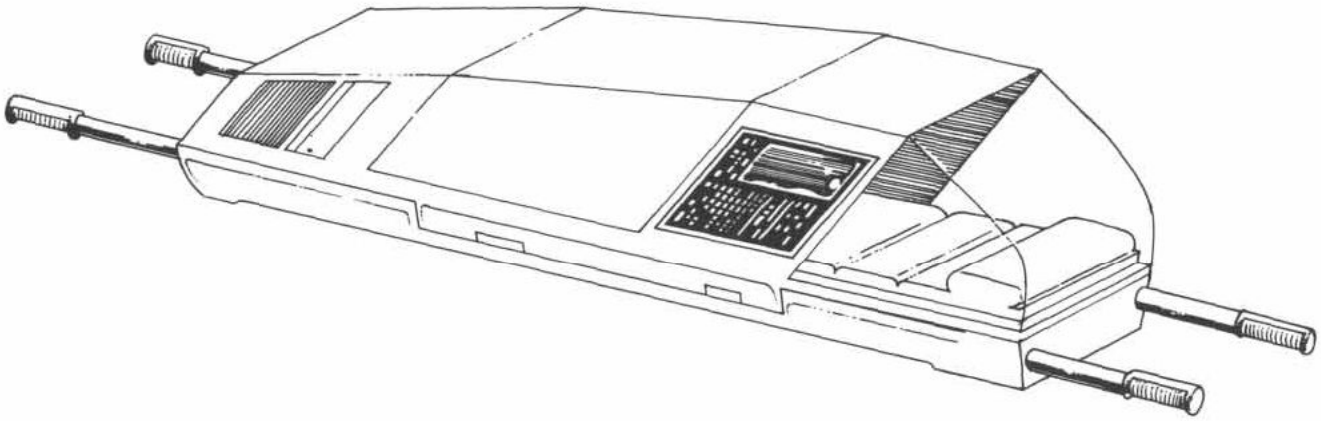
Ball, Rescue: Standard on all RCES and RCN vessels and on most private ships as well. When folded, the rescue ball is a cylinder 5 cm in diameter and 10 cm long. When deployed, it forms a sphere 1 meter in diameter which contains air sufficient to last one person for two hours. In the event of explosive decompression or other loss of air, a rescue ball allows an individual not in possession of a vac suit to survive until aid arrives. The user pulls a lanyard, climbs inside, seals the zip closure, and activates the compressed air bottle which inflates the ball.

The ball is made of a metal-coated plastic film for ease of location by radar and contains a bottle of compressed air, a first-aid kit (the personal medical kit described in the basic rules on page 334), a patching kit for minor punctures, and a transparent window through which the occupant may observe conditions outside the ball. Rescue balls provide some protection from stellar radiation and corrosive and insidious atmospheres for 5 to 7 hours (longer than the ball's air supply). The ball has several loops on the outside enabling balls to be linked together, tethered to one spot, or attached to a line for towing.

TL: 7
Volume: 1 liter (storage volume), 4.2 kl (deployed)
Weight: 5 kg
Price: Cr150

Survival Bubble: A large (2-meter-diameter) plastic sphere with alternating clear and opaque panels, a small oxygen tank (capable of supporting three occupants for two hours) for inflation, a patching kit for minor punctures, and three first aid kits (the personal medical kit described in the basic rules on page 334). Access to the interior is through a conforming plastic seal which functions similarly to an air lock (although $^1/_2$ person-hour of air is lost each time this is used in a vacuum or thin atmospheres). The bubble can be used for life support in a vacuum (it can be moved by walking on the inside, treadmill fashion assuming there is gravity), and it can also be used for protection against weather or as a lifeboat on a sea surface. The bubble is fairly robust and difficult to puncture accidentally, but it has no armor value.

TL: 9
Volume: 8 liters (storage volume), 33.5 kl (deployed)
Weight: 8 kg
Price: Cr600



Portable Automed: This is a smaller, less capable version of the standard automed. It is designed to stabilize a critically wounded patient for one hour, until he or she can be transported to better facilities. The portable automed has handles which permit it to be carried by two persons.

When placing a patient in a portable automed, the operator must place a respirator mask in place over the patient's face, attach a monitor/autoinjection sleeve in place using a self-adhesive patch, and close the lid. The automed then floods itself with a medical aerogel which stops bleeding, maintains temperature and blood pressure, disinfects, and in conjunction with drugs injected through the autoinjection sleeve, stabilizes the patient. If the patient's vital signs drop below a preset level, the device will initiate resuscitation procedures.

The portable automed provides no medical modifier; it simply prevents critically wounded characters from dying for one hour.

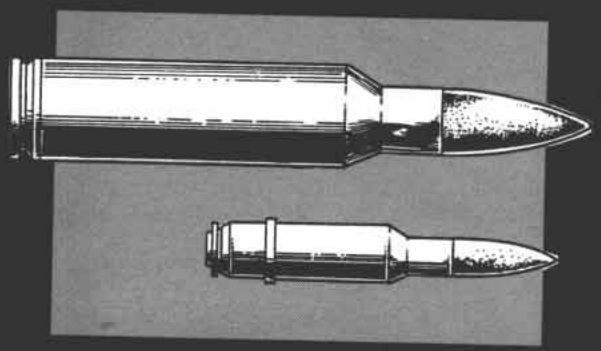
The portable automed pictured is usable with bipedal human-sized sentients, provided the correct recharge unit is used. Non-bipedal aliens or those larger than humans (Hivers, Schalli, etc.) require a portable automed of different construction.

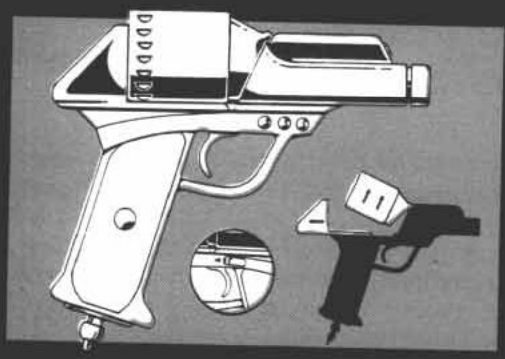
TL: 12
Volume: 2 m^3
Weight: 0.15 tonnes (not including patient)
Price: MCr0.05

Automed Recharge Unit: The drugs, aerogel, and other supplies in the automed are contained in a prepackaged recharge unit which is used up in treating one patient, and must be replaced before the automed can be used again. These recharge units are specific to each sentient race treated, and four separate types are available for the standard humanoid portable automed (Human, Droyne, Vargr, and Aslan). The portable automed used in RC service is copied from the old Imperial design, but Aslan and Vargr recharge units are not manufactured in the RC as these races are currently unknown in the area.

Volume: 0.1 m^3
Weight: 0.015 tonnes
Price: Cr7500

WEAPONS









WEAPONS

The weapons considered in this section consist of personnel-carried small arms, heavy infantry support weapons, personnel-carried antiarmor and antiaircraft guided missiles, and ground-based planetary defense (surface-to-orbit) missiles. These small arms include pistols, rifles, shotguns, and submachine guns, and these weapons are based on chemical slug-firing, electromagnetic slug-firing, laser, and plasma and fusion (high-energy) technology. Heavy weapons include rapid-fire antipersonnel weapons and antiarmor weapons. These are based on these same technologies, and include grenade- and rocket-launching projectile weapons.

Data Format

The small arms entries present their information in three sections.

First is a text introduction describing the background and history of the weapon. This section will explain such details as which groups and organizations use the weapon, how the weapon functions and is typically used, and its availability.

The second section shows the physical characteristics of the weapon, usually its mass, length, and cost, plus other details such as ammunition type and muzzle energy or pulse energy, depending upon the exact nature of the weapon. This section also includes the important characteristics of the weapon's ammunition: its dimensions, price, mass, and the details of the ammunition magazines: mass, price, and capacity in rounds of ammunition.

Finally, the weapon's combat performance characteristics are shown in terms of the **TNE** planetary combat rules. These include rate of fire (*ROF*) in shots per 5-second combat turn, damage value (*Dam Val*), penetration rating (*Pen Rtg*), bulk, magazine capacity (*Magazine*), single-shot (*SS*) and burst recoil, and short range in meters, and are presented in the standard tabular format shown below. Note that each line is for a different type of round fired from the gun. Although some factors such as ROF and magazine capacity are constant for all rounds, other characteristics vary from round to round.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
10mm Ball	SA	2	Nil	1	14	3	—	5

Round types are ball (standard solid slug), HE (high-explosive), HEAP (high-explosive armor-piercing), DS (discarding-sabot), tranq (tranquilizer), and flechette (multiple-round finned darts); *ROF* abbreviations are the standard codes from **TNE**, page 272; *Dam Val* and *Pen Rtg* are discussed on **TNE**, page 285; Bulk is explained under "Resolving Ties" on **TNE**, page 265; *Magazine* codes are discussed on **TNE**, page 272, but no letter always indicates a box magazine; Recoil is discussed on **TNE**, pages 275-277; *Short Range* is discussed on **TNE**, page 275. Some short range listings show an iron sight range; this is shown when a weapon has an integral sighting device installed and shows the short range if that sighting device were to be removed (see **Fire, Fusion, & Steel** for further details).

Sometimes there is more than one line for each round, as the addition of bipods or tripods will change the recoil rating and range, and the addition of other equipment to the weapon will change its weight, and therefore its recoil values.

Shotguns and weapons which fire flechettes have multiple lines for each shotgun and/or flechette round because these rounds perform differently at short and medium+ ranges. On the medium+ line they also have an additional parenthetical listing with their ROF value which shows the burst size in number of rounds. See **TNE**, pages 279-80, for further details.

Some heavy weapons and missiles, depending upon their characteristics and function, may add the following additional characteristics: penetration value (*Pen Val*, discussed on **TNE**, pages 296-7), concussion and burst ratings (*Con-Brst*, or C:, B: listed under *Damage*, see **TNE**, page 283), danger space (*Dngr Spc*, **TNE**, page 279-80), indirect fire range (*IFR*, see **TNE**, page 280), maximum range (**TNE**, page 278), combat move (*Cbt Move*), and agility (**TNE**, page 295), and substitute reload time (*Rld*), in 5-second combat turns, for ROF.

Lasers add a table to adjust laser performance for different atmosphere types—details are on page 89.

Most weapons have their size described in terms of mass, usually in kilograms or tonnes, where 1000 kg = 1 tonne. Unless volume is listed separately, weapons typically have a volume in liters equal to their mass in kg (an equivalent expression is *volume in cubic meters is equal to mass in tonnes*).

Some exceptions to this include high-energy weapons and magazines.

For high-energy weapons (plasma and fusion guns), the volume of their firing units and support hardware in liters is equal to mass in kg times 0.5 (volume in cubic meters = mass in tonnes × 0.5). All other components of high-energy weapons (except their magazines, see below) have a volume of 1 liter per kg (1 m^3 per tonne).

Magazines, which carry dense cartridges, are figured in a different way. For purposes of determining volume, there are three types of magazines: slug-firing cartridge magazines, high-energy weapon (pulsed power cartridge) magazines, and chemical laser cartridge magazines.

Slug-firing magazines have a volume in liters equal to the mass in kg of a full load of carried rounds times 0.5 (volume in m^3 = mass of rounds in tonnes × 0.5). High-energy weapon magazines have a volume in liters equal to the mass in kg of a full load of rounds times 0.25 (volume in m^3 = mass of rounds in tonnes × 0.25). Chemical laser cartridge magazines have a volume in liters equal to the mass in kg of a full load of rounds times 0.2 (volume in m^3 = mass of rounds in tonnes × 0.2).

Small Arms Ammunition







Security Clearance

Yes No

28 IX 1201

Date

Small Arms Ammunition Designation

Ammunition is given two similar designations, a technical designation, and a common designation.

Technical Designations: In the technical designation system used by the RC, ammunition is identified by its diameter and the cartridge case length in millimeters (5×22mm, 7×57mm, etc.), sometimes followed by additional descriptive codes (9×24mm-5, 5.5×45mmE) representing other important characteristics.

The designation E identifies the ammunition as using ETC (electrothermal chemical) propulsion. For example, 7×46mmE indicates an ETC round 7mm in diameter with a 46mm case length. ETC rounds have a small band around their cartridge cases, to prevent them from chambering in non-ETC guns of the same caliber.

A number following a dash indicates the tech level of the ammunition. For example, the two 9mm pistol rounds 9×20mm-4 and 9×20mm-6 are manufactured for different weapons and are different rounds (that is, their chamber pressures are radically different), even though their diameter and case length are the same. In most cases, there is little danger of confusion, and the TL designator is omitted.

Because gauss rounds do not have a cartridge case, the designation indicates the length of the projectile instead of the case length. Often, gauss rounds will carry a further number, following a slash in the designation, indicating the muzzle velocity in hundreds of meters per second at which a weapon fires the round. All 4mm gauss rounds used by the Coalition are 4×20mm, for example, but those fired from the gauss pistol are sometimes labeled 4×20mm/15, those from the gauss rifle 4×20mm/35, and those fired from the VRFGG 4×20mm/60, indicating muzzle velocities of 1500, 3500 and 6000 mps respectively.

Ball, Dart, slug, HE, HEAP, DS, and so on are used to designate various specialized classes of projectile. These names are fully explained in **Fire, Fusion, & Steel**, and will not be discussed here.

Common Designation: Ammunition in common parlance seldom uses the full technical designation. Also, the same type of ammunition may have several different common designations used in different circles. Common designations use the diameter in millimeters and a descriptive abbreviation. The round fired in the Coalition's standard ACR is technically designated 7×46mmE-10, but is also called 7mm RC(E) (the Coalition name indicating an electrothermal chemical round), 7mm ACR (a common name indicating the weapon it is most commonly used in), or 7mm ImpE (the old Imperial designation for the round, indicating an ETC round).

Note that most standard RC rounds are merely newly manufactured standard Imperial rounds with a new name. This is because of the large amount of relic Imperial ammunition and small arms that can be recovered. Military units can often "live off the land" by recovering relic ammunition and weapons of a common caliber. For ease of supply and standardization, adopting the old Imperial standards cannot be beat.

The following should help sort out the bewildering plethora of names, numbers, and abbreviations. The rounds are listed according to their technical designations, but the entries for each round include other designations and indicate which weapons the round is used in.

Note in these ammo entries that *average* muzzle energy is the energy inherent to the round itself. The muzzle energies listed with the weapons entries are the *actual* muzzle energies when fired from those weapons. Actual muzzle energy varies from average muzzle energy depending on barrel length; see **Fire, Fusion, & Steel** for more information. Gauss rounds have no inherent muzzle energy; this depends entirely on the weapons which fire them.

Some of the ammunition shown on the following pages do not correspond to weapons in this book; they are used with weapons shown in the **TNE** basic rules, pages 351-353.

Reformation Coalition Ammunition



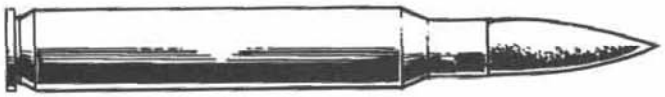
4×20mm Gauss



5×50mm-7



5.5×45mmE-9



7×64mm-8



7×30mmE-10



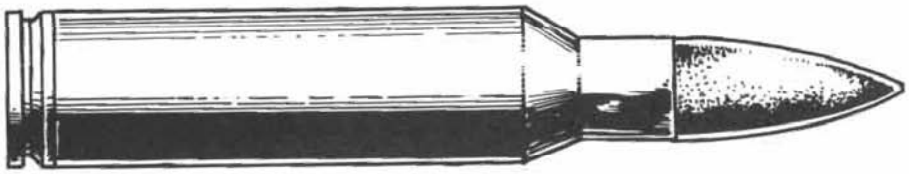
7.5×50mmE-9



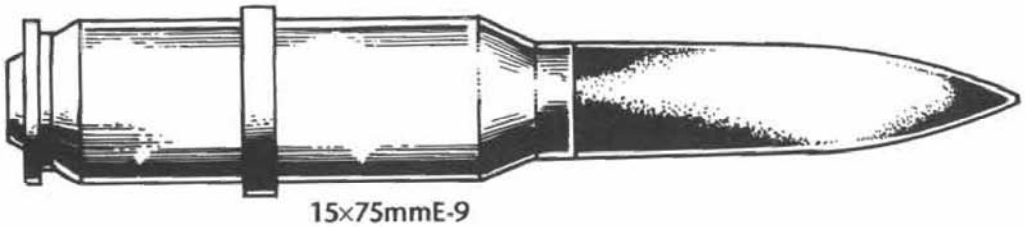
7.6×15mmE-9



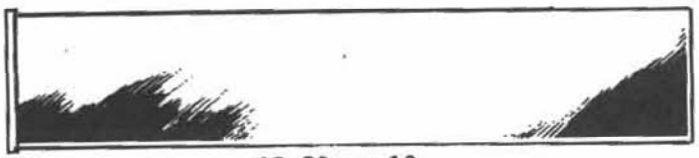
9×20mm-6



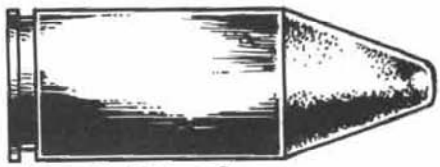
13×75mm-6



15×75mmE-9



18×90mm-10



20×35mm-8

Small Arms Ammunition

4×20mm Gauss
Common Designation(s): 4mm Gauss
Average Muzzle Energy: N/A
Weapons: 4mm gauss pistol, 4mm gauss rifle, 4mm gauss SAW, 4mm VRF GG (Veh), 4mm VRF GG (MP)
Comments: Gauss pistols are scarce in the Coalition, but 4mm gauss rifles and support weapons such as the SAW and VRF gauss gun are becoming more common. VRF gauss guns are often used as the primary armament on troop carrier grav APCs. An interesting side note concerning gauss weapons, the bores are not perfectly circular as with other weapons, but are machined out with small slits to accommodate the round's stabilizing fins.

5×22mm-5
Common Designation(s): 5mm Pistol, 5mm Short
Average Muzzle Energy: 138 joules (Tranq: 83 joules)
Weapons: 5mm revolver
Comments: This cartridge was originally developed in pre-Collapse times as a sporting round for small game and target shooting. It is encountered primarily as a secondary weapon in the hands of ill-equipped militias.

5×27mm-8
Common Designation(s): 5mm BP, 5mm Long
Average Muzzle Energy: 233 joules (Tranq: 140 joules)
Weapons: 5mm body pistol
Comments: The body pistol is a common "hideout" weapon throughout charted space, and the cartridge it fires is equally common. A number of "spy" type clandestine weapons (firearms concealed in writing implements, cameras, and the like) are chambered for this round.

5×50mm-7
Common Designation(s): 5mm Imperial, 5mm RC
Average Muzzle Energy: 1571 joules (Tranq: 943 joules)
Weapons: 5mm assault rifle, 5mm LMG, 5mm rotary (tech levels 7 and 8).
Comments: The Coalition still makes use of this cartridge in its 5mm rotary weapons, but these are gradually being phased out in favor of a weapon firing the 5.5mmE-9 round. Other weapons chambered for this round are common on less-developed worlds throughout the Wilds.

5.5×45mmE-9
Common Designation(s): 5.5mm RC(E)
Average Muzzle Energy: 4448 joules (Tranq: 2669 joules)
Weapons: 5.5mm assault rifles, 5.5mm Rotary
Comments: This round is the standard small rifle cartridge for the Coalition.

7×23mm-5
Common Designation(s): 7mm Short
Average Muzzle Energy: 283 joules (Tranq: 170 joules)
Weapons: 7mm revolver
Comments: Weapons firing this pre-Collapse round are found throughout the Wilds as a secondary weapon equipping low-technology armed forces and used by civilians for personal defense.

7×26mm-5
Common Designation(s): 7mm Carbine
Average Muzzle Energy: 1281 joules (Tranq: 769 joules)
Weapons: 7mm carbine, 7mm carbine (folding stock), 7mm carbine (civilian)
Comments: Carbines are primarily used by vehicle crews and others whose primary job does not require a full rifle, but from time to time need more effective armament than a pistol. Civilian weapons firing this round were originally developed as sporting weapons and to arm settlers in remote areas.

7×30mm-6
Common Designation(s): 7mm Pistol, 7mm Long
Average Muzzle Energy: 416 joules (Tranq: 250 joules)
Weapons: 7mm autopistol
Comments: Another pre-Collapse pistol round, sometimes used by paramilitary police organizations.

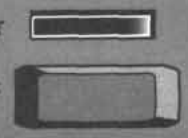
7×30mmE-10
Common Designation(s): 7mm ACR, 7mm ETC Imperial, 7mm RC(E)
Average Muzzle Energy: 4803 joules (Tranq: 2882 joules)
Weapons: 7mm advanced combat rifle, 7mm Coalition Multipurpose Weapons System
Comments: This round is the standard ACR cartridge for the Coalition, and is based on the pre-Collapse Imperial ACR round.

7×44mm-7
Common Designation(s): 7mm AR, 7mm Guild
Average Muzzle Energy: 2709 joules (Tranq: 1625 joules)
Weapons: 7mm assault rifle
Comments: Weapons using this cartridge are widely used by local armed forces throughout the Wilds.

7×57mm-5
Common Designation(s): 7mm Imperial Rifle, 7mm RC Rifle
Average Muzzle Energy: 2808 joules (Tranq: 1685 joules)
Weapons: 7mm rifle, 7mm rifle (civilian), 7mm autorifle, 7mm MMG, 7mm LMG, 7mm rotary (tech level 7).
Comments: This round is commonly used in many armed forces throughout the Wilds, and is used in some of the Coalition's 7mm rotary weapons (although these are in the process of being replaced by weapons chambered for the 7×30mmE-10 cartridge used in the 7mm advanced combat rifle).

7×64mm-8
Common Designation(s): 7mm RC Rotary
Average Muzzle Energy: 4335 joules (Tranq: 2601 joules)
Weapons: 7mm rotary (tech level 8).
Comments: This cartridge was developed for use in rotary weapons, and no other weapons make use of it. These weapons are widely used by the Coalition, but will ultimately be replaced by weapons chambered for the 7×30mmE-10 cartridge used in the 7mm advanced combat rifle.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
2•3 2•6 2•9
1•3 1•6 1•9
0•3 0•6 0•9
« • »
Security Clearance
Yes No
28 IX 1201
Date



7.5×50mmE-9
Common Designation(s): 7.5mm RC(E)
Average Muzzle Energy: 8482 joules (Tranq: 5089 joules)
Weapons: 7.5mm MMG
Comments: This round was developed by the Coalition for use in 7mm MMGs, but the only weapons using it so far are coaxial MGs on Coalition AFVs.

7.6×15mmE-9
Common Designation(s): 7.6mm Super-pistol, 7.6mm RC(E)
Average Muzzle Energy: 653 joules (Tranq: 392 joules)
Weapons: 7.6mm autopistol, 7.6mm SMG
Comments: This round was developed by the Coalition for use in SMGs and is the standard-issue sidearm for starship crewmembers.

9×20mm-4
Common Designation(s): 9mm Short
Average Muzzle Energy: 356 joules (Tranq: 214 joules)
Weapons: 9mm revolver-4, 9mm revolver-5
Comments: Revolvers chambered for this round are in use by low-tech armed forces, police agencies, and paramilitary forces throughout the Wilds. This round can be used in weapons chambered for 9×20mm-6 rounds, but at a loss in performance (see the weapon's listing on page 47).

9×20mm-6
Common Designation(s): 9mm Imperial, 9mm RC Pistol
Average Muzzle Energy: 458 joules (Tranq: 275 joules)
Weapons: 9mm autopistol
Comments: Automatic pistols chambered for this round are in use by low-tech armed forces, police agencies, and paramilitary forces throughout the Wilds. It can be used in weapons designed for the 9×20mm-4 round (these weapons are not presented in this book), but is too powerful for them, and will ultimately damage these weapons (see the discussion of overpowered cartridges in the Rules Expansion section).

9×24mm-5
Common Designation(s): 9mm Guild
Average Muzzle Energy: 489 joules (Tranq: 293 joules)
Weapons: 9mm SMG, 9mm folding stock SMG
Comments: This round is primarily used by the Mercantile Guild in SMGs and its "Deck-Sweeper" boarding weapon.

9×33mm-5
Common Designation(s): 9mm Imperial Magnum, 9mm Guild Magnum
Average Muzzle Energy: 672 joules (Tranq: 403 joules)
Weapons: 9mm magnum revolver
Comments: Revolvers using this cartridge are primarily used by low-tech police agencies and by civilians. Guild crews prefer this weapon as a sidearm.

9×44mm-7
Common Designation(s): 9mm Rifle
Average Muzzle Energy: 4479 joules (Tranq: 2687 joules)
Weapons: 9mm rifle
Comments: This cartridge and the weapons using it were developed prior to the Collapse for hunting large game animals. The Mercantile Guild sells both the weapons and the ammunition for them to TEDs throughout the Wilds.

10×17.5mm-8
Common Designation(s): 10mm Pistol, 10mm Imperial Navy
Average Muzzle Energy: 605 joules (Tranq: 363 joules)
Weapons: 10mm snub revolver, 10mm snub auto
Comments: This cartridge pre-dates the Collapse, and weapons chambered for it are used by Free Trader crewmembers throughout the Wilds.

12×45mm-5
Common Designation(s): 12mm Rifle
Average Muzzle Energy: 1629 joules (Tranq: 977 joules)
Weapons: 12mm hunting rifle
Comments: This cartridge and the weapons using it were developed prior to the Collapse for hunting large game animals. They are often encountered in the hands of low-tech military forces and militias.

13×75mm-6
Common Designation(s): 13mm RC, 13mm Imperial
Average Muzzle Energy: 14,336 joules (Tranq: 8601 joules)
Weapons: 13mm HMG, 13mm sniper's rifle
Comments: Many armies throughout the Wilds make use of this cartridge in a heavy machinegun and as a sniper's round. It is still in use with the Coalition in the latter capacity. The tranq round is used only against large animals.

14.5×146mm
Common Designation(s): 14.5mm Guild, 14.5mm AAR
Average Muzzle Energy: 31,008 joules
Weapons: 14.5mm AAR
Comments: This cartridge is used in the infamous "Crunch Gun," and is the bane of many an RCES landing team. The origin of this weapon is unknown, but it has been spread throughout the Wilds by Guild merchants, who sell the dies and machine tools for its manufacture to low-tech worlds to create a market for higher tech ammunition chambered for the weapon.

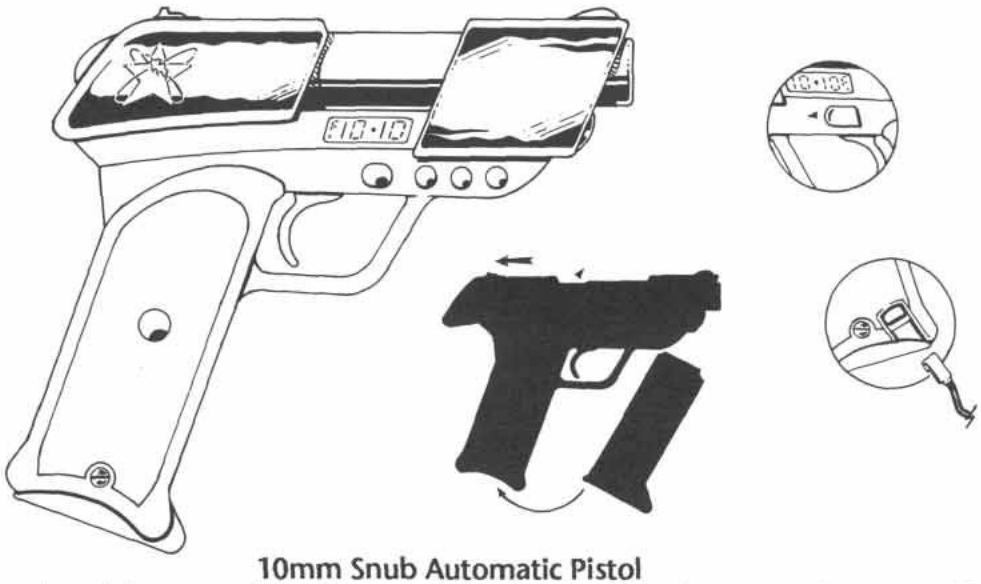
15×75mmE-9
Common Designation(s): 15mm RC(E)
Average Muzzle Energy: 55,135 joules
Weapons: 15mm HMG
Comments: This round is almost solely used in the Coalition's vehicle-mounted 15mm heavy machinegun (not included in this book), used by heavy assault troops.

18×70mm-4
Common Designation(s): 18mm Shotgun, 12 Gauge
Average Muzzle Energy: 2494 joules (Tranq: 1496 joules)
Weapons: 18mm pump shotgun, 18mm auto shotgun, 18mm double-barreled shotgun, 18mm sawed-off double-barreled shotgun
Comments: This round and the weapons designed for it predate the Collapse, and are common throughout the Wilds in civilian (hunting and personal defense), police, and military applications.

18×90mm-10
Common Designation(s): 18mm Long Shotgun Caseless, 18mm RC shotgun
Average Muzzle Energy: 5497 joules (Tranq: 3298 joules)
Weapons: 18mm assault shotgun
Comments: This round was developed for use in the Coalition's 18mm assault shotgun.

20×35mm-8
Common Designation(s): 20mm Imperial, 20mm RC, 2cm LAG
Average Muzzle Energy: 4838 joules (Tranq: 2903 joules)
Weapons: 2cm LAG
Comments: Based on a pre-Collapse design, this round is used in the Coalition's 2cm light assault gun. Weapons using it are also manufactured and sold throughout the wilds by the Mercantile Guild. Tranq round is used for very large animals.

10mm Snub Pistols



10mm Snub Automatic Pistol

Snub pistols are low-velocity weapons designed for use on shipboard and in zero-G environments, and are common sidearms for starship crewmembers throughout the Wilds. Because of the low muzzle velocity of these weapons, their ball round is of minimal effectiveness, and HE, DS, or HEAP rounds are preferred. The range of the weapons are woefully short compared to other pistols, but this is not considered a disadvantage in close quarters. The semiautomatic snub pistol uses the same ammunition as the snub revolver (10×17.5mm-8 cartridge). This page covers the automatic version of the snub pistol; see the facing page for the snub revolver.

The weapon is of conventional layout for an automatic pistol, and utilizes a 14-round detachable box magazine inserted in the pistol grip. An attachment point is provided for a lanyard, which many users find useful to prevent the weapon from drifting away in zero-G conditions

Because of its use in zero- and low-gravity combat situations, the snub pistol is sometimes fitted with an attached laser sight, a device which projects a red dot at the point of impact. Zero-G weapons training stresses a different firing stance than that used in conventional combat: The weapon is held close to the body at the center of mass (rather than at arms' length) to minimize recoil induced rotational motions.

HEAP rounds for this weapon are manufactured at TL-9 and above, and are designed not to exceed safe chamber pressures for the weapon.

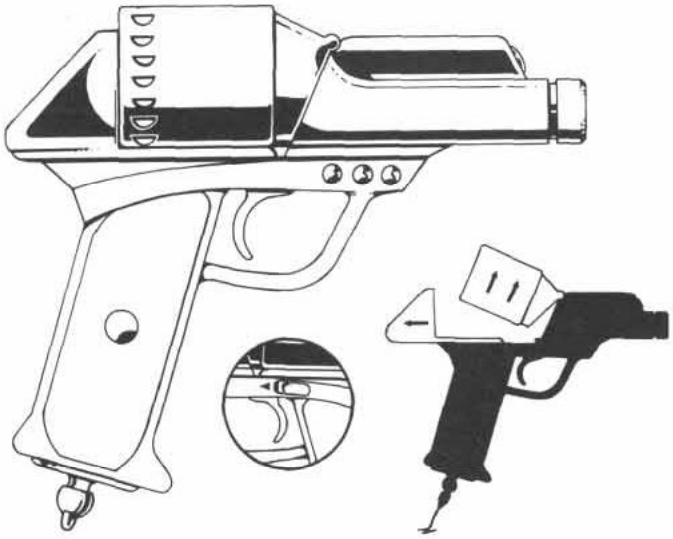
TL: 8
Ammo: 10×17.5mm-8
Muzzle Energy: 484 joules (Tranq: 290 joules)
Weapon Length: 17 cm
Weapon Weight: 1.198 kg loaded, 1.044 empty (includes weight of empty box magazine)
Weapon Price: Cr160
Magazine Weight: 0.2728 kg loaded, 0.119 kg empty
Magazine Price: Cr10 empty
Ammunition Price: Cr0.44 (Ball), Cr0.88 (HE, DS, Tranq), Cr1.32 (HEAP) per round
Ammunition Weight: 11 grams per round
Features: None. TL-8 laser sight optional.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
10mm Ball	SA	2	Nil	1	14	3	—	5
10mm DS	SA	2	1-Nil	1	14	3	—	7
10mm HE	SA	3	Nil	1	14	3	—	4
10mm HEAP-9	SA	3	2-2-2	1	14	3	—	4
10mm Tranq	SA	-1*	Nil	1	14	2	—	4

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.

Attaching a laser sight adds 1 kg to the weapon's mass, Cr400 to the price, and changes the recoil to SS: 1, Burst: — for all rounds. It requires a different holster.

Power
ON/OFF




10mm HE


10mm HEAP-9


10mm Ball


10mm Tranq


10mm DS

10mm Snub Revolver

For a description of this pistol, see facing page.

The snub revolver uses the same ammunition as the snub semiautomatic pistol.

The weapon departs from conventional revolver design in that the cylinder hinges upwards for loading, and that the barrel lines up with the lowest chamber in the cylinder rather than the highest. It is rumored that this design reduces rotational torque in zero-G conditions, but tests have shown that the effect is minimal.

TL: 8
Ammo: 10x17.5mm-8
Muzzle Energy: 472 joules (Tranq: 283 joules)
Weapon Length: 17 cm
Weapon Weight: 0.981 loaded, 0.915 empty
Weapon Price: Cr117.8
Magazine: None. Speedloader available, 6 rounds weigh 0.066 kg or 66 grams
Ammunition Price: Cr0.44 (Ball), Cr0.88 (HE, DS, Tranq), Cr1.32 (HEAP) per round
Ammunition Weight: 11 grams per round.
Features: None. TL-8 laser sight optional.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
10mm Ball	DAR	2	Nil	1	6R	3	—	4
10mm DS	DAR	2	1-Nil	1	6R	3	—	5
10mm HE	DAR	3	Nil	1	6R	3	—	3
10mm HEAP-9	DAR	3	2-2-2	1	6R	3	—	3
10mm Tranq	DAR	–1*	Nil	1	6R	3	—	4

*1D6–1 points of damage plus tranq effect on TNE, page 350.

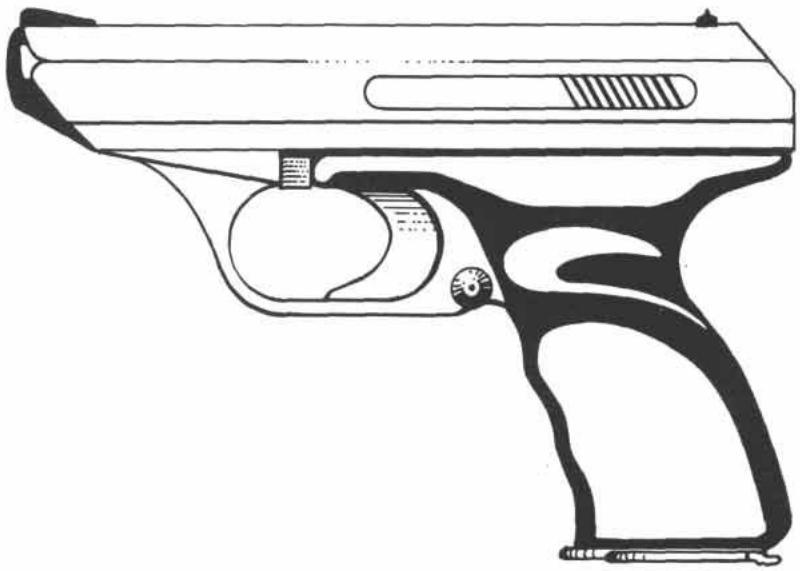
Attaching a laser sight adds 1 kg to the weapon's mass, Cr400 to the price, and changes the recoil to SS: 1, Burst: — for all rounds. It requires a different holster.

Speedloaders

Speedloaders are small devices that hold a number of cartridges ready for rapid insertion into a revolver cylinder, enabling a revolver to be reloaded in a single turn regardless of how many rounds are to be inserted. Speedloaders are reusable, like magazines, but unlike magazines do not form part of the weapon. Speedloaders are uniquely designed for each pistol, and users normally carry 2-4 in a small snap pouch.

TL: 5
Mass: Negligible other than mass of ammunition
Price: Cr2 for all weapons

Automatic Pistols



7.6mm Autopistol

Pistols chambered for the 7.6mm RC(E) round have become the standard sidearm of the RCES and other Coalition forces, gradually replacing the earlier 9x20mm autopistols. Although the range is slightly less than that of the 9mm round, the 7.6mm round has superior penetration, less recoil, and the smaller ammunition means that more rounds can be carried in a magazine. The 7.6mm HEAP ammunition has good stopping power for a pistol, 7.6mm DS is preferred where range is important, but the 7.6 ball round is a good compromise between these two factors.

TL: 9
Ammo: 7.6x15mm RC(E)
Muzzle Energy: 653 joules (Tranq: 392 joules)
Weapon Length: 22 cm
Weapon Weight: 1.5093 kg loaded, 1.4233 empty (includes weight of empty box magazine)
Weapon Price: Cr476.3
Magazine Weight: 0.5828 kg loaded, 0.4968 kg empty
Magazine Price: Cr87.76
Ammunition Price: Cr0.11 (Ball), Cr0.22 (HE, DS, Tranq), Cr0.33 (HEAP)
Ammunition Weight: 5.4 grams per round
Features: None

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7.6x15mm ETC Ball	SA	2	1-Nil	1	16	2	—	9
7.6x15mm ETC DS	SA	2	1-Nil	1	16	2	—	11
7.6x15mm ETC HE	SA	3	Nil	1	16	2	—	7
7.6x15mm ETC HEAP	SA	3	2-2-2	1	16	2	—	7
7.6x15mm ETC Tranq	SA	–1*	Nil	1	16	1	—	4

Security Clearance
Yes No

28-IX-1201
Date



9mm Autopistol

Automatic pistols chambered for this round are in use by low-tech armed forces, police agencies, and paramilitary forces throughout the Wilds and with the Coalition as well. The Coalition military is phasing them out in favor of 7.6mm RC(E) pistols, which means that increasing numbers are becoming available to free-lancers.

Of the high-tech ammunition manufactured to TL-6 chamber pressures for this weapon, DS is the most common due to its superior penetration.

TL: 6
Ammo: 9x20mm-6
Muzzle Energy: 595 joules (Tranq: 357 joules)
Weapon Length: 24 cm
Weapon Weight: 1.018 kg loaded, 0.908 empty (includes weight of empty box magazine)
Weapon Price: Cr169.6
Magazine Weight: 0.2 kg loaded, 0.09 kg empty
Magazine Price: Cr1 (empty)
Ammunition Price: Cr0.4 (Ball), Cr0.8 (HE, DS, Tranq), Cr1.2 (HEAP)
Ammunition Weight: 10 grams per round
Features: None

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
9x20mm Ball-6	SA	2	Nil	1	11	3	—	13
9x20mm DS-8	SA	2	1-Nil	1	11	3	—	16
9x20mm HE-6	SA	2	Nil	1	11	3	—	10
9x20mm HEAP-9	SA	2	Nil	1	11	3	—	10
9x20mm Tranq-6	SA	–1*	Nil	1	11	3	—	6
9x20mm Ball-4	SA	1	Nil	1	11	3	—	12

Holsters and Ammo Pouches

Few people want to carry weapons jammed into their hip pocket or tucked into their belt—holsters were created to make weapons easily portable and readily accessible.

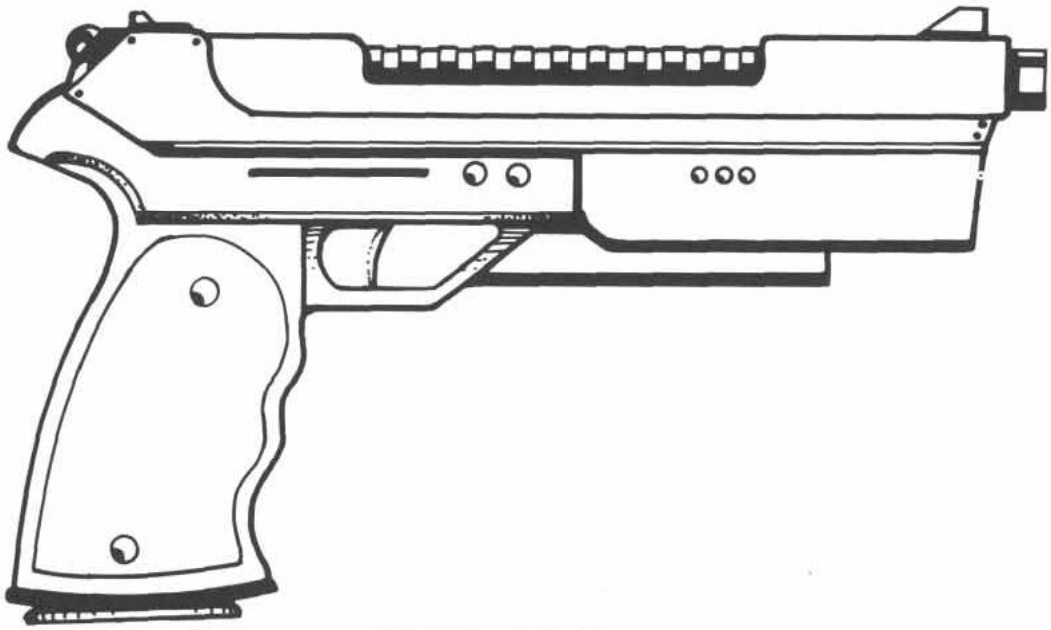
Holsters for bulk 0 and bulk 1 weapons may be concealed under clothing, and can be carried at the wrist or ankle, the small of the back, the hip, or under the arm (known as a shoulder holster). Knives and daggers count as bulk 0 for this purpose, bayonets bulk 1, hatchets and blades bulk 2, and clubs bulk 3.

Holsters for bulk 2 and bulk 3 weapons are normally carried on the thigh, across the back, or hung under the shoulder, and while they may be covered by clothing, their bulges are unmistakable.

Weapons of bulk 4 and greater (including all melee weapons not detailed above) may not be carried in holsters.

Concealed Weapons: Holsters carried concealed under clothing can be detected by an intensive physical search ("frisking"), or via technical means such as metal detectors or chemical sniffers. Detecting a concealed weapon by a visual search is a Difficult: Observation task for bulk 0 weapons, Average for bulk 1 weapons.

Gauss and Body Pistols



4mm Gauss Pistol

All gauss weapons in Coalition service use the old Imperial standard 4mm gauss ammunition, which CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) chose to adopt over the Hiver standard 5.5mm gauss round for various reasons which will not be discussed here. Since the technology required for their manufacture is more than the Coalition is presently capable of, gauss pistols in Coalition service are either relics salvaged from pre-Collapse arsenals, or newly manufactured weapons made using TL-13 receivers and magazine batteries imported from the Hivers.

The selective fire feature of this weapon and its large magazine capacity have made it a very popular sidearm within the RCES, and demand constantly exceeds the supply.

The gauss pistol can be fitted with a TL-10 laser sight which improves its accuracy and controllability at the expense of almost doubling the weapon's mass (loaded weight with laser sight becomes 1.285 kg).

TL: 13
Ammo: 4x20mm/15
Muzzle Energy: 563 joules (required power: 1013 joules)
Weapon Length: 22 cm
Weapon Weight: 0.785 kg loaded, 0.768 empty (includes weight of empty box magazine)
Weapon Price: Cr248.5
Magazine Weight: 0.2245 kg loaded, 0.207 kg empty
Magazine Price: Cr1.35 (loaded), Cr1 (empty)
Ammunition Price: Cr0.01 (Dart), Cr0.02 (HE, Tranq), Cr0.03 (HEAP)
Ammunition Weight: 0.5 grams per round
Features: Optional TL-10 laser sight

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
4x20mm/15 Dart	5	2	Nil	1	35	2	6	12
with laser sight						1	4	
4x20mm/15 HE	5	3	Nil	1	35	2	6	9
with laser sight						1	4	
4x20mm/15 HEAP	5	3	2-2-2	1	35	2	6	9
with laser sight						1	4	
4x20mm/15 Tranq	5	–1*	Nil	1	35	2	4	7
with laser sight						1	3	

Security Clearance
Yes No
28-IX-1201
Date



5mm Body Pistol

This weapon is a small, semiautomatic handgun designed to evade detection by most weapon detectors, and is a common "hideout" weapon throughout known space. A silencer is available, but when attached the weapon becomes bulk 1 instead of bulk 0. It requires three turns (15 seconds) to attach or remove the silencer. With a silencer, recoil is reduced to SS: 2, Burst: — for all rounds. Ball and tranq are the rounds most commonly used; the others are rarely seen.

Note that this weapon is specially made with all non-metallic components so that it is not susceptible to discovery by metal detectors. This standard of manufacture is quite expensive and must extend to all components of the weapon, including magazine and ammunition, so that all prices below are three times those of a metallic weapon of identical performance.

Covert operatives are occasionally equipped with disguised weapons firing this cartridge, but otherwise the weapon is not used by the Coalition, although it is occasionally found in the hands of free-lancers.

TL: 8
Ammo: 5x27mm-8
Muzzle Energy: 198 joules (Tranq: 118 joules)
Weapon Length: 14 cm
Weapon Weight: 0.662 kg loaded, 0.55 kg empty (includes weight of empty box magazine)
Weapon Price: Cr280.8
Magazine Weight: 0.1888 kg loaded, 0.077 kg empty
Magazine Price: Cr3
Ammunition Price: Cr0.48 (Ball), Cr0.96 (HE, DS, Tranq), Cr1.44 (HEAP)
Ammunition Weight: 4 grams per round.
Features: Optional silencer available.
Silencer Weight: 0.233 kg
Silencer Price: Cr141

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5x27mm Ball	SA	1	Nil	0	28	3	—	4
5x27mm DS	SA	1	Nil	0	28	3	—	5
5x27mm HE	SA	1	Nil	0	28	3	—	3
5x27mm HEAP	SA	1	Nil	0	28	3	—	3
5x27mm Tranq	SA	–1*	Nil	0	28	2	—	4

* 1D6–1 points of damage plus tranq effect from **TNE**, page 350.



7mm Assault Rifle

This weapon is the most commonly used rifle among the armed forces serving the members of the Mercantile Guild. Weapons using this cartridge are also widely used by local armed forces throughout the Wilds. Both the Guild and the Coalition also make TL-8 ammunition (DS and HEAP rounds) designed with this weapon in mind.

TL: 7
Ammo: 7x44mm-7
Muzzle Energy: 2729 joules (Tranq: 1637 joules)
Weapon Length: 100 cm
Weapon Weight: 4.805 kg loaded, 4.325 empty (includes weight of empty box magazine)
Weapon Price: Cr920
Magazine Weight: 0.8064 kg loaded, 0.3264 kg empty
Magazine Price: Cr4
Ammunition Price: Cr0.32 (Ball), Cr0.64 (HE, DS, Tranq), Cr0.96 (HEAP)
Ammunition Weight: 16 grams per round
Features: Flash supressor, bayonet lug, rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7x44mm Ball	S	4	2-Nil	6	30	3	6	40 (44)
7x44mm DS-8	S	4	1-2-Nil	6	30	3	6	50 (53)
7x44mm HE	S	4	Nil	6	30	3	6	30 (33)
7x44mm HEAP-9	S	4	2-2-2	6	30	3	6	30 (33)
7x44mm Tranq	S	–1*	Nil	6	30	2	5	20 (20)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.

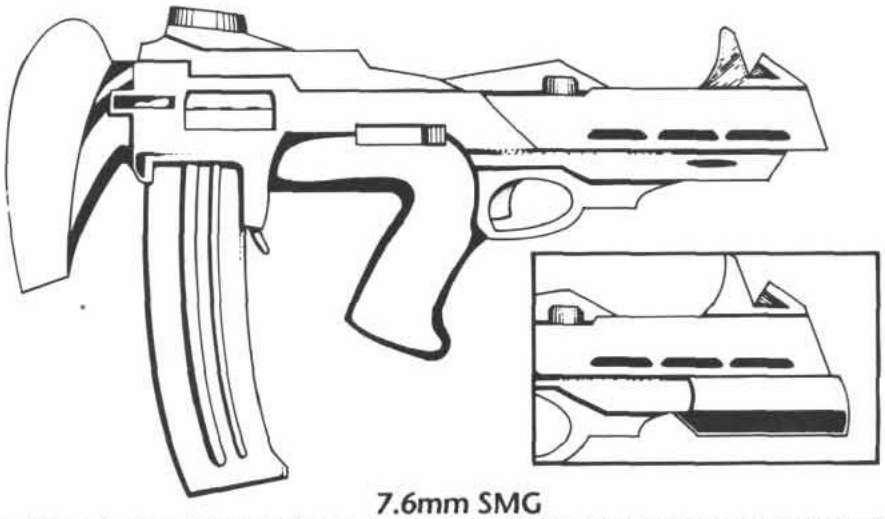
7mm Autorifle

This weapon is widespread throughout the Wilds, and manufactured on a number of worlds by various TEDs. It uses the same ammunition as the 7mm rifle and 7mm civilian rifle. The Mercantile Guild sells advanced rounds (higher than TL-5) for this weapon.

TL: 6
Ammo: 7x57mm-S
Muzzle Energy: 2685 joules (Tranq: 1611 joules)
Weapon Length: 117 cm
Weapon Weight: 5.694 kg loaded, 5.254 empty (includes weight of empty box magazine)
Weapon Price: Cr998
Magazine Weight: 0.7568 kg loaded, 0.3168 kg empty
Magazine Price: Cr4
Ammunition Price: Cr0.44 (Ball), Cr0.88 (HE, DS, Tranq), Cr1.32 (HEAP)
Ammunition Weight: 22 grams per round
Features: Flash suppressor, bayonet lug, rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7x57mm Ball-S	S	4	2-Nil	7	20	3	8	60 (60)
7x57mm DS-8	S	4	1-2-Nil	7	20	3	8	70 (72)
7x57mm HE-6	S	4	Nil	7	20	3	8	30 (45)
7x57mm HEAP-8	S	4	2-2-2	7	20	3	8	50 (45)
7x57mm Tranq-6	S	–1*	Nil	7	20	3	8	30 (28)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.



7.6mm SMG

The 7.6mm SMG has replaced the various 9mm SMGs in Coalition service. The 7.6mm RC(E) round was one of the first rounds developed by CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition), and represents one of its greatest successes.

The round has the same stopping power as the 7.6mm autopistol, but at a greater range. Some users mix rounds in each magazine, loading a 3:1:1 ratio of ball, DS, and HE or HEAP rounds. Tranq rounds are seldom used in this weapon.

The weapon is short and easy to handle, and lends itself readily to the attachment of a TL-10 laser sight. With the sight attached, recoil becomes as noted on the table below.

TL: 9
Ammo: 7.6x15mm RC(E)
Muzzle Energy: 1110 joules (Tranq: 666 joules)
Weapon Length: 40 cm
Weapon Weight: 2.27 kg loaded, 2.11 empty (includes weight of empty box magazine)

Weapon Price: Cr844
Magazine Weight: 1.0822 kg loaded, 0.9202 kg empty
Magazine Price: Cr163.3
Ammunition Price: Cr0.11 (Ball), Cr0.22 (HE, DS, Tranq), Cr0.33 (HEAP)
Ammunition Weight: 5.4 grams per round
Features: TL-10 Laser Sight optional

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7.6x15mm Ball	3/5	2	1-Nil	2	30	2	3/5	80 (77)
with TL-10 Laser sight						2	3/4	
7.6x15mm DS	3/5	2	1-Nil	2	30	2	3/5	90 (92)
with TL-10 Laser sight						2	3/4	
7.6x15mm HE	3/5	3	Nil	2	30	2	3/5	60 (58)
with TL-10 Laser sight						2	3/4	
7.6x15mm HEAP	3/5	3	2-2-2	2	30	2	3/5	60 (58)
with TL-10 Laser sight						2	3/4	
7.6x15mm Tranq	3/5	–1*	Nil	2	30	2	2/4	30 (30)
with TL-10 Laser sight						1	2/4	

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.

9mm Rifle

This rifle is a military version of a pre-Collapse sporting rifle, adapted for military use. The Mercantile Guild manufactures the weapons and the ammunition for them, selling both to TEDs throughout the Wilds.

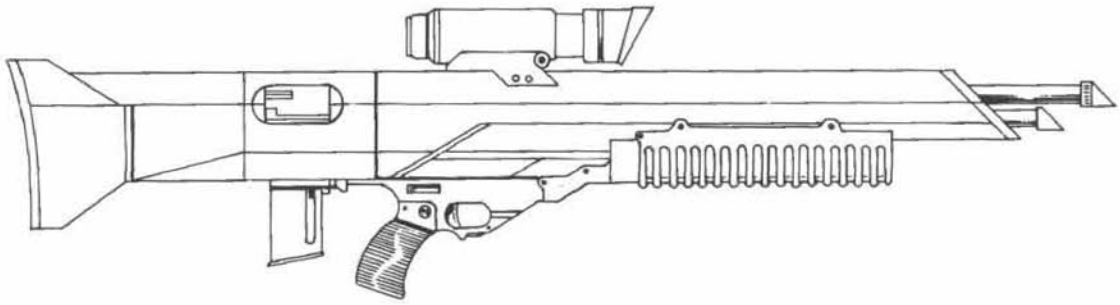
TL: 7
Ammo: 9x44mm-7
Muzzle Energy: 4438 joules (Tranq: 2663 joules)
Weapon Length: 128 cm
Weapon Weight: 9.022 kg loaded, 8.462 empty (includes weight of empty box magazine)

Weapon Price: Cr1157
Magazine Weight: 0.9632 kg loaded, 0.4032 kg empty
Magazine Price: Cr5
Ammunition Price: Cr0.56 (Ball), Cr1.12 (HE, DS, Tranq), Cr1.68 (HEAP)
Ammunition Weight: 28 grams per round
Features: Flash supressor, bayonet lug

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
9x44mm Ball-7	SA	4	2-3-Nil	8	20	3	—	90 (85)
9x44mm DS-8	SA	4	1-2-3	8	20	3	—	100 (102)
9x44mm HE-6	SA	5	Nil	8	20	3	—	60 (64)
9x44mm HEAP-9	SA	5	2-2-2	8	20	3	—	60 (64)
9x44mm Tranq-7	SA	–1*	Nil	8	20	3	—	30 (30)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.

5.5mm Assault Rifle with Grenade Launcher



5.5mm Assault Rifle

The 5.5mm assault rifle represents one of CSAARC's (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) attempts to create a standardized weapon system unrelated to any previous ammunition type.The purpose of the design was to create an assault rifle with a larger magazine capacity than the 7mm ACR, but with the same overall mass. A secondary purpose was to create a weapon that could be completely manufactured at TL-9. The standard 5.5mm assault rifle achieves these goals.

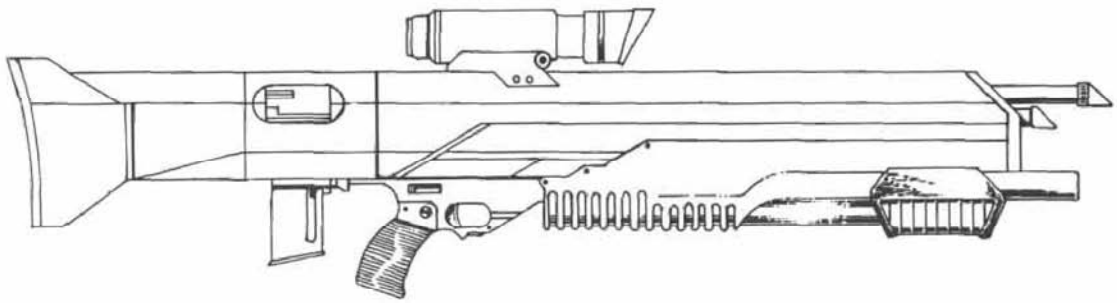
The weapon features an optic sight, flash suppressor, bayonet lug, RAM rifle grenade adaptor, and sling swivels.

TL: 9
Ammo: 5.5x45mm RC(E)
Muzzle Energy: 4448 joules (Tranq: 2669 joules)
Weapon Length: 129 cm
Weapon Weight: 6.158 kg loaded, 5.828 empty (includes weight of empty box magazine)
Weapon Price: Cr1776
Magazine Weight: 1.3644 kg loaded, 1.0344 kg empty
Magazine Price: Cr160
Ammunition Price: Cr0.22 (Ball), Cr0.44 (HE, DS, Tranq), Cr0.66 (HEAP)
Ammunition Weight: 11 grams per round
Features: Optic sight, flash suppressor, bayonet lug, RAM rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5.5x45mm Ball-9	3/5	5	2-3-Nil	8	30	2	3/5	90 (78)
5.5x45mm DS-9	3/5	5	1-2-Nil	8	30	2	3/5	110 (94)
5.5x45mm HE-9	3/5	5	Nil	8	30	2	3/5	70 (59)
5.5x45mm HEAP-9	3/5	5	2-2-2	8	30	2	3/5	70 (59)
5.5x45mm Tranq-9	3/5	–1*	Nil	8	30	2	3/5	30 (30)
with integral 2.5cm GL						2	3/4	

Range in parentheses is iron sight range (unrounded)

*1D6–1 points of damage plus tranq effect on TNE, page 350.



5.5mm Assault Rifle with Integral 2.5cm Grenade Launcher

This weapon is the main variant of the 5.5mm assault rifle, containing an integral 2.5cm pump-action grenade launcher (manufactured so as to be contained inside the weapon's plastic casing), along with the same optic sight, flash suppressor, bayonet lug, RAM rifle grenade adaptor, and sling swivels as the primary model, and is normally assigned one per four-soldier fire team. The rifle and its ammunition are TL-9, but the grenades and launcher are TL-10. Twin selector switches enable the same trigger to fire both weapons. Engaging the grenade launcher causes the grenade sight to swing up into position, and places the rifle on safe; engaging the rifle causes the GL to go on safe and the sight to fold down. Attachment of the 2.5cm GL changes recoil only for the tranq round: it becomes SS: 2, Burst: 3/4.

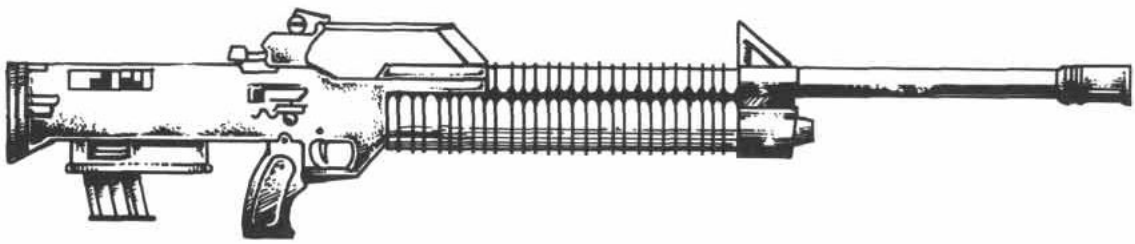
For data on the grenade launcher, see pages 98-99.

TL: 9
Ammo: 5.5x45mm RC(E)
Muzzle Energy (Rifle): 4448 joules (Tranq: 2669 joules)
Weapon Length: 129 cm
Weapon Weight (with Integral GL): 9.5584 kg loaded, 8.7784 empty (includes weight of empty box magazine and empty GL)
Weapon Price (with Integral GL): Cr2276
Magazine Weight (Rifle): 1.3644 kg loaded, 1.0344 kg empty (GL rounds are individually inserted)
Magazine Price (Rifle): Cr160
Ammunition Price (Rifle): Cr0.22 (Ball), Cr0.44 (HE, DS, Tranq), Cr0.66 (HEAP)
Ammunition Weight: 11 grams per round (see pages 98-99 for GL round data)
Features: Optic sight, flash suppressor, bayonet lug, RAM rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5.5x45mm Ball-9	3/5	5	2-3-Nil	8	30	2	3/5	90 (78)
5.5x45mm DS-9	3/5	5	1-2-Nil	8	30	2	3/5	110 (94)
5.5x45mm HE-9	3/5	5	Nil	8	30	2	3/5	70 (59)
5.5x45mm HEAP-9	3/5	5	2-2-2	8	30	2	3/5	70 (59)
5.5x45mm Tranq-9	3/5	–1*	Nil	8	30	2	3/5	30 (30)
with integral 2.5cm GL						2	3/4	

Range in parentheses is iron sight range (unrounded)
*1D6–1 points of damage plus tranq effect on TNE, page 350.

Light Assault Gun & Sniper Rifle



2cm Light Assault Gun (LAG)

This weapon is based on a pre-Collapse Imperial weapon, and has been adopted by the Coalition without major change. The tremendous close-range damage of the flechette round makes it a devastating close combat weapon, but its weight makes it less than desirable for infantry without strength-enhancing battle dress. This weapon is manufactured in the RC with the characteristics below, but relic weapons have identical performance.

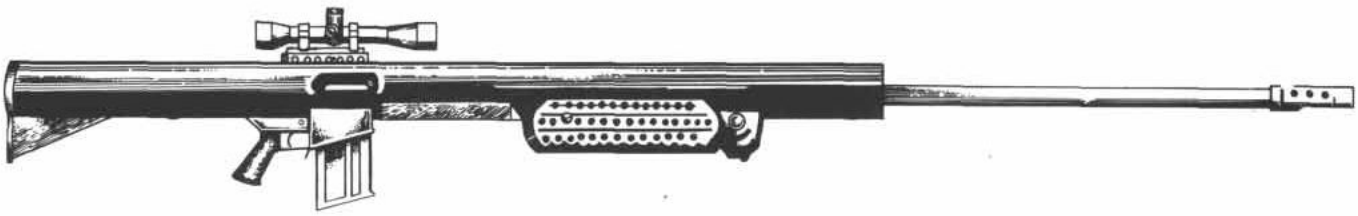
Laser sights are sometimes fitted to this weapon for close actions. Fitting such sights increase the weight of the weapon by 1 kg for the TL-8 version and by 0.5 kg for the TL-10 version, but does not change the recoil values of the weapon.

TL: 8
Ammo: 20×35mm-8
Muzzle Energy: 8063 joules (Tranq: 4838 joules)
Weapon Length: 91 cm
Weapon Weight: 11.921 kg loaded, 11.4812 empty (includes weight of empty box magazine)
Weapon Price: Cr2476
Magazine Weight: 0.9152 kg loaded, 0.4752 kg empty
Magazine Price: Cr5
Ammunition Price: Cr1.76 (Ball), Cr3.52 (HE, DS, Tranq), Cr5.28 (HEAP)
Ammunition Weight: 88 grams per round
Features: Flash suppressor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
20×35mm Ball	SA	6	2-4-Nil	6	5	2	—	210 (210)
20×35mm DS	SA	6	1-3-5	6	5	2	—	250 (252)
20×35mm HE	SA	9	Nil	6	5	2	—	160 (158)
20×35mm HEAP-9	SA	9	2-2-2	6	5	2	—	160 (158)
20×35mm Tranq	SA	–1*	Nil	6	5	2	—	30 (30)
20×35mm Flechette								
Short	SA	2×9 hits**	1	6	5	2	—	70 (70)
Medium-Long	SA (10)	2	1-Nil					

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Range in parentheses is unrounded iron sight range.
** A hit indicates that 9 flechettes have hit the target, each with a damage value of 2 and the listed penetration rating.

Note: The (10) following the SA under the ROF column for the medium- to long-range flechette round indicates that each shot is rolled as a 10-round burst.



13mm Sniper Rifle

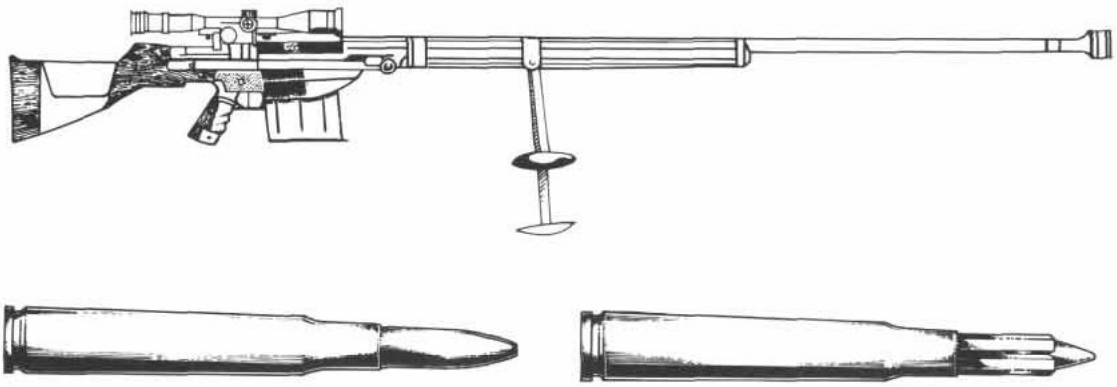
Although this weapon is rather archaic technologically, CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) chose to retain it in Coalition service because of the widespread availability of the ammunition and its respectable performance as a sniper's weapon. The weapon is bipod-mounted and features a telescopic sight as standard equipment. This weapon is manufactured in the RC with the characteristics below, but relic weapons have identical performance.

TL: 6
Ammo: 13x75mm-6
Muzzle Energy: 18,551 joules (Tranq: 11,131 joules)
Weapon Length: 224 cm
Weapon Weight: 28.9 kg loaded, 27.9 empty (includes weight of empty box magazine)
Weapon Price: Cr4369
Magazine Weight: 1.84 kg loaded, 0.84 kg empty
Magazine Price: Cr9
Ammunition Price: Cr2 (Ball), Cr4 (HE, DS, Tranq), Cr6 (HEAP)
Ammunition Weight: 100 grams per round
Features: Telescopic sight

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
13x75mm Ball	SA	9	2-3-4	14	10	4	—	240 (225)
bipod	SA	9	2-3-4	14	10	2	—	300 (293)
13x75mm DS-8	SA	9	1-2-3	14	10	4	—	300 (300)
bipod	SA	9	1-2-3	14	10	2	—	300 (300)
13x75mm HE	SA	10	Nil	14	10	4	—	210 (191)
bipod	SA	10	Nil	14	10	2	—	270 (248)
13x75mm HEAP-9	SA	10	2-2-2	14	10	4	—	210 (191)
bipod	SA	10	2-2-2	14	10	2	—	270 (248)
13x75mm Tranq	SA	–1*	Nil	14	10	4	—	30 (30)
bipod	SA	–1*	Nil	14	10	2	—	30 (30)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Range in parentheses is unrounded iron sight range.

14.5mm AAR ("Crunch Gun")



14.5mm AAR (Antiarmor Rifle, a.k.a. "Crunch Gun")

Nicknamed the "Crunch Gun" by the first teams to encounter it, the 14.5×146.7mm AAR represents a serious threat to RCES personnel and equipment. Because of its size, the weapon is normally deployed with a sniper team consisting of a weapon, a sniper, and a spotter, firing from a concealed position. In urban settings, this combination can be particularly effective. When the target is equipped with battle dress, snipers seldom risk using their scarce DS ammunition at longer ranges, but they will often engage less well-armored targets with ball ammunition at ranges in excess of 2000 meters. Electronic equipment and light vehicles are particularly vulnerable.

The origin of the design is unknown, but Guild merchants sell tooling and manufacturing set-ups to enable low-tech worlds to make the weapon and its basic ammo, evidently in order to create a market for Guild-manufactured high-tech ammunition. It would appear that the Guild also provides some form of training as well, as tactical employment of the weapon has proven suspiciously similar on several different worlds.

TL: 5
Ammo: 14.5×146.7mm
Muzzle Energy: 30,114 joules
Weapon Length: 260cm
Weapon Weight: 53.787 kg loaded, 52.577 empty
Weapon Price: Cr8307
5-Round Clip Weight: 1.21 kg
5-Round Clip Price: Cr60.5
Ammunition Price: Cr0.24 (Ball), Cr0.48 (HE, DS, Tranq), Cr0.72 (HEAP)
Features: Bipod, telescopic sight

Ammo weight and price is for a 5-round clip. The clip has effectively no weight or price beyond those of the 5 rounds themselves. The magazine is internal to the weapon.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
14.5×146.7mm Ball	SA	12	2-2-3	17	5i	5	—	230 (210)
Bipod	SA	12	2-2-3	17	5i	3	—	290 (273)
Higher Tech Rounds*:								
14.5×146.7mm HE-6	SA	12	Nil	17	5i	5	—	170 (158)
Bipod	SA	12	Nil	17	5i	3	—	220 (205)
14.5×146.7mm DS-8	SA	12	1-1-2	17	5i	5	—	270 (252)
Bipod	SA	12	1-1-2	17	5i	3	—	300 (300)

Short range in parentheses is unrounded iron sight range.

*Manufactured at TL-6+ for enhanced performance, but using lower chamber pressures consistent with the lower tech weapon.

Security Clearance
Yes No
28-IX-1201
Date

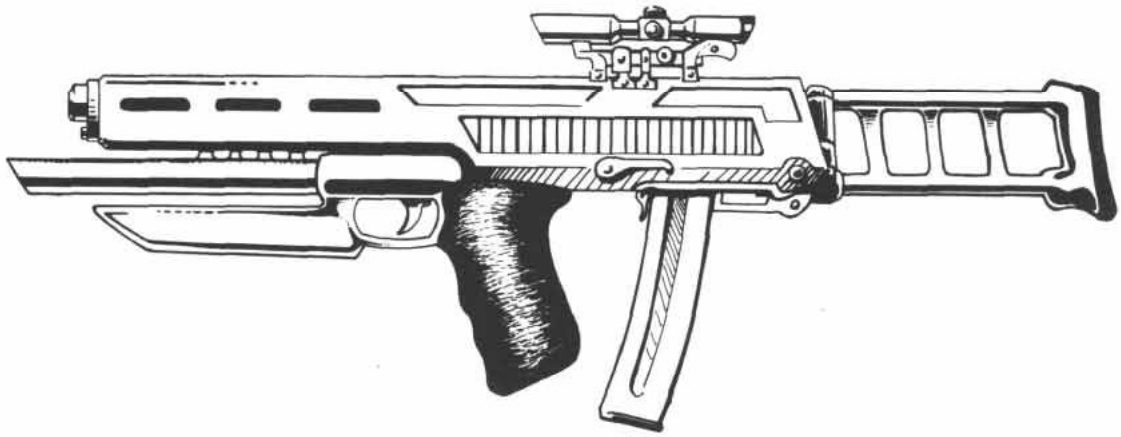


My first encounter with a Crunch Gun was when we were mopping up a DZ near some little burg on Montezuma. A sniper opened up on us, and nailed Janni in the leg. She went down, and me and Hawk-Man went over to see how bad she was hurt. Hawk was first, and he had no more than got up to her when he took one in the head, and collapsed like a rag-doll. I got there a couple of seconds later, and the zipper must have decided to empty his magazine and leave, because three more rounds cratered the pavement in rapid succession. He was just pumping them out, not trying to aim, and the shots went wild all around me as I dove for what little cover was available. Jocko thought he spotted a muzzle flash from a hilltop about half a click away, and the rest of the squad started pumping RAMs over there, while a couple of us drug Janni and Hawk-Man into a building.

Whatever hit Hawk-Man's helmet put a dent in it the size of my fist, but didn't punch it. That must have been the plain vanilla ball round for the Crunch Gun. Janni's thigh plate had a hole in it I could have stuck my finger through.

Hawk-Man woke up with one helluva headache about the same time it took us to get Janni packed up and on the medevac. We secured the DZ and then poked around on the hilltop until we found the sniper's nest. The zipper left so fast he didn't pick up after himself, and we found some expended cartridge cases and the rocks he piled up as cover. We turned the brass over to the INTEL shop. Our heavy assault units have an HMG with a round that big, but zippers aren't supposed to have that kind of firepower. And they don't have the factories to make a DS round, which is what turned part of Janni's femur into chalk dust. I don't know who's selling them that stuff, but whoever it is, I want to find them and tap-dance on their kidneys for a few minutes.

Guild Small Arms



Guild Deck Sweeper Boarding Weapon TL-5

Designed around a pre-Collapse pistol/SMG round and the same 2.5cm low-velocity grenade used by the Coalition, this weapon is primarily used by Guild boarding parties during close combat aboard starships, and for this reason has acquired the nickname "Deck-Sweeper." The 2.5cm grenades are issued on a basis of one or two per weapon, and seem to be primarily designed to deal with locked doors and hatches, although they will also penetrate body armor quite effectively.

The most unique feature of the "Deck-Sweeper," however, is its duplex receiver, which permits two magazines to be loaded side-by-side. The firer may select which magazine is used by flipping a selector switch. This enables the user to load magazines loaded with ball and DS, for example.

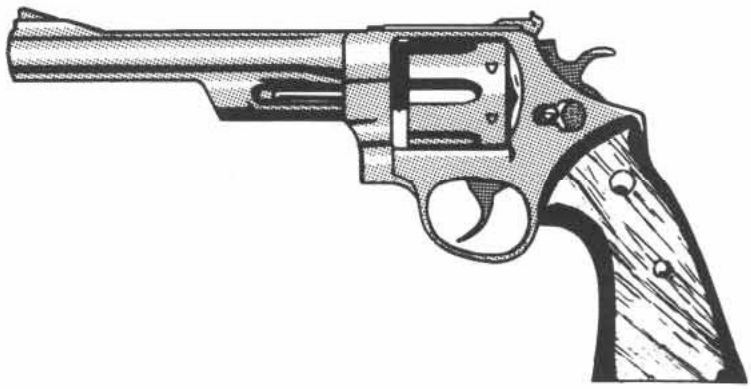
Some weapons are equipped with TL-8 laser sights. When fitted with this, the weapon's mass increases by 1 kg, and its price by Cr400. Recoil remains the same, except that Tranq becomes SS: 1, Burst: 1.

TL: 5
Ammo: 9x24mm-5, 2.5cm low-velocity grenades
Muzzle Energy: 856 joules (Tranq: 514 joules)
Weapon Length: 45cm (stock folded) 65 cm (stock open)
Weapon Weight: 3.9056 kg loaded, 3.0956 empty (includes weight of two empty box magazines)
Weapon Price: Cr634.7
Magazine Weight: 0.6048 kg loaded, 0.2448 kg empty
Magazine Price: Cr2
Ammunition Price: Cr0.24 (Ball), Cr0.48 (HE, DS, Tranq), Cr0.72 (HEAP)
Ammunition Weight: 12 grams per round (9mm), 90 grams each (2.5cm low-velocity grenade)
Features: TL-8 laser sight optional

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
9x24mm Ball	5	2	1-Nil	3/4	30+30	1	2	70 (73)
9x24mm DS	5	2	1-2-Nil	3/4	30+30	1	2	90 (87)
9x24mm HE	5	2	Nil	3/4	30+30	1	2	60 (55)
9x24mm HEAP	5	2	2-2-2	3/4	30+30	1	2	60 (55)
9x24mm Tranq	5	–1*	Nil	3/4	30+30	1	2	30 (30)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Range in parentheses is unrounded iron sight range

Security Clearance
Yes No
28 IX 1201
Date



Guild 9mm Magnum Revolver

Guild starship crews seem to have a preference for large-bore sidearms, and the 9mm magnum revolver is the most popular. HE and HEAP rounds for this weapon are inferior in penetration and range to ball and DS rounds, and are not manufactured (range is the only advantage DS rounds have). Tranq rounds are manufactured at TL-6, designed to perform to TL-5 parameters.

The 9mm magnum revolver is reserved by the Guild for starship crew sidearms, unlike the 5mm assault rifle (below) which is primarily used for export.

TL: 5
Ammo: 9x33mm-5
Muzzle Energy: 703 joules (Tranq: 422 joules)
Weapon Length: 27 cm
Weapon Weight: 1.234 kg loaded, 1.132 empty

Weapon Price: Cr158
Magazine: None
Ammunition Price: Cr0.68 (Ball), Cr1.36 (HE, DS, Tranq), Cr2.04 (HEAP)
Ammunition Weight: 17 grams per round
Features: None

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
9x33mm Mag Ball	DAR	2	1-Nil	1	6R	3	—	13
9x33mm Mag DS-8	DAR	2	1-Nil	1	6R	3	—	16
9x33mm Mag Tranq-6	DAR	–1*	Nil	1	6R	3	—	10

*1D6–1 points of damage plus tranq effect on TNE, page 350.

5mm Assault Rifle

This weapon is commonly found in use by military forces throughout the Wilds, and is manufactured by various TEDs and by the Mercantile Guild. Both the Guild and the Coalition sell TL-8 ammunition (DS and HEAP rounds) for this weapon.

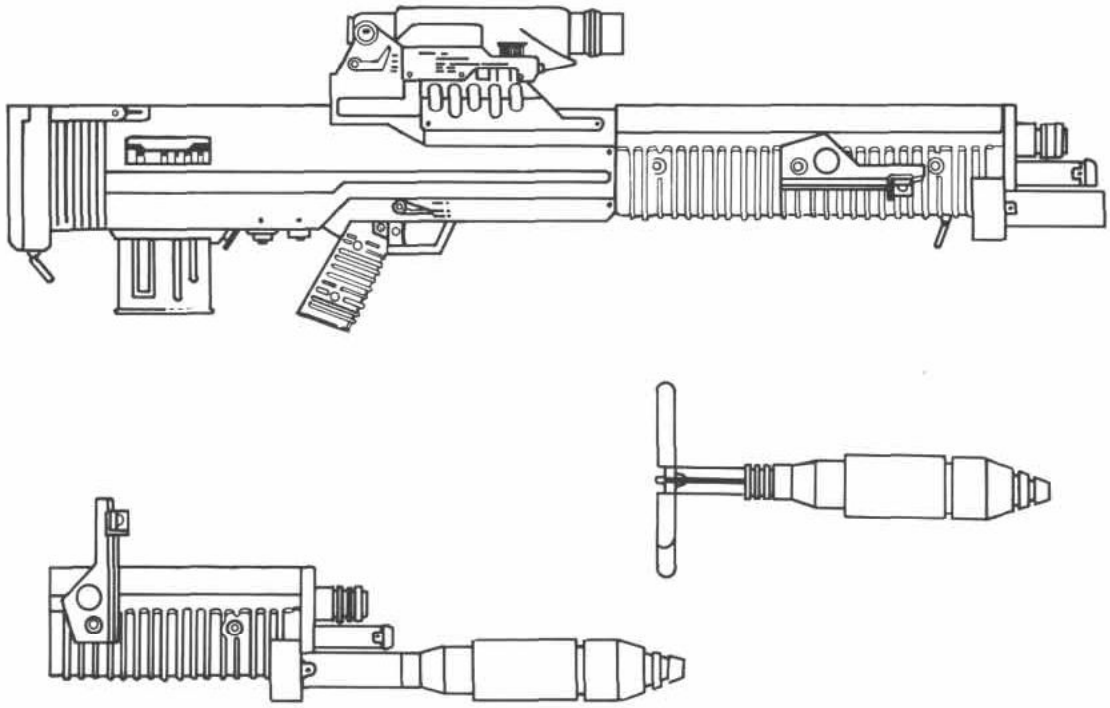
TL: 7
Ammo: 5x50mm-7
Muzzle Energy: 1584 joules (Tranq: 950 joules)
Weapon Length: 119 cm
Weapon Weight: 3.953 kg loaded, 3.653 empty (includes weight of empty box magazine)

Weapon Price: Cr737
Magazine Weight: 0.552 kg loaded, 0.252 kg empty
Magazine Price: Cr3
Ammunition Price: Cr0.2 (Ball), Cr0.4 (HE, DS, Tranq), Cr0.6 (HEAP)
Ammunition Weight: 10 grams per round
Features: Flash suppressor, bayonet lug, rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5x50mm Ball-7	5	3	1-Nil	7	30	2	6	50 (52)
5x50mm DS-8	5	3	1-2-Nil	7	30	2	6	60 (62)
5x50mm HE-7	5	3	Nil	7	30	2	6	40 (39)
5x50mm HEAP-8	5	3	2-2-2	7	30	2	6	40 (39)
5x50mm Tranq-7	5	–1*	Nil	7	30	2	5	20 (24)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.

RC 7mm ACR (Advanced Combat Rifle)



Reformation Coalition 7mm ACR (Advanced Combat Rifle)

The 7mm ACR is based around a pre-Collapse Imperial round, the 7×30mm Imperial (ETC), renamed the 7×30mm RC(E), RC(E) standing for "Reformation Coalition (Electrothermal-chemical)." The model depicted on this page is manufactured on Oriflamme for use by that world's armed forces (see below), but similar weapons are in use by most of the Coalition. The rifle is especially popular with Oriflamme's Marines.

The weapon is manufactured with electronic and laser sights, a flash suppressor, bayonet lug, and RAM rifle grenade adapter (for 4cm RAM rifle grenades). A sling is fitted for ease of transport, but has been omitted in the illustration for clarity. The rifle's features are either duplicated on both sides of the rifle for use by both right- and left-handed soldiers, or can be switched to whichever side the individual soldier chooses by a unit armorer (the ambidextrous magazine release and selector switch are examples of the former, the ejection port and bayonet lug are examples of the latter).

When CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) worked out the original design specifications for the 7mm ACR, Oriflamme's representative insisted that the rifle be designed so that 90% of the components could be manufactured at TL-9 (since Oriflamme is a TL-9 world). A weapon with such great potential, she argued, should not be beyond the reach of the world with the largest military force. As a result, the weapon's ammunition, magazine batteries, and laser sight must be imported, but Oriflamme's factories are capable of making the rest of the rifle. For this reason, the ACR is a hybrid weapon, a TL-10 rifle with mostly TL-9 components. The performance of the versions manufactured at TL-9 and those made at TL-10 is the same.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
2•3 2•6 2•9
1•3 1•6 1•9
0•3 0•6 0•9
« • »

Security Clearance
Yes No
28-IX-1201
Date

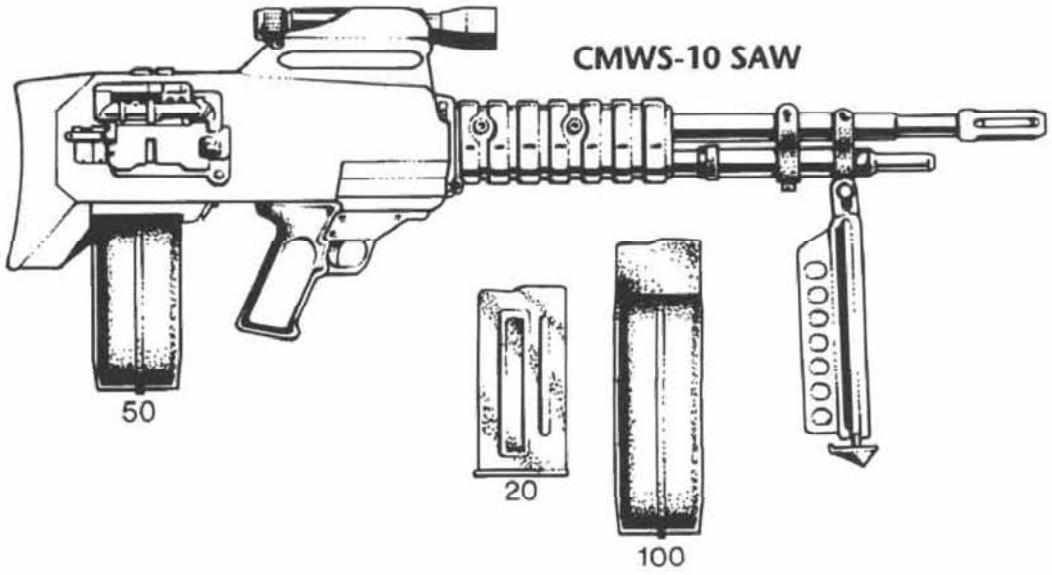


7×30mm RC(E) ACR
TL: 9/10
Ammo: 7×30mm ETC
Muzzle Energy: 4803 joules (Tranq: 2882 joules)
Weapon Length: 106 cm
Weapon Weight: 6.135 kg loaded, 5.895 empty (includes weight of empty box magazine)
Weapon Price: Cr4097
Magazine Weight: 0.793 kg loaded, 0.553 kg empty
Magazine Price: Cr103
Ammunition Price: Cr0.24 (Ball), Cr0.48 (HE, DS, Tranq), Cr0.72 (HEAP)
Ammunition Weight: 12 grams per round
Features: Electronic and laser sights, flash suppressor, bayonet lug, RAM rifle grenade adaptor.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7×30mm RC(E) Ball	5	5	2-3-Nil	7	20	1	2	100 (83)
7×30mm RC(E) DS	5	5	1-2-3	7	20	1	2	120 (97)
7×30mm RC(E) HE	5	5	Nil	7	20	1	2	80 (61)
7×30mm RC(E) HEAP	5	5	2-2-2	7	20	1	2	80 (61)
7×30mm RC(E) Tranq	5	–1*	Nil	7	20	1	2	30 (30)

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.

Short range is given as short range with standard electronic sight, with unrounded iron sight short range in parentheses.



Coalition Multipurpose Weapons System, TL-10 (CMWS-10)

The CMWS (pronounced "See Mews") is an effort to produce a family of modular small arms that can be used by all Coalition armed forces in one version or another. The weapon is built around a common receiver assembly, and is assembled into one of five weapon configurations—carbine, rifle, squad automatic weapon (SAW), general-purpose machinegun (GPMG), or vehicle-mounted machinegun (VMMG)—by adding the appropriate barrel, stock, and ammunition feed system. These parts are removable, so that the same set of CMWS components can be disassembled and reassembled into various configurations any number of times.

Reconfiguring a weapon takes significant time, requiring tools and calibration, and is not intended to be done in the heat of combat. However, a force armed with these weapons can easily alter the composition of its weapons before and after combat operations.

The intent is to make the most effective use of the Coalition's limited manufacturing base by reducing the number of different small arms designs that need to be produced, and also to allow the Coalition armed forces to travel light and make the best use of its weapons production capacity. Rather than requiring large inventories of carbines and rifles and automatic weapons, RC armed forces can cover these diverse needs with a smaller pool of CMWS components.

The CMWS uses the standard 7mm RC(E) round, the same as is used in the 7mm ACR. The common CMWS receiver is a heavy self-loading deluxe (multiple automatic rates of fire) receiver. The receiver is capable of taking ammunition from either box magazines or belts (including cassettes).

There are four barrel types which can be fitted: the Light Short barrel (also known as the Carbine barrel), the Light Long barrel (also known as the Rifle barrel), the Heavy Short barrel (this is the same length as the Rifle barrel, so is also called the Heavy Rifle Length, HRL, barrel), and the Heavy Long (or MG) barrel. All are fitted with a flash suppressor and long muzzle brake.

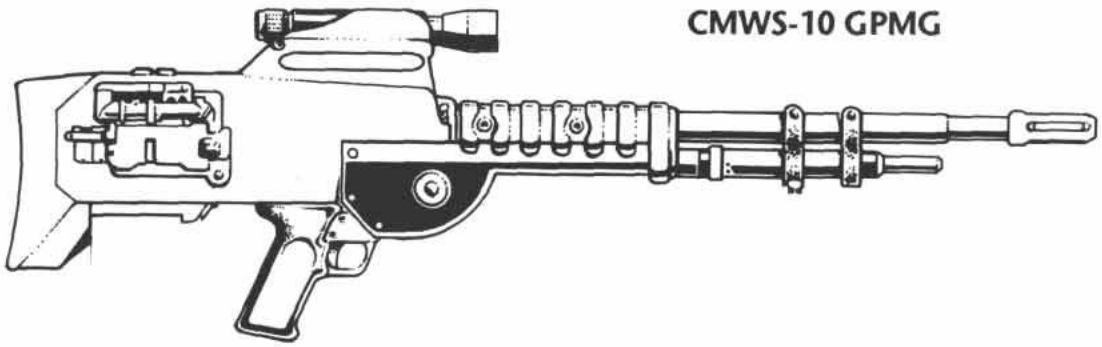
There are three types of stock: bullpup, standard, and pistol grip. All variants are fitted with optic sights, and laser sights can also be added as an option (not included in prices or weight listed below) to any of them.

All variants can take ammo from 20-, 50-, or 100-round box magazines, or from belts (including cassettes). However, the weapons below are only listed with the most useful magazine sizes for their configurations.

Security Clearance
Yes No
28 IX 1201
Date

Power

ON/OFF



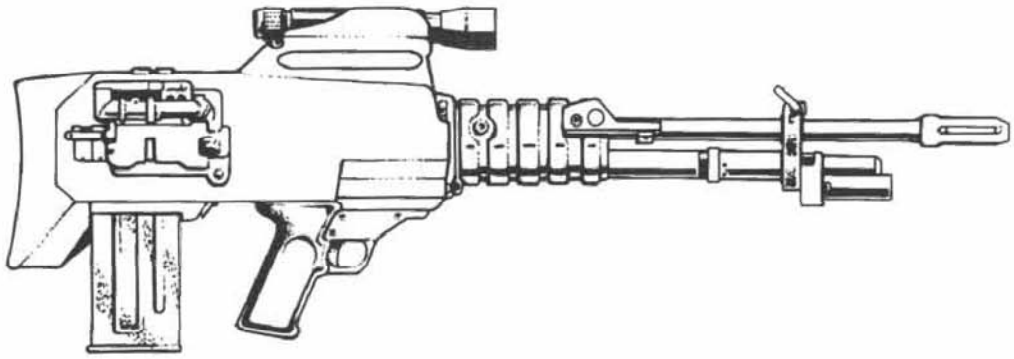
CMWS-10 GPMG

CMWS Component Price List

Component	*Weight (kg)*	*Price (Cr)*
Receiver		
Receiver	5.6	2068
Barrels		
Light Short (Carbine) with flash suppressor, long muzzle brake, bayonet lug, and grenade adapter	1.45	463
Light Long (Rifle) with flash suppressor and long muzzle brake, bayonet lug, and grenade adapter	1.54	582
Heavy Short (HRL) with flash suppressor and long muzzle brake	2.03	863
Heavy Long (MG) with flash suppressor and long muzzle brake	2.16	917
Stocks		
Hollow pistol grip	0.1	28
Bullpup stock	0.1	11
Ammo Feed Systems (Empty)		
20-round box	0.55	106
50-round box	1.34	254
100-round box	2.65	508
Box with battery for 100-round belt	1.9	500
1000-round Cassette	21	120
Sights		
Optic sight	0.1	150
Laser sight	0.5	300
Weapon Mounts		
Bipod	2.5	75
Tripod	8	180

7×30 RC(E) (7×30mm ETC) Ammunition Statistics (per round)

Caliber	*TL*	*Length (mm)*	*Weight (grams)*	*AME (Joules)*	*Price (Cr)*
7×30 RC(E) Ball	10	44	12	4,803	0.24
7×30 RC(E) DS	10	44	12	4,803	0.48
7×30 RC(E) HE	10	44	12	4,803	0.48
7×30 RC(E) HEAP	10	44	12	4,803	0.72
7×30 RC(E) Tranq	10	44	12	2,882	0.48



CMWS-10 CARBINE

Bullpup stock, carbine barrel (includes bayonet lug, long muzzle brake, flash supressor, RAM grenade adapter), optic sights, uses 20-round magazines. (The carbine is limited to the 20-round magazine by the light barrel's inability to stand up to high sustained rates of fire.)

Ammo: 7x30mm ETC
Muzzle Energy: 4607 joules (Tranq: 2764 joules)
Weapon Length: 101 cm
Weapon Weight: 7.853 kg with empty 20-round magazine, 8.093 with loaded 20-round magazine
Weapon Price: Cr2692
Magazine Specifications: 20 rounds 7x30 RC(E), 0.553 kg empty, 0.793 kg loaded, Cr106 for empty magazine with battery
Ammo Price: Cr4.8 for 20 rounds ball; Cr9.6 for 20 rounds DS, HE, or Tranq; Cr14.4 for 20 rounds HEAP
Features: Optic sights, bayonet lug, flash suppressor, RAM grenade adapter

7x30 RC(E) CMWS-10 Carbine

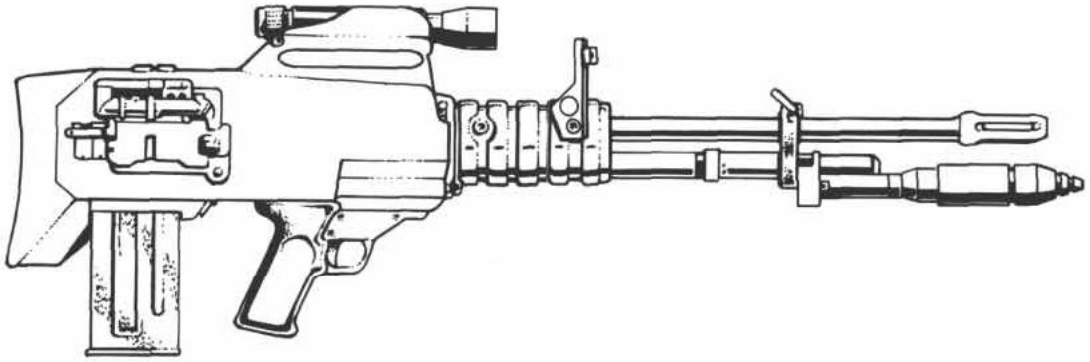
						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7x30 RC(E) Ball	3/5/10	5	2-3-Nil	6	20	2	2/4/8	(70) 80
7x30 RC(E) DS	3/5/10	5	1-2-3	6	20	2	2/4/8	(84) 100
7x30 RC(E) HE	3/5/10	5	Nil	6	20	2	2/4/8	(52) 60
7x30 RC(E) HEAP	3/5/10	5	2-2-2	6	20	2	2/4/8	(52) 60
7x30 RC(E) Tranq	3/5/10	–1*	Nil	6	20	1	2/4/7	(30) 30

Range is given with optic sights; values in parentheses are unrounded iron sight ranges

Security Clearance
Yes No
28 IX 1201
Date

Power

ON/OFF



CMWS-10 RIFLE

Bullpup stock, rifle barrel (includes bayonet lug, long muzzle brake, flash supressor, RAM grenade adapter), optic sights, uses 20-round magazines. (The rifle is limited to the 20-round magazine by the light barrel's inability to stand up to high sustained rates of fire.)

Ammo: 7x30mm ETC
Muzzle Energy: 4803 joules (Tranq: 2882 joules)
Weapon Length: 106 cm
Weapon Weight: 7.943 kg with empty 20-round magazine, 8.183 with loaded 20-round magazine
Weapon Price: Cr2711
Magazine Specifications: 20 rounds 7x30 RC(E), 0.553 kg empty, 0.793 kg loaded, Cr106 for empty magazine with battery
Ammo Price: Cr4.8 for 20 rounds ball; Cr9.6 for 20 rounds DS, HE, or Tranq; Cr14.4 for 20 rounds HEAP
Features: Optic sights, bayonet lug, flash suppressor, RAM grenade adapter

7x30 RC(E) CMWS-10 Rifle

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7x30 RC(E) Ball	3/5/10	5	2-3-Nil	7	20	2	2/4/8	(81) 90
7x30 RC(E) DS	3/5/10	5	1-2-3	7	20	2	2/4/8	(97) 110
7x30 RC(E) HE	3/5/10	5	Nil	7	20	2	2/4/8	(61) 70
7x30 RC(E) HEAP	3/5/10	5	2-2-2	7	20	2	2/4/8	(61) 70
7x30 RC(E) Tranq	3/5/10	–1*	Nil	7	20	1	2/4/7	(30) 30

Range is given with optic sights, values in parentheses are unrounded iron sight ranges

CMWS-10 SAW

Bullpup stock, bipod, rifle length heavy barrel (includes long muzzle brake and flash supressor), optic sights, 50- and 100-round magazines standard, but can also use 20-round magazines and belt feed.

Ammo: 7×30mm ETC
Muzzle Energy: 4803 joules (Tranq: 2882 joules)
Weapon Length: 101 cm
Weapon Weight: 11.72 kg with empty 50-round magazine, 12.32 with loaded 50-round magazine
13.03 kg with empty 100-round magazine, 14.23 with loaded 100-round magazine
10.38 kg configured for belt-feed, 11.58 kg with 100-round belt and battery
Weapon Price: Cr3167
Magazine Specifications: 50 rounds 7×30 RC(E), 1.34 kg empty, 1.94 kg loaded, Cr254 for empty magazine with battery
100 rounds 7×30 RC(E), 2.65 kg empty, 3.85 kg loaded, Cr508 for empty magazine with battery
100-round belt 1.2 kg, plus 1.9 kg battery
Ammo Price: Cr12/24 for 50/100 rounds ball; Cr24/48 for 50/100 rounds DS, HE, or Tranq; Cr36/72 for 50/100 rounds HEAP
Features: Optic sights, bipod

7×30mmE CMWS-10 SAW

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	6	50	1	2/3/7	(81) 90
bipod	3/5/10	5	2-3-Nil	6	50	1	1/2/4	(105) 120
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	6	100	1	2/3/7	(81) 90
bipod	3/5/10	5	2-3-Nil	6	100	1	1/2/4	(105) 120
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	6	100B	1	2/4/7	(81) 90
bipod	3/5/10	5	2-3-Nil	6	100B	1	1/2/4	(105) 120
7×30 RC(E) DS	3/5/10	5	1-2-3	6	50	1	2/3/7	(97) 110
bipod	3/5/10	5	1-2-3	6	50	1	1/2/4	(126) 160
7×30 RC(E) DS	3/5/10	5	1-2-3	6	100	1	2/3/7	(97) 110
bipod	3/5/10	5	1-2-3	6	100	1	1/2/4	(126) 160
7×30 RC(E) DS	3/5/10	5	1-2-3	6	100B	1	2/4/7	(97) 110
bipod	3/5/10	5	1-2-3	6	100B	1	1/2/4	(126) 160
7×30 RC(E) HE	3/5/10	5	Nil	6	50	1	2/3/7	(61) 70
bipod	3/5/10	5	Nil	6	50	1	1/2/4	(79) 90
7×30 RC(E) HE	3/5/10	5	Nil	6	100	1	2/3/7	(61) 70
bipod	3/5/10	5	Nil	6	100	1	1/2/4	(79) 90
7×30 RC(E) HE	3/5/10	5	Nil	6	100B	1	2/4/7	(61) 70
bipod	3/5/10	5	Nil	6	100B	1	1/2/4	(79) 90
7×30 RC(E) HEAP	3/5/10	5	2-2-2	6	50	1	2/3/7	(61) 70
bipod	3/5/10	5	2-2-2	6	50	1	1/2/4	(79) 90
7×30 RC(E) HEAP	3/5/10	5	2-2-2	6	100	1	2/3/7	(61) 70
bipod	3/5/10	5	2-2-2	6	100	1	1/2/4	(79) 90
7×30 RC(E) HEAP	3/5/10	5	2-2-2	6	100B	1	2/4/7	(61) 70
bipod	3/5/10	5	2-2-2	6	100B	1	1/2/4	(79) 90

Range is given with optic sights; values in parentheses are unrounded iron sight ranges

CMWS-10 GPMG (TRIPOD MOUNT)

Bullpup stock, tripod, machinegun barrel (includes long muzzle brake and flash supressor), optic sights, belt feed standard, but can also use 50- and 100-round magazines.

Ammo: 7×30mm ETC
Muzzle Energy: 4999 joules (Tranq: 4499 joules)
Weapon Length: 106 cm
Weapon Weight: 8.01 kg configured for belt feed, 11.11 with 100-round belt and battery
Weapon Weight on tripod: 16.01 kg configured for belt feed, 19.11 with 100-round belt and battery
Weapon Price: Cr3146
Tripod Specifications: 8 kg, Cr180
Magazine Specifications: 50 rounds 7×30 RC(E), 1.34 kg empty, 1.94 kg loaded, Cr254 for empty magazine with battery
100 rounds 7×30 RC(E), 2.65 kg empty, 3.85 kg loaded, Cr508 for empty magazine with battery
100-round belt 1.2 kg, plus 1.9 kg battery, Cr500 for battery, ammo price below
Ammo Price: Cr12/24 for 50/100 rounds ball; Cr24/48 for 50/100 rounds DS, HE, or Tranq; Cr36/72 for 50/100 rounds HEAP
Features: Optic sights, tripod

Security Clearance
Yes No
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Date

7×30 RC(E) CMWS-10 GPMG (Tripod Mount)

Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	— Recoil — SS	Burst	Short Range
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	7	50	2	2/4/7	(88) 100
tripod	3/5/10	5	2-3-Nil	7	50	1	1/1/2	(176) 200
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	7	100	1	2/4/7	(88) 100
tripod	3/5/10	5	2-3-Nil	7	100	1	1/1/2	(176) 200
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	7	100B	2	2/4/8	(88) 100
tripod	3/5/10	5	2-3-Nil	7	100B	1	1/1/2	(176) 200
7×30 RC(E) DS	3/5/10	5	1-2-3	7	50	2	2/4/7	(105) 120
tripod	3/5/10	5	1-2-3	7	50	1	1/1/2	(210) 240
7×30 RC(E) DS	3/5/10	5	1-2-3	7	100	1	2/4/7	(105) 120
tripod	3/5/10	5	1-2-3	7	100	1	1/1/2	(210) 240
7×30 RC(E) DS	3/5/10	5	1-2-3	7	100B	2	2/4/8	(105) 120
tripod	3/5/10	5	1-2-3	7	100B	1	1/1/2	(210) 240
7×30 RC(E) HE	3/5/10	5	Nil	7	50	2	2/4/7	(66) 80
tripod	3/5/10	5	Nil	7	50	1	1/1/2	(132) 150
7×30 RC(E) HE	3/5/10	5	Nil	7	100	1	2/4/7	(66) 80
tripod	3/5/10	5	Nil	7	100	1	1/1/2	(132) 150
7×30 RC(E) HE	3/5/10	5	Nil	7	100B	2	2/4/8	(66) 80
tripod	3/5/10	5	Nil	7	100B	1	1/1/2	(132) 150
7×30 RC(E) HEAP	3/5/10	5	2-2-2	7	50	2	2/4/7	(66) 80
tripod	3/5/10	5	2-2-2	7	50	1	1/1/2	(132) 150
7×30 RC(E) HEAP	3/5/10	5	2-2-2	7	100	1	2/4/7	(66) 80
tripod	3/5/10	5	2-2-2	7	100	1	1/1/2	(132) 150
7×30 RC(E) HEAP	3/5/10	5	2-2-2	7	100B	2	2/4/8	(66) 80
tripod	3/5/10	5	2-2-2	7	100B	1	1/1/2	(132) 150

Range is given with optic sights; values in parentheses are unrounded iron sight ranges

CMWS-10 VEHICLE MG

Pistol grip, machinegun barrel (includes long muzzle brake and flash supressor), optic sights, cassette-feed standard, but can also use belt feed and 20-, 50- and 100-round magazines.

Ammo: 7×30mm ETC
Muzzle Energy: 4999 joules (Tranq: 4499 joules)
Weapon Length: 101 cm
Weapon Weight: 29.01 kg with empty 1000-round cassette, 41.01 kg with loaded 1000-round cassette
8.01 kg configured for belt feed, 11.11 with 100-round belt and battery
Weapon Price: Cr3163
Magazine Specifications: 1000-round 7×30 RC(E) cassette, 21 kg empty, 33 kg loaded, Cr5120 for empty magazine with battery
100-round belt 1.2 kg, plus 1.9 kg battery, battery costs Cr500
Ammo Price: Cr240 for 1000 rounds ball; Cr480 for 1000 rounds DS, HE, or Tranq; Cr720 for 1000 rounds HEAP
Features: Optic sights

7×30 RC(E) CMWS-10 Vehicle MG

Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	— Recoil — SS	Burst	Short Range
7×30 RC(E) Ball	3/5/10	5	2-3-Nil	6	1000C	—	—	(196) 230
7×30 RC(E) DS	3/5/10	5	1-2-3	6	1000C	—	—	(234) 270
7×30 RC(E) HE	3/5/10	5	Nil	6	1000C	—	—	(146) 170
7×30 RC(E) HEAP	3/5/10	5	2-2-2	6	1000C	—	—	(146) 170

Range is given with optic sights; values in parentheses are unrounded iron sight ranges

Shotguns

Double-Barreled Shotgun

Originally developed as a sporting gun, double-barreled shotguns are sometimes found in use by poorly equipped militias and irregular military units. Short range damage is impressive, but the ability to fire only two shots before reloading makes the weapon unsuitable for conventional military use.

TL: 4
Ammo: 18x70mm-4
Muzzle Energy: 3258 joules (Tranq: 1955 joules)
Weapon Length: 102 cm
Weapon Weight: 6.099 kg loaded, 5.993 empty
Weapon Price: Cr266.9
Magazine: None. Each barrel contains one individually inserted round.
Ammunition Price: Cr0.53 (Ball), Cr1.06 (HE, DS, Tranq), Cr1.59 (HEAP)
Ammunition Weight: 53 grams per round
Features: None

						— Recoil —		
Round	*ROF†*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18x70mm Slug	SA	4	3-Nil	6	2i	3	—	50 (54)
18x70mm Shot Short	SA	9	Nil	6	2i	3	—	30 (31)
Medium	SA (10)	1	Nil					
18x70mm DS	SA	4	1-3-Nil	6	2i	3	—	70 (65)
18x70mm HE	SA	5	Nil	6	2i	3	—	40 (41)
18x70mm HEAP	SA	5	2-2-2	6	2i	3	—	40 (41)
18x70mm Tranq-6	SA	–1*	Nil	6	2i	3	—	30 (30)

† The weapon is rated SA to enable both barrels to be fired in the same turn.
*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Range in parentheses is unrounded iron sight range
Note: The (10) following the SA under the ROF column for the medium-range shot round indicates that each shot is rolled as a 10-round burst.

Double-Barreled Sawed-Off Shotgun

This weapon is sometimes called a "whippit gun" because it is often concealed under clothing (sometimes in improvised holsters) and the user must "whip it out." Cutting off the barrels and changing the stock to a pistol grip reduces the weapon's length and makes it more readily concealable, but a considerable price is paid in range.

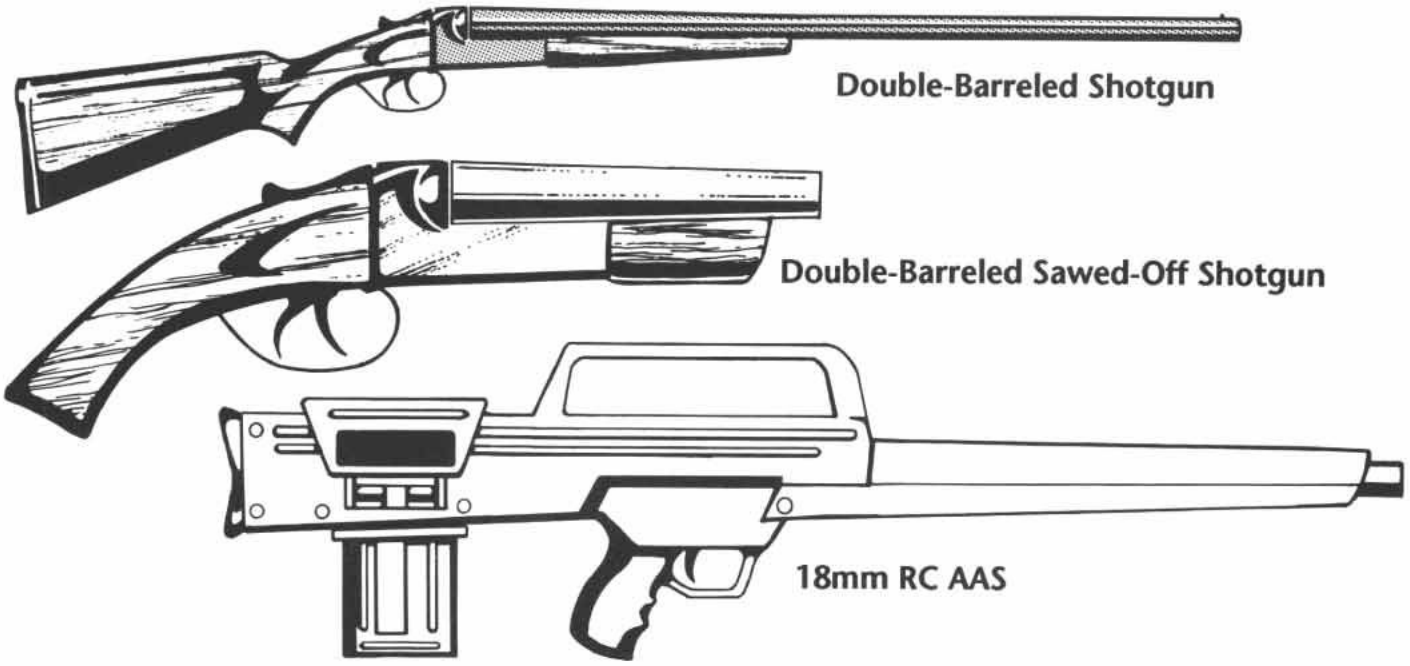
Sawed-off shotguns are often used by criminals, but some Free Trader starship crew prefer them to pistols because of the high short-range damage of shot rounds, and the lack of range is not a detriment in the close quarters of a starship.

TL: 4
Ammo: 18x70mm-4
Muzzle Energy: 1488 joules (Tranq: 893 joules)
Weapon Length: 33 cm
Weapon Weight: 3.539 kg loaded, 3.433 empty
Weapon Price: Cr71
Magazine: None. Each barrel contains one individually inserted round.
Ammunition Price: Cr0.53 (Ball), Cr1.06 (HE, DS, Tranq), Cr1.59 (HEAP)
Ammunition Weight: 53 grams per round
Features: None

						— Recoil —		
Round	*ROF†*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18x70mm Slug	SA	3	Nil	2	2i	3	—	3
18x70mm Shot Short	SA	9	Nil	2	2i	3	—	2
Medium	SA (10)	1						
18x70mm DS-8	SA	3	2-Nil	2	2i	3	—	4
18x70mm HE-6	SA	5	Nil	2	2i	3	—	2
18x70mm HEAP-8	SA	5	2-2-2	2	2i	3	—	2
18x70mm Tranq-6	SA	–1*	Nil	2	2i	2	—	4

† The weapon is rated SA to enable both barrels to be fired in the same turn.
*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Range in parentheses is unrounded iron sight range
Note: The (10) following the SA under the ROF column for the medium-range shot round indicates that each shot is rolled as a 10-round burst.

Security Clearance
Yes No
28-IX-1201
Date



18mm RC AAS (Automatic Assault Shotgun)

Manufactured primarily on Aurora, this bullpup-configuration weapon is another new design by CSAARC, unrelated to any pre-Collapse weapon. The weapon is normally carried on a sling that enables it to be fired from the hip using the attached laser sight. The performance of this weapon is respectable (the shot round will penetrate AV 1 at short range). For close fighting where range is not an important consideration (such as is found in boarding actions or urban locales), this is the small arm of choice for Coalition troops.

TL: 10
Ammo: 18x90mm caseless
Muzzle Energy: 4931 joules (Tranq: 2959 joules)
Weapon Length: 91 cm
Weapon Weight: 8.992 kg loaded, 7.612 empty (includes weight of empty box magazine)
Weapon Price: Cr2457
Magazine Weight: 2.3736 kg loaded, 0.9936 kg empty
Magazine Price: Cr10
Ammunition Price: Cr0.69 (Shot, Slug), Cr1.38 (HE, DS, Tranq), Cr2.07 (HEAP)
Ammunition Weight: 69 grams per round
Features: Gyroscopic recoil compensation, optic and laser sights

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18x70mm Slug	3	5	3-4-Nil	6	20	2	3	30 (28)
18x70mm Short Shot	3	2x6**	1	6	20	2	3	20 (20)
Medium	3 (5)	2	Nil					
18x70mm DS	3	5	2-3-4	6	20	2	3	40 (34)
18x70mm HE	3	8	Nil	6	20	2	3	20 (21)
18x70mm HEAP	3	8	2-2-2	6	20	2	3	20 (21)
18x70mm Tranq	3	–1*	Nil	6	20	2	3	15 (13)

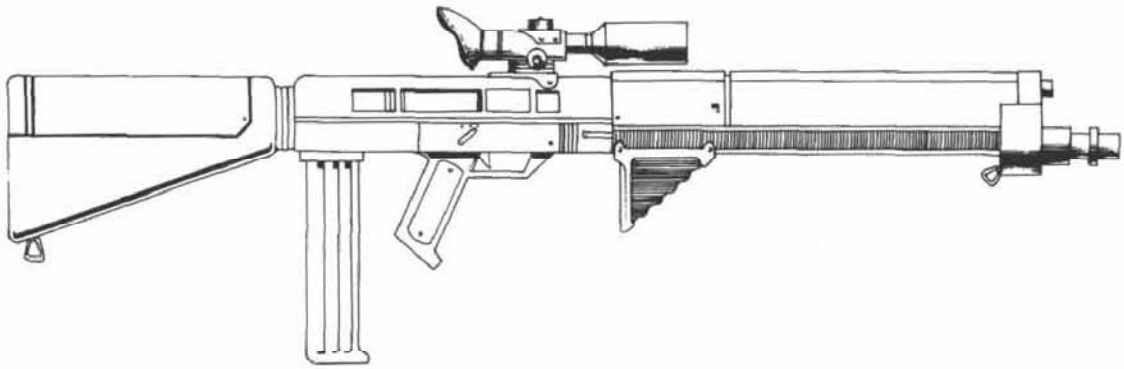
*1D6–1 points of damage plus tranq effect on TNE, page 350.

** A hit indicates that 6 pellets have hit the target, each with a damage value of 2 and the listed penetration rating.

Range in parentheses is unrounded iron sight range.

Note: The (5) following the SA under the ROF column for the medium-range shot round indicates that each shot is rolled as a 5-round burst.

Gauss Small Arms



4mm Gauss Rifle

As is mentioned on page 48, all gauss weapons in Coalition service use the old Imperial standard 4mm gauss ammunition. In the gauss rifle, the 0.5 gram round is shot from the barrel at approximately 3740 meters per second, although in official references this is rounded to 3500 mps, as seen in the official ammunition designation "4x20mm/35."

The gauss rifle is highly prized with Coalition ground forces because of its high rate of fire and large magazine capacity made possible by the compactness of its ammunition. The round itself can be manufactured at TL-10 and up, a decided advantage in the Coalition, where high-tech manufacturing facilities are at a premium.

TL: 12
Ammo: 4x20mm/35
Muzzle Energy: 3500 joules (Tranq: 2100 joules), required energy: 7000 joules
Weapon Length: 76.4 cm
Weapon Weight: 4.076 kg loaded, 4.056 empty (includes weight of empty box magazine)
Weapon Price: Cr1063
Magazine Weight: 1.713 kg loaded, 1.693 kg empty
Magazine Price: Cr4
Ammunition Price: Cr0.01 (Dart), Cr0.02 (HE, Tranq), Cr0.03 (HEAP)
Ammunition Weight: 0.5 grams per round
Features: Bayonet lug, optic sights, RAM rifle grenade adaptor

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
4x20mm/35 dart	5/10	4	1-2-Nil	5	40	2	4/9	100 (85)
4x20mm/35 HE	5/10	4	Nil	5	40	2	4/9	70 (64)
4x20mm/35 HEAP	5/10	4	2-2-2	5	40	2	4/9	70 (64)
4x20mm/35 Tranq	5/10	–1*	Nil	5	40	2	4/7	30 (30)

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Range in parentheses is unrounded iron sight range

Security Clearance
Yes No

28-IX-1201
Date



4mm Gauss SAW

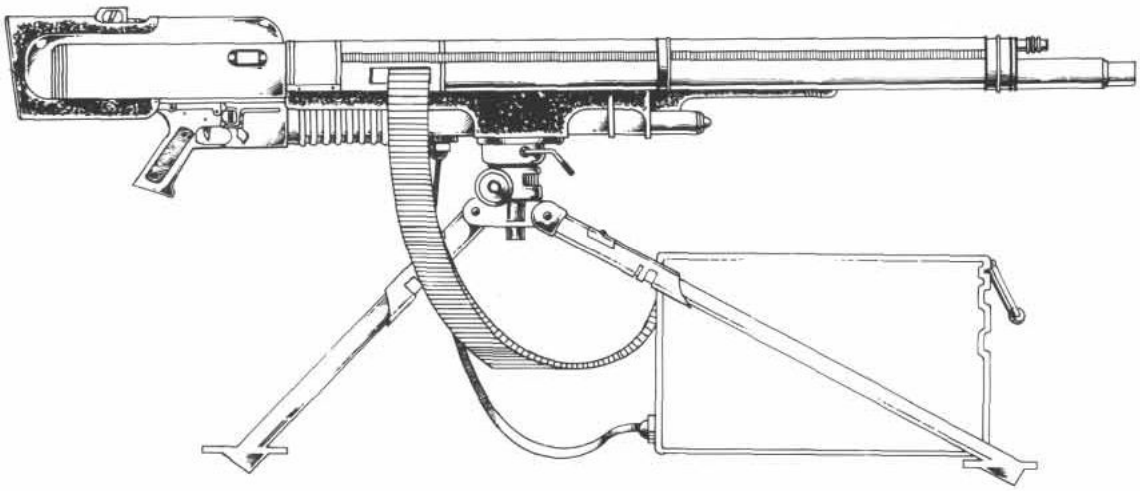
The 4mm gauss SAW is a CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) design intended to fill the gap between the 4mm gauss rifle and the VRF gauss gun. The weapon is equipped with optic sights, a bipod for stable firing, and a 100-round detachable box magazine, and has a muzzle velocity of 5000 meters per second.

TL: 12
Ammo: 4x20mm/50
Muzzle Energy: 6250 joules (Tranq: 3750 joules), Required Energy: 11,250 joules
Weapon Length: 92 cm
Weapon Weight: 14.11 kg loaded, 14.06 empty (includes weight of empty box magazine)
Weapon Price: Cr1412
Magazine Weight: 7.58 kg loaded, 7.53 kg empty
Magazine Price: Cr16
Ammunition Price: Cr0.01 (Dart), Cr0.02 (HE, Tranq), Cr0.03 (HEAP)
Ammunition Weight: 0.5 grams per round
Features: Optic sight, bipod

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
4x20mm/50 Dart	5/10	5	1-3-Nil	6	100	2	4/8	130 (114)
Bipod	5/10	5	1-3-Nil	6	100	1	2/4	170 (148)
4x20mm/50 HE	5/10	6	Nil	6	100	2	4/8	100 (86)
Bipod	5/10	6	Nil	6	100	1	2/4	130 (112)
4x20mm/50 HEAP	5/10	6	2-2-2	6	100	2	4/8	100 (86)
Bipod	5/10	6	2-2-2	6	100	1	2/4	130 (112)
4x20mm/50 Tranq	5/10	1*	Nil	6	100	2	3/8	30 (30)
Bipod	5/10	1*	Nil	6	100	1	2/4	30 (30)

*1D6-1 points of damage plus tranq effect on **TNE**, page 350.
Range in parentheses is iron sight range

VRF Gauss Gun



VRF Gauss Gun (Man-Portable Field Mount)

As is mentioned on page 48, all gauss weapons in Coalition service use the old Imperial standard 4mm gauss ammunition. In the gauss rifle, the 0.5-gram round is shot from the barrel at approximately 6000 meters per second, as reflected by the "60" in the ammunition designation. This velocity grazes the upper limit for such weapons, and gives the VRF gauss gun very good performance, but at a cost of a very high weight.

The large size of the battery needed to power this weapon's high rate of fire means that VRF gauss guns are largely limited to static positions such as bunkers and the like. The man-portable weapon can use the larger cassettes of the vehicle-mounted version, but must have an outside power source (0.027 Mj) as the vehicle cassettes contain no battery.

Coalition-manufactured versions of this weapon are identical to Imperial relic weapons.

TL: 10
Ammo: 4x20mm/60
Muzzle Energy: 9000 joules (Tranq: 5400 joules), Required Energy: 27,000 joules
Weapon Length: 243 cm
Weapon Weight: 162.43 kg loaded, 162.18 empty (includes weight of empty cassette)
Weapon Price: Cr5563
Cassette Weight: 137.25 kg loaded, 137 kg empty
Cassette Price: Cr1370
Ammunition Price: Cr0.01 (Dart), Cr0.02 (HE, Tranq), Cr0.03 (HEAP)
Ammunition Weight: 0.5 grams per round
Features: Gyro compensation
Tripod Weight: 22 kg
Tripod Price: Cr320

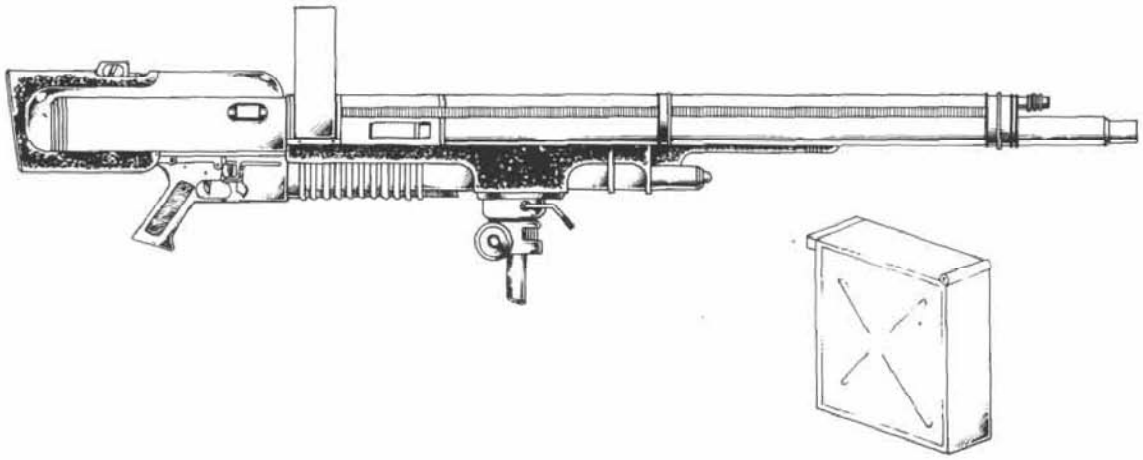
						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst†*	*Short Range*
4x20mm/60 Dart	50	6	1-3-5	16	500C	1	22	150 (152)
Tripod	50	6	1-3-5	16	500C	1	6	300 (300)
4x20mm/60 HE	50	7	Nil	16	500C	1	22	110 (114)
Tripod	50	7	Nil	16	500C	1	6	230 (228)
4x20mm/60 HEAP	50	7	2-2-2	16	500C	1	22	110 (114)
Tripod	50	7	2-2-2	16	500C	1	6	230 (228)
4x20mm/60 Tranq	50	–1*	Nil	16	500C	1	22	30 (30)
Tripod	50	–1*	Nil	16	500C	1	6	30 (30)

† The non-tripod recoil number is for those who wish to attempt off-hand firing using strength enhancements.
*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Short range in parentheses is the unrounded iron sight range.

Security Clearance
Yes No
28-IX-1201
Date

Power

ON/OFF



VRF Gauss Gun (Vehicular Mount)

The vehicle-mounted version of the VRF gauss gun uses 30,000-round cassettes and draws power from the vehicle's power plant (1.35 MW), thus obviating the need for a battery in the ammunition cassette. (The illustration above, when compared to the man-portable version on the facing page, shows the tremendous bulk savings by not relying on a battery. If this weapon used a battery, it would mass 8.1 tonnes.) The vehicle-mounted VRF gauss gun can use the smaller cassettes of the man-portable version.

Relic Imperial and new-build Coalition versions of this weapon are identical in all respects.

TL: 10
Ammo: 4x20mm/60
Muzzle Energy: 9000 joules (Tranq: 5400 joules), Required Energy: 27,000 joules
Weapon Length: 243 cm
Weapon Weight: 42.18 kg loaded, 27.18 empty (includes weight of empty cassette)
Weapon Price: Cr3913
Cassette Weight: 17 kg loaded, 2 kg empty
Cassette Price: Cr20
Ammunition Price: Cr0.01 (Dart), Cr0.02 (HE, Tranq), Cr0.03 (HEAP)
Ammunition Weight: 0.5 grams per round
Features: Gyro compensation

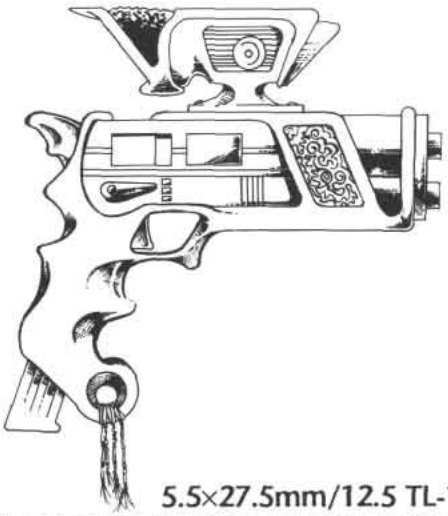
						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
4x20mm/60 Dart	50	6	1-3-5	16	30000C	†	†	300 (300)
4x20mm/60 HE	50	7	Nil	16	30000C	†	†	230 (228)
4x20mm/60 HEAP	50	7	2-2-2	16	30000C	†	†	230 (228)
4x20mm/60 Tranq	50	–1*	Nil	16	30000C	†	†	30 (30)

† Fired from a vehicle mount, this weapon has negligible recoil and tripod range.
*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Short range in parentheses is the unrounded iron sight range.

Recording Ammo Consumption

Because of the large number of rounds in the VRF gauss gun's ammunition cassette, you may wish to create a special ammunition form for it by photocopying six 100-round forms, indicating that one box on the ammo form represents a burst of 50 rather than a single round. Otherwise, the ammunition record form will require 30,000 boxes!

Ithklur Small Arms



5.5×27.5mm/12.5 TL-14 Gauss

The 5.5mm round was the standard Hiver gauss round before the Collapse, and has continued to be such to this day. The Hivers themselves dislike combat, and leave it to their subject race auxiliaries, primarily the Ithklur, for whom the 5.5mm-caliber weapons were designed.

The Ithklur are larger than humans (averaging twice the body mass), and whose joints articulate differently. CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) field tests indicate that the most common human problems when firing Ithklur weapons are in moving the various selector switches and knobs and aligning the sights properly (by contrast, the most common Ithklur complaint about human weapons is that things snap off them too easily). All direct fire tasks by humans using Ithklur weapons are increased by one difficulty level.

Ithklur weapons also have a distinctive ornate look, see discussion on facing page.

5.5mm TL-14 Gauss Pistol (Ithklur)

The 5.5mm gauss pistol is manufactured only in Hiver Space, being TL-14, and as such is very rare in the Coalition. Humans find the handgrip of this pistol slightly oversize, and firing it requires a little practice, as the weapon is built for Ithklur hands. At a muzzle velocity of 2500 mps, the weapon's performance is impressive, but it is almost two and a half times as heavy as the 4mm gauss pistol, and few humans care for it due to its large size.

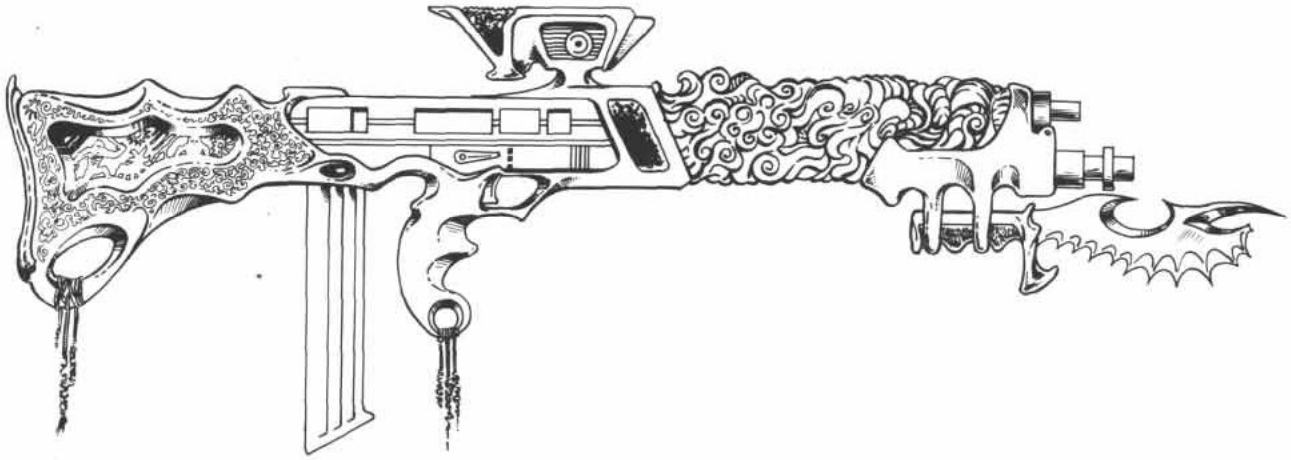
When fitted with the optional TL-10 laser sight, the weight of the weapon is increased by 0.5 kg, the price is increased by Cr300, and the recoil becomes SS: 2, Burst — for all rounds.

TL: 14
Ammo: 5.5×27.5mm/25
Muzzle Energy: 4094 joules (Tranq: 2456 joules), Required Power: 6550 joules
Weapon Length: 18.6 cm
Weapon Weight: 1.913 kg loaded, 1.879 empty (includes weight of empty box magazine)
Weapon Price: Cr499.4
Magazine Weight: 0.739 kg loaded, 0.705 kg empty
Magazine Price: Cr2
Ammunition Price: Cr0.03 (Dart), Cr0.06 (HE, Tranq), Cr0.18 (HEAP)
Ammunition Weight: 1.31 grams per round
Features: Optic sights, laser sight optional

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5.5×27.5mm Dart	SA	4	1-2-Nil	2	26	3	—	30 (26)
5.5×27.5mm HE	SA	5	Nil	2	26	3	—	20 (19)
5.5×27.5mm HEAP	SA	5	2-2-2	2	26	3	—	20 (19)
5.5×27.5mm Tranq	SA	–1•	Nil	2	26	2	—	14 (12)

*1D6–1 points of damage plus tranq effect on TNE, page 350.
Short range in parentheses is the unrounded iron sight range.

Security Clearance
Yes No
28-IX-1201
Date



5.5mm TL-14 Gauss Rifle (Ithklur)

This weapon is the standard weapon of the Ithklur Marines in Hiver service. It uses the same 5.5mm gauss ammunition as the gauss pistol (see facing page), but fires it at a muzzle velocity of 3500 meters per second. The 5.5mm rifle is larger than normal human weapons, but not excessively so, and the increased mass makes recoil easier to deal with.

When fitted with the optional TL-10 laser sight, the weight of the weapon is increased by 0.5 kg, the price is increased by Cr300, and the recoil remains the same.

The Ithklur are well-known as the Hivers' elite natural shock troops, which in itself is remarkable because the Hivers are well-known for eliminating the aggressive tendencies of their subject races. Either the Hivers elected to cultivate the Ithklur aggressiveness in this one case, or the Ithklur's current "boisterous" tendencies are the remains of truly epic violent tendencies. Those who study Hiver psychohistorical manipulation speculate that the latter is in fact the case, and that the intricate Ithkluri sense of martial aesthetics is an artifact of Hiver efforts to channel Ithklur tendencies into less energetic pursuits. This martial aesthetic is seen in Ithklur pastimes such as ritualized full-contact "ballet," but is nowhere more evident than in the design of Ithklur weapons. Each Ithklur weapon is unique, with ornate brightly colored fittings carved and painted by its owner. These carvings are highly symbolic, representing events or concepts of talismanic significance to its owner, and are modified after each battle in which they are used. Thus, the trained Ithklur eye can tell by looking at a weapon's ornamentation which battles it was used in, how well its owner performed, and so on. Ithklur art, therefore, consists entirely of personal weapons and military vehicles, embellished wth breathtaking examples of Ithklur decorative craftsmanship.

Much of this ornamentation is decidedly non-tactical, such as the bright colors of rifle stocks and barrel housings, and the noisy strings of beads. Each Ithklur battle is preceded by the solemn ceremony of "darking" the weapons, in which the bright colors are covered with tactical camouflage, and beads are either removed or coated with noise-damping grease. It is probably no accident that a subdued Ithklur weapon, festooned with camouflaged decoration, is quite well-camouflaged, as the distinctive straight lines present on the weapons of other races are not present. Once darked, Ithklur weapons are not stripped and restored to their gleaming glory until the battle, campaign, or war has been brought to its intended conclusion. Thus the sight of Ithklur units darking their weapons for war can be a very intimidating experience indeed. (The bayonet illustrated is for ceremonial use only.)

TL: 14
Ammo: 5.5x27.5mm/35
Muzzle Energy: 8024 joules (Tranq: 4814 joules), Required Power: 12,838 joules
Weapon Length: 66 cm
Weapon Weight: 6.575 kg loaded, 6.477 empty (includes weight of empty box magazine)
Weapon Price: Cr1044
Magazine Weight: 4.012 kg loaded, 3.914 kg empty
Magazine Price: Cr8
Ammunition Price: Cr0.03 (Dart), Cr0.06 (HE, Tranq), Cr0.18 (HEAP)
Ammunition Weight: 1.31 grams per round
Features: Optic sights, gyroscopic compensation, bayonet lug, RAM rifle grenade adaptor; laser sight optional

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
5.5mm Dart	5/10	6	1-3-5	4	75	1	2/4	120 (105)
5.5mm HE	5/10	7	Nil	4	75	1	2/4	90 (79)
5.5mm HEAP	5/10	7	2-2-2	4	75	1	2/4	90 (79)
5.5mm Tranq	5/10	–1*	Nil	4	75	1	2/3	30 (30)

*1D6–1 points of damage plus tranq effect on **TNE**, page 350.
Short range in parentheses is the unrounded iron sight range.

COLOR PLATE CAPTIONS

These are the captions for the following eight color plates. The captions contain references to pages where more information on the illustrated equipment may be found.

A: Fitting Out

RCS *Maggart* (TailNo 10095), lead ship of the group IV "Stretch" clippers (page 136), is loaded for a strike mission while in orbit around Trybec. *Maggart* is fitted with a 400-ton fuel module in the normal aft position, along with a 200-ton habitation module just abaft the command section. Yard tugs are bringing up other modules (see pages 132-135 for module descriptions).

In the foreground is a Wildbat fighter (page 149), one of eight assigned to the mission, while RCC *Condor* (TailNo 20080F), the *Manta*-class fueler (page 131) assigned to *Maggart* for this mission, holds station to port.

In the background, starport *Vesna* (a former Imperial Scout base) is seen against the looming bulk of Trybec itself.

B: Combat Drop in Progress

RCS *Kelley Victrix* (TailNo 10067) releases a load of troop-laden drop capsules from her mission-configurable pod (pages 138-139). Note that the remote chin turret containing the SSL is obscured by the firing of the drop-capsule autolaunchers (visible as the two holes in the ship's belly). The various types of drop capsule are virtually indistinguishable from the outside, so it cannot be told which capsules actually contain troops, which are drones, and which are cargo-carriers (pages 14-15).

Each drop capsule has eight maneuvering thrusters (four at each end) for course adjustments and defensive "jinking." Additional protection is granted by three decoy launchers distributed about its "equator," each carrying five decoys, one launcher each of anti-passive sensor (flares), anti-ladar (light-diffracting aerosols), and anti-active sensor (streamer-bearing corner reflectors) decoys, which are dispensed by the onboard computer during the descent.

C: Decapitation Strike Team

A powered team in light battle dress (pages 18-19) sets up for a decapitation strike from a concealed position. While the communications tech sets up a maser uplink (page 24) in the foreground, the team leader keeps the target under observation with PRIS binoculars (page 28). The other two troopers set up the laser sniper weapon (page 97) and its tripod. At the designated time, the LSW gunner will open fire and knock out the communications antennae on the enemy headquarters in the background, isolating it from the planetary communications net. This will also be the signal for the attack to begin. During the attack, the team will provide covering fire, seeking out officers or other important targets to inflict maximum disruption upon the enemy.

D: SSL Team in Position

Near the scene depicted in plate C, a mixed-powered/muscle SSL team (page 9) has set up and readied itself for its role in the upcoming action. The team consists of a spotter, gunner, and ammo carrier for the SSL. Each member of the team carries a part of the disassembled SSL when moving.

The team's deployment is standard, the spotter scanning for targets, the gunner ready to fire, and the ammo carrier watching for the approach of hostiles from the flanks.

The spotter has PRIS binoculars and a personal defense laser (PDL, page 95), and is wearing an RC-issue utility vest along with private-purchase chaps and gauntlets over her body sleeve (pages 16-17). The fringe on her chaps and her use of a non-standard utility harness is typical of the informal approach to uniforms in the RCES. The gunner also wears the body sleeve but has chosen the standard harness. He has laid aside his PDL for the moment, and probably carries the SSL gunner's tool pouch on one hip.

Ammo carriers often wear light battle dress, as its powered feature enables them to carry more SSL ammunition than their strength would otherwise allow. This particular example is quite well camouflaged.

E: Counterattack

This plate shows a Coalition advisor helping indigenous forces resist an attack by AFVs. The advisor is using his arm-mounted laser designator to "paint" one of the attacking "Prairie Fire" tanks (pages 120-121) for an approaching Lyrebird tac missile fired from a short distance to the rear (pages 106-107). After the first target has been hit, the advisor will switch to a different target for the second Lyrebird.

In the right foreground are two local soldiers, Coalition allies trained and equipped by the RC as part of a continuing bootstrap operation. One fires a Coalition-supplied plasma bazooka (page 85), while the other, the loader in the bazooka team, takes cover.

F: Hot Recovery

A light-powered raiding party dropped as a diversion has done its job all too well and drawn a large part of the main force onto its position. The team is heavily outnumbered, and under fire from small arms as well as heavier weapons, but has successfully made it to its retrieval point, and is in the process of boarding its Fury assault landers (page 149).

The team is armed with a combination of 4mm gauss rifles (page 70) and 7mm ACRs (pages 60-61), along with 4cm RAM rifle grenades (pages 100-101), and equipped with Coalition-issue light battle dress (pages 18-19). This team has added its names or call signs to its battle dress shoulder plates, and the trooper in the foreground ("Kirby") has added an inscription to his personal weapon. Kirby has his helmet's faceplate in the partially open position.

After embarking the team, the lander will rendezvous with an ambulance skiff in orbit (page 135), transfer wounded, and proceed back to *Maggart* for debriefing.

G: Cargo Bay after the Storm

This plate shows a quiet moment aboard a Hiver transport (page 151) cargo bay after most of the cargo has been unloaded into a secured landing zone.

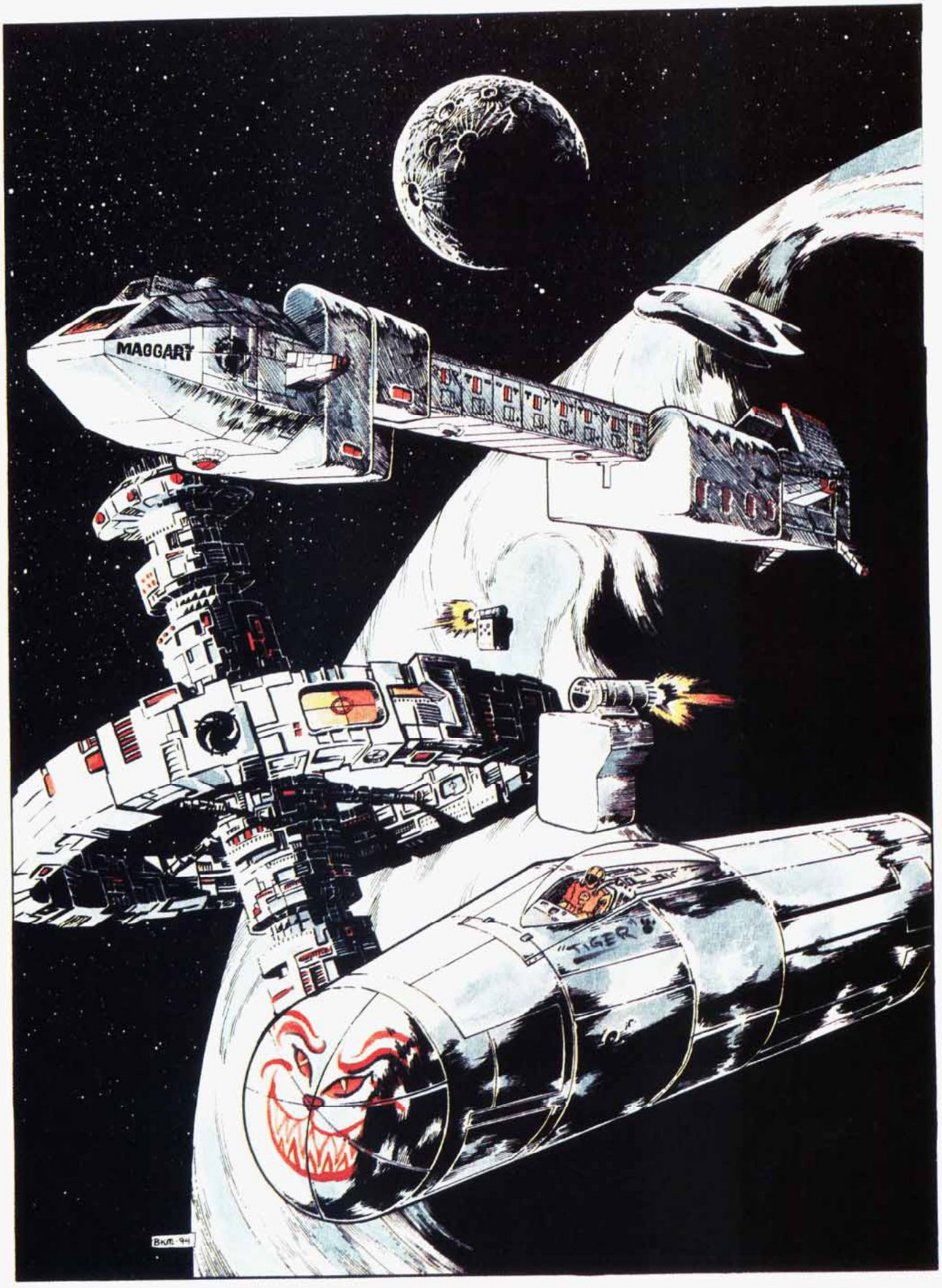
In the foreground, a BRT "Big Brute" (similar to the "Baby Brute" on page 21, but based on the Schalli battle dress skeleton with performance: 268-kg mass, Cr400,340 price, maximum load 2880 kg, 8 hours endurance) has just picked up a TL-8 "lightning bolt" Virus-killer (page 31) and is about to carry it to ground transport waiting outside. Through the open cargo hatch in the background, a platoon of Pyrrhus TL-13 support sleds (page 126) move out to reinforce the perimeter, while the last of the passengers brought by the transport (relic recovery teams and other specialists) march off to add their numbers to those already on the ground.

H: Serendipity

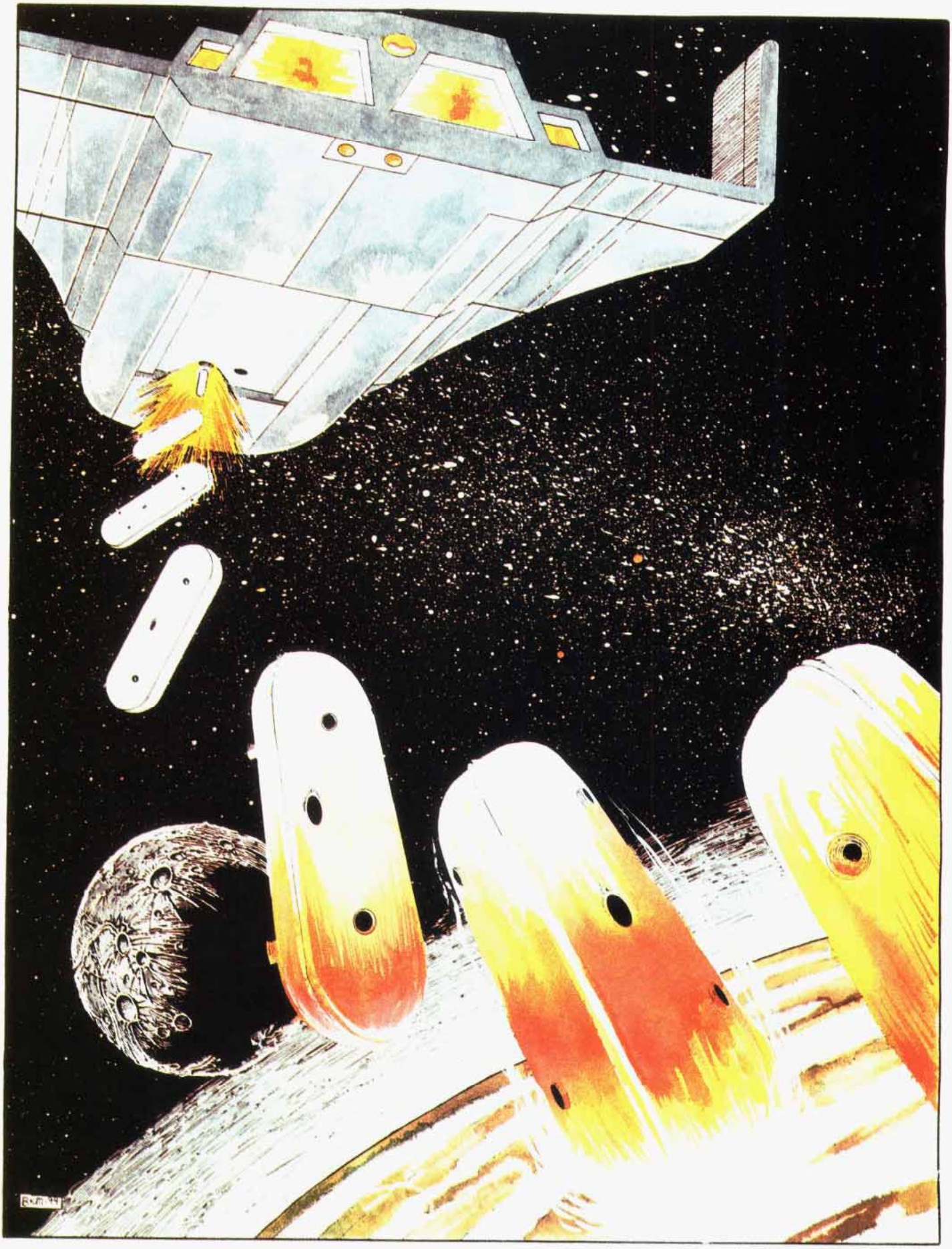
In the ruins of a boneyard city, a group of free-lancers discover a wrecked but possibly salvageable Intrepid grav tank (pages 112-113).

The group's clothing and equipment illustrate the wide variation seen in such groups. The party is armed with a variety of weapons, always a wise precaution in the Wilds. Their relative lack of gear indicates that they are not too far from their ship, or have a vehicle that carries the bulk of their supplies.

The grav tank has crashed through a building wall after coming under heavy fire, and has rested in this spot for a number of years. Curiously, the tank's crew had not removed the tampion from the gun barrel, which indicates a hasty departure from a vehicle park or warehouse facility. This is is a lucky discovery for the team, as it indicates that the main gun has been protected from the elements and may actually be in working condition. If the group's luck holds, the tank will have a full supply of ammunition, and it will make a tidy profit from this trip.



A



B



c



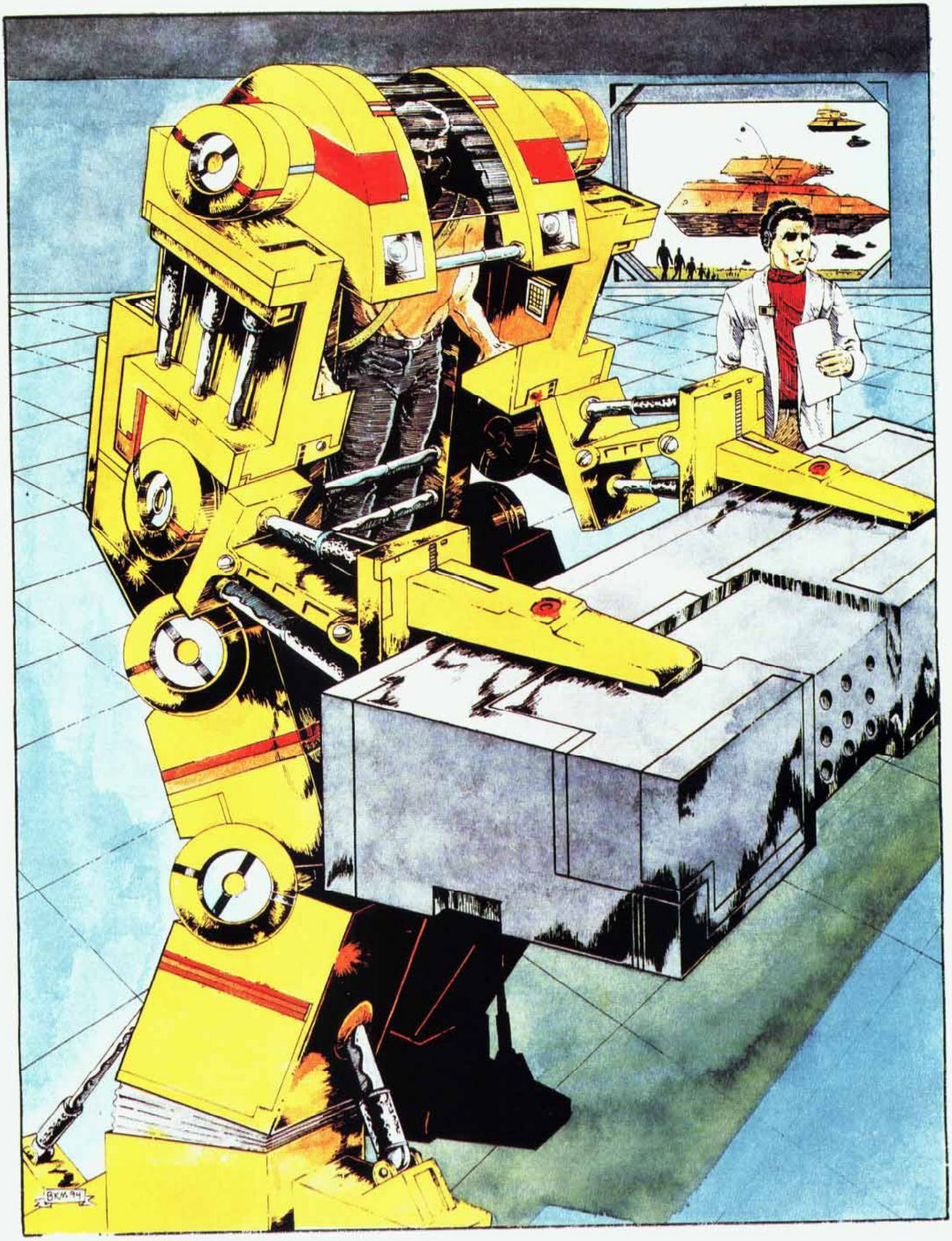
D



E



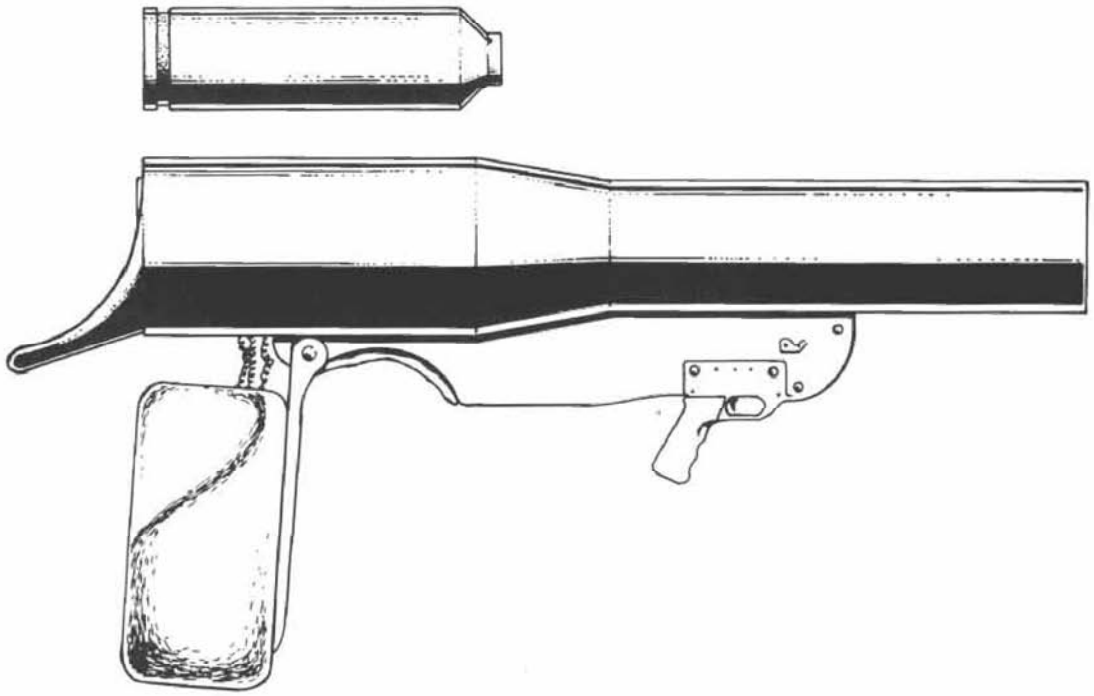
F



G


THUNDER
FROM
THE SKIES

Plasma Bazooka



TL-10 9cm Plasma Bazooka

This is the least sophisticated of the high-energy weapons, but it does provide moderately portable antiarmor firepower at much lower tech levels than those at which effective man-portable high-energy weapons become practical. These are manufactured by the Reformation Coalition primarily for supply to Coalition allies in the Wilds, but they are also used in limited numbers by RC member world armed forces.

Unlike the more sophisticated plasma rifles which separate their firing units from their support hardware, the plasma bazooka comes in one piece, and is fired from the shoulder. It fires an individually loaded chemical plasma cartridge (CPC). The cartridge contains the ignition chamber for the plasma stream and a disposable chemical laser ignition system. Part of the cartridge's great weight comes from the fact that it must vent a significant amount of energy out of the rear of the bazooka in order to negate its recoil. However, this creates considerable backblast. All personnel standing within 10 meters directly behind the weapon is fired take 5D6 backblast damage, and the weapon may not be fired from inside an enclosure (such as a building or bunker).

The plasma bazooka takes two combat turns to reload (one turn is spent on the cooling cycle, the second is spent loading the new CPC).

The plasma bazooka crew usually consists of two personnel, the bazooka gunner and a loader/ammo carrier. The bazooka team is typically provided with a light vehicle as well, such as a range truck or air raft.

Cartridge/Bore Diameter: 9 cm
Weapon Length: 85 cm
Discharge Energy: 2 Mj
Weapon Specifications: 27 kg empty, 43.2 kg loaded with one round, Cr 67,500 for weapon only
Cartridge Specifications: "9×32 CPC," actual dimensions 90×318 mm Chemical Plasma Cartridge (2.25 Mj), 16.2 kg, Cr400 each
Features: Optic sights

Combat Performance

Weapon	*Rld*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Bulk*	*Mag*	*Recoil*	*Short Range*
9cm Plasma Bazooka-10	2	16	1-2-10	17-17-9-2	5	1i	—	70

HIGH-ENERGY WEAPONS

High-energy weapons use a laser to heat hydrogen in a magnetic bottle into a high-temperature plasma, and then release this plasma in a high-velocity jet. These weapons are commonly divided into two types: plasma weapons and fusion weapons. Both sub-types work in the same basic way; the difference is that in the fusion weapons the plasma continues to be heated in the weapon until its atoms begin to undergo nuclear fusion.

These weapons use hydrogen which is contained in pulse plasma or pulse fusion cartridges (PPCs or PFCs) which also contain the circuitry to allow them to function as the magnetic bottles which confines the plasma until it is fired. The cartridge is then expelled during the cooling/reload cycle. The diameter of the pulse cartridge in centimeters is usually used to describe the weapon, although the diameter of the plasma stream itself is less than this.

The support equipment required for the plasma or fusion weapon (such as the cooling system and batteries to power the laser) are carried in a backpack which is connected to the weapon by a flexible, heavy-duty cable. The same laser which ignites and heats the hydrogen (by firing through the center of the pulse cartridge) also is fired at the target a split-second before the plasma is released. This pilot laser burns a small "tunnel" through the atmosphere which assists the passage of the plasma which follows along behind it.

High-energy weapons generate a large amount of recoil, and are usually intended for use by powered (battle dress-equipped) troops, or are fitted with recoil compensators.

Non-Compensated High-Energy Weapons

Nonrecoil-compensated high-energy weapons are almost always used with battle dress, which provides the strength enhancement to allow the firer to handle the high recoil. The three non-compensated weapons on the table below must be used with battle dress, as they are not fitted with buttstocks. Instead, they have a plug assembly which fits into a socket on the battle dress breastplate (one and each side to allow for right- or left-handed firing). This plug holds the weapon in place when being fired, and also allows the weapon to be integrated into the battle dress sensor suite. While the weapon is plugged into the socket, its boresight line is projected onto the heads-up display on the battle dress visor.

Non-compensated high-energy weapons are usually quite heavy, as the battle dress-enhanced strength allows them to carry a greater load of ammunition than could be handled by unpowered troops.

The TL-12 4.3cm plasma rifle is manufactured in small numbers by the Reformation Coalition for use with powered troops. The other weapons listed on the table below are relic weapons which can also be found in service, provided sufficient compatible ammunition has also been recovered.

TL-12 4.3cm Plasma Rifle (Powered Troops)

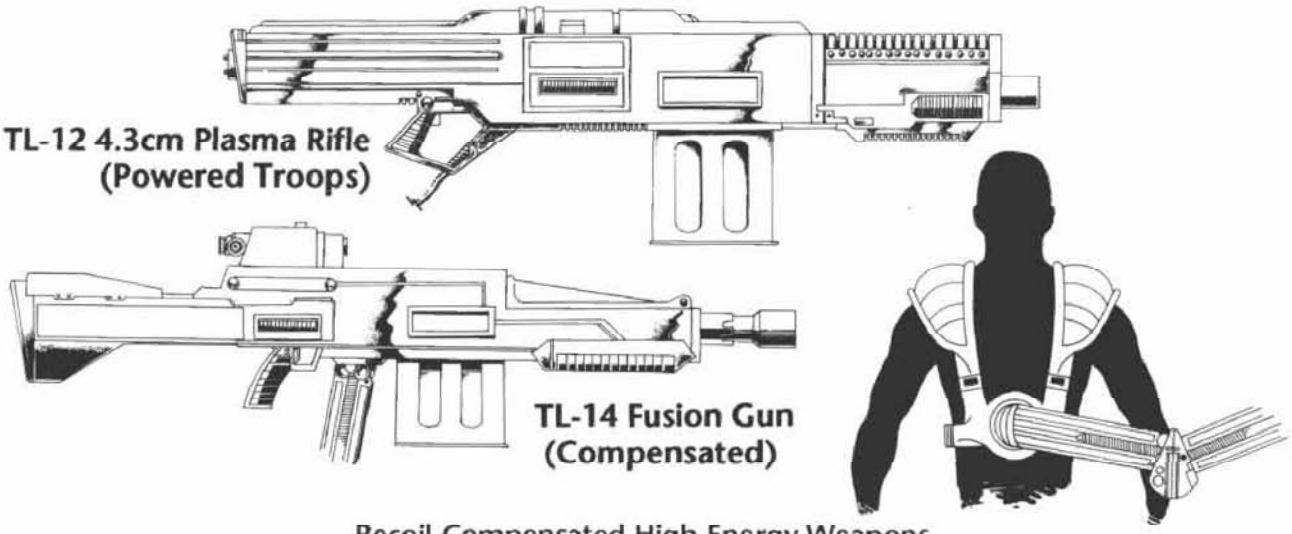
Weapon Length: 72 cm
Pulse Energy: 0.6 Mj
Weapon Mass: 2.4 kg empty, 17.4 kg with full magazine
Backpack Mass: 4.8 kg
Weapon Price: Cr18,000 (Cr6000 firing unit, Cr12,000 backpack)
Cartridge Specifications: "4.3 cm PPC," actual dimensions 4.3×12.4 cm Pulse Fusion Cartridge (0.6 Mj), 1.44 kg, Cr15 each
Magazine Specifications: 7.8 kg empty, 15 kg with 5 rounds, Cr78 empty, Cr153 fully loaded with 5 rounds PPC
Features: Optic sight

				Weight				Price	
Weapon	*TL*	*Pulse*	*Ammo*	*Empty*	*Loaded*	*BP*	*Mag*	*Weapon*	*Ammo*
4.3 cm Plasma Rifle	12	0.6	4.3 PPC	2.4	17.4	4.8	5	18,000	15/153
4.7 cm Plasma Rifle	13	0.8	4.7 PPC	3.2	35.53	4.8	10	20,000	20/361
4.7 cm Fusion Rifle	14	1.2	4.7 PFC	4.8	40.1	4.8	10	72,000	9.6/257

Pulse energy in Mj; *Ammo* diameter in cm and type; *Weight* in kg, where *BP* is backpack weight; *Price* in credits, *Ammo* price for a single round/fully loaded magazine in credits.

							Recoil		
Weapon	*ROF*	*Dam*	*Pen Rtg*	*Pen Val*	*Bulk*	*Mag*	*SS*	*Burst*	*Range*
4.3 Plasma 12	SA1	9	1-2-10	9-9-5-1	5	5	11	—	20
4.7 Plasma 13	SA1	10	1-2-10	10-10-5-1	5	10	8	—	20
4.7 Fusion 14	SA1	13	½-1-4	26-26-13-3	5	10	8	—	60

The *Damage* and *Penetration Rating* (short/medium-long-extreme) columns are used for firing against personnel. The *Penetration Value* column (short-medium-long-extreme) is used against vehicles.



Recoil-Compensated High-Energy Weapons

Because non-powered troops cannot typically control the recoil of high-energy weapons, lighter versions of these weapons are manufactured with recoil compensators which reduce the recoil to manageable levels. These compensators are gyroscopic in design from tech level 10-13, and are inertial at tech level 14 and higher. They are carried in the weapons' backpacks along with the other support equipment. The fitting of either type of compensator requires a modification to the hardware which connects the backpack to the weapon. Rather than the simple cable, the compensated weapon is connected to the backpack by a flexible, articulated arm. This arm has a number of joints which allow the user to move the weapon freely and fire it from the hip or the shoulder. However, at the moment the weapon fires, the joints become rigid, allowing the recoil to be carried down the arm into the backpack, where a portion of it is absorbed by the compensator. The remaining recoil is within the ability of the average soldier to control.

Recoil-compensated weapons are quite a bit more expensive than the non-compensated versions, but are economical from the standpoint that they do not also require a battle dress suit for each soldier. Because non-powered troops cannot manage overly massive weapons, compensated high-energy weapons also have much smaller magazine capacities than their non-compensated counterparts.

The compensated TL-14 fusion rifle described here is rated limited standard in RC service, as a significant cache were discovered on Nike Nimbus (which had been a naval base during the Final Imperium). The other two weapons on the table below are relic weapons which had been fairly common in the Imperial era.

TL-14 Fusion Gun (Compensated)

Weapon Length: 80 cm
Pulse Energy: 1.2 Mj
Weapon Mass: 4.8 kg empty, 21.7 kg with full magazine
Backpack Mass: 9.6 kg
Weapon Price: Cr156,000 (Cr72,000 firing unit, Cr84,000 backpack with inertial compensator)
Cartridge Specifications: "4.7 cm PFC," actual dimensions 4.7 × 13.8 cm Pulse Fusion Cartridge (1.2 Mj), 1.92 kg, Cr9.6 each
Magazine Specifications: 9.22 kg empty, 16.9 kg with 5 rounds, Cr93 empty, Cr131.4 fully loaded with 5 rounds PFC
Features: Optic sight, inertial compensator harness and backpack

				Weight				Price	
Weapon	*TL*	*Pulse*	*Ammo*	*Empty*	*Loaded*	*BP*	*Mag*	*Weapon*	*Ammo*
4.1 cm Plasma Rifle/comp	14	0.8	4.1 PFC	3.2	14.5	6.4	4	40,000	6.4/87
4.7 cm Fusion Rifle/comp	14	1.2	4.7 PFC	4.8	21.7	9.6	4	156,000	9.6/131
5.1 cm Fusion Rifle/comp	15	1.5	5.1 PFC	3	24	6	4	97,500	12/163

Pulse energy in Mj; *Ammo* diameter in cm and type; *Weight* in kg, where *BP* is backpack weight; *Price* in credits, *Ammo* price for a single round/fully loaded magazine in credits.

							Recoil		
Weapon	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Bulk*	*Mag*	*SS*	*Burst*	*Range*
4.1 Plasma 14c	SA1	10	1-2-10	10-10-5-1	4	4	5	—	20
4.7 Fusion 14c	SA1	13	½-1-4	26-26-13-3	5	4	3	—	60
5.1 Fusion 15c	SA1	14	½-1-4	28-28-14-4	3	4	4	—	80

The notation "comp" or "c" indicates that the weapon is fitted with a recoil compensator in the backpack.

The *Damage* and *Penetration Rating* (short/medium-long-extreme) columns are used for firing against personnel. The *Penetration Value* column (short-medium-long-extreme) is used against vehicles.

Lasers

LASERS

Lasers (Light Amplification by the Stimulated Emission of Radiation) function on a principle called *stimulated emission*, meaning that an atom or molecule is hit by light of a particular wavelength which then causes that particle to emit light of that same wavelength. The reason that substances can be stimulated to produce specific wavelengths has to do with the way atoms and molecules store and release energy with their electrons. Electrons belonging to an atom are found in "orbits" (they are not really orbits, but they are a close enough concept for these purposes) around the atom's nucleus. These electrons move from low-energy orbits close to the nucleus out to high-energy orbits farther from the nucleus as they gain energy by absorbing photons, and move back in toward the nucleus as they give up energy by emitting photons.

These orbits are not set up with an infinite number of fine gradations. Rather, they are like the rungs of a ladder—there are only so many, and they are a fixed distance apart. One can step up or down one, two, three or more rungs at a time, but cannot go up or down a fraction of a rung. Like the difference between electron orbits, the differences between the rungs on a ladder are *quantized*. This means that an electron which absorbs a photon and moves, or *transitions*, to a higher orbit, or *energy level*, can only have absorbed a photon with a certain fixed amount of energy, no more and no less, to move to that energy level. As that same electron transitions back down to the earlier lower energy level, it emits that same amount of energy, the difference between the two energy levels, in the form of a photon which is identical to the photon it absorbed earlier. Thus, based on the number of available energy levels and the combination of transitions (energy level 0-1, 0-2, 0-3, 1-2, 1-3, etc.), an atom can only absorb or emit photons of certain discrete energies.

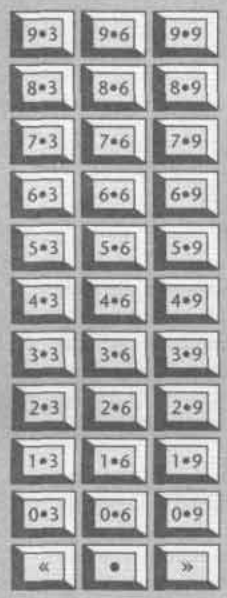
Photons are described in three ways: by their energy, their frequency, and their wavelength (remember that electromagnetic radiation behaves as simultaneously as particles—photons—and waves, so that particles can be said to have frequency and wavelength). However, these are merely three different descriptions of the same thing—a given wavelength is equivalent to a certain frequency is equivalent to a certain energy. That means that an atom which can only absorb or emit photons of certain energies can only absorb or emit radiation of a certain wavelength.

Molecules also store energy electronically as just described, but they additionally store energy as vibrational energy, where the component atoms vibrate back and forth with relation to each other, and rotational energy, where the molecule rotates around its center of mass (atomic nuclei cannot store energy like this because their mass is completely symmetrical). However, like electronic energy, vibrational and rotational energy are also quantized—there are only certain allowed levels of these energies, which define the energy/wavelength of the photons that these molecules can absorb or emit.

Most photon emission is spontaneous. Energetic atoms or molecules, like those in the filament of a light bulb, shed their energy by spontaneously spewing photons—atoms and molecules tend toward their lowest energy states, so the chances of spontaneous emission increase with the energy state. What stimulated emission does is to hit an energetic atom or molecule with a photon of a wavelength that corresponds to one of that atom or molecule's transitions (i.e., a wavelength which it can absorb or emit). If the atom or molecule is already at the energy state where it can emit a photon of the wavelength which struck it, the atom or molecule will emit that photon, and in the same direction as the photon which struck it, so that now there are two identical photons travelling in the same direction. So long as this takes place within a population of atoms or molecules which are already at the required energy level, this chain reaction will continue, creating ever more photons of the same wavelength. This is a laser. If this emission takes place between a pair of focusing mirrors, the photons will bounce back and forth, continuously stimulating more photons travelling in the same direction, until one of the mirrors is made transparent ("Q-switched"), and the focused beam of photons is released. This is what we normally think of as a laser, although it is more properly called a "diffraction limited laser." These diffraction limited lasers are used as weapons in **Traveller**, and are referred to here simply as "lasers."

However, a population of atoms or molecules will not all be at the proper energy state at the same time. Instead, they will naturally be at thermodynamic equilibrium, which means that the number of atoms or molecules at a given energy state varies inversely with the amount of energy in that energy state, with the result that each energy state is outnumbered by the lower energy state immediately beneath it (i.e., the energy state which will immediately absorb photons released by the upper energy states). What this means is that this population would rather absorb the photons coming by than be stimulated to emit any. The stimulated emission chain reaction is dead before it begins.

In order to get stimulated emission to work, there must be a *population inversion*. A population inversion means that the target energy state (that which produces the photon wavelength desired) is more common than the energy states beneath it. This allows the target energy state population to stimulate each other's emission without these photons being absorbed by the remainder of the population. This inversion cannot be created simply by heating the population, as this would merely create thermodynamic equilibrium at a higher set of energy states, which would be just as detrimental to the chain reaction. Three ways to selectively populate an upper energy level are via electrical current, intense light, or chemical reaction.





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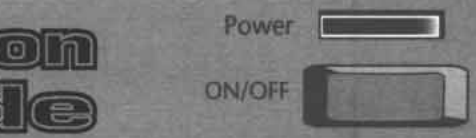
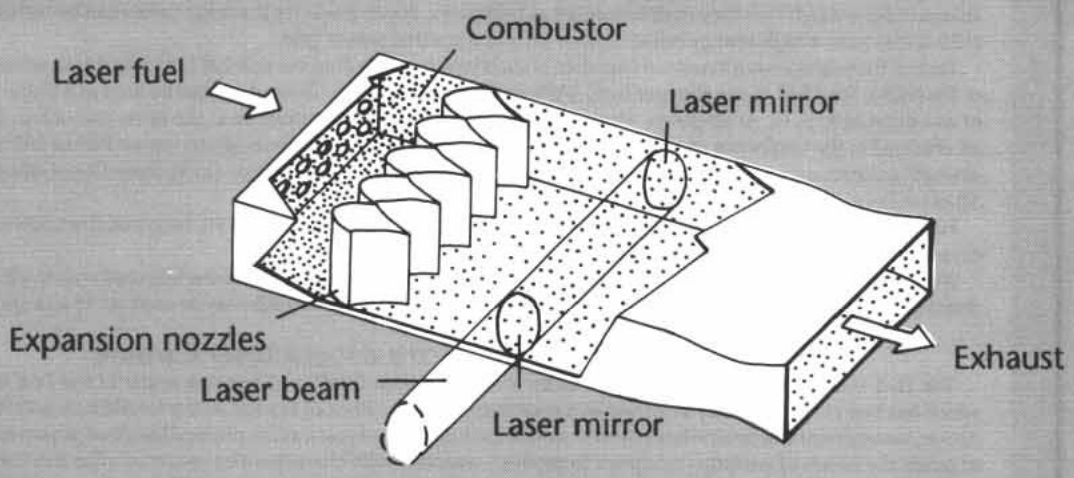


These give rise to the types of lasers used in **Traveller** and presented on the following pages.

First is what we will call a static laser. A static laser uses a single population of atoms or molecules which are energized by electrical or light input, emit their photons and fall to a lower energy state, and are then re-energized to emit again, over and over and over. They are called static because they use the same population time after time. They are distinguished by the need for significant electrical input in order to function, and also by the fact that they are not tunable (i.e., they cannot be manipulated to emit more than one wavelength of light, because the static population is typically limited to one useful wavelength by its very nature). Static lasers are represented in **Traveller** by non-tunable direct electrical input lasers, and examples of these are found on pages 90-91.

Second are chemical lasers. These lasers do not use the same population over and over, but continuously create a new energized population which emits its photons and is discarded. These atoms or molecules are not energized *per se*, but are created in an energized state as the products of an energetic chemical reaction. By keeping a continuous reaction going and venting away the spent material, a population inversion can be maintained without the need for outside power input, as the energy comes purely from combusting chemicals (which come from a chemical laser cartridge, or CLC). These lasers can be described as tunable because the laser wavelength they emit is based on the chemicals they are burning. By designing a laser to combust a variety of different chemicals, each of which produces a different wavelength, that laser can be used to produce a number of different wavelengths merely by changing the chemicals used. Examples of this type of laser are found on pages 92-95.

There is also a third type of laser, the free-electron lasers, or FELs. These are true tunable lasers, but the only FELs presented here are starship-mounted turret lasers; no small arms FELs are presented in this book.



Chemical Laser

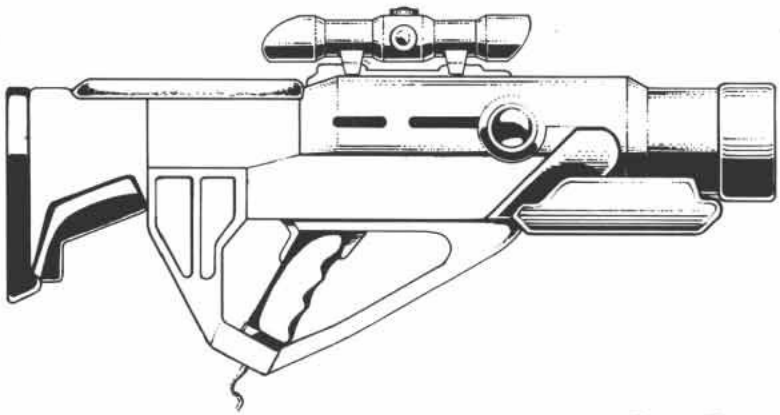
Chemical fuel extracted from the chemical laser cartridge (CLC) is burned in the combustor at left, and its pressure causes it to pass through the expansion nozzles into the laser-generation cavity. By firing a tiny starting pulse of photons, energy from the hot gas is extracted in the form of photons of the same wavelength, which are then bounced back and forth between the mirrors, stimulating more photon emission from the gas. The pressure of the hot gas causes a continuous flow from the combustor to the exhaust. But because the pressure in the combustor is often less than 1 atmosphere, a vacuum evacuator must be installed at the exhaust unless the laser is being vented directly into space. The laser is fired to the lower left.

Laser Atmospheric Adjustments

Lasers have widely differing performance in different atmosphere types. The combat performance charts on the following six pages show performance in a standard atmosphere (codes 6, 7). For performance in other atmosphere types, look at the Atmospheric Adjustment tables and use the following procedure. Use the listed short range from the SR column to resolve hits, and then find damage at that range by consulting the column for the correct atmosphere type, Vacuum (code 0), Trace (code 1), Very Thin (codes 2 and 3), Thin (codes 4 and 5), Dense (codes 8 and 9), and Exotic (codes A-C). All of these columns provide four entries, for short-medium-long-extreme ranges. The entry will usually be a letter code, showing which damage entry to use on the combat performance table. If the entry reads "0," the laser does no damage at that range.

For dense and exotic atmospheres, there is an additional parenthetical listing. This shows the weapon's short range in meters in this atmosphere to achieve the same S-M-L-E damage performance it has in a standard atmosphere as listed on the combat performance table. This allows players to use their weapons at shortened ranges in thick atmospheres to regain damage performance. If the entry reads "NA," there is no shorter range that may be used.

DEI Lasers



DIRECT ELECTRICAL INPUT LASERS

All direct electrical input (DEI) lasers require a direct electrical power supply which feeds directly into the laser's capacitor or homopolar generator. For vehicle- or starship-mounted weapons, this is a power plant. For small arms, this is almost always a battery pack which is combined with the capacitor to form a power pack. At lower tech levels, these power packs are almost always bulky enough that they must be carried as backpacks. Power packs for the lasers below can be recharged in 10 minutes (120 turns) from a high-energy power source such as a starship power grid.

Each of these lasers has a maximum number of shots which can be fired per combat turn, listed as its semiautomatic (SA) rate of fire (ROF). Thus SA1 is one shot per turn, SA2 two shots per turn, etc. These shots can be fired as a single high-energy pulse, or as a burst of 3, 5, 10, or 50 pulses. However, all shots fired in one turn must be at the same rate of fire. This rate of fire may be changed at the beginning of each combat turn at no action cost. Thus a laser which has an ROF of SA3 could fire three full-strength pulses in a turn (SA3), three three-pulse bursts (3×3), three five-pulse bursts (3×5), three 10-pulse bursts (3×10), or three 50-pulse bursts (3×50) in a combat turn.

For weapons (such as the pistol and rifle below) which have different SA rates of fire based on their power pack, the number of multi-pulse bursts allowed is based on the SA rate.

All DEI lasers are equipped with integral laser sights (**TNE**, page 275) which simply use the laser itself on a very low (negligible power drain) power level. The laser sights for all three DEI lasers in this book (pages 90-92) may be used out to a range of 240 meters.

TL-8 10cm Direct Electrical Input Laser Carbine

The TL-8 10cm laser carbine manufactured by the Reformation Coalition is but one avatar of the TL-8 laser carbine design which has been independently designed and engineered on thousands of worlds. As the lowest tech practical small arms laser design, variations of this carbine have been in service for thousands of years, as the physical laws that govern such things continue to guide the hands of weapons designers to produce weapons with characteristics very much like this one.

This carbine remains in service even at higher tech levels as a designation weapon used by scouts and artillery spotters because of its all-around utility, low price, and good range performance.

Focal Array Diameter: 10 cm
Weapon Length: 72.15 cm
Pulse Discharge Energy: 0.01 Mj (SA1), 0.0033 Mj (1×3), 0.002 (1×5), 0.001 (1×10), 0.0005 (1×50)
Weapon Specifications: 4.33 kg, Cr2310
Power Pack Specifications: 19.5 kg, capacity of 50×0.01 Mj shots, Cr215
Features: Laser sight, optic sight, ruggedized weapon body (to grenade standard)

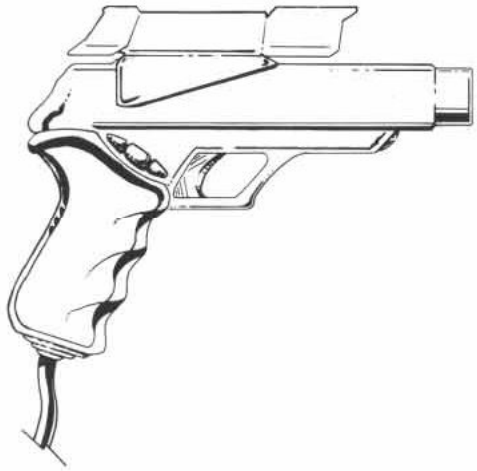
Combat Performance (in Atmosphere types 6, 7)

Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
10cm DEI Carbine-8	SA1	5-3-1-1	0-0-0-0	Nil	4	50 PP	200
	1×3	3-1-1-0	0-0-0-0	Nil	4	50 PP	200
	1×5	2-1-1-0	0-0-0-0	Nil	4	50 PP	200
	1×10	2-1-0-0	0-0-0-0	Nil	4	50 PP	200
	1×50	1-0-0-0	0-0-0-0	Nil	4	50 PP	200

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
10cm DEI Carbine-8	290	S-S-S-M	S-S-S-M	S-S-M-L	S-M-L-E	M-L-E-0	L-E-0-0 (100)	0-0-0-0 (20)

Note that the laser carbine uses a reduced short range on the combat performance table in order to maximize its damage performance. The values under Standard atmosphere above allow players to use the carbine's best range performance, at a penalty in damage performance at range.



TL-9 5cm Direct Electrical Input Laser Pistol

This weapon is a much lighter alternative to the laser rifle manufactured at the same tech level (see next page), although it is so heavy that it hardly fills the classic sidearm role. The lightweight power pack (below) allows the pistol's use by specialist troops, such as heavy weapons crews, radio operators, etc.

This pistol may be fitted with any one of three standard power packs. One power pack provides power for 50 shots at the 0.01 Mj level, or 25 shots at the 0.02 Mj level, or a combination of the two. The second power pack provides 100 shots at 0.01 Mj or 50 shots at 0.02 Mj, or a combination. The third "lightweight" power pack provides 50 shots at 0.01 Mj and sacrifices the ability to fire at the 0.02 Mj level, but is appreciably lighter than the other two packs. All three power packs are backpack configuration, and use the same power hook-up cable.

While the pistol is built to handle a rate of fire of four 0.01 Mj shots or two 0.02 Mj shots (SA4 and SA2, respectively), only the second, largest power pack allows fire at this rate. The smaller power packs limit the pistol to SA2 at 0.01 Mj and SA1 at 0.02 Mj (or not shots at all in the case of the lightweight power pack) because of their battery discharge rates.

An adaptor assembly may be installed in a vehicle to allow the pistol to be fed directly from the vehicle's power plant. This assembly masses 13.6 kg (0.0136 tonnes), displaces 6.8 liters (0.0068 cubic meters), costs Cr295, and requires 0.02667 MW power from the power plant if the pistol is to fire at its full performance (equivalent to power pack 2), or only 0.0133 MW to allow performance equivalent to that with power pack 1.

Focal Array Diameter: 5 cm
Weapon Length: 42 cm
Pulse Discharge Energy: 0.02 Mj (at SA1 or SA2, see above), 0.01 Mj (at SA2 or SA4, see above), 0.0033 Mj (three-pulse bursts), 0.002 (five-pulse bursts), 0.001 (10-pulse bursts), 0.0005 (50-pulse bursts)
Weapon Specifications: 1.67 kg, Cr1250
Power Pack Specifications: Power Pack 1: 19.6 kg, capacity 50×0.01-Mj or 25×0.02-Mj shots, Cr320, or
Power Pack 2: 23.5 kg, capacity 100×0.01-Mj or 50×0.02-Mj shots, Cr330, or
Power Pack 3: 11.9 kg, capacity 50×0.01-Mj shots, Cr280
Features: Laser sight, optic sight, ruggedized weapon body (to grenade standard)

Combat Performance (in Atmosphere types 6, 7)

Weapon	*Mj*	*ROF(1/2/3)*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Mag (1/2/3)*	*Short Range*
5cm DEI Pistol-9	0.02	SA1/SA2/—	7-4-2-1	1-0-0-0	Nil	2	25/50/—*	90
	0.01	SA2/SA4/SA2	5-3-1-1	0-0-0-0	Nil	2	50/100/50	90
	0.01	2×3/4×3/2×3	3-2-1-0	0-0-0-0	Nil	2	50/100/50	90
	0.01	2×5/4×5/2×5	2-1-1-0	0-0-0-0	Nil	2	50/100/50	90
	0.01	2×10/4×10/2×10	2-1-0-0	0-0-0-0	Nil	2	50/100/50	90
	0.01	2×50/4×50/2×50	1-0-0-0	0-0-0-0	Nil	2	50/100/50	90

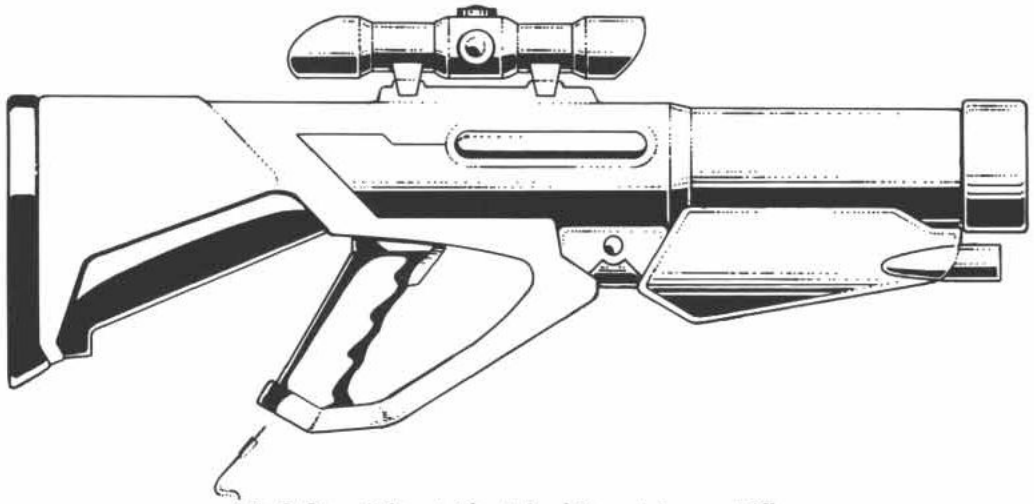
Mj column shows the discharge energy of the shot (either single pulse or total energy of all pulses in a burst) in megajoules. Notations 1/2/3 above in the *ROF* and *Mag* columns are for power packs 1, 2, and 3, respectively. Each multi-pulse burst consumes the same amount of energy as a 0.01-Mj single-pulse shot.

*Note that each 0.02-Mj shot consumes the equivalent energy of two 0.01 Mj shots for purposes of keeping track of power expenditure.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
5cm DEI Pistol-9	90	S-S-S-S	S-S-S-S	S-S-S-M	S-S-M-M	S-M-L-E	M-L-E-W (50)	W-0-0-0 (10)

DEI and CLC Lasers



TL-9 8cm Direct Electrical Input Laser Rifle

Like the DEI pistol manufactured at the same tech level (page 91), the combat performance of this rifle varies with the power pack it is fitted with. While the rifle is constructed to be able to fire 0.04 Mj pulses at a rate of fire of two per combat turn (SA2) or 0.02 Mj pulses at a rate of four per turn (SA4), this full performance is only permitted by the heavier of the two power packs available.

With the first, lighter power pack, the battery's discharge rate limits the rifle to a ROF of SA2 at 0.02 Mj or SA1 at 0.04 Mj. The second, heavier power pack allows the full rate of fire described above.

While the rifle itself is relatively light and handy, the power required by the weapon results in very heavy power packs. Even the less capable power pack constitutes a burdening load for most persons, and the heavier high-performance pack is almost guaranteed to be a burdening load (see **TNE**, pages 35 and 265).

Nonetheless, the 8cm rifle is a formidable antipersonnel small arm.

An adaptor assembly may be installed in a vehicle to allow the rifle to be fed directly from the vehicle's power plant. This assembly masses 27.2 kg (0.0272 tonnes), displaces 13.6 liters (0.0136 cubic meters), costs Cr590, and requires 0.05332 MW power from the power plant if the rifle is to fire at its full performance, or only 0.02667 MW to allow performance equivalent to that with the lighter power pack.

The rifle is not fitted with a bayonet lug as its structure is not ruggedized to hand-to-hand combat standards.

Focal Array Diameter: 8 cm
Weapon Length: 71.62 cm
Pulse Discharge Energy: 0.04 Mj (at SA1 or SA2 see above), 0.02 Mj (at SA2 or SA4, see above), 0.00667 Mj (three-pulse bursts), 0.004 (five-pulse bursts), 0.002 (10-pulse bursts), 0.0004 (50-pulse bursts)
Weapon Specifications: 4.21 kg, Cr2855
Power Pack Specifications: Power pack 1: 44.3 kg, capacity of 100×0.02 Mj or 50×0.04-Mj shots, Cr656, or
Power Pack 2: 57.3 kg, capacity of 200×0.02-Mj or 100×0.04-Mj shots, Cr684
Features: Laser sight, optic sight, ruggedized weapon body (to grenade standard), RAM rifle grenade adapter

Combat Performance (in Atmosphere types 6, 7)

Weapon	*Mj*	*ROF (1/2)*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Mag (1/2)*	*Short Range*
8cm DEI Rifle-9	0.04	SA1/SA2	10-5-3-1	1-0-0-0	Nil	4	50/100*	160
	0.02	SA2/SA4	7-4-2-1	0-0-0-0	Nil	4	100/200	160
	0.02	2×3/4×3	4-2-1-1	0-0-0-0	Nil	4	100/200	160
	0.02	2×5/4×5	3-2-1-0	0-0-0-0	Nil	4	100/200	160
	0.02	2×10/4×10	2-1-1-0	0-0-0-0	Nil	4	100/200	160
	0.02	2×50/4×50	1-1-0-0	0-0-0-0	Nil	4	100/200	160

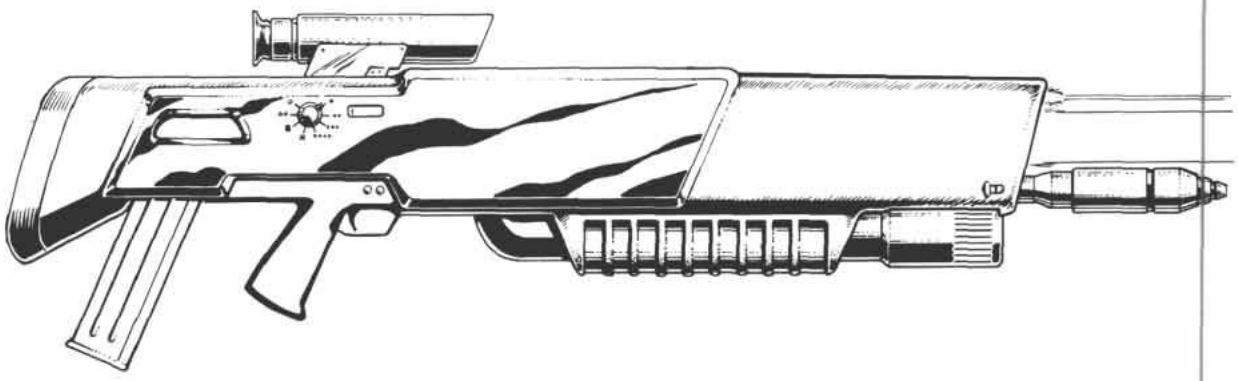
Mj column shows the discharge energy of the shot (either single pulse or total energy of all pulses in a burst) in megajoules. Notations 1/2 above in the *ROF* and *Mag* columns are for power packs 1 and 2. Each multi-pulse burst consumes the same amount of energy as a 0.01 Mj single-pulse shot.

*Note that each 0.04-Mj shot consumes the equivalent energy of two 0.02-Mj shots for purposes of keeping track of power expenditure.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
8cm DEI Rifle-9	300	S-S-S-S	S-S-S-S	S-S-M-L	S-M-L-E	M-L-E-W	L-E-W-0 (80)	0-0-0-0 (20)

Security Clearance
Yes No
28-IX-1201
Date



CHEMICAL LASERS

The basic functioning of chemical lasers has already been described on page 89.

Chemical lasers have a base rate of CLCs which they may fire each combat turn, which is shown as the SA rate of fire. Each CLC expended is called a "shot." SA3 means three CLCs or shots may be fired per turn, SA5 is five per turn, etc. The energy in these shots may be expended at different rates of fire (ROF): as a single powerful pulse (SAN, where N is the number of shots that can be fired per turn), a three-pulse burst (N×3), a five-pulse burst (N×5), a 10-pulse burst (N×10), or a 50-pulse burst (N×50). All shots fired during the same combat turn must be at the same ROF. The ROF may be changed at the beginning of each combat turn at no action cost.

Most of the CLC lasers in this book are fitted with integral laser sights (see **TNE**, page 275) which are powered by batteries, and thus do not require the expenditure of a laser cartridge. The range of all of these laser sights is 240 meters.

TL-13 4cm Chemical Cartridge Laser Rifle

The 4cm laser rifle is the standard laser weapon used by Coalition troops. Like all laser weapons, it has penetration shortcomings, so its use is based on tactical requirements. When expecting to encounter large numbers of unarmored or partially armored troops, lasers are unsurpassed for their high automatic rates of fire and antipersonnel damage capabilities. On the other hand, in a situation where armored troops are expected, lasers are usually traded for ACRs, gauss weapons, or in extreme cases, plasma or fusion weapons.

Focal Array Diameter: 4 cm
Weapon Length: 78.47 cm
Pulse Discharge Energy: 0.04 Mj (SA3), 0.0133 Mj (3×3), 0.008 Mj (3×5), 0.004 Mj (3×10), 0.0008 Mj (3×50)
Weapon Specifications: 8.87 kg empty, 10.71 kg with full 10-round magazine, 11.51 kg with full 15-round magazine, Cr8800 weapon only
Cartridge Specifications: "16×48 CLC," actual dimensions 16.2×48.6mm Chemical Laser (0.2 Mj), 0.1 kg, Cr6 each
Magazine Specifications: 10-round box magazine: 0.84 kg empty, 1.84 kg with 10 rounds 16×48 CLC, Cr9 empty, Cr69 fully loaded with 10 rounds 16×48 CLC

15-round box magazine: 1.14 kg empty, 2.64 kg with 10 rounds 16×48 CLC, Cr12 empty, Cr102 fully loaded with 15 rounds 16×48 CLC
Features: Laser sight, Optic sight, ruggedized weapon body (to grenade standards), RAM rifle grenade adapter

Combat Performance (in Atmosphere types 6, 7)

Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
4cm CLC Rifle-13	SA3	10-10-7-3	2-1-0-0	Nil	5	10/15*	300 (260)
	3×3	6-6-4-2	1-1-0-0	Nil	5	10/15*	300 (260)
	3×5	5-5-3-2	1-0-0-0	Nil	5	10/15*	300 (260)
	3×10	3-3-2-1	1-0-0-0	Nil	5	10/15*	300 (260)
	3×50	1-1-1-1	0-0-0-0	Nil	5	10/15*	300 (260)

*One CLC cartridge is used per SA shot or per burst, not one cartridge per pulse in the burst.
Parenthetical figure in Short Range column is the unrounded iron sight short range.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
4cm CLC Rifle-13	300	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-M	S-M-L-E	S-L-E-W (150)	W-X-0-0 (30)

CLC Lasers

TL-13 3cm Chemical Cartridge Laser Carbine

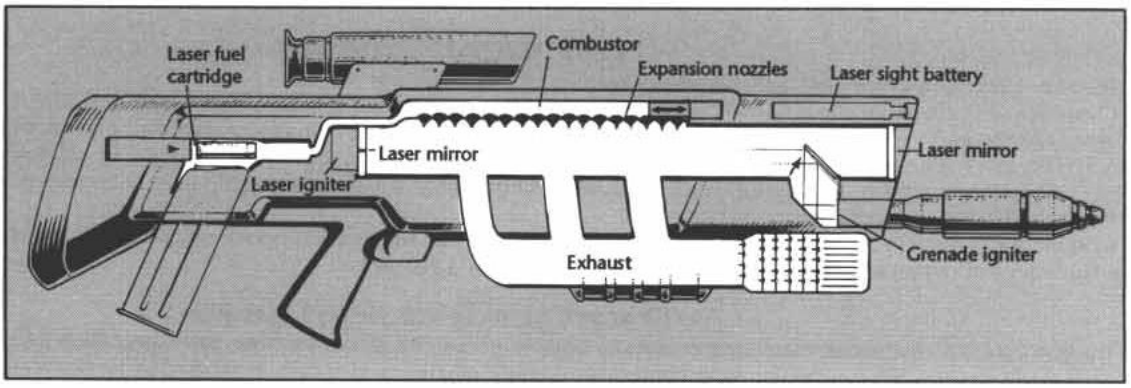
The CLC laser carbine is a lighter, cheaper, lower performance version of the laser rifle on page 94. While it is intended for use by support troops who do not have the need for the punch of the full-size rifle, it is most often used as a combat rifle by armed forces intent on economizing.

It may fire three shots per combat turn.

This carbine is built in the Reformation Coalition using TL-13 parts imported from the Hivers, including the focal array and laser cartridges.

Like all CLC lasers, laser carbines have a chemical purge system (illustrated below). The purpose of this purge system is two-fold: to eliminate the thermal and sound signatures of an open evacuator, and to neutralize the highly toxic chemical byproducts of the chemical laser process. During the evacuation cycle, which is continuous throughout the pulse generation period, the spent chemical gases are drawn from the combustion chamber into a receiving cannister. On some CLC laser designs, this cannister is called a purge can, and is disposable. Once it is filled with spent chemicals, the cannister is discarded and replaced with another. Some of these purge cannisters contain catalysts to detoxify the chemicals, while some purge cans merely hold the poisonous material until it eventually corrodes its way out, years or decades later.

More advanced designs, including all of those manufactured by the Coalition, use a safer and more convenient method. The spent chemical gas is pumped into a multi-stage catalyst cannister. Here, the evacuation cycle of each succeeding shot pushes the spent gas farther forward through one-way valves into successive cells of the cannister where catalysts render it non-toxic and it is cooled to the background temperature. The harmless gas is eventually vented out of the end of the cannister, at the front of the rifle, once it has cooled to the point that it no longer presents a thermal signature. The catalysts in the cannister need to be replenished periodically, and this is done as part of the normal field stripping/servicing procedure.



Focal Array Diameter: 3cm

Weapon Length: 64.32 cm

Pulse Discharge Energy: 0.02 Mj (SA3), 0.00667 Mj (3×3), 0.004 Mj (3×5), 0.002 Mj (3×10), 0.0004 Mj (3×50)

Weapon Specifications: 4.78 kg empty, 5.7 kg with full 10-round magazine, 6.1 kg with full 15-round magazine, Cr4650 weapon only

Cartridge Specifications: "13×39 CLC," actual dimensions 12.86×38.6 mm Chemical Laser (0.1 Mj), 0.05 kg, Cr3 each

Magazine Specifications: 10-round box magazine: 0.42 kg empty, 0.92 kg with 10 rounds 13×39 CLC, Cr5 empty, Cr35 fully loaded with 10 rounds 13×39 CLC

15-round box magazine: 0.57 kg empty, 1.32 kg with 15 rounds 13×39 CLC, Cr6 empty, Cr51 fully loaded with 15 rounds 13×39 CLC

Features: Laser sight, optic sight, ruggedized weapon body (to grenade standard), RAM rifle grenade adapter

Combat Performance (in Atmosphere types 6, 7)

Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
3cm CLC Carbine-13	SA3	7-5-3-1	1-0-0-0	Nil	4	10/15*	300 (260)
	3×3	4-3-2-1	0-0-0-0	Nil	4	10/15*	300 (260)
	3×5	3-2-1-1	0-0-0-0	Nil	4	10/15*	300 (260)
	3×10	2-2-1-0	0-0-0-0	Nil	4	10/15*	300 (260)
	3×50	1-1-0-0	0-0-0-0	Nil	4	10/15*	300 (260)

*One CLC cartridge is used per SA shot or per burst, not one cartridge per pulse in the burst.

Parenthetical figure in Short Range column is the iron sight short range.

Atmospheric Adjustments (see page 89 for instructions)

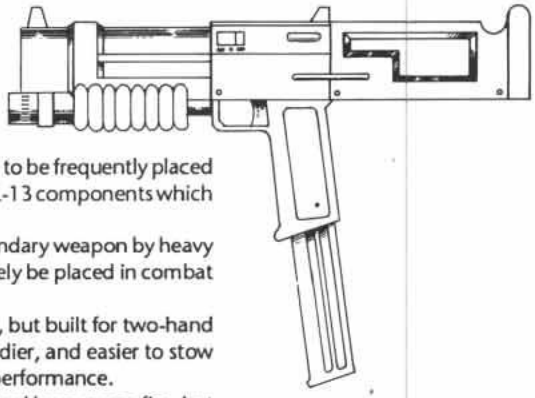
Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
3cm CLC Carbine-13	300	S-S-S-S	S-S-S-S	S-S-S-M	S-S-M-L	S-M-L-E	M-L-E-W (150)	W-0-0-0 (30)

Security Clearance

Yes No

28-IX-1201

Date



TL-13 2cm Chemical Cartridge Laser Pistol and 2cm Personal Defense Laser (PDL)

The 2cm laser pistol is a standard laser sidearm used by personnel who are not intended to be frequently placed in combat. Like the other TL-13 laser weapons produced by the Coalition, it requires key TL-13 components which are imported from the Hivers, such as its focal array and ammunition cartridges.

The PDL is a standard lightweight laser used by officers and vehicle crews, and as a secondary weapon by heavy weapons crews or equipment operators. These are personnel who are expected to routinely be placed in combat situations where the 2cm laser pistol's range is insufficient.

The PDL is a redesigned 2cm CLC laser pistol, using the same laser "guts" as the pistol, but built for two-hand firing, ruggedized for harder use, and with a greater magazine capacity. It is lighter, handier, and easier to stow than the TL-13 CLC laser carbine, although it naturally has significantly lower combat performance.

Because it is essentially the laser version of a submachinegun, it is not intended for aimed long-range fire, but for use at short ranges, primarily "spraying" at high pulsed rates of fire.

Unlike the pistol, the PDL has no optic sights, and its short range is actually "de-rated" from 260 to 200 meters in order to take full advantage of its effective range.

The PDL is ruggedized to melee standards not in order to have a bayonet lug (it doesn't), but because the weapon is expected to take a good deal of abuse by being tossed into vehicles, banged by ammo boxes and tripods, etc.

TL-13 2cm Chemical Cartridge Laser Pistol

Focal Array Diameter: 2cm
Total Weapon Length: 42.43 cm
Pulse Discharge Energy: 0.01 Mj (SA3), 0.0033 Mj (3×3), 0.002 Mj (3×5), 0.001 Mj (3×10), 0.0002 Mj (3×50)
Weapon Specifications: 2.64 kg empty, 3.26 kg with full 14-round grip magazine, Cr2535 weapon only
Cartridge Specifications: "10×30 CLC," actual dimensions 10.2 × 30.6 mm Chemical Laser (0.05 Mj), 0.025 kg, Cr1.5 each
Magazine Specifications: 14-round grip type, 0.27 kg empty, 0.62 kg with 14 rounds 10×30 CLC, Cr3 empty, Cr24 fully loaded with 14 rounds 10×30 CLC
Features: Laser sight, Optic sight, ruggedized weapon body (to grenade standards)

TL-13 2cm Chemical Cartridge Personal Defense Laser (PDL)

Focal Array Diameter: 2cm
Total Weapon Length: 49.4 cm
Pulse Discharge Energy: 0.01 Mj (SA3), 0.0033 Mj (3×3), 0.002 Mj (3×5), 0.001 Mj (3×10), 0.0002 Mj (3×50)
Weapon Specifications: 2.82 kg empty, 3.88 kg with full 25-round magazine, Cr2398 weapon only
Cartridge Specifications: "10×30 CLC," actual dimensions 10.2 × 30.6 mm Chemical Laser (0.05 Mj), 0.025 kg, Cr1.5 each
Magazine Specifications: 25-round extended grip type, 0.435 kg empty, 1.06 kg with 25 rounds 10×30 CLC, Cr5 empty, Cr42.5 fully loaded with 25 rounds 10×30 CLC
Features: Laser sight, double-ruggedized weapon body (to melee standards)

Combat Performance (in Atmosphere type 6, 7)

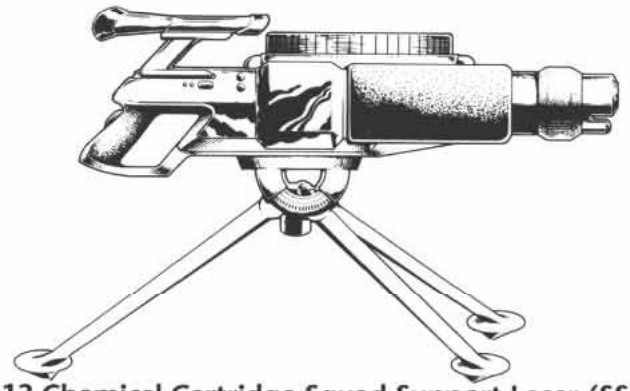
Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
2cm CLC Pistol-13	SA3	5-5-3-1	1-0-0-0	Nil	2	14*	90
	3×3	3-3-2-1	0-0-0-0	Nil	2	14*	90
	3×5	2-2-1-1	0-0-0-0	Nil	2	14*	90
	3×10	2-2-1-0	0-0-0-0	Nil	2	14*	90
	3×50	1-1-0-0	0-0-0-0	Nil	2	14*	90
2cm CLC PDL-13	SA3	5-3-1-1	1-0-0-0	Nil	3	25*	200
	3×3	3-1-1-0	0-0-0-0	Nil	3	25*	200
	3×5	2-1-1-0	0-0-0-0	Nil	3	25*	200
	3×10	2-1-0-0	0-0-0-0	Nil	3	25*	200
	3×50	1-0-0-0	0-0-0-0	Nil	3	25*	200

*One CLC cartridge is used per SA shot or per burst, not one cartridge per pulse in the burst.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
2cm CLC Pistol-13	90	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-M	S-M-L-E	S-L-E-W (50)	W-0-0-0 (10)
2cm CLC PDL-13	200	S-S-S-S	S-S-S-S	S-S-S-M	S-S-M-L	S-M-L-E	M-L-E-0 (100)	W-0-0-0 (20)

Laser Heavy Weapons



TL-13 Chemical Cartridge Squad Support Laser (SSL)

The TL-13 Squad Support Laser (SSL) is a powerful heavy infantry weapon used by RC ground forces. Because it uses technologies above the current manufacturing capabilities of RC worlds, it is manufactured using crucial internal components purchased from the Hivers, such as its focal array and the chemical cartridges themselves.

The SSL is heavy, and, when not vehicle mounted, requires a crew of three due to the weight of its components. One crewmember carries the laser (59 kg), one carries the ammunition box (73 kg), and one carries the tripod (66 kg). Once the laser is set up, one crew serves as the gunner, another as the spotter, and another as security/ammunition runner.

There is also a special version of the SSL used in an integral mount on the right shoulder of the Schalli battle dress (page 23). The SBD version of the SSL is used with a 50-round magazine as shown below.

The SSL also comes in a vehicle-mounted version without the pistol grip, laser and optical sights, and built for use with cassette-fed ammo for Cr57,360. This weapon is fitted in a standard remote turret with TL-12 fire control, and ballistic computers, a 2000-round cassette, and advanced stabilization with firing characteristics identical to those below (plus the 4 Diff Mod ballistic computer bonus). This installation, including the fire control components at the gunner's remote station masses 1.18877 tonnes, has a volume of 4.1277 cubic meters, and costs Cr244,895 exclusive of ammo (full load of 2000 rounds costs Cr54,000). See page 138 for a starship installation.

Focal Array Diameter: 6cm
Weapon Length: 132.13 cm
Pulse Discharge Energy: 0.18 Mj (SA5), 0.06 Mj (5x3), 0.036 Mj (5x5), 0.018 Mj (5x10), 0.0036 Mj (5x50)
Weapon Specifications: 59.39 kg empty, 132.47 kg with full 100-round box magazine, 198.72 kg mounted on tripod, 96.47 in Schalli battle dress configuration with full 50-round box magazine, Cr57,835 weapon only
Cartridge Specifications: "27x80 CLC," actual dimensions 26.7x80.2mm Chemical Laser (0.9 Mj), 0.45 kg, Cr27 each
Magazine Specifications: 100-round box magazine: 28.08 kg empty, 73.08 kg with 100 rounds 27x80 CLC, Cr280 empty, Cr2981 fully loaded with 100 rounds 27x80 CLC
50-round box magazine (used with integral SSL mounted on Schalli battle dress only): 14.58 kg empty, 37.08 kg with 50 rounds 27x80 CLC, Cr146 empty, Cr1496 fully loaded with 50 rounds 27x80 CLC
Tripod Specifications: 66.25 kg, Cr763
Features: Laser sight, Optic sight, ruggedized weapon body

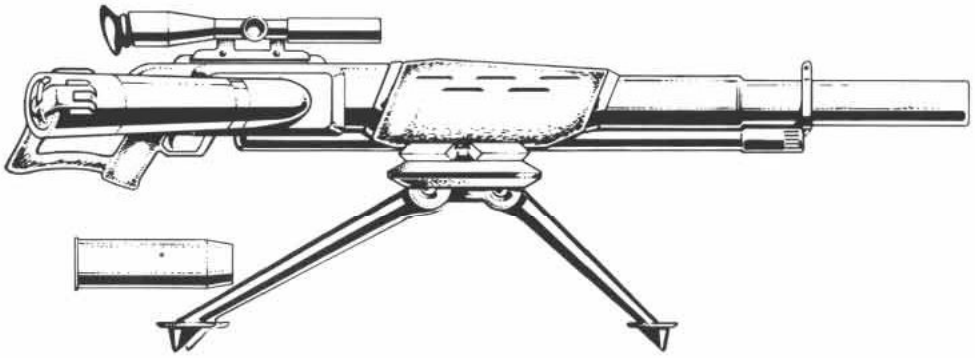
Combat Performance (in Atmosphere types 6, 7)

Weapon	*ROF*	*Dam Dice (S-M-L-E)*	*Dam Dice (W-X-Y-Z)*	*Pen Rtg*	*Bulk*	*Magazine*	*Short Range*
6cm CLC SSL-13	SA5	21-21-21-16	8-4-2-1	Nil	8	100*	300
	5x3	12-12-12-9	5-2-1-1	Nil	8	100*	300
	5x5	10-10-10-7	4-2-1-1	Nil	8	100*	300
	5x10	7-7-7-5	3-1-1-0	Nil	8	100*	300
	5x50	3-3-3-2	1-1-0-0	Nil	8	100*	300

*One CLC cartridge is used per SA shot or per burst, not one cartridge per pulse in the burst.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
6cm CLC SSL-13	300	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-S	S-M-L-E	S-S-E-W (150)	W-X-Y-Z (30)



TL-13 Chemical Cartridge Laser Sniper Weapon (LSW)

More commonly called the "laser can opener," the LSW is a specialized heavy infantry weapon used for taking out lightly armored targets at long ranges. Although it is capable of penetrating light battle dress at reasonable ranges, its intended use is the destruction of enemy sensors, communications antennae, etc., at long ranges.

The LSW's feed mechanism is a single-shot, manually operated breech, and is a modified version of a vehicle-mounted autoloading action. The weapon's listed ROF of 1/4 means one shot every four turns, whether at full strength or a 3-, 5-, 10-, or 50-pulse burst. Four reloading actions are required to prepare for the next shot (usually two each performed by the gunner and loader), assuming that ammunition is stored close at hand.

When ground mounted, the LSW has a crew of three; gunner, loader, and ammunition carrier. When the laser is being moved, the gunner and loader carry the weapon itself, and the ammo carrier carries five or more rounds. Because of the difficulty in man-packing enough ammunition for long engagements, the weapon is usually vehicle mounted. In RC service, the loader and ammunition carrier are each secondarily armed with a personal defense laser (page 95).

The LSW's body is not ruggedized, and hence cannot stand up to careless or abusive treatment.

Focal Array Diameter: 6 cm
Weapon Length: 152.59 cm
Pulse Discharge Energy: 3.6 Mj (1/4), 1.2 Mj (1/4x3), 0.72 Mj (1/4x5), 0.36 Mj (1/4x10), 0.072 Mj (1/4x50)
Weapon Specifications: 90.69 kg empty, 99.69 kg with a loaded cartridge, 140.69 kg empty mounted on tripod, 149.69 kg with a loaded cartridge mounted on a tripod, Cr54,815 weapon only
Cartridge Specifications: "7.2 cm CLC," actual dimensions 72x221mm Chemical Laser (0.9 Mj), 9 kg, Cr540 each
Magazine Specifications: No magazine, each round loaded individually
Tripod Specifications: 50 kg, Cr600
Features: Electronic sight

Combat Performance (in Atmosphere types 6, 7)

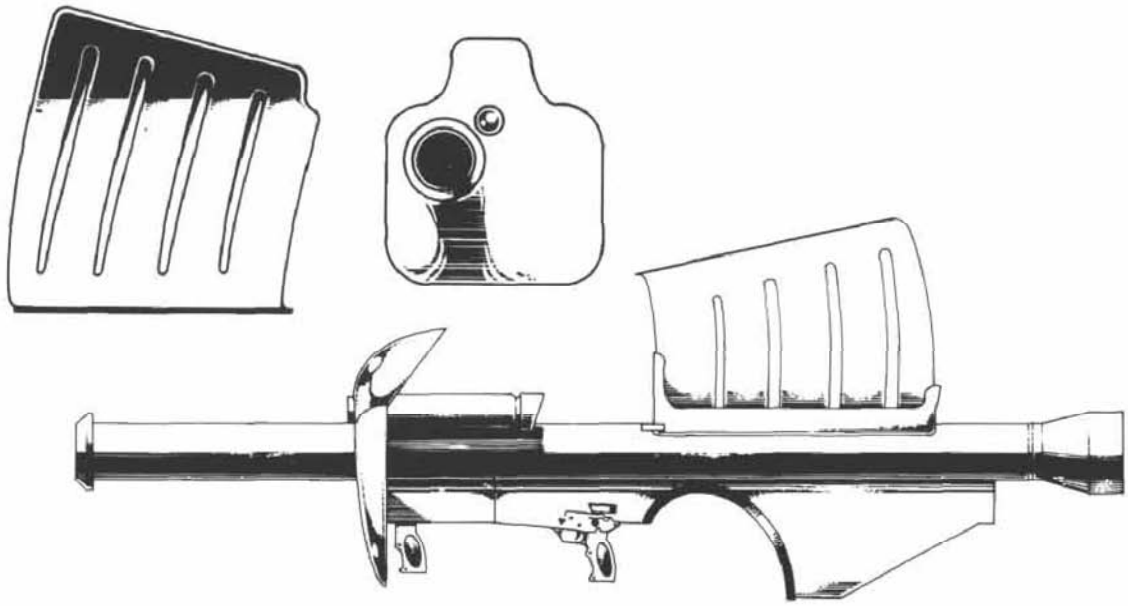
Weapon	*ROF*	*Dam Val (S-M-L-E)*	*Dam Val (W-X-Y-Z)*	*Pen Rtg (S-M-L-E)*	*Pen Rtg (W-X-Y-Z)*	*Damage Dice* (S-M-L-E-W-X-Y-Z)*	*Bulk*	*Mag*	*Range*
6 cm CLC LSW-13	1/4	5-5-5-4	2-Nil-Nil-Nil	1/2-1/2-1/2-1	1-Nil-Nil-Nil	95-95-95-71-36-18-9-4	10	SS**	300
	1/4x3	3-3-3-2	Nil	1-1-1-1	Nil	55-55-55-41-21-10-5-3	10	SS**	300
	1/4x5	2-2-2-2	Nil	1-1-1-1	Nil	42-42-42-32-16-8-4-2	10	SS**	300
	1/4x10	Nil	Nil	Nil	Nil	30-30-30-23-14-6-3-1	10	SS**	300
	1/4x50	Nil	Nil	Nil	Nil	13-13-13-10-5-3-1-1	10	SS**	300

*Listed Damage Dice are for direct hits on personnel or animal targets without first penetrating armor. When penetrating armor, lasers spend points of *damage value* to achieve penetration. After determining the amount of damage value expended in penetrating the armor, multiply the remaining damage value by 25. This is the number of *damage dice* applied against the target.

**One CLC cartridge is used per SA shot or per burst, not one cartridge per pulse in the burst.

Atmospheric Adjustments (see page 89 for instructions)

Weapon	*SR*	*Vacuum*	*Trace*	*VThin*	*Thin*	*Standard*	*Dense*	*Exotic*
6 cm CLC LSW-13	300	S-S-S-S	S-S-S-S	S-S-S-S	S-S-S-S	S-M-L-E	S-S-E-W (150)	W-X-Y-Z (30)



TL-10 6cm Assault Rocket Launcher

The assault rocket launcher (ARL) is a shoulder-fired infantry support weapon that fires a variety of 6cm direct fire rockets. Like the plasma bazooka from the same tech level (page 85), the ARL is manufactured primarily for use by RC-supported "Bootstrap" forces.

As the ARL is merely a rocket-launching tube with a box magazine-fed autoloader on top of it, it generates no recoil. However, the backblast from the rocket motor generates a distinctive and easily observed visual and thermal signature, and makes it impractical for firing from enclosed structures.

The weapon comes with simple optical sights, and the range listed is its maximum achievable range, as free-flight unguided rockets are only so accurate. Laser or electronic sights (to enable night vision) can be fitted at additional cost.

By mounting multiple ARLs in the back of a small vehicle, such as a range truck or air raft, field-expedient rocket artillery launchers may be created.

Weapon Caliber: 6cm
Weapon Length: 190 cm
Weapon Specifications: 6 kg empty, 18.32 kg with full 4-round magazine, 22.8 kg with full 6-round magazine, Cr210 weapon only
Round Specifications: 6cm high-velocity rocket, 1.4 kg, 49.5 cm long; Price varies by type: HE = Cr12.4; HEAP = Cr18.4; WP = Cr24.4; Flechette = Cr60.4
Magazine Specifications: 4-round box magazine: 6.72 kg empty, 12.32 kg loaded with 4 rockets, Cr68 empty, loaded price varies with ammunition type
6-round box magazine: 8.4 kg empty, 16.8 kg loaded with 6 rockets, Cr84 empty, loaded price varies with ammunition type
Features: Optic sight

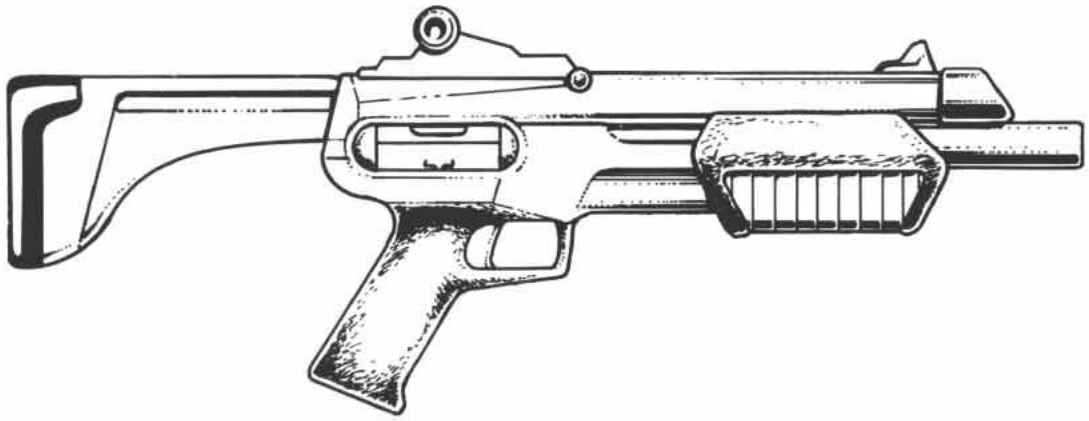
The table below shows the combat values for the types of rockets that may be fired by the 6cm ARL-10. *Con-Brst* is the warhead's concussion and burst values, *Pen Val* is the warhead's penetration value, *Dngr Spc* is the width×length of the flechette primary danger space in meters, *Dam Val* is the damage value of flechettes in the primary/secondary danger space, and *Pen Rtg* is the penetration rating of flechettes in the primary/secondary danger space.

SR is direct fire short range in meters, *IFR* is maximum indirect fire range in kilometers.

Weapon	*ROF*	*Con-Brst*	*Pen Val*	*Dngr Spc*	*Dam Val*	*Pen Rtg*	*Bulk*	*Mag*	*SR*	*IFR*
6cm HE	1*	9-35	2C	—	—	—	12	4	200	23
6cm HEAP	1*	6-25	6SC	—	—	—	12	4	200	23
6cm WP	1*	2-15	Nil	—	**	—	12	4	200	23
6cm Flechette	1*	—	Nil	10×50	2D6/1D6	1/Nil	12	4	200	23

*One shot per combat turn, not per fire action.
See burns, **TNE page 286.

Security Clearance
Yes No
28-IX-1201
Date



2.5cm Low-Velocity Grenade Launcher

This weapon was designed first and foremost as an integral part of the 5.5mm assault rifle (discussed on pages 52-53), using a pre-Collapse round. It was a simple design step, however, to add a folding stock and issue the weapon separately.

At present, only two types of rounds are manufactured, HE and HEAP, as these are the two most useful in such a small grenade.

When attaching this weapon to another rifle, the shoulder stock is removed. Data for this variant is provided separately.

Shoulder-Fired 2.5cm Low-Velocity Grenade Launcher

TL: 10
Ammo: 2.5 cm low-velocity propelled grenades
Average Muzzle Energy: 253 joules
Weapon Length: 42.5/62.5 cm
Weapon Weight: 3.45 kg (loaded), 3 kg (empty)
Weapon Price: Cr550
Magazine: 5-round internal tubular magazine
Grenade Price: Cr0.9 (HE), Cr1.35 (HEAP)
Grenade Weight: 90 grams each
Features: Folding stock

Attached 2.5cm Low-Velocity Grenade Launcher

Where the data duplicates the shoulder-fired version, it is omitted
Weapon Length: 37.5 cm
Weapon Weight: 2.95 kg (loaded), 2.5 kg (empty)
Weapon Price: Cr500
Features: None

2.5cm Low-Velocity GL

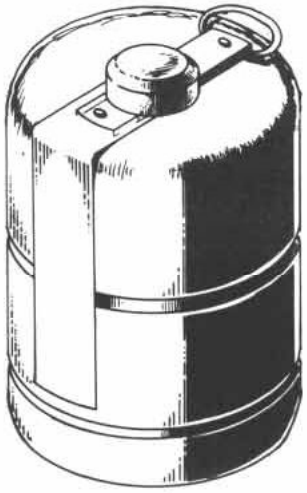
Type	*Range*	*IFR*	*Damage*	*Pen Val*	*Bulk*	*Magazine*	*Recoil**
2.5cm HE	100	400	C: 2, B: 15	Nil	2/4	Si	1
2.5cm HEAP	100	400	C: 1, B: 5	23C	2/4	Si	1

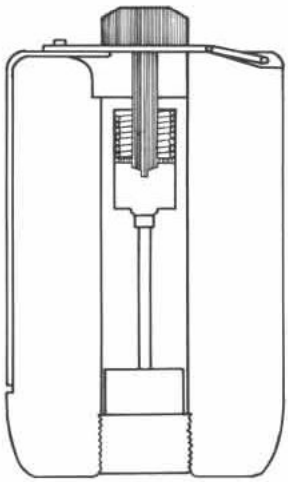
*Recoil when fired separately or when attached to any rifle.

Effects on Recoil of Other Weapons

The 2.5cm grenade launcher may be attached to any weapon with a barrel 37.5cm or longer. The following weapons have the recoils noted below when the 2.5cm GL is attached:

4mm Gauss Rifle: Ball, DS, HE, & HEAP: SS:1 Burst 4/7; Tranq: SS: 1 Burst 3/6
5mm Assault Rifle: Ball, DS, HE, & HEAP: SS:2, Burst 1; Tranq: SS: 2, Burst: 4
7mm ACR: Ball, DS, HE, & HEAP: SS:1, Burst, 2; Tranq: SS: 1, Burst 2
7mm Assault Rifle: Ball, DS, HE, & HEAP: SS: 2, Burst: 5; Tranq: SS: 2, Burst: 4
7mm Auto Rifle: Ball, DS, HE, & HEAP: SS:3, Burst 7; Tranq: SS: 3, Burst 6
7mm TL-5 Rifle Mil & Civ: Ball, DS, HE, & HEAP: SS: 3, Burst —; Tranq: SS: 3, Burst —
9mm TL-7 Rifle: Ball, DS, HE, & HEAP: SS:3 Burst: —; Tranq: SS: 3, Burst —





GRENADES AND PYROTECHNIC SIGNALS

Hand Grenades

Hand grenades are small portable explosive or pyrotechnic devices primarily designed to be thrown. Hand grenades are present on all worlds with tech levels sufficient to manufacture them. Range and deviation of thrown weapons are discussed on **TNE**, page 282.

HE/Frag: These grenades are the most common, and are designed to inflict damage by throwing fragments in all directions.

HEAP: HEAP hand grenades are designed to penetrate armor by means of a shaped charge, and usually have fins, a streamer, or some other form of stabilization to ensure that the warhead lands in the proper orientation with relation to the target.

Chem: These grenades do damage by dispersal of a chemical agent rather than by explosive power. The effects of various chemicals used in them are discussed in the chemical warfare rule (**TNE**, page 306).

WP/IS: These grenades are filled with compounds which release clouds of smoke when ignited. IS comes in various colors (red, green, yellow, purple, and white), WP comes only in white. All of these grenades are a source of ignition, and WP grenades throw burning fragments (see Burns, **TNE**, pages 286-287).

ILLUM: ILLUM grenades produce a very bright light, but unlike propelled ILLUM rounds, they are not launched into the air, but remain where they land. They light up a smaller area than airburst pyrotechnics.

Concussion: Concussion grenades are specialized versions of HE grenades designed to have a more powerful explosion but no lethal fragmentation.

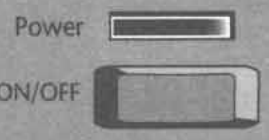
Thermite: These are extremely hot incendiary grenades designed for destruction of equipment such as artillery tubes or vehicle engines. Thermite grenades generate enough heat to melt most metals after a few seconds of contact and actually produce small streams of molten iron as their filler burns. They are a source of ignition, and throw burning fragments like WP grenades (see Burns, **TNE**, pages 286-287).

Mass: 0.35 kg (all types)
Price: HE/Frag: Cr3.5
HEAP: Cr5.25
Chem: Cr3.5
WP/IS: Cr7
ILLUM: Cr3.5
Concussion: Cr3.5
Thermite: Cr3.5

Hand Grenades

Type	*Range*	*Dam*	*Pen Val.*
HE/Frag, TLs 4-5	*	C: 2, B: 5	Nil
HE/Frag, TLs 6-7	*	C: 3, B: 15	Nil
HE/Frag, TLs 8-9	*	C: 4, B: 15	Nil
HE/Frag, TL 10+	*	C: 5, B: 15	Nil
HEAP, TL 5	*	C: 2, B: 5	11C
HEAP, TL 6	*	C: 2, B: 5	20C
HEAP, TL 7	*	C: 2, B: 5	29C
HEAP, TL 8	*	C: 3, B: 5	38C
HEAP, TLs 9+	*	C: 3, B: 5	47C
Chem TLs 4+	*	C: 2, B: 3	Nil
WP/IS	*	C: 2, B: 5	Nil
ILLUM, TLs 4-5	*	C: 0, B: 65	Nil
ILLUM, TLs 6-7	*	C: 0, B: 95	Nil
ILLUM, TLs 8-9	*	C: 0, B: 125	Nil
ILLUM, TLs 10+	*	C: 0, B: 165	Nil
Concussion, TLs 4-5	*	C: 3, B: 0	Nil
Concussion, TLs 8-9	*	C: 6, B: 0	Nil
Concussion, TLs 10+	*	C: 8, B: 0	Nil
Thermite, TLs 4+	*	C: 2, B: 5	Nil

* See Thrown Weapons (**TNE**, page 282) for range and deviation.

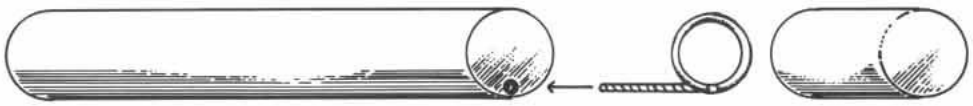


Pyrotechnic Signals

Flare: These devices are ignited to produce an intense, extremely bright light and are used for signaling and illumination. The user removes a safety cap, pulls the ignition pin, and the flare ignites a few seconds later. Flares manufactured before TL-8 are a source of ignition and burn for 30 seconds (6 turns), during the last half of which they inflict damage on the person holding them (in the relevant arm). These flares inflict burn damage as if they were a single WP fragment. At TL-8 and after, flares are manufactured based on cold-light technology, and are no longer sources of burn damage or ignition, but are otherwise identical to earlier flares.

Flares illuminate an area depending upon their tech level, as noted by the following table.

TL	*Diameter of Area Illuminated*
4-5	15 m
6-7	15 m
8-9	25 m
10+	35 m

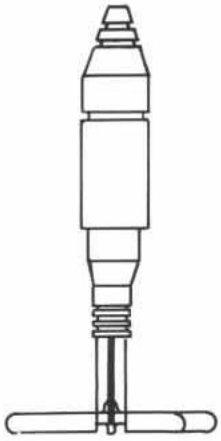


Starburst: Sometimes called parachute flares, these signals contain a small rocket charge to launch the signal skyward, where it deploys a small parachute before it ignites. The signal then drifts to the ground over a period of 30 seconds (6 turns), at which point it is extinguished. Otherwise, starbursts are identical to flares (they become cold-light at TL-8, etc.), except that the diameter of the area they illuminate is increased, as noted on the following table. Starbursts are normally launched from the hand by pulling a firing lanyard (directing the business end upwards).

TL	*Diameter of Area Illuminated*
4-5	25 m
6-7	35 m
8-9	50 m
10+	65 m

4cm RAM Grenades

These are described in the basic rules, page 357. RAM and rifle grenades below were used almost universally in the Imperium, and are widely distributed in the new era, used in the Wilds and by the Coalition.



Mass: 0.48
Price: HE: Cr48, HEAP: Cr72, APERS: Cr240, CHEM: Cr48, WP/IS: Cr96, ILLUM: Cr48.

Type	*Range*	*IFR*	*Damage*	*Pen Val*
4cm RAM HE-8	30	500	C: 3, B: 15	Nil
4cm RAM HEAP-8	30	500	C: 2, B: 5	33C
4cm RAM APERS (Flechette)-8	30	500	C: *, B: 6	Nil
4cm RAM CHEM-8	30	500	C: 2, B: 3	Nil
4cm RAM WP/IS-8	30	500	C: 2, B: 5	Nil
4cm RAM ILLUM-8†	30	500	C: 0, B: 195	Nil
4cm RAM HE-9	40	550	C: 3, B: 15	Nil
4cm RAM HEAP-9	40	550	C: 2, B: 5	41C
4cm RAM APERS (Flechette)-9	40	550	C: *, B: 8	Nil
4cm RAM CHEM-9	40	550	C: 2, B: 3	Nil
4cm RAM WP/IS-9	40	550	C: 2, B: 5	Nil
4cm RAM ILLUM-9†	40	550	C: 0, B: 195	Nil

• 2D6 in primary radius, 1D6 in secondary radius. Flechette penetration is for the whole round; should it strike an armored surface, penetration for the flechettes is as for normal fragments.

†RAM ILLUM rounds are parachute rounds with a duration of 30 seconds (6 combat turns).

Rifle Grenades (6cm), TL-5

The use of rifle grenades is explained on pages 280-282 of the basic game.

Mass: 1.5 kg
Price: HE: Cr15, HEAP: Cr22.5, Chem: Cr15, WP/IS: Cr30, ILLUM: Cr15.

Type	*IFR*	*Damage*	*Pen Val*
6cm RG-5 HE	*	C: 4, B: 15	2C
6cm RG-5 HEAP	*	C: 3, B: 15	17C
6cm RG-5 Chem	*	C: 2, B: 5	Nil
6cm RG-5 WP/IS	*	C: 2, B: 15	Nil
6cm RG-5 ILLUM	*	C: 0, B: 225	Nil

* Range varies with the damage value of the rifle or carbine firing the grenade.

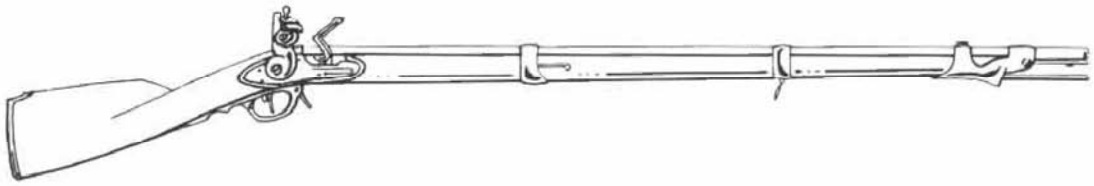
Rifle Grenade Range

Dam Val	*Indirect Fire Range*
2	123 m
3	158 m
4	193 m
5	228 m

LOW-TECH WEAPONS

The weapons on these two pages are representative of those in use on the deeply regressed worlds of the Wilds. These are the only pieces of equipment in this book that were not designed with the **Fire, Fusion, & Steel** design sequences. They were designed using the black-powder weapons and bow design sequences in the **World Tamer's Handbook**.

The "Reload" column in the combat performance tables shows the number of *actions* (not turns, i.e., high-Initiative characters can perform more than one action per combat turn) required to reload the weapon. The tech level "3M" listed below indicates a *mature* TL-3 society which has more innovations available to it than one which has just barely crossed the TL-3 threshold.



Smoothbore Flintlock Musket

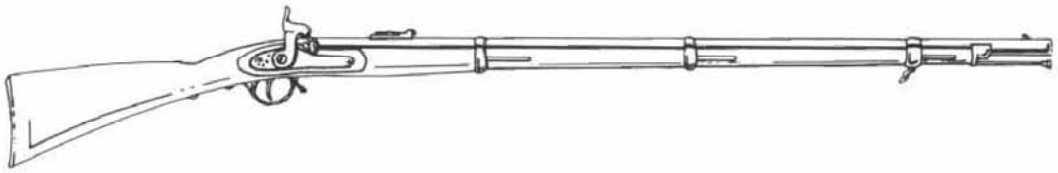
A flintlock uses a spring-loaded flint-and-steel striker to ignite the main powder charge in a gun barrel. The weapon illustrated is typical of numerous archaic designs in use on very low TL worlds, and in the hands of poorly equipped militias and insurgents on worlds with higher technology levels. Because of its short range and poor accuracy, smoothbore muskets are most effective when used by massed bodies of soldiers exchanging volley fire.

This weapon holds one individually loaded round inserted in the muzzle, and requires two actions to reload. If prepared paper cartridges are not available, the weapon may be loaded using loose powder and ball, but this takes one additional action.

TL: 3
Ammo: 18×52mm black powder and ball in paper cartridge
Muzzle Energy: 1446 joules
Weapon Length: 130 cm
Weapon Weight: 5.19 kg loaded, 5.15 kg empty

Weapon Price: Cr390
Magazine: None.
Ammunition Price: Cr0.4 (Ball)
Ammunition Weight: 40 grams per round
Features: Bayonet lug.

						— Recoil —		
Round	*Reload*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
18mm P&B	2	3	Nil	8	1i	1	—	30



Rifled Musket

Rifled muskets of the type illustrated are more advanced archaic firearms. Using a rifled barrel and a conical bullet, the rifle musket achieves greater range and damage than the smoothbore version, and the percussion cap ignition system results in fewer misfires. Soldiers using these weapons are able to make use of more modern tactics and need not resort to massed volleys (although the weapons are sometimes used in that fashion).

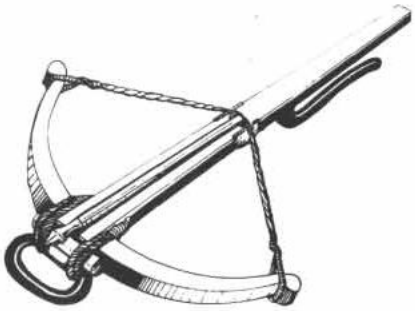
This weapon holds one individually loaded round inserted in the muzzle, and requires two actions to reload. If prepared paper cartridges are not available, the weapon may be loaded using loose powder and ball, but this takes one additional action.

TL: 3M
Ammo: 12×76mm black powder and ball in paper cartridge
Muzzle Energy: 2010 joules
Weapon Length: 110.8 cm
Weapon Weight: 4.41 kg loaded, 4.37 empty

Weapon Price: Cr560
Magazine: None.
Ammunition Price: Cr0.43 (Ball)
Ammunition Weight: 43 grams per round
Features: Bayonet lug.

						— Recoil —		
Round	*Reload*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
12mm P&B	2	3	1-Nil	7	1i	2	—	80

Light Crossbow



A crossbow is simply a bow fitted to a wooden stock (crosswise, hence the name), the string held in the cocked position by a simple latch and the projectile (called a bolt or quarrel) placed in a groove on the upper surface of the stock. The firer cocks the crossbow using a lever or handcrank, pulling the string back over the latch. A bolt can then be placed in the groove, and the bow held ready to fire for as long as desired. To fire, the archer simply takes aim and squeezes the firing lever or trigger.

Because of its design, the bow in a crossbow can be more powerful than an individual could otherwise use, and greater range can be achieved. Crossbows require more sophisticated construction techniques than simple bows.

TL: 2
Ammo: Bolt/quarrel
Weapon Length: 100 cm
Weapon Weight: 4 kg
Weapon Price: Cr275

Magazine: None.
Ammunition Price: Cr1
Ammunition Weight: 40 grams per bolt
Features: None.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
Bolt/quarrel	3	1	Nil	6	1i	5	—	40



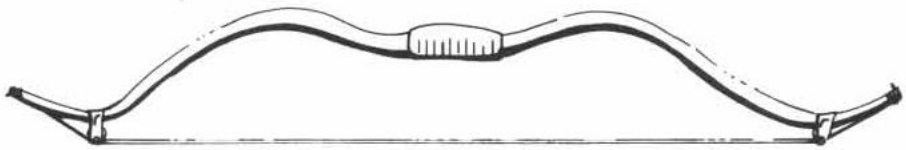
Short Bow

Archery is a common development on many primitive worlds, and this weapon is typical of the smaller, more compact weapons that can be encountered. The archer grasps the bow by the middle and nocks an arrow against the bowstring, where it can be held in place by finger-pressure until ready to fire. To fire, the archer draws the string back, takes aim and releases the arrow. Weapons of this type are handier when mounted on a riding animal, and are often used in such a fashion by warriors or hunters.

TL: 0
Ammo: Arrow
Weapon Length: 80 cm
Weapon Weight: 0.48 kg
Weapon Price: Cr80

Magazine: None.
Ammunition Price: Cr1
Ammunition Weight: 40 grams per arrow
Features: None.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
Arrow	1	-1	Nil	5	1i	3	—	20



Long Composite Bow

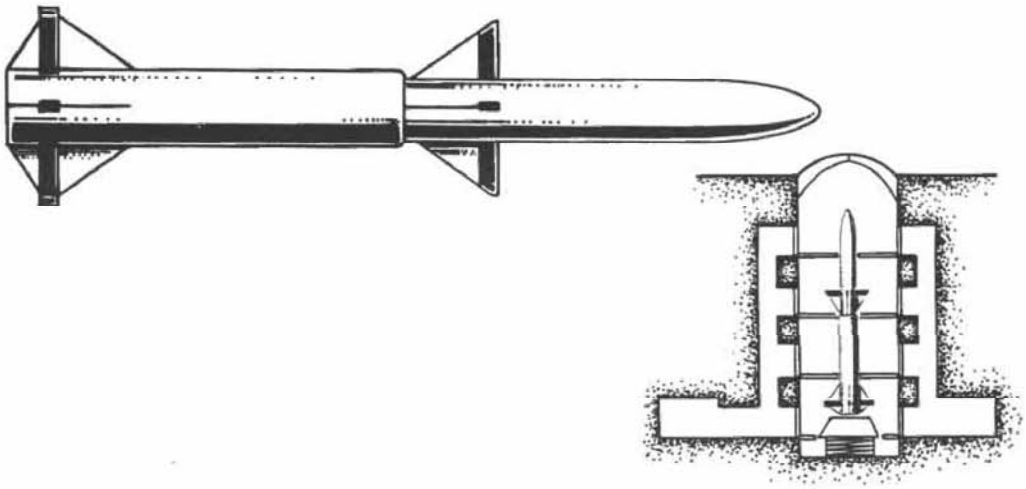
Composite bows are made by carefully shaping and gluing alternating layers of different materials together. Such bows are stronger than if constructed of either material alone, but require more sophistication in their manufacture and are considerably more expensive. Such bows are often constructed to an archer's special special size requirements, and are highly individualized.

TL: 1
Ammo: Arrow
Weapon Length: 150 cm
Weapon Weight: 1.05 kg
Weapon Price: Cr300

Magazine: None.
Ammunition Price: Cr1
Ammunition Weight: 40 grams per arrow
Features: None.

						— Recoil —		
Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*SS*	*Burst*	*Short Range*
Arrow	1	-1	Nil	10	1i	7	—	30

Aerospace Defense Missiles



Planetary Defense Missiles

Aerospace or planetary defense missiles (PDMs) are one of the primary components of any world's planetary aerospace defense system (PADS). Although in Imperial times these missiles were often emplaced off-world, such as on its moons, specially built space stations, asteroids in the trojan points, etc., PDMs encountered in the Wilds are almost always launched from the surface of a world (although they may still use surviving passive or active fire control or early warning sensors deployed in orbital arrays or on moons). Most of these missiles are emplaced in hardened bunkers or silos, making them difficult to destroy from orbit without coming within the PDM's range.

For purposes of determining range to spacecraft in planetary orbit, take the world's size code (from its UPP) and multiply by 20. The result is the altitude in kilometers of a standard orbit above that world. A high orbit, typically used by ships conducting planetary bombardment, is the world's size code times 100. For all non-gas giant worlds, these orbits fit comfortably within a single starship combat range band or **Brilliant Lances** hex.

A selection of representative PDMs from six different tech levels are provided below, and are a cross-section of the sorts of missiles that can be encountered in the Wilds.

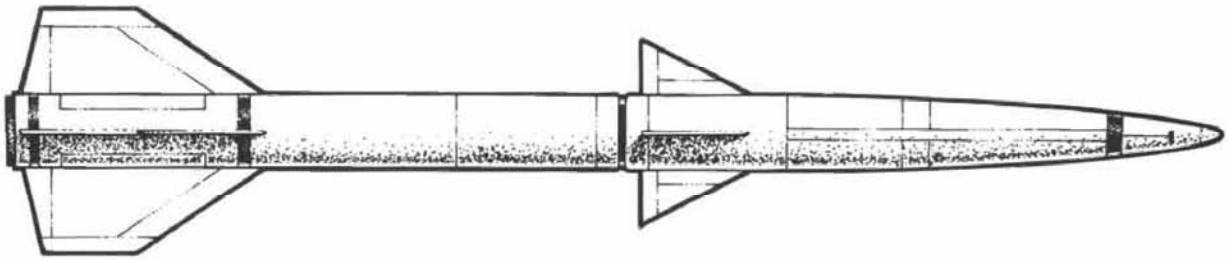
See the Rules Expansion section at the end of this book for a discussion of the guidance systems.

TL	*Mass*	*Price*	*Guidance*	*Shrt Rng*	*Max Rng*	*Speed*	*Agility*	*AV*	*Comments*
6	24.3	0.05	Radar Designated	—	221	1390	4	1	two stages
7	19.3	0.039	Radar Designated	—	297	2085	5	2	two stages
8	14.3	0.029	Radar/Laser Desig	—	403	2085	5	3	two stages
9	10.3	0.044	Dual mode Adv ARM	36	2036	6367	6	3	one stage
9	10.3	0.043	Dual mode Adv IR	20	2036	6367	6	3	one stage
10	16.3	0.068	Dual mode Adv ARM	36	3187	6230	7	3	one stage
10	16.3	0.067	Dual mode Adv IR	20	3187	6230	7	3	one stage
11	42.3	0.172	Dual mode Adv ARM	36	2140	15,429	9	3	two stages
11	42.3	0.172	Dual mode HOJ	36	2140	15,429	9	3	two stages
11	42.3	0.171	Dual mode Adv IR	20	2140	15,429	9	3	two stages

All missiles on this table have a warhead payload of 0.29 tonnes.

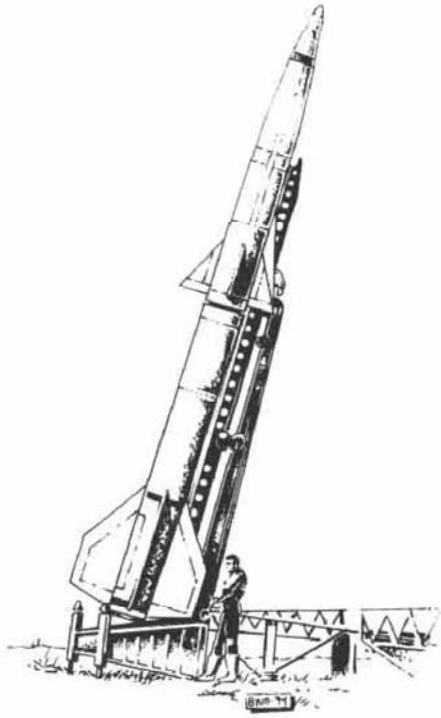
Mass: In tonnes; *Price:* in MCr, *not* including nuclear warhead; *Guidance*: Guidance mode of missile, Radar/Laser designated means it may use either mode, Adv ARM = advanced anti-radar missile, Adv IR = advanced infrared, HOJ = "home on jamming," a variant of ARM where guidance system homes on area jamming only (not deceptive jamming); *Shrt Rng*: Missile's short range in kilometers, where applicable to guidance type, see Rules Expansion for missiles listed with dual mode guidance and short range; *Max Rng*: Missile's maximum range in kilometers; *Speed*: In meters per 5-second combat turn; *Agility*: The missile's agility, see **TNE**, page 295; *AV*: Armor value of missile fuselage (any hit on the missile which penetrates this AV destroys the missile)

Security Clearance
Yes No
28 IX 1201
Date



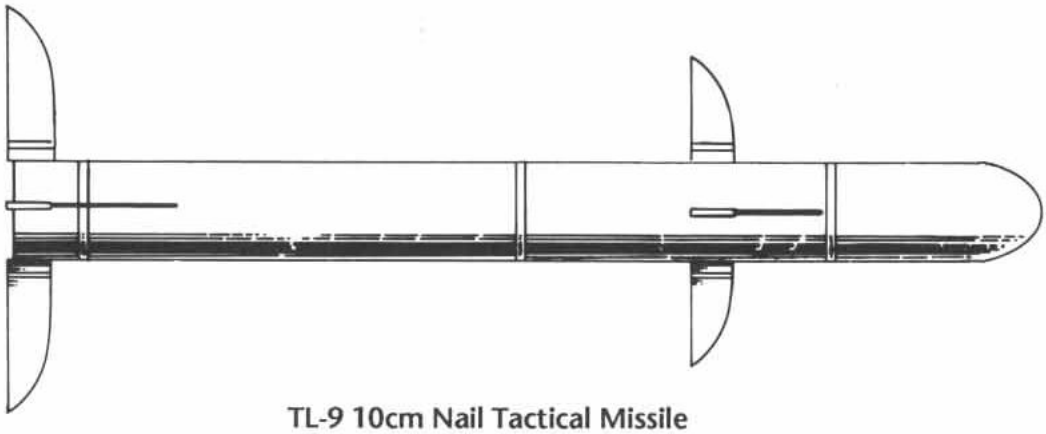
All of these missiles are designed to be able to loft a 0.29-tonne TL-8 10-kiloton warhead into orbit. However, if higher technology relic warheads are available, these more compact and powerful warheads may be used instead. See the following table to find all of the warheads that may be fitted into that same 0.29-tonne payload. This table shows their performance in space combat, i.e., using their warheads as detonation-pumped X-ray laser generators. As these warheads may only function in this fashion in the vacuum of space, these warheads may also be used to destroy targets within the planetary atmosphere by the effects of their nuclear detonations alone. See the "Effect of Nuclear Warheads in Atmosphere" rule in the Rules Expansion section at the end of this book.

TL	*Yield*	*Mass*	*MCr*	*Hits*	*Damage*	*Range*
8	10	0.29	0.6	1D6	1/8-25	0
9	10	0.195	0.6	1D6	1/8-25	0
9	20	0.215	0.7	1D6	1/11-35	0
9	50	0.235	0.8	1D6	1/14-43	0
9	100	0.265	0.9	1D6	1/18-56	0
11	10	0.16	0.6	1D6	1/8-25	0
11	20	0.18	0.7	1D6	1/11-35	0
11	50	0.2	0.8	1D6	1/14-43	0
11	100	0.22	0.9	1D6	1/18-56	0
11	200	0.28	1.1	1D6	1/21-66	0
13	2x10	0.264	1.2	2D6	1/8-25	0
13	20	0.148	0.7	1D6	1/11-35	0
13	50	0.168	0.8	1D6	1/14-43	0
13	100	0.188	0.9	1D6	1/18-56	0
13	200	0.248	1.1	1D6	1/21-66	0
15	2x10	0.206	1.2	2D6	1/8-25	0
15	10	0.206	6.0	1D6	1/8-25	1
15	2x20	0.226	1.4	2D6	1/11-35	0
15	20	0.226	7.0	1D6	1/11-35	1
15	2x50	0.254	1.6	2D6	1/14-43	0
15	50	0.254	8.0	1D6	1/14-43	1
15	100	0.147	0.9	1D6	1/18-56	0
15	200	0.167	1.1	1D6	1/21-66	0
15	500	0.247	1.2	1D6	1/25-79	0



Yield: Warhead yield in kilotons; *Mass*: In tonnes; *MCr:* Price in millions of credits; *Hits:* Dice to roll for hits in space combat resolution; *Damage:* Penetration rating and damage value; *Range:* In starship combat range bands/**Brilliant Lances** hexes, 0 equals same range band/hex only.

Tac Missiles



TL-9 10cm Nail Tactical Missile

Nail missiles are manufactured in large quantities on Oriflamme, and, with the Lyrebird remote missiles (themselves a variant of the Nail), are used as the standard infantry support tactical (tac) missiles by the RC armed forces.

The Nail is a high-speed line-of-sight (LOS) laser-designated missile, usually used in the antiarmor role. It is carried in disposable-package launchers, and was intended for use with battle dress-equipped troops then entering service among the worlds of the Dawn League. The integral 6-km laser designators installed in all RC battle dress were specifically intended for use with the Nail.

Nails may also be fired from vehicle-mounted launch rails or tube launchers. Nails are also used in four-round package launchers installed on the left shoulder of Schalli battle dress (page 23).

Nail Missile and Launcher Physical Characteristics

Tech Level: 9
Missile Diameter: 10cm
Missile Guidance: Laser Designated
Missile Mass: 14.4 kg (0.0144 tonnes) missile alone, exclusive of launcher
Missile Volume: 14.4 liters (0.0144 cubic meters) missile alone, exclusive of launcher
Launcher Specifications: Package launcher: 28.8 liters volume, 7.2 kg without missile, 21.6 kg with missile inside, Cr72 exclusive of missile
Launch rail: Negligible volume,14.4 kg rail alone, Cr720 exclusive of missile
Launch tube: 57.6 liters volume, 57.6 kg, Cr 5760 exclusive of missile

Nail LOS Missiles Combat Performance

Type	*Range*	*Damage*	*Pen Val*	*Price*	*Cbt Move*	*Agility*
HE	6	C: 20, B: 45	8C	594	195	5
HEAP	6	C: 13, B: 35	113C	636	195	5
WP	6	C: 3, B: 35	Nil	678	195	5

Range is maximum range in kilometers; *Damage* is given in concussion (C) and burst radius (B) in meters; *Pen Val* is penetration value, *Price* is in Cr; *Cbt Move* is combat move in 10-meter grid squares per 5-second combat turn

The Nail is also manufactured in two antiaircraft homing versions, one with advanced IR (homing) guidance, and one with advanced ARM (anti-radiation homing) guidance. The IR version is used against normal aircraft and homes on their heat signature, while the ARM version homes on active emissions (usually radar, active EMS, or area jamming) coming from the aircraft. The Nail ARM will also home on ground emitters.

These missiles have the same launcher characteristics as the basic Nails above, but each Nail launch station requires a launch control unit which simply reports to the gunner that the missile's seeker has acquired the target and is ready for launch. This unit masses 0.5 kg and costs Cr500. With launch rails and tubes it is added to the crewstation of the gunner. On the package launcher it is added to the package itself, increasing the unloaded mass to 7.7 kg, loaded mass to 22.1 kg, and price to 572. The control unit may be detached from the discarded package launcher and clipped to the next one, so one controller need not be bought for each package launcher.

Nail Antiaircraft Missiles

Type	*Short Range*	*Damage*	*Pen Val*	*Price*	*Cbt Move*	*Agility*
Nail SAM (IR) HE	750	C: 20, B: 45	8C	1594	195	5
Nail ARM HE	750	C: 20, B: 45	8C	3094	195	5

Short Range is short range in meters (homing missiles use short range for resolution rather than maximum range); other data is as on Nail LOS table above.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
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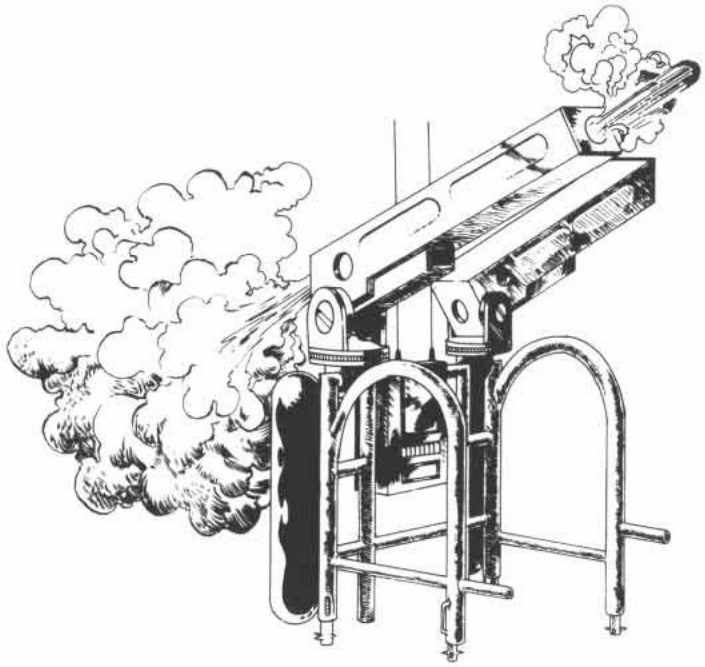
Security Clearance
Yes No
28-IX-1201
Date



TL-9 10cm Lyrebird Remote Missiles

The Lyrebirds are a modified version of the Nail, and were developed to arm the remote missile launchers on the RC drop capsules (pages 14-15). For purposes of standardization, it was decided to retain the same components and dimensions of the Nail, and merely substitute a slower burning propellant to gain more range, assuming the missile is lofted onto a ballistic trajectory, which was consistent with the requirement for the drop capsule missile. This allows all Lyrebird and Nail launchers to use either missile.

Two Lyrebirds are mounted on the parachute harness of each drop capsule. When the trooper reaches the ground, he or she removes the harness, unfolds two legs, and sets it on the ground, ready to fire. The harness contains a TL-12 modified flight computer (with battery) which then takes over as the missile launch controller. The computer has a voice-recognition capability, and monitors the radio net for firing instructions from its trooper.

When the trooper is ready for a Lyrebird, he or she consults the battle dress' inertial navigator which gives the direction and distance from the touchdown point (the missile launcher location). The trooper calls the computer, gives a codeword authorizing launch, reports his range and direction from the launcher, and reports the codename of the trooper whose laser designator will be used (each battle dress suit has its laser designator tuned to pulse in a distinctive coded pattern which is recognizable by the missile's laser seeker, allowing each missile to home on the appropriate target). The computer then trains and elevates the Lyrebird package launcher to the correct angle and fires the missile, lofting it on a ballistic trajectory to arrive above the trooper's location. Once the missile arrives above the trooper, it searches for the correctly coded designated target, and dives on it from above. Because of their ballistic trajectory, all Lyrebirds are treated as overhead attack missiles (**TNE**, page 294). The trooper may also at any time transmit another code word that will cause the harness/launcher to self-destruct, preventing sensitive missile launch and control codes from falling into enemy hands.

Lyrebirds are notoriously slow missiles, taking about a minute to cover 6 kilometers. Thus troopers at the outer limit of the missile's range often find that they need to launch the missiles in anticipation of their fire support needs. This fact gives rise to the missile's nickname "Liarbird." (One trooper says, "I just called in a missile launch." The other looks at the sky, looks at his watch, looks at the sky again, and says, "Liar.")

Note that Lyrebirds have a theoretical maximum ballistic range of 120 km. However, because of the range limitations of battle dress radios and the length of time it would take the missile to arrive at this range, the direct fire range listed below is its practical maximum range.

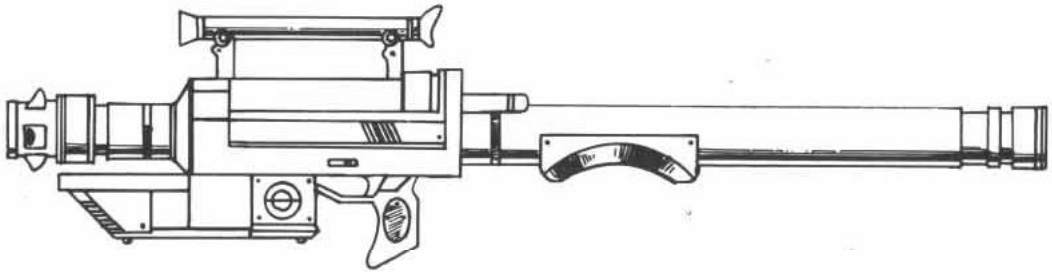
The physical characteristics of the Lyrebird missiles and their launchers are the same as those of the Nail missiles on the facing page.

Lyrebird Remote Missiles Combat Performance

Type	*Range*	*Damage*	*Pen Val*	*Price*	*Cbt Move*	*Agility*
HE	24	C: 20, B: 45	8C	594	49	3
HEAP	24	C: 13, B: 35	113C	636	49	3
SEFOP	24	C: 10, B: 35	113C	678	49	3
Chemical	24	C: 3, B: 15	Nil	594	49	3
WP	24	C: 3, B: 35	Nil	678	49	3
Illumination	24	C: 0, B: 1225	Nil	594	49	3
Lt Submunition	24	B: 25	(**TNE**, page 285)	1014	49	3
Homing Lt Submn	24	B: 15	(**TNE**, page 285)	1350	49	3

Range is maximum range in kilometers; *Damage* is given in concussion (C) and burst radius (B) in meters; *Pen Val* is penetration value, *Price* is in Cr; *Cbt Move* is combat move in 10-meter grid squares per 5-second combat turn

Tac and Planetary Strike Missiles



TAC MISSILES

There were a wide variety of tactical (tac) missiles in use by the worlds of the Last Imperium, and these weapons can still be found in profusion on the boneyard worlds of the Wilds. Tac missiles were always produced in large numbers, usually in easy-to-use disposable shoulder-fired package launchers, and this was especially true during the Final War. In the New Era, the armies of an entire world can be equipped from the weapons found in a relic ammo dump for which the final offensive never came, as all military plans collapsed before the coming of Virus.

Homing Missiles

Homing missiles are also called "fire and forget" missiles, because once they are fired, they continue to track and guide themselves to their targets, and the firer need not pay them any further mind. Homing missiles usually home on either infrared (heat) signatures from the target, or emissions from a hostile radar.

Many homing missiles, including most of the sample shown below, are intended as antiaircraft weapons. This allows an antiaircraft capability in a troop unit without the formidable investment in guidance radars, tracking arrays, etc.

The selection of homing missiles below is indicative of the relic missiles that can be found in the Wilds, and which are in use by Coalition armed forces, or are supplied to Coalition allies. Note that the Coalition also manufactures the TL-9 and 11 missiles listed below. These are built to the same standards as the relic versions, to ensure commonality of training and supply. The RC-manufactured TL-9 missile is known as the Dart, and the TL-11 missile is named the Bluejay.

All homing missile launchers below are disposable package launchers. All missiles and their launchers have a volume in liters equal to their mass in kilograms (note that loaded launchers have a volume equal to the launcher volume only as the missile's volume is subsumed within.)

Homing Missile Combat Performance

TL	*Guidance*	*MWt*	*PLWt*	*MP*	*LP*	*C-B*	*Pen Val*	*Short Rng*	*M/turn*	*AGL*
7	IR Homing	7.6	11.9	1018	538	4-25	1C	1340	2500	5
9	IR Homing	14.2	21.8	1536	571	7-25	2C	1320	3900	6
11	IR Homing	14.2	21.8	1536	571	9-35	2C	1980	3900	7
13	IR Homing	16.4	25.1	1539	582	4-25	53C	1110	7785	8

MWt = missile weight in kg, *PLWt* = package launcher weight (loaded with one missile) in kg, *MP* is missile price in Cr, *LP* is launcher price is Cr, *C-B* are the concussion and burst values of the warhead, *Pen Val* is the penetration value of the warhead, *Short Rng* is the short range of the missile in meters, *M/turn* is the number of meters the missile travels in a 5-second combat turn, *AGL* is the missile's agility. See TNE, pages 278 and 294 for more details.

Command-Guided and Designated Missiles

In contrast with the homing missiles above, most command-guided and designated missiles are used for antiarmor (usually antitank, but also anti-bunker, anti-battle dress, and anti-starship) purposes. With the exception of starships, these targets do not move as rapidly as aircraft, and the missiles are typically much slower.

Also in contrast to the homing missiles, antiarmor missiles are typically a primary armament, so are not always fired from disposable package launchers, but rather from reloadable tube launchers mounted on vehicles. The laser-designated missiles below are available in disposable-package launchers. These missiles are dependent upon laser designation from another source, as the package launchers do not contain designators.

All missiles and their launchers have a volume in liters equal to their mass in kilograms. (Note that loaded launchers have a volume equal to the launcher volume only as the missile's volume is subsumed within.)

As with the homing missiles above, the Coalition manufactures the TL-9 and 11 missiles below, with both types of launcher. The RC TL-9 missile is known as the Spike, while the TL-11 missile is the Swift.

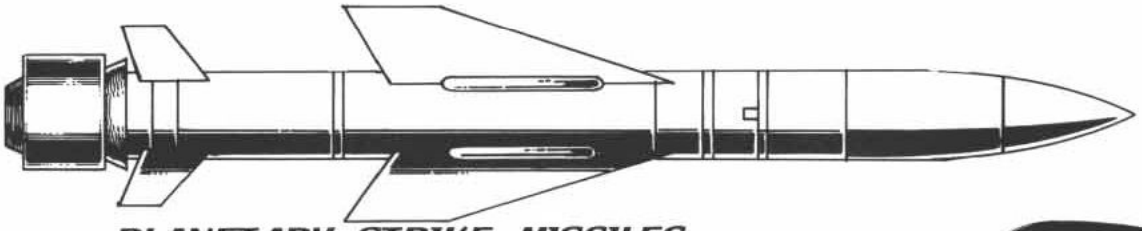
Command-Guided or Designated Missile Combat Performance

TL	*Guidance*	*MWt*	*TLWt*	*PLWt*	*MP*	*TLP*	*PLP*	*C-B*	*Pen Val*	*Range*	*M/turn*	*AGL*
7	Laser Cmnd	11.2	110	—	249	7128	—	6-25	57C	7575	975	4
9	Laser Desig. TA	13.8	126	20.7	716	13,572	785	11-35	101C	12,470	1250	4
11	Laser Desig. TA	19.4	167	29.1	772	16,036	869	17-45	113C	15,030	1950	6
13	Laser Desig. TA	21	176	31.5	820	16,740	925	20-45	125C	13,530	1950	6

Guidance indicates guidance type: Laser Cmnd is laser command guided, Laser Desig. is laser designated, TA is top attack (see Overhead Attacks, TNE, page 294, *MWt* = missile weight in kg, *TLWt* = empty weight of a tube launcher in kg, *PLWt* is package launcher weight (loaded with one missile) in kg, *MP* is missile price in Cr, *TLP* is the price of a tube launcher in Cr, *PLP* is the price of a disposable package launcher (including the price of the missile within) in Cr, *C-B* are the concussion and burst values of the warhead, *Pen Val* is the penetration value of the warhead, *Range* is the *maximum* range of the missile in meters, *M/turn* is the number of meters the missile travels in a 5-second combat turn, *AGL* is the missile's Agility. See TNE, page 278 for more details.

Power

ON/OFF



PLANETARY STRIKE MISSILES

The Reformation Coalition manufactures a family of 30cm TL-11 missiles used for planetary strike missions. While these are primarily used for planetary bombardment and precision strike from orbit (or in the case of the Mjolnir, from drop capsules which were fired from orbit), they are also able to be fired from ground launchers in the surface-to-surface mode.



Spruce, Fir, and Pine Planetary Strike Missiles

These missiles are fired from starships in support of ground operations, usually in preparation for an orbital assault. Targets are usually command and control centers, aerospace defense sites (guidance centers and missile sites), and key military formations.

These missiles are fitted with a variety of guidance systems to allow the greatest possible mission flexibility with a limited missile loadout. The missiles of the Spruce family may use Advanced Anti-Radiation (homing) guidance, Active EMS/laser designation (usually by ground assets, but this also allows the beam-riding mode, see below), IR Target Seeker guidance, or Visual Target Seeker guidance. The missiles of the Fir family may use all of the guidance modes listed for the Spruce family, but also have Imaging Radar Target Seeker guidance. The missiles of the Pine family have only the laser designation guidance mode, and are the inexpensive orbital support version of the family. All three families contain a variety of warheads as shown on the table below.

While each Spruce or Fir missile has the capability to use any of its guidance modes before it is launched, only one of these modes is selected to guide the missile when it is launched, and it may not switch to any other mode after it has been launched. (The one exception is that these missiles may be launched in a laser beam-riding mode to guide them in close to their targets where their homing or target-seeking packages take over—see the Rules Expansion section at the end of this book.) However, each of these missiles does have a target memory back-up. If for any reason the missile loses its lock on its way down (for example, if a radar station that was being homed on by an advanced ARM mode missile went off the air, or if a laser designator was destroyed by enemy fire), the missile retains the last targeted position in its memory and will hit it. If the target was mobile, this might not help, but the missiles are fast enough that their burst radius will usually ensure a kill on even a moving target in target memory mode.

These missiles were designed with very long ranges to allow starships to hit planets from safe stand-off distances. These ranges are sufficient to allow bombardment from high orbit around any non-gas giant planet.

Warhead	*Damage*	*Pen Val*	*Price (Cr: Spruce/Fir/Pine)*
HE	C: 225, B: 155	38C	28,868/38,868/17,668
HEAP	C: 149, B: 125	353C	29,868/39,868/18,668
SEFOP	C: 113, B: 105	353C	30,868/40,868/19,668
Chemical	C: 3, B: 115	Nil	28,868/38,868/17,668
Heavy Submunition	C: 0, B: 225	(TNE, page 285)	38,868/48,868/27,668
Hvy Homing Submn	C: 0, B: 115	(TNE, page 285)	46,868/56,868/35,668
Remote Del Mines	C: 0, B: 455	(TNE, pages 304-5)	46,868/56,868/35,668
Chaff	C: 0, B: 14,400	*	30,868/—/—

*All enemy attempts to use radar or active EMS through the chaff cloud are made at +1 difficulty level, plus one additional difficulty level for each tech level by which the chaff cloud exceeds the radar. Chaff detonated at high altitude remains effective for 1D6 minutes.

Common Characteristics

Tech Level: 11

Available Guidance Modes: Advanced Anti-Radiation (Homing), AEMS/Laser Designation (and beam-riding), IR Target Seeker (Smart), Visual Target Seeker (Smart), Imaging Radar Target Seeker (Smart, *Fir Only*), Target Memory available in all modes

Missile Mass: 4 tonnes, 4000 kg

Missile Volume: 4 cubic meters, 4000 liters

Average Speed: 9000 kph, 12,500 meters per combat turn (1250 grid squares)

Maximum Range: 1483 km

Short Range: Adv ARM: 36 km; IR Target Seeker: 40 km (atmosphere codes 0-3) or 20 km (atmosphere codes 4+); Visual and Imaging Radar Target Seeker: 40 km

Agility: 8

Mjolnir Advanced ARM

The Mjolnir is a specialized variant of the Spruce family designed for use with the Coalition Mk IIb Drop Capsule (see pages 14-15). The Mjolnir is carried within a drop capsule among a wave of troop-carrying capsules to perform the SPAD (Suppression of Planetary Aerospace Defenses) mission. The drop capsule opens up once it is within the planetary atmosphere, dropping out the Mjolnir, which deploys a parachute. While the troop-carrying capsules streak toward their targets, the Mjolnir slowly descends, hanging beneath its parachute, with its ARM seeker scanning for enemy active fire control sensors. Upon detecting enemy radar or active EMS sites, the Mjolnir ignites, blowing off its parachute. Like the Spruce and Fir missiles above, the Mjolnir possesses the target memory feature, allowing it to kill enemy radar sites even if they shut down.

As a final backup mode, the Mjolnir also has a laser-designation mode. Because the Mjolnirs deploy their chutes early to overwatch the troops, the troops will be on the ground while the Mjolnirs are still floating far above. Any Mjolnirs still aloft when the assault wave hits the ground switch over (by radio broadcast or pre-set timer, depending upon the mission—they cannot switch back once switched to laser mode) to laser-designation mode, allowing the ground troops to call them in as artillery support by using their laser designators.

Warhead	*Damage*	*Pen Val*	*Price (Cr)*
HE	C: 225, B: 155	38C	15,092
Heavy Submunition	C: 0, B: 225	(TNE, page 285)	25,092
Hvy Homing Submn	C: 0, B: 115	(TNE, page 285)	33,092

Tech Level: 11

Available Guidance Modes: Advanced Anti-Radiation (Homing), Laser Designation (and beam riding), Target Memory available in ARM mode

Missile Mass: 2.5 tonnes, 2500 kg

Missile Volume: 2.5 cubic meters, 2500 liters

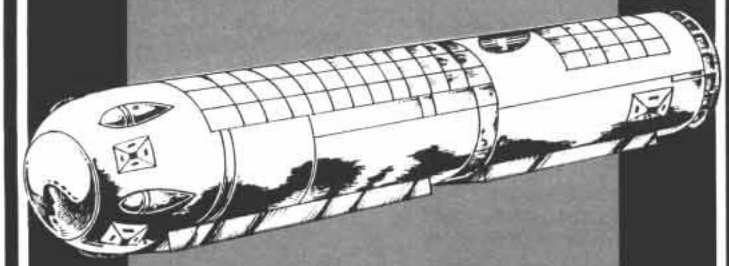
Average Speed: 10,000 kph, 13,900 meters per combat turn (1390 grid squares)

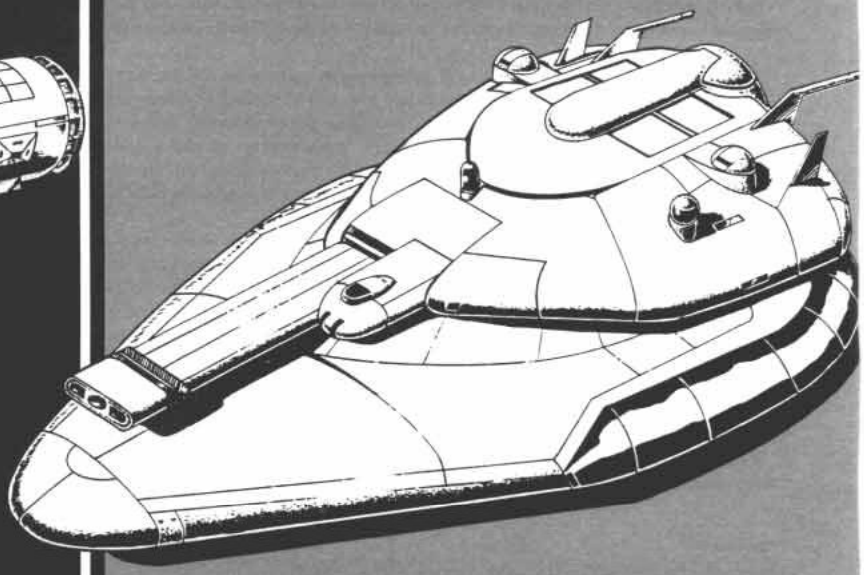
Short Range (for Homing mode): 6.44 km

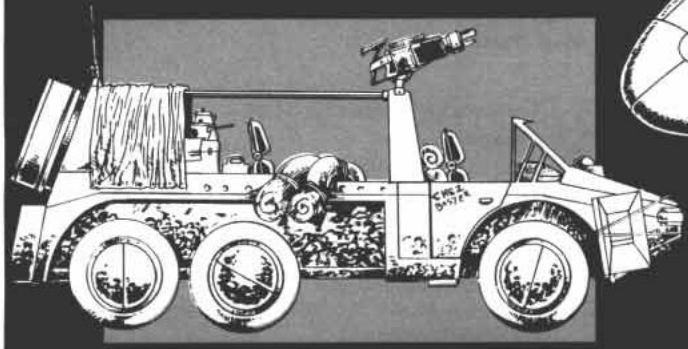
Maximum Range: 51.5 km

Agility: 8

VEHICLES









VEHICLES

There are effectively an infinite number of vehicles to be encountered in the universe. Not only does each mission require a different design, but different tech levels require different technological solutions to these missions, and each different world or nation will have a different set of mission and design concepts that further multiply the number of potential vehicles. For these reasons, the vehicles on the following pages are only the lightest possible sampling of some of the vehicles that can be encountered (and designed with the **Fire, Fusion, & Steel** technical architecture sourcebook).

This selection of vehicles is intended to show the diversity of designs available, as well as to be useful to the referee who needs to produce vehicles to assist or hinder his or her players. While the mighty Intrepid grav tank (known as the Trepida during the Imperial era) represents the best that money can buy, vehicles like the "Pathie" and Charina show the best that people can come up with, under the circumstances.

The "ragtop" air raft and the "Buster" weapons carrier are also a set, showing two different Coalition solutions to a multipurpose utility vehicle, one using the best technology available, and the other using cheap, age-old technology that can be kept running almost anywhere. The Thunderchicken attack helicopter and the Mongoose and Ferret attack speeders are another example of vehicles designed to carry out exactly the same mission, but viewed through two completely different sets of technological capabilities.

Even the relatively small sample of vehicles shown here can be used in a wide variety of ways. Virtually any of these vehicles can be a relic in use in the Wilds, or the target of a hot or cold recovery mission. An RC "lift" force could consist of convertible air rafts, attack speeders, Pyrrhus sleds, or Intrepid tanks, or a non-lift force could hit the ground with Thunderchickens and Busters. These forces could find themselves opposed by local opponents with a capable, balanced force of Prairie Fires, Pandinas, and Charinas, or maybe just a sad little "Pathie."

Note that, in keeping with the principle that there are an infinite variety of vehicles and variations of those vehicles, that the vehicles on the following pages may be modified. Most of the designs have excess power, as indicated under the power entry, and most of them have excess space in the form of cargo. Additional equipment, particularly sensors, commo gear, etc., may be installed within these limits. Each kilogram of listed cargo (as opposed to ammunition capacity) is usually equivalent to four times that amount in liters. Note, however, that no electronic equipment may be installed from a tech level higher than that of the vehicle's installed control system. This additional equipment can be taken from elsewhere in this book, or from **Fire, Fusion, & Steel**. This may require the recalculation of some figures, such as vehicle speed, but this will be familiar ground to owners of **Fire, Fusion, & Steel**.

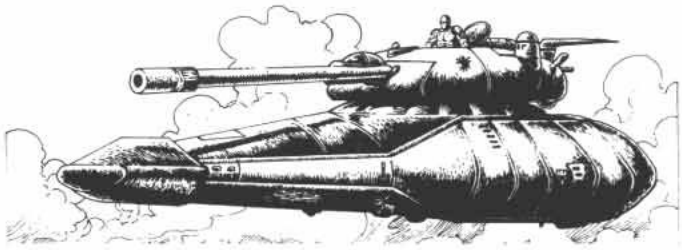
Vehicle characteristics are in the following format. **Tech Level** is the tech level the vehicle was constructed at, and not necessarily the level at which it is used. **Price** is in constant credits or megacredits, which can be adjusted for local exchange rates (see **TNE**, pages 230-231). **Size** is shown in cubic meters, displacement tons (each of 14 cubic meters), and includes the vehicle's target size code in parentheses. **Mass** is in metric tonnes (written simply as "tonnes"), of 1000 kg each. **Power** is in megawatts of output, and also describes thrust agencies, if any. **Maint** is maintenance points, i.e., the number of hours per week that the vehicle requires in routine preventive maintenance. **Controls** describe the controls used to operate the vehicle, plus any avionics and navigation systems. **Commo** is communications equipment, each listed with its *short* range, used when resolving communications tasks. **Sensors** lists the sensors equipment, also listed with the short range used to resolve sensor tasks. **Life Support** describes the facilities available to the crew and passengers; basic life support provides a sealed environment with air and water, and extended life support adds recycling, food, and sanitary facilities for extended periods in the vehicle. **Cargo** is in tonnes; multiply tonnes by 4 to find the volume of this cargo area. **Crew** is the number of persons necessary to operate the vehicle. **Passengers** are persons who may be carried above the required crew. Passenger space may sometimes be converted to cargo space according to notes with the vehicle itself. **Fire Control** shows the equipment used to control the vehicle's armament. Some of these systems are listed with Diff Mods which can be ignored; these counteract difficulty modifiers to due target movement, size, etc., but may not be used to change the basic task difficulty. Fire control also includes the equipment necessary to launch specific types of missiles. A vehicle may not fire missiles for which it has no control units, unless the missile is being controlled from another location. **Armament** names the weapons carried, although specifics of their combat performance, fire control, ammunition, etc., are detailed under other headings. **Stabilization** shows equipment which allows weapons to be fired from a moving vehicle. **Ammo** lists the amount and cost of ammunition that is carried.

Raw figures for **Speed** in kilometers per hour are often given simply for information purposes, as the game itself uses speed defined in the following terms. **Travel Move** is in kilometers per four-hour period. For ground vehicles, this is given in road speed/cross country speed, and sometimes water speed. For aircraft, including grav vehicles, this is given in high mode and NOE mode. **Combat Move** is the distance moved in each five-second combat turn. For ground vehicles this amount is in meters, and is given in road speed/cross country speed, and sometimes water speed. For aircraft and grav vehicles, this is given in the number of 10-meter grid squares moved per combat turn, and is given in high mode and NOE mode. Note that high mode speeds are absolute speeds and NOE speeds are safe speeds which can be exceeded by up to three times by overdriving (see "Mishaps," **TNE**, page 292). Some vehicles have their "Agility" or target movement difficulty modifiers listed with them for quick reference, but these can be easily calculated from current speed or combat move by using the table on **TNE**, page 294 (note, however, that aircraft or grav vehicles flying in nape-of-the-earth (NOE) mode have these Diff Mod numbers *doubled*). **Fuel Capacity** shows type of fuel and amount in liters, while **Fuel Consumption** defines how rapidly this fuel is used, and therefore how long it will last.

Combat Statistics show the configuration of the vehicle used when resolving hits (see **TNE**, page 298) and its armor. TF, TS, TR, HF, HS, HR, Deck, and Belly show the armor value of the turret front, turret side, turret rear, hull front, hull side, hull rear, deck (top of hull), and belly respectively. **Susp** shows the vehicle's suspension damage value (**TNE**, page 299).

Where weapon performance is listed separately, it is described in the same terms used in normal weapons listings, and discussed on page 39.

Intrepid Grav Tank



TL-14 Intrepid Grav Tank

This tank was the pre-eminent symbol of irresistible armored firepower before the Collapse, and was the standard heavy grav tank of the pre-Collapse armed forces of the Last Imperium. As such it was heavily used, and its numbers heavily depleted, during the Final War. Wrecked Intrepid hulls are fairly common sights throughout the Wilds, but salvageable Intrepids are somewhat rarer.

The Intrepid fully deserves every bit of its unparalleled reputation; it is a fearsome weapon indeed, able to penetrate the equivalent of 1.28 meters of steel out to a range of 12.5 kilometers, but armored to withstand that same firepower across its frontal arc. Although the tank is expensive, it is more than a match for most starships (provided they get within its range). Curiously, Reformation Coalition researchers report that its Last Imperium name, Trepida, is associated with scurrying about with alarm or confusion, trembling, and timidity, as in "trepidation." While this name would clearly describe those who come into contact with this powerful tank, the name seems inapt to this surely fearless vehicle, so those few which have found their way into Coalition service have been renamed "Intrepid."

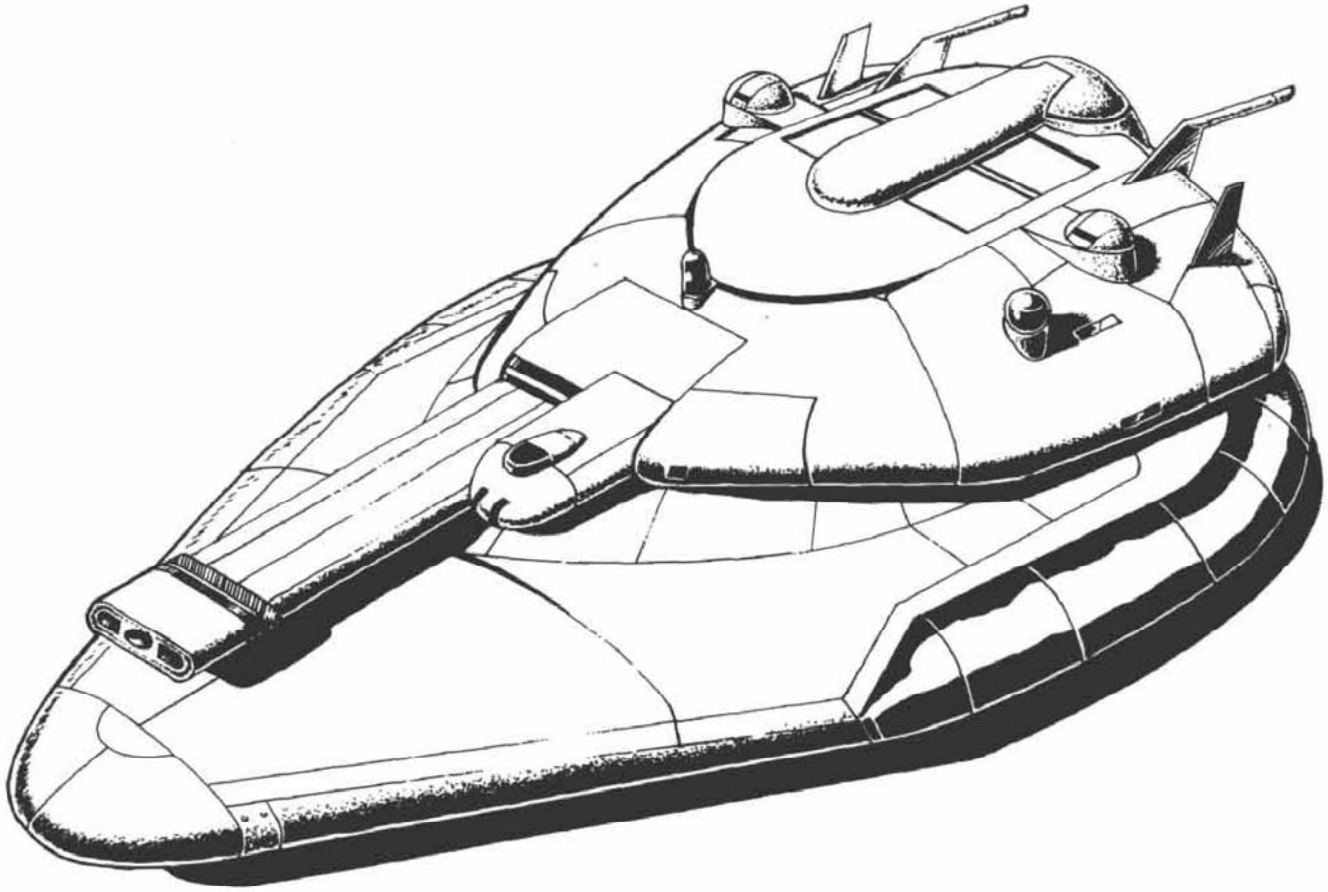
It is interesting to note that almost the entire price of the tank (81 million credits) is attributable to its fusion gun, valued at almost 79 million credits. These high-performance weapons are clearly difficult to maintain at the Coalition's tech level, with the result that many of the Intrepids in RC service have been re-armed with other weapons, such as hyper-velocity CPR guns. Although their offensive power is thus somewhat reduced, there is still very little in the Wilds that can hurt even an under-armed Intrepid.

Tech Level: 14
Price: MCr81.34
Size: 140 cubic meters = 10 displacement tons (VS)
Mass: 213.59 tonnes empty, 255.61 loaded
Power: TL-14 5.37 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 58.65 tonnes of thrust (0.0123 MW excess power)
Maint: 43
Controls: Holographic linked, TL-10+ flight avionics, TL-14 terrain-following avionics, 3xTL-14 Model FIt flight computers, TL-10+ IGS navigation system
Commo: TL-14 3000-km radio, 2xTL-14 3-km masers
Sensors: 30-km passive EMS sensor, 3000-km passive EMS sensor, 3-km active EMS sensor, 2xWSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of anti-laser, anti-active sensor, or anti-active sensor decoys (see facing page, bottom)
Life Support: Heat, light, sealed and pressurized environment with extended life support, artificial gravity/G-compensators, and one air lock
Cargo: 324 kg of crew equipment (1.295 m^3)
Crew: 2 (driver/gunner, commander)
Passengers: None
Fire Control: EMS rangefinder and TL-14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions)
Armament: TL-14 rapid-fire 125-Mj fusion gun
Stabilization: Advanced (fire at any speed)
Ammo: 200 rounds of 126-Mj 12x37cm PFC cartridges (Cr1000 each, MCr0.2 for full load of 200)
Speed: 717 kph maximum, 538 kph cruising (1950 kph maximum in vacuum)
Travel Move: 2152/1080 (7800/1080 in vacuum)
Combat Move: 100 (high mode absolute speed)/25 (NOE safe speed) in 10-meter grid squares (271/25 in vacuum)
Diff Mods vs. Fire: +6 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +8 at safe NOE speed, +10 at 2x and 3xsafe NOE speed
Fuel Capacity: 2052.75 liters reaction mass plus 44.75 liters for fusion reactor
Fuel Consumption/Endurance: 733.125 liters/hour (endurance of 28 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129

Security Clearance
Yes No
28-IX-1201
Date



Combat Performance

TL	Weapon	ROF	Dam Val	Pen Rtg	Pen Val	Conc-Burst	Short Range
14	125-Mj RF Fusion Gun	SA2	129	1/2-1/2-1/2-1	258-258-258-129	17-15	3000 m*

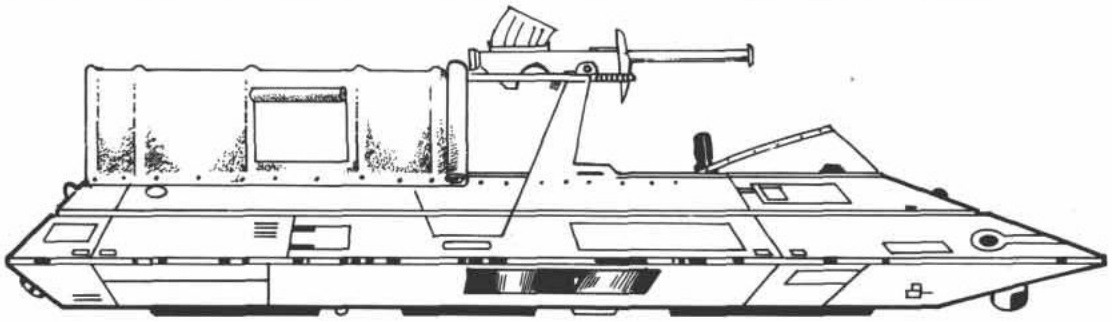
*Short range is limited by fire control maximums, and listed penetration rating and penetration values are calculated based on that 3000-meter short range. Actual weapon's performance short range is 6250 meters, with penetration rating 1/2-1/2-1-4 and penetration values 258-258-129-32.

Decoys

Decoys are of three types: anti-laser (which affect attempts to detect a target with ladar or to designate it with a laser designator), anti-active sensor (which affect attempts to detect a target or designate it with radar or active EMS), and anti-passive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by 1 level vs. TL-14+ systems, or by 2 levels vs. TL-13– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Intrepid grav tanks cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

Convertible Air Raft



Reformation Coalition TL-12 Convertible "Ragtop" Air Raft

This air raft is the standard air raft in production for all forces of the Reformation Coalition. Rather than building an enclosed and an open version of the same vehicle, Aubaine is producing a single convertible version which can be used as a standard enclosed, pressurized air raft, or which can have its top removed for use in the classic open-topped mode. When removed, the top masses 0.64 tonnes and is stored at 12.6 m^3 of volume (0.9 displacement tons).

This air raft is also rather well-equipped, with a 30-km (short range) passive EMS sensor, 300-km (short range) radio, and a laser rifle power adapter. This allows a standard 8cm TL-9 laser rifle (see page 92) to be fired off of the air raft's power, without requiring the massive backpack. The adapter allows the laser to be fired at its 0.02-Mj power level.

When used open-topped, the air raft is often fitted with a canvas cover to keep the elements off of the passengers. This cover uses lightweight metal tubing and snaps along the side of the hull. The canvas cover kit comes with the air raft at no additional cost. It is this canvas cover, universally used by RCES survey teams, that has earned the convertible air raft the nickname "ragtop."

Unless the passengers are all wearing vac suits or some other form of breathing apparatus and face protection, maximum speed when travelling open-topped is 300 kph (and even this is not comfortable for unprotected passengers). Movement rates with the top removed are shown below.

Although removing the top of the air raft is fairly simple in the field, fitting the top back on and restoring the vehicle's airtight integrity is more difficult: Reattaching the top requires 2 hours and requires a hangar or maintenance bay.

When configured in its enclosed mode, the convertible air raft is pressurized and is fully capable of travelling through hostile atmospheres, as it is equipped with basic life support. As the air raft is powered by an air-breathing MHD, however, there are some limitations on this capability.

The air raft may freely operate in thin, standard, and dense atmospheres (codes 4-9), although it does require intake filters in tainted atmospheres (types 4, 7, and 9). Intake filters cost Cr150 and have negligible mass and volume. If the atmosphere is very thin (codes 2 and 3), the air raft requires an intake compressor (see facing page). The required volume is taken from the air raft's cargo capacity. In code 2 atmospheres (very thin tainted), the air raft requires intake compressors *and* intake filters.

If the air raft is to operate in vacuum, trace, or exotic+ atmospheres (0, 1, A, B, and C), it must be fitted with a self-contained oxygen supply for its MHD turbine. This modification splits the air raft's fuel tankage into equal parts liquid hydrogen and liquid oxygen, costs Cr175, and doubles its rate of fuel consumption (reduces fuel endurance by half to 6.75 hours). Note that the air raft may be used in this self-contained mode in all atmosphere types, obviating the need for troublesome intake filters and compressors, so long as the decreased endurance is acceptable. Fuel tankage modified for dual use may freely be switched back and forth from dual to single (LHyd only) use without cost, by succeeding at an Average test of Mechanic skill.

Cargo may be added in place of passenger seats at the rate of 0.625 tonnes per seat removed, or vice versa; cargo space is 7.45 m^3, each passenger seat (cramped) requires 2.5 m^3.

Tech Level: 12

Price: Cr508,332 (Cr 507,732 without lid, Cr600 for top alone)

Size: 42 cubic meters = 3 displacement tons (Mc)

Mass with Top: 5.26 tonnes empty, 7.96 tonnes loaded

Mass without Top: 4.62 tonnes empty, 7.32 tonnes loaded

Power: 0.9 MW MHD turbine power plant, with HEPlaR thruster generating 6 tonnes of thrust (0.02213 MW excess power)

Maint: 2

Controls: Dynamic linked, TL-10+ flight avionics, TL-12 terrain-following avionics, 2xTL-12 Model FIt computers, TL-12 IGS positioning navigation

Commo: 300-km radio, 30-km laser

Sensors: 30-km passive EMS

Life Support: Light, heat, basic life support (sealed and pressurized with top fitted)

Cargo: 1.86 tonnes (7.45 m^3)

Crew: 1

Passengers: 5

Speed: 630 kph maximum, 473 kph cruising, 158 kph NOE (safe speed), 300 kph maximum in any mode when top is removed and passengers have no protective gear or breathing apparatus

Travel Move (Enclosed): 1890/945

Travel Move (Open): 1200/945

Combat Move (Enclosed): 88/22

Combat Move (Open): 42/22 (note that only 2xsafe speed may be achieved in NOE mode)

Fuel Capacity: 3450 liters liquid hydrogen (LHyd)

Fuel Consumption: 255 liters/hour (endurance of 13.5 hours)

Combat Statistics

Statistics show air raft in its enclosed/open-topped configurations

Config: Standard/open topped

Susp: G

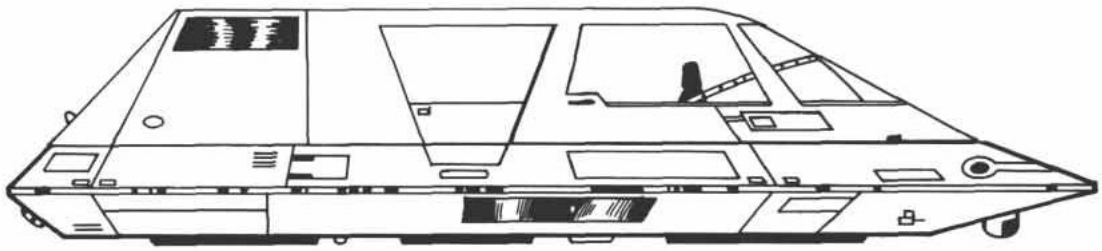
Deck: 2/open

HF: 4/[4]

HS: 2/[2]

HR: 2/[2]

Belly: 2



Add-On Options

The following are some additional options that may be fitted to the air raft. Volume is subtracted from the cargo volume of 7.45 m^3, and MW is subtracted from the excess power. The MW rating assumes that these items will be powered directly from the vehicle itself (obviously if battery-powered gear is installed, this will not be an issue). The listing for the 300-km passive EMS sensor assumes that the 30-km sensor will be removed, so the figures show the additional requirements beyond that of the 30-km sensor already installed.

The firing information for the weapons listed below appears on their individual page entries. These page references are listed parenthetically after each weapon. The laser rifle adapter shown allows the rifle to be fired at its 0.02-Mj power level. The laser rifle adapter is shown in order to allow its removal to free up enough power for installation and full-time functioning of the 3000-km laser uplink. (Note, however, that shutting down the standard 300-km radio and 30-km laser communicator free up an additional 0.02 MW, which would allow the 3000-km laser uplink to be installed and operated while the other two communicators were off.)

The weapons shown below can be easily mounted on either or both of the roll bars when the air raft is in its open configuration. A weapon mount is shown on the forward roll bar; the rear roll bar slopes to the rear of the vehicle from the rear edge of the door like a mirror image of the forward bar, and is concealed beneath the canvas cover. The canvas cover is shown only partially extended in this view.

Options	*Volume (m^3)*	*Mass (tonnes)*	*MW*	*Cr*
Laser rifle adapter (page 92)	0.0136	0.0272	0.02667	590
3000-km laser uplink	0.01	0.02	0.04	21,000
300-km passive EMS (replace)	+0.04	+0.08	+0.004	+80,000
PEMS antenna (replace)	+0.004	+0.004	—	+4000
Squad Support Laser (page 96)	0.0594	0.0594	—	57,835
10×100-round magazines	0.15	0.7308	—	29,810
Laser Sniping Weapon (page 97)	0.0907	0.0907	—	54,815
80×rounds	0.15	0.72	—	43,200
Assault Rocket Launcher (page 98)	0.006	0.006	—	210
9×6-round magazines	0.15	0.15	—	1425.6-4017.6
9cm Plasma Bazooka (page 85)	0.027	0.027	—	67,500
37×rounds	0.15	0.6	—	14,800
Intake filter	—	—	—	150
Intake compressor	0.3	0.3	—	3000
Dual LHyd/LOx fuel tankage	—	—	—	175

Attack Speeders

Reformation Coalition TL-12 Attack Speeders

The attack speeders detailed here illustrate the difficulties of building contra-grav vehicles at TL-12. While fusion reactors are still not quite small enough to efficiently power vehicles of this size, their long endurance and lack of oxygen requirements make them very attractive to vehicle designers. Because the Coalition has only a very limited TL-12 production capacity (existing entirely on Aubaine), TL-12 production must be carefully husbanded and not wasted on large numbers of one-off designs.

CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) is currently overseeing a program to design a family of standard TL-12 high-speed grav vehicles, popularly known as speeders. Some of these designs are powered by MHD turbines with dual LHyd/LOx fuel tankage to allow operations in hostile or thin atmospheres, while other designs are centered around oxygen-independent fusion plants, either new-production TL-12 plants or TL-13 plants scavenged from Pyrrhus support sleds (page 126). The speeders illustrated here, the "Mongoose" and "Ferret" types, are examples of TL-12 fusion reactor entrants. Both of these designs have been produced only in very limited numbers as developmental prototypes, but as part of the evaluation program, both types will be available to RCES and free-lance expeditions for field testing (accompanied of course, by 3-6 tech reps and observers).

The Mongoose/Ferret speeders are unusual designs. In order to take advantage of the tremendous power offered by the oxygen-independent fusion plant, they were given the capability to perform at 3Gs, albeit only in airless environments. In this mode, their high-efficiency plasma recombustion (HEPlaR) engines draw 7.5 megawatts, while they only draw 0.635 in atmospheres where their airframes limit their top speeds. They are also equipped with artificial gravity G-compensators for crew comfort, as missions exceeding 40 hours are theoretically possible.

The Mongoose is the basic version, with a fully stabilized, fixed forward-firing plasma gun, and retractable missile launch bays. The Ferret trades some missile space for a much larger plasma gun. Facing page shows some of the missiles available for these designs (see also pages 106-109).

Both variants are listed in parallel below. Where only one value is listed, it applies to both Mongoose and Ferret variants.

Tech Level: 12

Price: *Mongoose:* MCr6.35
Ferret: MCr6.62

Size: 70 cubic meters = 5 displacement tons (Mc)

Mass: *Mongoose:* 69.2 tonnes empty, 77.4 tonnes loaded
Ferret: 68.33 tonnes empty, 81.2 tonnes loaded

Power: TL-12 20 MW fusion power plant supplying 0.5 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 12.7-150 tonnes of thrust (5.0173-11.8823 MW excess power)

Maint: 16

Controls: Dynamic linked, TL-10+ flight avionics, TL-12 terrain-following avionics, 2×TL-12 Model FIt flight computers, TL-10+ IGS navigation system

Commo: 2×3000-km radios, 300-km maser

Sensors: 300-km active EMS sensor, 300-km ladar, 300-km passive EMS sensor

ECM: Electromagnetic masking package, 3-km EMS deceptive (self-defense) jammer, 50-km area jammer, decoy dispenser with space for 10 of any combination of anti-laser, anti-active sensor, or anti-active sensor decoys (see facing page, bottom)

Life Support: Heat, light, sealed and pressurized environment with basic life support and artificial gravity/G-compensators

Cargo: 87.5 kg of crew equipment (0.35 m^3)

Crew: 2 (Pilot, weapons system officer)

Passengers: None

Fire Control: EMS rangefinder and TL-12 ballistic computer (ignore 4 Diff Mods) for plasma gun, 600-km laser designator, target seeker and target memory missile control units

Armament: *Mongoose:* 4.75-Mj plasma cradle gun, up to 4000 kg of tac missiles
Ferret: 14-Mj plasma cradle gun, up to 2000 kg of tac missiles

Stabilization: Advanced (fire at any speed)

Ammo: *Mongoose:* 300 rounds of 4.75-Mj 8.5×25cm PPC cartridges for plasma gun (Cr119 each, MCr0.036 for full load of 300), up to 4000 kg of tac missiles (see facing page and pages 106-109)
Ferret: 300 rounds of 14-Mj 12×37cm PPC cartridges for plasma gun (Cr350 each, MCr0.105 for full load of 300), up to 2000 kg of tac missiles (see facing page and pages 106-109)

Speed, Atmospheric: 800 kph maximum, 600 kph cruising

Speed, Vacuum: 4770 kph maximum, 3578 kph cruising

Travel Move (Atmospheric): 2400/960

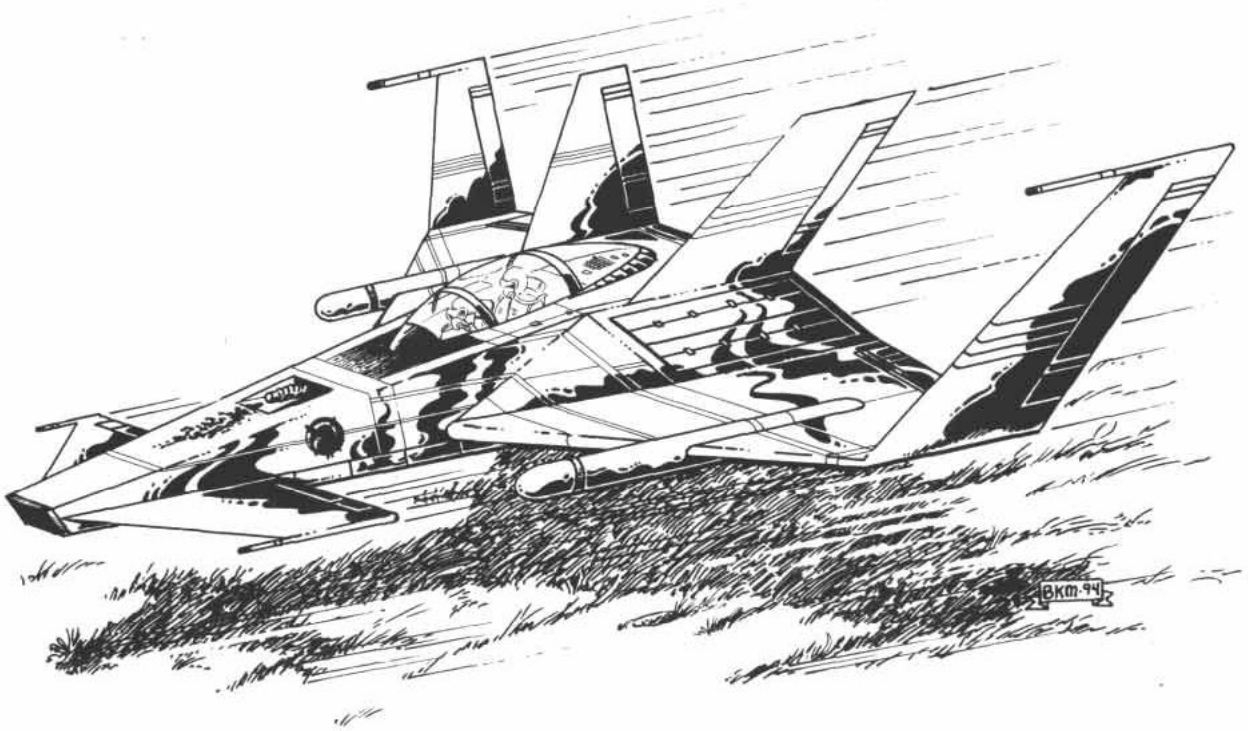
Combat Move (Atmospheric): 111 (high mode absolute speed)/22 (NOE safe speed) in 10-meter grid squares

Fuel Capacity: *Mongoose:* 6788.75 liters liquid hydrogen (LHyd)
Ferret: 6909.8 liters LHyd

Fuel Consumption/Endurance: *Mongoose:* 158.75 liters per hour in atmosphere (1875 liters/hour in vacuum), tankage is sufficient for one month duration of fusion reactor, plus 42.76 hours of reaction mass in atmosphere (3.62 hours in vacuum)
Ferret: 158.75 liters per hour in atmosphere (1875 liters/hour in vacuum), sufficient for one month duration of fusion reactor, plus 43.53 hours of reaction mass in atmosphere (3.68 hours in vacuum)

Combat Statistics

Config: Standard	**HF:** 21
Susp: Grav	**HS:** 16
	HR: 11
Deck: 11	**Belly:** 11



Tac Missiles

TL	Name	Guidance	Mass	Price	Conc-Burst	Pen Val	Dngr Spc	M Rng	S Rng	M/turn	Agility
12	Skybird	T, H, S	568	16,140	C: 121, B: 115	26C	—	382	20/40	31,882	10
12	Firebird	T, S	190	12,530	C: 24, B: 45	137C	—	32	—/40	7784	8
12	Thunderbird	T, H, S	365	15,340	C: 95, B: 95	281C	—	36	20/40	7784	8
12	Songbird	T, S	1317	17,640	C: 121, B: 115	26C	—	440	—/40	31,692	10
12	Jailbird	T, H, S	404	16,300	C: 225, B: 155	38C	—	62	20/40	32,546	10
12	Butcherbird	T, H	288	7200	—	Nil	60×280	23	20/40	7784	8

Guidance: Each missile may be launched under any of the listed guidance modes, for greater tactical flexibility—T = Target Designated (laser/radar/AEMS), H = Homing (Advanced IR), S = Target Seeker (Imaging Radar); *Mass*: In kg; *Price*: in credits; *Dngr Spc*: Dimensions of primary Danger Space of flechette warhead, in meters, see **TNE**, pages 279-280; *M Rng*: Maximum Range in km, used with target designated mode; *S Rng*: Short Range used with homing/target seeker mode; *M/turn:* Meters travelled per 5-second combat turn.

Weapon Combat Performance

Weapon	Vehicle	ROF	Dam Val	Pen Rtg	Pen Val	Conc-Burst	Short Range
4.75-Mj Plasma cradle gun	Mongoose	SA1	25	1-2-10	25-25-13-3	C: 1, B: 5	140 m
14-Mj Plasma cradle gun	Ferret	1/2	43	1-2-10	43-43-22-4	C: 2, B: 5	420 m

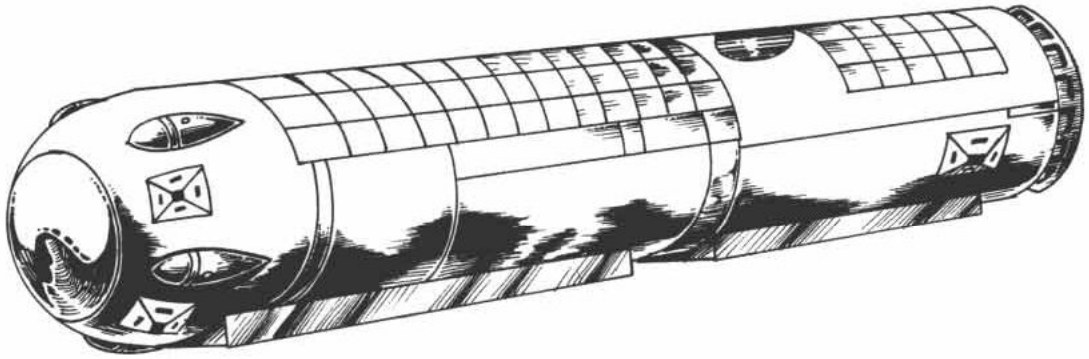
ROF: Rate of fire, in shots per combat turn—ROF of 1/2 equals one shot every second turn

Decoys

Decoys are of three types: anti-laser (which affect attempts to detect a target with ladar or to designate it with a laser designator), anti-active sensor (which affect attempts to detect a target or designate it with radar or active EMS), and anti-passive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by 1 level vs. TL-12+ systems, or by 2 levels vs. TL-11– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Mongoose/Ferret speeders cost Cr15,000 each regardless of type, or MCr0.15 for a full load of 10.

Sensor Drone & Thunderchicken Attack Helicopter



Reformation Coalition TL-12 Planetary Sensor Drone

This is the standard RC orbital sensor drone, allowing a starship to conduct fairly detailed examinations of the planetary surface without having to risk any personnel on the ground. It is fully recoverable and reusable, although it is naturally expendable as well.

The drone has a displacement of 0.5 tons, identical to that of standard space combat missiles or drop capsules, so may be launched from any standard missile or drop capsule launch tube. The drone may be controlled (using RCV skill) from any missile-capable MFD which has a direct line-of-sight to the missile via laser link, or, if not in direct line-of-sight, by any MFD that can tie into a 3000-km radio elsewhere aboard the ship. It may also be controlled from an RCV workstation equipped with a 3000-km radio or laser communicator, or one which can tie into one.

Because of the range of the communicators on the RCV, the controlling workstation or MFD should be within 3000 km of the drone, and *must* be within 24,000 km of it.

The short range of the drone's sensors make it useless in space combat, although the drone does have 1G performance and fuel sufficient for 9 G-turns.

The drone is propelled by a 1G HEPlaR thruster, and high-efficiency contra-grav lifters. It can enter and exit atmospheres under its own power, and fly around under grav power in any type of atmosphere. It has sufficient fuel to power it for 5 hours, although its reaction mass runs out after 4.5 hours. This allows the drone to broadcast its position and await pick-up for half an hour.

The sensor has space, weight, and power reserved for relic neural activity sensors (NAS) from tech levels 13, 14, or 15. These are quite rare, so any of these drones that are sent on a one-way mission will usually have its NAS removed. Its sensor suite has a short range in meters as follows:

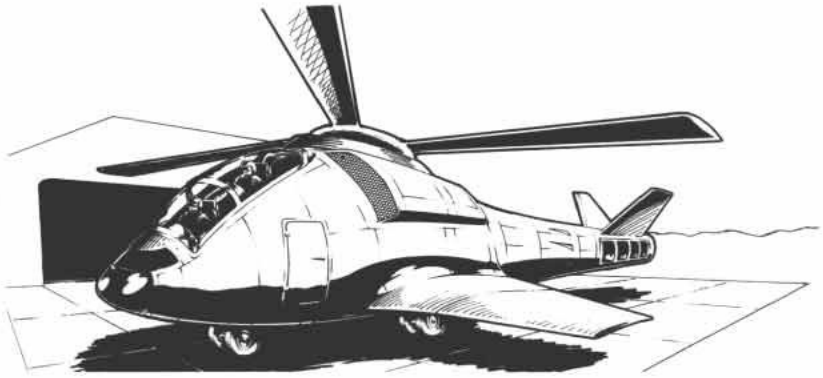
Sensor	*Short Range (meters)*
Active EMS	3000
Passive EMS	3000
Wide-Spectrum Viewer	400
Neural Activity Sensor	5, 25, or 50 (TL-13, 14, 15)

The sensor makes quite a small target, but is additionally equipped with a full EMM suite to make it even harder to detect by enemy sensors.

Tech Level: 12 (plus relic NAS)
Price: Cr552,550
Size: 7 cubic meters = 0.5 displacement tons (SM)
Mass: 5.35 tonnes empty, 7.7 tonnes loaded
Power: 1.1646 MW MHD turbine with HEPlaR thruster generating 5 tonnes of thrust
Maint: 1
Controls: Dynamic linked RCV controls, TL-10+ flight avionics, TL-12 terrain-following avionics, 2×TL-12 Model FIt flight computers
Commo: 3000-km radio, 3000-km laser
Sensors: 0.4-km wide-spectrum visual video camera, 3-km active EMS, 3-km passive EMS, space reserved for TL-13, 14, or 15 neural activity sensor
Life Support: None
Cargo: None
Crew: None
Passengers: None
Speed: 1100 kph maximum, 825 kph cruising, 160-480 kph NOE
Travel Move: 3300 (High mode), 960 (NOE)
Combat Move (in 10-meter grid squares): 153 (high mode absolute speed), 22 (NOE safe speed)
Fuel Capacity: 2329.2 liters dual LHyd/LOx power plant fuel, 281.25 liters reaction mass
Fuel Consumption: 465.84 liters dual LHyd/LOx per hour (5 hours duration), 62.5 liters LHyd reaction mass per hour (4.5 hours duration)

Combat Statistics

Config: Standard
Susp: G
Armor, all faces: 10



Reformation Coalition TL-9 "Thunderchicken" All-Weather Compound Attack Helicopter

This new design has only entered production recently, but is intended to be the standard attack helicopter and battlefield air superiority craft for all Oriflammen Marine and ground forces. The name, chosen by the Oriflamme Munitions Board, is a slap at the official CSAARC (Committee for the Standardization of Armament and Ammunition in the Reformation Coalition) naming conventions which call for the use of bird and animal themes for missiles and aircraft (e.g., Lyrebird) in place of the more straightforward imagery preferred by Oriflamme (Spike, Nail). Curiously, this aircraft whose name is already an informal nickname has an even more informal nickname used by its Oriflammen flight crews: "Thud-cluck."

Tech level 9 is the highest tech level at which helicopters are typically produced, as grav vehicles take over their roles beginning at this tech level. As such, the Thunderchicken X-wing compound helicopter is perhaps the ultimate expression of the helicopter concept. Able to hover and take off and land vertically like any helicopter, the X-wing design goes beyond compound helicopters which merely unload their rotors in flight to achieve higher speed: The X-wing locks down its strong, composite rotors and uses them as fixed wings, enabling the aircraft to achieve transonic speeds. (Note that the X-wing must transition from fixed-wing flight to helicopter mode before it can hover, land vertically, or fly in NOE mode, as the rotor blades are locked down at speeds greater than 320 kph.) Thus the Thunderchicken functions not only as a standard attack helicopter with air-to-ground munitions, it can also be loaded with air-to-air missiles to function as a limited air superiority aircraft to secure the local area over the battlefield.

Because of its stealth design, it has no turrets or external weapons carriage; its entire armament is carried in internal missile bays which can be loaded with any mix of tac missiles that will fit (see pages 106-108) and which can be launched by the Thunderchicken. Thud-cluck launch capabilities include all laser- and radar-designated missiles (out to a range of 60 km for laser- and 6 km for radar-designated), all homing missiles, and all target memory and target seeker missiles.

The Thunderchicken was designed from the outset to be used in multiple planetary environments, and has a beefed-up rotor assembly with gearing for thin (codes 4, 5), standard (codes 6, 7), and dense (codes 8, 9) atmospheres. All that is needed to prepare the Thunderchicken for these other environments is to change the rotor blades to a set designed for that atmosphere (blade sets are available for thin, standard, and dense atmospheres and can be purchased separately, see "Price" entry below and the rules expansion at the back of this book). The craft is already fitted with intake filters for use in tainted atmospheres.

Tech Level: 9

Price: Cr4,059,230 (price includes filters for tainted atmosphere), Cr50,000 for each additional set of rotor blades.

Size: 1440 cubic meters target size/storage volume = 103 tons (480 cubic meters = 34.3 tons with rotors removed; each rotor set displaces 20 cubic meters or 1.43 tons)

Mass: 21.0255 tonnes empty, 24 tonnes loaded; 1 ton per additional rotor set

Power: 4.95 MW gas turbine provides 4.8 MW to X-wing rotor assembly which provide 24 tonnes lift and 2.4 tonnes thrust. High-bypass turbofans producing 8.01 tonnes thrust and 0.1602 MW (0.3102 MW available for onboard electronics, 0.0037 MW excess power)

Maintenance Points: 6 (7 in tainted atmosphere)

Controls: Computer-linked controls, TL-8 all-weather flight avionics, TL-9 terrain-following avionics

Communications: 300-km radio, 30-km laser communicator/designator

Sensors: 3-km radar (designation capable), 30-km HRT sensor, 2ximage intensifier scopes (250 m)

Electronic Countermeasures: Stealth airframe (+1 Diff Mod vs. TL-9 radar and HRT, +2 Diff Mods vs. TL-8– radar and HRT), one dispenser with 12xanti-laser decoys (vs. ladar or laser designators), one dispenser with 12xanti-active sensor decoys (vs. radar or active EMS), one dispenser with 12xanti-passive sensor decoys (vs. HRT or passive EMS). Each decoy lasts one combat turn (5 seconds) and increases difficulty of all sensor tasks (of the indicated type which the decoy affects) vs. the Thunderchicken for that turn, from any direction, +1 Diff Mod for TL-9+ systems, +2 Diff Mods for TL-8– systems.

Life Support: Heat, lights, sealed, pressurized environment with basic life support for two crew

Cargo: None

Crew: 2 (pilot and weapons officer) with advanced cockpit armor (AV 4) and advanced ejection seats

Fire Control: Control/launch units for radar- and laser-designated missiles (may self-designate out to 60 km for laser and 6 km for radar), homing missiles, target memory, and target seeker missiles

Armament: Capacity for 400 kg of tac missiles in internal retractable missile bay

Ammo: Up to 400 kg of tac missiles, see pages 106-108

Maximum Speed: Helicopter mode: 320 kph; Fixed-wing mode: 1100 kph.

Cruising Speed: Helicopter mode: 240 kph; Fixed-wing mode: 825 kph

NOE Speed: 80-240 kph (helicopter mode only)

Travel Move: Assuming in-flight refueling, 960 (high mode)/480 (NOE) helicopter mode, 3300 (high mode) fixed-wing mode. Without in-flight refueling, use cruising speeds above and fuel endurance below to calculate figures.

Combat Move: 44 (high mode absolute speed)/11 (NOE safe speed) in helicopter mode, 153 (high mode absolute speed) in fixed-wing mode

Agility: Helicopter mode: +4 Diff Mod vs. maximum speed (combat move), +4 Diff Mod vs. cruising speed (travel move), +4 Diff Mod vs. NOE safe speed, +6 Diff Mod vs. 2xNOE safe speed, +8 Diff Mod vs. 3xNOE safe speed; Fixed-wing mode: +6 Diff Mod vs. maximum speed (combat move), +6 Diff Mod vs. cruising speed (travel move).

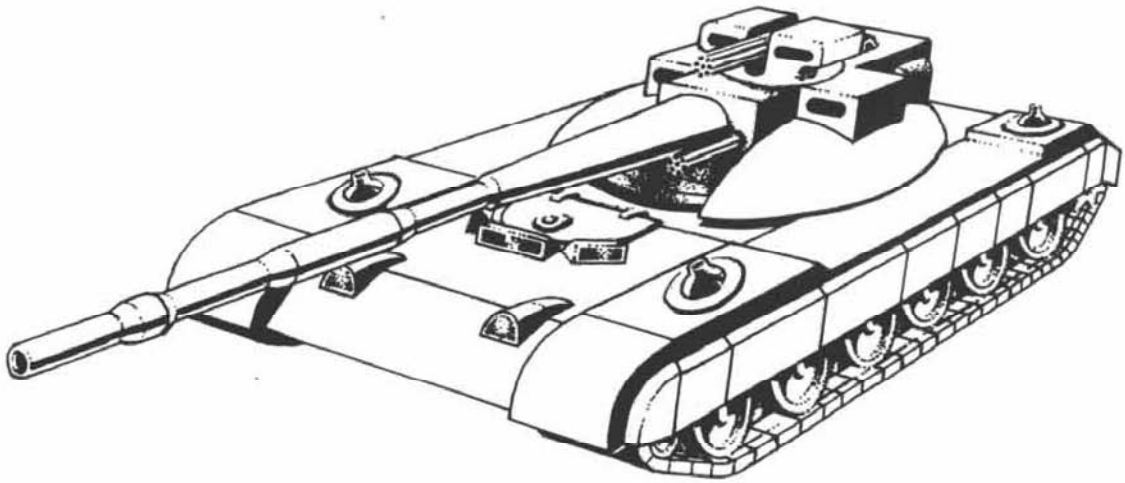
Fuel Consumption: 990 liters/hour in helicopter mode, 830 liters/hour in fixed-wing mode

Internal Fuel Capacity: 2284.5 liters hydrocarbon distillates, plus refueling probe. For ferry missions without in-flight refuelling, weapons bay can carry an additional 400 liters in place of weapons.

Endurance: 2.3 hours helicopter mode (138 minutes), 2.75 hours fixed-wing mode (165 minutes). For simplicity, choose a mode (helicopter or fixed wing) and track endurance in minutes in that mode only. Each minute in helo mode costs 1.2 minutes in fixed-wing mode; each minute in fixed-wing mode costs 0.8 minutes in helo mode.

Loading fuel in weapons bay for ferry missions adds 0.4 hours (24 minutes) endurance helo mode, or 0.48 hours (29 minutes) fixed-wing mode.

Prairie Fire Tank



Prairie Fire TL-8 Tank

The Prairie Fire is one of many standard pre-Collapse Imperial designs that can still be found on many worlds. It is not a main battle tank, as it is not armored quite well enough to stand up to TL-8 MBTs, but it is a high-speed heavy weapons platform that can perform many of the tasks of a tank, and is used as such on most worlds where it occurs.

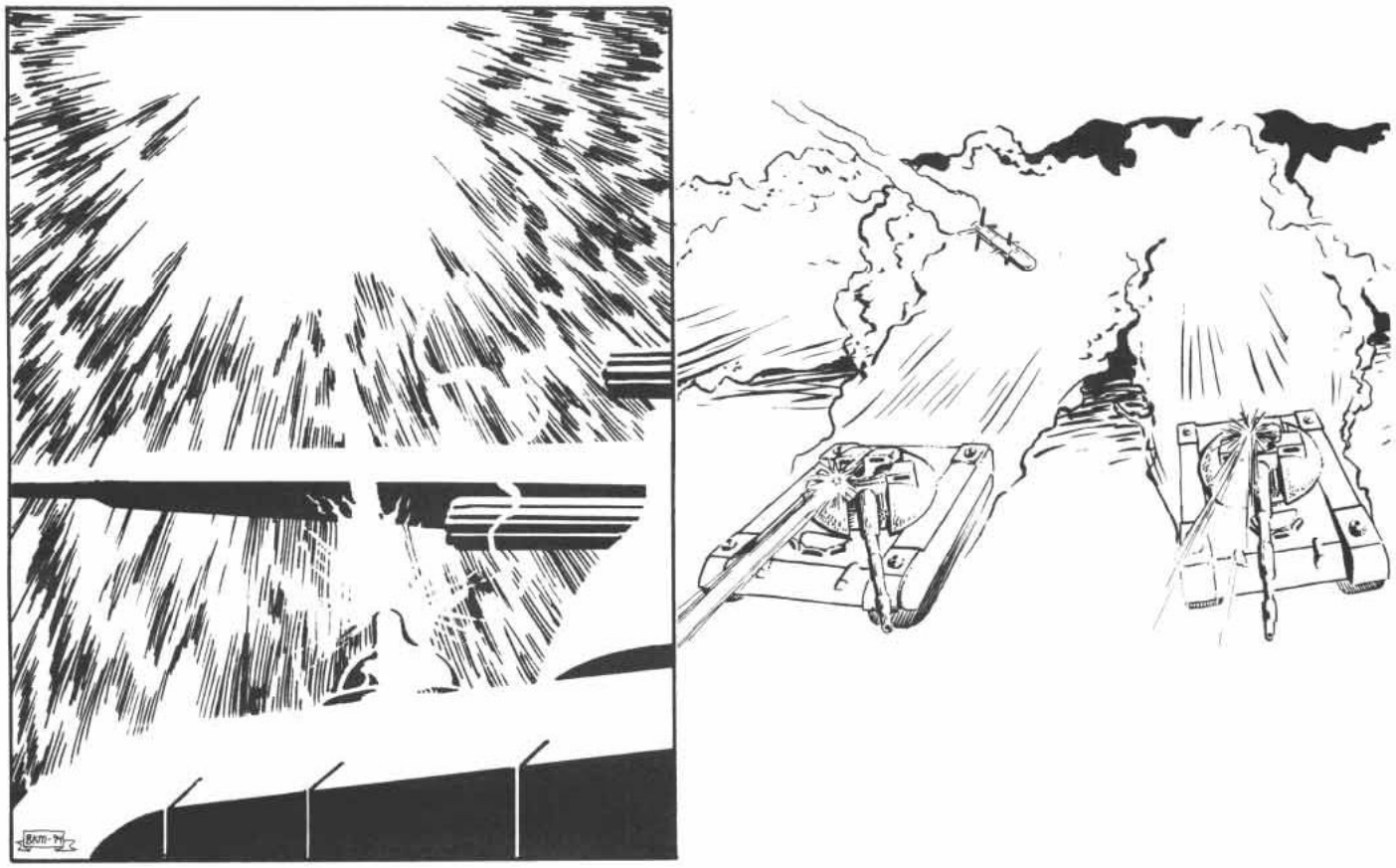
Both the commander and gunner can control and fire the Prairie Fire's fully stabilized main armament and its coaxial multi-barrel autogun. In addition, the commander controls a remote stabilized turret with another multi-barrel autogun. The main armament, coaxial weapon, and remote turret are all equipped with ballistic fire control computers, allowing all weapons to disregard 2 Diff Mods.

Tech Level: 8
Price: Cr866,875 (plus ammunition costs, see below)
Size: 168 kiloliters displacement = 12 tons (VS)
Mass: 239.56 tonnes empty, 247.1 tonnes loaded
Power: 13.62 MW MHD turbine (0.099 MW excess power)
Maint: 67
Controls: Enhanced electronic controls, TL-8 satellite positioning navaids
Commo: 2×30-km radios
Sensors: 3-km HRT
Life Support: Overpressure system
Cargo: None
Crew: 3 (driver, gunner, commander)
Passengers: None
Fire Control: –2 Diff Mods (main armament and remote turret)
Armament: Remote turret with stabilized 130mmL60 CPR gun and coaxial 7mm rotary MG, secondary remote turret with stabilized 5mm rotary MG
Stabilization: Advanced (fire at all speeds)
Ammunition: 100 rounds 130mm (price varies, see below), 2500 rounds 7mm (Cr1250 for full load), 5000 rounds 5mm (Cr1000 for full load)
Other Systems: Dispensers for anti-laser, anti-active sensor, and anti-passive sensor decoys, 20 each (Cr400,000 for each full load of 20)
Speed: 142 kph maximum road speed, 113 kph maximum cross-country speed
Travel Move: 280/215
Combat Move: 65/50
Fuel Capacity: 28,500 liters liquid hydrogen (Cr997.5)
Fuel Consumption: 2724 liters/hour (endurance of 10.46 hours)

Combat Statistics

Config: Turret	**TF:** 192	**HF:** 192
Susp: T 24	**TS:** 48	**HS:** 48
	TR: 24	**HR:** 24
	Deck: 36	**Belly:** 24

Security Clearance
Yes No
28 IX 1201
Date



Prairie Fire tank firing anti-IR decoy from forward dispenser

Weapon Characteristics

TL-8 130mm/60-Caliber Hypervelocity Gun

Round	ROF	Conc-Burst	Dam Val	Pen Val	Danger Space	Short Range	Ammo Price	Ammo Weight
APFSDSDU	1/5*	—	29D6	207/197/187/167	—	670	Cr1124	49.7
HEAP	1/5*	C: 20, B: 25	—	123C	—	510	Cr599	49.7
HE	1/5*	C: 30, B: 35	—	13C	—	510	Cr424	49.7
Flechette	1/5*	—	2D6/1D6**	1-Nil**	25x100	510	Cr1824	49.7

*One round every 5 combat turns.

**In primary/secondary burst area, see TNE, page 280.

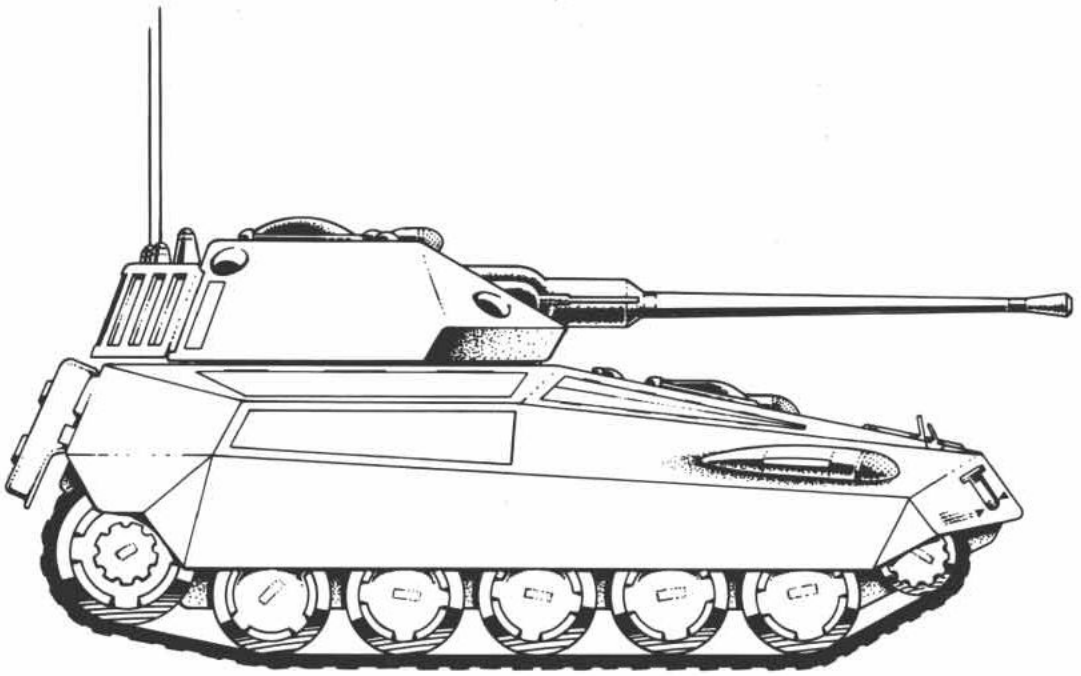
Secondary Weapons

Round	ROF	Dam Value	Pen Rtg	Magazine	Short Range
TL-8 7mm rotary MG-ball	50	5	2-3-Nil	2500C	270
TL-8 5mm rotary MG-ball	5/50	3	1-Nil	5000C	150

Decoys

Decoys are of three types: anti-laser (which affect attempts to detect a target with ladar or to designate it with a laser designator), anti-active sensor (which affect attempts to detect a target or designate it with radar or active EMS), and anti-passive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by 1 level if from the same tech level as the opponent, or by 2 levels if from a higher tech level. Each decoy lasts one combat turn, and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

LRV-51 Pandina



TL-6 LRV-51 Pandina
(Light Reconnaissance Vehicle, RCES Designation)

Tech Level: 6
Price: Cr66,648 (not including ammo)
Size: 56 kl (4 tons)
Mass: 33.78 tonnes empty, 35.08 tonnes loaded
Power: 0.75 MW improved internal combustion engine
Maint: 12
Controls: Basic mechanical controls
Commo: 30km radio
Life Support: Overpressure system
Cargo: None
Crew: 3
Passengers: None
Fire Control: Optic rangefinder at gunner's and commander's stations

Armament: 3cm/L70 turret-mounted autocannon and 7x57mm coaxial MG, pintle-mounted 7x57mm MG at commander's hatch
Stabilization: Basic (autocannon and coaxial MG)
Ammo: 140+6 3cm, 1000x7mm ball (prices below)
Travel Move: 130/85/20
Combat Move: 30/20/5
Fuel Capacity: 890 liters (0.89 kl) hydrocarbon distillates
Fuel Consumption: 0.19 kl/hr (4.68 hours)

Combat Statistics

Configuration: Turret
Susp: T 8

TF: 9	**HF:** 9
TS: 4	**HS:** 4
TR: 3	**HR:** 3
Deck: 3	**Belly:** 3

The origin of the LRV-51 is unknown, but the present Guild design is clearly taken from a pre-Collapse light guntrack intended for low-tech reconnaissance units. The Pandina (or "Panda") is used by a number of TEDs for sanctions against rebellious civilians, a purpose to which it proved admirably suited. The armor is enough to resist most small arms and fragments, the 3cm/L70 main gun outranges all small arms likely to be encountered in the hands of ill-equipped rural militias, and the AFV's two 7mm machineguns served to prevent attacks by small antiarmor attack teams.

The 3cm/L70 main gun is fed from a 140-round magazine, but most vehicles now carry 6 additional specialty rounds for hand loading. The gun's autofire sequence is interrupted by a manual override, the special round inserted by hand, and the gun fired.

Tooling and blueprints for the manufacture this vehicle have been widely disseminated by Guild merchants, who also supply high-tech ammo (the specialty rounds mentioned above) for the gun.

Most TEDs are capable of manufacturing 3cm ammunition in a variety of types (HE, APDS, HEAP, CHEM, WP/IS, and Flechette). None of these rounds present a serious threat to RC troops, but the Guild is known to be offering additional, higher-tech rounds (APFSDSDU, APFSDSCI, and APFSDSSD) some of which are capable of penetrating RCES battle dress at ranges in excess of 3600 meters.

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7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
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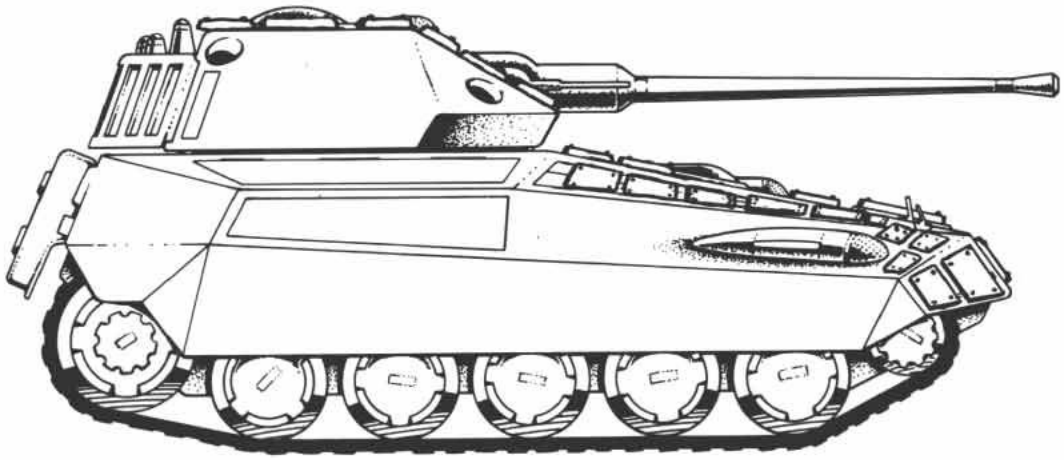
Security Clearance
Yes No
28-IX-1201
Date



3cm/L70 Autocannon

Round	ROF	Conc-Burst	Dam Val	Pen Val	Danger Space	Short Range	—Ammo— Price	Weight
HE	10	C: 1, B: 5	—	Nil	—	350	5	0.6
HEAP	10	C: 1, B: 5	—	11C	—	350	7	0.6
APDS	10	—	7D6	8/7/6/4	—	470	7	0.6
APFSDSDU-8	10	—	7D6	14/12/10/7	—	470	13	0.6
APFSDSCI-10	10	—	7D6	21/18/15/10	—	470	15	0.6
APFSDSSD-12	10	—	7D6	23/20/17/11	—	470	17	0.6
CHEM	10	C: 2, B: 3	—	Nil	—	350	5	0.6
Flechette	10	—	2D6/1D6*	1-Nil*	20×90	350	21	0.6

*as fragments, see TNE, page 280

7×57mm MG, Vehicle Mount

Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	—Recoil— SS	Burst	Short Range	Price
7×57mm ball	10	4	2-Nil	8	100B	—	—	150	Cr44 per 100 rounds

Reactive Armor Block Sets for the LRV Pandina

The Mercantile Guild manufactures and sells two sets of ERA (explosive reactive armor) blocks for their LRV "Pandina." These blocks provide additional armor protection for the top and front faces of the vehicle. The armor value is the additional armor protection provided by one layer of blocks for the relevant face. These blocks are machined to fit the Panda only, and cannot be used with other vehicles.

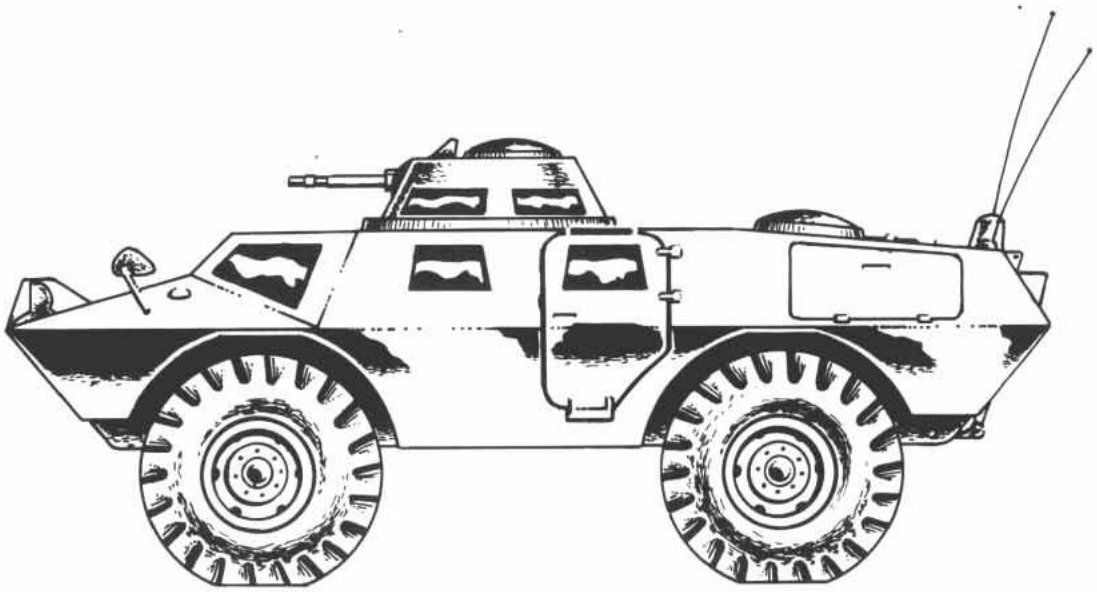
Panda ERA Set—Front Face
TL: 8
Volume: 2.6 kl
Mass: 520 kg
Price: Cr1820
AV: 16

Panda ERA Replacement Block—Front Face
TL: 8
Volume: 0.13 kl
Mass: 26 kg
Price: Cr91
AV: 16

Panda ERA Set—Top Face
TL: 8
Volume: 6.5 kl
Mass: 1300 kg
Price: Cr4550
AV: 16

Panda ERA Replacement Block—Top Face
TL: 8
Volume: 0.325 kl
Mass: 65 kg
Price: Cr228
AV: 16

Charina APC & "Pathie" Armored Car



Charina APC TL-7

The Charina is very simple light-wheeled vehicle designed to act as an armored personnel carrier and reconnaissance vehicle. With a maximum road speed of 94 kph (38 kph cross country) and a 30-hour endurance, the Charina is used for a variety of purposes, including mechanized infantry transport, cavalry/recon, military police, convoy escort, and riot control. The Charina's cargo allowance is rather small (25 kg per person), so long-term missions require support vehicles (either transport trucks or other APCs) to carry equipment and supplies.

Tech Level: 7
Price: Cr15,095.5
Size: 42 kiloliters displacement = 3 tons (Mc)
Mass: 8.74 empty, 12.04 tonnes loaded
Power: 0.3 MW Improved Internal Combustion Engine
Maint: 4
Controls: Basic mechanical
Commo: 30-km Radio
Life Support: Heat, light
Cargo: 200 kg (0.8 m^3)
Crew: 3 (driver, commander, and gunner)
Passengers: 5 in cramped seats
Fire Control: Optic RF
Armament: 7mm TL-5 MMG
Stabilization: None
Ammo: 2000 rounds 7x57mm, Cr880 for a full load
Speed: 94 kph maximum road speed, 38 kph maximum cross country speed, 9 kph maximum water speed
Travel Move: 195/85/20
Combat Move: 45/20/5
Fuel Capacity: 2250xliters hydrocarbon distillates
Fuel Consumption: 75 liters per hour, endurance of 30 hours

Combat Statistics

Configuration: Small Turret
Susp: W (4)

TF: 5	**HF:** 5
TS: 3	**HS:** 3
TR: 3	**HR:** 3
Deck: 3	**Belly:** 3

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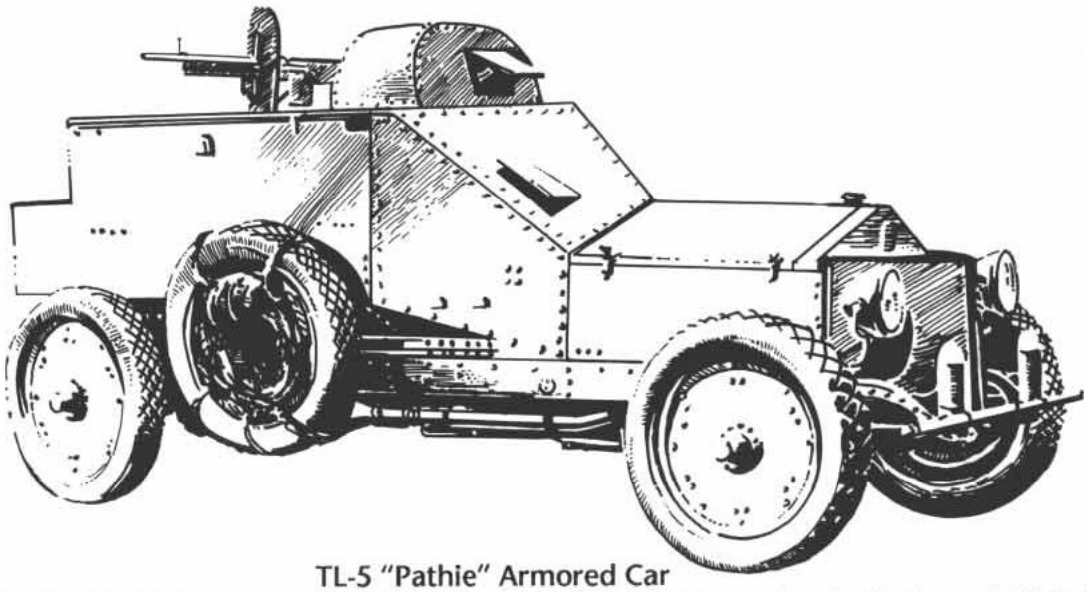
Security Clearance
Yes No
28 IX 1201
Date



TL-5 "Pathie" Armored Car

We were holding this DZ waiting for the strike team to show up when we heard this chugging sound from back in the woods. We looked at each other and hunkered down, and a few minutes later this thing comes down the road out of the trees. I guess I should call it an armored car, but "armored" is too kind—hell, even "car" is probably too kind. So this thing comes at us, wheezing up this moderate slope, with the crew all buttoned up and cowering, and a couple little pea-shooter guns poking out the turret, waving around like little antennas. The thought crossed my mind at that point that maybe we should just surrender to the thing, because I almost didn't have the heart to shoot it...

The "Pathie" armored car is not so much a specific type of vehicle as it is a representative of a broad class of vehicles encountered in the Wilds. These vehicles are known to RC crews as "Pathies," short for "pathetic," and are taken to include any TL-4 to 6 vehicle that are armored versions of civilian cars or trucks, armed with small arms weapons, and used for reconnaissance, security, etc. Although the specific example on this page was known as the "Impaler" armored car on Lebherz (3236/Khulam/Diaspora), this design can be taken as representative of low-tech "Pathies" throughout the Wilds as a whole.

Tech Level: 5
Price: Cr18,092
Size: 42 cubic meters = 3 displacement tons (Mc)
Mass: 22.33 tonnes empty, 27.39 tonnes loaded
Power: 0.75 MW improved internal combustion engine (no excess power)
Maint: 14
Controls: Basic mechanical
Commo: 30-km radio
Sensor: 2xvisible light headlights (30-meter short range)
Life Support: light, heat
Cargo: 0.2445 tonnes (0.978 m^3)
Crew: 3 (driver, gunner, radio operator)
Passengers: None
Fire Control: None (iron sights integral to the machineguns)
Armament: 2xTL-5 7mm medium machineguns
Stabilization: None
Ammo: 1000 rounds 7mm (500 per gun) in 10x100-round belts, Cr440 for full load
Speed: 83 kph maximum road speed, 33 kph maximum cross-country speed
Travel Move: 175/65
Combat Move: 40/15
Fuel Capacity: 4500 liters hydrocarbon distillates
Fuel Consumption: 187.5 liters/hour (endurance of 24 hours)

Combat Statistics

Config: Turret	**TF:** 6	**HF:** 6
Susp: W (4)	**TS:** 4	**HS:** 4
	TR: 4	**HR:** 4
	Deck: 4	**Belly:** 4

Weapon Performance

Weapon-Round	*ROF*	*Dam Val*	*Pen Rtg*	*Bulk*	*Magazine*	*— Recoil — SS*	*Burst*	*Short Range*
TL-5 7mm MMG-ball	10	4	2-Nil	8	100B	—	—	70

Pyrrhus Support Sled & "Buster" Weapons Carrier

Pyrrhus TL-13 Support Sled

The Pyrrhus grav "tank" was fielded by the Solomani during the middle portion of the Final War as the war entered its "meat grinder" phase. It was designed as a battlefield system which could be produced in large numbers to feed the battles of attrition that were grinding on throughout the Solomani Rim and Diaspora sectors. By setting its tech level at 13, the Solomani could produce the design on a larger number of worlds, and by cutting corners, such as on its armor and main armament, it could be produced more cheaply than a first-line main battle tank.

However, by naming it a "grav tank" (presumably to raise the morale of the crews who were about to die in it), the Solomani leaders made a serious mistake, as this led to its improper use and subsequent miserable reputation. Originally named the "Chariot grav tank," grim crews quickly renamed it the "Pyrrhus," and began to describe the "tank" as "a grav sled with an identity crisis."

However, just as it is only a poor carpenter who blames his tools, it is a poor commander who blames his equipment. When used properly, with adequate cover and in conjunction with missile-armed infantry, the Pyrrhus could hold its own. But when it was called a "tank" and rushed into combat with incompletely trained replacement units, it was used as a tank and died in droves like the tin can it was.

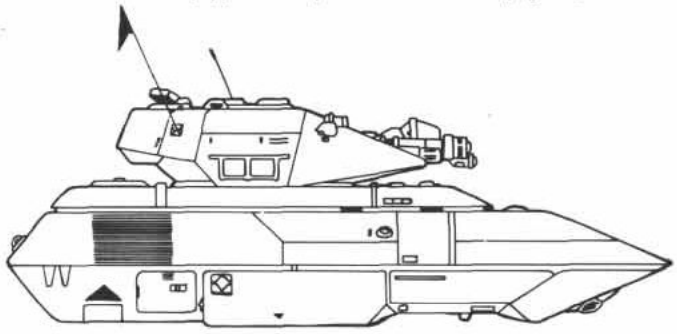
Because of its large numbers, the Pyrrhus has survived into the new era in relatively large numbers (for relic machinery), and sees use with the RC armed forces. Although the RC has retained the name "Pyrrhus," it is careful to designate the vehicle as a support sled, and instruct its crews in its proper use. Fortunately for the RC, their battlefields are a bit less demanding than the high-tech killing grounds of the Final War, and the Pyrrhus' weak points are less pronounced when dealing with the palace guards of a TED and his peasant yeomanry.

Nonetheless, as replacements are found, the Pyrrhuses are being removed from service to allow their light, compact TL-13 fusion plants to be used elsewhere.

The provision of a passenger seat allows platoon and company commanders to be carried without requiring them to pay attention to operating the tank. Instead, their full attention is devoted to commanding their units. When commanders are not carried, unit mechanics are sometimes carried, to allow rapid field repairs, and carry their tools and crucial spare parts in the spaces allocated for cargo.

The Pyrrhus may operate on worlds without breathable atmospheres as its power plant and propulsion system are not dependent upon oxygen, and it is equipped with basic life support for its crew.

In Coalition service, each crewmember is equipped with a personal defense laser (page 95).



Tech Level: 13
Price: Cr1,945,420
Size: 98 cubic meters = 7 displacement tons (Mc)
Mass: 26 tonnes empty, 42.2 tonnes loaded
Power: 3.3 MW fusion plant (1 year endurance) with HEPlaR thruster generating 16 tonnes of thrust (0.0572 MW excess power)
Maint: 7
Controls: Holographic linked, TL-10+ flight avionics, TL-13 terrain-following avionics, 2xTL-13 FLT computers
Commo: 300-km radio, 30km laser communicator
Sensors: 30-km passive EMS, 3-km active EMS, 3-km EMS jammer
Life Support: Heat, light, pressurized, basic life support
Cargo: 4 tonnes
Crew: 3 (commander, gunner, driver)
Passengers: 1
Fire Control: TL-13 ballistic computer allows up to 4 +Diff Mods to be disregarded

Armament: 12-Mj plasma cradle gun, coaxial 7.5mm machine-gun, coaxial target-painting laser
Stabilization: Advanced (for all three weapons), may fire at any speed
Ammo: 400 pulse plasma cartridges (Cr300 each), 3000 rounds 7.5mm. Full load of plasma cartridges costs Cr120,000, full load of machinegun ammunition costs Cr1320.
Speed: 720 kph high mode, 540 kph cruising, 170 kph safe NOE speed
Travel Move: 2160 (high mode), 1020 (NOE)
Combat Move (in 10-meter grid squares): 100 (high mode absolute speed), 24 (NOE safe speed)
Fuel Capacity: 4000 liters LHyd
Fuel Consumption: 200 liters/hour (endurance of 20 hours)

Combat Statistics

Config: Turret	**TF:** 60	**HF:** 60
Susp: G	**TS:** 8	**HS:** 8
	TR: 4	**HR:** 4
	Deck: 8	**Belly:** 4

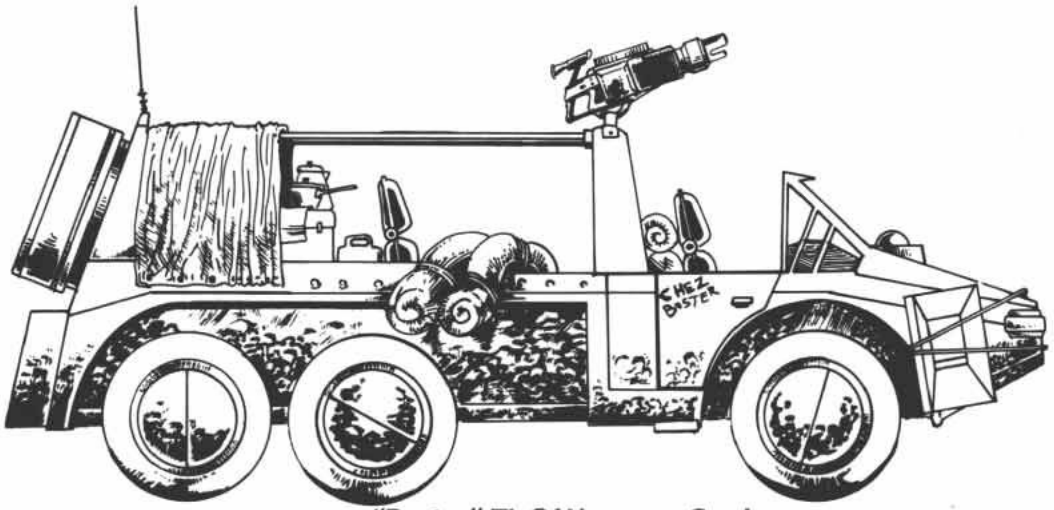
Weapon Values

Type	*ROF*	*Short Range*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Con-Burst*
12-Mj plasma cradle gun	SA1	360*	40	1-2-10	40-40-20-4	C: 2, B: 5
7.5mm MG	5	300	7	2-3-4	—	—
8cm laser rifle	SA3	300	—†	—†	—	—

*The plasma gun's accuracy does not go down (i.e., the gunner's task difficulty level does not increase) with range. Range bands change the weapon's performance only by reducing penetration and defining the weapon's maximum range (2880 meters).

†The laser is powered directly from the vehicle's power plant, but only at target designation intensities.

Security Clearance
Yes No
28-IX-1201
Date



"Buster" TL-8 Weapons Carrier

The "Buster" weapons carrier is based quite naturally on the TL-8 range truck, manufactured throughout the Last Imperium and available in relic form, and now manufactured on Lucifer, Oriflamme, and Nike Nimbus in the Reformation Coalition.

In this weapons carrier version, it has been enhanced by the addition of a TL-8 satellite-positioning ground navigation system, a 30-km radio, and a power adapter to allow an 8cm TL-9 laser rifle to be fired off of the vehicle's power supply, rather than requiring a backpack. The TL-9 adapter is the only item on the vehicle itself (exclusive of the installed weapons, below) that is not constructed at TL-8. The adapter allows the rifle to fire at the 0.02-Mj power level (see page 92).

The weapons carrier has a pintle mount installed on its forward roll bar, and is designed to carry any one of a large variety of Coalition heavy weapons, usually a squad support laser, laser sniping weapon, assault rocket launcher, or plasma bazooka. (Firing data for these weapons is presented on their individual entries; page references for these are listed under "Armament," below.) By mounting these weapons directly on a vehicle rather than having them carried by ground troops, the crew is able to rapidly "shoot and scoot" to avoid enemy counterfire. This makes the weapons carrier valuable for defensive operations, as it is difficult for an SSL or LSW crew to provide defensive covering fire and then pack up these heavy weapons and escape. The weapons carrier's high cross-country mobility has led to its nickname, "Buster." It can travel so rapidly across rough terrain that the crew seated inside complain that "it'll bust yer butt."

Note that of the weapons carrier's price of Cr24,888, Cr20,000 comes from its satnav system, meaning that this system is often left off to save money. Note also that the power shortfall below means that the laser rifle adapter and the satnav system may not be operated at the same time. However, since the satnav system only needs to operate periodically to update the vehicle's new location, this is not a problem.

Coalition range trucks and "Busters" have had their power plants converted to burn liquid hydrogen (LHyd), as this will always be available from starship fuel tankage, while many low-tech worlds will have no petroleum refining facilities to provide hydrocarbon distillate fuels.

Busters function without difficulty in atmosphere codes 4-9, but do require intake filters in tainted atmospheres (codes 4, 7, and 9). These cost Cr10 per vehicle and have negligible mass and volume. In order to function in very thin atmospheres (codes 2-3), the Buster requires an intake compressor. Compressors cost Cr200 and reduce the vehicle's cargo capacity by 0.1 cubic meters and 0.1 tonnes.

Buster crews are equipped with two image converter or PRIS binoculars (pages 28-29), one 8cm DEI laser rifle (page 92), and two personal defense lasers (page 95), in addition to whatever additional personal equipment and supplies they might wish to carry.

Tech Level: 8
Price: Cr24,888 (exclusive of weapons)
Size: 14 cubic meters = 1 displacement ton (Mc)
Mass: 1.95 tonnes empty, 3.8 tonnes loaded
Power: 0.2 MW improved internal combustion engine (0.00817 MW power shortfall)
Maint: 1
Controls: Enhanced electronic, TL-8 navigation aids
Commo: 30km radio
Sensors: Image converter or PRIS binoculars carried by crew (pages 28-29)
Life Support: Light, heat
Cargo: 0.25 tonnes for crew supplies and equipment, plus up to 1.25 tonnes of heavy weapons and ammunition (see below)
Crew: 3
Passengers: None
Fire Control: None
Armament: 1×Squad Support Laser (page 96), *or* 1×Laser Sniping Weapon (page 97), *or* 1×Assault Rocket Launcher (page 98), *or* 1×Plasma Bazooka (page 99), plus one DEI laser rifle (page 92)
Stabilization: None
Ammo: Varies by carried weapon: 16×SSL magazines (100 rounds each), *or* 128×LSW rounds, *or* 74×ARL clips (6 rounds each), *or* 75×Plasma Bazooka rounds
Maximum Speed: 145 kph on roads, 58 kph cross country
Travel Move: 280/110
Combat Move: 65/25
Fuel Capacity: 550 liters LHyd
Fuel Consumption: 50 liters/hour (endurance of 11 hours)

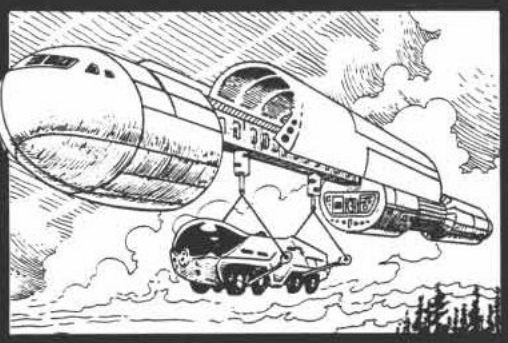
Combat Statistics

Config: Open vehicle	**HF:** [1]
Susp: W (2)	**HS:** [1]
	HR: [1]
Deck: Open	**Belly:** 1

STARSHIPS









SPACECRAFT

The following pages contain a sampling of starships and spacecraft commonly used by the Reformation Coalition and its member worlds, as well as three Hiver ships that are often encountered in Coalition Space. Note that the individual member worlds of the Coalition maintain fleets of mostly relic craft: large Last Imperium starships mostly used as system defense boats, and a profusion of smaller ships. These ships are not portrayed here, but are found in the **TNE** basic rules (pages 366-379) and in **Brilliant Lances**. Note that these sources show ships that have been rebuilt, redesigned, or modified over the years to TL-12 standards, even though these classes were usually considered TL-15 vessels in former times.

How to Read the Starship Data Profiles

The starship data profiles on the following pages are presented in the **Brilliant Lances** format. However, they are also fully usable with the space combat rules presented in the **TNE** basic rules. Where the range of any system is defined in hexes, this is the same as range bands in the basic **TNE** space combat rules.

The following abbreviations are used on the following pages.

AEMS: Active Electromagnetic Sensor; **AG:** Artificial Gravity (environmental and G-compensating); **AL:** Air Lock; **Ant:** Antenna; **Brb:** Barbette; **BS:** Barbette Socket; **CG:** Contra-Gravity Lifters; **CH:** Cargo Hatch; **Elec:** Electronics; **ELS:** Emergency Life Support; **EMM:** Electromagnetic Masking; **EMMR:** Electromagnetic Masking Radiators; **Eng:** Engineering; **FPP:** Fuel Processing Plant; **JD:** Jump Drive; **Las:** Laser; **LB:** Laser Barbette; **LBth:** Low Berth; **LP:** Launch Port; **LS:** Life Support; **LSR:** Large stateroom; **LT:** Laser Turret; **MB:** Missile Barbette; **MD:** Maneuver Drive (ignition chamber); **MFD:** Master Fire Director; **MG:** Meson Gun; **MS:** Meson Screen; **MT:** Missile Turret; **ND:** Nuclear Damper; **NDB:** Nuclear Damper Barbette; **NDT:** Nuclear Damper Turret; **PA:** Particle Accelerator; **PEMS:** Passive Electromagnetic Sensor; **PEMS Ant:** Passive Electromagnetic Sensor Antenna; **PP:** Power Plant; **Qtrs:** Quarters; **RC Ant:** Radio Communicator Antenna; **Sand:** Sandcaster Turret; **SSR:** Small Stateroom; **Trt:** Turret; **TS:** Turret Socket, i.e., an empty socket where a turret could be installed. All empty sockets take 1 minor hit (1h). If a turret or barbette is in the socket, it takes damage normally.

Note: Prices for ships do not include carried small craft, cutter modules, vehicles, etc., which must be purchased separately.

Small Craft

In the Last Imperium, small craft were classified by a bewildering array of specific terms which specified size, performance, and often hull configuration. With the Imperium's large high-tech manufacturing base, these standard designs could be produced in huge numbers at consistent levels of technology, and these fine distinctions of type were useful. However, with the low technology levels prevailing in the Reformation Coalition in the new era, these descriptions are no longer useful, as reigning tech levels will often not permit their construction, nor even their repair. For example, the 50-ton modular cutter, which in Last Imperium times maneuvered at 4Gs, cannot be built to perform at better than 2 at TL-12. These difficulties of building spacecraft with external similarities to Last Imperium craft but which did not fit many of the criteria of their Imperial descriptions led to a breakdown of small craft terminology in the RC.

Because of the large numbers of relic small craft, of widely varying characteristics and performance, that have been pressed into Coalition service, the RCES and RCN have been forced to adopt a new standardized system for classifying these craft. Because it is based categories of actual performance, it is more rational than the arbitrary Imperial system which allocated a unique type name to each separate design. However, because the imperial usage persists, confusion may sometimes result. Ironically, one of the most persistent of the anachronistic uses is the modular cutter, which strictly speaking should be called a modular shuttle under the new system. Although it does not fit either the Imperial nor the RC requirement of 4G performance, the fact that its design concept is identical to the old Imperial modular cutters means that the name is still used. Note that *cutter* used alone means a 50-99-ton craft with 4G+ performance; the term *modular cutter* must be used to describe the 50-ton craft with a 29-ton removable module.

Assault Lander: A heavily armored small craft, usually armed, designed to land combat-equipped troops under fire.

Barge: Any small craft assigned for the personal transport of an admiral or other high-ranking officer.

Boat: Generic term for any small craft. Term is also used for spacecraft in general, for example the starship-sized system defense "boats."

Cutter: Small craft between 50 and 99 tons and performance of 4Gs or greater, especially one with substantial cargo capacity.

Fighter: A high-performance, armed small craft intended only for space or atmospheric and space combat, with no utility role.

Gig: Small craft of 20 tons or less and performance of 4G or greater, and usually armed.

Launch: Small craft of 20-49 tons and performance of 3G or less.

Lifeboat: Powered small craft in the skiff or launch class fitted with emergency low berths or standard passenger couches, used for abandoning disabled or destroyed starships.

Liferaft: Unpowered small craft fitted with emergency low berths, used for abandoning disabled or destroyed starships.

Lighter: Nonstarship greater than 100 tons displacement, with performance of 3G or lower, designed to land cargo from orbit onto planetary surface.

Longboat: Any small craft between 20 and 99 tons with long-endurance accommodations for all crew and passengers.

Pinnace: Small craft of 21-49 tons with performance of 4G or greater.

Ship's Boat: See Boat. Because of Imperial practice, has also come to be associated with a 30-ton starship-carried general purpose utility craft, usually in the pinnace class.

Shuttle: Small craft between 50 and 99 tons and performance of 3Gs or less.

Skiff: Small craft of less than 20 tons and performance of 3G or less.

Small Craft: Non-jump-capable craft of less than 100 tons.

Spacecraft: Non-jump-capable space vessel of any size.

System Defense Boat: Non-jump-capable space vessel of 100+ tons displacement, intended purely for space combat, with no utility role.

Utility Small Craft/Spacecraft Classes

Size	Low Performance (1-3G)	High Performance (4+ G)
1-19/20	Skiff	Gig
20-49	Launch	Pinnace
50-99	Shuttle	Cutter
100+	Lighter	

Reformation Coalition *Manta*-Class Fueler



General Data

Displacement: 400 tons
Length: 33 meters
Price: MCr119.62
Configuration: Dome/Disc SL
Mass (Loaded/Empty): 2789.07/2481.57
Hull Armor: 31
Volume: 5600 m^3
Target Size: S
Tech Level: 12

Engineering Data

Power Plant: 700 MW Fusion Power Plant (50 MW/hit), 1 year duration (0.976 MW excess power)

G-Rating: 3G (200 MW/G), Contra-Grav lifters (40 MW)

G-Turns: 40.8, 25 m^3 of fuel each (using dedicated supply; +140 G-turns if using clipper's fuel)

Maint: 110

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)

Commo: 300,000km radio (10 hexes; 10 MW), 1000AU maser (∞; 0.6 MW)

Avionics: TL-10+ Avionics

Sensors: Passive EMS fixed array 60,000km (2 hexes; 0.06 MW), Active EMS 60,000km (2 hexes; 12.5 MW)

ECM/ECCM: EM Masking Package (5.6 MW)

Controls: Bridge with 3×bridge workstation, plus 8 other workstations

Armament

None. No turret sockets fitted.

Accommodations

Life Support: Basic (0.56 MW), Gravitic Compensators (3G; 28 MW)

Crew: 12 (1×Maneuver, 1×Electronics, 8×Engineering, 1×Maintenance, 1×Command)

Crew Accommodations: None, other than basic seats at workstations. Fueler is not designed for long duration missions.

Cargo: 62.5 cubic meters/tonnes with one small cargo hatch, plus 3500 m^3 for fuel

Air Locks: 4

Notes

Fuel scoops fitted, but no purification machinery.

The *Manta* is the ultimate expression of the fuel skimmer concept. In the case of the *Manta*, the fuel skimmer no longer shuttles back and forth between the mothership and the fuel source, gradually filling the fuel tankage; instead, the *Manta* itself is the fuel tank. By carrying the fuel tank to the fuel source and filling it there in one trip, time is saved.

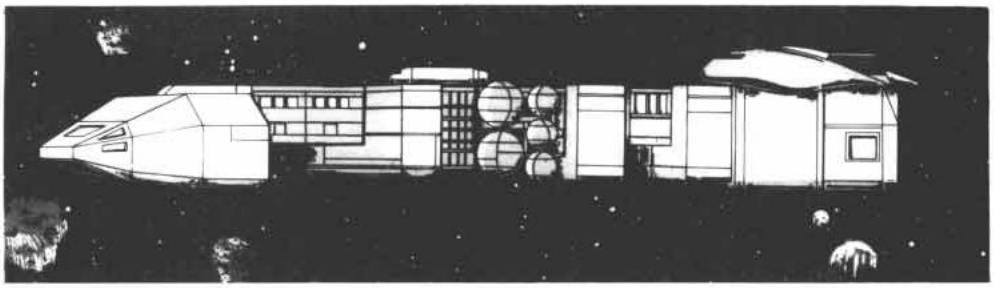
Although the *Manta* was intended to be almost permanently attached to the clipper, detaching only to refuel, clipper crews cannot resist using this extra craft for scouting, sensor sweep, or liaison missions in low-threat environments. Due care is taken of course, because the clipper cannot refuel without it, and carries no fuel other than that carried in the *Manta* or one of the fuel modules.

The *Mantas* are not designed for long duration missions, and have only basic life support; no showers, eating, or sleeping facilities. On long-duration fuel missions, improvised sleeping arrangements are made by setting up temporary bunks in the cargo hold. Crewmembers often bring along personal food supplies to supplement the preserved survival rations normally stocked.

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosions*	*Systems*
1	1-3: Ant, 4-6: CH	1-17 Elec, 18-20: Hold	LS-5H
2-5, 10-15		Hold	ELS-3H
6-7	1: AL	1-5: Qtrs, 6-20: Hold	EMM-1H
8-9	1-5: EMMR	Hold	EMMR-(5h)
16-17		1-4: Eng, 5-20: Hold	AG-1H
18-19		1-5: Eng, 6-20: Hold	PP-14H
20		Eng	MD-1H
			CG-1H
			ALL Others-(1h)

Reformation Coalition *Aurora*-Class Clipper



General Data

Displacement: 600/1080/2080 tons
Length: 144 meters
Price: MCr749.86
Configuration: Open Frame USL
Mass (Loaded/Empty): 17,659.77/13,715.17
Hull Armor: 20
Volume: 8400/14,000/28,000 m³
Target Size: M (L)
Tech Level: 12

Engineering Data

Power Plant: 2280 MW Fusion Power Plant (50 MW/hit), 1 year duration
Jump Performance: 2 at 1561-2080 tons, 3 at 1249-1560 tons, 4 at 1041-1248 tons (Group III only), 5 at 1040 or fewer tons (Group III only) (Fuel used per jump varies with displacement and jump distance, but is always 4368m³ for maximum jump at current displacement.)
G-Rating: 2 at all displacements, limited by hull construction. Divide displacement (in 14 m³ tons) by 2 to get MW needed per G of performance. No contra-grav lifters.
G-Turns: Assuming fuel from fuel skimmer (3500 m³) and 400-ton fuel module (4722 m³), 8222 m³ fuel is available, but fuel use varies with displacement. At 2080 tons, 130 m³ fuel per G-turn, 29.6 G-turns (63.2 using jump fuel). For other configurations, divide MW/G by 8 to get m³ of fuel per G-turn for current displacement.
Maint: 617

Electronics

Computer: 1×TL-12 Mod Fb Computer (0.8 MW), 2×TL-12 Mod St Computer (0.4 MW)
Commo: 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: TL-12 Passive EMS fixed array 120,000km (4 hexes; 0.15 MW), TL-12 Active EMS 300,000km (10 hexes; 27.5 MW), TL-11 Ladar 180,000 km (6 hexes; 2.5 MW)
ECM/ECCM: EM Masking (8.4 MW)
Controls: Bridge with 18×Bridge Workstation, plus 26 other workstations

Armament

Offensive: 8×TL-12 120-Mj Laser Turret (Loc: 4,5,5—Arcs: 1,2,3,4; Loc: 10—Arcs: All; Loc: 18,19,20,20—Arcs: 2,3,4,5; 3.3 MW ea.; 1 Crew ea.), TL-12 1000-Mj Meson Gun (Loc: Spinal; Arcs: 1; 27.8 MW; 5 Crew)
Master Fire Directors: 3×TL-12 MFD (4 Diff Mods; No Msl, 10 hexes; 2.95 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
120-Mj Laser Turret	4:1/4-27	8:1/4-27	16:1/4-20	32:1/3-10
1000-Mj Meson Gun	5:158	10:75	20:38	40:19

Accommodations

Life Support: Extended (1.68 MW), Gravitic Compensators (3G; 42 MW)
Crew: 85: 26×Engineering, 2×Electronics, 2×Maneuvering, 16×Gunnery, 7×Maintenance, 18×Flight Crew, 11×Command, 2×Steward, 1×Medical
Crew Accommodations: 20×Small Stateroom (double-occupancy; 0.0005 MW ea.). Additional accomodations for crew contained in 100-ton auxiliary quarters module.
Passenger Accommodations: None, but additional quarters modules may be added.
Cargo: 130.75 m³, plus cargo modules, one small cargo hatch
Small Craft and Launch Facilities: External grapples (USL) for 50-ton Cutter, 30-ton craft, 1×400-ton fuel skimmer, and 4×100-ton, 1×200-ton, and 1×400-ton auxiliary modules.
Air Locks: 6

Notes

Clipper carries no fuel of its own except for the year's supply (330 m³) for the power plant. All reaction mass and jump fuel carried in *Manta*-class fueler and fuel modules. Listed price does not include *Manta*, but *Manta*'s loaded mass is included with the clipper's loaded mass, along with loaded mass of one modular cutter and one 30-ton boat (which account for the extra 80 tons of displacement). Price and mass does not include any modules, although clipper is typically fitted at least with one 100-ton auxiliary quarters module and a 400-ton fuel module. The fuel module carries 4722.4 m³ of fuel, plus fuel purification machinery (9.9 MW) sufficient to purify that amount in 17.17 hours.

The Group III clippers are later models with recovered higher technology jump drives.

Fully loaded clipper only has an actual target size of medium (M), but because its laser turrets are all mounted on turret extenders, it is treated as a large (L) target when being scanned by active sensors.

On the damage table, modules A, B, C, and D are 100-ton modules, module E is a 200-ton module, and module F is a 400-ton module, almost always a fuel module.

When clipper is empty, treat as Open Frame for purposes of hit location and fire arcs. When loaded with any modules, use Close Structure. When *Manta* is not docked, treat hits on areas 12, 13, 16, and 17 as a surface hit on its 400-ton grapple, then reroll for interior hit location on 1D10+10.

For hits on fuel module, use 1-18: Fuel, 19-20: Fuel Purification, with FP-13H. Hits on a 100-ton quarters module are treated as SSR hits, there are 43 such rooms. Other locations should be handled abstractly as cargo.

DAMAGE TABLES

Area (1D10)	*Surface Hits*	*Internal Explosion*
1	1-6: Ant	1-4: MG, 5-11: Elec, 12-20: Hold
2	30-ton Craft	1-5: MG, 6-10:, Qtrs, 11-20: 100-ton Module B
3	30-ton Craft	1-5: MG, 6-10, Qtrs, 11-20: 100-ton Module A
4	1: AL, 2-3: Ant, 4-6: EMMR	1: LT, 2-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module B
5	1: CH, 2-3: Ant, 4-6: EMMR	1: LT, 2: LT, 3-4: Elec, 5-9: Grapple, 10: Qtrs, 11-20: 100-ton Module A
6, 8	1-10: Module C, 11-20: Module E	1-10: 100-ton Module C, 11-20: 200-ton Module E
7, 9	1-10: Module D, 11-20: Module E	1-10: 100-ton Module D, 11-20: 200-ton Module E
10	50-ton Craft	1-9 Meson Gun, 10: LT, 11-18: Module Grapple, 19: 30-ton Grapple, 20: 50-ton Grapple
11, 14-15	Module F	Module F
12-13, 16-17	Manta Surface	Manta
18	1-10: Module F	1-10: Fuel Module, 11: LT, 12: 400-ton Grapple, 13-20: Eng
19	1-10: Module F	1-10: Fuel Module, 11: LT, 12-20: Eng
20		1: LT, 2: LT, 3-20: Eng

Systems
AEMS-(2h)
MG-16H
JD-27H
EMM-1H
PP-46H
AG-2H
MFD-1H
SSR-(2h)
LS-7H
ELS-4H
MD-2H
LT-1H
All Others-(1h)
EMMR-(8h)
30-ton Grapple-1H
50-ton Grapple-1H
100-ton Grapple-2H
200-ton Grapple-2H
400-ton Grapple-6H

CLIPPER MODULES

The vessels of the *Aurora* class were originally designed as mercantile/exploratory vessels, adaptable to various missions by means of their modular nature. Encounters during early voyages revealed certain inadequacies (primarily in armament and power plant), and the ships were redesigned and rebuilt. The additions to the vessel came at the expense of some fuel and quarters space, and as a result, all *Aurora*-class clippers must carry supplementary fuel tankage, fuel processing machinery, and crew quarters modules.

Aurora-class clippers are normally assigned small craft and modules as follows:

— 1×Ship's boat, 1×Cutter, and 1×*Manta* in dorsal grapples

plus:

— 1×400-ton module

— 1×200-ton module

— 4×100-ton modules (or the equivalent in 25- and 50-ton combinations, i.e., 4×25s, 2×25s and a 50, or two 50s)

A number of specialty modules called Colonizer/Uplift modules are designed to be dropped off on a planetary surface to serve as pre-fabricated colonies on boneyard worlds or to become the center for an uplift mission. Colonizer modules include quarters and administrative centers (which are occupied by the colonists on the trip out, and become their permanent home upon arrival), and other modules such as medical, manufacturing, or educational modules which become training centers for their respective specialties upon arrival. All modules can be used as pre-fabricated components in modular orbital or deep space stations, but usually require additional structural components for this purpose.

Allocating Damage: Assign each module a spot on the main clipper damage table by deciding which of the lettered spaces it represents. For example, take a clipper with a 400-ton fuel module attached to F, a 100-ton quarters module at A, and a 100-ton cargo module at B. If a clipper takes a hit in location 15, module F has been hit, and the player should roll a D20 on the 400-ton fuel module's damage table below. A hit on location 5 would be slightly more complicated: a roll of 1-10 indicates that the clipper has been hit, a roll of 11-20 indicates that module A has been hit, and a further D20 roll on the relevant 100-ton module damage table is necessary. If a hit occured on location 9, where no modules have been attached, the result must be rerolled.

When resolving excess damage (**TNE**, page 320 or **Brilliant Lances**, page 23), the roll may call for the damage to be carried to another hit location,which means a location on the ship's main damage table, not the module's specific subtable. If the new hit location is a different module from the one where the initial damage took place (or is part of the clipper whereas the initial damage took place in a module or vice versa), the excess damage is not immediately resolved in the new location. First, it must penetrate the hull of the current module on its way out, and then penetrate the hull of the module or clipper main hull at the new location. This may use up the remaining damage before it can be resolved as internal explosions in the new location. Note that no surface damage is conducted during this penetration to the neighboring hit location, as these adjoining hull surfaces have no surface fixtures on them. Note also that in some cases the result "same internal area" will also require this procedure of re-penetration into an adjoining hull section. The paragraph above describes a hit on location 5, where 1-10 indicates the clipper and 11-20 indicates module A. If the initial damage were resolved in module A, and then excess damage was rolled for "same internal area," a subsequent roll of 1-10 would call for the excess damage to be taken out of the module and into the clipper hull and require hull penetration to exit the module and again to enter the clipper (which might well use up that damage before getting to the clipper's interior).

MODULE DESCRIPTIONS

25-ton Lifeboat Module

This module is a lifeboat capable of carrying 40 personnel (in emergency low berths) to a planetary surface as necessary during an emergency. It is normally unoccupied, and contains no artificial gravity and only basic life support. Module has insufficient power to run radio while emergency landing thrusters are in use. When not in use as a lifeboat, the module's power plant can supply 19.625 MW of surplus power to the rest of the clipper.

Volume: 350 m³
Mass: 161.8 tonnes (loaded), 144.6 (empty)
Price: MCr5.28
Crew: Pilot necessary for landing, otherwise none
Passengers: 40 in emergency low berths
Features: 20 MW fusion power plant, 10×emergency low berths, 300,000-km radio, 30,000-km PEMS, 1×normal workstation, 1.72 tonnes of rescue supples and emergency equipment
Maint: 5

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	EMMR	Engineering	LS-1H
2		Electronics	ELS-1H
3-4		Hold	PP-1H
5	AL	Quarters	All Others-(1h)
6-20		Quarters	

25-ton Missile Module

This module provides clippers with additional armament. No quarters are provided for the crew of five, and no outside power is required (0.093 MW surplus power).

Volume: 350 m³
Mass: 370.12 tonnes (loaded), 266.12 (empty)
Price: MCr39.13
Crew: 3 (1×gunner, 1×electronics, 1×MFD officer). Quarters not provided.
Passengers: None.
Features: 33.1 MW TL-12 fusion power plant, TL-12 300,000-km Missile-capable MFD (4 Diff Mods; Msl 10 hexes; 10 hexes; 3.1 MW; 1 Crew), TL-12 missile barbette, 300,000-km AEMS, TL-12 60,000-km PEMS, 2×normal workstations.
Maint: 15

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	AL	Quarters	AEMS-(2h)
2	EMMR	Power Plant	MFD-1H
3	Ant	Electronics	LS-1H
4-5	Ant	Electronics	ELS-1H
6	Ant	Hold	PP-1H
7-15	CH	Hold	MB-1H
16-20		Missile Barbette	All Others-(1h)

25-ton VIP/Special Quarters Module

This module provides quarters for important persons or those requiring special atmospheres, gravities, or other environments. No outside power is required (17.7975 MW surplus power). Internal arrangements vary.

Volume: 350 m³
Mass: 152.12 tonnes (loaded), 147.62 (empty)
Price: MCr4.23
Crew: None.
Passengers: Three in three large staterooms (single occupancy), up to six more in three small staterooms (single or double occupancy)
Features: 20 MW TL-12 fusion power plant, 3×large staterooms, 1×meeting room, 3×small staterooms.
Maint: 4

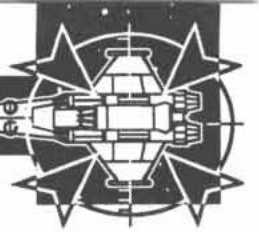
DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Power Plant	SSR-(2h)
2		Hold	LSR-1H
3	EMMR	Electronics	LS-1H
4	AL	Quarters	ELS-1H
5-20		Quarters	PP-1H
			All Others-(1h)

50-ton General Cargo Module

This module is an unpowered cargo carrier (525.15m³), without life support or artificial gravity. The module requires 0.752 MW of outside power. A 5-ton liferaft is provided in a docking ring adjacent to spinal corridor entryway.

Volume: 700 m³
Mass: 771.99 tonnes (loaded), 246.84 (empty)
Price: MCr3.37
Crew: None.
Passengers: None.
Features: External grapple for 50-ton module, 2×large cargo hatches, 5-ton liferaft and docking ring, 525.15 m³ cargo space
Maint: 34



DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems
1	AL	Quarters	EMM-(1h)
2	EMMR	Electronics	EMMR-(1h)
3-9	CH	Hold	Grapple-1H
10-20		Hold	LS-1H
			ELS-1H
			All Others-(1h)

50-ton Service Module for 10-ton Small Craft

This module provides a docking port and service facilities for a 10-ton small craft (called "skiffs" in RC service), along with three small staterooms for the maintenance crew. No outside power is required (14.6065 MW surplus power).

Volume: 700 m³
Mass: 500.63 tonnes (loaded), 358.23 (empty)
Price: MCr7.7
Crew: 6×Maintenance
Passengers: None.
Features: 20 MW TL-12 fusion power plant, internal hangar (minimal) and launch port for 10-ton small craft, machine shop, 142.4 m³ storage and supplies, 3×small staterooms.
Maint: 20

DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems
1	AL	Quarters	Hangar-3H
2-3		Quarters	Mach. Shop-1H
4		Power Plant	SSR-(2h)
5	EMMR	Electronics	LS-1H
6-14	LP	Hold	ELS-1H
15-20		Hold	AG-(3h)
			PP-1H
			All Others-(1h)

50-ton Power/Fuel Module

This module was specially designed to provide *Maggart*-class "stretch" clippers with additional energy to boost the power of their spinal mount meson weapons. The module is extremely massive, and its use requires careful balancing of mass throughout the rest of the ship. It is usually carried with a 50-ton fuel module (163.46 tonnes loaded, 116.42 empty, MCr3.27, No crew, 672 m³ fuel [47 tons], 3 Maintenance points, requires 0.752 MW outside power) to "dilute" its mass. The module carries one year's fuel for the reactor, and 206.8m³ (14.5 tonnes) of reaction mass. The module meets its own power needs, and supplies 562.606 MW to the clipper, sufficient to power the 2250-Mj spinal mount to the –2 Diff Mod power level.

Volume: 700 m³
Mass: 1296.45 tonnes (Loaded), 1281.98 (Empty)
Price: MCr55.036
Crew: 6 (engineering)
Passengers: Provision for up to 6 in 3 small staterooms (double occupancy)
Features: 567 MW TL-12 fusion power plant, 3×small staterooms,
Maint: 60

DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems	
1-3	AL	Quarters	EMM-(1h)	ELS-1H
4-11		Power Plant	EMMR-(1h)	AG-(3h)
12	EMMR	Electronics	SSR-(2h)	PP-12H
13-20		Fuel	LS-1H	All Others-(1h)

50-ton Survey Module

This module contains a laboratory and sensors for conducting a planetary survey along with a 10-ton small craft housed in a docking ring. Six small staterooms are provided for the crew. No outside power is required (5.545 MW surplus power).

Volume: 700 m³
Mass: 515.22 tonnes (loaded), 322.23 (empty)
Price: MCr74.26
Crew: 8 (5×scientists/lab technicians, 1×electronics, 2×skiff crew)
Passengers: None.
Features: 20 MW fusion power plant, laboratory, docking ring and launch port for 10-ton small craft, 109 m³ specimen supply storage, 180,000-km PEMS, 3000-km AEMS, densitometer, neutrino sensor, 4×normal workstations, 6×small staterooms
Maint: 21

DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems
1	Ant	Power Plant	Neut Sens.-(2h)
2	Ant	Quarters	Lab-1H
3-9	Ant	Electronics	SSR-(2h)
10	EMMR	Electronics	LS-1H
11	Ant	Hold	ELS-1H
12-20	LP	Hold	AG-(3h)
			PP-1H
			All Others-(1h)

100-ton Fighter Module

This module provides maintenance facilities and combat support for up to four 16-ton fighters (three in docking rings, one in internal hangar). Fuel and quarters for the crew of eight are not provided. No outside power is required (9.016 MW surplus power).

Volume: 1400 m³
Mass: 1506.28 tonnes (loaded), 476.58 (empty)
Price: MCr12.11
Crew: 8 (4×pilots, 2×maintenance, 1×electronics, 1×command).
Passengers: None.
Features: 20 MW TL-12 fusion power plant, internal hangar (minimal) for 16-ton fighter, docking rings and launch ports for 3×16-ton fighters, 4×16-ton "Wildbat" fighters, 2×1000 AU maser communicators, 1×normal workstation, machine shop, 41.7 m³ storage.
Maint: 18

DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems
1	EMMR	Quarters	EMM-(3h)
2	EMMR	Power Plant	Hangar-4H
3	Ant	Electronics	Mach. Shop-1H
4-5	Ant	Hold	LS-2H
6-20	LP	Hold	ELS-1H
			AG-1H
			PP-1H
			All Others-(1h)

100-ton General Cargo Module

This module is an unpowered cargo carrier (1353.1m³), without life support or artificial gravity. The module requires 1.502 MW of outside power.

Volume: 1400 m³
Mass: 1539.67 tonnes tonnes (loaded), 186.57 (empty)
Price: MCr6.56
Crew: None.
Passengers: None.
Features: 3×large cargo hatches, 1353.1 m³ of cargo.
Maint: 69

DAMAGE TABLES

1D20	Surface Hits	Internal Explosions	Systems
1	AL	Quarters	EMM-(3h)
2	EMMR	Electronics	LS-1H
3	EMMR	Cargo	ELS-1H
4-10	CH	Cargo	All Others-(1h)
11-20	CH	Cargo	



Clipper Modules

100-ton Quarters Mk Ia

This module contains 43 small staterooms, and is designed for maximum capacity, not crew comfort. No outside power is required (21.1965 MW power surplus).

This module is also equipped as a lifeboat: C-G Lifters, ignition chamber, reaction mass (4 G-turns), 1000 AU radio beacon, flight computer, and normal workstation provided for purposes of emergency planetfall only.

Volume: 1400 m³
Mass: 457.99 tonnes (loaded), 442.14 (empty)
Price: MCr15
Crew: None.
Passengers: Up to 86 in 43xsmall staterooms
Features: 30 MW TL-12 fusion power plant, artificial gravity/G compensators, extended life support, 14.1 m³ cargo/storage space, 43xsmall staterooms, 2xair locks. *For Emergency Landings:* 1000 AU radio beacon, 30 MW battery (2 hour duration), CG lifters, 1xnormal workstation, TL-12 Flt computer, 1G ignition chamber for emergency planetfall, reaction mass (4 G-turns).
Maint: 15

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1		Engineering	EMM-(3h)	ELS-1H
2	EMMR	Electronics	EMMR-(1h)	AG-1H
3	EMMR	Hold	Battery-1H	PP-1H
4	AL	Quarters	SSR-(2h)	CG-(4h)
5-20		Quarters	LS-2H	All Others-(1h)

100-ton Quarters Module Mk Ib

This module contains 31 small staterooms, a sickbay, electronics shop, and machine shop. No outside power is required (18.8005 MW power surplus).

This module is also equipped as a lifeboat: CG Lifters, 1G ignition chamber for emergency planetfall, reaction mass (4 G-turns), 1000 AU radio beacon, flight computer, and workstation provided for purposes of emergency planetfall only.

Volume: 1400 m³
Mass: 637.79 tonnes (loaded), 630.29 (empty)
Price: MCr21.78
Crew: None.
Passengers: Up to 62 in 31 small staterooms.
Features: 30 MW TL-12 fusion power plant, 7.5 m³ cargo/storage space, 31xsmall staterooms, sickbay, electronics shop, machine shop. *For Emergency Landing:* 1000 AU Radio Beacon, 30 MW battery, CG lifters, workstation, TL-12 flight computer, reaction mass (4 G-turns).
Maint: 24

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1-7	Ant	Quarters	EMM-(3h)	AG-1H
8	AL	Quarters	EMMR-(1h)	Sickbay-1H
9-10	EMMR	Engineering	Elec shop-1H	PP-1H
11-12	Ant	Electronics	Mach shop-1H	Batt-1H
13-20	Ant	Hold	SSR-(2h)	CG-(4h)
			LS-2H	All Others-(1h)
			ELS-1H	

100-ton Armed Quarters Module Mk Ic

This module contains 37 small staterooms, three laser turrets, and a 300,000-km missile-capable MFD (provided to allow missile turrets to be fitted instead of lasers). No outside power is required (5.4995 MW power surplus with power set aside for 3x150-Mj turrets).

This module is also equipped as a lifeboat: CG Lifters, 1G ignition chamber, reaction mass (4 G-turns), 1000 AU radio beacon, flight computer, and workstation provided for purposes of emergency planetfall only.

Turret arcs of fire are 2, 3, 4, regardless of where the module is fitted on the clipper.

Volume: 1400 m³
Mass: 687.95 tonnes (loaded), 657.95 (empty)
Price: MCr40.34
Crew: 4 (3xgunners and 1xMFD operator).
Passengers: Up to 74 in 37 small staterooms.
Features: 30 MW TL-12 fusion power plant, 30 m³ cargo/storage space, 37xsmall staterooms, 3xturret sockets, 3xTL-12 laser turrets, and TL-12 300,000-km missile-capable MFD (4 Diff Mods; Msl 10 hexes; 10 hexes; 3.1 MW; 1 Crew). *For Emergency Landing:* 1000 AU Radio Beacon, 30 MW battery, CG lifters, workstation, TL-12 flight computer, 1G ignition chamber, reaction mass (4 G-turns).
Maint: 27

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1	Ant	Engineering	MFD-1H	PP-1H
2	Ant	Electronics	EMM-(3h)	Battery-1H
3	Ant	Hold	EMMR-(1h)	CG-(4h)
4-5		Turret	SSR-(2h)	LT-1H
6	AL	Quarters	LS-1H	All Others-(1h)
7-9	EMMR	Quarters	ELS-1H	
10-20	Ant	Quarters	AG-1H	

100-ton Fuel Module

This is an unpowered fuel tank (1353 m³, 94.7 tons), without life support or artificial gravity. The module consumes 1.502 MW of outside power.

Volume: 1400 m³
Mass: 281.28 tonnes (loaded), 186.57 (empty)
Price: MCr6.5
Crew: None.
Passengers: None.
Features: 1353 m³ (94.7 tonnes) fuel.
Maint: 6

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	AL	Electronics	EMM-(3h)
2-3	EMMR	Fuel	All Others-(1h)
4-20		Fuel	

100-ton Troop Carrier Module

This module has docking rings for three Fury assault landers, 12 large staterooms (quad occupancy, total of 48: 39 soldiers and 9 lander crew), a ready room/assembly area, and power plant. No outside power is required (11.206 MW surplus power).

Volume: 1400 m³
Mass: 539.04 tonnes (loaded), 314.94 (empty)
Price: MCr10.81
Crew: None.
Passengers: 48 in 12 large staterooms (quad occupancy)
Features: 20 MW TL-12 fusion power plant, 3xFury assault landers and associated docking rings, ready room/assembly area, 12xlarge staterooms (quad occ.), 12.9 m³ storage.
Maint: 19

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	EMMR	Electronics	EMM-(3h)
2		Power Plant	SSR-(2h)
3-6		Hold	LS-2H
7	AL	Quarters	ELS-1H
8-20	LP	Quarters	AG-1H
			PP-1H
			All Others-(1h)

100-ton Drop Troop Module

This module contains 48 launch tubes for drop capsules (see pages 14-15) and quarters for 36 drop troops. Only 36 of the launch tubes have staging areas to allow the entry of personnel into drop capsules. This allows 12 additional support modules (cargo and decoys) to be carried. Standard load-out is 36×Mk 1, 6×Mk IIc, and 3 each of Mk IIa and IIb (loaded mass below assumes this mix). There is space for 71.9 tonnes of military equipment. The module has no power plant of its own, and requires 8.791 MW of outside power.

These modules are usually paired with the 100-ton troop carrier modules above. This is because recovery of these drop troops requires the assault landers carried aboard the other module, and because the excess power from the troop carrier module is sufficient to balance out the needs of the drop troop module.

Volume: 1400 m³
Mass: 1033.76 tonnes (loaded), 613.87 (empty)
Price: MCr 9.01
Crew: None.
Passengers: 36×drop troops in 9×large staterooms (quad occupancy)
Features: 48×drop capsule launch tubes, 36 equipped with staging area for personnel launch, 9×large staterooms, 71.9 m³ of cargo.
Maint: 26

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1-8		Pers Launch Tubes	LS-2H	Launch tube-(1h)
9-10		Supp Launch Tubes	ELS-1H	LSR-1H
11-19		Quarters	AG-1H	All Others-(1h)
20	EMMR	Cargo	EMM-(3h)	

Note: Pers (Personnel) launch tubes hold Mk 1 capsules, (1h) each if tube is loaded. Supp (Support) launch tubes hold Mk II capsules, which, if loaded, have hits as follows: Mk IIc (1h) unloaded or (2h) loaded, Mk IIb-(2h), Mk IIa-(4h)

200-ton General Cargo Module—Cutter

This module serves as a loading dock for a 50-ton modular cutter. A hangar allows loading of the 29-ton cargo modules onto/off the cutter, and the cargo bay holds three extra cutter modules. No quarters are provided, and outside power is required (17.562 MW).

Volume: 2800 m³
Mass: Loaded mass varies with cutter modules carried, up to 1732.275 tonnes (2525.295 if cutter with gunpack is carried as well), 365.125 (empty)
Price: MCr15.94
Crew: 6 cargo-handling personnel (with 3 "Big Brute" BRTs).
Passengers: None.
Features: Internal hangar (minimal) and launch port for 50-ton cutter, cargo bay (3 modules), 49.55 m³ additional cargo, 4×large cargo hatches.
Maint: 9

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1	AL	Quarters	EMM-1H	ELS-1H
2	EMMR	Electronics	EMMR-(2h)	AG-1H
3-11	LP	Hold	Hangar-14H	All Others-(1h)
12-20	CH	Hold	LS-2H	

200-ton Fuel Module (refining)

This module is an unpowered fuel tank (2250 m³), without life support or artificial gravity. The EMM radiators require 2.8 MW, the fuel purification plant (2250 m³ in 12 hours) requires 6.75 MW, and the rest of the module requires 0.202 MW, for a total of 9.752 MW from outside sources.

Volume: 2800 m³
Mass: 1369.125 tonnes (loaded), 1186.725 (empty)
Price: MCr13.1
Crew: None (fuel processing plant controlled from outside).
Passengers: None.
Features: 17.9 m³ additional cargo, fuel processing plant.
Maint: 57

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	AL	Electronics	EMM-1H
2-4	EMMR	FPP	EMMR-(2h)
5-20		Fuel	FPP-9H
			All Others-(1h)

200-ton Quarters Module Mk IIa

This module contains 40 small staterooms, a sickbay (accessible from the docking ring), storage space, and a 924 m³ recreation deck. No outside power is required (81.585 MW surplus power under normal circumstances—full power is only used in lifeboat mode when attempting emergency planetfal).

This module is also equipped as a lifeboat: CG Lifters, 1G ignition chamber, reaction mass, 1000 AU radio beacon, flight computer, and workstation provided for purposes of emergency planetfall only.

Volume: 2800 m³
Mass: 994.83 tonnes (loaded), 860.74 (empty)
Price: MCr37.71
Crew: None.
Passengers: Up to 80 in 40 small staterooms.
Features: 100 MW TL-12 fusion power plant, 40×small staterooms, recreation deck, sickbay, 10-ton ambulance skiff in docking ring, 46.6 m³ storage. *For Emergency Landing:* 1000 AU radio beacon, 20 MW battery (4-hour duration), CG Lifters, workstation, TL-12 flight computer, reaction mass (4 G-turns).
Maint: 34

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*	
1	EMMR	Electronics	EMM-1H	EMMR-(2h)
2	EMMR	Engineering	Sickbay-1H	SSR-(2h)
3	CH	Hold	LS-3H	Battery-1H
4-5	LP	Hold	ELS-1H	PP-2H
6-7	LP	Quarters	AG-1H	CG-1H
8	AL	Quarters		All Others-(1h)
9-20		Quarters		

400-ton Fuel Module (refining)

This module is an unpowered fuel tank (4722.4 m³), without life support or artificial gravity. The fuel purification plant (3300 m³ in 12 hours) requires 9.9 MW, EMM radiators require 5.6MW, and the rest of the module requires 0.404 MW, for a total of 15.904 MW of power from outside the module.

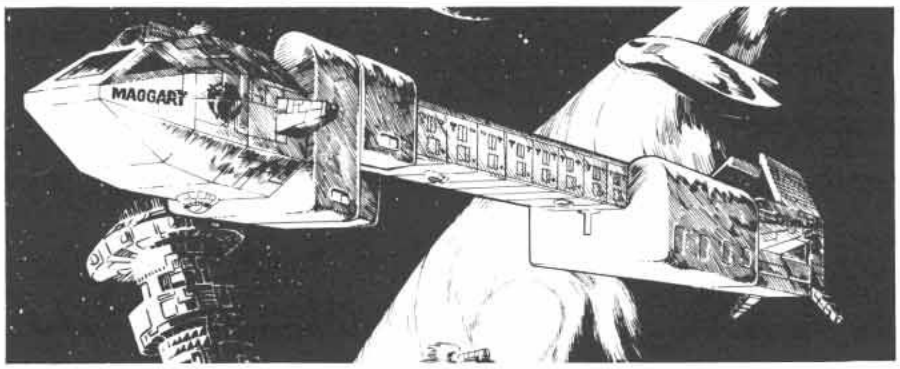
Fuel purifier requires 17.17 hours to purify its entire tankage at the rate of 275 m³ per hour.

Volume: 5600 m³
Mass: 2137.98 tonnes (loaded), 1807.01 (empty)
Price: MCr26.16
Crew: None (fuel processing plant controlled from outside).
Passengers: None.
Features: 4722.4 m³ (330.6 tons) fuel, fuel processing plant.
Maint: 87

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	EMMR	Electronics	EMMR-(5h)
2-3	EMMR	FPP	EMM-1H
4		Fuel	FPP-13H
5-20		Fuel	All Others-(1h)

RC *Maggart*-class Clipper ("Stretched *Aurora*")



General Data

Displacement: 850/2750 tons
Length: 162 meters
Price: MCr1150.25
Configuration: Open Frame USL
Mass (Loaded/Empty): 22,772.93/18,526.72
Hull Armor: 20
Volume: 11,900/38,500 m³
Target Size: M (L)
Tech Level: 12/14

Engineering Data

Power Plant: 2960 MW Fusion Power Plant (50 MW/hit), 38.6 weeks duration (fuel carried internally)

Jump Performance: 2 at 2063-2750 tons, 3 at 1651-2062.5 tons, 4 at 1376-1650 tons, 5 at 1375 or fewer tons (Fuel used per jump varies with displacement and jump distance, but is always 5775 m³ for maximum jump at current displacement.)

G-Rating: 2 at all displacements, limited by hull construction. Divide displacement (in 14 m³ tons) by 2 to get MW needed per G of performance. No contra-grav lifters.

G-Turns: Assuming fuel from fuel skimmer (3500 m³) and two fuel module (1×400-ton and 1×100-ton provide 6075 m³), 9575 m³ fuel is available, but fuel use varies with displacement. At 2750 tons, 171.875 m³ fuel per G-turn: 22 G-turns (55.7 using jump fuel). For other configurations, divide MW/G by 8 to get m³ of fuel per G-turn for current displacement.

Maint: 847

Electronics

Computer: 3×TL-12 Mod Fb Computer (0.8 MW ea.)

Commo: 2×300,000-km radios (only one powered; 10 hexes; 10 MW), 2×1000 AU masers (only one powered; ∞; 0.6 MW)

Avionics: TL-10+ Avionics

Sensors: TL-12 Passive EMS fixed array 180,000-km (6 hexes; 0.25 MW), TL-12 Active EMS 480,000-km (16 hexes; 50 MW), TL-11 Ladar 180,000-km (6 hexes; 2.5 MW)

ECM/ECCM: EM Masking package (11.9 MW)

Controls: Bridge with 22×bridge workstation, plus 35 other workstations

Armament

Offensive: 8×TL-12 120-Mj Laser Turret (Loc: 4,5,5—Arcs: 1,2,3,4; Loc: 10—Arcs: All; Loc: 18,19,20,20—Arcs: 2,3,4,5; 3.3 MW ea.; 1 Crew ea.), TL-12 2250-Mj Meson Gun (Loc: Spinal; Arcs: 1; 62.5 MW; 13 Crew)

Master Fire Directors: 3×TL-12 MFD (4 Diff Mods; No Msl, 10 hexes; 2.95 MW ea.; 1 Crew ea.)

	MW	*Short*	*Medium*	*Long*	*Extreme*
120-Mj Laser Turret	3.3	4:¹/₃-27	8:¹/₃-27	16:¹/₄-20	32:¹/₃-10
2250-Mj Meson Gun	62.5	6: 237	12: 107	24: 53	—
1165-Mj Meson Gun	32.36	6: 171	12: 77	24: 38	—

Accommodations

Life Support: Extended (2.38 MW), Gravitic Compensators (3G; 59.5 MW)

Crew: 112: 35×Engineering, 2×Electronics, 2×Maneuvering, 24×Gunnery, 13×Maintenance, 18×Flight Crew, 15×Command, 2×Steward, 1×Medical

Crew Accommodations: None; all crew accommodations are in 100-ton quarters modules.

Passenger Accommodations: None, but may be accommodated in quarters modules

Cargo: None; cargo is carried in cargo modules

Small Craft and Launch Facilities: External grapples for 2×50-ton small craft (modular cutters), 1×400-ton fuel skimmer (*Manta*), and 4×100-ton, 3×200-ton, and 1×400-ton auxiliary modules.

Air Locks: 9

Notes

Also known as Group IV, or "Stretched" *Auroras*, the *Maggarts*, like the Group IIIs before them, benefit from the installation of recovered relic TL-14 jump drives. This allows jump performance up to 5 parsecs at reduced displacements.

The *Maggarts* are improved *Auroras*, modified with improved equipment and lengthened to provide greater module carriage and increased range performance from the spinal weapon. This increased meson tunnel length has increased the weapon's short range from 150,000 km to 180,000, but the weapon does not have an extreme range band. This was accepted because of the weapon's increased reach at short to long ranges, and because the use of the weapon at its extreme range is of marginal utility at best.

The *Maggarts* have a nominal power shortfall of 30.139 MW. However, in practice this is not an issue, as clippers do not operate without modules. Many of these attached modules contain their own power plants which provide excess power back to the clipper which collectively more than make up for the shortfall. However, in the rare event that the clipper operates on only its internal power, the shortfall is taken from the 2250-Mj meson gun, reducing its performance to 1165 Mj. Performance ratings at both power levels are shown on the table in the Armament section. This weapon has beefed-up circuitry to allow its firing at the 5× and 10× overpowering levels (TNE, page 348).

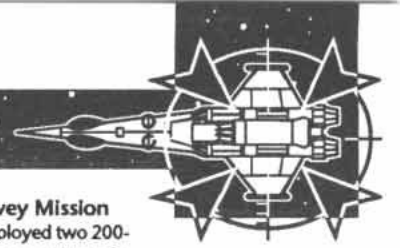
DAMAGE TABLES

Area (1D10)	*Surface Hits*	*Internal Explosion*
1	Ant	1-8: Elec, 9-12: Qtrs, 13: Hold, 14-20: MG
2	Cutter A	1-7: MG, 8-15: Module B, 16-20: Module D
3	Cutter A	1-7: MG, 8-15: Module A, 16-20: Module C
4	1-15: Ant	1: LT, 2-5: Eng, 6-7: 100-ton grapple, 8-14: Module B, 15-20: Module D
5	1-15: Ant	1: LT, 2: LT, 3-5: Hold, 6-7: 100-ton grapple, 8-14: Module A, 15-20: Module C
6-9		1-2: Module D, 3-8: Module E, 9-14: Module F, 15-20: Module G
10	Cutter B	1: LT, 2-10: MG, 11-20: Module grapples
11		1: Module C, 2: Module D, 3-8: Module E, 9-14: Module F, 15-20: Module G
12-13	11-20: Manta	1-10: Module H, 11-20: Manta
14-15		Module H
16-17	Manta	Manta
18-19	1-4: EMMR	1-3: 400-ton grapple, 4-6: Manta grapple, 7-12: Eng, 13-19: MG, 20: LT
20		1-18: Eng, 19: LT, 20: LT

Systems	
AEMS-(4h)	100-ton Grapple-2H
MG-39H	200-ton Grapple-2H
JD-29H	400-ton Grapple-6H
PP-59H	All Others-(1h)
MD-3H	
EMM-1H	
EMMR-(11h)	
AG-3H	
MFD-1H	
LS-9H	
ELS-5H	
LT-1H	
50-ton Grapple-1H	

Hits on modules are taken to the individual module damage tables on the previous pages, depending upon what type of module was fitted in that location. If a module location consists of several sub-modules (for example, 2×100-tonners in the space of a 200-tonner, or 2×50 tonners in place of a 100-tonner), roll randomly for which module was hit, then roll damage on its individual hit table.

Cutter hits are converted to hits on their grapples if the cutters are not in place.



The clipper carries no fuel of its own except for the 38.6-week supply (330 m³) for the power plant. All reaction mass and jump fuel is carried in *Manta*-class fueler and fuel modules. Listed price does not include the *Manta*, but the *Manta*'s loaded mass is included with the clipper's loaded mass, along with loaded mass of two modular cutters. Price and mass does not include any modules, although the clipper is typically fitted at least with one 100-ton and one 400-ton fuel module and two 100-ton quarters modules. The 400-ton fuel module carries 4722 m³ of fuel, plus fuel purification machinery (9.9 MW) sufficient to purify that amount in 17.17 hours. The 100-ton fuel module has no fuel purifier, so its 1353 m³ must be processed by the 400-ton module, requiring 4.9 hours. Note that reaction mass need not be purified, only jump and power plant fuel. Because of their low fuel reserve for G-turns, clippers must be carefully astrogated and piloted so that jump courses conserve the ship's residual velocity and allow it to be translated directly into refueling and orbital vectors.

A fully loaded clipper only has an actual target size of medium (M), but because its laser turrets are all mounted on turret extenders, it is treated as a large (L) target when being scanned by active sensors.

On the damage table, modules A, B, C, and D are 100-ton modules, modules E, F, and G are 200-ton modules (or pairs of 100-ton modules), and module H is the 400-ton module.

When clipper is empty, treat as Open Frame for purposes of hit location and fire arcs. When loaded with any modules, use Close Structure. When *Manta* is not docked, treat hits on areas 12, 13, 16, and 17 as a surface hit on its 400-ton grapple, then reroll for interior hit location on 1D10+10.

"STRETCH" CLIPPER LOADOUTS

The *Maggart*-class "Stretch" clippers are normally assigned small craft and modules as follows:

- 2×Small Craft (50-tons or less, normally two 50-ton modular cutters), and 1×*Manta* in dorsal grapples

plus:

- 1×400-ton module
- 3×200-ton modules (or the equivalent in 100-ton module combinations)
- 4×100-ton modules (or the equivalent in 25- and 50-ton combinations).

On very rare occasions, another ship of up to 400 tons can be "piggy-backed" on the engineering section in place of the *Manta*-class fueler, but this is normally done only with clippers that operate as part of a fleet.

Because stretch clippers are underpowered by 30.139 MW, this power shortfall must be made up by the power surplus from installed modules. Likewise, quarters for all of the the clipper's 112 crew must be provided in modules.

When configuring a clipper for an upcoming mission, it is important to be able to balance the ship's power needs as well as ensure that the ship is not overloaded. This table assists this process by grouping all of the modules together with their loaded masses and power surpluses or requirements.

Note that the loaded mass of *Aurora*-class clippers must remain below 32,124 tonnes, and the loaded mass of *Maggart*-class stretch clippers must remain below 42,472 tonnes.

Modules with Power Deficits

Module	*Mass*	*MW*
200-ton General Cargo-Cutter	2525.3	–17.562
400-ton Fuel Module (refining)	2137.98	–15.904
200-ton Fuel Module (refining)	1369.125	–9.752
100-ton Drop Troop Module	1033.76	–8.791
100-ton Fuel Module	281.28	–1.502
100-ton General Cargo Module	1539.67	–1.502
50-ton Fuel Module	163.46	–0.752
50-ton General Cargo Module	771.99	–0.752

Modules with Power Surpluses

Module	*Mass*	*MW*
25-ton Missile Module	370.12	+0.093
100-ton Armed Quarters Mk Ic	687.95	+5.4995
50-ton Survey Module	515.22	+5.545
100-ton Fighter Module	1506.28	+9.016
100-ton Troop Carrier Module	539.04	+11.206
50-ton Service Module for 10-ton Small Craft	500.63	+14.6065
25-ton VIP/Special Quarters Module	152.12	+17.7975
100-ton Quarters Mk Ib	637.79	+18.8005
25-ton Lifeboat Module	161.8	+19.625
100-ton Quarters Mk Ia	457.99	+21.1965
200-ton Quarters Module Mk IIa	994.83	+81.585
50-ton Power Generation/Fuel Module	1296.45	+562.606

Sample "Stretch" Loadout: Uplift/Survey Mission

The clipper is shown below after having deployed two 200-ton modules to an uplift mission in a system, on a survey of a second system. The missile module contains additional sensor apparatus that are used as backups for the clipper's normal sensor suite, and are not normally powered. If missile module does not power up its sensor suite (and instead uses that of the clipper), it produces an additional 27.56 MW.

The 200-ton Mk IIa and 100-ton Mk Ib modules provide a total of 71 small staterooms.

Fittings	*Mass*	*MW*
Maggart-Class Stretch Clipper	22,772.9346	–30.139
•2×modular cutters in dorsal grapples	1586.04672	—
•1×*Manta*-class fueler in dorsal grapple	2789.066	—
•1×400-ton Fuel Module (refining)	2137.98	–15.904
•1×200-ton Quarters Module Mk IIa	994.83	+81.585
•1×50-ton Survey Module	515.22	+5.545
•1×25-ton Missile Module	370.12	+0.093
•1×25-ton Lifeboat Module	161.8	+19.625
•1×50-ton Service Module for 10-ton Small Craft	500.63	+14.6065
•1×50-ton General Cargo Module	771.99	–0.752
•1×100-ton Quarters Mk Ib	637.79	+18.8005
•1×100-ton Fuel Module	281.28	–1.502
Total	33,519.68732	+91.9580

(with extra power from missile module: +119.518)

Sample "Stretch" Loadout: Escort Mission

The clipper shown below is equipped to carry 20 Wildbat fighters for convoy escort duty. The 200-ton and two 100-ton quarters modules provide a total of 114 staterooms.

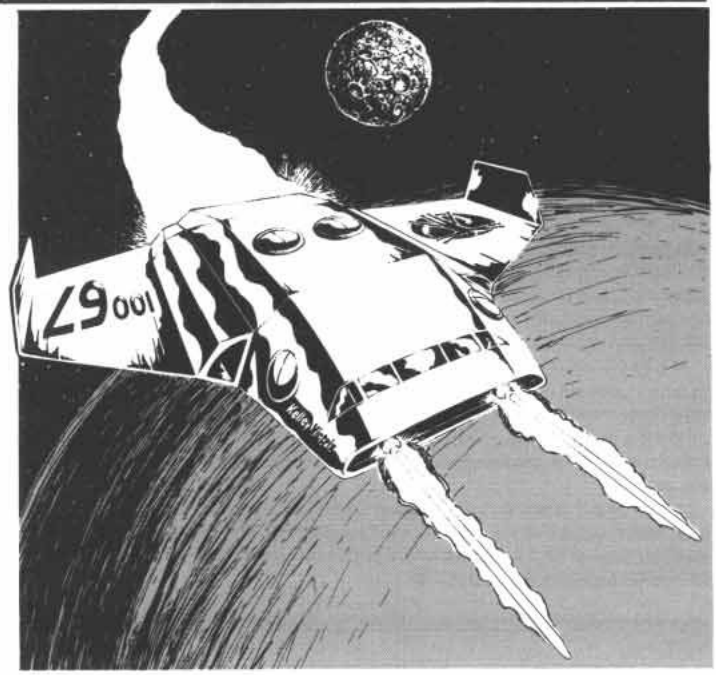
Fittings	*Mass*	*MW*
Maggart-Class Stretch Clipper	22,772.9346	–30.139
•2×modular cutters in dorsal grapples	1586.04672	—
•1×*Manta*-class fueler in dorsal grapple	2789.066	—
•1×400-ton Fuel Module (refining)	2137.98	–15.904
•1×200-ton Quarters Module Mk IIa	994.83	+81.585
•1×100-ton Fuel Module	281.28	–1.502
•2×100-ton Armed Quarters Mk Ic	1375.9	+10.999
•5×100-ton Fighter Module	7531.4	+45.08
Total	39,469.43732	+90.119

Sample "Stretch" Loadout: Moonshadow Mission

This clipper is equipped to set up a deep space listening post (using cutter habitation, supply and communications modules from pages 142-143 assembled into an orbital base), drop off supplies to friendly partisan groups, and deploy several covert operatives to a planetary surface. The 200-ton cutter support modules allow the clipper to haul as many as 4 modular cutters and 10 cutter modules. The 200-ton, 100-ton, and two 25-ton quarters modules provide a total of 83 small and 6 large staterooms.

Fittings	*Mass*	*MW*
Maggart-Class Stretch Clipper	22,772.9346	–30.139
•2×modular cutters in dorsal grapples	1586.04672	—
•1×*Manta*-class fueler in dorsal grapple	2789.066	—
•1×400-ton Fuel Module (refining)	2137.98	–15.904
•1×200-ton Quarters Module Mk IIa	994.83	+81.585
•2×200-ton General Cargo-Cutter	5050.59	–35.124
•2×25-ton VIP/Special Quarters Module	304.24	+35.595
•2×25-ton Lifeboat Module	323.6	+39.25
•2×50-ton Service Module for 10-ton Small Craft	1001.26	+29.213
•1×100-ton Fuel Module	281.28	–1.502
•1×100-ton Armed Quarters Mk Ic	687.95	+5.4995
Total	37,929.77732	+108.4735

Kelley Victrix (Victrix-Class Multimission Sloop)



General Data

Displacement: 400 tons
Length: 60.5 meters
Price: MCr349.00
Configuration: Slab AF
Mass (Loaded/Empty): 5704.46/5496.33
Hull Armor: 40
Volume: 5600 m³
Target Size: S
Tech Level: 12/13

Engineering Data

Power Plant: 955 MW TL-12 Fusion Power Plant (50 MW/hit), 1 year duration (29.61075 MW power shortfall)

Jump Performance: 4 (1400 m³ fuel for Jump-4, 1050 m³ for Jump-3, 700 m³ for Jump-2, 350 m³ for Jump-1) with relic TL-13 jump drive

G-Rating: 4G (200 MW/G), Contra-Grav lifters (40 MW)

G-Turns: 37 with Jump-4 fuel reserve (51 with Jump-3 fuel reserve, 65 with Jump-2 fuel reserve, 79 with Jump-1 fuel reserve, 93 using all jump fuel), 25 m³ fuel each

Fuel Tankage: 2325 m³ (166 tons), plus 143.25 m³ (10.23 tons) reserved for power plant

Maint: 222

Electronics

Computer: 3×TL-12 Mod Fb Computers (0.4 MW ea.)

Commo: 2×TL-12 1000 AU radio (only one powered to 300,000-km level,10 hexes, 10 MW), TL-12 1000 AU maser (∞; 0.6 MW)

Avionics: TL-10+ Avionics, TL-12 Terrain-Following Avionics

Sensors: TL-12 Passive EMS fixed array 150,000-km (5 hexes; 0.2 MW), TL-12 Active EMS 300,000-km (10 hexes; 27.5 MW)

ECM/ECCM: TL-12 120,000-km EMS Jammer (4 hexes; 33 MW), TL-12 15,000-km Area jammer (same hex; 6.75 MW), EM masking package (5.6 MW)

Controls: Bridge with 9×bridge workstations, plus 10 other workstations

Armament

Four hardpoints fitted with mass and power reserved for four turrets totalling up to 280 tonnes and drawing 18.3 MW (Loc: 2, 3, Arcs: 1, 2, 3; Loc: 10, 10, Arcs: All) Sample fittings include 4×150-Mj laser turrets, 1×TL-12 Nuclear Damper and 1×120-Mj laser turret, etc. Typical fitting is listed below. Weapons listed as "Planetary Combat Only" are permanent fittings.

Offensive: 3×TL-12 120-Mj Laser Turret (Loc: 2, 3; Arcs: 1, 2, 3; Loc: 10; Arcs: All; 3.3 MW ea.; 1 crew ea.)

	Short	*Medium*	*Long*	*Extreme*
120-Mj Laser Turret	4: 1/9-27	8: 1/9-27	16: 1/6-19	32: 1/3-9

Defensive: 1×TL-12 Sandcaster Turret (Loc: 10, Arcs: All; TL-12, 1D10×5 per hit; 30 Cann; 1 MW; 1 Crew)

Master Fire Directors: 2×TL-12 Missile/Beam MFD (4 Diff Mods; Msl 10 hexes; 10 hexes; 3.1 MW ea.; 1 Crew ea.)

Planetary Combat Only: 2×forward-firing rapid-fire plasma guns with 100 rounds per gun (data below), 1×remote turret with squad support laser with 2000 rounds (see page 96 for complete firing data). Both weapons below are fitted with advanced stabilization, meaning that they can be fired without loss of accuracy at any speed.

Description	*ROF*	*SR*	*Dam*	*Pen Val*	*Conc-Burst*	*FC*
76-Mj RF Plasma Gun	SA5	2280	100	100-100-50-10	10-15	4
Squad Support Laser	SA5	300	varies	Nil	—	4

ROF: Rate of fire in shots per 5-second combat turn, *SR*: Short Range in meters, *Dam*: Damage Value, *Pen Val*: Penetration Value at short-medium-long-extreme ranges, *Stab*: Stabilization, *FC*: Fire control, showing number of firing difficulty modifiers which may be disregarded

Accommodations

Life Support: Extended (1.12 MW), Grav Compensators (3G; 28 MW)

Crew: 26 (2×Maneuver, 2×Electronics, 6×Gunnery, 10×Engineering, 2×Maintenance, 3×Command, 1×Medic)

Crew Accommodations: 1×Small Stateroom (0.0005 MW), single occupancy for captain, 12.5×Small Staterooms (0.0005 MW ea.), double occupancy for remainder of crew

Passenger Accommodations: None, but pods may accommodate troops

Cargo: 8 m³ with small cargo hatch plus 40-ton multimission pod

Small Craft and Launch Facilities: None

Air Locks: 4

Notes

The Victrix ships are survivors of and copies of a class of multipurpose warships constructed by the Solomani Confederation during the Final War. They are true TL-12 thoroughbreds: fast, long-legged, well-armed, and highly capable, but "high-strung" and quite demanding to operate. All 11 units of the class currently serving the RCES are slightly different, but *Kelley Victrix*, detailed here, is a good representation.

Like all Victrix ships, *Kelley Victrix* is a tight design. Except for her recovered TL-13 jump drive, all of her systems are TL-12. (All Victrix ships have at least jump-3 performance with TL-12 drives, but some are fitted with recovered lightweight TL-14 drives. These not only allow higher absolute performance, but the weight savings allows these vessels to have beefed-up hull plating.)

All crewmembers except the captain are housed at double occupancy, but when extra crew or troops are carried (as is typically the case), "hot bunking" (three or more crew per small stateroom) is required. Fuel carriage is also at a premium; Victrix ships always require careful attention to fuel usage. The G-turn figures above based on fuel reserved for "Jump N" apply equally as well to a ship which has just arrived in system after having completed such a jump. An additional 6 G-turns may be gained by burning power plant fuel, but this is potentially risky. Although all Victrix ships have "good legs" based on their jump-3+ performance, the cost in their limited fuel tankage means that such deep penetration missions must have their jumps carefully plotted to place a fuel source very near the far end of the jumpspace "hole," preferably in such a position as to completely use up the ship's residual velocity (see TNE, page 224).

Ship's systems draw a total of 984.61075 MW, a shortfall of 29.61075 MW. When the contra-grav is secured, there is no shortfall, but while the CG is in use, the area jammer is usually shut down, and the EMS deceptive jammer has its short range reduced to 3000 km (quite sufficient to counter planetary surface and orbital threats when flying NOE). Note that the power shortfall varies. 18.3 MW are set aside for weapons (allowing a nuclear damper or relic 150-Mj lasers to be fitted), but the 3×120-Mj laser, 1×sandcaster fit shown above draws only 10.9 MW, leaving 7.4 MW for other purposes.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-16: Ant	1-2: Pl Gun A, 3-4: Pl Gun B, 5: Remote SSL, 6-20: Elec	JD-9H PP-19H
2-3	1-19: Ant	1-4: Elec, 5-7: LT, 8-11: Hold, 12-20: Qtrs	CG-1H MD-1H
4	1-9: Ant, 10: AL	1-4: Eng, 5-8: Elec, 9-20: Hold	FPP-5H
5	1-10: Ant	1-4: Eng, 5-8: Elec, 9-20: Hold	AG-1H
6-7		1-15: Qtrs, 16-20: Hold	LS-10H
8	1-2: SCH	1-5: Pod, 6-20: Hold	ELS-5H
9		1-5: Pod, 6-20: Hold	SSR-(2h)
10		1-3: Sand, 4-6: LT, 7-20: Hold	Sickbay-1H
11		Pod	MFD-1H
12-13		Hold	AEMS-(2h)
14-15		1-5: Pod, 6-20: Hold	EMMR-(5h)
16-17	1-2: EMMR	1-14: Eng, 15-20: Hold	LT-1H
18-19	1-2: EMMR	1-15: Eng, 16-20: Hold	Sand-1H Pl Gun-1H
20		Eng	Remote SSL-(1h)

For Pod hits, see specific pod damage table on facing page

EMM-1H
All Others-(1h)

Unlike most starships, Victrix ships are equipped with direct fire ground-attack weapons. These are of absolutely no use in space combat due to their limited range, but are used in planetary combat. The two plasma guns are used for strafing ground targets in support of ground troops, and are fired using the Approach Fire rules (TNE, page 295). These weapons are fired by the pilot/maneuver officer, and can be fired in High or NOE flight modes. They are fully stabilized to allow fire at any speed, and their fire control allows up to four Difficulty Modifiers to be disregarded. See the atmospheric ratings below for defensive benefits to the Victrix due to its speed in the planetary combat arena. A full load of ammunition for each gun (200 rounds total) costs MCr0.38 (Cr380,000).

Victrix ships are also equipped with a remote chin turret mounting a squad support laser (see page 96). This turret is fully stabilized with –4 Diff Mod fire control like the plasma guns, but is usually used in the NOE mode to lay down suppressive antipersonnel fire when recovering troops. The turret can be fired by one of the bridge command crew or an MFD operator, but no additional bonuses apply when fired under MFD control. The turret can bear in any direction below or at the same level as the ship, but may not fire at targets above the ship. Use data on page 96 for firing the SSL. A full load of ammunition costs MCr0.054 (Cr54,000).

Although some of the relic Victrix ships have not been refitted for multimission pod carriage, all of the new-build vessels (TailNo 10067 and later) are fitted for the carriage of a 40-ton (560 m³) mission configurable pod in their bellies. These pods are detailed below. The prices, maintenance requirement, and empty/loaded masses on the facing page are for the ship only, and do not include the pod. Maximum allowed mass for all pods is 473 tonnes, or ship's performance will fall to 2Gs.

TL-12 fuel purification machinery (3.6 MW), 23.25 hours to refine 2325 m³ (166 tons), or 100 m³ (4 G-turns) refined per hour. 11% scoops allow craft to skim full fuel load in one hour.

Because its mission and some of its weapons call upon the Victrix ships to operate in planetary atmospheres, planetary combat ratings (as distinct from the Brilliant Lances/Space Combat ratings above) are listed below.

Atmospheric Ratings

Speeds: 5600 kph maximum, 4200 kph cruising, 480 kph maximum NOE

Combat Move (10-meter grid squares per 5-second combat turn): 778 (High Mode absolute speed), 22 (NOE safe speed)

Travel Move (km per four hours): 16,800 (High Mode), 960 (NOE)

Agility (Target Movement Difficulty Modifiers): +9 Diff Mod (max speed, use vs. High Mode combat move), +8 Diff Mod (cruising, use vs. High Mode travel move), +6 Diff Mod (use vs. Safe NOE combat move), +8 Diff Mod (use vs. 2xSafe NOE combat move), +10 Diff Mod (use vs. 3xSafe NOE combat move)

40-TON PODS FOR VICTRIX-CLASS MULTIMISSION SLOOPS

Unlike many of the modules built for the modular cutters and clippers, the Victrix pods shown below have no provision for independent operation. Although they are built with internal frameworks, pods are not constructed with their own hull shells, and instead rely on the hull shell of the carrying ship. These shell-less pods must be fitted at a starport, and cannot be loaded in the field, as modules with hull shells can be.

Pod-equipped vessels use the same procedure for resolving excess damage as described for clipper modules on page 132.

Drop Capsule/Missile Launcher Pod

This pod contains facilities to launch up to 24 drop capsules or standard space combat missiles. Unlike the similar pod in the multimission scout, the Victrix pod contains no missile-capable MFD, as the Victrix already has two of its own. Another difference is that while the MM Scout pod uses a separate launch tube for each capsule, the Victrix pod has two automatic launchers. The advantage of the autolauncher is that it requires less space, as there is only one staging area per autolauncher rather than per tube, and it also requires less surface area. Disadvantages include its nominally lower rate of fire (one round every two seconds) and that there is no external life support for the drop troops once they are in their capsules. This means that the troops are on their internal oxygen while they wait for launch, which can create some sticky timing issues. Since it can take almost half an hour to load 12 troops into a 12-round autolauncher, the first troop loaded will be almost half finished with his on-board oxygen by the time all are ready to go. If the drop is planned for an ODHO (see page 14) profile, this may be a problem.

The pod also contains 5.5 small staterooms for the 22 troops, and cargo space for 36.67 m³ of their equipment (maximum of 36.67 tonnes). The mix of drop capsules carried is limited by a ceiling of 222.58 tonnes. Typical loadouts include: 16xMk I, 4xMk IIc, 2xMk IIb, 2xMk IIa; 14xMk I, 4xMk IIc, 3xMk IIb, 3xMk IIa; or 14xMk I, 2xMk IIc, 4xMk IIb, 4xMk IIa.

Volume: 560 m³

Mass: 250.42 tonnes unloaded, maximum loaded weight of 473 tonnes (maximum load of drop capsules is 24 totalling 222.58 tonnes, see pages 14-15 and use empty mass for Mk I and IIc, loaded mass for Mk IIa and IIb)

Price: MCr0.494

Crew: 0 (ship's MFD operator controls the pod).

Passengers: 22 (carried quadruple occupancy in 5.5xsmall staterooms)

Features: 2x12-round drop capsule/missile autolaunchers able to fire RC Mk I and II drop capsules or standard space combat missiles, quarters for 22 drop troops, cargo space for 36.67 tonnes/m³. Pod draws life support from the ship's main system, and requires 0.0055 MW power.

Maint: 13 (does not include maintenance required for each capsule, see pages 14-15).

DAMAGE TABLES

1D20	*Internal Explosion*	*Systems*
1-7	Autolauncher A	Autolauncher (each)-1H
8-14	Autolauncher B	SSR-(2h), ½ SSR-(1h)
15-19	Small stateroom	Roll randomly for individual capsule hit if
20	Cargo	autolauncher is loaded. Resolve hits against capsules within autolauncher as Mk I-(1h), Mk IIc-(1h) unloaded, -(2h) loaded, Mk IIb (2h), Mk IIa-(4h)

Troop Carrier Pod

This pod contains quarters for 48 troops (although up to 64 may be carried at an additional decline in comfort). The troop pod requires 0.008 MW of power from the carrying vessel, and additionally draws off of the ship's extended life support and artificial gravity, but at no further increase in power requirement. Cargo space is for battle dress, weapons and ammunition, and light vehicles such as broomsticks (page 11) or grav bikes (TNE, page 365).

Note that troops are not carried indefinitely in these conditions, as their efficiency will eventually be degraded by the lack of training and exercise spaces.

Volume: 560 m³

Mass: 51.95 tonnes empty, 162.62 tonnes loaded

Price: MCr0.68

Crew: None

Passengers: Accommodations for 48-64 troops in 16 small staterooms (0.0005 MW ea.) requires hot bunking (3-4 per room)

Features: 110.67 tonnes/m³ of cargo with one large cargo hatch

Maint: 8

DAMAGE TABLES

1D20	*Internal Explosions*	*Systems*
1-16	Small stateroom	SSR-(2h)
17-20	Cargo	

Vehicle Pod

This pod contains a minimal hangar for a vehicle of up to 15 tons (210 m³) and quarters for 15-20 troops. The hangar allows the craft to be maintained, and permits repair tasks to be conducted at +1 difficulty level. The pod requires 0.002 MW of power from the carrying vessel, and additionally draws off of the ship's extended life support and artificial gravity, but at no further increase in power requirement.

Stateroom capacity allows carriage of mixed infantry/vehicular unit.

Carried vehicle must mass less than 334.38 tonnes if Victrix is to maintain 4G performance. Mass above this level reduces Victrix to 2Gs while vehicle is being carried.

Volume: 560 m³

Mass: 113.95 tonnes empty, loaded mass varies with vehicle, recommended maximum loaded mass is 473 tonnes (334.38 tonne vehicle mass in addition to 26.67 tonnes cargo)

Price: MCr0.33

Crew: None.

Passengers: Accommodations for 12-16 troops in 4 small staterooms (0.0005 MW ea.) requires hot bunking (3-4 per room)

Features: Minimal hangar with launch doors for 15-ton vehicle, 26.67 tonnes/m³ of cargo with small cargo hatch

Maint: 7

DAMAGE TABLE

1D20	*Internal Explosions*	*Systems*
1-15	Hangar	SSR-(2h)
16-19	Small stateroom	Hangar-4H
20	Cargo	

Multimission Scout



General Data

Displacement: 100 tons
Length: 35 meters
Price: MCr52.03
Configuration: Wedge SL
Mass (Loaded/Empty): 575.8/523.0
Hull Armor: 28
Volume: 1400 m^3
Target Size: S
Tech Level: 15(–)

Engineering Data

Power Plant: 147 MW TL-15 Fusion Power Plant (147 MW/hit), 1 year duration (9.082 MW power shortfall)
Jump Performance: 2 (210 m^3 fuel)
G-Rating: 2G (50 MW/G), Contra-Grav lifters (10 MW)
G-Turns: 80 (113.6 using jump fuel), 6.25 m^3 fuel each
Maint: 22

Electronics

Computer: 3×TL-15 Mod St Computers (0.55 MW ea.)
Commo: TL-15 300,000-km radio (10 hexes, 10 MW), TL-15 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: TL-15 Passive EMS folding array 150,000-km (5 hexes; 0.15 MW), TL-15 Active EMS 300,000-km (10 hexes; 15 MW)
ECM/ECCM: TL-12 15,000km Area jammer (same hex; 6.75 MW)
Controls: Flight deck with 3×workstation

Armament

Offensive: 1×TL-12 120-Mj Laser Turret (Loc: 10; Arcs: 1, 2, 3; 3.3 MW; 1 crew)

	Short	*Medium*	*Long*	*Extreme*
120-Mj Laser Turret	4: 1/9-27	8: 1/9-27	16: 1/6-19	32: 1/3-9

Accommodations

Life Support: Extended (0.28 MW), Grav Compensators (6G; 7 MW)
Crew: 4 (2×Maneuver, 1×Electronics, 1×Gunner)
Crew Accommodations: 2×Large Staterooms (0.001 MW ea.), double occupancy
Passenger Accommodations: None
Cargo: 3.1 m^3 plus 20-ton multimission pod
Small Craft and Launch Facilities: None
Air Locks: 1

Notes

These are standard TL-15 relic scout/couriers which have been modified by the Aubani Navy to serve as small multimission special operations vessels, and are normally seconded to the RCES. These Scouts (MM) have had their cargo, hangar, and some accommodations spaces gutted, and the remainder of their internal systems rearranged to allow for a single 20-ton bay to be fitted along the ventral surface. The Scout (MM) has also been fitted with a TL-12 area barrage jammer with a 15,000 km range. This allows effective planetary surface jamming from orbit. The ship's systems draw a total of 156.082 MW, 9.082 MW more than its power plant provides. This means that its active EMS sensor may not be operated while its jammer and laser turret or firing, that it can only use 1G of maneuver while all other systems operate, or some other trade-off.

The ventral 20-ton bay accepts one of several 20-ton pods allowing the ships to be rapidly converted from one mission to another, as shown on the facing page.

These pods may be ejected at the end of the mission (although this is not advisable for any but the planetary strike pod, due to their expense). However, they cannot operate independently, as they have no outer hulls, but merely fit into the scout's modular bay. When the pod is ejected, the scout can close its bay doors and pressurize the now completely open 280 m^3 area. Hits in this area when it is empty must be re-rolled as additional internal damage. Damage indicated on the damage table below as "pod" are rolled on the pod damage tables on the facing page.

The prices, maintenance requirements, and loaded and empty masses listed above are for the scout without the pod. Add the pod figures from the facing page to these figures to get the final values.

TL-15 Fuel purification machinery (1.05 MW), 20.28 hours to refine 710 m^3 (50.7 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	Ant	1-15: Elec, 16-20: Hold	JD-1H
2-3	1-16: Ant	1-11: Qtrs, 12-20: Hold	PP-1H
4-5, 12-13		Hold	CG-(4h)
6-7		1-11: Qtrs, 12-20: Hold	ELS-1H
8-9, 14-15		1-15: Pod, 16-20: Hold	MD-(2h)
10	1: AL	1-12: LT, 13-20: Hold	FPP-1H
11		Pod	AG-1H
16-17		1-5: Eng, 6-20: Hold	LSR-1H
18-19		1-6: Eng, 7-20: Hold	LS-1H
20		Eng	All Others-(1h)

20-TON PODS FOR MULTIMISSION SCOUTS

There are only a limited number of 20-ton pods in existence, as the more capable Victrix ships (pages 138-139) are supplanting the MM scouts in the RCES' reconfigurable multimission role.

Unlike many of the modules built for the modular cutters and clippers, the scout modules have no provision for independent operation. Although they are built with internal frameworks, they are not constructed with their own hull shells, and instead rely on the hull shell of the scout. These hull shell-less modules must be installed at a starport, and cannot be removed, swapped, and replaced in the field as can modules with their own external hulls. For this reason, these hull-less modules are usually called "pods" to distinguish them from the more common hulled modules.

Pod-equipped vessels use the same procedure for resolving excess damage as described for clipper modules on page 132.

Drop Capsule/Missile Launcher Pod

This pod contains 15 launch tubes capable of launching standard 7-kiloliter space combat missiles or drop capsules, and a 300,000-km range missile-capable MFD. This MFD allows the launcher to fire space combat missiles, and also allows the scout (MM)'s gunner to operate the drop capsule launcher and ship's laser turret from this single location, eliminating the need to add an additional crewmember to the already cramped scout to operate this pod. Each of the 15 launchers includes a small staging area which allows the capsule occupants to enter and exit their drop capsule while they are loaded into their launch tube, and also provides external basic life support for capsule occupants before they are launched (meaning that the one-hour air supply fitted to the battle dress suit is not consumed while the trooper is in the tube waiting to be launched—this is crucial when conducting ODHO drops, see page 14). The pod requires 3.1 MW of power, raising the ship's shortfall to 12.182 MW, which can also be made up by shutting down the active EMS.

The pod does not contain quarters for the up to 15 drop troops, so they are only carried for a period of several hours before they board their capsules.

Volume: 280 m³
Mass: 149.65 tonnes unloaded, 254.65 tonnes loaded (assuming a mass of 7 tonnes per missile/drop capsule), maximum loaded weight of 431.95 tonnes (assuming load-out of all Mk IIa drop capsules, see pages 14-15)
Price: MCr25.71
Crew: 1 (scout gunner may be used for this position)
Passengers: None (carries up to 15 drop troops for short periods)
Features: 15 launch tubes able to fire RC Mk I and II drop capsules or standard space combat missiles, 1×TL-12 missile-capable MFD (4 Diff Mod; Msl 10 hexes; 10 hexes; 3.1 MW; 1 crew)
Maint: 8

DAMAGE TABLE

1D20	*Internal Explosion*	*Systems*
1-15	Launch Tube	Launch Tube-1h (unloaded), -3h (loaded Mk I, IIb, IIc), -1H (loaded Mk IIa)
16-17	MFD	MFD-1H
18-20	Reroll	Note: Launch Tube hit means 1 crew casualty if occupied

Planetary Strike Pod

The planetary strike (the term planetary bombardment is frowned upon within the RCES, as it smacks of the indiscriminate atrocities practiced during the Final War; strike implies pinpoint precision, and a commitment to limiting collateral damage and incidental casualties) pod contains launch rails for the Spruce, Fir, and Pine families of 30cm planetary strike missiles (page 109). In addition, it contains a workstation for the missile launch officer, which includes launch control units for homing and target seeker missiles, plus a 6000-km laser illuminator which can be used for target designation or beam-riding control.

The planetary strike pod requires 0.04 MW from the scout, and also draws off of its life support systems, but at no further power cost. These pods may not be reloaded in the field without special equipment, and are sometimes discarded after being emptied. Most of the maintenance time listed below consists of running automated diagnostic and troubleshooting programs on the sophisticated carried missiles.

The bay is constructed so that hits which destroy missiles do not cause internal explosions in the scout; but are vented into space.

Volume: 280 m³
Mass: 279.62 tonnes empty, 551.62 tonnes loaded
Price: MCr13.64, not including missile price (see page 109)
Crew: 1
Passengers: None
Features: Launch rails for 68 Spruce/Fir/Pine 30cm missiles
Maint: 28

DAMAGE TABLE

1D20	*Internal Explosion*	*Systems*
1-19	Missile rail	Gunner's Station-(1h)
20	Gunner's station	Missile rail: *

*1 minor hit per empty rail, 2 minor hits per loaded rail. In addition, each minor hit destroys 1D6 additional missiles in the pod.

Command Pod

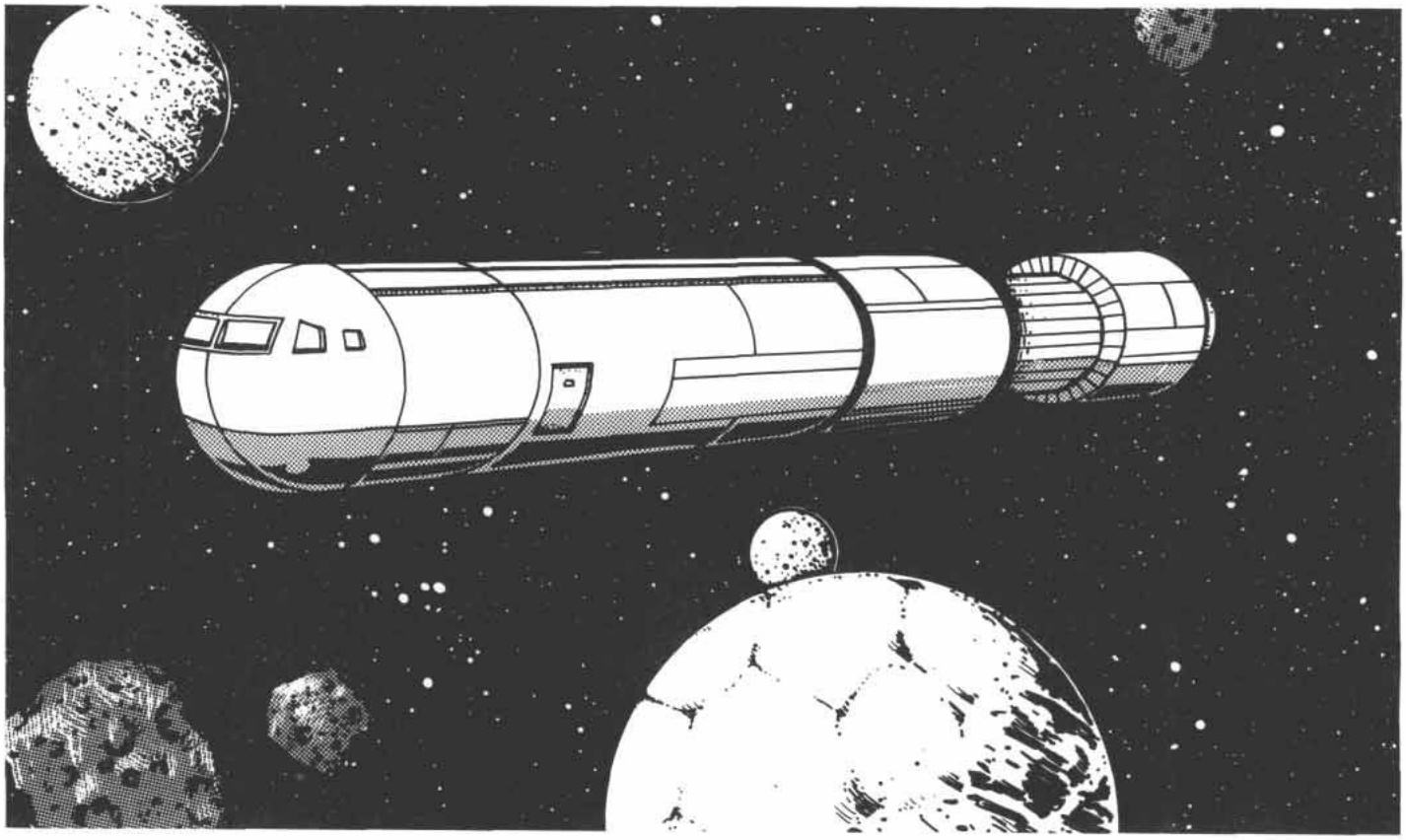
This pod meets the need for mobile command and control capabilities, and is the approximate equivalent of a flag bridge on a larger starship. Its integral power plant produces 20 MW, which is 8.3975 MW in excess of the pod's needs (the pod requires 11.6025 MW). This additional power is provided to the scout, which almost entirely makes up for the scout's power shortfall. The command pod does draw off of the scout's extended life support and artificial gravity, but at no increase in power requirement.

Volume: 280 m³
Mass: 61.6 tonnes empty, 67.7 tonnes loaded
Price: MCr5.8789
Crew: 8
Passengers: Accommodations for its 8 crew in 5 small staterooms (0.0005 MW ea.) requires double occupancy in three of the staterooms
Features: Flag bridge with 8×bridge workstations, 2×TL-12 300,000-km radios (only one powered, 10 hexes, 10 MW), 2×TL-12 1000 AU Maser communicators (∞, 0.6 MW ea), 1×TL-12 Mod St computer, TL-12 fusion power plant generating 20 MW (20 MW/hit, 8.3975 MW excess) with fuel for one year duration, 6.1 tonnes cargo, 3 m³ fuel (0.2 tons)
Maint: 3

DAMAGE TABLE

1D20	*Internal Explosions*	*Systems*
1	Power Plant	SSR-(2h)
2	Hold	PP-1H
3-10	Electronics	All Others-(1h)
11-20	Quarters	

Modular Cutter



General Data

Displacement: 50 tons
Length: 33 meters
Price: MCr18.98 (cutter alone)
Configuration: Needle SL
Mass (Loaded/Empty): 353.82/340.72 cutter alone
727.45/684.96 with fuel module
Hull Armor: 30
Volume: 700 m³
Target Size: VS
Tech Level: 12

Engineering Data

Power Plant: 100 MW Fusion Power Plant (50 MW/hit), 1 year duration (10.9196 MW excess power used to power modules)
G-Rating: 3 (25 MW/G), Contra-Grav lifters (5 MW)
G-Turns: 48, 3.125 m³ of fuel each
Maint: 13, +13 for fuel module

Electronics

Computer: 2×TL-12 Model St (0.4 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000 km (1 hex; 0.03 MW), Active EMS 300 km (0 hexes; use extreme range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 2×workstation, plus 1 other workstation

Accommodations

Life Support: Basic (0.0294 MW), Gravitic Compensators (3G; 1.47 MW)
Crew: 3 (1×Engineering, 1×Electronics, 1×Maneuver)
Crew Accommodations: Flight Deck
Passenger Accommodations: Varies depending upon module fitted.
Cargo: Varies depending upon module fitted (388 m³ in cargo module), 2.6 m³ in cutter
Air Locks: 1

Notes

Modular Cutter may be fitted with a variety of 29-ton (406 m³) modules, including lab module (336.3 tonnes loaded/284.4 empty, MCr14.12), passenger/cargo module (311.59 tonnes loaded/133.59 empty, MCr0.4, carries 30 passengers and 178 m³ cargo—passenger seats, 7 m³ each, can be traded for cargo or for smaller seats, but if cargo mass exceeds 284 tonnes, cutter G-rating will drop to 1G), ATV module (211.84 tonnes loaded/161.84 empty, MCr0.16, includes space for a single ATV of up to 50 tonnes).

Data assumes the fitting of a fuel scoop module (373.63 tonnes loaded/344.24 empty, MCr0.17). The module can scoop and carry 277 m³ (19.8 tons) of fuel and has fuel purification machinery sufficient to refine 277 m³ in 6 hours.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-2: Ant	1-10 Elec (C), 11-20 Qtrs (C)	PP-2H
2-3	1-2: AL	1-5 Qtrs (C), 6-10: Elec, 11-15: Hold (C), 16-20: Module	AG-(2h) LS-1H
4-5		1-15: Hold (C), 16-20: Module	ELS-1H
6-9, 11-15		Module	CG-(2h)
10, 20		Eng (C)	All Others-(1h)
16-19		1-5: Module, 6-20: Hold (C)	

(C) = Cutter Component, Module = Module Component (see module damage table).

CUTTER MODULES

The 50-ton modular cutter is one of the workhorses of the Coalition's fleet of small craft, largely due to the versatility and flexibility that the various modules created for it.

STANDARD MODULES

These modules are designed to operate with the cutter as an integrated unit, and many of them are dependent on the cutter for some or all of their power (for other modules, see Station Modules, below). The cutter has 10.9196 MW to cover module power needs, more than enough for those listed.

ATV Module

This module was designed to carry one wheeled or tracked ATV (up to 50 tonnes) from space to a planetary surface. The module has no artificial gravity, and any passengers or cargo in the ATV must be securely strapped down (which is why passengers are seldom carried inside ATVs transported in this fashion). The ATV requires no power from the cutter.

Volume: 406 m³
Mass: 211.84 tonnes (loaded), 161.84 (empty)
Price: MCr0.16
Crew: None.
Passengers: None (normally)
Features: ATV "hangar"

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1-10	LCH	ATV "Hangar"	ATV "Hangar"-1H
11-20	LCH	ATV	

Fuel Module

This is the standard fuel-skimming module and one of the most common modules for the 50-ton modular cutter. It contains a fuel processing plant capable of refining 277 m³ (19.8 tonnes) in 6 hours, and requires external power (1.662 MW) to operate, and carries 10 m³ of ordinary cargo in addition to 277 m³ of fuel. It is not fitted with artificial gravity or life support.

Volume: 406 m³
Mass: 373.63 tonnes (loaded), 344.24 (empty)
Price: MCr0.17
Crew: None (fuel processing plant controlled from cutter flight deck)
Passengers: None.
Features: Fuel processing plant, fuel scoop, 277 m³ LHyd fuel, 10 m³ ordinary cargo.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Cargo (non-fuel)	FPP-3H
2-7		Fuel Processing Plant	
8-20		Fuel (LHyd)	

Laser Gunpack (TL-11)

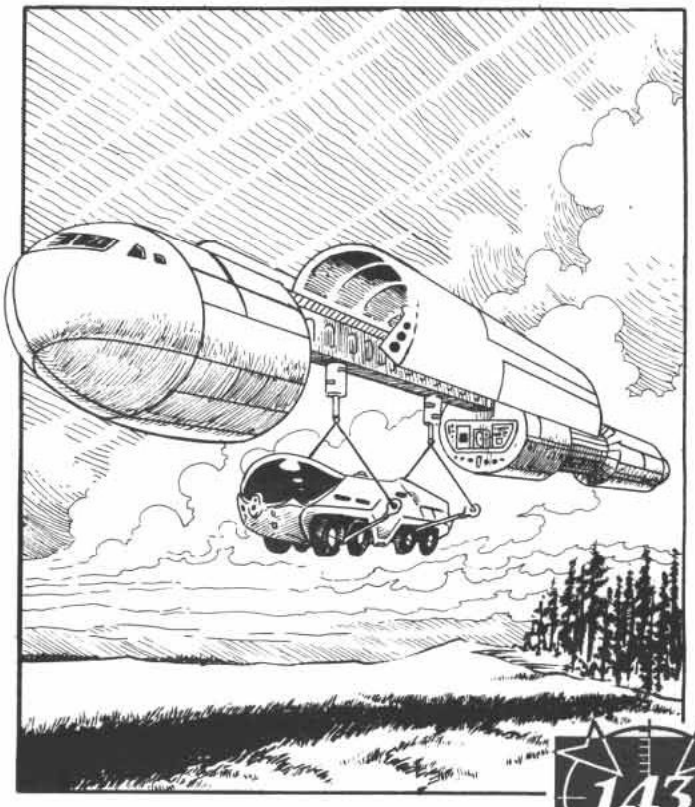
This module allows a cutter to be converted into an offensive weapon. With this module fitted, the cutter is reduced to 1G acceleration, but the gunpack contains an additional 30 m³ of reaction mass to extend the cutter's range (1.6 additional G-hours). The excess power from the cutter (46.27 MW at only 1G) plus the gunpack's onboard power can be used to overpower both laser barbettes to –1 Diff Mod.

Volume: 406 m³
Mass: 439.2 tonnes (loaded), 427.97 (empty)
Price: MCr58.4
Crew: 4 (2xgunners, 1xelectronics, 1xMFD)
Passengers: None.
Features: Artificial gravity/G-Compensators, basic life support, 5.1 MW MHD turbine, turbine fuel (12 hours), 160.6 m³ reaction mass, 300,000 km Beam MFD (4 Diff Mod; non-Msl; 10 hexes; 2.95 MW, 1 Crew), 180,000-km ladar, 2xnormal workstations, 2xTL-11 150-Mj laser barbettes.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Qtrs	MFD-1H
2	Ant	Elec	LS-1H
3		Elec	ELS-1H
4		Power Plant	AG-(2h)
5-12		Fuel	PP-(2h)
13-20		LB	LB-1H
			All Others-(1h)

	Short	*Medium*	*Long*	*Extreme*
TL-11 Laser Barbette	10:1/10-31	20:1/5-17	40:1/3-8	80:1-4



Passenger/Cargo Module

Passenger seats can be removed for additional cargo space (7 m³ ea.) if needed, although if total loaded module tonnage exceeds 284, the cutter's acceleration is reduced to 1G. In military service, roomy seats are replaced with adequate, and passenger capacity is doubled to 60. The passenger/cargo module requires 2.0716 MW from the cutter.

Volume: 406 m³
Mass: 311.59 tonnes (loaded), 133.59 (empty)
Price: MCr0.4
Crew: None.
Passengers: 30 in roomy seats (60 if adequate seats are fitted)
Features: Artificial gravity/G-compensators, basic life support, 178 m³ cargo, large cargo hatch

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	AL	Qtrs	LS-1H
2-9		Qtrs	ELS-1H
10-11	LCH	Cargo	AG-(2h)
12-20		Cargo/Passenger*	All Others-(1h)

* If passenger seats are carried, these hits are passenger hits; if cargo, these hits are cargo hits.

Survey Module

This module, in combination with a modular cutter, becomes an exploration and survey vessel. The AEMS and radio are designed to survey a world from near orbit, and the analysis lab is capable of performing preliminary chemical tests on soil, atmosphere, and mineral samples. The staterooms and the large cargo bay enable the module to carry supplies for an extended mission, and the neutrino sensor is for stellar surveys. The survey module carries its own power plant, which generates 12.7568 MW surplus to the module's own needs.

Volume: 406 m³
Mass: 354.06 tonnes (loaded), 270.06 (empty)
Price: MCr26.8
Crew: 7 (3xcutter crew, 3xscientist/lab technician, 1xelectronics)
Passengers: 4xsmall staterooms provided for the crew (including cutter crew)
Features: Extended life support, artificial gravity/G-compensators, laboratory, 20 MW TL-12 fusion power plant (with fuel for 1 year), TL-12 model ST computer. 3000-km radio, 1000 AU maser communicator, 2xnormal workstations, TL-12 densitometer, TL-12 neutrino sensor, TL-12 3000-km AEMS.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	Ant	Power Plant	Neut. Sen.-(2h)
2-3	Ant	Elec	Lab-1H
4-8	Ant	Hold	SSR-(2h)
9	AL	Qtrs	LS-1H
10-20		Qtrs	ELS-1H
			AG-(2h)
			PP-1H
			All Others-(1h)

STATION MODULES

While most of the modules are designed to be used while linked to the cutter, a fairly large number are designed to operate independently (and are merely carried to their final destination by the cutter). Station modules are intended to serve as part of a prefabricated base installation on a planetary surface, in planetary orbit, or in deep space, independent of the cutter. Station modules usually have self-erecting legs or other support structures which can be adjusted to allow for irregularities in the surface.

Stations can be configured to suit almost any purpose by careful selection of the station's constituent modules. Stations normally incorporate several habitation and storage modules (to shelter personnel and supplies), along with a number of more specialized modules such as portable laboratories, communications centers, medical facilities, and so on. Some modules are unpowered, and must be deployed in conjunction with others which can make up the energy deficit. Orbital and deep space stations usually incorporate additional structures such to link them together, and ground stations in hostile environment conditions do the same.

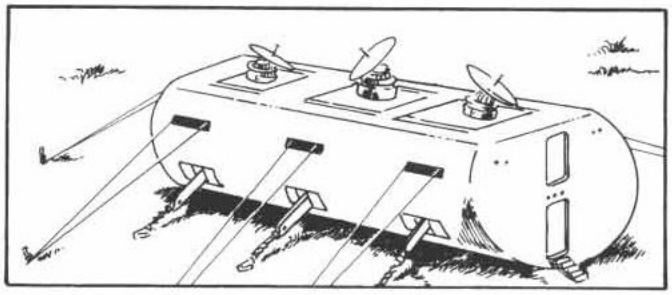
Communications/Command Module (Station)

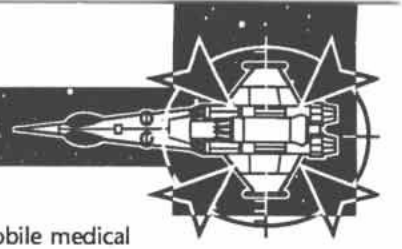
This module was intended for use as a communications center for a ground, orbital, or deep space installation, or as a command and control center for small military operations. Quarters for up to 12 personnel are provided, and the module is self-powered (5.6558 MW surplus power). For military operations, additional staff personnel are assigned to assist in planning and administration.

Volume: 406 m³
Mass: 297.758 tonnes (loaded), 205.958 (empty)
Price: MCr8.3
Crew: 3-7 (2xelectronics, 1xcommand, up to 4xmilitary staff)
Passengers: 6xsmall staterooms
Features: 20 MW TL-12 fusion power plant (with fuel for one year), 6xsmall staterooms, 105.8 m³ storage and supplies, 300,000-km radio, 2x3000-km radios, 2x1000 AU maser communicators, 7xbridge workstations, (2xcommo, 5xfor command/staff personnel), 2xTL-12 model St computers

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Eng	SSR-(2h)
2-6	Ant	Elec	LS-1H
7-10	Ant	Hold	ELS-1H
11		Hold	AG-(2h)
12	AL	Qtrs	PP-1H
13-20		Qtrs	All Others-(1h)





Habitation Module (Station)

This module was designed to provide long-term shelter for personnel of a ground, orbital, or deep space station. No outside power is requires (17.2528 MW surplus power).

Volume: 406 m³
Mass: 229.85 tonnes (loaded), 198.9 (empty)
Price: MCr2.9
Crew: None (electronics crew needed to operate communicator).
Passengers: Quarters for up to 24 (12xsmall staterooms).
Features: 12xsmall staterooms, 20 MW TL-12 fusion power plant (with fuel for 1 year), 31 m³ storage, 1000 AU maser communicator and 1xnormal workstation.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	Ant	Elec	SSR-(2h)
2		Power Plant	LS-1H
3-4		Hold	ELS-1H
5	AL	Qtrs	AG-(2h)
6-20		Qtrs	PP-1H
			All Others-(1h)

Lab Module (Station)

This module is a portable laboratory for use as part of a ground, orbital, or deep space station. Outside power is not required (15.257 MW surplus power), and quarters for the crew of four are provided.

Volume: 406 m³
Mass: 359.454 tonnes (loaded), 280.454 (empty)
Price: MCr14.2
Crew: 4 (3xscientists/lab technicians, 1xelectronics) in 2xsmall staterooms (double occupancy)
Passengers: None.
Features: 20 MW TL-12 fusion power plant (with fuel for one year), artificial gravity/G-compensators, extended life support, 2xlaboratories, 79 m³ storage and supplies, 1000 AU maser communicator, 1xnormal workstation, TL-12 model St computer.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Power Plant	Lab-1H
2-4	AL	Qtrs	LS-1H
5	Ant	Elec	ELS-1H
6	AL	Hold	AG-(2h)
7-20		Hold	PP-1H
			All Others-(1h)

Medical Module (Station)

This module serves as a small mobile medical center for a ground, orbital, or deep space station. Quarters for two medical personnel are provided, as well as 3 small patient staterooms. No outside power is required (15.257 MW surplus power).

Volume: 406 m³
Mass: 314.156 tonnes (loaded), 284.056 (empty)
Price: MCr14.1
Crew: 2 medical
Passengers: Up to 6 patients in 3xsmall staterooms
Features: Extended life support, artificial gravity/G-compensators, 2xsickbays, 20 MW TL-12 fusion power plant (with fuel for one year), 3000-km radio, TL-12 model St computer.

DAMAGE TABLES

1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1		Elec	SSR-(2h)
2		Eng	LS-1H
3-4		Hold	ELS-1H
5	AL	Qtrs	AG-(2h)
6-20		Qtrs	PP-1H
			Sickbay-1H
			All Others-(1h)

Support Module (Station)

This module provides maintenance and repair support for ground, orbital, or deep space stations. Quarters for 6 personnel (two each per electronics and machine shops) and power (4.7412 MW) must be supplied by other modules.

Volume: 406 m³
Mass: 437.344 tonnes (loaded), 414.244 (empty)
Price: MCr4.99
Crew: 6 (2 per shop) required, must be accommodated elsewhere
Passengers: None.
Features: Extended life support, artificial gravity/G-compensators, electronics shop, 2xmachine shops

DAMAGE TABLES

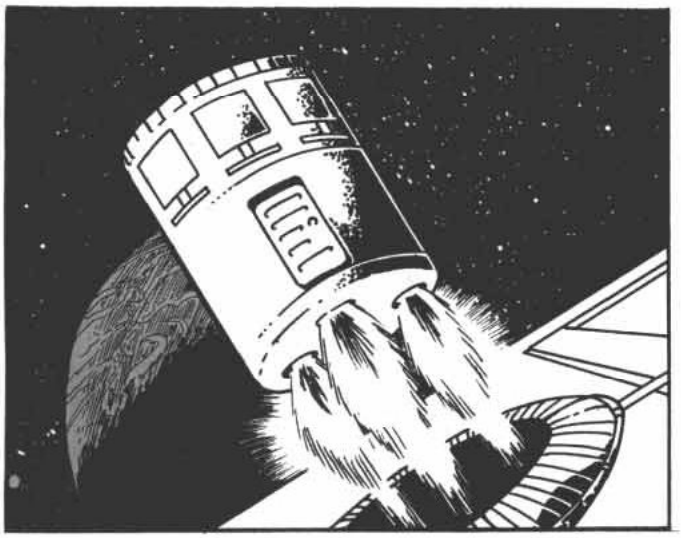
1D20	*Surface Hits*	*Internal Explosions*	*Systems*
1	AL	Qtrs	Mach Shop-1H
2-20		Hold	Elec Shop-1H
			LS-1H
			ELS-1H
			AG-(2h)
			All Others-(1h)

3-Ton Socket Liferaft

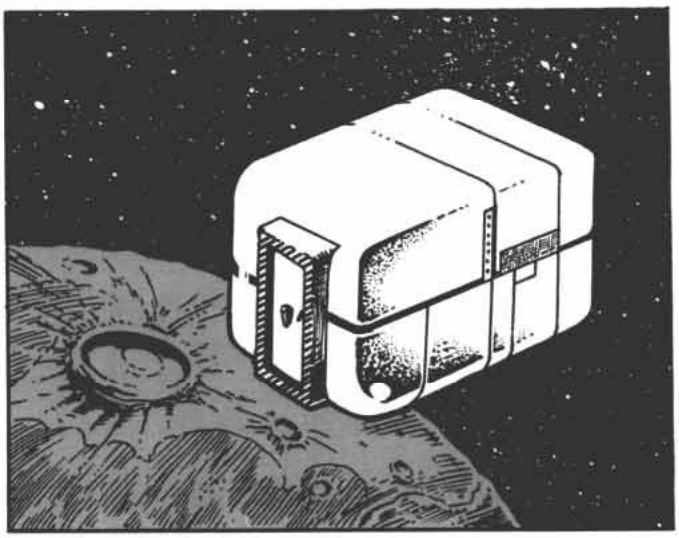
Liferafts have no maneuver drives; lifeboats do. Liferafts are built with simple, proven, reliable systems so that they can go without maintenance for years at a time, and do not roll for potential breakdowns. Liferafts are usually given a complete overhaul every five years (a process requiring one week in a class A or B starport and which costs 10% of their purchase price).

Lifeboats are subject to the normal maintenance and breakdown rules, except when they are acting as liferafts (floating without using their drives, with all passengers in low berths).

When abandoning ship in hostile territory, the flight computer can be set to activate the beacon only in response to friendly ID codes.



3-Ton Socket Liferaft



5-Ton Liferaft

General Data

Displacement: 3 tons
Length: 5.75 meters
Price: MCr0.425
Configuration: Box USL
Mass (Loaded/Empty): 18.65/16.68
Hull Armor: 10
Volume: 42 m^3
Target Size: Mc
Tech Level: 12

Engineering Data

Power Plant: 1 MW TL-12 rechargeable battery, 5 hours duration, 0.042 MW Solar Array.
Jump Performance: None.
G-Rating: None.
G-Turns: None.
Maint: 0

Electronics

Computer: 1×TL-12 Mod Flt Computer (0.04 MW)
Commo: 30,000-km Radio (1 hex; 1MW)
Avionics: None.
Sensors: None.
ECM/ECCM: None.
Controls: None.

Armament

Offensive: None.

Accommodations

Life Support: 1×emergency low berth (0.002 MW)
Crew: None.
Crew Accommodations: None.
Passenger Accommodations: 4 in emergency low berth
Cargo: 1.96 m^3
Small Craft and Launch Facilities: None.
Air Locks: None; hatch provides access to interior.

Note

The 3-ton liferaft is designed to fit in a standard 3-ton, 42-kl turret socket. It has a small solid fuel thruster to kick it free of the socket, and a similar thruster to cancel that thrust a short time, giving it the vector of the original ship when released, but paralleling it a short distance away. The 3-ton liferaft carries four passengers in an emergency low berth (no life support, G-compensation, or artificial gravity), a small computer, and a 30,000-km radio beacon to facilitate location of the raft by rescuers. Liferafts have no propulsion, and drift in space until picked up, the flight computer monitoring the radio receiver for a coded signal to activate the beacon.

The liferaft carries a 1 MW battery and a 0.042 MW solar array. This array can power the computer and the low berths in the habitable zone. Outside the habitable zone, the computer shuts down and the solar array powers the low berths and trickle charges the battery. The battery can power the beacon for 5 hours, then it must wait until enough power builds up before it can do so again.

The liferaft has no air lock, so its hatch must be mated to a standard air lock or the whole thing taken into a cargo hold to disembark its passengers. Rescuers can board the craft without harming the passengers, so long as they don't open the low berth.

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosions*	*Systems*
1	1-10: Hatch	1-12: Qtrs, 13-20: Hold	All-(1h)
2-5	1-12: Solar Panels	Qtrs	
6-11, 14-15		Qtrs	
12		1-11: Qtrs, 12-20: Eng	
13		1-10: Qtrs, 11-20: Hold	
16-19	1-12: Ant	1-18: Eng, 19-20: Elec	
20		Eng	

5-Ton Liferaft & 10-Ton Lifeboat

General Data

Displacement: 5 tons
Length: 4 meters
Price: MCr2.26
Configuration: Box SL
Mass (Loaded/Empty): 60.43/60.43
Hull Armor: 10
Volume: 70 m^3
Target Size: Mc
Tech Level: 12

Engineering Data

Power Plant: 20 MW TL-12 Fusion Power Plant, 290 years duration operating at 0.044 MW, 0.044 MW rechargeable battery, 1 hour duration.
Jump Performance: None.
G-Rating: None.
G-Turns: None.
Maint: 0

Electronics

Computer: 1×TL-12 Mod Flt Computer (0.04 MW)
Commo: 1000 AU Radio (∞; 20 MW)
Avionics: None.
Sensors: None.
ECM/ECCM: None.
Controls: None.

Armament

Offensive: None.

Accommodations

Life Support: 2×emergency low berths (0.002 MW ea.)
Crew: None.
Crew Accommodations: None.
Passenger Accommodations: 8 in emergency low berths
Cargo: None.
Small Craft and Launch Facilities: None.
Air Locks: None; hatch provides access to interior.

Notes

Like the 3-ton socket liferaft, the 5-ton liferaft has no propulsion, just a small charge to kick it free of the spacecraft and a counteracting thrust a few moments later. Liferafts have no propulsion, and drift in space until picked up, following the same vector as their parent ship. The 5-ton liferaft carries eight passengers in two emergency low berths (no life support, G-compensation, or artificial gravity), a small computer, and a 1000 AU radio beacon to facilitate location of the raft by rescuers.

The raft's power plant operates at a low level, providing just enough power to operate the low berths and the computer. The computer monitors the radio receiver (receiving takes negligible energy), and awaits a signal from a rescue ship. Upon receipt of this signal, the computer brings the power plant to full level, and activates the beacon. The beacon broadcasts for one hour at 20 MW, then shuts down and activates the computer, which continues to monitor the radio. While the radio is being operated, the low berth and the flight computer are powered by the battery, which is then recharged after the radio beacon shuts down.

The 5-ton liferaft's antenna is a special one-time inflatable array, and cannot be readily folded up after it has been deployed. The antenna is deployed after the raft has stabilized its vector (after the second thruster has cancelled the ejection thrust).

RCES vessels have encountered liferafts with living passengers dating from the pre-Collapse period, having spent more than 70 years in low berths.

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosions*	*Systems*
1-10, 12-16	Ant	Qtrs	PP-H
11	1-6 Hatch	1-6: Elec, 7-14: Hold, 15-20: Qtrs	All Others-(1h)
17		Qtrs	
18		1-17: Eng, 18-20: Hold	
19-20		Eng	

General Data

Displacement: 10 tons
Length: 14 meters
Price: MCr10.62
Configuration: Cylinder SL
Mass (Loaded/Empty): 90.34/88.85
Hull Armor: 14
Volume: 140 m^3
Target Size: VS
Tech Level: 12

Engineering Data

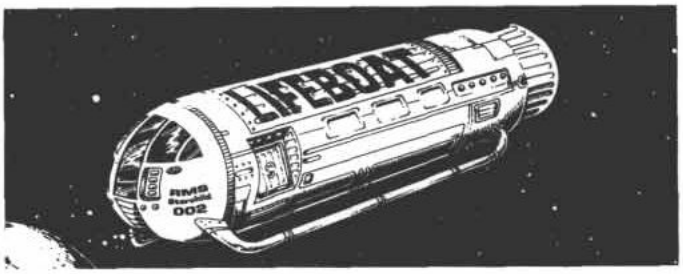
Power Plant: 20 MW TL-12 Fusion power plant, 1 year duration.
Jump Performance: None
G-Rating: 1 (5 MW/G), Contra-Grav Lifters: (1 MW)
G-Turns: 14, 0.625 m^3 of fuel each.
Maint: 3

Electronics

Computer: 2×TL-12 Mod St Computer (0.8 MW ea.)
Commo: 180,000-km Radio (6 hexes; 7 MW)
Avionics: TL-10+ avionics
Sensors: Passive EMS 30,000-km (1 hex, 0.03 MW), Active EMS 300-km (0 hexes; use extreme range for task difficulty in same hex; 5MW)
ECM/ECCM: None.

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosions*	*Systems*
1-3	Ant	Elec	LS-1H
4-5	Ant	1-5: Elec, 6-10: Hold, 11-20: Qtrs	ELS-(2h) PP-1H
6-7	1-2: AL	Qtrs	All Others-(1h)
8-9, 11, 14-16	Qtrs		
10	Ant	Qtrs	
12-13	1-11 Ant	Qtrs	
17		1-5: Hold, 6-20: Qtrs	
18		1-10: Eng, 11-20: hold	
19		1-9: Eng, 10-20: hold	
20		Eng	



Controls: Flight deck with 1×normal workstation

Armament

Offensive: None.

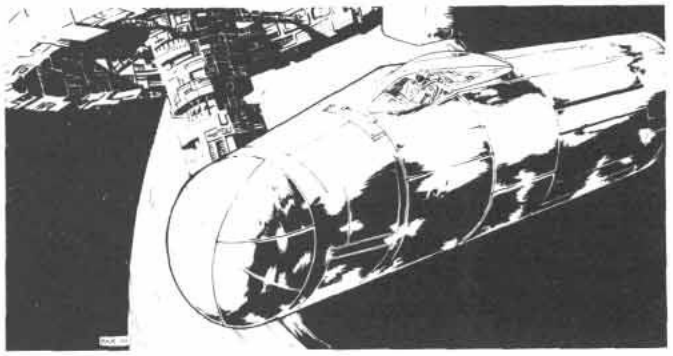
Accommodations

Life Support: 3×emergency low berths (0.002 MW ea.).
Crew: None, provision for pilot if landing is required.
Crew Accommodations: 1×workstation
Passenger Accommodations: 12 in emergency low berths
Cargo: 0.882 m^3
Small Craft and Launch Facilities: None.
Air Locks: 1

Notes

This vessel is a lifeboat modified from the hull of the 10-ton launch. The vessel contains no G compensators, no artificial gravity, and no life support, and is not intended for any use other than as a lifeboat. The workstation provided is for use should the situation demand a landing, the on-board computers are programmed to carry out a series of standard maneuvers, primarily designed to put the vessel in a stable orbit and broadcast distress signals. The cargo space consists of a rescue equipment locker designed to serve the 12 potential passengers likely to be aboard.

Wildbat Fighter/Foxbat Pathfinder



General Data

Displacement: 16 tons
Length: 15.2 meters
Price: MCr15.5
Configuration: Cylinder SL
Mass (Loaded/Empty): 246.98/238.58
Hull Armor: 30
Volume: 224 m³
Target Size: VS
Tech Level: 12

Engineering Data

Power Plant: 36.85 MW TL-12 Fusion Power Plant, 7 days duration.
Jump Performance: None.
G-Rating: 3 (8 MW/G), Contra-Grav Lifters (1.6 MW)
G-Turns: 60, 1 m³ of fuel each.
Maint: 9

Electronics

Computer: 2×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 1000 AU Maser, (∞; 0.6MW), 30,000-km Radio (1 hex; 1MW)
Avionics: TL-10+ avionics, TL-12 terrain-following avionics
Sensors: Passive EMS 90,000-km (3 hexes, 0.1MW), Active EMS 300-km (0 hexes; use extreme range for task difficulty in same hex; 5MW)
ECM/ECCM: EM masking package (0.224 MW)
Controls: Cockpit with 1×normal workstation

Armament

Offensive: 1×TL-12 120-Mj laser turret, (Loc: 1, Arcs: 1,2; 3.3 MW, crew = pilot), fuselage hardpoint (plumbed), max capacity 24,618 kg.

	Short	*Medium*	*Long*	*Extreme*
TL-12 120-Mj Laser	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9

Accommodations

Life Support: Basic (0.0014 MW, crew workstations and cargo only), Gravitic Compensators (3G, 0.07 MW, crew workstations and cargo only).
Crew: 1×pilot/gunner plus optional crewmember in turret.
Crew Accommodations: 1×cockpit workstation, plus workstation in turret.
Passenger Accommodations: None.
Cargo: 0.1 m³
Small Craft and Launch Facilities: None.
Air Locks: None; hatch provides access to crew compartment.

Notes

Wildbats are capable of refueling while in flight, either from other Wildbats, or from other vessels (a tanker has been specially designed for this purpose).

Basic life support and AG compensation provided only for the crew compartment workstation and the turret workstation, although the turret workstation is normally occupied only when the socket sensor pod is fitted. Wildbat pilots normally wear vac suits, and most bring personal reentry kits and other equipment (stowed in the cargo cabinet adjacent to the cockpit). No additional provision is made for personal equipment for the second crewmember, and they must split the space available with the pilot.

When equipped with the turret sensor package (noted in the "Socket Sensor Package" sidebar at left) instead of a laser turret, this craft is known as the Foxbat Pathfinder.

The fuselage hardpoint is provided for use in tactical support missions to a planetary surface. If loaded to more than 820 kg, this will reduce the craft to 1G acceleration unless fuel tonnage is likewise reduced, with appropriate deductions from the fighter's operating time. For example, the Wildbat could carry 2000 kg on the fuselage hardpoint without a G penalty by reducing its total fuel by 1180 kg (16.86 m³), a loss of 17 G-turns.

Other Turret Sockets

Because the Wildbat only provides 3.3 MW to the turret socket, socket lasers that normally draw greater power than this have their performance reduced when fitted to the Wildbat. Wildbat performance is shown below. Note that some lasers are limited to less than this by their focal arrays and leave part of the 3.3 MW power supply unused. The Mj listed under *Description* is the power for which the lasers are designed, however all socket lasers installed in the Wildbat function at no higher than 120-Mj. The value given under *MW* below shows the true power value at which they operate when installed in the Wildbat.

Note that the TL-13 150-Mj turret will cause the Wildbat to become overloaded, and reduce its acceleration to 1G.

TL	*Description*	*MW*	*MCr*	*Mass*	*Short*	*Medium*	*Long*	*Extreme*
10	60-Mj laser turret	1.7	1.56	55	1:1/6-19	2:1/6-19	4:1/3-9	8:1/2-5
11	80-Mj laser turret	2.2	2.08	59	2:1/7-22	4:1/7-22	8:1/6-19	16:1/3-10
12	120-Mj laser turret	3.3	0.94	65	4:1/9-27	8:1/9-27	16:1/6-19	32:1/3-9
13	150-Mj laser turret	3.3	0.72	68	1:1/9-27	2:1/9-27	4:1/9-27	8:1/9-27
13	106-Mj laser turret	2.9	1.45	59	10:1/8-26	20:1/6-20	40:1/3-10	80:1/2-5
14	150-Mj laser turret	3.3	0.72	63	2:1/9-27	4:1/9-27	8:1/9-27	16:1/9-27
15	150-Mj laser turret	3.3	0.86	57	10:1/9-27	20:1/9-27	40:1/9-27	80:1/9-27

Socket Sensor Package

The socket sensor package was designed to fit into a standard 3-ton socket, and provide ships with an improved sensor without overburdening their power-generation capabilities. Sensor packages such as this are used in Foxbat Pathfinders and are occasionally loaned to merchant vessels operating in cooperation with the RCES, RCN, or planetary governments.

The package combines both active and passive EMS antenna arrays, to conserve surface area, and contains a 240,000-km active EMS unit, a 60,000-km TL-12 passive EMS unit, a 24 MW fusion power plant with 1 year of fuel, and a workstation for the electronics technician. Because they share an antenna, only one EMS unit can be used at a time. This module, although it fits in a standard 3-ton socket, requires 20 m² of surface area because of the diameter of the PEMS antenna.

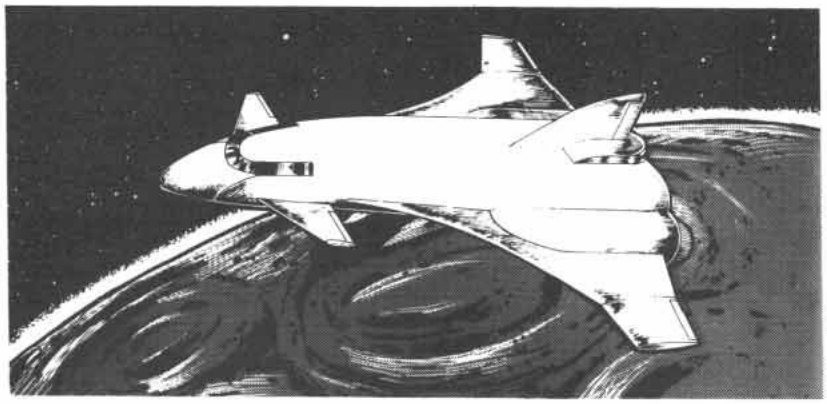
Sensors: Passive EMS 60,000 km (2 hexes, 0.06 MW), Active EMS 240,000 km (8 hexes, 24 MW).
TL: 12; **Mass:** 59.352 tonnes; **Volume:** 42 kl; **Price:** MCr13.3

DAMAGE TABLES

Area	*Surface Hits*	*Internal Explosions*	*Systems*
1, 4-5		LT	LS-1H
2-3	1-5: Ant	1-10: LT, 11-20: Elec	ELS-1H
6	1-3 EMMR	Elec	PP-1H
7-9, 12-15		Hold	LT-1H
10	1: Hatch	Qtrs	All Others-(1h)
11	FHP*	Hold	
16-19	1-5: Ant	1-5: Eng, 6-10: Elec, 11-20: Hold	
20		Eng	

* When no ordnance is carried, this counts as an unoccupied surface hit.

Fury-type Assault Lander



General Data

Displacement: 7 tons
Length: 18.6 meters
Price: MCr2.2
Configuration: Needle SL
Mass (Loaded/Empty): 70.37/69.57
Hull Armor: 21
Volume: 98 m^3
Target Size: Mc
Tech Level: 12

Engineering Data

Power Plant: 9 MW TL-12 Fusion Power Plant, 1 month duration.
Jump Performance: None.
G-Rating: 2 (3.5 MW/G), Contra-Grav Lifters: (0.7 MW)
G-Turns: 13, 0.4375 m^3 of fuel each.
Maint: 6

Electronics

Computer: 2×TL-12 Mod Flt Computers (0.04 MW ea.)
Commo: 1000 AU Maser, (∞; 0.6MW), 300-km Radio (0 hexes, use extreme range for task difficulty in same hex; 0.01 MW).
Avionics: TL-10+ avionics, TL-12 terrain following avionics.
Sensors: TL-12 Passive EMS 3000-km (0 hexes, use long range for task difficulty in same hex; 0.01 MW)
ECM/ECCM: EM Masking (0.098 MW)
Controls: Flight deck with 2×normal workstations (pilot and electronics crewman), 1×open crewstation (crew chief/gunner)

Armament

Offensive: 5mm rotary gun in remote turret (planetary combat only), 1×plumbed FHP (capacity 7037 kg), 2×dry FHPs (7037 kg ea.).

5mm Rotary Gun, TL-8

Round	ROF	Dam Val	Pen Rtg	Bulk	Magazine	— Recoil — SS	— Recoil — Burst	Short Range
5×50mm Ball	5/50	3	1-Nil	7	5000C	—	—	150
5×50mm DS	5/50	3	1-2-Nil	7	5000C	—	—	180
5×50mm HE	5/50	3	Nil	7	5000C	—	—	130
5×50mm HEAP	5/50	3	2-2-2	7	5000C	—	—	130
5×50mm Tranq	5/50	–1*	Nil	7	5000C	—	—	30

*1D6–1 points of damage plustranq effect on TNE, page 350.

DAMAGE TABLES

Area	Surface Hits	Internal Explosions	Systems
1	1-2: EMMR	20 Elec	LS-1H
2	1-2: Ant	20 Elec	ELS-(3h)
3	1-2: Ant	20 Elec	PP-(4h)
4	1-4: AL	14: Elec, 6: Cargo/Passengers*	All Others-(1h)
5		14: Elec, 6: Cargo/Passengers*	
6		15: Qtrs, 5: Cargo/Passengers*	
7		15: Qtrs, 5: Cargo/Passengers*	
8		20 Cargo/Passengers*	
9		20 Cargo/Passengers*	
10		20 Cargo/Passengers*	
11		20 Cargo/Passengers*	
12		20 Cargo/Passengers*	
13		20 Cargo/Passengers*	
14		20 Cargo/Passengers*	
15		20 Cargo/Passengers*	
16		3: Remote Turret, 17: Hold	
17		3: Remote Turret, 17: Hold	
18	1-13: CH	5: Eng, 15: Hold	
19	1-13: CH	5: Eng, 15: Hold	
20		20 Eng	

* When the seats are installed and passengers are carried, this location counts as Passengers for hits. When the seats are removed and cargo is carried, this location counts as Cargo.

Accommodations

Life Support: Basic (0.007 MW), Gravitic Compensators (0.35 MW).
Crew: 1×Pilot/commander, 1×Electronics Tech, 1×Crew Chief/Gunner.
Crew Accommodations: 2×normal workstations (pilot and electronics crewman), 1×open crewstation (crew chief/gunner)
Passenger Accommodations: 14×adequate seats (removable to create cargo space)
Cargo: 3.5 m^3 per seat removed.
Small Craft and Launch Facilities: None.
Air Locks: 1

Notes

This craft (also called the 7-ton assault lander) was designed to carry up to 14 fully equipped soldiers (or equivalent cargo) to/from a planetary surface, and provide fire support for them during landing and retrieval. Troops debark through cargo hatch in the rear directly from passenger compartment. All 14 passengers can embark/debark in 2-3 turns (10-15 seconds), even when wearing heavy battle dress.

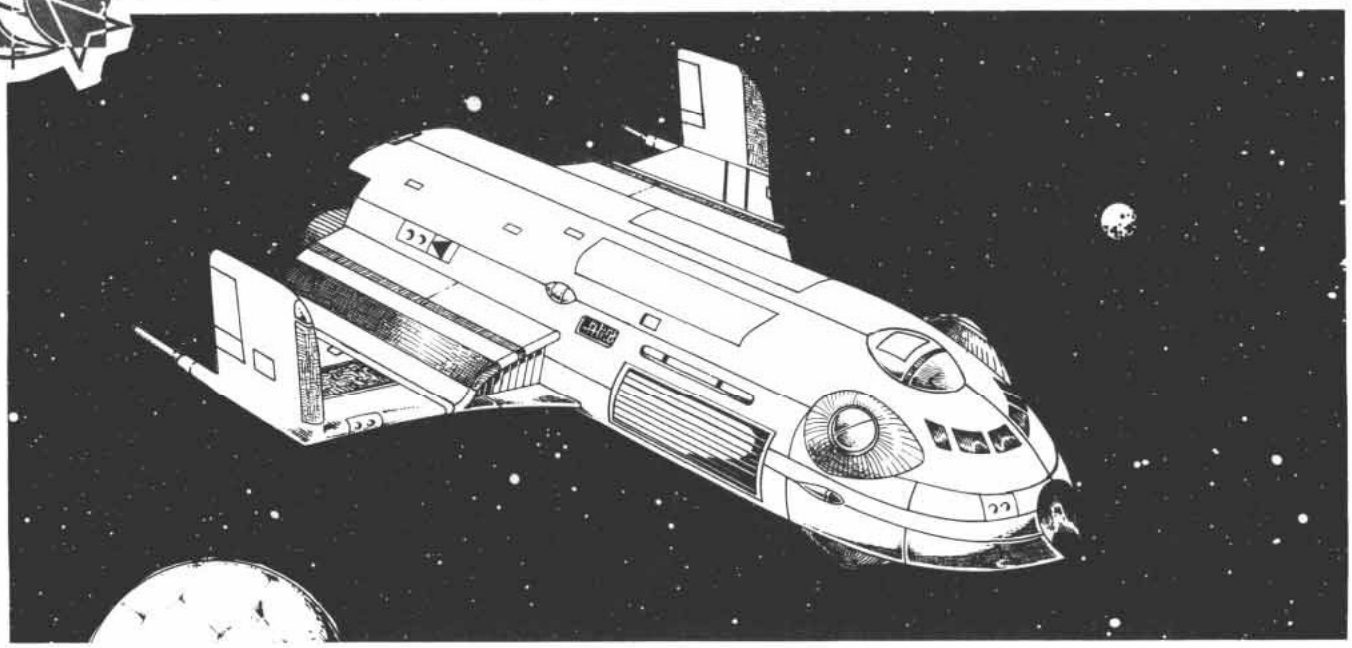
Because this craft only makes short trips between planetary orbit and the planet's surface, it is equipped with flight computers instead of fully capable models. No AEMS system is installed.

The crew chief fires the remote 5mm rotary gun (equipped with a TL-10 EMS RF) from a crewstation inside the flight deck. The ordnance carried on the fuselage hardpoints is fired/dropped from the pilot or electronics position.

The three fuselage hardpoints are capable of carrying a total of 21,111 kg (combined ordnance and racks). Fuel pods to extend range may be added only to the center hardpoint (the only plumbed hardpoint 7037-kg capacity). Ordnance racks, ECM/ECCM pods, or other specialty pods may be hung from all three.

Life support is provided only to occupied spaces, thus no maintenance may be conducted while the craft is being operated.

Mary Ellen Carter Armed Merchant



General Data

Displacement: 400 tons
Length: 44 meters
Price: MCr217.6
Configuration: Cylinder AF
Hull Armor: 10
Volume: 5600 m³
Target Size: S
Tech Level: 12
Mass (Loaded/Empty): 4333.78/3828.99

Engineering Data

Power Plant: 340 MW Fusion Power Plant (48.6 MW/hit), 1 year duration (1.782 MW excess power)
Jump Performance: 2 (840 m³ fuel)
G-Rating: 1G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (93.6 using jump fuel), 25 m³ of fuel each
Maint: 201

Electronics

Computer: 3×TL-12 Mod St Computer (0.4 MW ea.)
Commo: 300,000-km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS folding array 180,000-km (6 hexes; 0.25 MW), Active EMS 300,000-km (10 hexes; 27.5 MW)
Controls: Bridge with 9×workstation, plus 4 other workstations

Armament

Offensive: 4×TL-12 120-Mj Laser Turret (Loc: 2,3,4,5; Arcs: 1,2,3; 3.3 MW ea.; 1 Crew ea.)
Master Fire Directors: 2×TL-12 MFD (4 Diff Mod; No Msl; 4 hexes; 1.73 MW; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
TL-12 120-Mj Las Trt	4: 1/9-27	8: 1/9-27	16: 1/6-19	32: 1/3-9

Accommodations

Life Support: Extended (1.12 MW), Gravitic Compensators (3G; 28 MW)
Crew: 32 (2×Maneuver, 1×Electronics, 4×Engineering, 1×Maintenance, 2×Flight Crew, 6×Gunnery, 4×Command, 12×Ship's Troops).
Crew Accommodations: 22×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: None (space for 11 additional personnel)
Cargo: 257 m³, two large cargo hatches
Small Craft and Launch Facilities: 10-ton Launch with internal hangar (Minimal), and one launch port.
Air Locks: 4

Notes

Mary Ellen Carter is one of many pre-existing starships that have been modified to perform new missions in the New Era. She was originally a standard subsidized merchant ("Fat Trader") given increased performance, sensors, and armament. The ship itself displaces 400 tons with an internal small craft, unlike the original which carried an external craft.

Mary Ellen Carter is the sole survivor of three such Fat Traders modified to serve the Dawn League as "exploration cruisers" in the period following the loss of the 12 original trading scouts. Like the scouts, the exploration cruisers where hasty conversions made from ships that were on hand, but this time the emphasis was on armament and survivability. As two of this type, *Lady Elise* and *Taylor the Bruce*, have already been lost or listed as missing, this type has fallen into disfavor. No further ships of this type are planned.

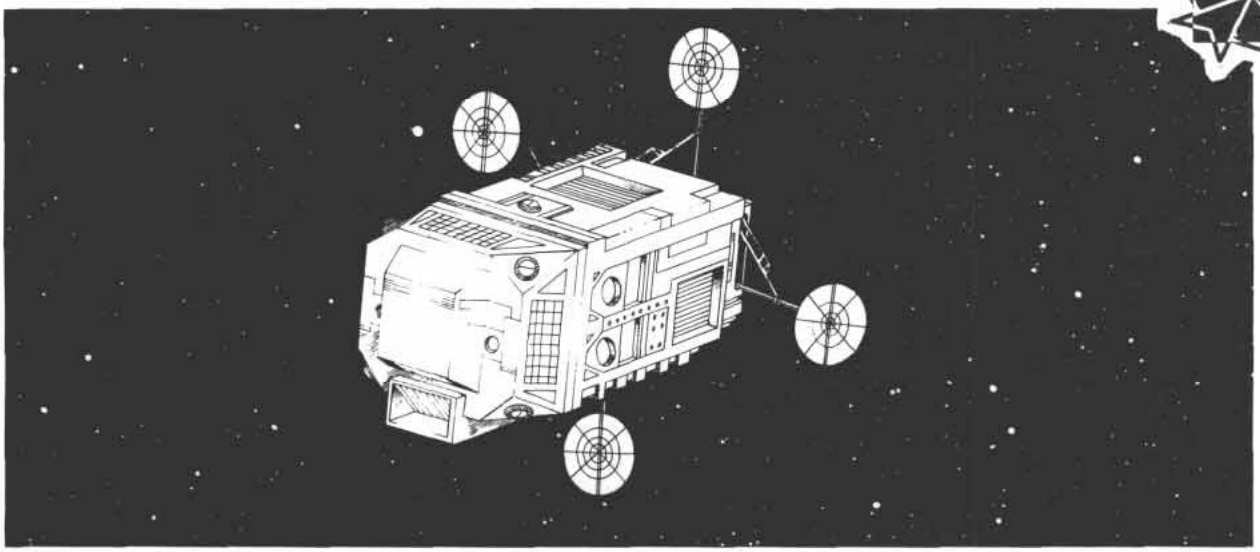
Fuel purification machinery (12.36 MW), 6.82 hours to refine 2340 m³.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1	Ant	Elec
2	Ant	1-3: TS, 4-20: Qtrs
3	Ant	1-3: TS, 4-20: Qtrs
4-5	1: AL, 2-9: Ant	1-3: TS, 4-19: Qtrs, 20: Hold
6-9, 11-13		Hold
10	Ant	Hold
14	1-9: LP	3 Eng, 17 Hold
15		1-10 Eng, 11-20 Hold
16-17	1-7: CH	1-10 Eng, 11-20 Hold
18-19	1-10: Ant	Eng
20		Eng

Systems	
JD-5H	AEMS-(2h)
PP-7H	PEMS Ant-1H
CG-1H	FPP-17H
AG-1H	ELS-1H
LT-1H	MFD-(3h)
LS-2H	All Others-(1h)
Hangar-1H	
LBth-(1h)	
MD-(4h)	
SSR-(2h)	

Hiver Transport



General Data

Displacement: 1000 tons
Length: 37.5 meters
Price: MCr318.92
Configuration: Box SL
Mass (Loaded/Empty): 9971.00/4640.10
Hull Armor: 31
Volume: 14,000 m³
Target Size: M
Tech Level: 14

Engineering Data

Power Plant: 756 MW TL-14 Fusion Power Plant (95 MW/hit), 1 year duration (1.205 MW excess power)
Jump Performance: 2 (2100 m³ for Jump-2, 1050 m³ for Jump-1)
G-Rating: 1G (500 MW/G), Contra-Grav lifters (100 MW)
G-Turns: 44 (77.6 using jump fuel), 62.5 m³ fuel each
Fuel Tankage: 4850 m³ (346.4 tons), plus 75.6 m³ (5.4 tons) reserved for power plant
Maint: 353

Electronics

Computer: 2×TL-14 Mod Fb Computers (0.5 MW ea.)
Commo: TL-14 300,000-km radio (10 hexes, 10 MW), TL-14 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: TL-14 Passive EMS folding array 150,000-km (5 hexes; 0.15 MW), TL-14 Active EMS 60,000-km (2 hexes; 7 MW)
ECM/ECCM: EM masking package (14 MW)
Controls: Bridge with 7×bridge workstations, plus 6 other workstations

Armament

Offensive: 4×TL-14 300-Mj Laser Barbettes (Loc: 2,3,4,5; Arcs: 1,2,3; 8.3 MW ea.; 1 Crew ea.)

	Short	*Medium*	*Long*	*Extreme*
300-Mj Laser Barbette	10: 1/14-43	20: 1/14-43	40: 1/8-26	80: 1/4-13

Defensive: 1×TL-14 Nuclear Damper Barbette (Loc: 10; +1 Diff Mod per CV+4; 6 MW; 1 crew)
Master Fire Directors: 1×TL-14 Beam MFD (5 Diff Mods; No Msl; 10 hexes; 1.92 MW; 1 Crew)

Accommodations

Life Support: Extended (2.8 MW), Grav Compensators (5G; 70 MW)
Crew: 23 (2×Maneuver, 1×Electronics, 6×Gunnery, 6×Engineering, 1×Maintenance, 3×Command, 3×Flight Crew, 1×Medic)
Crew Accommodations: 23×small staterooms (0.0005 MW ea.), single-occupancy
Passenger Accommodations: 7×small staterooms (0.0005 MW ea.), single-occupancy
Cargo: 4180 m³ with 12 large cargo hatches
Small Craft and Launch Facilities: Docking ring and launch port for 100-ton shuttle
Air Locks: 10

Notes

The Hiver transport is the most commonly seen Hiver vessel in Coalition Space, as it is these vessels that constitute the bulk of the Hiver technical assistance convoys that provide high-technology goods (such as TL-13 laser focal arrays and chemical laser cartridges, gauss receivers, batteries, etc.) to the fledgling industries of the Coalition. Rare Hiver transports will actually venture into the Wilds to spinward of the RC borders, but usually only on special recovery missions of interest to the Hivers themselves.

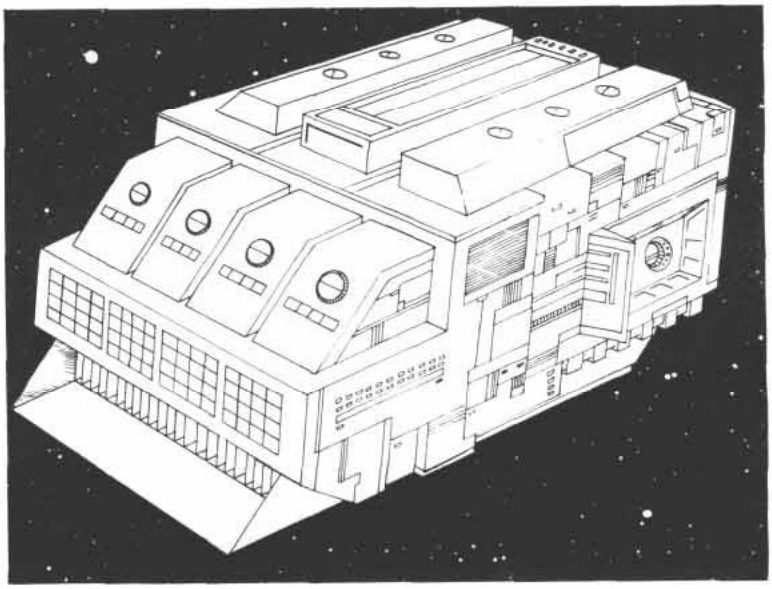
These vessels are armed for self-defense, but require convoy escort in other than secure areas. If these transports are damaged, they can be transported for repair by the Hiver tender (see page 152). The docking ring fitted to these transports does not allow any sort of repair or overhaul for the Hiver 100-ton shuttles; this must also be conducted by the Hiver tenders which are spaced out along the convoy routes in temporary staging areas between the Coalition and the Hiver Federation.

Fuel scoops (400 tons per hour) and fuel purification plant (6 MW), 24.45 hours to refine 4850 m³ (346.4 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*
1	1-8: Ant	1-12: Elec, 13-14: Hold, 15-20: Qtrs	JD-11H
2-3	1-2: Ant	1-3: LB, 4-11: Qtrs, 12-20: Hold	PP-8H
4-5	1-2: Ant	1-3: LB, 4-10: Qtrs 11-20: Hold	MD-1H
6-7	1: AL	Hold	CG-2H
8	LP	Hold	FPP-6H
9		Hold	EMM-2H
10	1-6: CH	1-2: DB, 2-20: Hold	EMMR-(14h)
11	1-3: LP, 4-9: CH	Hold	MFD-(4h)
12-14	1-4: CH	Hold	Sickbay-1H
15	1-5: CH	Hold	SSR-(2h)
16-17	1-4: EMMR	1-5: Eng, 6-20: Hold	LS-5H
18-19	1-4: EMMR	1-4: Eng, 5-20: Hold	ELS-3H
20		Eng	AG-3H
			LB-2H
			DB-1H
			All Others-(1h)

Hiver Tender



General Data

Displacement: 4800/5000 tons
Length: 61.75 meters
Price: MCr1578.69
Configuration: Box SL
Mass (Loaded/Empty): 37,549.00/30,828.03
Hull Armor: 31
Volume: 67,200/70,000 m³
Target Size: M
Tech Level: 14

Engineering Data

Power Plant: *6000 MW TL-14 Fusion Power Plant (100 MW/hit), 1 year duration (409.2365 MW excess power)*

Jump Performance: 3 (14,000 m³ for Jump-3, 9333 m³ for Jump-2, 4667 m³ for Jump-1)

G-Rating: 2G (2500 MW/G), no Contra-Grav lifters

G-Turns: 84 (128.8 using jump fuel), 312.5 m³ fuel each

Fuel Tankage: 40,250 m³ (2875 tons), plus 600 m³ (42.86 tons) reserved for power plant

Maint: 1387

Electronics

Computer: 1×TL-14 Mod Fb Computer (1 MW), 2×TL-14 Mod St Computers (0.5 MW ea)

Commo: TL-14 300,000-km radio (10 hexes, 10 MW), TL-14 1000 AU maser (∞; 0.6 MW)

Avionics: TL-10+ Avionics

Sensors: TL-14 Passive EMS fixed array 150,000-km (5 hexes; 0.15 MW), TL-14 Active EMS 300,000-km (10 hexes; 15 MW)

ECM/ECCM: EM masking package (67.2 MW)

Controls: Bridge with 22×bridge workstations, plus 50 other workstations

Armament

Offensive: 2×TL-14 300-Mj Laser Barbettes (Loc: 2,3; Arcs: 1,2,3; 8.3 MW ea.; 1 Crew ea.), 6×TL-14 150-Mj Laser Turret (Loc: 10; Arcs: 2,3,4; 4.2 MW ea.; 1 Crew ea.), 2×Missile Barbettes (Loc: 2,3; 5 ready Msls; 0.15 MW ea.; 1 Crew ea.) (Total of 10 ready Msls)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2: 1/10-31	4: 1/10-31	8: 1/10-31	16: 1/10-31
300-Mj Laser Barbette	10: 1/10-43	20: 1/14-43	40: 1/8-26	80: 1/4-13

Defensive: 1×TL-14 Nuclear Damper Barbette (Loc: 11; +1 Diff Mod per CV+4; 6 MW; 1 crew)

Master Fire Directors: 1×TL-14 Missile/Beam MFD (5 Diff Mods; Msl 10 hexes Maser; 10 hexes; 1.92 MW; 1 Crew)

Accommodations

Life Support: Extended (14 MW), Grav Compensators (5G; 336 MW)

Crew: 130 (2×Maneuver, 1×Electronics, 12×Gunnery, 50×Engineering, 20×Maintenance, 18×Command, 13×Flight Crew, 12×Ship's Troops, 1×Steward, 1×Medic)

Crew Accommodations: 75×small staterooms (0.0005 MW ea.), 20 single-occupancy, 55 double-occupancy

Passenger Accommodations: None

Cargo: 2176 m³ with 6 large cargo hatches

Small Craft and Launch Facilities: Minimal hangar for 4×1-ton work pods with launch port, spacious hangar for 100-ton shuttle with launch port sufficient for 200-ton craft, streamlined external grapple for 200-ton craft, unstreamlined external grapple for 1000-ton craft

Air Locks: 48

Notes

The Hiver tender is used to support Hiver lines of communication between the Hive Federation and the Reformation Coalition. The presence of a tender in a system constitutes a Hiver staging area, as seen marked on RC subsector maps (e.g., Tuer, 1636/Oriflamme/Old Expanses). This allows the Hivers to vary their avenues of approach into certain areas, and also to forego the expense of establishing permanent bases.

The Hiver tender carries extra maintenance personnel to support repairs on vessels alongside. It has a grapple with which to hold a 1000-ton vessel. This is typically only used when such a vessel is laying alongside for servicing; the tender can also carry the attached vessel, but at reduced performance of Jump-2 and 1G maneuver.

The shuttle hangar is based on a 100-ton vessel and can serve as a spacious hangar for vessels of that size and smaller. However, its doors are large enough to fit a 200-ton vessel, and the hangar can serve as a minimal repair bay for such vessels.

The tender is fitted to carry a 200-ton Hiver utility vessel (HUV—see page 153) in a streamlined external grapple, allowing the HUV to be carried even during fuel skimming. The tender's jump and maneuver drives are scaled to allow the above performance while the HUV is attached, but as the HUV is fully capable of maneuver, jump, and fuel skimming on its own, this is usually not attempted. Note that when the HUV is attached, the tender's electromagnetic masking benefits are lost, as the HUV has no EMM package. The tender may enter gas giant atmospheres to refuel, but may not land on planetary surfaces as it has no CG lifters.

This vessel is clearly intended for use only in areas which have been secured by naval sweeps. For example, its self-defense capability is severely limited by its possession of only one MFD.

Fuel scoops (1920 tons per hour) and fuel purification plant (70 MW), 17.79 hours to refine 41,500 m³ (2964 tons), but only six hours to refine 14,000 m³ jump fuel.

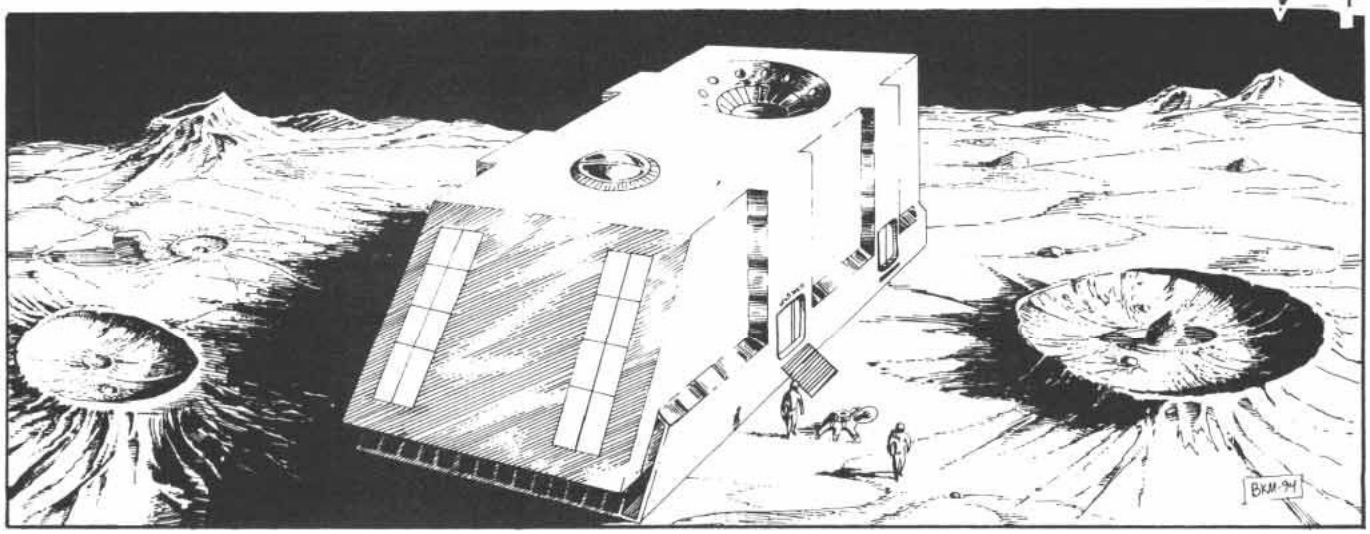
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosions*
1	1-6: Ant	1-10: Elec, 11-20: Qtrs
2-3	1: AL	1: LB, 2: MB, 3-8: Qtrs, 9-20 Hold
4-5, 13		Hold
6, 8	1-10: 1000-ton in grapple	Hold
7	1-13: LP	Hold
9	1: CH	Hold
10	1: AL, 2-3: CH	1: LT, 2: LT, 3: LT, 4: LT, 5: LT, 6: LT, 7-20: Hold
11	1: AL, 2-3: CH	1: NDB, 2-20: Hold
12, 14	1000-ton craft in grapple	Hold
15	1-19: HUV in SL grapple	Hold
16-17	1-7: EMMR	1-7: Eng, 8-20: Hold
18-19	1-7: EMMR	1-7: Eng, 8-20: Hold
20		Eng

Systems	
JD-70H	LB-2H
PP-60H	MB-1H
MD-5H	NDB-1H
FPP-70H	200-ton grapple-9H
AG-14H	1000-ton grapple-14H
LS-15H	All Others-(1h)
ELS-8H	
SSR-(2h)	
Sickbay-1H	
MFD-(4h)	
EMM-7H	
EMMR-(67h)	
LT-1H	

If 1000-ton ship or Hiver utility vessel are not in their grapples, these hits count as hits on the grapple

Hiver Utility Vessel



General Data

Displacement: 200 tons
Length: 21.25 meters
Price: MCr113.44
Configuration: Box SL
Mass (Loaded/Empty): 1746.16/1325.96
Hull Armor: 31
Volume: 2800 m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 272 MW TL-14 Fusion Power Plant (91 MW/hit), 1 year duration (0.337 MW excess power)

Jump Performance: 3 (560 m³ for Jump-3, 373 m³ for Jump-2, 187 m³ for Jump-1)

G-Rating: 2G (100 MW/G), Contra-Grav lifters (20 MW)

G-Turns: 60 (104.8 using jump fuel), 12.5 m³ fuel each

Fuel Tankage: 1310 m³ (93.6 tons), plus 27.2 m³ (1.9 tons) reserved for power plant

Maint: 63

Electronics

Computer: 1×TL-14 Mod Fb Computer (1 MW), 2×TL-14 Mod St Computers (0.5 MW ea)

Commo: TL-14 300,000-km radio (10 hexes, 10 MW), TL-14 1000 AU maser (∞; 0.6 MW)

Avionics: TL-10+ Avionics, TL-14 Terrain-Following Avionics

Sensors: TL-14 Passive EMS fixed array 120,000-km (4 hexes; 0.1 MW), TL-14 Active EMS 300,000-km (10 hexes; 15 MW)

Controls: Bridge with 5×bridge workstations, plus 2 other workstations

Armament

Offensive: 1×TL-14 150-Mj Laser Turret (Loc: 10; Arcs: 2,3,4; 4.2 MW; 1 Crew), 1×Missile Barbette (Loc: 11; 5 ready Msls; 0.15 MW; 1 Crew) (Total of 5 ready Msls)

	Short	*Medium*	*Long*	*Extreme*
150-Mj Laser Turret	2: 1/10-31	4: 1/10-31	8: 1/10-31	16: 1/10-31

Master Fire Directors: TL-14 Missile/Beam MFD (5 Diff Mods; Msl 10 hexes Maser; 10 hexes; 1.92 MW; 1 Crew)

Accommodations

Life Support: Extended (0.56 MW), Grav Compensators (5G; 14 MW)

Crew: 10 (2×Maneuver, 1×Electronics, 3×Gunnery, 2×Engineering, 1×Command, 1×Medic)

Crew Accommodations: 5×small staterooms (double-occupancy, 0.0005 MW ea.)

Passenger Accommodations: 5×small staterooms (0.0005 MW ea.), 3×emergency low berths (0.002 MW ea.)

Other Facilities: Sickbay (0.8 MW)

Cargo: 268.5 m³ with large cargo hatch

Small Craft and Launch Facilities: 1×TL-12 active/passive sensor drone carried as cargo and launched via cargo hatch

Air Locks: 2

Notes

The Hiver utility vessel (code-named HUV or "Hoover" in the Reformation Coalition) is a general-purpose ship. Each Hiver tender has one attached to it to fill such roles as scout vessel, auxiliary shuttle, courier, or search and rescue. It can be carried through jump while attached to the tender or jump separately using its own drives, depending upon the needs of the mission.

If no passengers are present, the crew will occupy the passenger staterooms.

Fuel scoops (40 tons per hour) and fuel purification machinery (2 MW), 19.65 hours to refine 1310 m³ (93.6 tons).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosions*	*Systems*
1	Ant	1-18: Elec, 19-20: Qtrs	JD-3H
2-3	1-6 Ant	Qtrs	PP-3H
4	1-6 Ant	1-18: Qtrs, 19-20: Hold	CG-1H
5	1-6 Ant	1-17: Qtrs, 18-20: Hold	MD-(4h)
6-9		Hold	FPP-2H
10	1-7: CH, 8-9: AL	1-6: LT, 7-20: Hold	AG-1H
11		1-12: MB, 13: Eng, 14-20: Hold	LS-2H
12-15		Hold	ELS-1H
16-19		1-9: Eng, 10-20: Hold	SSR-(2h)
20		Eng	Sickbay-1H
			MFD-(4h)
			LT-1H
			MB-1H
			All Others-(1h)

RULES EXPANSIONS

This section presents a number of expansions to the design sequences in **Fire, Fusion, & Steel (FF&S)**. These expansions allow the design of certain specialized forms of equipment that were not fully addressed in **FF&S**, and present enhanced rules for a more detailed exploration of some of the technologies presented in **FF&S**. Obviously, ownership of **Fire, Fusion, & Steel** is required to make a whole lot of sense out of the next four pages.

These expansion rules are broken down into the same categories and presented in the same order as in **FF&S**.

SPACECRAFT DESIGN

Modules and Pods

Modules and pods are both removable, interchangeable components that can be added to a ship designed to accommodate them. By designing the correct mix of pods, a single ship can change capabilities and missions rapidly by simply swapping out modules or pods. A module is such a modular component which has its own external hull shell (which is therefore carried exposed to space), while a pod has only internal structure without a hull shell (and is therefore carried internally, and relies on its carrying vessel's external hull to protect it).

Material Volume: When designing a module, the material volume used is that for the size of the module itself, not a percentage of the material volume of the ship it is attached to. For example, in designing a 600-ton ship which can carry a 100-ton module, the MV of the ship is 17 (600 tons total minus 100 tons of module = required material volume for a 500-ton hull) and the MV of the module is 6.

When designing a ship-pod combination, the ship uses the MV which corresponds to the total size of the ship plus the pod, and it calculates hull shell and internal structure based on this value. The pod uses the MV appropriate to its own size, but calculates only internal structure. Thus a ship-pod combination devotes more space to internal structure than a unitary design of the same size.

Controls and Life Support Systems: *If a pod or module's displacement is* equal to 30% or less of the total displacement of the ship-module combination, it need not be fitted with its own life support, artificial gravity, or controls. All that is required is that the carrying ship be designed with controls, life support, and artificial gravity based on the total volume of the ship plus the module or pod, and these systems are assumed to "plug into" the module or pod and perform those functions for it.

Pods or modules larger than 30% of the total displacement must instead carry their own life support and controls. Note that when calculating maintenance points, the module/pod uses the additional computer divisor if the carrying spacecraft is so equipped, without having to carry its own computer (this is one of the benefits of the installed controls).

All modules and pods may draw power from or provide power to the carrying craft.

Grapples: Grapples may be required for the carriage of modules, but are never required for pod carriage.

Grapples are required when the modules being carried are allowed to be of differing sizes, or if multiple modules are carried, not all of which need be fitted at one time (for example, the RCES clippers in this book). Grapples are designed using the normal rules, based upon the displacement of the module.

Grapples are not required when the module is considered to be an integral part of the craft's hull configuration, and the module(s) carried is always of the same size/configuration (for example, the modular cutter).

Surface Hits: When calculating surface hits for a module (pods have no exposed surface, so have no surface hits on their damage tables), modules use the box configuration multiplier, but then have surface area divided by four to reflect surface area that is actually exposed, and not butted up against neighboring modules, other portions of the carrying spacecraft, etc.

GROUND VEHICLE DESIGN

Flotation Screens

As described in the **FF&S** design sequence (page 20), a vehicle whose enclosed volume in cubic meters + loaded mass in tonnes equals 1 or more will float. Those with a value of 1 or less will not.

Vehicles with a value of between 0.9 and 1 may be fitted with flotation screens to allow them to float for short distances (such as across a river or into a beach from a landing ship off shore). The price of the screen is Cr50 times the vehicle's chassis volume in cubic meters.

Time required to erect the screen for use is a number of combat turns times the vehicle's chassis volume in cubic meters.

Vehicles which swim with the benefit of flotation screens are vulnerable to enemy fire, as the hull of the screen-assisted vehicle is actually below the surface of the water, it is only the top of the screen which is above the water. All hits on a vehicle swimming with a flotation screen are considered to be on the screen. Treat the screen as having an Armor Value of 1, and any minor hit on the vehicle holes the flotation screen sufficient to cause the vehicle to sink like a rock (or to begin floating like a rock, take your pick). Thus even small arms damage can sink such a vehicle. *Any crew aboard a vehicle which begins sinking* must succeed at a Formidable: Swimming task to successfully escape the vehicle.

LIFT VEHICLE DESIGN

Grav Belts

Grav belts use a special application of the lift vehicle design sequence.

Select the volume of the contra-grav unit to be used, and divide by the volume multiplier to find the size of the contra-grav "bubble" in displacement tons. At TL-12+, the minimum volume of a contra-grav unit is 0.03 cubic meters, which yields a CG bubble of 0.1 tons, or 1.4 cubic meters. 1.4 cubic meters is the minimum volume required for a human-sized being in a grav belt, and includes personnel wearing armor, such as battle dress.

Although a "hull size" has been determined, the grav belt has no hull or material volume. The grav belt is a backpack-style design, and all of the material that will be installed as part of the grav belt will be part of this pack and will be subsumed within the 1.4 cubic meters of the grav belt user.

In addition to the CG unit, all grav belts require controls of at least the same tech level as the CG unit (these are calculated based on the "hull size" of the CG bubble), TL-6 or better flight avionics, a workstation of that same tech level, and a "microflight" computer. The workstation has its normal cost according to tech level, but has negligible volume and a mass of only 0.02 tonnes (for a rigid-structure grav belt, such as the "Broomstick" on page 11 of this book, use 0.04 tonnes mass per workstation). The microflight computer is specifically designed for grav belts and their peculiar requirements (see page 10 of this book for a discussion). It has a mass of 0.016 tonnes, a volume of 0.016 cubic meters, requires 0.008 MW, and costs MCr0.06 at all tech levels. Terrain-following avionics may also be added, if the designer wishes a safe NOE speed of greater than 40 kph.

The grav belt requires a thrust agency, almost always in the form of shrouded, vectorable propellers (use values for TL-8 propellers, **FF&S**, page 69). These propellers will usually be powered by the same battery that powers the belt's other systems, but its price must also be multiplied by 2.5 as specified by the propeller table. In addition, if the propellers are powered by battery, they require a transmission with a volume of 0.3 cubic meters per MW of power (mass in tonnes equals volume in m^3, price in MCr equals volume times 0.0015).

Required thrust for the propellers is determined as follows: G-rating is determined by dividing thrust in tonnes by the volume of the CG bubble in displacement tons. When determining speed, grav belts have an efficiency multiplier of 0.65. The other details follow the lift vehicle sequence. Remember that the maximum allowable speed for unprotected personnel is 300 kph (personnel require vac suits, combat armor, battle dress, etc., to exceed this speed).

Once the total power requirement is known, set a duration time and design a battery which will meet those needs.

AIRCRAFT DESIGN

Compound Helicopters

When calculating the performance of compound helicopters (including X-wing helicopters), their performance must be separated into fixed-wing and rotary-wing modes. The fixed-wing mode uses the compound helicopter's maximum speed, but may not use the NOE mode. This is because there is no power being applied to the rotor blades (or in the case of the X-wing, the blades are locked), and the aircraft cannot hover. By definition, aircraft which cannot hover may not conduct NOE flight.

The rotary-wing mode allows NOE flight, but the aircraft is then limited to the helicopter top speed of 320 kph, reduced by drag points as normal.

Transitioning from one mode to the other requires a Difficult: Pilot (use lower of Fixed Wing or Rotary Wing cascade) roll. Outstanding Success indicates that the aircraft is considered to be in the new mode immediately. Normal success indicates that the aircraft is in the new mode on the following turn. Normal failure indicates that the roll must be attempted again on the following turn. Catastrophic Failure requires a Difficult: Pilot (use cascade for current mode) roll to avoid losing control of the aircraft and crashing on the following turn.

Aircraft Modifications for Other Planetary Environments

The aircraft design rules in **Fire, Fusion, & Steel** are intended to design aircraft for use in a standard atmosphere with 1 G gravity. Although it is primarily grav vehicles that are intended as flexible vehicles that can be taken from one planetary environment to another, in some cases the same will be required of aircraft. In the **TNE** basic rules, there is a simple prohibition against operating aircraft on worlds other than those for which they were designed. This is because of the many complicated interactions involved in getting an aircraft to fly in a multitude of environments, and because the **TNE** basic rules were not the place to go into involved discussions of speculative aerodynamics.

Strictly speaking, the rules below vastly understate the difficulties in designing aircraft for multiple environments (with atmospheric composition varying independently with gravity and temperature), and only obliquely touch upon such complex issues as the speed of sound varying with pressure and temperature, etc. In reality, each item of the **FF&S** design sequence would have to be re-evaluated based on the specific and cross-cutting local conditions, but this is the sort of abuse that we pay real aircraft designers to put up with, and not what helps players and referees to enjoy a science-fiction game. So while these exist to allow **Traveller** aircraft designers to have fun designing multi-environment aircraft, and to quickly and painlessly take these craft from one environment to another, referees should feel free to institute much stiffer prohibitions in their campaigns.

Atmosphere: Aircraft may only fly in thin, standard, or dense atmospheres (codes 4-9). If an aircraft (fixed- or rotary-wing) is intended to be able to operate in thin or dense atmospheres (or both) in addition to standard atmospheres, multiply its airframe cost by 1.5 to allow for reconfigurable or variable geometry intake ramps, lift devices, etc.

In addition, multiply rotary-wing rotor assembly mass by 2 if they are to function in another atmosphere type in addition to standard. This provides them with the additional gearing required to allow them to be fitted with different rotor assemblies for different atmosphere types. Each additional set of rotors masses 0.25 times the mass of the modified multi-atmosphere rotor assembly. These extra rotor sets will have to be stored and transported separately at a volume in m^3 of 20 times their mass in tonnes. Cost is calculated normally based on rotor assembly type.

In addition, an aircraft's airframe will yield different maximum and minimum speeds in different atmosphere types, and this must be examined. It may be that some aircraft can no longer fly, as they can no longer meet the minimum speed required to stay in the air in a thin atmosphere, for example. Maximum, cruising, and NOE speeds must be recalculated based on these new numbers, and aircraft with drag points calculate their new speeds down from these new maxima using the normal procedure. The new minimum speeds will change take-off and landing distances as well.

Note that while dense atmospheres "slide the performance window down" by reducing minimum and maximum speeds, thin atmospheres narrow the permissible performance bands. This is because the speed of sound is lower in thin atmospheres, and airframe maximum speed is based on its ability to handle the compression phenomena associated with the speed of sound. (The other side of this is that denser atmospheres provide more lift, hence lower stall speeds, while thinner atmospheres provide less lift so require greater speeds to remain airborne.)

Note also that this table uses a single average value for each of thin and dense atmospheres. The actual density of any atmospheres varies within a range, so in reality, these numbers would be different for each and every world, even those classified by **Traveller** as having the same atmosphere type. As the purpose of these rules is to allow aircraft to be relatively quickly converted from one world type to the next, it would be criminally stupid to attempt to calculate exact numbers for each individual world. Instead, for the purposes of these rules (and in the interest of universal mental health) any world of a given atmosphere code yields the same performance as any other world with the same code. The value used for thin atmospheres is 0.6 atmospheres and the value for dense is 2.0 atmospheres.

Airframes

	Thin (4, 5)		*Standard (6, 7)*		*Dense (8, 9)*	
Type	*Min*	*Max*	*Min*	*Max*	*Min*	*Max*
Simple	250/125	270	150/75	320	75/40	160
Autogyro	65/—	200	40/—	200	20/—	100
Fast Subsonic	265/135	680	160/80	800	80/40	400
Transonic	300/150	940	180/90	1100	90/45	550
Supersonic	465/235	2400	280/140	2800	140/70	1400
Hypersonic	585/290	4300	350/175	5000	175/90	2500
Wing-in-ground	125/—	400	75/—	400	40/—	200

Gravity: Note: **Traveller** does not focus on a world's gravity *per se*, but primarily on the density of its atmosphere, which is a reflection of its gravity. Players and referees should not feel compelled to worry about gravity effects on aircraft so long as they address the atmospheric requirements above. You have our permission to ignore it (goodness knows we'd like to).

For those who feel compelled to forge ahead to account for different gravities, multiply the aircraft weight by the local gravity before calculating G-Rating, Speed, and Take-off and Landing rolls. Calculate glide ratios normally, and then divide the result by the local gravity in Gs. In G-fields of greater than 1, multiply normally calculated maintenance points by the gravity in Gs, as more maintenance is required to watch for and repair stress fractures, etc.

SMALL ARMS

Dual-Feed Receivers

Weapons may be designed to accept ammunition from more than one magazine at a time, allowing the firer to switch back and forth between two or more supplies of rounds. This is accomplished in the Receiver step.

Add 10% to the mass of the receiver for each additional feed source that will be allowed. In other words, if a submachinegun will be allowed to draw from two separate magazines at one time, add 10% to mass. Three magazines at one time would add 20%.

The same rule applies to design a receiver which can accept ammunition from box magazines *or* belts (not both at the same time): this would add 10% to receiver weight. Note that weapons designed for belt feed may use belts or cassettes and vice versa at no penalty, and no increase in cost, as these types of feed are considered to be identical from the receiver's point of view.

Price is calculated normally based on the increased weight.

(This same rule may also be used with the Gauss Weapons design sequence.)

Modular Small Arms

Small arms may be built with key modular components that are designed to be able to be removed and replaced by other modular parts, or to be recombined with other parts to create different weapons for different purposes (for example, the CMWS on pages 62 to 66 of this book).

In order to have this modular capability, parts which are to be used in this way have their prices increased by 10%. Components which come under this rule are barrels, receivers, and stocks. Note that this modular capability only allows these parts to be fitted to other parts that were built with the same specifications (i.e., ammunition caliber and average muzzle energy).

Numerous weapon components do not come under this rule as they are either not in themselves modular (for example, muzzle brakes and flash suppressors which are permanently attached to a modular barrel are not increased by 10%, they merely add their normal cost to the 10% more expensive barrel price) or are already designed to be installed on or removed from any number of weapons. Among this latter category are tripods and bipods, backpack-mounted recoil compensators (as opposed to stock-mounted recoil compensators), silencers, and laser, electronic, telescopic, and optic sights.

(This same rule may also be used with the Gauss Weapons design sequence, but where receivers and barrels are built to different muzzle velocity standards, the assembled weapon uses the lower of the two.)

Overpowered Cartridges

It is possible for small arms to fire ammunition with a higher average muzzle energy than that for which the weapon was designed. Naturally, this is potentially dangerous. (Note that for the purposes of these rules, a weapon may only fire cartridges of the precise dimensions for which it is initially designed. This means that overpowered cartridges are only possible when constructed at a higher tech level, where the higher tech level energy multiplier means that more energy may be fitted into a cartridge of the same dimensions.)

When firing overpowered cartridges, there is a chance that the weapon will be damaged or actually explode, doing damage to the firer. This chance is calculated as follows:

10([NAME÷DAME]–1.2)

NAME: Average muzzle energy of the new (overpowered) cartridge

DAME: Average muzzle energy for which the weapon was designed

The result is the chance on 1D20 of the weapon to be damaged or explode from the excessive ammunition energy (round to the nearest whole number).

This roll is made each combat turn that the weapon is fired with the overpowered cartridges, regardless of the number of times it was fired or its rate of fire. If the indicated number or less is rolled, the weapon has had a problem. Roll 1D20 and consult the table below.

1-12	Weapon is damaged by internal explosion, and is no longer usable. Firer loses his or her next action due to surprise (although you know, he really shouldn't be, the silly bugger...)
13-16	Weapon explodes. If a one-handed weapon, the explosion does 1D10 hits to the firer's firing arm. If a two-handed weapon, it does 1D10 hits to each of the firer's firing arm and head. Weapon is destroyed.
17-20	As 13-16, but 2D10 hits of damage.

For example, if the TL-6 9x20mm round (458 joules, see page 43 of this book) is loaded in the TL-4 9mm revolver (designed for 356 joules, see TNE, page 352), the roll for each turn of fire is:

10([458+356]–1.2) = 0.865, rounded to 1

Thus a roll of 1 on a D20 means that the above table must be consulted.

HIGH-ENERGY WEAPONS

Rapid-Fire High-Energy Weapons

High-energy weapons have an inherently low rate of fire because of the large amount of energy they process and the time required for the weapon to be cooled for another shot. The plasma/fusion combustion chamber can only be cooled so fast, as overcooling will cause it to lose its tempering and begin to crack. These microscopic cracks can eventually cause combustion chamber explosions.

The solution to this problem is to build high-energy weapons with multiple chambers so that one chamber can fire while one or more other chambers are cooling. Relatively high rates of fire can be attained by this method, using the following formula:

ROF = Ep÷(25C)

where **Ep** is the weapon's pulse energy in Mj, **C** is the number of chambers, and **ROF** is rate of fire expressed in the number of 5-second combat turns between shots. Take the inverse of this result (i.e., divide 1 by this value) to get ROF in shots per 5-second combat turn. Drop all fractions (e.g., 1.99 becomes 1).

The design of a rapid-fire (multichambered) energy weapon differs from the standard sequence shown in **FF&S** in three ways: firing unit, supporting hardware, and ammunition feed.

Firing Unit: Establish the pulse energy and mass of a single-chamber firing unit using the normal **FF&S** rules, and determine the total number of chambers the weapon is to have. Each additional chamber beyond the first (the basic firing unit includes one chamber already) has a mass of 0.5 times the basic firing unit already calculated. Price of the rapid-fire firing unit is calculated normally: Cr2500 times total mass of the multichamber firing unit in kilograms for plasma weapons and Cr7500 times total mass in kg for fusion weapons.

Supporting Hardware: The multichamber firing unit requires supporting hardware beefed up to handle the larger cooling requirements of multiple firing chambers. The mass of this rapid-fire supporting hardware is equal to the mass of the supporting hardware for a normal single-chamber weapon of the required pulse energy times the value (number of chambers+2). Price is calculated normally based on final weight: Cr2500 times mass in kilograms for plasma weapons and Cr7500 times kg for fusion weapons.

Ammunition Feed: Rapid-fire energy weapons are fed from magazines. The magazine may be of any size desired by the designer. The mass of an empty magazine is equal to mass of all of the rounds carried multiplied by 0.01. The price of an empty magazine in credits is equal to its empty weight in kilograms times 5. The volume of a magazine in cubic meters is equal to the mass in tonnes of a full load of ammunition divided by 4. As with other automatic heavy weapons, when installed in a vehicle, the magazine must be in the same portion of the vehicle as the weapon in feeds.

Other portions of the weapon are designed as described in the basic **FF&S** sequence. The size of the recoil cradle is calculated normally, and is not increased in size based on the number of chambers (as rapid-fire high-energy weapons grow larger, their mass and structure gradually take over some of the recoil-absorption functions of the cradle).

Plasma and Fusion Bazookas

Plasma and fusion bazookas are less sophisticated versions of the plasma and fusion rifles designed in **FF&S**. High-energy bazookas fire one individually loaded round at a time, and expend a great deal of the round's energy out the back of the weapon so that they have no recoil.

Weapon: Bazookas use the same formulae presented in **FF&S**, but use different tech level multipliers (Tm) in the firing unit and support hardware formulae, as shown on the table below.

TL	*Firing Unit Tm*	*Support Hardware Tm*
10	6	6
11	4.5	5
12	3	4
13	3	3
14	3	2
15	1.5	1
16-17	0.75	0.5
18-19	0.375	0.25
20+	0.225	0.15

Ammunition: Bazooka ammunition is calculated using the procedure as described on **FF&S** page 67, but with the volume and MCr multipliers from the table below. These multipliers increase the mass and price to allow for the additional mass that is vented rearward to negate recoil, and for the disposable chemical laser ignition system contained in each plasma/fusion bazooka cartridge.

TL	*Description*	*Vol*	*MCr*
10	Chemical Explosive Cartridge (CPC)	0.0009	0.00018
12	Pulse Plasma Cartridge (PPC)	0.00045	0.000045
14	Pulse Fusion Cartridge (PFC)	0.0003	0.0000144
16+	Grav Compr. Fusion Cartridge (GCFC)	0.00015	0.0000072

Backblast: All personnel standing within 10 meters of the rear of the bazooka when it is fired must take backblast damage. Backblast damage is a number of D6 equal to the bazooka's pulse energy times 2. It is distributed in the same fashion as concussion damage (**TNE**, page 283).

All other details, such as range, damage, etc., are calculated just as printed in **FF&S**.

Concussion and Burst of High-Energy Weapons

The high-energy design sequence in **FF&S** did not discuss plasma and fusion gun burst and concussion, as it was written primarily with small arms weapons in mind. The following criteria comes into play only with weapons of 4.7 Mj and greater, as weapons of lower energy have a burst radius that rounds down to 0, and therefore have no concussion calculated. Both concussion and burst are calculated from the weapon's damage value (DV in the equations below), calculated normally. Burst radius is rounded to the nearest 10-meter grid radius value (e.g., 5, 15, 25, 35, etc.).

Concussion = 0.001(DV²)

Burst Radius (meters) = 0.1(DV)

MUNITIONS

Guidance and Missile Design

Target-Designated Guidance and Very Long-Range Missiles: Target-designated guidance (both laser and radar, and now AEMS, see below) is primarily intended to allow the missile to home on a target which is "painted" with a friendly designation or sensor system. However, this guidance package also enables the missile to function in "beam rider" mode. This capability is used almost exclusively for the very long-range planetary bombardment missiles which are fired at great distances from the planetary surface (often from far orbits hundreds of kilometers from the surface in order to provide safety for the firing starships). As these ranges are well in excess of homing, target seeker, and target memory ranges, the beam rider mode is used to guide these missiles through the long-distance first portion of their flight, until they get close enough to use their homing, seeker, or memory packages.

Beam riding means that the missiles fly along a beam of radar, laser, or AEMS energy, usually projected by a sensor on the launching ship. The missile's designation guidance package allows it to maneuver to stay within the confines of this beam and thereby maintain a course into the general vicinity of its target. Missiles which use beam riding in conjunction with terminal homing, target seeking, or target memory modes are called "dual mode" missiles (and include the Spruce and Fir missiles on page 109 of this book). Missiles launched in dual mode require a modified two-part to-hit task. First, the beam-riding portion is resolved as a normal target-designated task (**TNE**, page 278). This task will determine how close the missile arrives to the target when its terminal guidance system takes over. On normal success, the missile has arrived 1D10x5 kilometers from the target, and on Outstanding Success it has arrived 1D20 kilometers from the target. Compare the arrival range to the listed short range of the missile's terminal guidance package, and resolve the terminal portion of the missile's flight as a normal homing missile task (**TNE**, page 278) based on this range.

The disadvantage to this mode is that it requires use of active sensors, which invites notice by the enemy, and attack and countermeasures. A different form of dual mode missiles use command guidance for the first portion of the flight instead of laser/radar/AEMS beam riding. This allows missiles to be launched into their "target baskets" while only using passive sensors. These are resolved exactly as the beam riders above, but the first portion of the flight is resolved as an operator-guided task (**TNE**, page 278). All other details are the same. Examples of this type of dual mode missile are the planetary defense missiles on pages 104-105 of this book.

Additional Guidance Types: Add the following line to the target-designated guidance systems table (**FF&S**, page 145):

TL	*Type*	*Mass*	*Cr*
10+	AEMS	1	1000

AEMS signifies active EMS designation, meaning a guidance system which can be designated by a TL-10+ active EMS sensor. Since active EMS sensors use multi-spectrum illumination, a missile equipped with an AEMS designated seeker may also accept designation by radar or laser.

Add the following lines to the Homing Guidance Systems table (FF&S, page 145):

TL	*Type*	*Mass*	*Cr*	*Range*	*AGL*
9+	Advanced ARM	1	3000	36	—
9+	Advanced HOJ	1	3000	36	—

Range is short range in kilometers of a missile fitted with this guidance package.

HOJ is "home on jamming" which allows the missile to home on a functioning *area* jammer. Area jammers include the jammers of that name as well as jammers which are being used to jam radio transmissions (broadband jamming). The missile may not home on the radar and EMS jammers which are being used in a defensive deceptive jamming mode to increase the difficulty levels of sensors attempting to detect its owning platform.

Add the following information to the Smart Warheads Sensor table (**FF&S** page 145):

TL	*Type*	*Mass*	*Cr*	*Memory Range*	*Seeker Range*
7	Visual	1	200	8	40
7	IR	1	2000	4	20
8	Imaging Radar	1	10,000	8	40

Memory Range is the short range in kilometers of a target memory missile equipped with this sensor. *Seeker Range* is the short range in kilometers of a target seeker missile equipped with this sensor.

Effect of Nuclear Warheads in Atmosphere: Planetary defense missiles are fitted with nuclear-detonation laser warheads for use outside of atmospheres. Warhead detonation within an atmosphere will not allow the X-ray lasers to function properly, so the only damage that can be done to a spacecraft is by the nuclear explosion itself. Roll the to-hit task for the missile to hit the target normally. A result of Outstanding Success means that the warhead detonated 1D6x50 meters from the target. Normal success indicates that it detonated 1D20x50 meters from the target. Failure indicates that the warhead detonated 2D20x200 meters from the target. Roll the range of detonation and then find the line on the table below that corresponds to the warhead's yield, and see if the target is within one of the three listed radii. All fixed-wing or rotary wing aircraft within the secondary blast radius are destroyed. All spacecraft within the "destruction" radius are immediately destroyed (actually damaged so badly that they immediately crash to the ground). All spacecraft within the primary blast radius have 5 major hits rolled against their electronics. All spacecraft within the secondary blast radius have 1 major hit rolled against their electronics.

Yield	*Destruction*	*Primary*	*Secondary*
10	180	540	720
20	300	540	900
50	420	750	1200
100	480	750	1260
200	540	800	1400
500	600	880	1560

Yield: Of warhead in kilotons; Other entries are radii of destruction, primary blast, and secondary blast in meters.

LAUNCHERS

Shotgun and Flechette Rounds for Grenade Launchers

Most man-carried grenade launchers are provided with a shotgun or flechette round for close-range self-defense because grenades are typically useless or even counterproductive for close-range use.

Rating the performance of these rounds, however, requires a hybrid use of the grenade launcher and small arms design sequences as follows. Flechette rounds for grenade launchers are of the non-bursting variety, and are just like shotgun rounds except that they fire finned darts.

Price: The price of these rounds is determined the same way as any other grenade round, except that the price multiplier (**FF&S**, page 141, table I) for shotgun and non-bursting is 10.

Number of Rounds: Define the number of projectiles in the cartridge, and this must be a multiple of four. Note that four projectiles are resolved (using the shotgun/flechette rules on **TNE**, page 279) as a 3-round burst, eight projectiles as a 5-round burst, and 12 as a 10-round burst.

Damage and Penetration: Divide the muzzle energy of the grenade round (calculated using the normal grenade launcher sequence) by the number of projectiles contained in it. The result is the energy per projectile. This can be used on **FF&S**, page 94, to define the damage and penetration of these projectiles.

Range: This calculation (page 96, **FF&S**) requires an additional figure, "Blm" which is not created as part of the grenade launcher design sequence. To find Blm, first subtract 2 from the grenade launchers barrel length in calibers, and multiply the result by 0.233. This number is "Blp" which is used on page 96 to calculate Blm.

Blp = (barrel length in calibers –2)0.233

With Blm, short range of the shotgun or flechette round can be calculated using the normal procedures on **FF&S**, page 96. Grenade launcher shotgun and flechette rounds use the two-hand multiplier but ignore the smoothbore multiplier.

NEW RULE

All projectile weapons with a penetration of Nil may penetrate Armor Value 0 using the same method as melee weapon penetration. In other words, the armor absorbs a number of hits (rolled hits, not damage dice) equal to twice its parenthetical anti-melee armor value, and hits above that level "penetrate" the armor and are applied to the wearer.

MISCELLANEOUS

Workstations and Labs

All laboratories (from the Optional Features section) are assumed to have a number of workstations in them that permit scientists and technicians to use the laboratory's equipment. However, if the scientists are intended to use some of the ship's other equipment, such as sensors or communicators (as in the case of the Lab Ship, **TNE**, page 371), normal workstations must be provided for the number of personnel who will be using these devices at any given time.

Hatches and Rates of Troop Egress

Cargo hatches set a limit on the number of troops who may embark/debark through them in a single combat turn (five seconds). A large cargo hatch allows 20 troops to pass through per combat turn, and a small cargo hatch allows 12. These numbers assume troops not equipped with rigid armor (includes battle dress and combat armor) and a troop bay equipped with adequate or better seats. If troop bay is equipped with cramped seats, cut this rate in half. If troops are wearing rigid armor, cut this rate in half again. Thus a single small cargo hatch used by troops in battle dress and cramped seats will allow 3 troops to pass through per combat turn.

Treat air locks the same way, but with a base rate of 2 troops and a minimum of one.

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Science Fiction Roleplaying Game

TRAVELLER
The New Era

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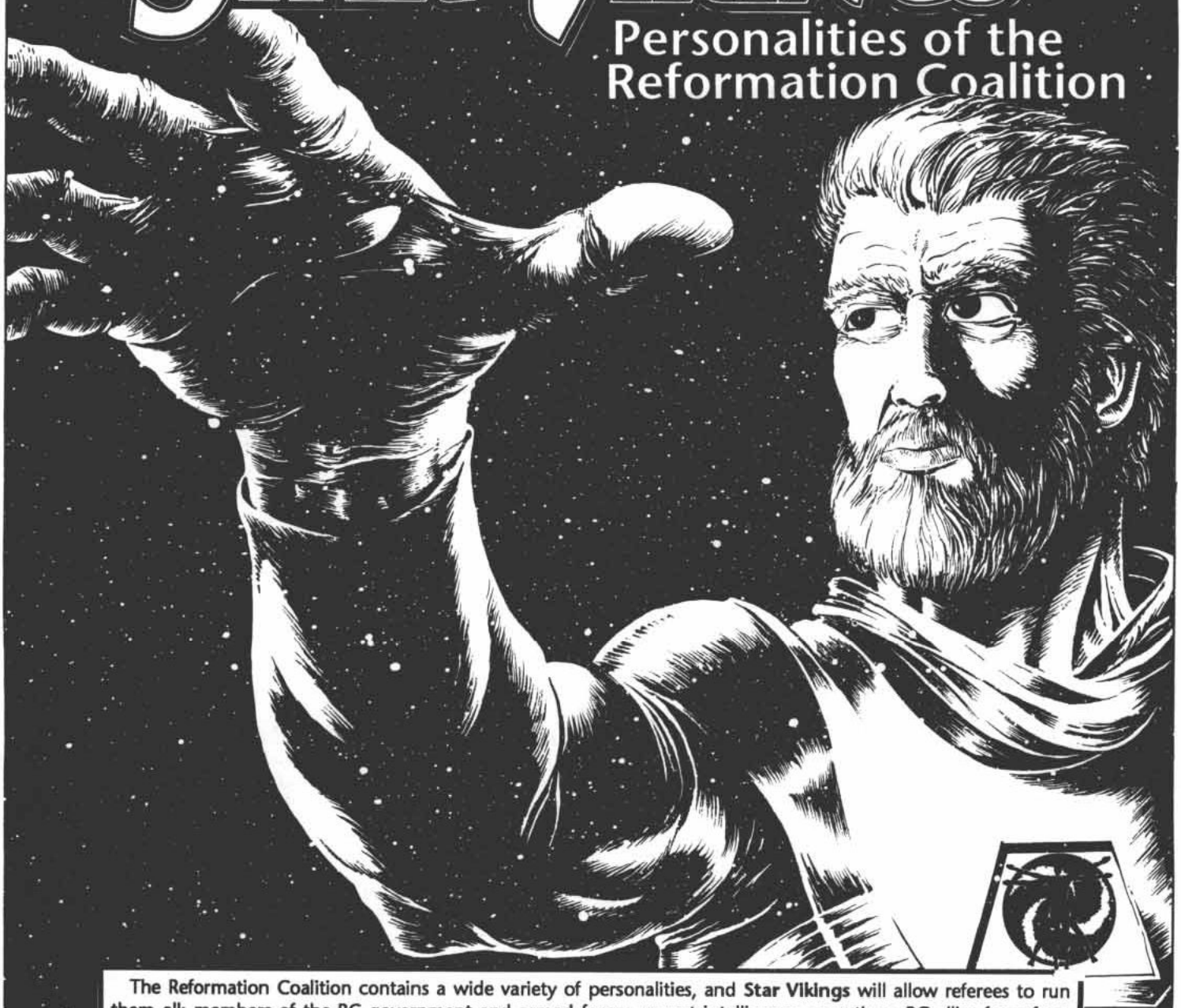
STAR VIKINGS™

Personalities of the Reformation Coalition



The Reformation Coalition contains a wide variety of personalities, and **Star Vikings** will allow referees to run them all: members of the RC government and armed forces, covert intelligence operatives, RC allies from free-lancers to Free Traders, plus representatives of the RC's implacable opponents: the Guild and the ruthless dictators from the Wilds.

Each personality is a fully detailed **Traveller** character ready for use in a Star Viking campaign, with extensive referee's notes on the characters' motivations and backgrounds, plus guidelines on how to introduce these characters into a campaign, and keep them crossing the players' paths.

In addition, **Star Vikings** presents eight unique starships and their crews, complete with maps of their areas of operation and scheduled trade routes, and full color profiles of their configurations and markings.

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The New Era

TNE Referee's Screen

This screen assembles the most commonly used task resolution and combat charts into an easy-to-use format for referees and players alike. Other commonly used charts and tables are collected into a charts booklet to free **Traveller** gamers from having to flip through the rulebook to find the information they need. In addition to all of this information at your fingertips, the **Referee's Screen** comes with a complete **Traveller: The New Era** adventure that brings the players face to face with one of the most fearsome and complicated challenges of the New Era: sentient electronic life.

TNE Players' Forms

The perfect companion to the **Referee's Screen**, this booklet contains a multitude of ready-to-use forms to organize and detail your New Era campaign, useful for players and referees. Revised, more useful character sheets and worksheets head the list, followed by NPC and ammo sheets. But the remainder of the book is all-new forms: player possessions register, ship design and hit location worksheets, blank ship data profiles, subsector data sheets, animal encounter forms, and trade forms. For the cartographically inclined, the book also includes blank map forms that use a convenient multi-scale hex grid system that zooms in or out all the way from local surface scale to continental scale all the way to an entire planetary surface.

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REFORMATION COALITION

Equipment Guide



In order to re-build a universe, first you need the right tools...

The Star Vikings of the Reformation Coalition Exploratory Service (RCES) are always on the look-out for useful relic technology from the fallen imperium. The **Reformation Coalition Equipment Guide** details some of that relic technology, but it also describes the most important equipment, weapons, and vehicles used by the Coalition. The hallmark of this equipment is the Coalition's attention to flexibility and ruggedness: their designs are intended to make the maximum use of their limited technological and manufacturing resources.

Spacecraft

A wide variety of new and unique spacecraft are detailed in the **Reformation Coalition Equipment Guide**. Small craft covered include the assault lander, and "Wildbat" fighter, additional details on the 50-ton modular cutter (including a variety of new modules), and detailed examinations of the *Aurora* and *Maggart*-class clippers: the backbone and strong right arm of RCES operations. Three Hiver ships are also described, as well as a new type of Scout, and (last, but not least) the *Victrix*-class multipurpose starships.

Weapons

The Wilds are a dangerous place, and weapons are a necessity. The weaponry described in the **Reformation Coalition Equipment Guide** ranges from the 5mm "pen pistol" covert operations concealed weapon through conventional pistols, SMGs, carbines and rifles, to light and heavy machineguns. The Coalition 2.5cm grenade launcher, 4cm RAM rifle grenades, and heavier weapons are described in detail. Energy weapons are not neglected, covering everything from laser pistols to plasma bazookas, and the weapons in-between.

Heavier weaponry ranges from the tiny Lyrebird support missiles to planetary defense missiles more than 9 meters long. Need a laser-guided tank-buster? Call in a Nail tac missile. Tanks? You can use a light TL-6 "Panda" recon tank, the TL-8 "Prairie Fire" tank, or (if you are lucky enough to find one) à TL-15 "Intrepid" grav tank.

Transportation

Getting from place to place on a planetary surface is another problem everyone faces, and the **Reformation Coalition Equipment Guide** covers this subject as well. Need to get from orbit to dirtside in a hurry? You have a choice of assault lander, drop capsule, or personal reentry kit. Need to get around once you're there? Hop in a *Charina* wheeled APC, or strap a grav belt to your back and fly there.

Et Cetera

We cannot begin to list everything else that's in here, so flip to the index on page 158 and start reading. The **Reformation Coalition Equipment Guide** is copiously illustrated, and contains everything you need to use these items in a **Traveller: the New Era** campaign.

So what are you waiting for, trooper? Strap up and move out!
History's written by the winners, and I just got myself some paper

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Science Fiction Roleplaying Game

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Miniatures Warfare in the far future



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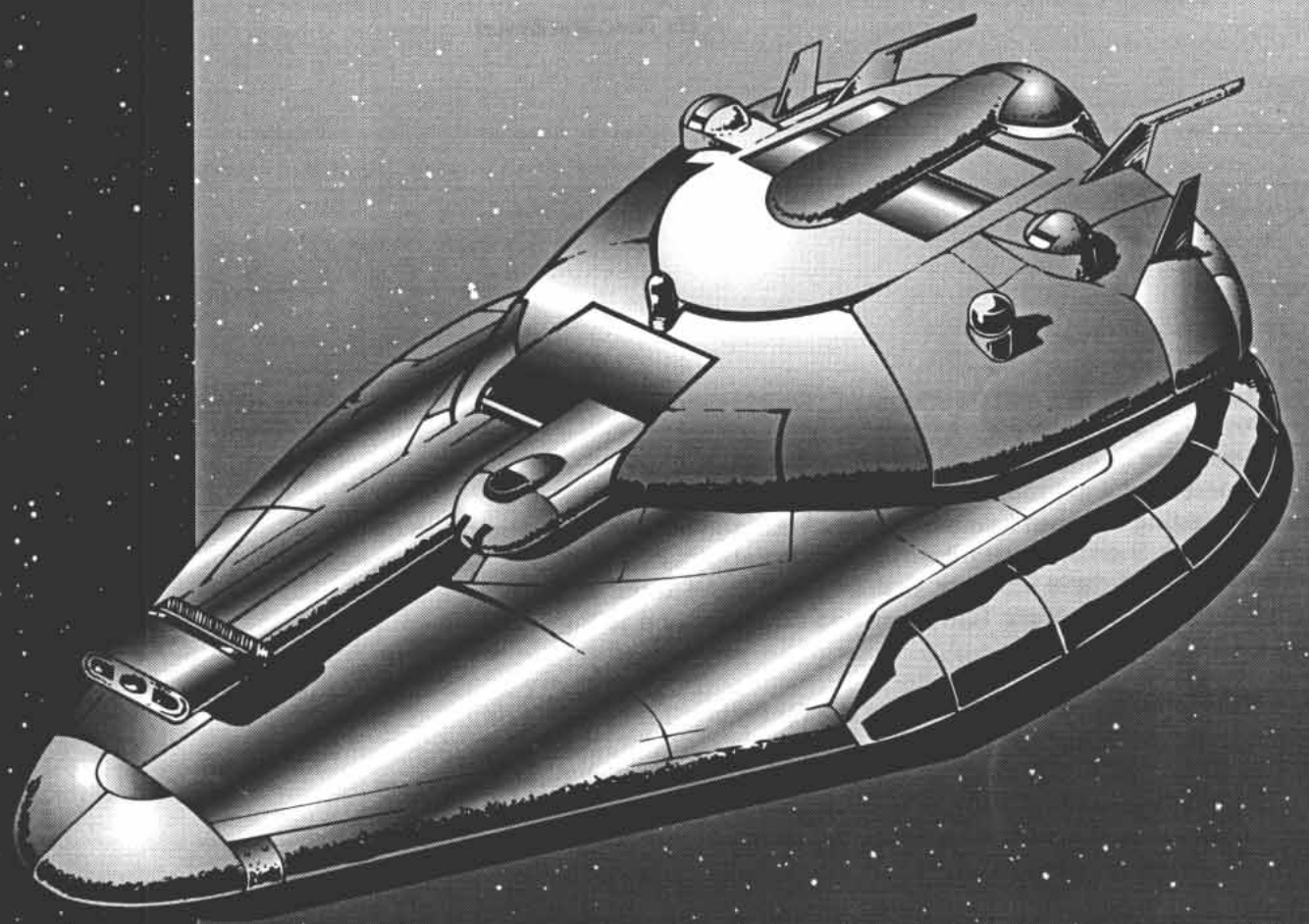

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For Tessa and Devon

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Basic Rules

RULE 1: THE FUNDAMENTALS

Striker is a tactical miniatures game of ground combat in the far future. It is designed to emphasize the two salient aspects of combat at this level—rapidly changing tactical situations and the importance of leadership and troop quality—while allowing for a wide variety of weapons and vehicles from all tech levels covered by the **Traveller®** science-fiction roleplaying game.

Striker is set in the universe of **Traveller: The New Era**, but its rules can as easily be used for resolving science-fiction battles in any milieu. Game information for vehicles, weapons and personnel are listed in the equipment data charts. The appendices to these rules contain the organization charts of typical main force units (primarily battalions) for the Reformation Coalition, the Regency of Deneb and a variety of smaller states. Equipment data for these units is included in another appendix. The game reference charts contain information most frequently used during the play of the game.

1.1 Scale

These rules are written with 25mm miniatures in mind, but may be used with any scale desired. Each vehicle or heavy weapon represents one actual vehicle or heavy weapon of that type. Single-figure stands represent single individuals, while multiple-figure stands represent four-person fireteams.

Ground scale is 1:1000, which means that each millimeter on the gaming table represents one meter of actual distance. All movement and ranges in the game are given in centimeters on the playing surface (each representing 10 meters of real distance). For players without access to metric rulers, one inch equals 25 meters.

Each game turn represents five minutes of elapsed time.

1.2 The Referee

Striker may be played with or without a referee. A referee should be a player who knows the rules well and is willing to supervise the game being played, but not play. A referee's tasks are to generate the scenario, determine the terrain and the makeup of both sides, and keep track of hidden units. In addition, the referee is responsible for keeping the game moving and adjudicating any dispute of the rules that may occur. This leads us to the following ironclad statement:

The referee's word is law during the course of the game, even if the ruling is directly contrary to the printed rules.

Each group of players will have varying opinions about values of specific weapons, the best way to represent specific battlefield activities and so on. The middle of a game is not the best time to debate such points. The best way to avoid this is to make the referee's rulings final for the scenario being played. Discussion should wait until after the game is over (indeed, a post-game "debriefing" can be very rewarding).

A referee can be dispensed with if a group consists of cooperative, well-experienced players who can agree upon a scenario ahead of time.

A well-planned scenario takes into account the number of players, their experience with the rules, the table space and troops available for play and the time that can be devoted to the game. The referee has the right to alter rules, ratings and organizations so as to best suit the scenario he is attempting to run. Victory conditions, if needed, and any other information necessary for the scenario should be given to players. As a general rule, the more organized the scenario, the better the actual game will be for the players.

1.3 Sequence of Play

1.31 Phases: Each game turn is played in a series of phases. In general, these phases are resolved in sequence, with all action in one phase being resolved before another phase begins. The phases, in order, are:

Command Phase
Movement Phase
Fire Phase
Morale Phase
Melee Phase

The details of what occurs in each phase will be taken up later in these rules. It is the job of the referee to see that each phase is carried out quickly and in its proper sequence.

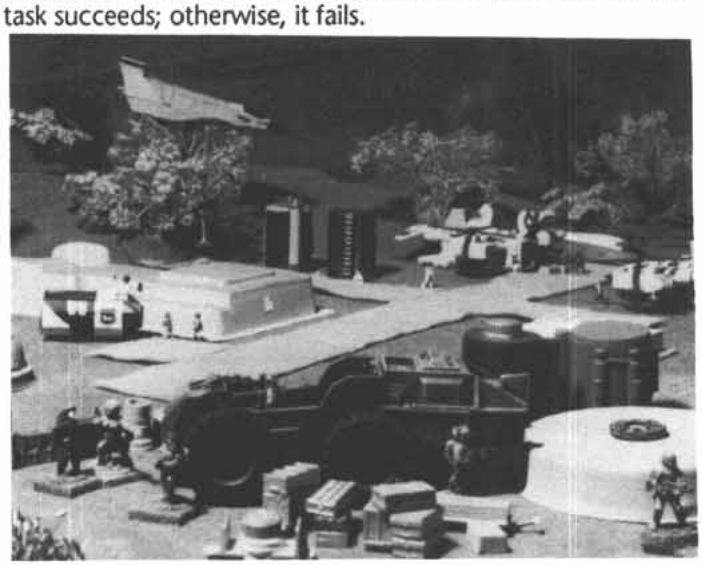
1.4 Task Rolls

The central game mechanic in **Striker** is a D20 task roll. This roll is made to determine if targets are seen or hit by fire, among other things.

The target number for the roll is usually determined by the range and quality of troops making the attempt. This will then be modified by difficulty modifiers, abbreviated "diff mods," in the rules. A +diff mod makes the task more difficult by halving the target number (rounding fractions down), while a –diff mod makes it easier, doubling the target number.

All applicable diff mods are combined into a single composite modifier, which is then applied to the task. As a practical matter, diff mods serve to shift the range column used to the right (+diff mod) or the left (–diff mod).

Once the target number is determined, roll 1D20. If the number rolled is less than or equal to the target number, the task succeeds; otherwise, it fails.





RULE 2: MOUNTING TROOPS

For convenience, these rules will use the term "stand" to refer to any group of based figures, a vehicle model or a towed weapon (although when dealing with vehicles or towed weapons, these rules sometimes use the word "model"). There are three main types of stands—vehicles, towed weapons and personnel—with each type further subdivided according to several classifications.

2.1 Vehicles

Vehicles consist of all vehicles, including towed trailers and horse-drawn wagons and carts (but not cycles).

All vehicles are divided into six classes according to weight: class I (up to 1.5 metric tons), class II (1.5 to 3 metric tons), class III (3 to 9 metric tons), class IV (9 to 20 metric tons), class V (20 to 36 metric tons), and class VI (more than 36 metric tons).

Vehicles also are subdivided according to their suspension (wheeled, tracked or lift), and whether or not they are open-topped. Half-tracked vehicles are treated as wheeled vehicles unless otherwise noted.

2.2 Towed Weapons

Towed weapons consist of all towed guns, howitzers, energy weapons and towed mortars.

Towed weapons are subdivided into the same six weight classes as vehicles: class I (up to 1.5 metric tons), class II (1.5 to 3 metric tons), class III (3 to 9 metric tons), class IV (9 to 20 metric tons), class V (20 to 36 metric tons), and class VI (over 36 metric tons).

Each towed weapon's model represents only the towed weapon itself; its crew is represented separately by a personnel stand or stands. Therefore, towed weapons are never mounted on stands but are instead placed on the stands of their crews during the course of the game. This enables the crew stand of a weapon to be moved separately from the gun model (necessary in some situations, such as when gun crews panic and abandon their weapons).

2.21 Fixed Weapons: Some artillery pieces are labeled "fixed" instead of having a weight classification. Moving a fixed weapon involves dismantling it and transporting its component pieces, something which cannot be accomplished in the normal course of a battle.

2.3 Personnel Stands

Personnel stands consist of all other stands. There are a large number of names applied to personnel stands: infantry, cavalry, gun crew, command, engineer, MMG, pack animal and HIW stands, among others. Some stands have two or more names, such as "SMG cavalry stand" or "mounted command engineer stand." The name applied to a stand indicates how it is referred to on tables of organization and on the Personnel Movement and Small Arms Fire Characteristics Tables **(see page 00)**.

Notes: The term "HIW" (heavy infantry weapon) refers to those personnel stands with certain weapons that are not towed, but carried by the men in that stand. These weapons include medium mortars, heavy machineguns and similar weapons. For example, an 8cm mortar stand is a stand equipped with an mortar model fastened to the stand along with two to three crew figures.

Cycle stands (bicycles, motorcycles and grav cycles) are considered to be infantry riding the cycles unless otherwise specified. For example, a "motorcycle MMG stand" is a MMG stand riding motorcycles.

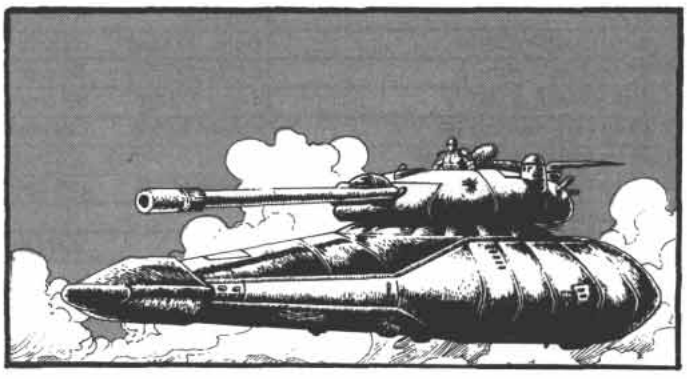
Finally, these rules distinguish between three different sizes of personnel stands: fire team stand, single stand and crew stand.

2.31 Fire Team Size: The base for a fire team stand, representing four infantrymen, is 1.5 inches wide by 1 inch deep (or 40 mm by 25 mm). Two or more figures should be mounted on each stand (whichever looks best) and should show the weapons carried by that stand if at all possible. (A gauss rifle stand will have gauss rifles, a plasma bazooka stand has a plasma bazooka, etc.) In some cases, it may be necessary to use a slightly larger stand than this to accommodate larger figures, as in the case of mounted cavalry.

2.32 Double Size: A double-sized stand, representing the crew of a large heavy weapon (one which is fired from a mount instead of from the shoulder) is 2 inches wide by 1.5 inches deep (or 50 mm by 40 mm). Two or more figures should be mounted on each stand. If the weapon used by the stand is a man-packed weapon, such as a mortar, the weapon should also be mounted on the stand. If the stand is to be used as a crew for a towed weapon, the figures should be mounted in such a way that the weapon can be placed (but not glued) on the stand.

2.33 Single Size: The single-figure stand, representing a single commander, scout, or sometimes commando, is 3/4 inch by 3/4 inch (or 20 mm by 20 mm). Only one figure should be mounted on each stand. In some cases, it may be necessary to use a slightly larger stand than this to accommodate a larger figure, as in the case of a trooper wearing battledress, or a race more massive than humans.

If necessary, these stand sizes may be changed slightly to allow infantry stands to fit into the back of model vehicles, and so on. This is not required, but the visual effect of troops riding in the models is very pleasing. (However, this may not be possible with some types of model vehicles.)





RULE 3: UNIT CARDS

Each platoon-sized unit should have a unit card. Unit cards contain all the information needed for players to run the unit. All weapons and equipment, including vehicles, used by the unit should be rated. These ratings are broken into three general groups: unit values, performance, and weapons and sensors.

3.1 Unit Values

This section of the card lists the troop quality type (Elite, Veteran, Experienced or Novice), the morale value and the initiative number of the troops in the unit. All these should be identical. If separate elements of the platoon have different values, separate cards should be made up for each of them.

One of the duties of the referee is to see that each stand used in the scenario being played is assigned one of the four troop qualities, as well as a morale value. The referee may use the ratings found in the appendices, or may choose to modify them for the scenario being played.

The troop quality categories and their definitions are:

Elite: Elite units are few and far between. They represent excellent units which are experienced and tested in combat many times. An example of an Elite unit would be Reformation Coalition marines who were veterans of several major operations.

Veteran: Veteran units have extended combat experience. Veteran units are occasionally found on Balkanized worlds, the products of nearly constant warfare between local warlords.

Experienced: Experienced units have either "seen the elephant" (been in combat) or had reasonably good training. Most armies are made up of experienced troops.

Novice: These are inexperienced troops who have been put into action with a minimum of training. Most planetary militias are from this category.

Towed weapons do not have a troop quality *perse*. Rather, their quality is equal to the personnel stand operating the weapon. The effects of troop quality rating are found on the Troop Quality Summary Table (page 7).

Morale ratings range from 8 to 22, with higher numbers indicating better morale. While troop quality and morale often go together, this is not always the case. There are times when Veteran troops may have poor morale, such as an experienced but battle-weary unit, or when poorly trained and equipped units go into action with great elan and vigor, as in highly motivated and well-led militia defending their homes.

3.2 Performance

This section of the card describes the armor protection (if any) of the unit, its movement allowance and its communication gear. The format of this section of the card is different for vehicle and personnel units.

3.21 Armor: Personnel armor descriptions consist of an armor type description (such as "heavy battledress") followed by a saving throw number. Vehicle armor descriptions include separate armor values for a variety of different surfaces of the vehicle.

3.22 Movement: Personnel stands have a single movement allowance. Vehicles have two movement allowances: either cross-country and road (for ground vehicles), or low and high (for flying vehicles).

3.3 Weapons, Sensors, and Communicators

Weapons, sensors and communicators are handled as a single group because they function in a similar manner (though their effects are different). This section of the chart consists of a list of sensors, communicators, and weapons carried, followed by four columns, representing performance at each of the four range bands. The values recorded in each column indicate the equipment's performance at that range.

3.31 Assets: There are four ranges in the game: short, medium, long and extreme. These are the headings of the four range columns on the

Gamma Company, 6th Battalion, 4518th Lift Infantry Regiment, The Duke of Regina's Own Huscarles, with:
- **Company Headquarters,** with:
  - 1 operational command stand
- **3 Jump Troop Platoons,** each with:
  - 1 tactical command stand
  - 1 support infantry stand
  - **3 Jump Troop Squads,** each with:
    - 1 tactical command stand
    - 2 infantry stands

Notes: Each stand is outfitted with TL14 light battledress. Command and infantry stands are armed with TL14 4.7cm fusion rifles, the infantry stands additionally having an integral 4cm RAM grenade launcher. The support stands are armed with TL-15 30kg "Fire and Forget" missiles and an integral TL15 5.1cm fusion rifle.

Troop Quality: Elite **Morale:** 20 **Initiative:** 4
Armor: Battledress **Save:** 8
Movement: 18 cm

System:	*Short (15)*	*Medium (7)*	*Long (3)*	*Extreme (1)*	*Notes*
4.7cm fusion rifle-14	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
5.1cm fusion rifle-15	18 cm: 2 (37+)	36 cm: 1 (37+)	72 cm: 1 (19+)	144 cm: 1 (4+)	
4cm RAMGL-9 HE	24 cm: 3 (Nil)	48 cm: 2 (Nil)	96 cm: 1 (Nil)	192 cm: 1 (Nil)	EP: 3, BR: 2 cm
30 kg F&F homing HE	(20 km) 1 (5+)	(40 km) 1 (5+)	(54 km) 1 (5+)	—	A10, EP: 8, BR: 5 cm
30 kg F&F homing HEAP	(20 km) 1 (149+)	(25 km) 1 (149+)	—	—	A10, EP: 11, BR: 6 cm
30 kg F&F homing flechette	(20 km) 1* (2)	(40 km) 1* (2)	(54 km) 1* (2)	—	A10, DS: 15x60 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300 cm	600 cm	1200 cm	2400 cm	



chart below. Following the heading is a space to write the unit's *asset* at that range. The unit's asset is a quantification of its performance at that range, and is based on the troop quality level of the unit. The following table lists the asset of each troop type at short range.

Troop Quality Summary

Type	*Asset*	*Initiative*
Elite	15	5
Veteran	13	4
Experienced	11	3
Novice	9	1

Write this value in the blank following the short range heading. The asset value is then halved, rounding fractions down, at each higher range band. The asset values for an Experienced unit, for example, would be 11 at short, 5 at medium, 2 at long, and 1 at extreme range.

3.32 Range: Each sensor, communicator and weapon has a listed short range, either found by consulting the data annexes of this book or by looking at the **Traveller** rating for a weapon. The range recorded on the card in the first column is the equipment's short range in centimeters. (Since each centimeter in the game represents 10 actual meters, take the range in meters of **Traveller** equipment and divide by 10 to find the range in centimeters.)

The equipment's medium range is twice short range. Long range is twice medium range. Extreme range is twice long range. Write each of these ranges in the appropriate column and place a colon (:) after each.

Some weapons and sensors have ranges so long that they are listed in kilometers instead of centimeters. Each kilometer is one meter on the gaming table.

3.33 Rate Of Fire: Rate of fire is the number of dice thrown for successes each phase.

Sensors and communicators do not have rates of fire. (Sensors always throw one die for successful spotting attempts. See Rule 6.4.)

Weapons have a rate of fire or 1 or more, depending on how fast the weapon actually fires. This can be found by looking at the data annexes of this game or by consulting the **Traveller** ratings for the weapon (and the rule on converting **Traveller** weapons to **Striker** values).

The weapon's game rate of fire (number of dice rolled) is written after the colon in each range column. This rate of fire drops by one at each higher range band, but is never reduced below 1.

3.34 Penetration: Sensors do not have a penetration. All weapons have a penetration which is written in parentheses following the weapon's rate of fire value. As penetration sometimes declines with range, it is written separately in each column. If using the data annex in this book, simply copy the penetration values listed.

Most heavy weapons have a final penetration equal to their penetration value plus the roll of 2D6. For these weapons, place a plus sign (+) after their penetration as a reminder. In the following rules these are referred to as "plus penetration weapons."

The sample unit cards on the previous page illustrate how unit cards are laid out. Several blank unit cards are provided later in the book, and permission is specifically granted to photocopy these sheets for use with the game.

3.4 Vehicle Cards

Units equipped with vehicles have a slightly different format for their unit cards, as the cards also contains the ratings for the vehicles in the unit. If more than one type of vehicle is used, separate unit cards are filled out for each vehicle. The general information on the card, however, is the same as for personnel units described above. Consult the sample vehicle unit card on the previous page for an example.

The Tercio of Steel (Novice, Morale: 14), with:
Tank Detachment

1 tactical command TL8 Prairie Fire fast tank
3 TL8 Prairie Fire fast tanks

Prairie Fire Fast Tank (TL8)

Troop Quality: Novice **Morale:** 14 **Initiative:** 1
Movement: 130 road (+1, +2, +2), 100 cross-country (—, +1, +2)
Front Armor: 192
Side Armor: 48
Rear Armor: 24
Deck Armor: 36
Belly Armor: 24

Cargo Capacity: —
Environmental: Overpressure, Air breathing
Electronic Warfare: Decoys (5)
Ammunition: 25 shots of 130mm (any combination of above), unlimited shots for both MGs
Maintenance Points: 62
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Ignores 2 Diff Mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
130mm L60 Gun-APFSDSDU	67 cm: 1 (207+)	134 cm: 1 (197+)	268 cm: 1 (187+)	536 cm: 1 (167+)	F, S
130mm L60 Gun-HEAP	51 cm: 1 (123+)	102 cm: 1 (123+)	204 cm: 1 (123+)	408 cm: 1 (123+)	F, S, EP: 9, BR: 3 cm
130mm L60 Gun-HE	51 cm: 1 (13+)	102 cm: 1 (13+)	204 cm: 1 (13+)	408 cm: 1 (13+)	F, S, EP: 11, BR: 4 cm
130mm L60 Gun-Flechette	51 cm: 1 (2)	102 cm: 1 (2)	204 cm: 1 (2)	408 cm: 1 (2)	F, S, DS: 3x10 cm
7mm Rotary MG-Ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	F, S
5mm Rotary MG-Ball	15 cm: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	F, S
Sensors:					
3km HRT	300 cm	600 cm	1200 cm	2400 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30km radio	(30 km)	(60 km)	(120 km)	(240 km)	



RULE 4: COMMAND AND CONTROL

Orders issued during the Command Phase allow units to carry out operations during the Movement Phase. Orders are always issued by specific commanders. The order itself is represented by a game marker placed on the playing surface.

Units must receive orders to move, but do not need orders to fire.

4.1 Commanders

There are four types of commanders in the game: self-commanders, tactical commanders, operational commanders and strategic commanders. Self-commanders represent high-initiative troops, such as reconnaissance patrols or specially trained commandoes. Other commanders represent leaders who may direct the actions of other troops.

All commanders may issue one (and only one) order during the Command Phase of each turn. The order is represented by a command chit which is placed on the playing surface. All orders are removed from the playing surface at the end of the game turn.

The principal difference between commanders resides in where they may place their order chits.

4.11 Self-Commanders: Order chits issued by self-commanders are placed on or immediately adjacent to the stand that issued the order. The order affects only the stand which issued the order.

4.12 Tactical Commanders: Order chits issued by tactical commanders are placed on or immediately adjacent to the commander's stand. The order affects any or all (at the owning player's option) subordinate stands within 15 cm of the order chit.

4.13 Operational Commanders: Order chits issued by operational commanders may be placed anywhere on the gaming table visible to the commander's stand. The order affects any or all (at the owning player's option) subordinate stands within 15 cm of the order chit.

4.14 Strategic Commanders: No commander can function as a strategic commander by himself. Instead, operational commanders when working with a staff stand function as strategic commanders. See Rule 4.4 below for a discussion of staff stands.

Order chits issued by strategic commanders may be placed anywhere on the gaming table, whether visible to the commander or not. The order affects any or all (at the owning player's option) subordinate stands within 15 cm of the order chit.

4.2 Orders

Orders may are issued by command stands during the Command Phase. Orders affect any or all stands subordinate to the issuing stand, at the owning player's option (see Rule 4.32, below).

The following are the orders that may be issued, as well as the phase in which the orders take effect. Note that chits are included in the counter mix for each type of order.



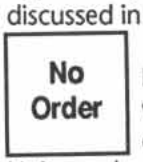
4.21 *Cautious Advance* (Movement Phase): Units with a *cautious advance* order may move any distance desired up to their normal movement allowance. They must move in the direction the arrow on the order chit points. *Cautious advance* orders are discussed further in Rule 5.11.



4.22 *Rapid Advance* (Movement Phase): Units with a *rapid advance* order must move their full movement allowance and may move up to twice their normal movement allowance. They must move in the direction the arrow on the order chit points. *Rapid advance* orders are discussed in Rule 5.12.



4.23 *Disengage* (Movement Phase): Units with a *disengage* order move directly away from the closest visible enemy unit and may move any distance desired up to their full movement allowance. Disengaging units are assumed to be making maximum use of concealing terrain, evasive movement and artificial cover (such as smoke), and so may not be fired on by opportunity fire (see Rule 7.23). *Disengage* orders are further discussed in Rule 5.14.



4.24 *No Order* (Command Phase/Movement Phase): *No order* orders are used in situations where a player does not wish to move a unit, but does not wish to let the enemy know that fact. Units under a *no order* order may change facing within the limits outlined in Rule 5.8, but may not otherwise move. They may fire normally.



4.25 *Rally* (Morale Phase): *Rally* orders enable a routed unit to rally, and also are used to raise the morale of units who have suffered morale reductions during the game. *Rally* orders are discussed further in Rule 9.3.



4.26 *Take Command* (Command Phase): *Take command* orders enable a commander to take a unit under its command (make it subordinate) which was not subordinate at the beginning of the game. *Take command* orders are discussed further in Rule 4.421.



4.27 *Travel* (Movement Phase): Units issued a *travel* order must move at least their normal movement allowance and may move up to three times their normal movement allowance. *Travel* orders are discussed further in Rule 5.13.

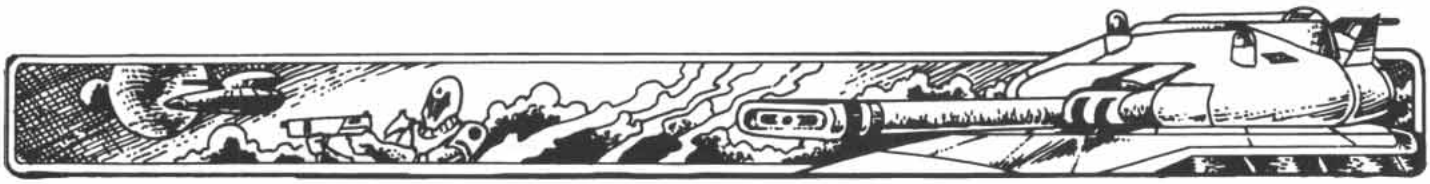


4.28 *Regroup* (Morale Phase): *Regroup* orders enable a commander to return eliminated fireteams to play. *Regroup* orders are discussed further in Rule 9.4.

4.3 Issuing Orders

Orders are issued by command stands. In all cases, there are limitations on what orders can be issued to which units.

4.31 Chain of Command: Orders chits, once placed on the playing surface, can only affect those stands which are subordinate to the commander issuing the order. The referee will



determine which stands are subordinate to which commanders when setting up the scenario. A large number of sample organizations are provided later in this book as a guide.

As a general rule, all stands of a battalion are subordinate to the battalion's commander. In addition, the battalion stands are also considered subordinate to the regimental commander. Thus, stands belonging to an infantry company could be issued orders by the company commander, by the battalion commander or by the regimental/brigade commander. They could not be issued orders by the commander of a different company or battalion, however.

When issuing a *take command* order to transfer control of a unit from one commander to another, commanders may not be subordinated to a different commander at the same or higher level of command. A regiment can thus take command of a battalion and its command stands, but a battalion commander cannot take command of another battalion's commander. It could, however, take command of the subordinate elements of that battalion.

4.32 Placing Orders: Orders are issued by placing an order chit next to the stand or group of stands to which it is intended to apply. The chit is placed with the order to be used facing up. The distance from the stand issuing the order and the point at which it is placed will depend on the type of stand issuing the order.

The radius of effect of the order is 15 cm from the spot where it is placed, unless the unit is moving along a road or trail in column, in which case the order is placed at the head of the column, and all stands within the column will obey it. A stand need not be able to see the point at which the order was placed. If it is within 15 cm of the order, it may obey that order.

A stand must be subordinate to the stand issuing the order for it to obey. If a stand that is under that command is not intended to follow the order, that fact must be stated when the order is revealed. Stands that do not intend to follow the order are considered to have been given a *no order*.

Example: A local defense infantry platoon with a platoon (tactical) commander mounted on an infantry fireteam stand, two other infantry stands and two machinegun stands decides to move forward. The player places a *rapid advance* order chit next to his command/infantry stand, which is within 15 cm of his other two infantry stands and both machinegun stands. Upon revealing the order, the player states that the machinegun stands will remain in place to give the rest of the platoon covering fire. The commander and the three infantry stands are then moved, and the machinegun stands remain stationary.

4.33 Order Caps: Included in the counter mix is a set of chits which are blank on one side and marked as "Command," "Staff" or "Self ordering" on the reverse. Each player should be given a number of these caps equal to the number of commanders under his control. Self order caps are used for self-commanders. Staff caps are used for strategic commanders. Command caps are used for tactical and operational commanders. These order caps serve two purposes:

- They are placed on top of the order chits so that the opposing players may not see what orders have been issued until they are revealed during the start of the Movement Phase.
- They serve as a reminder of the maximum number of orders which may be issued in any one turn by a player. If a player only has two command caps and one staff cap, that player may not use more than three order chits in any one turn.

4.4 Command Stands

Command stands may each issue one order per turn. As mentioned, orders can be issued to any stand or group of stands that are subordinate to that command stand and within command range. Stands to which a *Take command* order was issued become subordinate to the command stand that issued the order.

4.41 Types of Command Stands: There are two ways of mounting commanders on stands in the game. They can be either single-figure (pure) command stands, or double-figure (joint) command/other function stands. Tactical commanders are usually mounted as part of a fire team stand, while operational and strategic commanders are always mounted as single figures.

Pure command stands are labelled "command stands" in the TO&E listings. Double-figure command stands are listed as part of another type of stand in the TO&E listings: "command infantry stand," "command weapons stand," "command engineer stand," and so on.

The difference between the types of commanders (tactical, operational and strategic) is related to the communications ability of their unit and to the level of command it represents. These capabilities will be determined by the referee prior to the start of the scenario, again using the sample organizations provided as a guide.

4.42 Restrictions on Command Stands: The following restrictions exist on the ability of all command stands to issue orders:

4.421 Take Command Orders: Any command stand which is issued a *take command* order by another command stand in order to change its subordination for the turn, may not itself issue any orders for that turn. This restriction only applies to the stand which was issued the order, not to those command stands which are in turn subordinate to the command stand that was issued the order.

Example: The command stand of an infantry company is given a *take command* order which is intended to make the company subordinate to the battalion commander of a tank battalion. During this turn, the infantry company commander may not issue any orders of its own, but the platoon commanders of the company could.

4.422 Pinned Command Stands: Command stands which are pinned, either through fire or failure of morale, or the use of a voluntary pin, may not issue orders until they are unpinned. The pinned command stand, and those stands around it, may only be given an order by another command stand to which they are subordinate.

4.423 Visibility and Command Stands: Visibility affects the



placement of an order by a commander (except in the case of strategic commanders). No commander (other than a strategic commander) may ever place any order chit farther away from it than its visibility will allow. Once an order is placed, that order affects all stands within 15 cm, regardless of visibility, so long as the stand in question is subordinate to the stand issuing the order, and not exempted from the order by the player placing it.

Example: A commander is in woods, where visibility is limited to 5 cm. The commander is therefore limited to placing his order chit within 5 cm of his location. However, once placed, the order may affect all subordinate stands within 15 cm of its location, even though visibility is limited to 5 cm.

4.5 Staff Stands

Staff stands represent groups of trained staff officers with the ability to plan, coordinate and communicate with distant subordinate units. Staff stands enable operational commanders to function as strategic commanders.

4.51 Types of Staff Stands: The types of staff stands used in the game are differentiated by their means of communication. There are staff telephone stands, staff radio stands and staff uplink stands. The difference between these stands is their communications ability. Note that it is possible for an army to use several types of staff stands in the same unit.

4.52 Differences Between Staff Stands: The differences between the types of staff stand are:

4.521 Staff Telephone Stands: Staff telephone stands may only function in scenarios where their units start with a setup area on the game board. Once placed on the board, they allow an adjacent operational commander to issue one order per turn to any point within that area, regardless of whether that point is visible to the commander. Visibility never affects staff telephone stands. This setup area should be marked on the referee's scenario map, but not indicated on the playing surface itself. It represents the area in which telephone lines have been laid.

Note that any stand or group of stands which leaves the setup area may no longer be issued an order by the staff telephone stand.

Staff telephone stands that move during the course of a game lose their ability to function as a staff stand for the remainder of the game.

4.522 Staff Radio Stands: Staff radio stands actually represent staffs using open channel broadcast radios. They are usually mounted on vehicles (and thus may be listed on the order of battle as a "staff radio truck," "staff radio G-carrier," etc.) at lower tech levels, but become more mobile at higher tech levels. Once placed on the board, they allow an adjacent operational commander to issue one order per turn to any point on the board where stands subordinate to the commander are found, regardless of whether that point is visible to the staff stand. Visibility never affects staff radio stands.

Staff radio stands or vehicles that move during the course of a turn lose their ability to function as a staff stand for that turn. Once stationary, they resume their role as a staff stand.

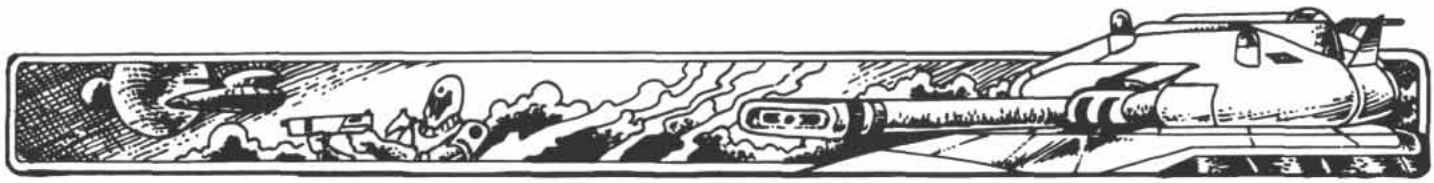
4.523 Staff Uplink Stands: Staff uplink stands rely on satellite retransmission of communications instead of broadcast radio. They function exactly like staff radio stands for purposes of the command rules. (If using the electronic warfare rules, they may not be jammed. If playing as part of larger campaign., uplink requires control of close orbit.)

4.53 Restrictions on Staff Stands: The following restrictions exist on the ability of all staff stands to issue orders:

4.531 Take Command Orders: A staff stand of any type which has been issued a *take command* order by another command stand in order to change its subordination, may not assist a command stand that turn.

4.532 Pinned Staff Stands: Staff stands which are pinned may not assist commanders until they are unpinned.





RULE 5: MOVEMENT

Stands are moved in the Movement Phase. Even involuntary movement such as routs, retreats and force-backs is considered to take place in the Movement Phase, although the actual displacement of the stands may have been handled in previous Morale or Fire Phases.

Each personnel stand has a single movement allowance, which for humans on foot (the most common personnel stand in the game) is 20 centimeters.

Each ground vehicle stand has two movement allowances: a cross-country movement allowance and a road movement allowance.

Flying vehicles also have two movement allowances: a low-level movement allowance and a high-altitude movement allowance.

Towed weapons have no movement allowance; they are moved by being towed or man-handled into position.

A movement allowance states the basic distance (in centimeters) a stand may move in the Movement Phase. The actual distance a stand moves may be modified by its orders and/or by the terrain it crosses.

5.1 Movement and Orders

There are limitations on how stands may move which are imposed by the movement order given to those stands. The movement orders and their effects are as follows:

5.11 Cautious Advance: The *cautious advance* order allows a stand or group of stands to its full movement allowance. The stand or group of stands need not move, but if it does, it must move in the same general direction as the arrow on the order chit. For all game purposes, the stand or group of stands so ordered is considered to be moving regardless of whether or not it actually does so. Flying vehicles use their low-altitude movement allowance when issued this order.

5.12 Rapid Advance: A *rapid advance* order allows a stand or group of stands to move up to twice its full movement allowance. Stands need not move their full movement allowance but must move at least half of their movement allowance. Flying vehicles use their low altitude movement allowance when issued this order.

5.13 Travel: The *travel* order affects different types of stands differently. Stands of any type issued this order may not fire during the Fire Phase.

Travel can only be issued to a personnel stand or group of stands that starts the turn on a road. This order allows the stand or group of stands to move three times their normal movement on the road. The stands may follow any twists or turns in the road, but may not leave the road during the turn.

Ground vehicles may be issued this order whether or not they are on a road, and move three times their appropriate movement allowance.

Flying vehicles issued this order move at their high-altitude movement allowance.

5.14 Disengage: When units disengage, they make maximum use of covering terrain and artificial cover (such as smoke grenades) to conceal their withdrawal. A *disengage* order allows a stand to move directly away from the nearest visible enemy stand up to its full movement allowance. It need not move its full movement, but it must move at least half of its movement, unless it retreats into a higher state of cover.

Stands operating under a *disengage* order may *not* be fired upon using Opportunity Fire (see Rule 7.23). The only exception is if the disengaging stand moves closer to an enemy stand, in which case only the enemy stand(s) which had the range decrease may fire. Note that as a disengaging stand must move directly away from the closest visible enemy unit, it is possible to move toward another enemy unit.

A *disengage* order may never be issued to unlimbered towed weapons, Novice units or units which are pinned. Vehicles must use their cross-country movement allowance when using the *disengage* order, even if disengaging along a road. Flying vehicles must use their low-altitude movement allowance.

5.2 Road Movement

A stand may only use its road movement allowance if it starts the turn on a road and moves along the road for the entire Movement Phase, never leaving it during the Movement Phase.

5.21 Direction: A stand may move in one direction along a road. When a stand comes to a crossroad, it may continue onto any branch (so long as its route does not cause it to move on the same section of road twice in a turn) regardless of the direction of that travel.

The direction arrow on the order chit does not limit a stand's ability to move along a road. If a stand starts off-road, the arrow on the chit indicates its required cross-country movement direction. Once it reaches a road, it may freely move in either direction along the road. If, however, a stand moves off its ordered axis of advance while travelling on a road, it may not leave the road for the rest of the Movement Phase.

The stand must end its turn on the road facing in the direction that it was last moving.

5.22 Blocked Roads: A stand may not use road movement through a blocked road point. A blocked road point can be caused by enemy action such as an antivehicle obstacle, or by a vehicle which remains stationary there during the course of the Movement Phase. The wreckage of a disabled or destroyed vehicle on a road is also considered a blocked road point.

Stands may not leave a road to travel on terrain they cannot move on (although they may be pushed off onto such terrain in accordance with Rule 12.3).

5.3 Cross-Country Movement

If a vehicle moves off-road for any portion of its movement during its Movement Phase, it must use its cross-country movement allowance for the entire phase.

A stand must attempt to move in the direction shown by the arrow on its order chit and must end the Movement Phase facing in the same direction as the arrow on the order chit.



Small changes of direction are allowed during movement in order to avoid obstacles, but such a unit must still end the phase facing in the same direction as the order chit. If a referee is present, he judges what variations of movement direction are reasonable. In games without a referee, a stand may not use more than 20% of its movement allowance to dodge obstacles.

Stands may freely move through positions held by friendly stands, so long as they do not end the move in the same position as friendly stands.

5.4 Movement and Enemy Units

No personnel stand may move through or end its movement in a position (a bunker, entrenchment, pillbox, etc.) occupied by an enemy stand.

No ground vehicle stand may move through or end its movement in a position occupied by an enemy vehicle. A vehicle may move through a position occupied solely by enemy personnel stands.

Flying vehicles are not affected by the presence of enemy stands.

5.5 Terrain Effects and Movement

Terrain can affect the movement of stands, depending on their type and the terrain they are attempting to cross. The cost of a stand to move across a given type of terrain is either:

- Times two (×2): The stand pays 2 cm of movement for every 1 cm of actual movement.
- Times 4 (×4): The stand pays 4 cm of movement for every 1 cm of actual movement.
- Prohibited: The stand is not allowed to move into that type of terrain.

The penalties caused by contour lines represent natural slowing when moving up or down a grade.

5.51 Effects of Terrain on Personnel Stands: Personnel stands pay double movement costs when moving through jungle, settlement, rubble, steep slopes and swamps and when moving across creeks or along creekbeds.

5.52 Effects of Terrain on Tracked Vehicle Stands: Tracked vehicle stands pay double movement costs when moving through woods, settlements and creeks. They may not enter jungle, rubble, steep slopes or swamps, nor may they move along creeks. They pay a 5cm penalty for each contour line they move across (either up or down).

5.53 Effects of Terrain on Wheeled Vehicle Stands: Wheeled vehicles pay quadruple movement costs when moving through woods. They may not enter jungle, swamps, rubble or steep slopes, or move along creeks. They may only cross creeks at a ford. They pay double movement costs when crossing a creek at a ford, or when moving through a settlement. They pay a 10cm penalty for each contour line they cross.

5.54 Effects of Terrain on Air Cushion Vehicle Stands: Air cushion vehicles pay quadruple movement costs when moving through rubble and settlements. They may not enter jungle or woods, nor may they cross steep slopes. They pay double movement costs when moving through open woods. They may cross water barriers and move through swamps at

Terrain Effects

Terrain Type	*Personnel*	*Wheeled Vehicle*	*Tracked Vehicle*	*Air Cushion Vehicle*
Broken	×2	P	×4	×2
Cliff	P	P	P	P
Contour line	—	–10 cm†	–5 cm†	–20 cm†
Creek/ford (cross)	×2	×2*	×2	—
Dense vegetation (Jungle)	×2	P	P	P
Light vegetation (open woods)	—	—	—	×2
Moderate vegetation (woods)	—	×4	×2	P
Railway embankment (cross)	—	P	–10 cm†	–20 cm†
Rubble	×2	P	P	×4
Sand	—	×2	—	—
Sand dune	×2	×4	×2	—
Settlement	×2	×2	×2	×4
Steep slopes	×2	P	P	P
Swamp/marsh	×2	P	P	—

*Only at fords.
†Per line crossed.
P: Prohibited.
—: Normal movement.
This chart does not include terrain types discussed in the Advanced Rules.



no additional penalty. They pay a 20cm penalty for each contour line they cross.

5.55 Settlement Blocks: Only personnel stands and towed weapons may be placed in settlement blocks. Vehicles may enter settlements but must remain on the streets or in alleyways.

Each block of buildings in a settlement should have a 1:1 scale cutout of card stock or paper. The number of personnel stands that can be placed in the settlement block is the number which can physically be fit on the cutout. A towed weapon doubles the effective size of its crew stand.

Refer to the Terrain Effects Table on the previous page.

Example: An infantry stand is moving through a jungle under a *cautious advance* movement order. With a movement allowance of 20 cm, the stand could move 10 actual centimeters through the jungle (each centimeter of jungle costs it 2 cm of movement allowance). If the stand crosses a 5cm creek and then moves through a jungle, it would only be able to move 5 actual centimeters in the jungle (the creek costs it 10 centimeters of movement allowance).

5.6 Special Movement Cases

There are a number of special movement cases that need to be covered:

5.61 Backing Up: A ground vehicle that receives a *cautious* or *rapid advance* order may back up using the cross-country movement rate. It does so by paying quadruple movement costs prior to any modifiers for terrain. The vehicle moves in the direction of the arrow but faces in the opposite direction.

5.62 Man-Handling Towed Weapons: Players may elect to have unlimbered class I and II towed weapons moved forward by their crew or other personnel stands. To man-handle a towed weapon, the personnel stand must start adjacent to the weapon and must be given a *cautious* or *rapid advance* order. Class I towed weapons are moved 2 cm with a *cautious advance* order and 4 cm with a *rapid advance* order. They pay any terrain modifiers as if they were a personnel stand. Class II towed weapons are moved 1 inch with a *cautious advance* order and 2 cm with a *rapid advance* order. They pay any terrain modifiers as if they were a wheeled vehicle.

5.7 Movement to Contact

Occasionally, stands of opposing sides will find themselves ordered to move toward a common destination or through one another's lines. In these cases, resolve the point of contact by moving stands on both sides proportionally (for example, move each stand one quarter or one-tenth of its movement at a time until contact is made).

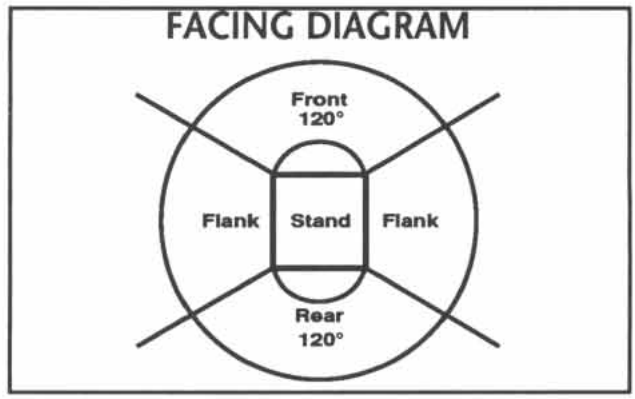
5.71 Closing to Contact: A unit given a *cautious advance* order may never move more than halfway toward any visible enemy unit. If it encounters a previously unspotted enemy unit during movement, it immediately stops at the normal autospot distance for that terrain. Units may only close to contact with enemy units if given a *rapid advance* order.

5.72 Drive-Through: Ground vehicles given a *rapid advance* order may drive through or over enemy personnel and towed weapons. The vehicle is stopped immediately before moving through the stands, but its order marker is moved to its projected final destination. The vehicle will finish its movement only after all opportunity fire (see Rule 7.23) has been resolved. If the vehicle is still able to move after opportunity fire, it completes its movement.

Any towed weapon of a smaller mass category than the moving vehicle driving through is crushed.

Any unarmored vehicle of a smaller mass category than a tracked vehicle driving through is crushed.

Each personnel stand driven through must make a saving throw to avoid taking a casualty (the casualty being crushed by the moving vehicle). The saving throw is made by the owning player rolling 1D20 as if conducting close range fire. In other words, Elites avoid a casualty by rolling 15 or less, while Novices avoid a casualty by rolling 9 or less.



5.8 Facing

All stands have facing. They must face in a specific direction. In the Movement Phase, stands have their facing determined by their movement chit (that is, they must end the turn facing in the direction of the movement chit). All stationary stands may freely change their facing at the beginning of the General Fire sub-phase. All stands may freely change their facing at the beginning of the Final Fire sub-phase, no matter what order they were given.

5.81 Front and Flank: The front of a stand is the 120° arc to its front. The stand's remaining 240° arc is its flank. To determine front and flank, use the template included with the game.

5.82 Fields of Fire: All personnel stands, all vehicle weapons in turrets and all towed weapons mounted on turntables have 360° fire (they may fire in any direction). All other weapons may only fire to their front 120° arc.

5.83 Firing on the Flank: AFVs have armor ratings for front and flank. If the incoming fire is from the flank, use the flank armor rating. Otherwise, use the frontal armor rating.

5.84 Top Attack: AFVs have top armor ratings as well. If the incoming fire is a top-attack missile or is fired from a flying vehicle firing from higher than NOE altitude, it is considered a top attack.



RULE 6: VISIBILITY AND SPOTTING

Opposing stands are not visible to each other at all times. Enemy stands may be hidden from view and must be spotted before they become visible.

6.1 HIDDEN STANDS

Stands that are not visible to the opposing player are not placed upon the playing surface. Some or all stands may start the game hidden, depending on the scenario being played and the referee's decisions. There are two methods available to keep track of hidden stands. The first method requires the use of a referee; the second is used if there is no referee.

6.11 Hidden Stands With a Referee: The hidden units are not placed on the playing surface. The owning player keeps track of the hidden stands and their orders on a map. Orders issued to hidden stands do not have their chits placed on the playing surface.

The referee keeps track of the location of the hidden stands and resolves all game functions regarding the hidden stands without revealing any information about the stands. All die rolls for spotting, therefore, are made by the referee to avoid revealing any information about the die roll. The opposing player is only informed of the spotting attempt if it is successful and the spotted stands are placed in position on the playing surface.

6.12 Hidden Stands Without a Referee: If a referee is not available, then it is suggested that the players use the numbered counters supplied with this game to represent hidden stands (if more are needed, they are also easy to make out of blank game counters, tiddly-winks, poker chips and the like).

Each side should have an equal quantity of numbered counters, regardless of the number of stands they have hidden. A numbered counter may represent one or more similar stands, or the counter might represent a dummy (no stands assigned to it).

Treat dummy counters as if they represent real stands until spotted. A dummy stand may move as any type of stand, and change its type from turn to turn. However, dummy stands still need an order chit to move, though this chit is free and need not be actually issued by a command or staff stand. When attempting to spot such a chit, treat it as what it last moved as. Thus, if it moves as a vehicle, then all spotting attempts should treat it as a vehicle.

If the spotting attempt succeeds, the numbered counter is replaced with the stands it represents. The dummy counter is removed from play when spotted. If the spotting attempt fails, then the counter continues as before.

Dummy counters may not attempt to spot enemy stands.

If a visible stand starts the Movement Phase without any enemy stands having a line of sight (see Rule 6.3, below) to that stand, the stand may be replaced with two numbered chits. One chit represents the actual stand, while the second serves as a dummy. Either (or both) chits may be move in the Movement Phase that follows.

6.2 Visibility

The normal maximum visibility range is 500 cm, which is almost always the range of the table or more. For spotting only, increase the maximum visibility distance by 50 cm for every level higher that the spotting stand is over the intended target.

Example: A recon stand is on a hill three levels high. For purposes of attempting to spot a unit on the board on the base level, it would have a maximum visibility of up to 650 cm.

6.3 Line of Sight (LOS)

A stand may only be visible to another stand if it is within visibility range and an unblocked line of sight can be traced between the two stands. A line of sight is a straight line between the two stands. It is blocked if it passes through an obstacle. Obstacles are cover, hills, smoke, friendly stands, and disabled and destroyed vehicles.

6.31 Cover: Cover is defined as any of the following: jungle, woods, open woods, swamps, sand dunes, settlements and rubble. In addition, depending on the scenario, stone walls, hedgerows, fields, exceptionally tall grass or scrub vegetation, very broken ground, embankments and other terrain may offer cover for purposes of determining visibility (at the discretion of the referee or by previous agreement among the players).

If any portion of a stand is not in cover or smoke, then that portion of the stand may be spotted (which reveals the entire stand).

6.32 Open Woods and LOS: A line of sight between stands in the same open woods is not blocked if the stands are within 10 cm of each other. A line of sight may be traced 5 cm into an open woods area from outside.

6.33 Woods and LOS: A line of sight between stands in the same woods is not blocked if the stands are within 5 cm of each other. A line of sight may be traced 1 cm into a woods area from outside.

6.34 Jungle and LOS: A line of sight between stands in the same jungle is not blocked if the stands are in contact. Troops in a jungle are visible only if in contact with the edge of the woods.

6.35 Roads/Trails and LOS: Roads or trails through woods and jungle have a line of sight of 10 cm along the road/trail itself, while roads/trails through an open woods have a line of sight along the road of 20 cm. Stands which are using line of sight along a road or trail must be inside the edge of the open woods, woods or jungle.

Any stand *outside* the open woods, woods or jungle boundary looking down a road or trail that is *inside* an open woods, woods or jungle boundary has its visibility blocked at 5 cm for open woods, 1 cm for woods and 1 cm for jungle.

6.36 Settlements, Streets and LOS: A line of sight between stands is not blocked in the same settlement block or adjacent settlement blocks if the stands are within 2 inches of each other. (Settlement blocks divided by roads or streets are *not* considered to be adjacent.) A line of sight may be traced 1 inch into a settlement block from outside the settlement, or from a



nonadjacent settlement block.

Streets through settlements have a line of sight of 10 cm along the street itself, while roads through a settlement have a line of sight along the road of 20 cm. Stands which are using line of sight along a road or trail must be past the boundary of the settlement. Any stand looking down a road or trail that is not inside the settlement boundary still has its visibility blocked at 1 cm.

When a line of sight is traced between stands at different elevation levels, the line of sight may pass over any obstacles or cover in between the stands, leaving the actual line of sight unblocked. If the height of the obstacle is less than or equal to the height of both stands, the line of sight is unblocked.

If the obstacle is higher than one of the stands, then the following applies: The minimum requirement for passage of line of sight over an obstacle is that the stand on the higher elevation must be at least one level higher than the obstacle, and that the obstacle be closer to the higher stand than the lower stand.

In addition, the obstacle can not be within 2 inches of either stand. If the higher stand is at least two levels higher than the lower stand, the obstacle can be at any point along the line of sight, as long as it is not within 2 inches of either stand.

The height of the obstacles is computed as follows:

Obstacle Height

Obstacle	*Height*
Friendly stand	1 level
Hill	2 levels for each contour level that the hill is above the lower stand. Sand dunes count as one contour hill.
Cover	2 levels, unless the referee/scenario determines otherwise
Smoke	3 levels

For purposes of determining an obstacle, hills have a cumulative effect in that they are added to any other obstacle found on top of them. Thus, if woods (cover) are found on top of a hill one contour high, the obstacle would be treated as if it were four levels high.

If single-figure stands are attempting to spot out of a settlement, for all purposes of spotting they are considered to be at level 2 elevation. All stands located in a settlement, including single-figure stands, are considered to be at level 1 for purposes of being spotted.

Example: A command stand is located in a settlement, and attempting to spot a vehicle on a one level contour hill 100 cm away. There are woods 35 cm away from the settlement. Since both the command stand and the target stand are considered to be located on level 2, the same as the height of the woods, the woods do not block line of sight for the command stand.

However, for the vehicle attempting to trace a line of sight to the command stand, it is considered as being on the first level of the settlement, and since the woods are equal in height to that of the vehicle, the vehicle does not have a line of sight back to the settlement.

Note that only single-figure stands can claim this bonus. All other stands attempting to spot out of the settlement are considered to be at the first level, and therefore do not have a line of sight back to the vehicle, since the woods are two levels high.

6.4 Spotting

Spotting may be attempted in the Movement Phase and at the end of each Fire sub-phase (provided the target of the spotting attempt fired in that sub-phase). Each time that there is a chance of spotting an enemy unit, a spotting attempt may occur. For each hidden enemy stand that a player is attempting to spot, there must be at least one stand that has an unblocked line of sight to the enemy stand. Regardless of the number of stands that have an unblocked line of sight to the hidden enemy stand, only one spotting attempt may be made to spot the stand per phase. This attempt is made by the stand with the best chance of spotting.

6.41 Spotting During Movement Phase: In the Movement Phase, spotting is resolved at the end of the phase, but it is assumed to take place at the point where the stand would have its best chance of spotting the enemy. If both the spotting and hidden stand are moving, use proportional movement to determine where the spotting would have taken place.

6.42 Spotting During Fire Phase: During each Fire Phase, one additional attempt to spot enemy stands is allowed. Only enemy stands which fire may be spotted during the Fire Phase. Spotting is resolved at the end of the sub-phase in which the stand fired. Those stands that were moving during the Movement Phase are still considered to be moving for purposes of spotting, though all actual movement is finished by this point in the turn. All spotting attempts during the Fire Phases are made from where the stands end their movement.

6.43 Resolving Spotting: The unit attempting to spot determines what sensor it will use. All units have "eyeball" sensors available, but many also have one or more form of advanced vision enhancement or sensor available. Only one may be used per spotting attempt.

Measure the range to the target against which the spotting attempt is to be made. The referee should do this, perhaps with the spotting team turned away, to avoid disclosing the actual location of units when no dummy counters are in use. The range determines the correct sensor range column (short, medium, long or extreme) used.

The status of the spotting unit and the target unit provided will provide increases or decreases to the difficulty of the spotting attempt, called +diff mods or –diff mods. Each + or – diff mod has the effect of moving the range band at which the attempt is made one closer or farther away. These are listed on the table below and are expressed in terms of diff mods.

All modifiers (both positive and negative) are added together to find a single cumulative difficulty modifier. If this reduces the range to less than short range, the target is automatically spotted, and no die roll is made. If it increases it



to more than extreme range, no die roll is made, and the attempt automatically fails, *unless the target is within short range of the unit attempting the spot.*

Units very close to hidden enemy units may still be able to spot them. If the target is within short range, the cumulative +diff mods are instead used as progressive halvings of the printed short range of the spotting unit.

Example 1: An enclosed vehicle spotting to its flank or rear using eyeball is attempting to spot an enemy personnel stand stationary under cover at a distance of 30 cm. This is within eyeball close range (100 cm), but the target enjoys a total of +4 diff mods, which would normally make the spot impossible. Converting this to four progressive halvings of the short range produces a modified short range of 6.25 cm (rounded down to 6 cm). This would make medium range 12 cm, long range 24 cm and extreme range 48 cm. Since the target is at 30 cm, the spotting attempt is resolved using the extreme range success number.

Example 2: A personnel stand using eyeball is attempting to spot an enemy personnel stand stationary under cover at a distance of 20 cm. This is within eyeball close range (100 cm), but the target enjoys a total of +2 diff mods, which would normally push the spotting range out to long. Converting this to two progressive halvings of the short range produces a modified short range of 25 cm. Since the target is at 20 cm, the spotting attempt is still resolved using the short range success numbers.

Spotting Difficulty Modifiers

Spotting Stand is	*Diff Mod*
Recon	–1
Elite	–2
Veteran	–1
Green	+1
Moving	+1
Enclosed vehicle spotting to front	+1*
Enclosed vehicle spotting to flank	+2*

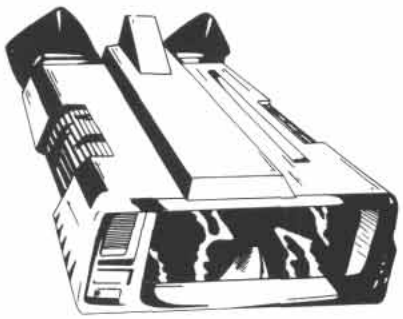
Target Stand is	*Modifier*
Moving	–1
Firing	–1
Stationary under cover	+1
Personnel	+1

*Modifiers apply only when conducting naked eye spots; they do not apply when using any sort of electronic sensor or vision enhancement equipment.

6.44 Handing Off Targets: Once a hidden enemy stand is spotted, it can be fired at during the next Fire Phase by all elements of the spotting unit that have a direct line of sight to it and are otherwise eligible to fire. Other stands not part of the spotting unit may fire at it on the turn after that. For this purpose, a "unit" is defined as all elements that are subordinated to the same platoon or company-level headquarters.

Example: A Reformation Coalition force has two task forces operating together, each built about a company headquarters, with an grav tank platoon, lift infantry platoon, powered armor platoon, recon squad, etc., attached to each. If a stand in either task force is successful in spotting an enemy unit, all elements of that task force may fire at it in the next Fire Phase. The elements of the second task force must wait until the following turn before they can engage those targets.

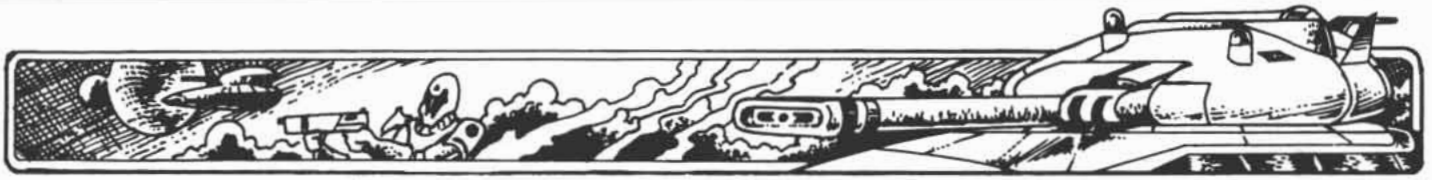
6.45 Autospot: Stands are automatically spotted under certain limited conditions. Any stand in contact with another stand is automatically spotted by that stand. Any personnel stand that approaches within 5 cm (or the limits of visibility as modified by weather, terrain and all other factors, whichever is less) of an enemy stand automatically spots that stand. Any stand moving and firing in the open is automatically spotted by all units within visibility distance.



PRIS binoculars



Light Amplifier goggles



RULE 7: DIRECT FIRE COMBAT

There are two types of fire combat: direct fire and indirect fire. Direct fire consists of flat trajectory fire from a firing unit to a visible target. Indirect fire consists of any fire which is at a target observed by a different stand as well as any high-angle plunging fire. Thus, mortar fire is always indirect fire, even when the firing crew can see its target.

Fire combat takes place in the Fire Phase. All fire is directed at individual stands, which will be referred to as "targets." The information presented in this section is relevant to all types of fire.

Units eligible to fire in the Fire Phase may do so, but are not required to. Fire in the Fire Phase is not simultaneous, but is instead conducted in order based on the type or order given the unit and its initiative level. To facilitate this, the Fire Phase is broken down into three sub-phases: Opportunity Fire, General Fire, and Final Fire.

7.1 Direct Fire Resolution Overview

When a stand direct fires at a target, the fire is resolved in several simple steps. The fire from the stands involved will depend on the weapons with which they are equipped. The unit's data card provides the necessary information.

First the firing player measures the range from the firing stand to the target, measuring from the center of the edge of the firing stand closest to the target to the closest edge of the target stand. Comparing this to the ranges listed for the firing weapon on the unit's data card, the firing player determines which of the four range bands the fire is resolved at.

Consulting the correct column of the unit data card, the firing player notes the firing weapon's rate of fire (how many dice are rolled for hits). This may be reduced due to movement of the firing stand, as noted below.

Next the firing player looks at the top of the correct range column of the unit data card to determine the firing unit's hit number. This may be affected by target movement or concealment or other factors noted below.

Once the correct hit number is known, roll the correct number of D20. Each roll equal to or less than the hit number causes a hit.

In many cases, a stand will have the ability to use more than one weapon in the course of the turn. For example, a Pandina light reconnaissance vehicle is equipped with an autocannon and machinegun in its turret. During the Fire Phase it could fire both turret-mounted weapons, provided they fired at a single target.

7.2 Sequence of Fire

7.21 Fire Eligibility and Orders: The ability to fire depends on the order given. The Orders Summary Table below lists the sub-phase in which a unit fires depending on the order given in the Command Phase.

Thus a stand given a *disengage* order does not fire until the Final Fire sub-phase, while a stand given a *take command* order fires in the Opportunity Fire sub-phase.

Pinned units may not fire until the Final Fire sub-phase, regardless of the order given them.

7.22 Order of Fires: Fire is conducted in the general order prescribed by the Fire sub-phases. Within a sub-phase, units fire in the order of their initiative number, with the highest initiative units firing first. All fire by a unit is carried out before the next unit (with a lower initiative number or firing in a later Fire sub-phase) fires. A stand which is eligible to fire could therefore be destroyed or driven out of range early in the Fire Phase, and as a result not be allowed to fire when its turn comes.

Units firing in the same sub-phase and with the same initiative numbers fire simultaneously. All fire in a phase is simultaneous. The results of simultaneous fire do not apply to a stand until after it has had an opportunity to fire as well.

All firing stands of a unit must be allocated a specific target before any rolls are made. If more than one stand is to fire at an enemy stand, and the target stand is destroyed before the other stands have a chance to fire, they are *not* allowed to switch targets. They must fire at their designated target without regard for the effects of the other fire.

7.23 Opportunity Fire Sub-Phase: Stands conducting direct fire during the Opportunity Fire sub-phase may fire at a target at any point along its movement. The targets are returned to the point at which the firing player designates, and the fire carried out, with any results taking effect at that point. If the fire fails to halt the target stand, it is returned to its original destination.

Stands which are moving in cover and are fired at during the Opportunity Fire sub-phase do *not* receive benefit of cover for that sub-phase only.

7.24 General Fire Sub-Phase: The General Fire sub-phase is resolved after all opportunity fire. All fire is resolved based on the actual location of the target stands after all movement has been carried out.

7.25 Final Fire Sub-Phase: The Final Fire sub-phase is resolved after the General Fire sub-phase. All stands which fire in this phase may fire direct fire at any enemy stand within 25 cm. Stands further than 25 cm from an enemy stand may not fire during the Final Fire sub-phase.

7.26 Stabilized Guns: Stabilized weapons on vehicles facilitate fire on the move, and may modify the above general rules. See Rule 7.34 for the effects of stabilized guns on sequence of fire.

Orders Summary

Order	*Opportunity*	*General*	*Final*
No order	Yes	—	—
Take command	Yes	—	—
Cautious advance	—	Yes	—
Rapid advance	—	—	Yes
Disengage	—	—	Yes
Travel	—	—	—
Rally	—	—	—
Regroup	—	—	—



7.3 Number of Dice Thrown

7.31 Rate of Fire: Each weapon has a rate of fire (ROF), listed on the unit data chart. The ROF is the number of dice rolled for hits when the weapon is fired, assuming the weapon is stationary. Note that the ROF of the weapon varies with the range at which it is fired.

A weapon is not required to fire its full number of allowed dice.

7.32 Firing at Multiple Targets: A stand may normally use its full ROF during a turn. If it fires at more than one target, reduce its ROF by 1 for that phase. (A stand would have to have an ROF of 3 or greater to fire at more than one target in a phase.)

7.33 Movement and Fire: Movement affects both when a unit fires and its rate of fire.

Units which have received a *cautious advance* order subtract 1 from their ROF.

Units which have received a *rapid advance* or *disengage* order subtract 2 from their ROF.

7.34 Stabilized Weapons: Some vehicles have stabilized weapons which allow for more effective fire while moving. Stabilized weapons, if present, will be listed as basic, good or advanced.

7.341 Basic Stabilization: Weapons with basic stabilization do not subtract 1 from their ROF for a *cautious advance.*

7.342 Good Stabilization: Weapons with good stabilization treat a *cautious advance* as a *no order* and a *rapid advance* as a *cautious advance* for both ROF and sequence of fire purposes.

7.343 Advanced Stabilization: Weapons with advanced stabilization treat both a *cautious advance* and a *rapid advance* as *no order* for both ROF and sequence of fire purposes.

7.4 Determining Hits

The troop quality of the firing unit and the range band determine the unit's base hit number, which is recorded on the data card. Once the final hit number is determined, roll the correct number of D20. Each roll equal to or less than the final hit number is a hit.

7.41 Concealment: This base hit number is halved (rounding fractions down) if the target is concealed (+1 diff mod).

A target is concealed if it is in vegetation, partially obscured by smoke, deployed partially behind an obstacle (such as a vehicle hull-down or infantry firing over a wall), or inside of a structure, such as a settlement, entrenchment or hardened pillbox.

7.42 Single-figure Stands: Single-figure stands always have their hit number halved (rounding fractions down) in addition to all other modifications (+1 diff mod).

7.43 Small Arms Hit Distribution: Hits from small arms fire are not placed on just the target stand, but are randomly distributed within a 10cm area of the target. Any personnel stands in the same cover as the designated target stand may be hit. Vehicles in the target area are not affected by small arms fire unless they were targeted by the firing player. (Usually this will mean that they are wheeled or open-topped, but occasionally a player may choose to fire small arms at a more heavily protected vehicle to cause morale check.)

7.431 Procedure: Count the number of possible target stands within 10 cm of the target stand that are in the same cover. Assign each stand an equal chance of being hit, and roll 1 D20 to see which stands are hit. Note that some stands may be hit more than once, and that other stands, including the original target stand, may be left untouched.

Example: A native defender player inflicts six small arms fire hits on a group of Reformation Coalition stands. In the target area, there are two squad support laser (SSL) stands, a command infantry stand and three infantry stands. The native player states that he will use the following to determine which stand is hit.

Sample Small Arms Hit Distribution

Die Roll	*Target*
1-3	1st SSL stand
4-6	2nd SSL stand
7-9	Command infantry stand
10-12	1st infantry stand
13-15	2nd infantry stand
16-18	3rd infantry stand
19-20	Reroll

If the native player rolls a "13, 14, 12, 5, 20, 9, 10," he must reroll the 20. He does so, and rolls an 8. The first SSL stand and the third infantry stand are untouched; the second SSL stand takes one hit; and the command infantry, first and second infantry stands each take two hits. The effect of the hits will be determined by the troop quality of the target stand (see Rule 7.0).

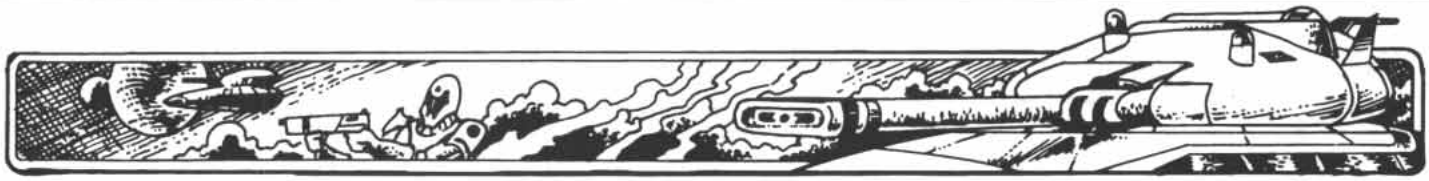
7. 432 Different Modifiers: There will be circumstances where stands in the same area have different modifiers. The firing player may elect to fire at all the enemy stands in an area, only if he is willing to give all enemy stands the best possible modifiers. Otherwise, stands with a different modifier may not be fired at, even though they are in the same target area.

7.5 Protection and Penetration

Traditional low-tech infantry wears no armor heavier than a wool uniform, but as the battlefield becomes more dangerous, target protection becomes more widespread. Armored protection is treated differently for personnel stands and vehicles. In both cases, weapon penetration is important in determining what, if any, damage is inflicted by a hit.

7.51 Penetration: Each weapon has a penetration which is noted on the unit data card. The weapon's penetration is in parentheses after the unit's ROF. Some weapons have a "+" following the penetration value. These weapons are known as "plus penetration weapons." Other weapons are called "small arms."

7.511 Small Arms: The penetration value listed on the unit data card for the weapon is its actual penetration value. Note that this is usually different at different ranges. A listed penetra-



tion of "nil" means that it is largely ineffective at that range when used against armor.

7.512 Plus Penetration Weapons: Heavier weapons (those with a plus following their damage value) are called plus penetration weapons because their actual penetration value is the value listed *plus* the roll of 2D6. This roll is made separately for each hit scored by the weapon.

7.52 Personnel Stands: Some personnel stands are equipped with body armor. Body armor gives the personnel stand wearing it a saving throw whenever a hit is scored. In addition, hard cover can provide the same benefit.

7.521 Saving Throws: Whenever a personnel stand wearing body armor or behind hard cover is hit, the owning player rolls 1D6. If the roll is greater than the unit's saving throw number, the hit is suffered normally. If the roll is equal to or less than the unit's saving throw number, the hit has no effect. *However, a die roll of 6 always fails.*

7.522 Armor Saving Throw Numbers: The listed saving throw number is the **Traveller** armor value of the protection worn. If the armor only covers part of the target (as with a flak jacket or bullet proof vest), the saving throw number is halved, rounding down.

7.523 Cover Saving Throw Numbers: Certain types of hard cover provide a saving throw, as noted below.

Cover Saving Throw Number

Cover	*Save Number*
Wood building	1
Entrenchment, stone or masonry structure	2
Reinforced concrete structure	3
Crew or passengers in open armored vehicle	3

Troops wearing body armor and behind hard cover add their saving throw numbers together.

7.524 Penetration: The saving throw number is reduced by the penetration value of the firing weapon. Subtract the penetration of the firing weapon from the saving throw value of the target to get the final saving throw number. If the final number is less than 1, no saving throw is made.

7.5241 "Nil" Penetration Weapons: Some weapons have a penetration rating of "nil." Double the saving throw number of personnel stands when fired at by nil penetration weapons.

7.5242 Plus Penetration Weapons: Plus penetration weapons automatically cause one casualty on protected troops when they hit. The saving throw (if one is possible after subtracting the weapon's penetration) is made to avoid a second casualty.

7.53 Vehicles: All vehicles have some armor protection, even if from the sheet metal body. Vehicles do not receive saving throws. Instead, vehicles are unaffected by any direct fire hits which do not penetrate the armor.

7.531 Vehicle Armor: The unit data card should list the armor of the vehicle on a variety of faces. Vehicles attacked from the front 120° arc of the vehicle are protected by their front armor. Vehicles attacked from the rear 120° arc are protected by their rear armor. Attacks from outside those arc are protected against by side armor. Belly and deck armor are used only in special cases detailed later.

7.532 Penetration: Hits with penetrations less than or equal to the armor value have no effect.

If the penetration is greater than the armor by 1, 2 or 3, then the AFV takes one hit.

If the penetration is greater than the armor value by 4, 5 or 6, then two hits are taken by the AFV.

If the penetration value is greater by 7 or more, then the AFV, regardless of type, is eliminated in a particularly spectacular fashion, and is destroyed. Destroyed AFVs are marked with the burning vehicle counter supplied.

7.6 Exploding Rounds

Some types of ammunition explode on impact. Direct fire with exploding rounds is resolved using the same steps as above—the firing player rolls to see if a direct hit was obtained and then determines whether it caused any damage. However, whether the round scores a direct hit on the intended target or not, it will land in the general area of where it was fired, explode and potentially cause additional damage, both to the intended target and to any other stands within the burst area of the round.

7.61 Definitions: The effects of an explosive round are defined by its burst radius and its explosive power. Both values will be recorded on the unit's data card.

7.611 Burst Radius: The burst radius of a round is expressed in centimeters. All targets completely or partially inside the burst radius are attacked by the explosion. Each such target is attacked separately. When converting **Traveller** weapons to **Striker** terms, divide the round's primary burst radius (in meters) by 10 and round all fractions up.

7.612 Explosive Power: Stands within the burst radius of the round are attacked using the round's explosive power. Explosive power is the number or less that the firing player must roll on a D20 to cause a hit on the target, absent any modifiers to the roll for target type or target cover. Only vehicles and personnel stands are affected by the burst radius of an exploding round; towed weapons are not (although their crews are).

7.62 Target Modifiers: The explosive power of the round may be modified down due to either target type (vehicle) or target cover, or by both if both conditions apply.

7.621 Vehicles: Vehicles, particularly armored vehicles, enjoy a modifier against explosive damage. This modifier is recorded on the unit data card and applies to any stands carried as passengers as well.

7.622 Cover: Stands in certain types of covering terrain also receive an explosive power modifier, as shown on the following table.

Cover Explosive Power Modifier

Terrain	*Modifier*
Wooden building	–4
Entrenchment	–6
Entrenchment with overhead cover	–8
Stone or cement building	–8
Pillbox	–10



7.63 Example: The defender fires two exploding rounds at an enemy armored vehicle. One round hits the vehicle directly, while the other misses. Using the penetration value for the round, the firing player resolves the direct fire hit normally.

After the direct hit has been resolved, the firing player next determines the effect of the explosion of the two rounds. Even though the second round missed (i.e., did not score a direct hit on the tank), it is assumed to strike the ground very near the tank, and the actual aiming point is used as the center of its burst radius.

The firing player measures all around the tank and discovers that two personnel stands are in the radius. One of the stands is in an entrenchment, while the other is in the open. The tank is in the open and has an explosive power modifier of –5. The infantry in the entrenchment has a modifier of –6. The infantry in the open has no modifier.

The exploding rounds have an explosive power of 8. Since there are two rounds exploding, the firing player will roll two dice for hits on each stand in the burst radius. He will roll two dice for 8s or less against the infantry in the open, two dice for 2 or less for hits on the infantry in entrenchments, and two dice for 3 or less for hits on the tank. Note that this is in addition to any damage the direct hit on the tank may have caused.

7.7 Effects of Fire

Fire combat affects the target stand by inflicting hits. In addition, regardless of whether the stand fired at was hit, all stands in a group fired at must check morale (see Rule 9.1). The effects of any hits on a stand depend on whether the stand being hit was a personnel stand, vehicle or towed weapon.

7.71 Definition of Terms: The following terms are used to describe the effects of hits on stands:

7.711 Forced Back: A stand that is forced back must immediately move away from the closest visible enemy stand. Note that this may not be the stand whose fire caused the forceback. It must move as directly away from the enemy as possible, as long as it does not move toward any other enemy stands. If no enemy stand is visible, a forced-back stand moves toward the nearest cover. A forced-back stand must move its full cross-country movement allowance, but it may stop when it reaches cover. A stand that starts in cover may not be forced back out of cover, but it may be forced back deeper into that cover, and thus out of sight of an enemy stand. A forced-back stand is also pinned.

If a gun crew is forced back while it is adjacent to its towed weapon and that weapon's transport, it may limber the weapon with no movement penalty, then move the weapon with the crew during the forceback. If no transport is present, the weapon must be abandoned. Abandoned guns contacted by enemy stands are eliminated.

7.712 Eliminated: A personnel stand that is eliminated is removed from the playing surface. It is then available for regrouping and may thus return to play.

A vehicle that is eliminated through cumulative fire is disabled and remains on the table even though it is no longer in play, its status indicated by the "disabled" marker placed upon it. Vehicles which are disabled may be repaired in the course of a campaign game.

Passengers in or on a vehicle that is eliminated take one hit per stand, and dismount.

7.713 Destroyed: A vehicle eliminated by the effects of a penetration by 7 or more points (noted above), a flamethrower attack, or a single aerial bomb is destroyed and remains on the table, even though it is no longer in play. Its status is indicated by placing a burning wreck marker upon it. Vehicles which are destroyed may not be repaired in the course of a campaign game.

Passengers in or on a vehicle that is destroyed take one hit per stand, and dismount.

7.72 Personnel Stands: The effect of hits on a personnel stand is dependent upon the troop quality of the stand.

Novice: A Novice stand is eliminated when it takes its first hit.

Experienced: An Experienced stand is forced back when it takes its first hit. On its second hit, it is eliminated. All hits inflicted in the same Fire Phase take effect at the end of that Fire Phase. In other words, wait until all fire has been completed before implementing results.

Veteran: A Veteran stand suffers no effect from its first hit. If hit a second time, it is forced back. If hit a third time, it is eliminated and removed from play. All hits inflicted in the same Fire Phase take effect at the end of that Fire Phase.

Elite: An Elite stand suffers no effect from its first or second hit. If hit a third time, it is forced back. If hit a fourth time, it is eliminated. All hits inflicted in the same Fire Phase take effect at the end of that Fire Phase.

7.73 Vehicle Stands: The effect of a hit on a vehicle stand (a vehicle model) is dependent upon its armor value, as well as on the troop quality of the stand.

The cumulative effect of hits is the same as for personnel stands: The troop quality of the AFV stand being hit determines the effect of the hit(s). Thus, a Novice AFV is always eliminated by its first hit, regardless of the actual penetration. A Veteran AFV ignores its first such hit from a penetration value of 1 to 3, and is forced back on its second such hit.

Eliminated vehicles are left on the playing surface (since they block line of sight) but are specially marked.

7.731 Command Personnel in Vehicles: If a command vehicle is eliminated, its command personnel may switch to an adjacent vehicle at the start of a Command Phase. If a command vehicle is destroyed, however, the command personnel are eliminated.

7.74 Towed Weapons: Normally, hits inflicted on towed weapons are taken by the gun crew stands. However, in the event that they take a direct hit from a plus penetration weapon, the weapon that was hit is destroyed, even though the gun crew stand may still remain in play.



7.75 Marking Hits: Hits are best marked with the counters provided with the game, using the following code:

Counter Codes

Counter	*Code*
Green marker	1st hit on Elite
Yellow marker	2nd hit on Elite
	1st hit on Veteran
Red marker	3rd hit on Elite
	2nd hit on Veteran
	1st hit on Experienced

So whenever a stand with a green hit marker on it takes another hit, the green marker is removed and replaced with a yellow marker. Whenever a stand with a yellow hit marker already on it is hit again, the yellow marker is removed and replaced with a red marker. Whenever a stand with a red hit marker already on it is hit again, the stand is eliminated.

Note that stands which receive a red hit marker are forced back and pinned, regardless of their experience level. Some players may wish to mark disabled vehicles with tufts of white cotton and burning vehicles with tufts of black cotton, for increased visual effect.

7.8 Limitations on Fire

The following limitations exist on all types of fire.

7.81 Range and Line of Sight: An eligible stand may only use direct fire at visible targets if it is both in its line of sight and within its range.

If line of sight does not exist, no fire is allowed. If the weapon is out of range, then the fire is carried out, but has no effect on the intended target.

7.82 Mount Weapons: All weapons fired from a mount (such as a tripod mount or a mortar fired from a bipod) must be stationary to fire.

7.83 Towed Weapons: All towed weapons must be unlimbered in order to fire. Some towed weapons may take more than one Movement Phase to unlimber.

7.84 Restricted Field of Fire Stands: Stands with restricted fields of fire may only engage targets which are to their front facing. The following have restricted fields of fire:

- All vehicle weapons not mounted in turrets or on open pintle mounts.
- All towed weapons.

Stands with all-around fields of fire may fire at targets through any of their facings. The following have all around fields of fire:

- Personnel stands.
- All vehicle weapons in turrets.

7.85 Vehicle Passengers: All vehicle passengers, including stands that are being transported on AFVs, may only fire in the Final Fire sub-phase.

7.86 Hull Weapons: Hull weapons are mounted in the hull of a vehicle, as listed on unit data charts. If a vehicle is in a hull down position in regard to another stand, the vehicle's hull weapons may not fire at that stand.

7.87 Turret Weapons: All turret mounted weapons of a vehicle must be fired at the same target. A vehicle may not fire its main turret gun at one target, and engage another target with its turret machineguns, for example.

7.88 Multiple Weapons: Some personnel stands have multiple weapons. A fireteam might, for example, be equipped with gauss rifles as the team's primary weapon but also have RAM rifle grenades and a plasma bazooka as an integral antitank weapon.

In general, a personnel stand may only fire one weapon at a time. A stand may fire an integral antitank weapon as well as the stand's principal armament, but the ROF of both weapons is halved, rounding fractions down (but never reducing the ROF to zero).

Hand grenades are an exception to this. A stand may always throw hand grenades (if in range) in addition to firing the stand's primary weapon, at no ROF penalty.

7.89 Limited Ammunition: For purposes of the basic game, all vehicles, towed weapons and personnel stands are assumed to have unlimited ammunition for their main weapons and for all small arms. Secondary weapons, such as rifle grenades or integral antitank weapons, or specialized weapons, such as **Traveller** launchers, may have a limited number of shots available.

Troops usually carry only one Fire Phase worth of grenades, so each stand can fire grenades only once per scenario.

Integral weapons (those carried by a fireteam in addition to their main weapons) usually only have ammunition for two turns worth of fire.

So, for example, an infantry stand with an integral assault rocket launcher (ARL) would have unlimited ammunition for its small arms and two turns worth of fire for its ARL. A stand identified as an ARL stand, on the other hand, would have unlimited shots for its ARL.

Tac missiles have the number of rounds indicated in the data annex.

For more detailed ammunition rules, consult the supply and ammunition rules in the campaign section.

7.9 Tac Missiles

In the basic game, there are two types of tactical (Tac) missiles: operator-guided and target-designated. Operator-guided missiles are flown to the target by an operator who has a direct line of sight to the target. Target-designated missiles are fired from a distant launcher and home on the reflected radiation of a target designator used by an observer with a direct line of sight to the target.

Target-designated missiles are not considered direct fire, and are covered later under the heading "precision indirect fire." Operator-guided missiles, however, are treated as direct fire.

7.91 Range and Accuracy: Tac missiles have only a single range, which is the missile's maximum effective range. All targets within that range are attacked as if at close range. For this reason, Tac missiles are listed only with short range performance information.



RULE 8: INDIRECT FIRE

There are two types of indirect fire: precision and area.

Precision indirect fire consists of an observer with a direct line of sight to the target guiding in an individual round fired from a separate launcher. The round is usually a missile, but could also be a guided bomb or artillery shell. Meson gun fire is also treated as precision indirect fire. The observer usually uses some sort of target designator, like a laser, but may instead actually remotely pilot the round to its target.

Area indirect fire consists of a launcher firing unguided rounds (usually explosive) into the area of the target. An observer directs the fire. Usually the observer is considerably closer to the target than is the firing weapon, but not always. Certain weapons which do not have a direct fire capability (such as mortars and artillery rockets) often engage targets directly observed by the gun crew. Since this is high arcing fire, though, it is considered a form of indirect area fire.

8.1 Precision Fire

8.11 Observation: Observers for precision indirect fire must have an unobstructed line of sight to the target and a means of directing the ordnance to the target. In most cases this consists of a laser designator, although in early Tac missiles this consists of the missile launcher/control system itself. The unit data card will indicate which stands can observe for which precision indirect fire weapons.

If the observer of a precision indirect fire mission is eliminated or forced back by fire during a turn before the precision indirect fire is resolved, it automatically misses.

8.12 Accuracy: Precision indirect fire is resolved exactly as direct fire, using the accuracy and range bands of the observer's laser designator or, if it is controlled by the launcher, using the accuracy and range bands of the vision system used (usually "eyeball"). Range is measured from the observer to the target.

If the observer received any sort of movement order during the turn, the range is treated as one range band longer. That is, short becomes medium, medium becomes long, etc.

8.13 Restrictions: The launcher for a precision indirect fire attack must be issued a *no order* for it to fire (or must be mounted on an aircraft, or mounted on a vehicle with good enough stabilization for the vehicle to be considered as having a *no order* for firing purposes).

The target must be within the maximum range of the launcher when the fire takes place.

The launcher must fire in the Opportunity Fire sub-phase. This will affect enemy unit spotting of it if they have a direct line of sight to it. If the launcher is destroyed before its attack is resolved, the missile or round is still in the air and may still hit. Only if the observer is part of the crew of the launcher (as with early Tac missiles) will it be affected by hits suffered before the attack is resolved.

8.14 Sequence of Fire: Precision indirect fire takes place one sub-phase later in the Fire Phase than it normally would based on the order given the observer. That is, precision fire directed by an observer with *no order* would take place in the General Fire sub-phase. Precision fire directed by an observer with a *cautious advance* order would take place in the Final Fire sub-phase. Order of fire within the sub-phase is based on the initiative of either the observer or the launcher crew, whichever is lower.

Precision indirect fire which takes place in the Final Fire sub-phase is not subject to the normal range limitation of final fire.

8.2 Area Fire

8.21 Observation: Observers for area indirect fire must have an unobstructed line of sight to the target and a means of directing the fire mission to the target. In most cases, this consists of a communication link back to the firing weapon, although in some cases the gun crew may be observing for its own fire.

If the observer of an area indirect fire mission is eliminated or forced back by fire during a turn before the indirect fire mission is resolved, it automatically misses.

There are two types of observers for area indirect fire missions: dedicated forward observers and temporary spotters.

8.211 Dedicated Forward Observers: The unit data card will indicate which stands are dedicated forward observers for which indirect fire weapons. There is usually one dedicated forward observer for every unit of two or more area indirect fire weapons.

Dedicated forward observers must have been given *no order* in order to call a fire mission. All fire missions called by dedicated forward observers are resolved during the General Fire sub-phase. The owning player decides during the sub-phase where the mission is desired and then resolves it.

8.212 Temporary Spotters: Any platoon or higher command stand can function as a temporary spotter if it has a communication link to the indirect fire weapon.

All spotter stands must be given *no order* in order to call a fire mission. Spotters may only control fire from one unit at a time. To do so, during the Command Phase, the owning player must record the following information for each mission:

1. Which unit is firing the mission.
2. What type of round it is firing.
3. The geographic target point on the playing surface.
4. Sheaf pattern.
5. The spotter for the mission.

Temporary spotters must have been given *no order* in order to call a fire mission. All fire missions called by temporary spotters are resolved during the Final Fire sub-phase, even though it is plotted in the Command Phase

8.22 Sheaf Patterns: All indirect area fire missions of more than one firing weapon or where the firing weapon has a rate of fire greater than 1 are fired using a sheaf to show how the rounds will fall in relation to the target. Two types are used: a converged sheaf where all rounds impact on the same point, or a dispersed sheaf where the rounds are placed to cover a wider area. If fire is being plotted at a moving target, then a converged sheaf pattern may not be used.



Sheaf patterns may be cut out of any convenient material (paper, thin cardstock, acetate or plastic). They are always circles, and their dimensions vary with the burst radii of the individual weapons. Consult the unit data card for specific dimensions.

8.221 Converged Sheaf: A converged sheaf means that all shots fired for this mission land on the same target point. If the fire is on target, then a single template is used, with all rounds fired landing in that area.

Example: A battery of three mortars, each with an ROF of 2, fire a converged sheaf. All six rounds fired land in the same place, and any target inside the sheaf is attacked by six separate die rolls.

A converged sheaf may not be used against a moving target. If a converged sheaf is fired at a stationary target and a moving unit has ended its movement within the burst area of the sheaf, only one round (one die) is used to attack the moving target, while all rounds in the sheaf attack the stationary target.

8.222 Dispersed Sheaf: A dispersed sheaf means that the rounds fired for this mission are spread out over a wider area than in the converged sheaf. The templates for each weapon in the firing unit are placed adjacent to each other, perpendicular to the line of fire, and with the target point in the center of the templates.

For each stand firing in the unit with a dispersed sheaf, there must be an equivalent impact area. If the ROF of the unit is 2 or more, then additional impact areas may be added, or the additional rounds fired into the existing areas at the firing player's option.

Example: In the case of the mortar battery mentioned above, its dispersed sheaf could consist of three impact templates in a line, each with two rounds hitting, or it could consist of six impact templates in a line, each with one round hitting.

8.23 Accuracy: Accuracy is a function of troop quality and range. The hit number for the area fire mission is the long-range accuracy for spotters and medium-range accuracy for observers. Observers and spotters calling fire through a fire direction center (FDC), use the accuracy for the next closest range band (medium for spotters, short for dedicated observers).

If the mission is on target, its fire is resolved using the procedure under indirect fire effects. If the mission fails, then the rounds go wide of the target and have no effect on the game.

Example: A Veteran forward observer stand is operating under a *no order*. The owning player declares during the General Fire sub-phase its planned point of impact, rounds fired and sheaf. As the stand is a Veteran forward observer stand, its medium-range accuracy is 6. Therefore, for the mission to fall as planned, the firing player must roll a 6 or less on 1D20.

Once a mission has been fired, it may be adjusted during the course of subsequent turns.

8.231 Continued Missions: Once an indirect area fire mission has been fired, it may continue to fall on the aiming point for the following turn as long as the spotter has a direct line of sight to the impact point. No further die roll is needed to keep the fire on that point.

Thus, if a mission that failed due to the die roll is continued on the next turn, it will automatically fall on that point without a further die roll needed.

8.232 Shifting Fire: Once a mission is on target, its target point may be shifted up to 10 cm (in any direction) and remain on target, provided the observer-spotter is operating under *no order* and has a line of sight to the new target impact point.

No new accuracy die roll is required, providing the impact point is moved 10 cm or less. Shifts of more than 10 cm are treated as if they were new fire missions.

8.24 Sequence of Fire: Area indirect fire takes place during either the General Fire sub-phase or the Final Fire sub-phase, depending on the type of observer used. Order of fire within the sub-phase is based on the initiative of either the observer or the launcher crew, whichever is lower.

Area indirect fire which takes place in the Final Fire sub-phase is not subject to the normal range limitation of final fire.

8.25 Limitations: The following limitations exist on stands engaging in indirect fire:

8.251 Movement: Any stand which is carrying out indirect fire must be stationary during the entire turn. It must be operating under a *no order* order for the turn. In addition, if it is a towed weapon, it must have been unlimbered before the start of the Command Phase.

8.252 Orders: A firing unit may only fire missions for one observer/spotter a turn. If more than one fire mission is ordered, then the owning player must choose during the Command Phase which mission the stand will fire. All other orders will be ignored.

8.253 Range: The IDF (indirect fire) data on the unit card (and in the data annexes to this book) lists a weapon's maximum indirect fire range. In addition, guns, howitzers and rocket launchers may not conduct indirect area fire at targets closer than one-tenth of their maximum range.

Mortars may not conduct indirect area fire attacks at targets closer than one-twentieth of their maximum range.

8.254 Fire Direction Centers: A fire direction center (FDC) is required if more than one weapon is firing the same fire mission (i.e., firing at the same target and directed by a single observer/spotter). The FDC must be in communication with the observer and the firing weapons.

FDCs have an effective indirect fire range based on their tech levels. Fire may be conducted by area fire weapons at ranges longer than the FDC's effective range, but accuracy is resolved at one higher range band. This means that spotters use long-range accuracy, and dedicated observers use medium-range accuracy.

8.3 Indirect Fire Special Rules

A number of special rules affect indirect fire.

8.31 Indirect Area Fire in the Opportunity Fire Sub-Phase: A stand may only conduct indirect fire in the Opportu-



nity Fire sub-phase if it successfully fired at the same target point in the previous turn. If ordered to continue firing at the same target point during this turn, it may fire during the Opportunity Fire sub-phase at any stand that moves through its impact area. If the target point is shifted, opportunity fire does not occur.

8.33 Ranging Fire: A player may elect to use ranging fire in order to place his fire mission. Ranging fire is carried out in the same manner as for indirect fire mission, so a *no order* order must be issued. Spotters must plot it during the Command Phase, while forward observers may mark it during the General Fire sub-phase.

Ranging shots are always on target but do no damage and use no ammunition for the turn they are carried out. A puff of smoke should be placed on the table, however, to show that a marking shell was fired at the target point.

A ranging shot allows the same observer/spotter to call a fire mission from the same firing unit on the same target point next turn without need for an accuracy die roll. The mission is always on target.

8.34 Preplotted Defensive Area Fire: In a scenario when one side is holding a defensive position and has been in place for several hours, the referee may allow each dedicated forward observer stand to select up to six geographic points on which to preplot area fire for their parent unit. The plot must be of an actual geographic point (a village, crossroads, bridge, hilltop), and include the sheaf to be used for that fire mission.

If used in the course of a game, fire missions called on these points do not have to be rolled for accuracy; they automatically hit the chosen point of impact.

8.36 Multiple Control: Forward observers may control the fire of more than their parent firing unit under certain conditions. If they are working with the assistance of an artillery staff stand which has been issued a *no order* and to whose headquarters the other units have been subordinated, they may bring fire from more than one battery on the same impact point. Only one roll is made for accuracy, and it applies to all units firing at that point.

All plotting for this mission is done as before, with the exception that the number of units to fire must be listed.

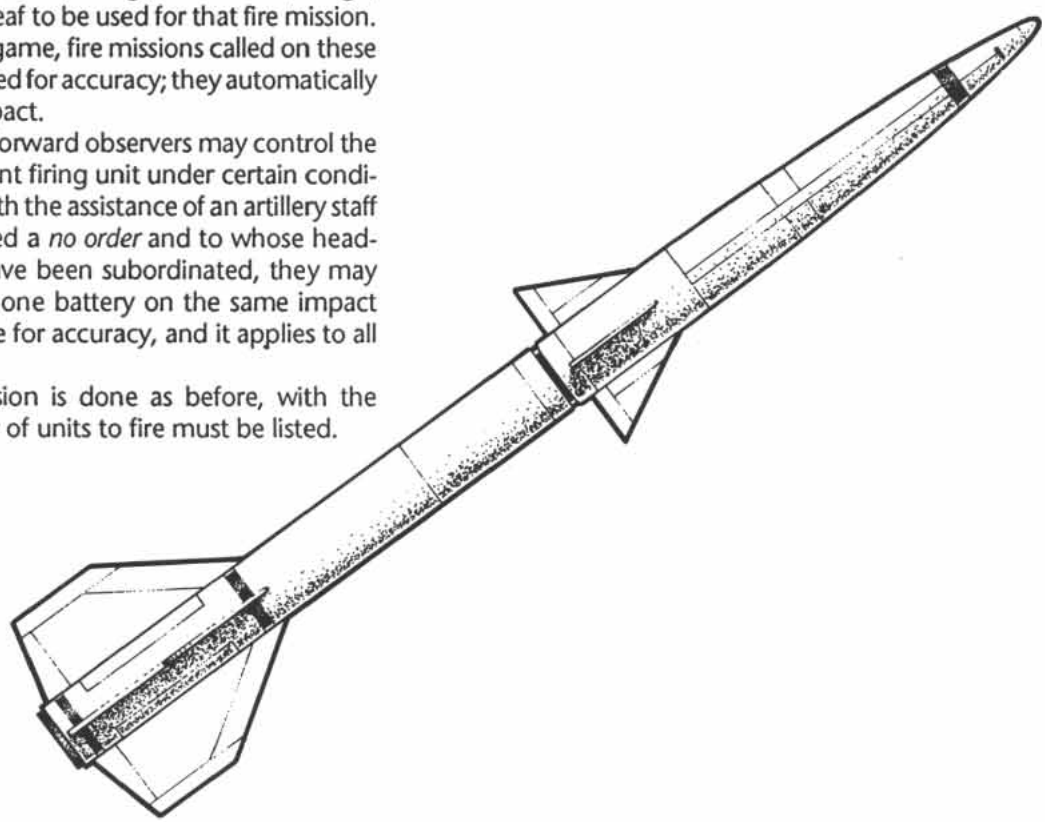
8.4 Indirect Fire Smoke

Indirect fire weapons with smoke rounds may create smoke screens. The indirect fire procedure is followed for firing smoke missions with the difference that accuracy is not checked, as smoke missions are always on target.

8.41 Smoke Templates: Smoke templates have the same width as the round's HE template, but the length is three times the normal width. Thus, a smoke template for an HE round with a burst of 5 cm would have a smoke template 5 cm wide and 15 cm long. Smoke templates are always placed so that the length runs in a downwind direction from the point where the round was targeted. Additional rounds fired at the point of impact lengthen the screen, so that a screen made up of three rounds as described above would be 45 cm in length.

8.42 Duration of Indirect Fire Smoke: Indirect fire smoke is placed when the fire mission would normally arrive, and then it does not actually block line of sight until the beginning of the next turn. The smoke screen remains in effect for the entire following turn.

Note that smoke will therefore not block line of sight in the turn in which it is first placed, but will affect line of sight on the following turn.





RULE 9: MORALE

After the Fire Phase is finished, all stands which were fired at during the course of the turn must check morale. All stands start the game with a morale number (ranging up to 20), which may be changed as the game progresses due to losses and enemy action.

In addition, all *rally* and *regroup* orders are carried out at the end of the Morale Phase.

9.1 How Morale is Checked

All stands check morale as a group. For this purpose, a group consists of those stands operating under the same order chit, even if they may no longer be within 15 cm of each other.

As a practical matter, this usually means a command stand and all stands immediately subordinate to it. Stands must check even if the fire could not have caused any damage according to the rules (i.e., heavily armored vehicles which were fired at by small arms with a penetration of "nil" still must check morale). In addition, if any stand in a group is able to see a friendly stand eliminated, then the group must check morale. No matter what the reason is, no group will check morale more than once in the Morale Phase of a given turn.

Example: A gun crew, an attached engineer stand, an MG stand and an infantry stand are all operating under the direct command of a platoon commander. For game purposes, if any stand in the group has been fired at, the entire group must check morale.

9.11 Computing Morale: Compute the current morale of the group by checking with the following list of modifiers, and add or subtract any that apply.

9.12 Checking Morale: Roll 1D20 for each group which is checking morale. Note that different stands in the same group may have different morale numbers. If this is the case, only one die is rolled, and its result applies to all checks by the group. If the number rolled is equal to or less than their modified morale, the stands successfully pass the morale check. If the number rolled is higher, then they fail the check. The number by which the check is failed determines what happens to the unit.

Morale Modifiers

Condition	*Modifier*
Each stand/vehicle in the group hit this turn*	–1
Each stand/vehicle in group eliminated/destroyed this turn	–2
Stand is pinned	–2
Each friendly group within sight eliminated this turn	–4
Any enemy stand/armed vehicle within 25 cm	–4
Unit is operating under a travel order	–4
Any permanent morale modifiers	–1, –2, –3 or –4
Stand is under cover	+4

*If the stand is hit more than once in the same turn, the modifier remains –1, regardless of the total number of hits taken by the stand. Thus, an Elite stand which takes three hits still causes the unit only a –1 modifier.

Example: A Veteran infantry platoon, morale 16, has a command infantry stand, two infantry stands, and an MG stand operating together. The MG stand is left behind in cover to provide covering fire, while the remaining three stands press forward across an open field. During the Fire Phase, a total of four hits were taken. The command infantry stand and one infantry stand each took one hit. The second infantry stand took two hits, which forced it back, pinned, into cover. All stands are within 25 cm of enemy infantry.

The base morale number is 16, modified as follows: -3 as three stands were hit, –4 as enemy personnel are within 25 cm, so the modified morale number is a 9. The MG stand is in cover, so its morale is up 4 to 13. The forced-back stand is also in cover, but is pinned, so that its morale number is 11. For all stands to pass morale, a 9 or less is needed.

If a 10 was rolled, the MG stand and forced-back stand would pass morale, while the other two stands would fail by 1, and go pinned.

9.2 Morale Results

If the die roll is equal to or less than the modified morale of the stand, the stand passes morale. If the die roll is greater than the modified morale, the stand fails morale.

9.21 Pinned: If the die roll is 1, 2 or 3 higher than the modified morale of the stand, then that stand is pinned. Pinned stands may never move toward the enemy, and may only fire in the Final Fire sub-hase. The fire value of all attacks against pinned personnel stands is halved. The halving is done after all other modifiers to fire have been calculated. Pinned stands check morale with a –1 modifier.

When a unit receives a pin, either through morale or through fire, place a P2 marker next to it. At the end of the each Close Assault Phase, remove all P1 chits and flip each P2 chit over to the P1 side. P2 and P1 chits have the same effect. If a stand is pinned and already has a P2 or P1 chit, replace the chit with a P2 chit.

Rally orders are not needed to recover from the effects of a pin. Unless an additional pin result is collected, a unit recovers from a pin at the end of the Melee Phase when the P1 chit is removed.

9.22 Forced Back: If the die roll is 4, 5, or 6 higher than the modified morale of the stand, then the stand is forced back, pinned, and suffers a *permanent* morale reduction of 1. The morale modifier remains with the stand until it can be rallied. This condition is represented by the use of the morale modifier markers provided (Morale –1, etc.).

9.23 Demoralized: If the die roll is 7, 8, or 9 higher than the modified morale of the stand, then the stand is demoralized and suffers a *permanent* morale reduction of 2. A demoralized stand keeps a P2 marker until rallied, with the additional requirement that it may not fire or move unless it is not in cover and it can see enemy units. If unable to move without moving closer to an enemy unit, it is eliminated. This condition is represented by the use of the demoralized markers and the morale modifier markers provided (Morale –2, etc.).



If a demoralized stand receives another demoralized morale result, it is eliminated.

9.24 Eliminated: If the die roll is 10 or higher than the modified morale of the stand, then the stand is eliminated. If any enemy stands are within 10 inches of it when that happens, the eliminated stands are considered to have surrendered and become prisoners. Prisoner stands are removed from play immediately, but are available for regrouping as if they were casualty stands (the assumption here is that not all of the personnel are captured, and some make their way back to be put into battle again).

9.3 *Rally* Orders

Rally orders are placed during the Command Phase, but are not carried out until the Morale Phase. A *rally* order placed next to a stand or group of stands allows any demoralized stands within 6 inches to recover from being demoralized. In addition, any nondemoralized stands in the area with a permanent morale loss can recover 1 point.

Stands operating under a *rally* order may not move or fire during the turn that they receive the order. A demoralized stand, which has an permanent morale modifier of –2, would need *rally* orders issued for three successive turns to recover from demoralization.

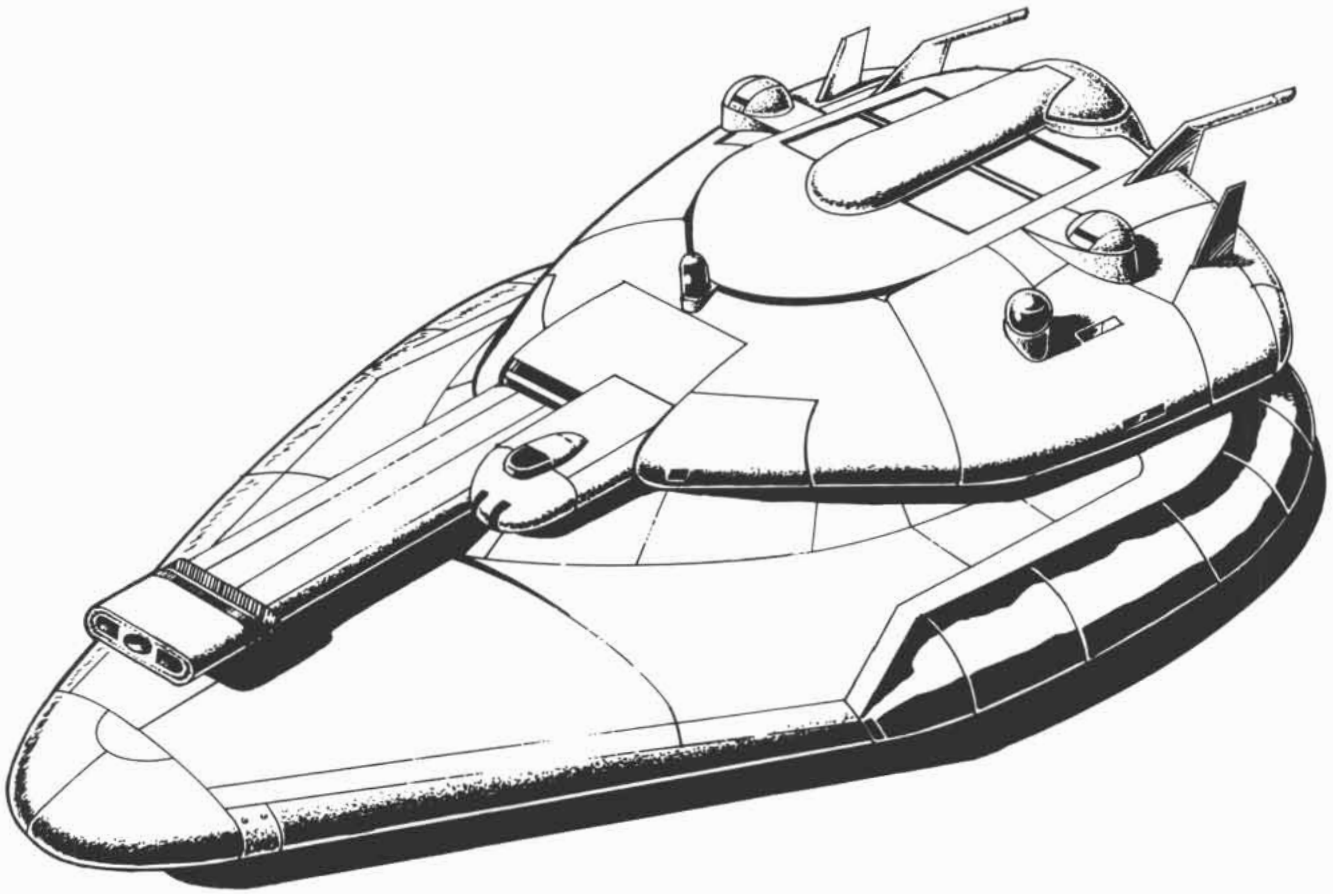
9.4 *Regroup* Orders

Regroup orders are placed during the Command Phase, but are not carried out until the Morale Phase. A *regroup* order is issued to a pair of eliminated personnel stands, and allows one of them to return to the game. (The assumption is that "eliminated" means no longer effective as a fighting force, not completely destroyed, and regrouping represents collection and reorganization of stragglers.) A *regroup* order only affects one pair of stands at a time. The stands to whom the order is issued must have been subordinate to the stand issuing the order, and exactly the same type of stand (i.e., two infantry stands, two battledress stands, two crew stands, etc.). One of the stands is returned to play by placing it next to the stand issuing the order, while the other is permanently removed from play and may not be used again for the purposes of a *regroup* order.

Stands operating under a *regroup* order may not move or fire during the turn that they receive the order.

Vehicles may not be regrouped.

Example: A Coalition company commander has lost two command battledress stands, one SSL stand and three battledress infantry stands so far. He can issue a regroup order to the pair of command battledress stands, or to two of the battledress infantry stands. He may not regroup the SSL stand (he has only lost one, and a pair of stands is needed to regroup). He must wait until he has lost a fourth battledress infantry stand in order to regroup the third.





RULE 10: MELEES

Melees are resolved in the Melee Phase. Melees consist of hand-to-hand struggles between personnel stands, usually using melee weapons of some sort.

10.1 Setting Up Melees

All stands engaging in melee must be in contact with the enemy stand they are assaulting. Stands attempting to move into melee combat must have passed morale. Each individual melee involves one or more personnel stand against one enemy personnel stand. When opposing players have several stands mutually in contact with each other, the players alternate, selecting one of their personnel stands, in contact, to melee one enemy stand. The players alternate this procedure until all involved stands resolve their melees. To determine who chooses, roll one die; high die roll wins.

Note that stands do not check morale after melees are carried out.

10.2 Resolving Melees

Each player rolls a die. Each player's die is modified as shown below.

The side with the lower modified die roll loses the melee. Each losing stand will suffer one hit and be forced back. If the modified die rolls are equal, then the melee has no effect.

Melee Modifiers

Stand Type	*Modifier*
Single-figure stand	–5
Heavy weapon crew stand	–5
Cavalry stand	+5
Each additional stand	+5
Melee only*	+2
Carrying shield	+2
Melee armored**	+save number
Regular armored	+twice save number
Higher morale	+difference

*Melee-only troops are those which are without firearms and are equipped exclusively for melees, such as low-tech armored knights or primitive spearmen.

**Melee armored troops are those wearing armor useful against melee weapons but not useful against firearms. Melee weapon armor value is shown on the unit card in parentheses and does not provide a saving throw versus small arms.

Example: A native unarmored shield-carrying melee-only cavalry stand (morale 16) engages in melee combat with a light battledress-equipped single-figure infantry stand (morale 18).

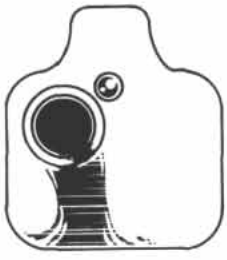
The native cavalry adds 9 to its roll (+2 melee only, +2 shield, +5 cavalry).

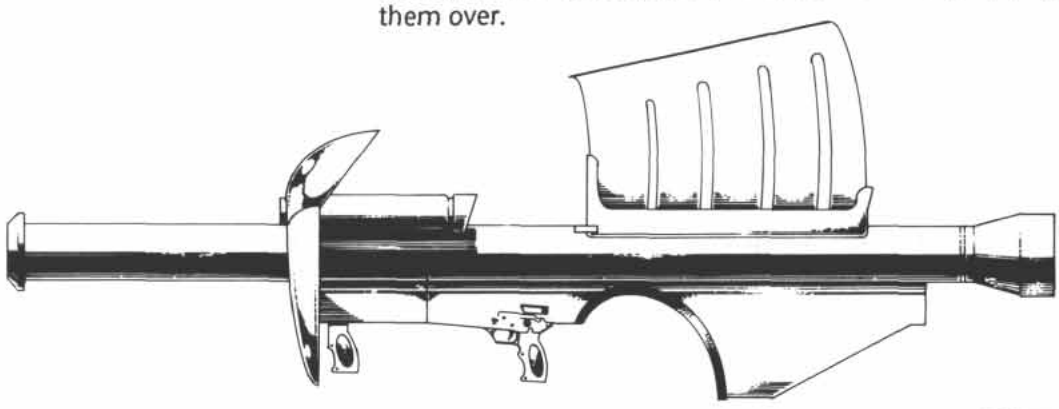
The battledress infantry adds 7 to its roll (+12 for armor [2×6], +2 for morale, -5 for single-figure stand).

The native player rolls a 9, modified to a 18. The invading player rolls a 12, which is modified to a 19. The native cavalry stand takes a hit and is forced back.

10.3 Pin Marker Change

At the end of the each Melee Phase, remove all P1 chits from the table, then replace all P2 chits with P1s by flipping them over.





RULE 11: PLANETSCAPES

Striker is played out on a tabletop (also called the playing surface or board), using various miniature versions of terrain, such as model buildings and trees. The referee must ensure that all terrain features on the playing surface are clearly marked for the players. In particular, the edges of forests, woods, open woods, cover and towns need to be clearly represented on the tabletop (although precisely how this is accomplished is not important).

Terrain affects movement, line of sight and combat. The specific effects of the most common types of terrain are covered in the rules for each particular activity. A general summary and description of the types of terrain in the game follow.

11.1 Vegetation

11.11 Light Vegetation: A wooded area more easily traversed than forest or woods. Orchards, coconut plantations and lightly wooded meadows fall into this category.

11.12 Moderate Vegetation: A wooded area more open than forest or jungle, and thus more easily traversed. Fairly closely spaced trees still impose limits on movement and visibility.

11.13 Dense Vegetation: Tropical rainforest or other densely wooded terrain, difficult to traverse because of its large trees and dense undergrowth. Includes jungle and virgin forest.

11.14 Cover: Cover is a special case where the terrain reduces visibility without affecting movement. Examples include corn or wheat fields at harvest time, seven-foot-tall prairie grass, light brush, etc.

11.15 Heath: Heath is an area of brush-covered, uneven terrain. Any stand that is stationary in heath is treated as being in cover, although heath does not block line of sight. AFVs stationary in heath are treated as being hull down.

11.16 Hedgelines: Hedgelines are linear barriers of dense brush. Hedgelines may be freely crossed by all stands. A stand adjacent to a hedgeline treats the hedgeline as cover for any direct fire on the stand that crosses the hedgeline. A hedgeline does not block line of sight, but does provide cover for purposes of spotting.

11.2 Ground Surface

11.21 Broken: Broken ground consists of an uneven surface difficult for most vehicles to traverse and ample cover for personnel. Broken ground can be either natural, as in the case of lava fields or boulder fields, or it may be man-made, as in the case of walled and terraced vineyards.

11.22 Cliff, Escarpment: A cliff or escarpment represents a slope so extreme that all normal movement across it is prohibited. Such areas should be defined by the referee and noted on the referee's map before the game begins.

The referee may allow personnel stands (except bicycle and motorcycle stands) from mountain units or those trained in mountaineering (such as commandoes) to move into or through such an area, or may allow a conventional infantry unit to do so in a place where the referee determines that there is a path. The stands must use a *rapid advance* order while crossing such an area and will pay quadruple costs while doing so.

11.23 Contour Lines: As the playing surface is considered to be level unless otherwise indicated, contour lines are used to show changes in elevation. Contour lines can indicate the elevation of hills and ridges or the depressions for valleys and wadis. These can be represented by any convenient means.

11.24 Sand: An area consisting mostly of sandy terrain, such as can be found in beaches or certain desert areas.

11.25 Sand Dune: An expanse of sand blown by the wind into small ridges, also known as an erg.

11.26 Steep Slope: Steep slopes represent areas across which ground movement is only allowed by personnel stands.

11.27 Swamp: A marshy area, usually wooded. Wooded swamps affect visibility in the same way as ordinary woods.

11.28 Clear: All other areas of the tabletop.

11.3 Water Barriers

Water barriers present obstacles to movement due to their width and depth, and by the nature of their banks.

Boats may either be found locally (as determined by the referee) or supplied by engineering units. Points at which boats may be launched should be indicated on the referee's map in advance.

11.31 Bridges: Bridges span streams, canals and rivers. They should be classified before the scenario begins (as class I, II, III, IV, V or VI), but this information need not be made available to the players before play begins. Personnel may cross any type of bridge. A vehicle and towed weapons may only cross a bridge which has a class equal to or greater than the vehicle or weapon's weight classification. For movement purposes, bridges count as roads. Railway and monorail bridges are always class VI.

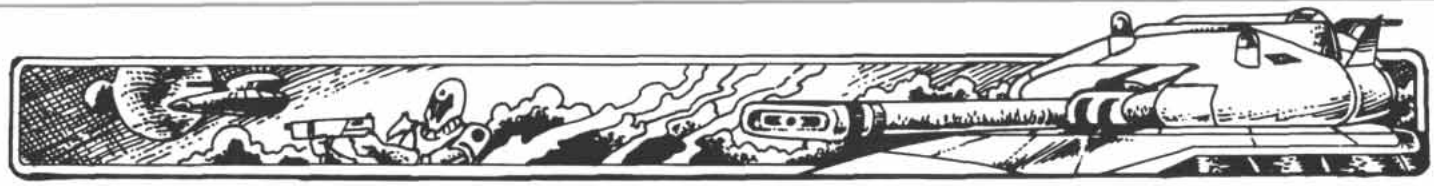
Bridges may be damaged or destroyed by engineers (see Rule 18.6) or explosions (see Rule 14.3). For every 3 points of damage taken, the bridge's rating is reduced by one level, so that a class IV bridge becomes a class III bridge when its damage value is reduced to 6. If this same class IV bridge took only 2 points of damage, it would still be treated as a class IV bridge. To be reduced to a class II bridge, it would have to take a total of 6 points of damage.

Bridges may be repaired by engineers (see Rule 18.23).

11.32 Rivers: A linear body of water which is wider then a creek and which can range from a minor waterway to a major waterway. Normally, rivers and canals may not be crossed by any stands except for amphibious vehicles and boats. The referee should determine (and sometimes let players know) if and where it can be forded, or if bridges exist which allow units to cross.

River banks should be rated as any of the slope types discussed in Rule 11.2 above, as this will affect the ability of amphibious vehicles to enter and exit the river.

11.33 Canal: A narrow, man-made waterway which may not be crossed except at a bridge.



11.34 Creek or Stream: A linear body of water smaller than a river. These are usually less than one meter in depth and are usually fordable by personnel everywhere, but vehicles may require assistance in leveling the banks.

11.35 Ford: A shallow crossing place on a creek, stream, or river where the water is shallow and the banks a gentle enough slope to allow entrance and exit by vehicles.

11.36 Deep Water: Lakes, ponds and the sea are prohibited to all stands except those with amphibious capabilities, aquatic vessels or flying vehicles.

11.4 Structures

Structures are civilian man-made additions to the natural terrain.

11.41 Settlement: A built-up area. A settlement may consist of wood or masonry buildings, and be crossed by streets or highways. Towns are laid out in roughly square blocks which show the type of building and the capacity of the block in terms of stands. Each block should be represented by a model building (constructed to represent stone or wood, and of a style suitable to the time and place of the battle) for enhanced appearance.

Buildings may be destroyed by explosions, either from direct fire, area fire or engineer activity (see Rules 14.3 and 18.6).

11.411 Wooden Buildings: Wooden buildings have a damage value of 6. When 6 damage points are taken, the building is destroyed and is considered to be on fire. No stand may occupy a burning building. If a stand is occupying a wooden building when it is destroyed, it must move from the building in the next Movement Phase or be eliminated from play. Smoke from a burning building blocks line of sight through the building's position.

11.412 Masonry Buildings: Masonry (stone, brick or cement) buildings have a damage value of 15. When 15 damage points are taken, the building is destroyed and it becomes rubble. Likewise, stands occupying a stone/cement building when it is destroyed must move from the building in the next Movement Phase or be eliminated from play. They may reoccupy the rubble, however.

11.42 Rubble: The ruins of masonry buildings.

11.43 Stone Walls: These are man-made obstacles which may be represented for a given scenario and whose effects are determined by the referee for that scenario. They may or may not affect movement, cover or line of sight, at the referee's option and depending on their construction.

Low stone walls, for example, may usually be crossed by personnel stands without penalty. Class IV, V and VI tracked vehicles may cross a stone wall at the cost of half their movement allowance. Air cushion vehicles (and any flying vehicles) may cross stone walls at no cost. No other vehicles may cross stone walls.

A gap is created in a wall where a tracked crosses it, through which other vehicles may cross. A gap is treated as open terrain by personnel stands and tracked vehicles, but is still treated as impassible by wheeled vehicles.

A personnel stand adjacent to a wall is in cover from any direct fire which crosses the wall. A turreted vehicle adjacent to a wall is hull-down against any direct fire that crosses the wall.

A low stone wall does not block line of sight.

11.5 Transportation Lines

Transportation lines are additional man-made features on the planet's surface.

11.51 Highway, Road: A major, hard-surfaced roadway with good all-weather capability.

11.52 Railways: These represent railroad, monorail and maglev tracks. They are usually difficult for conventional vehicles to cross except at established crossing points and sometimes provide cover in the form of an elevated embankment.

11.53 Street: A minor roadway running through a settlement.

11.54 Trail, Dirt Road: A minor, unpaved roadway. In inclement weather this will turn to mud (see Rule 16.2).

11.55 Embankments: The need for roads or railroads to maintain a level bed usually, but not always, results in the creation of a causeway or rail embankment. As a rule, these are low, but provide some cover for infantry. Causeways and railroad embankments do not affect movement. A personnel stand adjacent to a causeway/embankment is in cover from any direct fire which crosses the causeway/embankment. A turreted vehicle adjacent to an embankment is hull-down against any direct fire that crosses the feature. A causeway/embankment does not block line of sight.

11.56 High Embankments: In some cases, railroads and roads run along embankments that are highly elevated over the surrounding terrain. Personnel stands pay a 5cm penalty to get on or off the high embankment. Vehicles may not get on or off a high embankment except at points where entrances exist, such as where a road crosses the embankment. While on the embankment, a vehicle may only move along it.

A high embankment blocks line of sight, but stands on the embankment are not considered on a higher elevation for purposes of spotting.

Stands on a high embankment during daylight are skylined for all direct fire from stands at the same or lower elevation. The hit difficulty is decreased by one level versus skylined stands.

11.57 Cuts: In certain circumstances, railroads and roads run though cuts. Cuts can be either shallow or deep, depending on the circumstances. Shallow cuts are bordered by steep slopes, but allow stands in the cut to be considered in cover (or hull down, if vehicles).

Deep cuts are also bordered by steep slopes as well, but are of such a depth that stands may not fire out of them. Stands in deep cuts may only be fired upon by indirect fire.

11.6 Fortifications

Fortifications cover such items as bunkers, pillboxes, entrenchments, barbed wire entanglements, antitank ditches



and the like. Some fortifications may be constructed during the course of a game (see Rule 15.5), but most are placed before play commences, as part of the scenario. For a stand to use one of these fortifications, it must occupy the fortification and be stationary. Cavalry, bicycle and motorcycle stands must dismount in order to use a fortification.

Fortifications provide protection from fire combat, as listed in the Fortification Fire Modifiers chart below. Against direct fire they provide a saving throw, while against explosions they provide a reduction in explosive power.

Fortification Fire Modifiers

Type	*Direct Fire Save No.*	*Explosive Modifier*
Entrenchment	2	–6
Weapons pit	2	–6
Bunker	2	–8
Pillbox	3	–10

11.61 Bunkers, Pillboxes and Entrenchments: Each bunker or pillbox may hold one personnel stand or a class I to III towed weapon and its crew (excluding recoilless weapons and multiple rocket launchers). Each inch of entrenchment may hold a personnel stand. Bunkers (which are entrenchments with overhead cover, pillboxes and entrenchments provide protection from fire in any direction.

Bunkers and pillboxes may be destroyed by engineers, artillery or aircraft. A bunker may take 6 damage points before it is destroyed. When destroyed, it is replaced by an entrenchment. A pillbox may take 12 damage points before it is destroyed. However once destroyed, it is removed from play and *not* replaced, becoming rubble instead.

Entrenchments are not damaged, only the stands in them.

11.62 Weapons Pits: A weapons pit may hold one towed weapon and its crew. It provides protection only to its front and flanks; it is open to its rear and provides no modifier to fire from this direction.

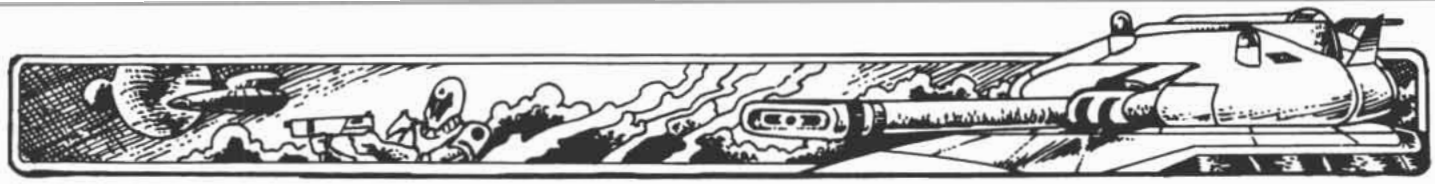
11.63 Tank Ramps: Tank ramps are weapons pits for vehicles, providing a hull-down position where one wouldn't ordinarily be. Turreted vehicles are hull down to fire from all directions when in a tank ramp. Vehicles may leave a tank ramp only by backing out of it, in a direction fixed by the construction of the ramp.

11.64 Antitank Ditches: Antitank ditches may not be crossed by wheeled or tracks vehicles without the aid of engineer stands (see Rule 18.524). Air cushion and all flying vehicles are unaffected by antitank ditches. Personnel stands may cross an antitank ditch, paying a cost of 10 cm to do so. Personnel stands within an antitank ditch are in cover.

11.65 Barbed Wire: Barbed wire may not be crossed by wheeled vehicles. Personnel stands adjacent to barbed wire may cross it if they receive a *cautious advance* order and spend their entire available movement allowance crossing the wire.

Tracked, air cushion and flying vehicles may cross barbed wire without any movement penalty, and tracked vehicles create a gap where they cross. A gap through barbed wire is treated as open terrain for all stands.





RULE 12: VEHICULAR TRANSPORT

Vehicles may carry personnel stands, and ground vehicles may carry towed weapons. Each vehicle capable of transporting stands and/or towing weapons should be noted on the unit's data card.

12.1 Transporting Personnel Stands

Personnel stands may be carried by dedicated transport vehicles (such as trucks and armored personnel carriers). They may ride on the top of armored fighting vehicles such as tanks, and they may be carried by transport considered part of the stand, such as bicycles or riding mounts.

12.11 Transport Vehicles: A vehicle capable of carrying personnel stands has a transport capacity which specifies the number of fireteam stands it may carry. A truck, with a capacity of three, for example, can carry three single stands. A double stand counts as two fireteam stands for transport purposes, while a single-figure stand counts as a half stand. There are two exceptions to this rule:

- Motorcycle, bicycle, grav cycle and cavalry stands, all of which are treated as personnel stands, may not be transported by other vehicles.
- Vehicles with a transport capacity of 1 or greater may carry one single-figure stand for free, in addition to any other stands transported. Thus, a truck with a capacity of 2 could carry two fireteam stands and a single-figure stand, or a double stand and a single-figure stand.

Personnel stands mount and dismount from transport vehicles during movement. It costs both the transport vehicle *and* the personnel stand half their movement allowance for the turn to mount or dismount. If either stand has moved before the mounting/dismounting takes place, that percentage of movement is lost by both the stand being transported and the transporting vehicle.

Example: Two infantry stands are ordered to carry out a rapid advance, which gives them a maximum move of 40 cm. They run to a medium truck sitting on a road which is 10 cm away. They spend half their move, or 20 cm, to mount the truck. The truck may now move, but as the stands it is transporting have used 30 cm, or 75% of their movement, it is limited to using 25% of its road move.

12.12 AFV Passengers: Any personnel stand, except cavalry, bicycle, motorcycle, grav cycle or a double-sized stand, may ride on an AFV. One stand may ride on each qualified AFV. Any tracked AFV that is not a transport vehicle and is not open topped is qualified for AFV passengers.

12.13 Dismounted Troops: Any cavalry, bicycle, grav cycle or motorcycle stands may elect to dismount from their horses, bicycles, grav cycles and motorcycles, and serve as dismounted stands. These stands may mount/dismount in the same way as personnel stands mount/dismount transport vehicles, at a cost of half their movement allowance.

Once dismounted, these stands move as all other personnel stands. Cavalry, bicycle and motorcycle stands may only remount in the same location where they dismounted. Should enemy stands pass through this location, they may not remount.

12.14 Grav Belts: Personnel stands equipped with grav belts move using the characteristics of the grav belt, but are in all respects treated as personnel stands. Grav belt stands may be transported by other vehicles.

12.2 Transporting Towed Weapons

A transport vehicle capable of towing has a towing capacity code (I, II, III, IV, V or VI) corresponding to the maximum class of towed weapon it may pull.

A transport vehicle may pull a towed weapon lighter than its towing capacity, but it is limited to one towed weapon at a time. Thus, a light truck, with a towing capacity of IV, could pull a class I, II, III or IV towed weapon. Note that a vehicle may be able to tow a weapon, yet not necessarily have the capacity to transport the weapon's crew.

12.21 Limbering/Unlimbering Towed Weapons: A towed weapon must be limbered to its towing vehicle in order to be towed. If limbered, it must be unlimbered from its towing vehicle in order to fire. The gun crew of a towed weapon pays a movement cost to limber or unlimber the towed weapon. However, the gun crew does not pay any additional cost to mount/dismount the transport vehicle when limbering/unlimbering a towed weapon from the same transport vehicle. Limber and unlimbering costs are:

Class I Towed Weapon: It costs half the movement allowance of both the vehicle and crew to either limber or unlimber the weapon.

Class II Towed Weapon: It costs half the movement allowance of both the vehicle and crew to unlimber the weapon, and all the movement of both to limber the weapon.

Classes III-VI Towed Weapons: It costs all the movement allowance of both the vehicle and crew to either limber or unlimber the weapon.

As with the mounting/dismounting of troops, if the stands which are attempting to limber/unlimber have moved prior to the act of limbering/unlimbering, that movement is deducted from any remaining.

12.3 Towing/Pushing Vehicles

A disabled vehicle may be pushed out of the way by any recovery vehicle, or by any vehicle of an equal or greater weight class (as defined in Rule 1.13). A vehicle which is destroyed during the game may not be pushed out of the way; it is assumed that the wreck is on fire and too dangerous to approach. If a game is played with wrecks (destroyed vehicles) present from the start of the game, those wrecks may be pushed out of the way.

12.31 Pushing: To push a vehicle out of the way, the pushing vehicle must start adjacent to the vehicle and be given a *full advance* order. It takes the pushing vehicle's entire movement allowance for the turn to push the vehicle out of the way.

A vehicle forced back due to fire during this process must roll dice to see if it succeeded in pushing the other vehicle out of the way before being forced back. It succeeds on a roll of 5 or less.

12.32 Towing: A disabled vehicle may be towed by a recovery vehicle or other vehicle of equal or greater weight class. To prepare a vehicle for towing, the towing vehicle must spend one Movement Phase stationary and adjacent to the vehicle to be towed.

A vehicle forced back during this process does not succeed in the tow and must start over when it returns. When a vehicle tows another vehicle, its movement is quartered. A destroyed vehicle may not be towed; it is assumed that damage to the vehicle is too severe.



RULE 13: ADVANCED DIRECT FIRE

This rule expand the direct fire rules by adding agility, fire control computers and other special cases.

13.1 Agility

Agility is the game mechanism which shows the difficulty of hitting a fast-moving target. Fast-moving vehicles, missiles and even artillery shells have agility ratings, which are progressive increases in the difficulty level of the to-hit die roll.

Each such increase in difficulty, called a "diff mod," halves the chances of success, rounding fractions down. As a practical matter, this means that the shot is resolved as if it were one range band more distant for purposes of hitting (but not for ROF or penetration purposes).

If the diff mods increase the range of the shot beyond extreme range, each additional diff mod increase reduces the number of dice rolls (ROF) by 1. If the ROF is reduced to 0 or less, no shot is possible.

13.11 Target Agility: Many vehicles and all aircraft have agility diff mods based on their speed. These diff mods are recorded on the vehicle's data card in parentheses after their movement allowances. Three diff mods are given for most movement allowances, the three mods being (in order) that for a *cautious advance*, a *rapid advance* and a *travel* order. Vehicles which have no agility diff mods at a given speed will have a — instead.

For example, a vehicle with the notation (—, —, +1) would have no agility diff mods when conducting either a *cautious* or *rapid advance*, but would have a diff mod of 1 when travelling.

Flying vehicles only have a total of three diff mods: two for low altitude/NOE flight and one for high-altitude flight. The two low-altitude diff mods are used for *cautious* and *rapid advance*, while the high-altitude mod is used for *travel* orders.

13.12 Missile Agility: All missiles have a single agility, which is recorded on the unit data card. Missiles may not be fired at by weapons which do not have point defense fire control (see Rule 13.2 below).

13.13 Artillery Agility: All indirect fire nonmissile artillery rounds (both area fire and precision fire) have an agility of +6. Artillery rounds may not be fired at by weapons which do not have point defense fire control (see Rule 13.2 below).

13.2 Fire Control

Many larger weapons have sophisticated fire control computers which assist them in tracking and engaging fast-moving targets.

Fire control computers enable a weapon to ignore one or more diff mod increases due to target agility. The number of diff mods the weapon ignores is referred to as its "fire control bonus." Note that fire control systems do not reduce difficulty below the level determined by the actual range; they merely allow the weapon to ignore increases.

13.3 Point Defense

Only weapons equipped with point defense fire control may fire like any other weapon, using their printed fire control bonus to ignore agility diff mods. They have several special features in addition, however.

First, only weapons with point defense fire control may fire at missiles and ballistic projectiles (artillery rounds). Only weapons with a penetration greater than Nil have an effect on missiles and artillery rounds.

Point defense weapons may fire in self-defense at incoming missiles and ballistic projectiles in any Fire sub-phase, regardless of the movement order received, provided the movement order allows the weapon to fire at all. (Units operating under *travel, rally* and *regroup* orders, for example, may not fire point defense in self-defense.)

When firing at missiles or ballistic projectiles not directed at them, or when firing at any other target, they fire in the Fire sub-phase determined by the order they were issued in the Command Phase.

Regardless of the initiative level of the firing gun crew, point defense fire in a sub-phase is always resolved before the fire of the missile or ballistic projectile fired at by the point defense weapon. If, for example, an Elite stand fired a missile at an enemy tank, an enemy point defense weapon eligible to fire in that sub-phase could still fire at the missile and attempt to shoot it down, and that attempt would be resolved before the missile attack, even if the point defense weapon's crew were only Experienced.

Second, when firing at either nonevading ballistic projectiles (such as artillery) or at flying vehicles conducting travel movement, the point defense system doubles its fire control bonus. Note that this does not apply to missiles or flying vehicles in at low altitude (executing a *cautious* or *rapid advance* order).

Any hit on a missile or artillery round destroys it.

13.4 Advanced Missiles

This rule introduces several more sophisticated types of missiles to the game.

13.41 Homing Missiles: Homing missiles are locked onto a target and then actively seek it after firing. Homing missiles have the same range bands as for conventional direct fire weapons and use the accuracy asset of the firing troops.

Homing missiles have an agility rating, the same as any other missile. Homing missiles, however, use their agility rating minus as a fire control bonus versus the agility of the target. A homing missile with an agility of 4, for example, could ignore up to four agility diff mods due to the target's speed.

13.42 Overhead Attack Missiles: Overhead attack missiles attack the top armor of a vehicle instead of the armor face presented to the firer. There are two types of overhead attack missiles—top attack and plunging attack—based on their flight path.

13.421 Top Attack Missiles: Top attack missiles are available from tech level 8 on. Their penetration is usually much lower than comparably sized missiles which approach the vehicle directly, since the warhead is much less efficient when placed at an angle to the centerline of the missile and there is less



control over optimal stand-off range. Top attack missiles fly directly at the target but then fly across the top of it. As they pass over the target, their warhead fires down (and usually slightly forward) to hit the top armor of the vehicle.

Top attack missiles are treated as conventional Tac missiles in all respects except that they always attack the top armor of the vehicle.

13.422 Plunging Attack Missiles: Plunging attack missiles are also available from tech level 9 on. Their penetration is the same as for a conventional missile, as they approach the target from a higher altitude and then dive down onto it, thus attacking with the warhead in a conventional position.

Plunging attack missiles are treated as conventional Tac missiles in all respects save two. First, they always attack the top armor of the vehicle. Second, they are treated as nonevading ballistic rounds for purposes of defensive fire by point defense systems.

13.43 Drone Missiles: Drone missiles are small remotely piloted aerial vehicles equipped with both a sensor and a warhead. Each drone missile is controlled from the launch station by a pilot and is self-ordered while aloft, so long as it is in communication with the launch vehicle. The missile may remain airborne throughout the scenario; the range bands listed for the missile are purely for determining accuracy of fire.

A drone missile attacks by flying into a target structure, vehicle or stand. The attack is treated as direct fire, and the distance the missile moved that movement phase is the range used to determine the accuracy die roll of the attack. For example, a missile with a short range (for accuracy purposes) of 20 cm and which moved 60 cm the turn it struck its target would resolve its accuracy die roll as fire from long range.

A drone missile may be ordered to hit an armored face other than the one the missile is facing, but this increases the difficulty of hitting by one range band. The long-range attack mentioned above, for example, would be resolved as an extreme-range attack.

13.5 Aerial Attacks

Flying vehicles firing at ground targets do so in one of two ways—by turreted fire and approach fire.

13.51 Turreted Fire: Some flying vehicles have turrets mounted on their bellies to direct fire at ground targets. Only flying vehicles capable of NOE flight have such turrets. (Fixed-wing aircraft not capable of NOE flight may have turreted weapons, but they are for fire at other aircraft, not ground targets.)

Flying vehicles fire turreted weapons in the same manner as do ground vehicles, with the move order restricting the ability of the weapon to fire by stabilization overcoming this.

13.52 Approach Fire: Flying vehicles firing nonturreted weapons do so via approach fire. This includes fixed forward-firing projectile and energy weapons as well as rockets, missiles and bombs. Flying vehicles following a *travel* order (and thus flying at higher altitudes) may attack using approach fire. (Note that this is the only time that a unit in the game may fire while executing a *travel* order.)

Approach fire requires the aircraft to fly in a straight line directly at the target for the entire turn. (If capable of hovering, the aircraft may hover in place facing the target.) If flying above NOE altitude, the player also specifies the altitude (in centimeters on the game table) at which the aircraft is flying. If dropping bombs, the flying vehicle must pass directly over the target during movement.

Approach fire is conducted at the end of the fire phase after all ground units have fired. However, the fire is conducted as if from any point along its movement. If the flying vehicle has been forced back or destroyed by fire during the turn, and the fire which destroyed it or forced it back came at a point along its flight path before the point at which it fired, its fire does not take place. If the fire hit the aircraft on its flight path after the designated firing point, the aircraft is allowed to fire.

13.521 Direct Fire: All approach fire from cannons, energy weapons and missiles are resolved as direct fire attacks using the normal direct fire rules.

13.522 Bombs and Rockets: All approach fire using bombs and rockets is resolved as indirect area fire, with the accuracy roll based on the altitude of the attacking aircraft. Aircraft flying at up to 10 cm attack as if at short range; those flying at up to 50 cm do so as if at medium range; those flying at up to 100 cm do so as if at long range; and those flying at over 100 cm do so as if at extreme range.

All rocket and bomb attacks which miss deviate in the same manner as artillery rocket launchers.

Aerial Bombardment

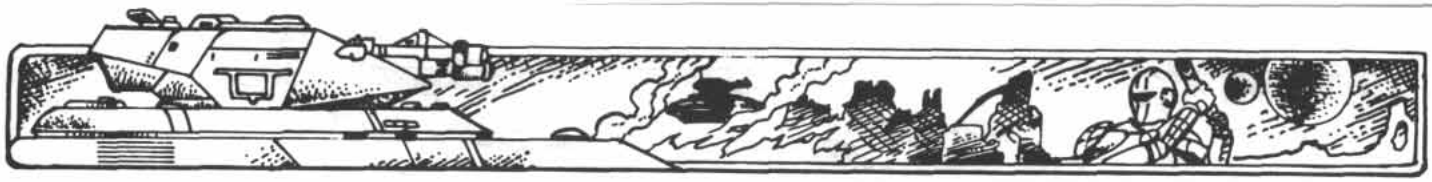
Altitude	*Range for Accuracy*
0-10 cm	Short
11-50 cm	Medium
51-100 cm	Long
101+ cm	Extreme

13.6 Meson Guns

Meson guns have the advantage of being able to fire through objects (such as planets) without interacting with the intervening material. Meson gun fire against targets visible to the gun crew is treated as direct fire. Meson guns may also fire against targets not visible to the gun crew, provided an observer can direct the fire onto target. This type of fire is treated as indirect area fire.

In the case of direct fire, a direct hit on a target always causes a casualty; no saving throw is made, nor is any penetration check versus vehicle armor made.

In both direct and indirect fire, the meson pulse is treated as a conventional exploding round, with one important difference. No reductions to the explosive power of the meson gun's fire are ever made for terrain, cover, vehicle weight or armor, or any other factor. The explosive value of the round is always the target number rolled to inflict a hit on the target.



13.7 Orbital Bombardment

Attacks from orbit by directed energy weapons (meson guns, lasers and particle accelerators) are treated as direct fire, with the following exceptions.

13.71 Allowed Targets: Orbital direct fire may only be used to attack surface installations (such as settlements), vehicles, and towed or emplaced weapons (such as air defense missiles). They may not attack personnel stands (although personnel stands riding in vehicles or occupying structures may be attacked as the vehicle or structure is attacked).

13.72 Range: For purposes of accuracy, all orbital direct fire is treated as short-range fire. For purposes of damage and penetration, all orbital meson gun fire is treated as short-range fire, all laser direct fire is treated as medium-range fire, and all particle accelerator fire is treated as extreme-range fire.

13.73 Angle of Attack: All orbital direct fire attacks the top armor of vehicles.

13.74 Target Agility: All ground and flying targets double their agility ratings when being fired at from orbit.

13.8 Multiple Projectile Rounds (MPRs)

Multiple projectile rounds include shotgun rounds, flechettes and cannister.

13.81 Small Arms: Small arms multiple projectile rounds are shotgun rounds and flechette rounds fired from light assault guns (LAGs). Small arms MPRs roll twice their normal number of dice at short range. This is indicated by an asterisk after the short-range ROF number.

For example, a shotgun with an ROF of 3* would roll 6 dice for hits.

13.82 Heavy Weapons: Heavy weapon multiple projectile rounds (MPRs) are flechette rounds and (in black-powder cannons) cannister.

13.821 Flechette: Some weapons have the ability to fire flechette rounds, antipersonnel ammunition containing hundreds of tiny darts.

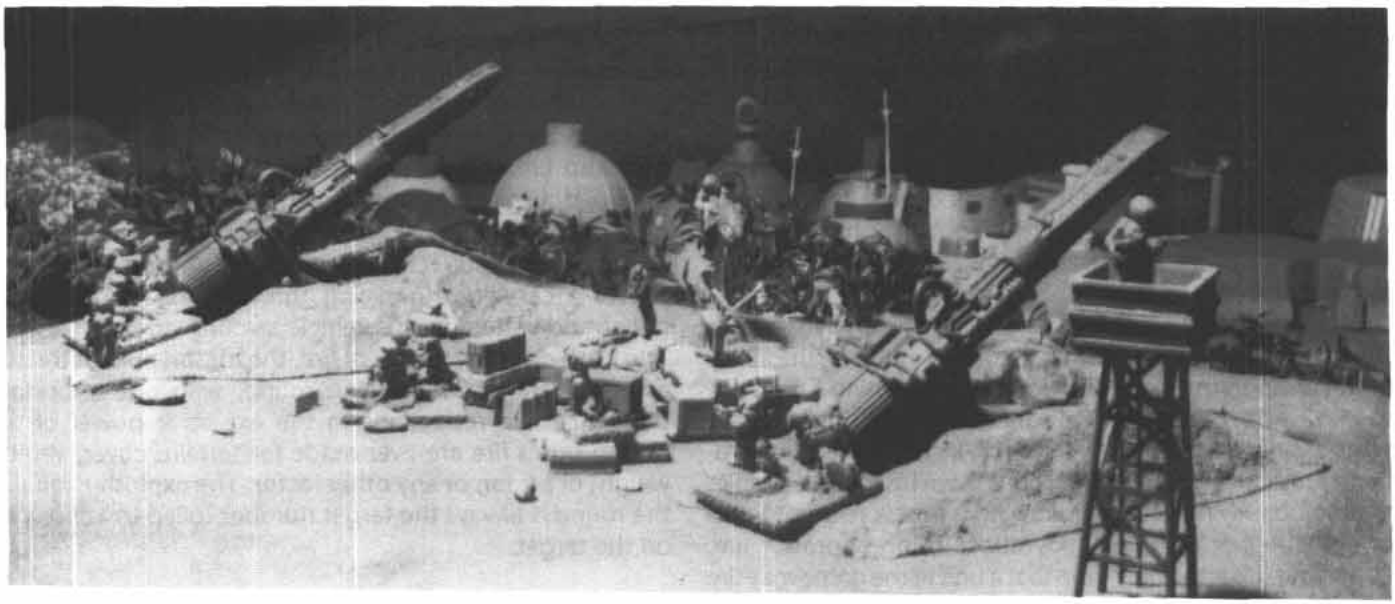
Flechette rounds may only be fired by direct fire. Unlike other direct fire, flechette rounds do not require a to-hit roll. Instead, the area of effect of the flechette round, called its "danger space," is placed on the table by the firing player along the imaginary line from the firing unit to the target, with the danger space's long dimension lying along that line, and its width centered on that line. This danger space must remain completely within a single range band of the firing weapon.

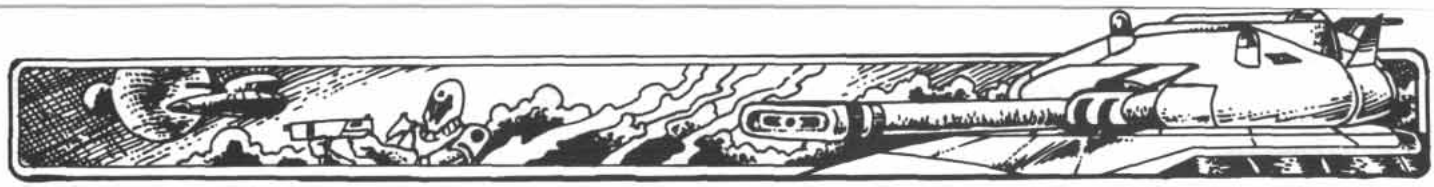
All targets within the area of effect roll 1D20 for hits. A roll of 1-6 results in two hits, and a roll of 7-12 results in one hit. Rolls of 13+ are no effect.

Each hit has a penetration value of 2, and targets make saving throw rolls with cover benefits as normal.

13.822 Cannister: Cannister is resolved like a flechette round, except that the burst area is always placed starting at the barrel of the cannon.

13.9 Laser Armor: Lasers are not affected by nonrigid armor. Melee-only armor as well as flak jackets, ballistic cloth, ballistic weave and combat environment suits provide no saving throws vs. laser fire.





RULE 14: ADVANCED ARTILLERY

The following rules deal with abilities of artillery not found in the basic game.

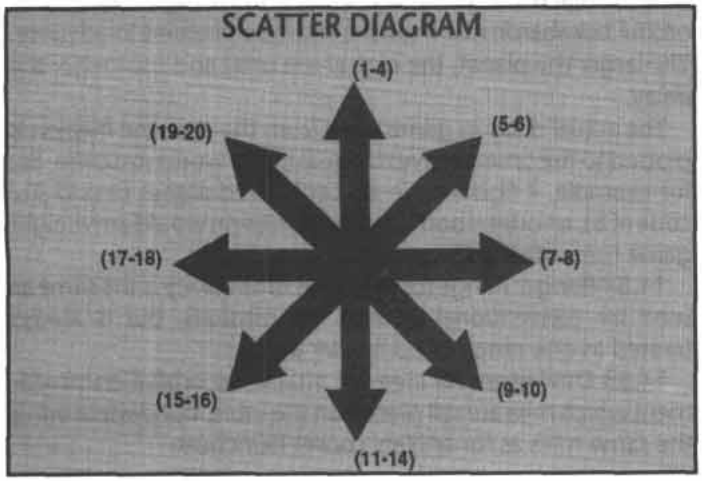
14.1 Artillery Rocket Launchers

Artillery rocket launchers (ARLs) conduct indirect fire in a slightly different manner than regular artillery fire. Although ARLs have multiple tubes, they are treated as one round with a very large burst area. This burst area is a circle and covers the beaten zone of the rocket salvo. ARLs may not conduct ranging fire, nor may they use preplotted points for targets. All ARL fire missions are plotted in the usual manner, but there is always a die roll to see if they are on target.

If the accuracy roll fails, then unlike the procedure normally used for artillery, the firing player uses the deviation chart to find where the rounds actually land. To do so, roll 1D20. The number rolled determines the direction that the impact point will shift. Then roll 1D20 again for the distance (in centimeters) that the mission will deviate from the plotted target point, doubling the number rolled if the firing stand is Novice and halving it if the crew is Elite. Move the target point of the mission in the direction and distance rolled, and center the burst template at that point in accordance with Rule 8.

Once an ARL fires, it may not fire again until it is reloaded. It takes the crew two complete turns to reload its ARL. If the ARL is equipped with an autoloader, reloading takes only one full turn. The crew and weapon must be stationary while reloading. Due to their nature, ARLs never continue fire in the Opportunity Fire sub-phase, as it is not possible to keep up a bombardment on the same area with a single unit. An ARL is automatically spotted in the Fire Phase in which it fires if an enemy stand has an unblocked line of sight to the ARL when it fires.

Example: An ARL carries out a mission which was plotted by an Experienced forward observer stand. The target accuracy die roll number is a 5 or less. The die roll is a 6, which means the mission fails to hit the impact point. The roll for deviation is a 10, which means the mission will drop short. The roll for distance is a 16, which means the point of impact is shifted 16 cm away from the intended point of impact. Any units present, whether enemy or friendly, may be hit by this fire.



14.11 Remote MRLs: Remote MRLs are small unmanned multiple-tube ARLs emplaced a safe distance from friendly troops. They fire like any other ARL, but once employed may not be moved or reloaded during a game.

Remote MRLs are off-loaded like any stand or may be dropped by purpose-built emplacement vehicles in one turn.

14.2 General Support Fire

In a number of cases, artillery fire is referred to as general support (GS) as opposed to direct support (DS). The main difference is that direct support artillery is controlled by a unit on the field. General support artillery, while operating in support of the units there, is not controlled by any unit on the battlefield. The following missions are examples of general support missions. They occur according to a prefixed schedule, and may not be altered in the course of a game except to cancel them. They are fired by battalions; a single battery may never be assigned to a general support mission. All die rolls for general support missions are carried out by the referee.

14.21 Harassment and Interdiction Fire: Often referred to as "map fire," these missions are designed to call fire down on specific geographic points such as towns, bridges, road junctions, etc., to deny their use to the enemy. This mission can never be a converged sheaf, and the explosive value on stands moving through the impact area is halved, rounded down. Note that this is in addition to any other modifiers for the stands in the impact area.

Fire from a harassment and interdiction mission falls during the Opportunity Fire sub-phase.

Example: A 15cm howitzer battery is firing at a crossroads which an enemy tank battalion needs to move through. The explosive value of the artillery is a 14, halved to a 7. The tanks have an explosive value modifier of –5, so they can only be damaged by the fire on a roll of 1 or 2. However any soft vehicles (explosive value modifier of –1) moving with the battalion would be hit on a roll of a 1 to 6.

Players should note that the area under bombardment may be circumvented by a unit to avoid passing through the target zone. Such a move is perfectly correct, as that is the goal of such a mission.

ARL battalions which are assigned to such missions must always roll for deviation. However, the explosive value of the impact areas are not halved.

14.22 Counterbattery Fire: Counterbattery fire is conducted against enemy artillery stands. It can be carried out in one of two ways. It may be conducted as "map fire" against suspected enemy positions as in the section above. If the resources exist, it may be carried out with the aid of counterbattery sensors.

Counterbattery sensors have ranges just like other sensors, but they are used exclusively to detect and track incoming area fire rounds shot by guns or mortars. By plotting the trajectory of the round, the sensor's computer can pinpoint the location of the firing weapon.

Each counterbattery sensor in use can detect one firing



enemy artillery unit and allow an attack on that unit in the next turn by area fire (not precision fire) weapons. The accuracy roll for the indirect fire attack is based on the range from the sensor to the firing unit. (In most cases, both of these will be off-table). In other words, no roll for success is made when the enemy artillery fires. Instead, the accuracy roll for the counterbattery fire is the real indication of how successful the sensor was.

14.3 Destruction by Area Fire

Buildings, bridges and certain types of fortifications may take damage from artillery fire (either direct or indirect fire HE, and certain types of AP fire). For each turn that such a structure is in the blast area of an explosive weapon, it takes damage equal to half the explosive value of the round minus 4. Thus, weapons with an explosive value of 8 or less have no effect on a structure. A 10cm round with an explosive value of 10 will do 1 point of damage to a structure, while an 8cm round with an explosive value of 8 will do 0 points of damage.

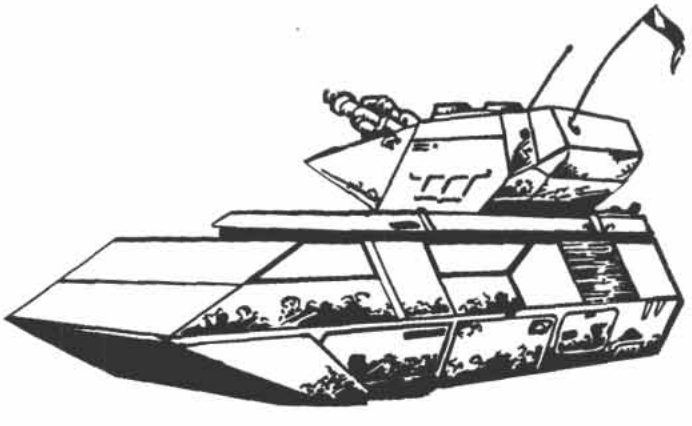
AP rounds greater than 7 cm do 1 point of damage per hit. Smaller AP rounds have no effect.

Note that in the case of a converged sheaf fired at a structure, each round will cause damage. Thus, a class V bridge which is hit by a converged sheaf of three 15cm rounds, each with an explosive value of 14, will take 3 points damage from each round. Thus, in one turn, the class V bridge, which is reduced one level for every 3 damage points suffered (see Rule 11.31), would be reduced to a class II bridge.

For the damage capacity of structures, see Rule 11.4 (planetscapes).

14.4 Submunition Rounds

There are three types of submunition rounds: standard submunitions, dual purpose (DP) submunitions and homing submunitions. Submunition rounds carry a large number of small grenades which are spread across the burst area and which detonate when they strike the ground or a target. DP submunitions include antitank grenades.



Submunition rounds cover a burst area larger than the size of a normal HE round, as shown in the data annexes to the rules. Conventional submunitions and DP submunitions both have an explosive value of 16. Homing submunitions have an explosive value of 20 versus vehicles and 10 versus nonvehicle stands.

All submunition rounds use the following modifiers to their explosive value (instead of those normally used for exploding rounds).

Submunition Fire Modifiers

Target is:	*Modifier*
Armored vehicle*	–12/–8
Terrain is:	*Modifier*
Light vegetation**	–6
Moderate vegetation**	–10
Dense vegetation**	NE (–16)
Entrenchment	–12
Weapons pit	–8
Building	–14
Bunker, pillbox	NE (–16)
Open water	NE (–16)

*Only counts as armored if it has top armor of 2 or more. Lower modifier is used versus DP submunitions.

**Vegetation must include some overhead canopy of branches and leaves to provide modifiers.

14.5 Orbital Bombardment

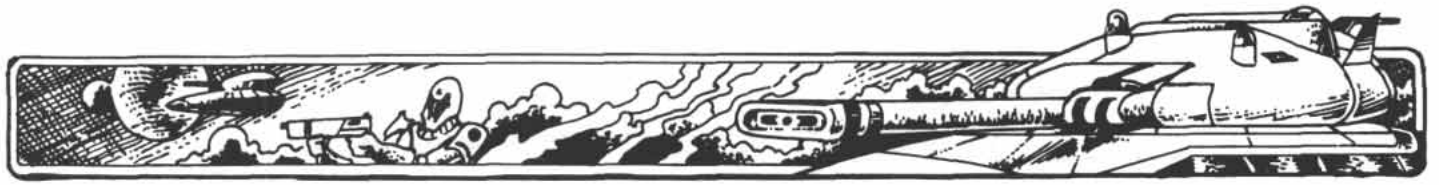
Orbital bombardment using missiles and deadfall bombs (both guided and unguided) is treated as a form of indirect fire. Missiles and guided bombs are precision indirect fire, while unguided bombs are indirect area fire.

14.51 Delay: Bombs and missiles dropped from orbit are actually fired at the planetary surface with a respectable initial velocity (on the order of 800 to 1200 km per hour), but still take time to reach the planetary surface from high orbit, so all orbital bombardment missions must be planned in advance. The larger the planet, the higher the orbit and the longer the delay.

The actual delay in game turns from the time the mission is plotted to the time it arrives is equal to the world size code. So, for example, if fighting on an Earth-sized planet (world size code of 8), an orbital bombardment mission would arrive eight game turns after it was plotted.

14.52 Range: Range for purposes of accuracy is the same as used for conventional indirect fire missions, but is always treated as one range band farther away.

14.53 Deviation: All area fire attacks by orbital bombardment which miss are still placed on the table, but deviate using the same rules as for artillery rocket launchers.



RULE 15: ADVANCED VISIBILITY

Environmental variations affect visibility and the ability of a unit to detect hostile units in a variety of ways.

15.1 Horizon

The maximum line of sight visibility is always the distance to the horizon. This may be reduced by unevenness of the ground or atmospheric conditions, but is never more than that. Elevations (such as on a hill) can increase this by pushing the horizon further out, as detailed in the basic game rules.

The basic rules assume a size 8 planet (in **Traveller** terms) with a mean diameter of 12,800 km. Horizon distances on different-sized worlds are listed below.

Distance to Horizon

World Size Code	*Mean World Diameter (km)*	*Distance to Horizon (cm)*
1 (Small)	1600	1800
2 (Small)	3200	2500
3 (Small)	4800	3100
4 (Small)	6400	3600
5 (Medium)	8000	4000
6 (Medium)	9600	4400
7 (Medium)	11,200	4700
8 (Large)	12,800	5100
9 (Large)	14,400	5400
A (Large)	16,000	5700

15.2 Night

Visibility at night varies considerably, depending on the amount of background light.

The referee should assign a background light level from 1 to 3, with 1 being the brightest, representing a clear night with one or more full moons high in the sky, and 3 being the darkest, a cloud-covered, moonless night.

The background light level equals the number of +diff mods applied to the naked eye detection task. Some vision enhancement devices avoid these diff mods, however, as indicated below.

The effects of night are expressed as +diff mods to the spotting task, but all of these diff mods should be used as progressive halvings of the eyeball short range. The resulting extreme range is then the absolute limit of visibility.

For example, on a very dark night (+3 diff mod), eyeball short range becomes 12.5 cm, which makes the absolute upper limit of eyeball visibility 100 cm.

15.21 Other Effects: Reduced visibility due to darkness has effects beyond spotting and maximum sighting range.

15.211 Troop Quality/Morale: During night turns, all units have their troop quality reduced by one level (Elites function as Veterans, Veterans function as Experienced, Experienced function as Novice. Novice units remain Novice). In addition, morale levels are reduced by 4 during night hours.

15.212 Command and Orders: During night turns, the radius of effect for an order is reduced from 15 cm to 5 cm. In addition, units may not be given *regroup* or *rally* orders during night turns.

15.213 Engineering: Engineering tasks (see Rule 18) take twice as long if carried out at night.

15.3 Weather

Weather which affects visibility includes fog, low clouds, high winds which carry dust and, of course, precipitation (rain and snow).

For purposes of visibility, however, the referee simply classifies inclement weather as to its diff mod level, ranging from +1 to +3 (or, very occasionally, +4).

Difficulty modifiers for weather should also be used to determine the reduced upper limits of visibility.

15.4 Smoke

Light smoke (that generated by artillery smoke rounds when they hit) imposes a +1 diff mod on spotting attempts through it. On subsequent turns, it blocks line of sight completely.

15.5 Wind

There are three classes of wind: light, moderate and high. It is quite rare for no wind at all to be blowing, and therefore the normal wind condition is light.

15.51 Effects: Light wind has no effects other than to move smoke in a given direction (see Rule 15.362).

Moderate wind reduces visibility by 10 inches in dusty conditions. Moderate wind during a rain or snow storm halves visibility (in addition to the effect of the storm).

High wind reduces visibility by 20 inches in dusty conditions. High wind during a storm quarters visibility (round to the nearest inch). High wind makes sound ranging impossible.

The maximum length of a smoke template in high wind conditions is 4 inches. Because of the deleterious effects of high winds on the game, referees are advised to limit high wind conditions to one or two turns and then reduce them to moderate.

15.52 Direction: Wind direction is determined at the start of the game. This may be accomplished by referee fiat, or randomly by consulting the scatter diagram (see the Game Reference chart). To use the chart, the referee picks a direction on the table and orients the chart so that the "1-6" arrow on the chart points that way. Roll 1D20 and consult the chart. The arrow corresponding to the result is the wind direction.

15.53 Changes in the Wind: For simplicity, the referee may decide that the wind direction and intensity will not change over the course of a game. If desired, however, a chart similar to the one below can be used.

Each turn, roll for a change in wind intensity and direction (two separate rolls).



Wind
(roll twice per turn)

Roll	*Direction*	*Intensity*
1-2	No change	Light unchanged, moderate becomes light, high becomes moderate
3-16	No change	No change
17-18	Shift 1 clockwise	No change
19-20	Shift 1 counterclockwise	Light becomes moderate, moderate becomes high, high is unchanged

15.54 Wind and Storms: The arrival of a storm is usually accompanied by a change in the wind. Most often this is a shift in direction of one point (sometimes the wind increases one level in intensity as well).

15.6 Vision Enhancement Devices

A variety of vision enhancement devices may be available to the unit. These are listed in the data annexes to the rules along with their short ranges. Vision enhancement devices have the following special capabilities.

15.61 Infrared (IR): Infrared devices are not affected by night +diff mods.

15.62 Light Amplification: Light amplification devices are not affected by night +1 or +2 diff mods, but suffer the full effect of +3 diff mods. They may not be used at all in any sort of poor weather.

15.63 Image Intensifiers: Image intensifiers are not affected by night +diff mods.

15.64 Thermal Viewers: Thermal viewers are not affected by night diff mods or +1 weather diff mods or +1 smoke diff mods. They are affected by any weather diff mod greater than +1, and they suffer a +1 diff mod when attempting to spot or see through a solid smoke screen.

15.65 Radar and Ladar: Radar is not affected by smoke, night or weather. It may be jammed (see **Rule 0.00: Electronic Warfare**).

Ladar is not affected by night +diff mods. It is affected by weather and smoke at tech level 12 and below. At tech level 13 and above, it is unaffected by smoke and weather. Ladar cannot be jammed.

15.7 Illumination

Objects which are illuminated can be seen at normal daylight eyeball ranges. Several means of illumination are available.

15.71 ILLUM Rounds: Many artillery weapons are equipped with ILLUM (illumination) rounds. An ILLUM round illuminates the area within its burst radius as if it were full daylight.

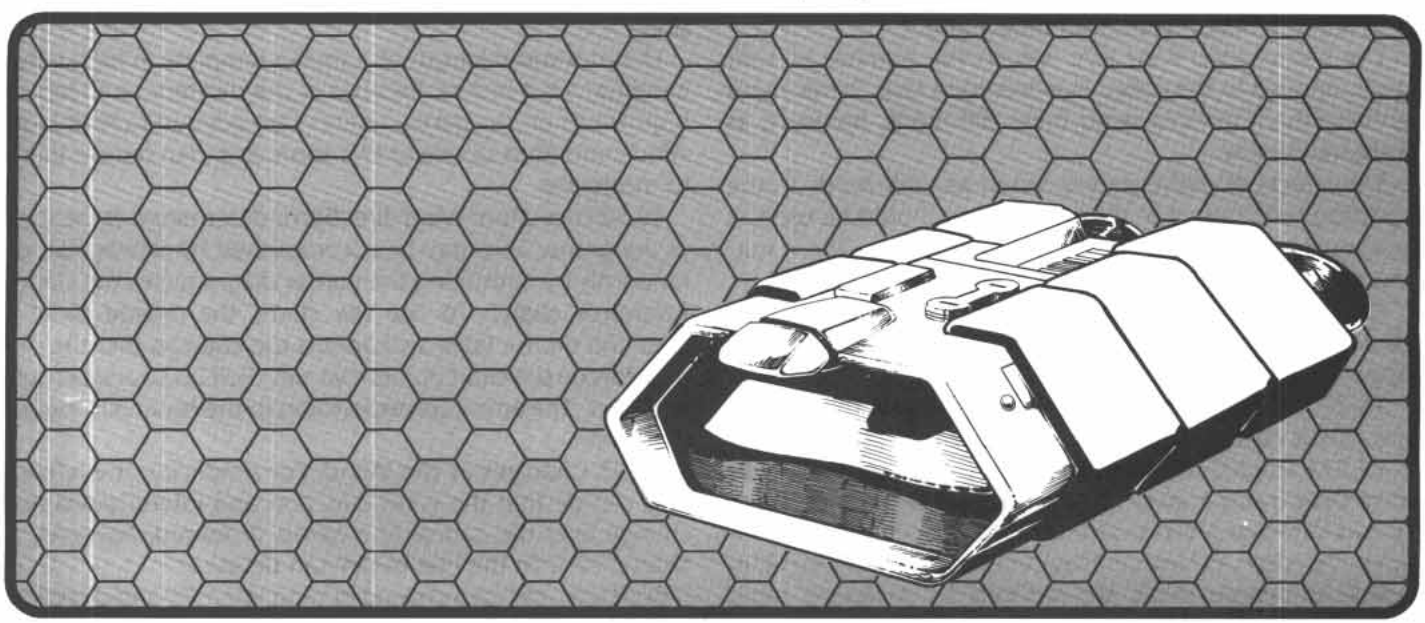
ILLUM rounds have no effect in bad weather or in smoke.

15.72 White Light Spotlight: A white light spotlight will illuminate an area 2 cm across at ranges up to 200 cm, and allows any stand to spot targets within the illuminated area as if it were daylight. The light itself is automatically spotted (at night) by all stands at any distance, provided they have an unobstructed line of sight to it.

White light spotlights have no effect in bad weather or in smoke.

15.73 IR Spotlights: An infrared spotlight can illuminate an area 2 cm across at a range of up to 100 cm. Only stands equipped with IR goggles can see the light, and they make spotting rolls against the targets within the illuminated area as if it were daylight (regardless of the listed ranges of the IR goggles). The light itself is automatically spotted (at night) by all stands at any distance, provided they have an unobstructed line of sight to it and are equipped with IR goggles.

IR spotlights have no effect in bad weather or in smoke.





RULE 16: ADVANCED WEATHER

Weather may affect both movement and visibility. The effects of each type of weather are as follows:

16.1 Rain

Rain reduces visibility and, depending on its duration, may produce mud and thus restrict movement as well. The visibility effects of rain are covered in Rule 15 under weather.

The referee may make a table to determine the extent of the rainfall, as well as any changes in its type. For example:

Rainfall
(roll each turn)

Die Roll	*Effect*
1-2	Light ceases, steady becomes light, heavy becomes steady, clear remains unchanged
3-9	No change
10	Light becomes steady, steady becomes heavy, clear becomes light

If rain continues for any length, it will affect the ground conditions by producing mud. Count the number of turns that it has been raining, with each turn of light rain counting as one-half, and each turn of heavy rain as two turns, and check on the following table:

Rain Ground Conditions

Hours	*Condition*
3 hours of rain	Light mud
6 hours of rain	Medium mud
12 hours of rain	Heavy mud

Note that the referee may determine as part of the scenario that it has been raining a set number of turns before the start of the game.

16.2 Mud

Mud caused by rain or other weather is temporary; mud caused by poor drainage or a high water table is permanent. Mud affects the movement of all stands except those on hard-surfaced roads. The effects of each type of mud condition are as follows:

16.21 Light Mud: All ground stands moving do so by paying double movement costs in addition to any other movement costs they must pay. Thus, a tracked vehicles moving in a woods would pay double movement costs for the woods, and double again for the light mud. Thus, they would be paying quadruple costs (i.e., 4 cm for every centimeter actually moved).

16.22 Medium Mud: All personnel stands move by paying double movement costs in addition to any other movement costs they must pay. All ground vehicles (except air cushion vehicles) move by paying quadruple movement costs in addition to any other movement costs they must pay. Thus, a tracked vehicle moving in a woods would pay double movement costs for the woods, and quadruple again for the medium mud, octupled total movement costs or 8 cm for every centimeter actually moved.

In addition, all ground vehicles (except air cushion vehicles) while moving cross country may become mired.

16.23 Heavy Mud: All personnel stands move by paying double movement costs in addition to any other movement costs they must pay. All ground vehicles (except air cushion vehicles) move by paying quadruple movement costs in addition to any other movement costs they must pay.

All ground vehicles (except air cushion vehicles) while moving cross country may become mired. In addition, wheeled vehicles may become mired when moving on unpaved roads.

16.24 Flooded Areas: Depending upon the scenario, the referee may choose to mark certain areas along rivers and creeks as flooded. Such areas may either be considered as impassible or as heavy mud, at the referee's discretion. In addition, flooded areas may block access to some bridges. As a general rule, the area within 5 cm of an impassible flooded area should be treated as heavy mud.

16.25 Mired Vehicles: At the end of each Movement Phase in which a vehicle that moves has a chance to mire, check the following chart. Roll 1D20 for the vehicle. If the die roll is equal to or less than the number indicated, it is mired. Recovery vehicles are exempt from having to roll on the Miring chart, below.

Miring

Vehicle Type	*Miring Roll Medium Mud*	*Miring Roll Heavy Mud*
Wheeled vehicle on dirt road	—	2
Wheeled vehicle off road	4	8
Tracked vehicle off road	2	4

A mired vehicle may not move until unmired, either with the help of vehicles or by itself.

Normally the check to mire is made at the end of a turn. If, however, a vehicle moves across an area where it can mire to an area where it is safe, it still must check at the point where it left the area.

Example: An wheeled armored car is moving down a hard road. It must leave the road and detour around a wreck onto heavy mud. Even though it will start and end the turn on a hard surface road where it is a wheeled vehicle safe from miring, it still must check at the point where it attempts to regain the road. On a roll of a 1 to 8, it will be mired.

16.26 Unmiring Vehicles: A vehicle may be unmired in one of the two ways. It may be pushed or pulled by another vehicle for at least 1 cm (per Rule 12.3). If this happens, the vehicle is unmired.

As an alternative, a vehicle may attempt to unmire itself. The vehicle must be given a *cautious advance* order and must spend its entire movement allowance in the attempt. A D20 is rolled, with a result of a 1 or 2 indicating that the vehicle is now free and may move 1 cm for this turn. Veteran or Elite crews may



subtract 2 from the die roll to unmire. The vehicle is free to move on the following turn, but may need to check on the following turn for miring again.

16.3 Snow

Snow reduces visibility and, depending on its duration, may restrict movement as well. The visibility effects of snow are covered in Rule 15.

The referee may make a table to determine the extent of the snowfall, as well as any changes in its type.

Snowfall
(roll each turn)

Die Roll	*Effect*
1-2	Light ceases, steady becomes light, heavy becomes steady, clear remains unchanged
3-9	No change
10	Light becomes steady, steady becomes heavy, clear becomes light

If snow continues for any length, it will affect the ground conditions. Count the number of turns that it has been snowing, with each turn of light snow counting as a half-turn and each turn of heavy snow as two turns. Check on the following table:

Snow Ground Conditions

Hours	*Result*
3+ hours of snow	Snow cover
6+ hours of snow	Deep snow cover

Note that the referee may determine as part of his scenario that it has been snowing a set number of turns before the start of the game.

16.31 Snow Cover: Snow cover affects the movement of all stands by doubling all costs, except for flying vehicles, air cushion vehicles and ground vehicles on roads. Vehicles on plowed roads may move normally with their road movement factor. Ground vehicles (except air cushion vehicles) moving on unplowed roads may not use their road movement factor, but are limited to their cross country factor. Thus, a tracked vehicle moving in a woods would pay double movement costs for the woods and double again for the snow cover. Thus, they would be paying quadruple costs (i.e., 4 cm for every centimeter actually moved).

Ski-equipped personnel stands and specially constructed snow-crossing vehicles (such as arctic tractors or animal-drawn sleds) ignore the terrain effects of snow and move normally.

16.32 Deep Snow Cover: Deep snow cover affects the movement of all personnel stands by doubling all costs. Vehicles on plowed roads may move normally with their road movement factor. Ground vehicles (except air cushion vehicles) moving on unplowed roads may not use their road movement factor, but are limited to their cross country factor. In addition, ground vehicles (except air cushion vehicles) must pay quadruple costs for any movement, including that on unplowed roads. Thus, tracked vehicles moving in a woods would pay double movement costs for the woods and quadruple again for the snow cover. Thus, they would be paying octuple costs (i.e., 8 cm for every centimeter actually moved).

16.4 Other Arctic or Winter Conditions

The following other arctic or winter effects may come into play in the course of a game, at the referee's discretion.

16.41 Frost: Frost reduces the effects of mud by one level. For every two hours of frost, reduce the mud level by one additional level, so that after three hours of frost heavy mud is reduced to light mud.

16.42 Ice: Ice affects the movement of all ground vehicles (except air cushion vehicles) by doubling their movement costs on all types of terrain, including roads. In addition, the formation of ice may allow stands to move across frozen bodies of water. The possible levels of lake ice thickness are expressed as the same weight classes as bridges (i.e., class I through class VI).

Note that class 0 ice is not open water, but water with a crust of ice too thin to support personnel. Also, note that one class of ice can blend into another level (up or down one) without necessarily showing any surface indications.

If a stand attempts to move on lake ice that is not frozen enough to support it, the stand breaks though the ice. Personnel stands take one hit and are moved back to the last place on the lake ice that could support them. Vehicles and towed weapons are removed from play.

In areas with snow cover, a frozen lake may be hidden by the cover and not visible, and will look as if it is a snow-covered clearing. In games where one side or both are not familiar with the terrain, these lakes will not be shown as such on the playing surface, but rather the referee will keep track of them on a map. The referee will check to see if a stand moving on to a snow-covered lake will break through the ice. Stationary personnel stands or any patrol stand will be able to determine that they are on a snow-covered lake and must be informed of this fact by the referee immediately when they end movement on the ice.



RULE 17: ALIEN ATMOSPHERES

The basic rules assume an Earth-type atmosphere. Unusual atmospheres have several effects. Some are on combat specifically, but most are general effects which can complicate any activity.

17.1 Weapons Effects

Atmospheric friction and opacity to bolts of energy can alter the performance of weapons. These changes are characterized as changes in range for purposes of penetration only and do not affect the difficulty levels of hitting targets at various ranges. Atmospheric taint does not affect these figures; only relative density does.

17.11 Plasma, Fusion and Slug Weapons: In Vacuum or Trace atmospheres, weapons use their short-range penetration number at all ranges. In Very Thin atmospheres, weapons use the penetration value for one range band less than the target is at. In Thin, Standard and Dense atmospheres, weapons use the normal printed values. In Exotic, Corrosive and Insidious atmospheres, they use the penetration for one range band farther than the target really is, except that fire at short range is not modified.

Atmosphere	*Weapons Effects*
Vacuum, Trace	Use short range penetration at all ranges
Very Thin	Penetration as one range band closer, but no effect at short range
Thin, Standard, Dense	Use normal values
Exotic, Corrosive, Insidious	Penetration as one range band farther, but no effect at short range

17.12 Lasers: In Vacuum, Trace, or Very Thin atmospheres, lasers use their short-range penetration number at all ranges.

In Thin atmospheres, lasers use the penetration value for two range bands less than the target is.

In Standard atmospheres, lasers use the normal printed values.

In Dense atmospheres, they use the penetration for one range band farther than the target really is.

In Exotic, Insidious and Corrosive atmospheres, they use the penetration for three range bands farther than the target really is. (I.e., they may only fire at short range and do so using the extreme-range penetration values.)

Atmosphere	*Weapons Effects*
Vacuum, Trace, Very Thin	Use short range penetration at all ranges
Thin	Penetration as two range bands closer
Standard	Use normal values
Dense	Penetration as one range band farther
Exotic, Corrosive, Insidious	Penetration as three range bands farther

17.3 Planetary Bombardment: Lasers and particle accelerators use different range bands for damage and penetration, based on the atmosphere type, as shown below.

Atmosphere	*Laser*	*Particle Accelerator*
Vacuum, Trace, Very Thin	Short	Short
Very Thin	Short	Medium
Thin	Medium	Long
Standard	Medium	Extreme
Dense	Long	Not allowed
Exotic, Corrosive, Insidious	Extreme	Not allowed

17.2 Personnel Effects

Worlds with Thin, Standard and Dense atmospheres are all breathable without additional preparation. Tainted atmospheres require personnel to use filtering systems, either masks on individuals or vehicle filter systems.

Worlds with Trace and Very Thin atmospheres require the use of oxygen tanks and eye and ear protection, or sealed vehicles with life support. Worlds with no atmospheres require the use of vacuum suits. Worlds with Exotic, Corrosive or Insidious atmospheres all require the use of oxygen tanks plus additional protection: eye protection in Exotic atmospheres, and vac suits, combat armor or battle dress in Corrosive and Insidious atmospheres.

Vacuum, Trace, Very Thin, Exotic, Corrosive and Insidious atmospheres are all collectively termed hostile atmospheres. Units in hostile atmospheres can take one fewer hits than in a nonhostile atmosphere. The first hit on Elite stands is marked with a yellow marker. The first hit on Veteran stands is marked with a red marker (and they are forced back and pinned). The first hit on both Experienced and Novice stands eliminates them.

17.3 Other Technical Effects

The following additional factors affect play of the game on alien worlds.

17.31 Communication: Worlds with Vacuum, Trace and Very Thin atmospheres do not have an ionosphere to reflect radio waves back to the planet's surface. As a result, all broadcast communicators (radios) become effective only while in line of sight of the target of the communication.

Staff radio stands may not convert operational commanders to strategic commanders. Although they can communicate with stands to which they have a direct LOS, operational commanders already have that capability.

Forward observers and spotters for indirect fire missions must have either a line of sight back to the firing unit or an uplink satellite communication link.

Exotic, Corrosive and Insidious atmospheres may have a high degree of radio interference, which can disrupt both broadcast and tight beam uplink communications on an irregular basis. As this can vary greatly from world to world; the referee is left to exercise unlimited discretion in this regard.

17.32 Air Breathers: No air-breathing machinery (such as



jet engines, internal combustion engines, etc.) can function on Vacuum, Trace, Exotic, Corrosive or Insidious atmosphere worlds. They can function in Very Thin atmospheres if fitted with specially designed intake compressors.

17.33 Airplanes: Aircraft cannot fly at all in Vacuum, Trace or Very Thin atmospheres, nor can they fly in an atmospheric density less than that of the world for which they were designed. For example, an airplane designed for use in a Standard atmosphere could fly in a Dense atmosphere, but not in a Thin atmosphere.

Exotic, Corrosive and Insidious atmospheres are all considered to have the same approximate pressure for this purpose, and all are denser than a Dense atmosphere.

17.34 Hovercraft: Hovercraft/air cushion vehicles cannot function in Vacuum or Trace atmospheres. Their movement allowances are quartered in Very Thin atmospheres and halved in Thin atmospheres.

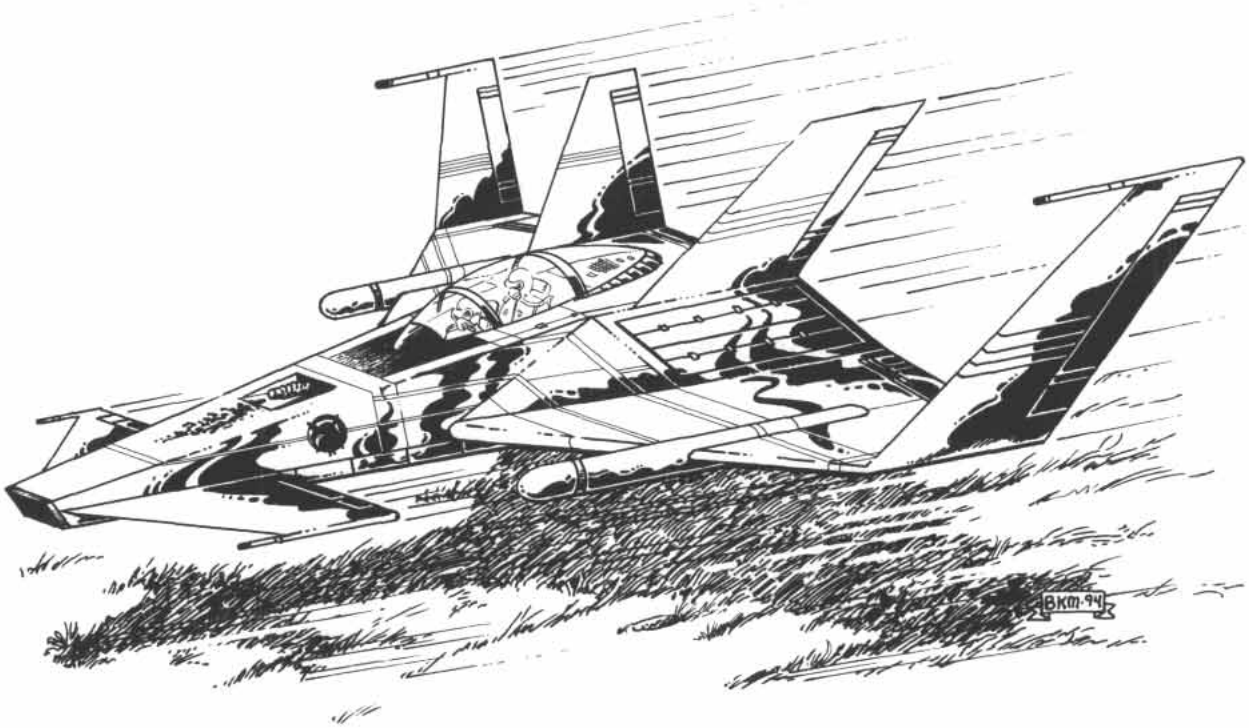
17.35 Maintenance: Exotic, Corrosive and Insidious atmospheres do cumulative damage to all vehicles and equipment. This is handled by increasing the maintenance points of vehicles in a unit, and thus increasing the need for maintenance personnel. This is only important in campaign games (see **Rule 24.2: Mechanics**).

In Exotic atmospheres, multiply the maintenance point value of all unsealed equipment by 1.5. In Corrosive atmospheres, double the maintenance point value, and in Insidious atmospheres, quadruple it.

Completely sealed vehicles and equipment, such as submarines, spaceships, and battledress, use the multipliers 1, 1.5 and 2, respectively.

Maintenance Point Multiplier

Atmosphere	*Unsealed*	*Sealed*
Exotic	1.5	Unmodified
Corrosive	2	1.5
Insidious	4	2





RULE 18: ENGINEERING

The following engineering rules are intended mainly for pregame or campaign purposes. The referee may allow a side to a set number of hours before the game starts to engage in engineering tasks. Players need to bear in mind that times given below represent ideal conditions and that they can be modified by terrain, weather and other considerations imposed by the referee.

18.1 Engineer Stands

Engineer stands are those that are equipped and trained to carry out combat engineering and combat construction tasks. They are listed as such in the relevant TO&E for various countries. In some cases, nonengineer personnel stands may help carry out specific engineering tasks, but those cases are specifically listed below. To replace one engineer stand at a task (where it is allowed), two nonengineer stands must be employed. Single-figure command stands, staff stands and pack animal stands may not be used for engineering purposes. Mounted stands (bicycle, motorcycle, grav cycle and cavalry stands) must be dismounted (per Rule 12.13).

18.2 Engineers and Bridges

As mentioned in Rule 11.31, there are six classes of bridges in the game system, labelled with Roman numerals I through VI. Portable bridging equipment is labelled in the same way. The bridge class represents the highest class of vehicle or towed weapon allowed to cross it.

18.21 Portable Bridges: Portable bridges are sets of prefabricated components designed for assembly on-site by engineers. A single unit of bridging equipment can be used to assemble a 2cm span of bridge of the unit's nominal weight, a 1cm span of bridge one weight class higher, or a 4 cm span of bridge of one weight class less.

Thus, a set of unit IV bridge equipment could be used to assemble 4 cm of class III bridge, or 2 cm of class IV bridge, or 1 cm of class V bridge. This upgrade or downgrade may only be done by one level. The class IV bridge noted above could be converted into twice as much class III bridge or half as much class V bridge, but not into four times as much class II bridges or one-quarter as much class VI bridge.

Each unit of bridge is carried on a vehicle or a trailer towed behind a vehicle. At lower tech levels, it is animal-drawn. At tech level 7 and above, special amphibious vehicles with the bridge unit built in can drive directly into the water and self-deploy.

Portable bridge units at tech levels up to 5 each require three stands of engineers to deploy and require one full hour per unit to place. If enough engineers are available, multiple units may be placed simultaneously.

Portable bridge units at tech level 6 and above each require a single engineer stand to deploy and require two turns per unit to place.

Self-deploying portable bridge units require only the vehicle crew to deploy and take only one full turn to place.

Bridges, ferries and other items of engineering equipment used to cross streams are limited to points where the riverbanks are gentle enough to allow for the loading and unloading of the equipment. Such places should be marked on the referee's map before the start of the game and revealed to players as the scenario dictates. Three engineer stands can build a ramp in nonsteep-sided river banks in one hour (12 game turns), or have an earthmover do the task in three game turns.

18.22 Building Bridges: Bridges may be emplaced using prefabricated components or built from locally procured materials. Materials for bridges of class I and II should be readily available in most places. Materials for bridges of higher classes should be increasingly scarce as the weight class rises. The number of stands needed and the time needed to emplace/build a bridge (in hours) is noted on the Bridging table below.

Bridging

Type	*Stands*	*Hours to Emplace*	*Hours to Build*	*Hours to Repair*
Class I	4*	1	3	1.5
Class II	4*	1	4	2
Class III	10*	2	6	3
Class IV	10*	2	8	4
Class V	16*	4	16	8
Class VI	16*	8	32	16

*Up to half the stands needed to emplace/build/repair a bridge may be nonengineer stands. However, the time needed to build the bridge is doubled if any nonengineer stands are used. Thus, a class V bridge could be built with two engineer stands and two infantry stands, but would take 32 hours to complete. Likewise, a class V bridge could be repaired with two engineer stands and two infantry stands, but it would take 16 hours.

18.23 Repairing Bridges: Bridges which are damaged due to artillery, aircraft or demolitions may be repaired, but a bridge may never be repaired to a condition better than its starting class. A damaged class V bridge may be repaired back to class V, but no higher. While the bridge is being repaired, it may not be used by any units.

Repairing stands must be continually in contact with the bridge and must not be fired upon; otherwise, the turn when firing is received does not count. The time needed to repair a bridge is listed in hours, as well as the number of stands needed to do the work, noted on the Bridging table above.

18.24 Ferries: Portable bridging equipment may be to used to assemble ferries to transport stands across a river. The number and type of ferries that can be assembled are dependent upon the bridge class: Each unit of bridge can only be converted into one ferry of the same class or two ferries of the next lower class. A class IV bridge, for example, could be used to make one class IV ferry or two class III ferries, but could not be made into a ferry of any other class.

A ferry may transport only stands of its own class or below,



and may only carry one stand across the river at a time (stands loaded into transport vehicles or stands carrying cargo count as one stand for this purpose). Bulk cargo may be carried on ferries provided a stand is present on each riverbank to load/unload (it takes half a turn to load/unload a ton of cargo).

A ferry can cross a river up to 25 cm wide in a half move, and up to 50 cm wide in a full move.

It requires half a turn to load/unload a ferry.

The time needed to assemble a ferry in hours, the number of stands needed to do the work, the ferry's cargo capacity and the number of hits required to sink a ferry are noted in the Ferry table, below.

Ferry Table

Ferry Class	*Stands*	*Hours to Build*	*Cargo Capy*	*Damage To Sink*
Class I	1	0.5	1	1
Class II	1	1	3	1
Class III	2	1	8	2
Class IV	2	1.5	20	3
Class V	2	2	30	4
Class VI	3	2	36	4

A ferry counts as a soft vehicle for the purposes of fire. Passengers or cargo on sunken ferries are removed from play unless the ferry is within 2 cm of the shore. If the ferry is within 2 cm of the shore when sunk, personnel stands take one hit and are placed on the shore (all cargo is eliminated).

18.241 Improvised Ferries: Any engineer stand may fabricate a class I ferry from locally available materials, even if the stand has no bridging equipment available, taking twice the time indicated on the table above. This represents a river crossing using improvised rafts from oil drums, logs, etc.

Larger ferries may be constructed from local equipment at the referee's discretion, at twice the time indicated above. Improvised ferries larger than class III should be extremely rare.

18.25 Vehicle-Mounted Bridges: Vehicle-mounted bridges take one-half turn to emplace once they arrive at the point where they are needed. These bridges cannot be used to cross any obstacle more than 2 cm in width, and they may not be converted into ferries. Vehicle-mounted bridges, once emplaced, are destroyed after taking three hits, regardless of their class.

The class of a vehicle-mounted bridge is indicated on the relevant data chart for the vehicle in question.

18.3 Assault Boats

Some engineer units also have access to inflatable or collapsible assault boats as specified in their organization charts. An assault boat may carry either one personnel stand (half, single or double-sized), one class I towed weapon without crew, or one ton of supplies. An assault boat moves 10 cm per turn. It requires half a turn to load/unload an assault boat.

Assault boats can be damaged by small arms fire, explosive fire and aircraft bombs. Armor piercing fire has no appreciable effect on assault boats. One hit is sufficient to sink an assault boat. Passengers or cargo on sunken assault boats are removed from play unless the assault boat is within 2 cm of the shore. If the assault boat is in within 2 cm of the shore when sunk, personnel stands take one hit and are placed on the shore (all cargo is eliminated).

18.4 Minefields

Minefields are laid by engineer stands. They are laid in 5cm by 5cm squares, with every ton of engineering supplies providing enough mines for eight such minefields. In addition, dummy minefields may be placed if the player so wishes (and do not require the consumption of any supplies). Minefields are always marked and visible to the enemy. The easiest way to show them in a game is to use 5cm by 5cm pieces of paper or cardstock, with "actual" or "dummy" written on the square. These are then placed with the writing side down on the playing surface.

When a minefield square is entered by any stand for the first time in a game, the minefield marker is turned over and revealed to be real or dummy. If it is real, it remains on the board; if it is a dummy, it is removed from play.

18.41 Laying Minefields: Minefields may be laid using a number of different techniques.

18.411 Manual Placement: In battle conditions, an engineer stand may lay out two real minefield squares as well as two dummy minefield squares per turn, or the engineer stand may lay out four dummy squares per turn. The stand must be given a *cautious advance* order, but does not move. The minefields must be placed within 10 cm of the location of the stand which is placing the mines.

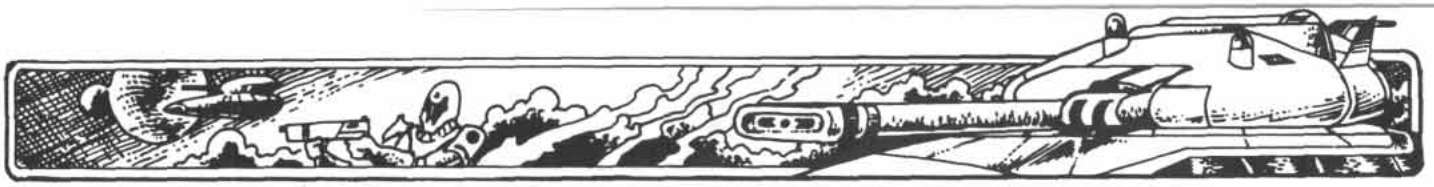
In nonbattle conditions, each engineer stand can construct up to eight actual minefields and eight dummy minefield squares, or a total of 16 dummy minefield squares in one hour.

18.412 Minelayers: Each minelayer can place 12 uncamouflaged or six camouflaged minefields per turn. Minelayers carry up to 30 minefield squares.

18.413 Mine Launchers: Mine launchers are a quick means of placing uncamouflaged minefields. Each launcher can hold up to eight mine squares, and place them in a single turn within 50 cm of the location of the launcher. All mines launched at the same time must be adjacent to one another.

The mines are launched in the General Fire sub-phase, subject to the normal movement and fire restrictions. The launcher need not place all the mines at one time, but may place some, move on the following turn, and place another field. Once empty, a mine launcher may be reloaded by an engineer stand in one turn.

18.414 Remotely Delivered Mines (RDM): Mines may be artillery or dropped by flying vehicles. RDM minefields are always 25 cm in diameter. The mine value listed for the round is its chance of obtaining a hit. Each round covers the area indicated by its burst radius. The uncamouflaged minefield covers an area 10 inches by 15 inches and may be either AP or AT. One round of each type of mine may be fired into the same



area to produce a mixed minefield. Artillery battalions of three weapons may deliver one minefield per turn; MLRS battalions may place two minefields per turn.

18.42 Minefield Attacks: At the instant that a stand enters a real minefield square, it is attacked. Regardless of the result of the attack, the stand may elect to cease movement for the remainder of the turn at that point. If so, it is not considered in the minefield, but halted at the edge. If the player elects to continue the advance through the minefield, a second attack on the stand occurs. If the stand moves into the same minefield on a following turn, it will suffer the results of the additional attack as well.

If a stand advances into a new minefield square as the result of its movement, the procedure is repeated.

18.421 Conventional Minefields: To resolve the minefield attack on a stand, roll 1D20 All vehicles and personnel stands are hit on a die roll of 1 or 2. The die roll result is halved if the stand is conducting a *rapid advance* and quartered if conducting *travel* movement.

Mines have no effect on towed weapons. Vehicles and personnel stands which take a hit from mines must check morale (in addition to suffering the hit).

18.422 RDMs: Remotely delivered minefields (RDMs) have a variable chance of hitting a stand passing through, based on the minefield value of the mine ammunition fired. If several shots are fired into an area, the values are added to determine the chance of a hit.

For example, a howitzer has RDM ammunition with a minefield value of 2. The howitzer fires two rounds at the same target. The resulting minefield has a value of 4, so any unit moving through it will be hit on a die roll of 4 or more.

18.43 Detecting and Lifting Minefields: An engineer stand may detect whether a minefield is real or a dummy by moving adjacent to the field and spending one turn there with a *cautious advance* order. At the end of the turn, the minefield marker can be turned over without causing any casualties on the engineer stand.

18.431 Manual Lifting of Mines: An engineer stand may clear a path through a real minefield by moving adjacent to the field, then spending two turns there with a *cautious advance* order. The stand is not attacked by a minefield while it clears its path. Once a path has been cleared, the minefield may be removed from the playing surface, as it is no longer relevant.

18.432 Mine Plows: Mine plows are mounted on tracked vehicles and each turn may be either in the "up" or "down" position. Mine plows in the up position do not affect the speed of the vehicle on which they are mounted. When placed down and in use, the vehicle's speed is halved, and there is a chance that the roller will be damaged. After the vehicle has passed through the minefield, roll 1D20, with a roll of a 1-6 indicating that the plow is damaged and can no longer be used. A vehicle with a damaged plow also takes a hit and moves at one-quarter speed until the damaged plow is jettisoned (which takes one full turn, during which time the vehicle must remain stationary and not receive fire).

18.433 Line Charges: Line charges are used to breach minefields. They are either mounted on vehicles or carried on trailers. Each weapon has four line charges, each of which may breach one minefield. To breach a minefield, the vehicle/trailer must start its turn adjacent to the minefield. Breaching minefield counts as direct fire and is resolved as a close-range attack. A successful attack opens a breach 5 cm deep and wide enough for vehicles to pass through in single file.

18.5 Fortifications

Stands may dig in for protection from enemy fire. The actual type of protection will depend on the time spent digging in, as well as the type of stand doing the work. Stands may not fire at enemy units on turns that they are digging fortifications. The time needed to carry out a task should be doubled in adverse weather or terrain conditions (at the referee's discretion). Fortifications may not be constructed in flooded areas, heavy mud or any type of permanent mud. Fortifications can be built in ground that may later turn to mud, and such a change has no effect upon them.

18.51 Digging In: Digging in is defined as foxholes, small slit trenches and similar field fortifications. Any personnel stand may dig in by remaining stationary for two hours at the same point. At the end of that time, the stand is considered to be in cover for purposes of small arms fire and morale as long as it remains in that location.

18.52 Constructing Fortifications and Obstacles:

18.521 Entrenchments and Weapons Pits: Four engineer or nonengineer personnel stands will produce one entrenchment or weapons pit in eight hours. One earthmover will produce one entrenchment or weapons pit in one hour.

18.522 Bunkers: An engineer stand may build a bunker in eight hours or convert two previously built entrenchments to bunkers in eight hours.

18.523 Tank Ramps: An engineer stand may construct one tank ramp in four hours. One earthmover may build one tank ramp in a half hour (six game turns).

18.524 Antitank Ditches: An engineer stand may build 1 cm of antitank ditch in four hours. An earthmover may dig 1 cm of antitank ditch in a half hour (six game turns)

An engineer stand may create a crossing point on an existing antitank ditch by moving to a point on the ditch and spending four turns there with a *cautious advance* order building the crossing point. An earthmover may construct a crossing point in one turn.

18.525 Barbed Wire: An engineer stand may place one ton of wire in one hour. Each ton covers 10 cm of frontage. Nonengineer stands may also place barbed wire, but at a rate of 5 cm per hour. Engineer stands may breach barbed wire by moving adjacent to the wire and spending one turn there with a *cautious advance* order. At the end of that turn, there is a gap 1 cm wide created in the wire.

18.526 Road Craters: An engineer stand may crater a road in one hour (12 turns), or an earthmover in three turns. The crater may be filled in by hand by an engineer in a half hour



(six turns) or by an earthmover in two turns.

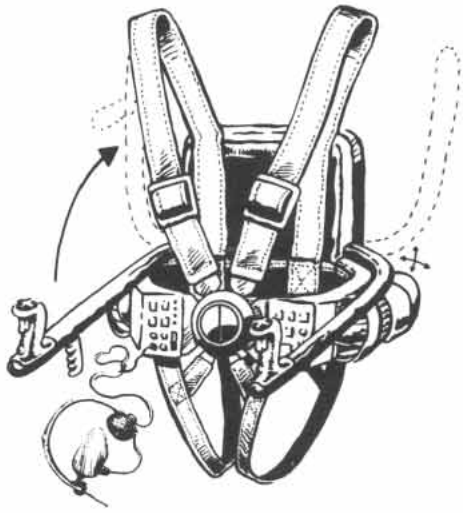
18.527 Abatis: An engineer stand in woods or forest may construct an abatis at a rate of 1 cm per turn when given a *cautious advance* order. Earthmovers can construct abatis at a rate of 4 cm per turn. Abatis is impassible to all stands.

An engineer stand may make a 1 cm breach in abatis in two turns. An earthmover may make a 1 cm breach in one turn.

18.528 Antivehicular Obstacles: These are specially built impediments to the passage of ground vehicles, such as dragon's teeth, steel I-beam hedgehogs, log jack-knives and similar obstacles. Ground vehicles cannot cross antivehicular obstacles.

An engineer stand can built 1 cm of antivehicular obstacles per hour, consuming one tenth of a ton of engineer supplies in the process. An engineer stand can clear a path through them at rate of 1 cm per turn, provided they do nothing else during that time. Earthmovers do not assist in building antivehicular obstacles, but can clear a path through them at the rate of 1 cm per turn.

18.53 Destruction: Earthmovers can be used to destroy a bunker, entrenchment, weapons pit, tank ramp or pillbox if they start the turn adjacent to it and spend a full turn there under a *full movement* order. At the end of the Final Fire subphase, the fortification is destroyed and its inhabitants eliminated if the earthmover has not been eliminated or forced back.



18.6 Demolitions

Demolitions may be emplaced on or in structures such as bridges or buildings. Each ton of demolitions will cause three points of damage when detonated. A class IV bridge, which needs 12 points of damage to completely destroy it, can therefore be destroyed by four tons of emplaced explosive.

An engineer stand may emplace one ton of demolitions in an hour. When a structure is prepared for demolition, the preparing player must specify a point from which the charge will be detonated. This point is where the detonating wires/fuses have been brought together, and may be on any side of the structure, as long as it is within 10 cm of it.

A player may attempt to detonate a prepared structure in either battle or nonbattle conditions. In any Fire Phase that a stationary engineer stand is present at the detonation point, it may attempt to set off the charge. The chance of success is the same as for a short-range direct fire attack to hit based on the type of stand that placed the charge. If stands placing the charge were of different troop quality, use the lowest troop quality for the die roll.

If the roll is unsuccessful, the player must reset the charges. The engineer stand at the detonation point must spend one turn stationary with a *cautious advance* order. The subsequent attempt to set off the charge will use the troop quality of the engineer stand that reset the charges.

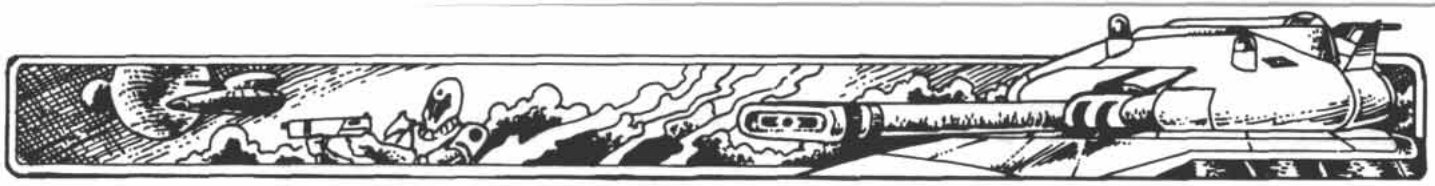
If an opposing engineer stand reaches the demolitions point, or any point directly between the demolitions and the detonation point, and remains there for one turn stationary, the wires are cut and the charge may not be detonated. The charge may only be reset if the enemy stand is driven off, then a friendly engineer stand regains the point held by the enemy stand and spends a turn stationary restoring the wire.

When the charge is set off, all stands in or on the structure are considered to have taken an HE attack equal to half the value of the damage points that will be caused, rounding fractions down.

The stands receive no cover modifier for the attack. If the structure is destroyed by the explosion, any stand on or in the structure is also destroyed.

18.7 Mobility Assistance

Breaks in the ground, such as creeks and gullies, can limit mobility of ground vehicles. Engineers may create a crossing point over such an obstacle in the same way as for an antitank ditch (see Rule 18.524 above).



RULE 19: ELECTRONIC WARFARE

Electronic warfare (EW) involves the use of radio and radar locators, radio and radar jammers, decoys, and other means of reducing a unit's detectability.

19.1 Direction Finders

Direction finders are used to detect the source of any active electromagnetic emissions. These include broadcast radio, radar, active EMS and lasers. Each direction finder is designed to detect and locate only one type of electromagnetic emission, so a radar locator may only locate radar emissions, not radio or laser. The exception to this is EMS direction finders, which may detect any form of emission. All passive EMS sensors have direction-finding capability.

19.11 Procedure: Locating the hostile emitter is a task using the accuracy values for the troop type operating the direction finder but using the range of the active emitter. All ranges are treated as being one range band closer than they actually are, so a direction finder has an extreme range equal to twice the extreme range of the active emitter being located.

For example, a direction finder is used to detect a radio communicator with a short range of 3 km. The actual range from the direction finder to the radio is 12 km, which is the long range of the radio. The detection task is resolved as a medium-range task using the asset of the crew operating the direction finder.

Each direction finder may make only one detection attempt per turn. This is usually made against the emitter which the detector has the best chance of locating (i.e., the closest, strongest signal). A player may deliberately attempt to locate a weaker signal instead, but suffers a +1 diff mod penalty for doing so.

19.12 Effects: Successful detection of an emitter allows the detecting player to discover the approximate location and power of the emitter, to fire an antiradiation missile in the current turn, or to call an indirect area fire mission on the emitter the following turn.

19.121 Anti-radiation Missiles (ARMs): An antiradiation missile is a special variety of homing missile designed to home on electromagnetic emissions. Firing procedure is the same as for other homing missiles, with the success roll being the same as it was to detect and locate the emitter. (A separate die roll is required for the actual missile fire, however.)

19.122 Area Fire Missions: An area fire mission called on an active emitter is fired using the normal procedure for such a mission. The chance of the mission being on target is the same as it was to detect and locate the emitter. (A separate die roll is required for the actual fire mission, however.)

19.13 Common Communicators: Different command levels routinely use different powers of radios to communicate. No radios are in use before tech level 5. At tech level 5, count each unit as being three command levels lower than on the following chart. At tech level 6, count it as one level lower. At tech levels 7 and 8, use the chart as printed. At tech level 9 and above, treat each unit as being one tech level higher than on the chart.

For example, a tech level 5 company has no radio available. A tech level 12 company has a 30km short-range radio.

Communicators

Level	*Short Range*
Squad	—
Platoon	3
Company	3
Battalion	30
Brigade	30
Division+	300

19.2 Jamming

Jammers broadcast a series of conflicting signals on a given frequency or frequencies to overwhelm or confuse other signals. Radio jammers disrupt communications, while sensor jammers make detection tasks more difficult.

19.21 Radio Jamming: Radio jamming takes place during the Command Phase and continues throughout the turn.

19.211 Procedure: Each jammer has a set of ranges, just as with weapons and sensors. The jamming player rolls the die once and then consults the success numbers for the different range bands. If the die roll is sufficiently low to succeed at a range band, the jamming is successful at that range band and all closer ones.

For each tech level the jammer is above or below the enemy radios being jammed, apply a – or +diff mod of 1.

For example, a Veteran crew mans a radio jammer with a short range of 3 km. Veterans have success numbers of 13 at short range, 6 at medium, 3 at long and 1 at extreme. The player rolls a 7, which is too high for medium, long or extreme, but is sufficient for a close-range success. All enemy radios within short range (3 km) of the jammer are jammed, if they are from the same tech level. No radios from higher tech levels would be jammed. Radios from one tech level lower would be jammed at a medium range (6 km), 2 tech levels lower at long range (12 km) and 3 tech levels lower at extreme range (24 km).

19.212 Effects: Radio jamming affects only stands which rely on radio for communication. Telephone and uplink staff stands, for example, are not affected, nor are any stands which have line of sight laser or maser communicators (and are communicating to someone in direct line of sight) or uplink tight-beam communicators.

All command stands being jammed and issuing operational or strategic orders must make a short-range task roll to successfully place the order.

All indirect fire accuracy rolls from units which rely on a jammed radio link between the observer and the weapons, observer and FDC, or FDC and weapons is conducted with a +1 diff mod.

Whenever a jammer is in use and the opposing side has a radio locator, the jammer is automatically located.

19.22 Sensor Jamming: Vehicles equipped with jammers



may attempt to jam enemy units which are attempting to detect the vehicle. Specially equipped electronic warfare vehicles with jammers may attempt to jam enemy units which are attempting to detect any friendly unit within the short range of the jammer mounted on the vehicle.

Jammers consist of radar jammers and EMS jammers. Radar jammers may only be used against hostile radars, while EMS jammers are used against either radars or active EMS sensors.

19.221 Procedure: The jamming task is rolled once for each enemy sensor attempting to detect the target. The success of the task is based on the range from the jammer to the detecting unit and the quality of the crew manning the jammer. The difference in tech level between the jammer and sensor (if any) is applied as a + or - diff mod to the jamming attempt.

19.222 Effect: If the jamming attempt is successful, the detection attempt is made with a +1 diff mod.

19.3 Sensor Decoys

Many vehicles are equipped with sensor decoys. These consist of a mix of anti-laser aerosols, chaff (light-weight strips of radar-absorbing or radar-reflecting material) and flares. These decoys are designed to confuse sensors, target designators and rangefinders which rely on lasers, active electromagnetic emissions (such as radar) or detection of infrared radiation.

19.31 Systems Affected: All detection attempts using radar, active or passive EMS, ladar and HRT are affected by decoys. All target designation attempts using lasers or active EMS are affected by decoys. All direct fire attempts by tech level 7+ large-caliber guns (which rely on laser or active EMS rangefinders) are affected by decoys.

19.32 Effects: Decoys cause affected firing and detection tasks to be carried out with a +1 diff mod if from the same tech level. If the decoy is from a higher tech level than the sensing or firing unit, the task is carried out with a +2 diff mod. Decoys from lower tech levels than the sensing or firing unit have no effect.

19.33 Limits: Vehicles have a limited number of decoys, listed in parentheses on the vehicle card. That is the number of turns that a vehicle may use decoys. Each turn in which any affected sensor or fire attempt is made, the vehicle automatically fires decoys unless the owning player deliberately abstains.



TL 9
3000 KM
Communicator

19.4 Stealth and EMM

Stealth and electromagnetic masking (EMM) are both means of reducing the signature of vehicles versus certain common sensors.

19.41 Stealth Vehicles: Some vehicles are listed as being stealth designs. Spotting attempts made against stealth vehicles using radar or thermal/IR sensors are made with a +1 diff mod. If the stealth design is from a higher tech level than the sensor, the detection roll is made with a +2 diff mod.

19.42 EMM: Electromagnetic masking is an advanced form of stealth design. EMM-equipped vehicles will apply a diff mod of +1 or +2 (depending on the vehicle) to detection attempts against it using thermal or radar and may apply a +1 diff mod versus active or passive EMS (again depending on the vehicle). The exact diff mods applied are noted on the vehicle's data entry.



RULE 20: METEORIC ASSAULTS

Meteoric assaults from orbit by means of drop capsules require planning and forethought. In most cases, meteoric assaults will occur at the start of a scenario, and in all cases should have a mission order drawn up in advance either by the players or the referee.

All personnel stands, class I towed weapons and supplies may be dropped by drop capsule. Vehicles and towed weapons of class II or heavier may not be dropped by drop capsule. Animals (cavalry stands, pack animals or animal-drawn vehicles) may not be dropped by drop capsule. Supplies are dropped in one-ton increments.

20.1 Mission Orders

The mission order needs to indicate the specific stands comprising each "stick" of drop capsules, the turn or arrival of each stick, and the drop zone for each stick.

A stick may consist of as many or as few stands as desired, but as a practical matter should seldom exceed 10.

Each drop zone center must be at least 50 cm from any other drop zone center. No more than one stick may use a single drop zone in the same turn. If the drop is to be spread out over several turns, each turn of the drop must be specified and planned in advance.

20.2 Fire at Drop Capsules

Ground-based weapons may fire at drop capsules, but some drop capsules are outfitted with decoys and other countermeasure devices to avoid this fire.

20.21 Allowed Weapons: Only plus penetration weapons may fire at drop capsules; small arms may not.

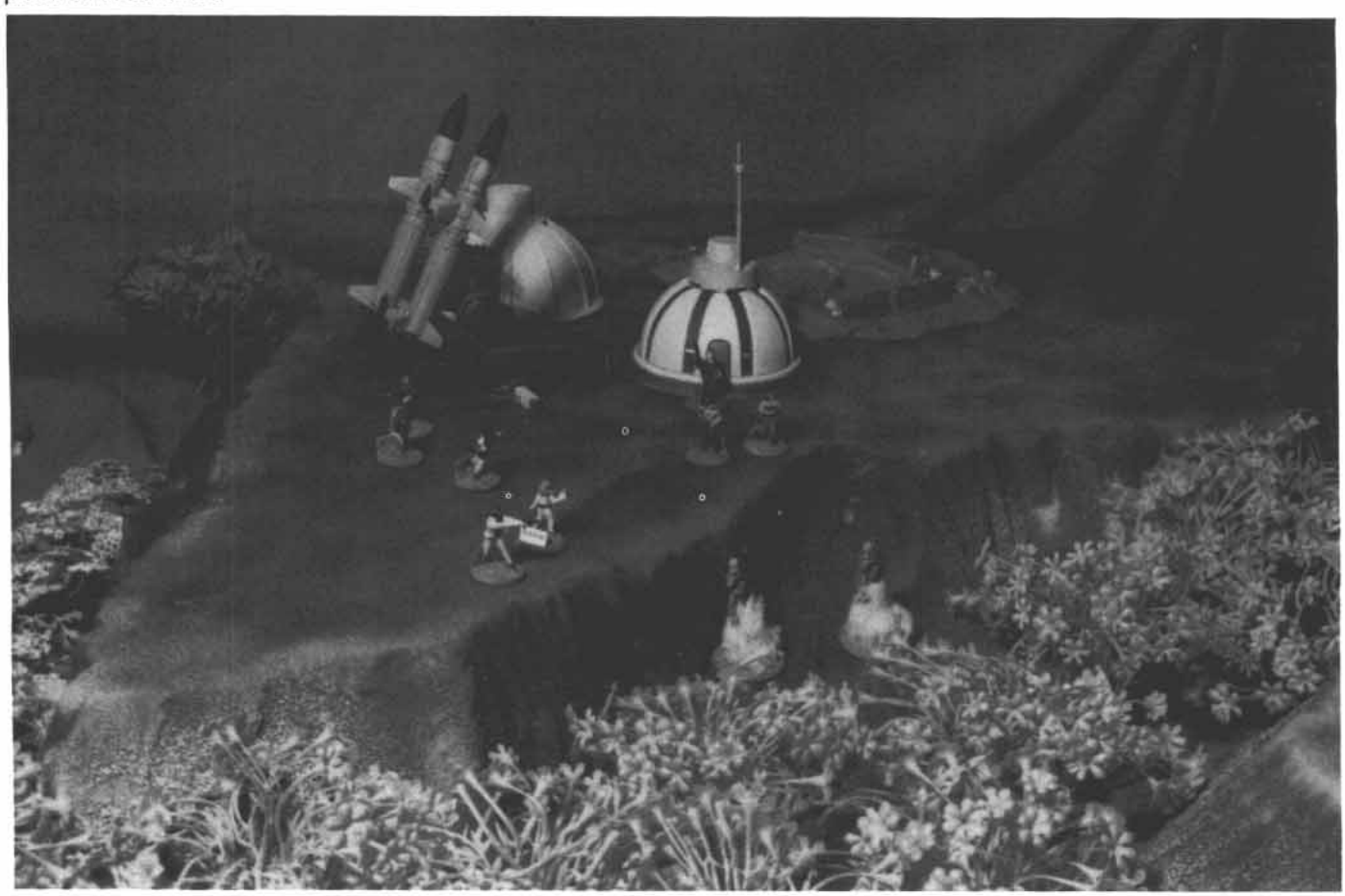
20.22 Range: Weapons firing at drop capsules measure their range to the point of landing and then add 20 cm.

20.23 Agility: Drop capsules in reentry (when fired upon by long-range planetary defense missiles or beam weapons) have an agility of 9, plus or minus the difference in tech levels between the drop capsule and the fire control of the firing weapon. When landing (and fired on by weapons deployed on the gaming table), they have an agility of 4, plus or minus the tech level difference.

Some drop capsules have limited evasion ability, while others do not. Weapons with point defense fire control double their fire control bonus when firing at nonevading drop capsules.

20.24 Decoys: Some drop capsules have decoys. For the effects of decoys, see Rule 19.3.

Each hit on a drop capsule causes a hit to the stand carried by the drop capsule, but has no other effect.





20.3 Drop Capsule Landings

Drop capsule landings are resolved out in the following manner. Each stand should have a 2cm by 2cm square of paper prepared, marked with its unique designation. Gun crews and weapons which are dropped by air should have a separate square for the crew, ammunition and weapon. The squares should be placed on a ruler or yardstick, with the number up or down as the player wishes, in whatever sequence is desired, their edges touching but not overlapping. The ruler should be placed at the drop zone, with the end of the ruler placed at the drop point and the ruler aligned along the flight path. The ruler then is turned over to dump the squares, which should be allowed to flutter to the playing surface unhindered.

The distance above the playing surface the ruler is held will be determined by the troop quality of the troops making the drop. The heights for each stand troop quality level are shown below.

Meteoric Assault Drop Height

Type	*Height*
Elite	15 cm
Veteran	30 cm
Experienced	60 cm
Novice	120 cm

Squares that fall with the marked side up are replaced by their actual stands and a P1 marker. Squares that fall with their marked side down are given a P2 marker. Squares that fall with their marked side down in woods/forest, buildings or swamps, take one hit and a P2 marker.

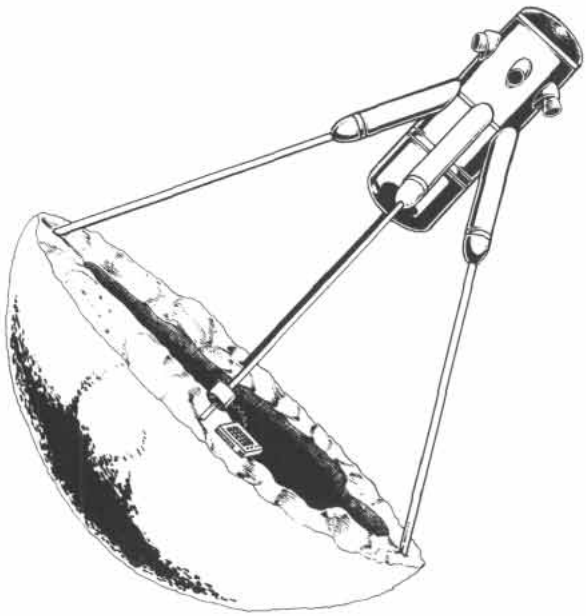
If a square falls marked side down in a lake or deep body of water, then that stand is eliminated and removed from play, unless the troops are equipped with battledress, vac suit or some other form of oxygen apparatus. If so equipped, the stand is placed on the nearest point of land, takes one hit and is marked with a P2 marker.

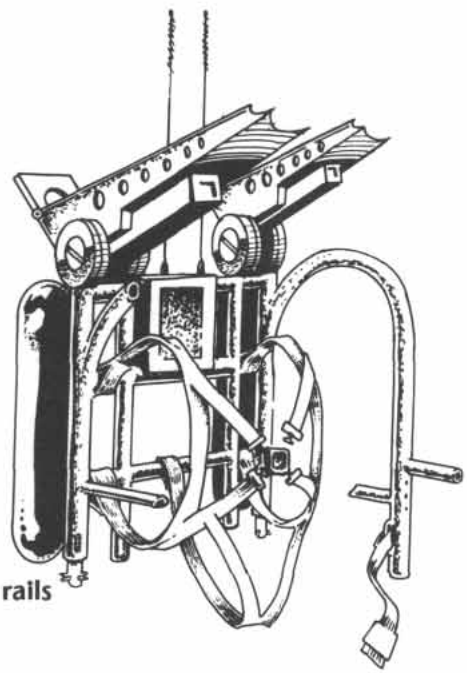
If the square falls number side up in a lake or deep body of water, the stand is placed on the nearest point of land, takes one hit (unless equipped with battledress or some form of oxygen apparatus) and is marked with a P2 marker. If so equipped, it is placed on the land and is marked with a P2 marker, but does not take a hit.

Squares that fail to land on the playing surface are considered to be lost en route, and are removed from play.

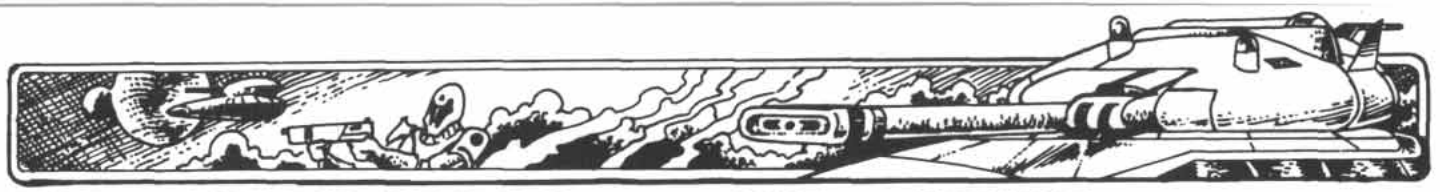
20.4 Armed Drop Capsules

Some drop capsules include missile launch rails for Tac missiles, and once landed, they become fixed missile launchers. Mark the location of these launchers on the map. Each has a limited number of missiles, as specified by the scenario or capsule description.





Parachute harness with missile launch rails



RULE 21: NUCLEAR WEAPONS

Some weapons in the game, mostly missiles, mount nuclear warheads.

21.1 Nuclear Warhead Effects

Nuclear warheads are explosive rounds which do damage as a conventional explosive, with several important differences.

Most explosive rounds have an EP (explosive power) and burst radius (BR) value. Nuclear rounds have these as well (and nuclear rounds always have an EP value of 18). In addition to an explosive power, however, nuclear warheads also have a destruction radius. All stands, weapons, vehicles and structures within the destruction radius of the warhead are eliminated from play. Masonry buildings are reduced to rubble.

21.2 Nuclear Dampers

Because nuclear warheads are hellaciously deadly, most advanced armed forces employ nuclear damper units to protect conventional forces.

Nuclear dampers fire at incoming nuclear warheads using the same procedure as point defense weapons. Nuclear dampers only have a single range, and this is listed under the medium-range column, as all nuclear damper attacks are made using the asset score for medium range. In addition, no diff mods for missile agility are applied. Instead, the only diff mods are a +1 or –1 diff mod per tech level difference between the damper and the warhead.

For example, a tech level 14 damper firing at a tech level 15 missile would use the long-range asset value instead of medium range.

A successful damping roll renders the warhead harmless.

21.3 Lingering Radiation

Nuclear warheads which strike the ground irradiate the soil and leave a high level of residual radiation. For purposes of this rule any warhead fired at a personnel stand on the ground or using NOE movement, a ground vehicle, or a flying vehicle using NOE movement counts as striking the ground.

The radius of lingering radiation of a nuclear warhead is the same as the destruction radius of the warhead. This can be marked with model craters, cut out templates, or just pieces of string if you are particularly lame.

All unprotected units which pass through an area of lingering radiation take a hit. Unprotected units include all personnel stands not in battledress and all open vehicles. Enclosed vehicles do not take damage, nor do personnel in battledress.

All personnel in combat armor and combat environment suits may make saving throws against the radiation damage, using the normal saving throw number of their armor. Personnel stands in other types of armor may not make saving throws.

Nuclear damper units may be used to reduce the long-term environmental hazards of lingering radiation, but have no effect on lingering radiation during the course of a miniatures game scenario.

RULE 22: PSIONICS

Psionics, the ability to harness the extraordinary power of the mind, is widely used in the Zhodani Consulate and, since the collapse of the Third Imperium, has come into wider use in formerly Imperial space. The following rules cover the effects of psionics on combat.

22.1 Teleportation

About 20% of psionic combat specialists can teleport. Psionic teleporters simply appear behind enemy lines. They cannot teleport between positions of dramatically different altitude, so this technique cannot be used to assault from orbit. It is nevertheless a dramatic and effective means of introducing commandoes.

Each teleporter must have a clear mental image of his destination, so each platoon has a "director" present. The director is an adept clairvoyant and telepath who can clairvoyantly scan the target area and then telepathically impress that image on the teleporters.

In order to teleport, a stand must be given a *travel* order. Teleporting into a combat situation, assuming the psion does so from a secure area, is assumed to take place without mishap. Teleporting out again is a task roll conducted as if making a direct-fire attack at long range. Failure means that the stand remains in its original location (but suffers all of the effects of a *travel* order).

22.2 Scramblers

About 20% of psionic combat specialists are "scramblers," gifted telekinetics who pin down enemy stands in preparation for an assault. They accomplish this by telekinetically pulling pins on grenades, squeezing triggers, etc.

Scramblers have an ROF at each different range which is used exactly like a direct fire weapon, except that a "hit" causes no damage, but instead places a Pin-1 marker on the stand.

22.3 Recon

About 40% of psionic combat specialists are recon troops. Each recon specialist is a clairvoyant trained to spot hidden enemy units in likely areas of concealment. Recon specialists have a clairvoyant "sensor" rating used for spotting which is used like any other sensor. Clairvoyant spotting attempts are unaffected by night, weather, smoke, cover or any other normal spotting +diff mod.

22.4 Intel

About 20% of psionic combat specialists are intel officers used to interrogate prisoners using deep mental probes. This has no effect on the tactical battlefield, as virtually all troops facing psionic opponents equip at least their command personnel with psionic shielded helmets.

RULE 23: FORCE COMPOSITION

While players will seldom be in a position to raise, train and equip an army from scratch, they will often come in contact with armies. The following guidelines can help the referee determine the general type of army available to a planet, country or small settlement.

23.1 Army Size

Warlike governments will average about 1% of their populations in the armed forces, while peaceful governments will average only about 0.25% of the population under arms. Governments (worlds or nations) with a population of 1 billion or more halve the percentages listed above.

Not all the armed forces will be in the army, but a substantial part will. Up to 10% of the total will be in the wet navy, and about 20 to 30% will be in the air force (if the world has a tech level high enough to have an air force). The balance will be in the army.

23.11 Number of Units: Instead of dividing the total number of men and women under arms by four to determine how many "stands" there are, then trying to organize them from the ground up, it is much easier to describe the army from the top down.

The army has one division equivalent in service for every 20,000 personnel. For smaller forces, it is more convenient to deal with battalions. Armies have one battalion equivalent for every 2000 personnel.

This does not mean that the troops on a world are necessarily organized into traditional battalions or divisions. They may be grouped into legions, hordes, maniples, tercios, columns or any variety of units. The terms above are used to give a rough idea of the equivalent combat power of the force.

23.12 Unit Strength: A standard "division equivalent" usually consists of 10 maneuver battalions (of about 500 personnel each), 10 support battalions (of 500 each) and up to 10,000 other support personnel not present with the division, but in the military infrastructure.

In smaller armies, a standard "battalion equivalent" usually consists of one maneuver battalion, one support battalion and up to 1000 other personnel in the supporting military infrastructure.

Maneuver battalions are close combat units, including infantry, cavalry, armor, airborne, commando, etc. Support battalions include both combat support (combat engineers, field artillery, air defense artillery, antitank artillery, coast defense artillery, fortress artillery, etc.) and noncombat support (signal, forward supply, transport, maintenance, military police, etc.). Infrastructure includes medical, veterinary, administrative, training, theater and rear area supply, judge advocate general, and general staff personnel.

23.2 Troop Quality

Troop quality is measured by the NPC types who man the unit and the unit's morale. These are determined by the type of society which raises the army. Societies for the purpose of this rule are divided into primitive and advanced as well as into warlike and peaceful.

Primitive societies are generally those which do not have a sufficiently developed technological or industrial base to support space travel. As a rough rule of thumb, societies at tech level 9 and above are advanced, while 8 and below are primitive.

Warlike does not necessarily suggest an aggressive society (although that would certainly qualify as warlike), but can simply indicate a society frequently called upon to defend itself.

Most societies on Balkanized worlds are "warlike," while a government which ruled an entire world and was not called upon to engage in combat very often would be considered "peaceful."

23.21 NPC Type: The following table lists the proportion of units in an army made up of each of the four different NPC types. In general, a unit will be made up almost entirely of the same troop types (with an occasion higher experience stand or group of troops as scouts, leaders or cadres).

Troop Quality

Type	*Novice*	*Experienced*	*Veteran*	*Elite*
Prim. peaceful	75%	25%	—	—
Prim. warlike	60%	30%	10%	—
Adv. peaceful	40%	50%	10%	—
Adv. warlike	—	40%	50%	10%

23.22 Morale: Morale is a function of NPC type as modified by whether the world is peaceful or warlike. A variety of other factors can also affect morale, so the referee should feel free to change the morale rating of the unit by several points up or down from this base.

The table below gives the average morale of each NPC type from peaceful and warlike societies.

Troop Quality

Type	*Novice*	*Experienced*	*Veteran*	*Elite*
Peaceful	10	12	14	18*
Warlike	12	14	18	20

*Peaceful armies do not routinely have Elite NPC units, but may develop them as a result of prolonged combat. See the experience section below.

23.23 Leaders: Separate commanders and combined command stands are available in greater numbers at higher tech levels. The following chart shows which levels have combined command stands and which levels have separate single-figure command stands. The level shown with a separate command stand is the lowest level having that type of stand; all levels above it also have separate command stands.



Leadership Level

TL	*Combined*	*Separate*
1-3	Battalion	Brigade+
4-6	Company	Battalion+
7-9	Platoon	Company+
10-12	Squad	Platoon+
13-15	—	Squad+

All combined command stands are tactical commanders. All single-figure command stands from company level and above are operational, while all from platoon level and below are tactical.

Command vehicles (such as command tanks) are either operational or tactical, depending on their command level and tech level. Tech level 4-6 company command tanks, for example, are tactical command stands (since if personnel they would be a combined stand), while battalion command tanks at the same tech level would be operational command stands.

23.24 Increasing Experience: At the end of every campaign week in which a unit fought one or more combats, elements of the unit will be promoted in terms of combat proficiency. Ten percent of the surviving stands in the unit will increase one proficiency level. In addition, the number of surviving leaders in the unit will increase by 10%, either by adding additional single-figure command stands or by converting noncommand fireteams to a combination command stand.

The exact stands promoted in experience and/or leadership will be determined by the referee.

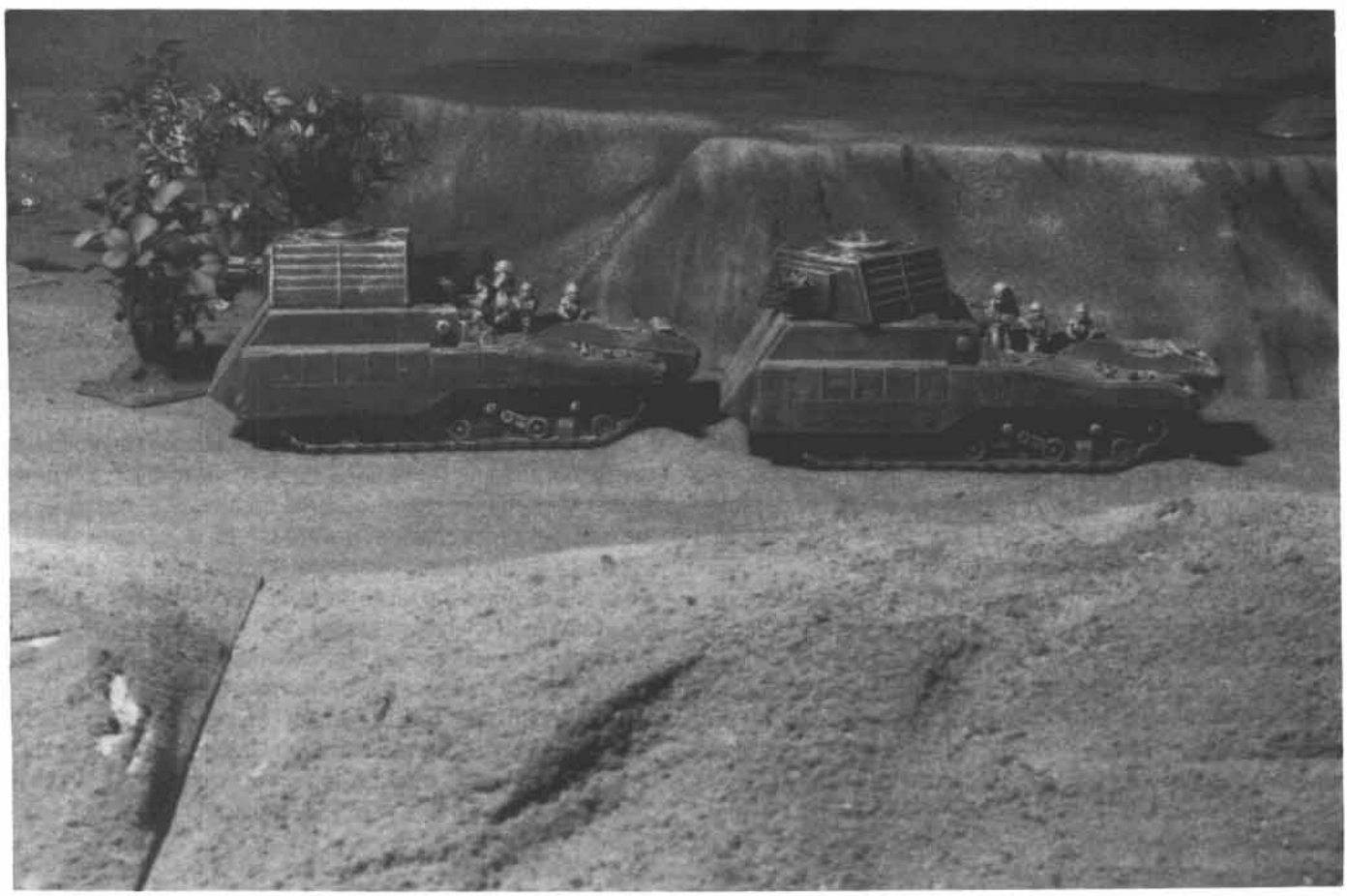
23.3 Equipment

Although there is vast variety of equipment possible at different tech levels, some rough direction is possible. Units with good equipment tend to have the highest tech level gear available (if material from multiple tech levels is available) and tend to be more heavily armed, have more armored vehicles, have a higher level of mobility, etc. Poorly equipped troops are almost invariably on foot and have only the most primitive and light weapons available. They are usually used as local defense troops and are not suitable for offensive operations.

The following table is a guide to the proportion of equipment levels in typical armies.

Equipment Level

Type	*Poor*	*Average*	*Good*
Primitive	60%	30%	10%
Advanced	40%	50%	10%





RULE 24: SUPPORT PERSONNEL

The basic TO&Es provided in the book are intended to represent the combat elements of a unit only. When fighting a campaign, however, it becomes more important to take into account the "tail" as well as the "teeth" of a unit.

24.1 Medical Personnel

Medical personnel tend to battle casualties when the unit is engaged in combat missions and monitor the general health of the unit the rest of the time.

24.11 Required Personnel: All medics are noncombatants and may not be used for offensive combat missions. Medics are sometimes armed for self-defense, however, and in some combat environments they are required to fight to protect themselves or their wounded. All combat units requires the following medical personnel:

A unit needs one single-figure medic stand per 10 nonmedic stands (with each single-figure nonmedic stand counting as a quarter of a stand).

A unit needs one dressing station (one fireteam stand of medics which will include one doctor) per 20 nonmedic stands (with each single-figure nonmedic stand counting as a quarter of a stand).

Larger units (brigades and higher) need a field hospital with one stand of medical personnel per 40 nonmedic stands (with each single-figure nonmedic stand counting as a quarter of a stand).

24.12 Effects: Failure to provide sufficient medics will cause the morale of the unit to go down after its first time in combat. Morale will drop by 1 if more than half of the required number of medical stands are in the unit, or by 2 if fewer than half of the required number of stands are provided.

Failure to provide sufficient medical personnel will also cause a deterioration in the unit's health. Before beginning a battle, roll 1D20. The result is the percentage of the stands in the unit which are not present due to sickness. In particularly healthy environments, halve the die roll. In particularly unhealthy environments, double it. The referee determines which stands (usually chosen randomly) are missing.

24.13 Wounded: Whenever a crew stand or fireteam stand is eliminated or a vehicle destroyed, a wounded figure is placed on the table in place of the removed stand. Whenever a single-figure stand is eliminated, roll 1D20. On a roll of 1-5, a wounded figure is placed on the table.

Wounded figures may not move by themselves. Wounded figures may be moved by any other stand, however, including single-figure stands.

Units conducting covert raids or fighting particularly hated or feared enemies will suffer a reduction in morale for leaving wounded behind. Leaving one or more wounded behind will cause a reduction in unit morale of 1. Leaving wounded figures behind equal to 10% of the force's original strength in fireteam stands (with single-figure stands counting as a quarter stand) will cause a morale reduction of 3.

Over the course of an extended campaign, most wounded will return to duty. A returning soldier can be used to replace a single-figure stand or one quarter of a fire team/crew stand.

At tech level 5 and below, one actual soldier will return to duty per recovered wounded figure. The recovered soldier will return to duty after one week.

At tech levels 6 through 10, two actual soldiers will return to duty per recovered wounded figure. The first soldier will return after one week and the second after three weeks.

At tech level 11 and above, three actual soldiers will return to duty per recovered wounded figure. The first soldier will return after one week, the second after three weeks and the third after six weeks.

24.2 Mechanics

All units with any sort of sophisticated machinery require mechanics to provide routine maintenance on vehicles and repair combat damage.

24.21 Required Personnel: Each piece of major equipment in the game has a maintenance point associated with it (as listed in the data annex). One mechanic is required per 50 maintenance points worth of equipment. Mechanics may be in single-figure stands or four-man fireteam stands, whichever is most appropriate to the organization.

One mobile workshop (vehicle-mounted) and a one-ton replacement parts trailer must be provided for every 20 mechanics. Mechanics may serve as vehicle drivers for their own transport vehicles.

24.22 Effects: Failure to provide sufficient maintenance personnel results in vehicles and weapon systems becoming nonoperational.

For each 10% shortage of maintenance personnel, a unit suffers a 1% breakdown rate each week. The referee chooses equipment with a maintenance point total equal to 1% of the unit's total requirements and declares it to be inoperative. If desired, the referee may give a percentage chance of breaking down to a piece of equipment with a larger maintenance point number. A unit which would lose 5 points worth of equipment might instead have a 50% chance of losing a single 10-point item of equipment.

In addition to the above, during each week of intense combat or training operations, equipment totaling 5% of the unit's maintenance point total will break down, regardless of the number of mechanics available.

24.23 Repairs: Repair of broken-down equipment takes one week and requires the same number of maintenance points as maintaining it. Mechanics employed repairing broken down equipment, however, are not available for routine maintenance, so may increase the unit's maintenance deficit.

Any vehicle damaged in combat (one or more hits suffered) may be repaired in one day. Any vehicle disabled in combat (all of its hits suffered) may be repaired in one week. Vehicles destroyed in combat may not be repaired.

24.3 Cooks

Cooks provide hot, nutritional and (hopefully) palatable meals to troops in the field.



24.31 Required Personnel: One four-man fireteam stand of cooks and one field kitchen is required for every 50 stands in a unit (with each single-figure noncook stand counting as a quarter of a stand).

24.32 Effects: Troops who do not receive a hot meal for three consecutive days have their morale reduced by 1 until they do receive a hot meal. Troops in cold or inclement weather have their morale reduced by 1 each day that they do not receive a hot meal. Note that in cold and inclement weather this can quickly destroy the morale of the unit. One hot meal, however, will restore the unit's morale.

24.4 Veterinarians

Veterinarians look after the health of the animals in a unit. This is particularly important in lower-tech units.

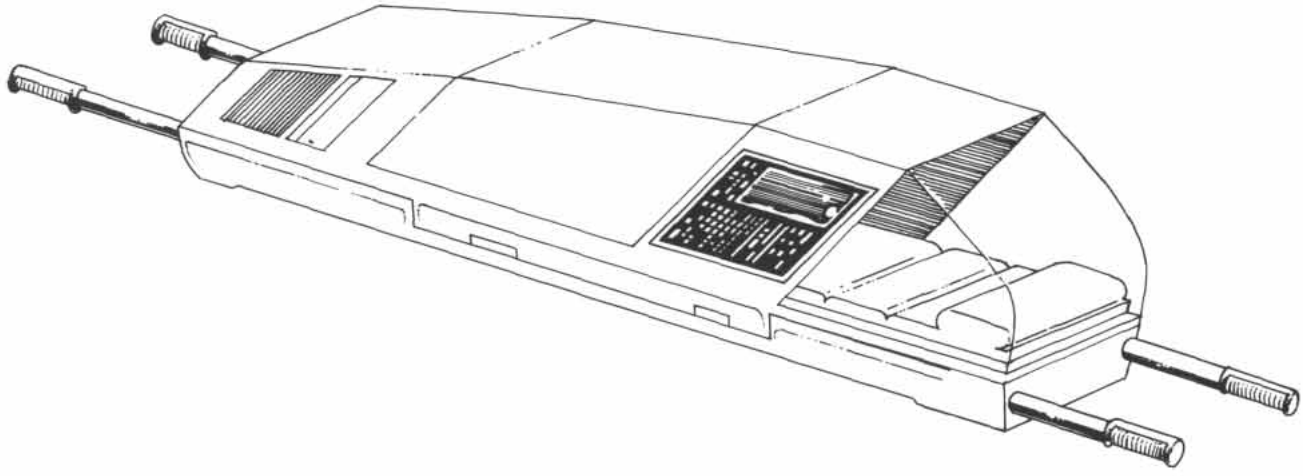
24.41 Required Personnel: One veterinarian is required for every 10 stands of animals (either cavalry or horse-drawn vehicles) in the unit, with single-figure stands (such as mounted commanders or scouts) counting as a quarter stand. In periods of intense heat, cold or inclement weather, one veterinarian is required for every five stands of animals.

Veterinarians may be grouped into larger four-man fireteams for larger units.

24.42 Effects: If insufficient veterinarians are present in the unit, the unit will lose 1% of its animals (but at least one stand worth) per week until the number of animals is reduced to the correct veterinarian-to-animal ratio. In periods of intense heat, cold or inclement weather, the attrition rate increases to 5% per week until the correct ratio is restored.

24.5 Force Composition

The figures given earlier on force composition apply to combatants in the force structure. If support personnel are added to the force, all are considered Novices (for combat purposes) and do not affect the ratios laid out previously for combatant troops.





RULE 25: CAMPAIGN MOVES

When fighting out an extended campaign, it is useful to have a set of simple but comprehensive rules for resolving strategic movement, scouting, supply, etc. This rule is intended to serve that function.

25.1 Scale

Each campaign turn represents eight hours of time. Movement and combat are plotted on maps using a 20km hex grid scale.

Campaign units may range from companies, or even smaller detachments, up to divisions, with battalions being the most common force in most campaigns.

25.2 Turns

In each eight-hour turn, players give orders to friendly units and, in most cases, the friendly units act on those orders.

Movement is simultaneous by both sides and adjudicated by the referee. Following movement, the referee resolves all detection and sets up battle games, if any battles are to be fought out.

Note that since movement is simultaneous and combat can occur when opposing units enter the same hex, it will sometimes be necessary to pro-rate movement by all units and move them hex by hex to determine if opposing units are in the same hex at the same time.

25.3 Detection

Players should not be told the location of enemy ground combat units unless they are detected by a friendly unit in communication with other friendly units (and ultimately the players).

Detection of aircraft by electronic sensors or detection from orbit is resolved using the normal detection rules in the game.

A special procedure is used for detection of ground units by hostile ground units, however.

Detection takes place when two opposing units enter the same hex.

Units moving by road or in high mode are automatically detected. Other units may be detected if a successful task roll is made.

Detection is resolved immediately, as detection of an enemy unit may stop movement and initiate combat. Detection is a standard task roll using the asset level of the average NPC quality of troops in the unit (Elite=15, Veteran=13, Experienced=11, Novice=9, as noted on **The New Era** page 59). Detection is a Difficult task, and the difficulty level is modified as shown on the following table. The terrain occupied by the unit affects the difficulty of detection. The difficulty levels are noted on the Terrain Effects chart on the following page. For other modifying conditions, +numbers are increases in the difficulty level, while –numbers are decreases.

Detection Modifiers

Condition	*Modifier*
Heavy detecting unit	+2
Medium detecting unit	+1
Target less than a battalion	+1
Light target unit	+1
Night or inclement weather	+1
Detecting unit deployed	–1
Target a division or more	–1
Heavy target unit	–1
Every two tech levels detector is above target	–1
Terrain	See Terrain Effects chart

25.4 Mobility

Units' movement is expressed in hexes moved per eight-hour turn. The mobility of the unit is determined by the travel movement of the slowest vehicle in use in the unit. Divide the **Traveller** travel movement rate (in kilometers) by 25 to determine the mass combat system movement in hexes per turn.

The following table lists common movement allowances for low-tech units and may be used as a general guide to movement rates of hostile forces. The first number is the number of hexes moved per turn on a road or, in the case of helicopters and lift units, in high mode. The second number is the number of hexes moved cross country or, in the case of helicopters and lift units, in NOE mode.

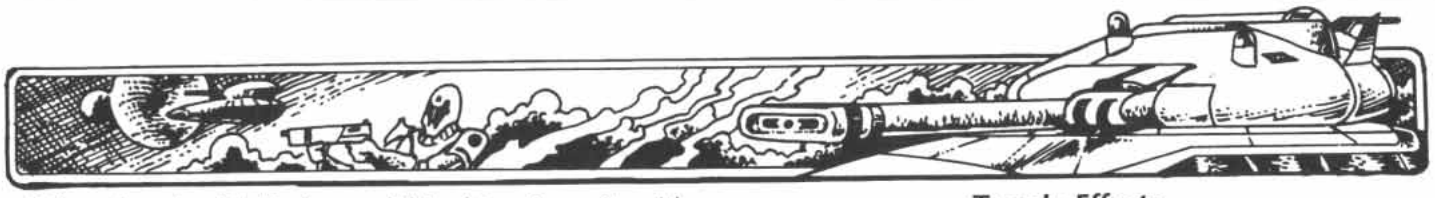
Movement Allowances

Type	*Movement*
Infantry	2/1
Cavalry	3/2
TL5 motorized	5/2
TL6+ motorized	15/5
Mechanized/armored	10/5
ACV	20/15

25.41 Terrain: Some terrain is more difficult to move through than others and so slows movement. The Terrain Effects Chart on the following page lists most common terrain types encountered and their movement costs. Terrain types with a dash are moved through normally, while those with a number following the multiplication sign cost additional movement. These movement costs vary with the type of unit actually moving through the hex. Hill terrain, for example, has no special cost for track-mobile, ACV-mobile and lift-mobile units. Leg-mobile and wheel-mobile units, however, count the hex as two hexes for movement.

Units which do not have sufficient movement left to enter a hex may not do so, but may expend their remaining movement toward the entry cost of the hex for the next turn. (It would otherwise be impossible for infantry to enter any difficult terrain.)

Units may move along roads at the road movement rate, regardless of the type of terrain in the hex. The presence of



a "P" on the chart indicates prohibited terrain; units with that mobility type may not enter the hex (except on a road).

25.42 Supply and Fatigue: A unit's ability to move is constrained by supply and fatigue. Supply limits a unit's movement usually due to fuel limits.

Vehicles which have limited fuel must spend a turn refueling after they have expended their normal load. Troops may rest while refueling.

Fatigue limits all units, and while the specific effects of fatigue are covered later, it is normal for a unit to rest for one turn per 24-hour day. See Rule 26.1 for details.

25.43 Deploying: A unit which does not move during a turn is considered to be deployed in the hex it occupies and should be so noted. A deployed unit has advantages in combat and detection. A unit may rest at the same time that it is deployed.

Terrain Effects

	Movement					
Terrain	*Detect*	*Leg*	*Wheel*	*Track*	*ACV*	*Lift*
Clear	—	—	—	—	—	—
Prairie	–1	—	—	—	—	—
Rough	—	×2	×2	—	—	—
Mountain	+1	×2	P	×4	P	—
Marsh	—	—	×4	×4	—	—
Swamp	+1	×2	P	P	—	—
Forest	+1	×2	×4	×2	×4	—
Jungle	+2	×2	P	×4	P	—
Desert	–2	×2	×2	—	—	—
Broken	+1	×2	×4	×2	×4	—
Glacier	–2	×2	×4	×2	—	—





RULE 26: SUPPLY & FATIGUE

Although supply and fatigue are critical to sustained combat, it is very easy to become completely absorbed by logistics to the exclusion of other game considerations. As a result, only the simplest of logistical rules are presented here.

26.1 Fatigue

Units which fight a battle are fatigued until they spend a turn resting. In addition, units not in combat which do not rest for one turn per day are fatigued. Each condition which causes fatigue (i.e., each battle fought and each day spent without rest) increases the fatigue level of the unit by 1. Each turn spent resting reduces the fatigue level of the unit by 1.

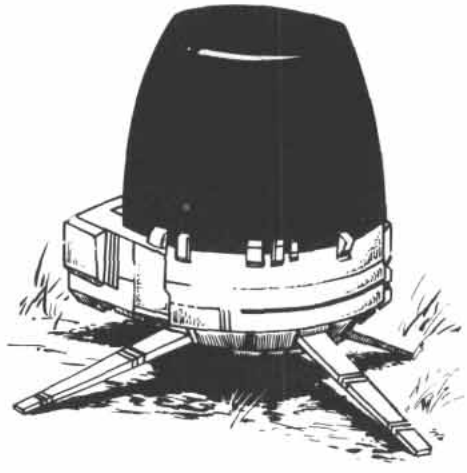
Units which are fatigued have their morale reduced. For every fatigue level, lower the unit's morale by 2.

No unit may be reduced below a morale level of 4. Any unit with a fatigue level of 10 or more automatically surrenders to any enemy unit it encounters.

26.2 Types of Supply

There are three types of supply considered in the game: rations, fuel and munitions.

26.21 Rations: Each unit requires rations once per day, and the rations are used when the unit is resting. If the unit does not receive its rations for the day, it has its fatigue level increased by 1. Units which are already fatigued and which are resting for more than one turn are denied the beneficial effect of one turn of rest per day if they receive no rations. There are no additional effects from lack of rations.



26.22 Fuel: Fuel is required each time a vehicle uses up its on-board fuel. Units fuel all their vehicles at once and usually do so while resting. Fuel supply must be available while the unit is resting in order for the vehicles to refuel.

26.23 Munitions: Whenever a unit fights, it uses munitions and must receive more to fight at full effectiveness. Munitions are received at the beginning of a turn; the receiving unit does not have to rest to receive munitions.

26.231 Small Arms: Once a unit fights, cut the rate of fire of all small arms weapons in the unit in half (rounding fractions up) until it receives munitions.

26.232 Vehicles: Each vehicle has a specified number of shots carried on-board. These are used up in combat and are not replenished until a unit receives munitions.

26.233 Other Heavy Weapons: Other heavy weapons, such as rocket launchers, towed artillery, missile launchers, etc., which do not have a specified number of rounds carried may or may not have ammunition remaining after a battle. Roll a die once for each weapon that fired. There is a 60% chance (roll 12 or less on 1D20) that it will have ammunition remaining.

26.3 Tracing Supply

Units are in supply if they can trace a supply line back to a friendly supply base. The supply line should be shorter than one turn's movement of the movement rate of the supply vehicles available to the unit. If it is longer than one turn's movement, units which require supplies may or may not receive them, based on the following table. The number under the die roll column is the roll (or less) needed on 1D20 for a unit to receive supplies.

Supply

Distance	*Die Roll*
2 turns	16
3 turns	12
4 turns	8
5 turns	4

Each unit rolls separately to determine whether or not it received supplies.

26.4 Supply Bases

Players may establish supply bases wherever they like in friendly territory. Any city hex is also considered to be a supply base. If a move into enemy territory is required, it will probably be necessary to establish additional forward supply bases to sustain the move.

In order to create a new supply base, the player must tell the referee where the base is to be and then spend three turns "stocking" it. Once supplies have been available to the hex for three consecutive turns, the base is operational.

If a supply base ever goes for six consecutive turns without receiving supplies, it is no longer an active supply base.



RULE 27: INTEGRATION WITH TRAVELLER

This rule allows integration for player characters and detailed NPCs from **Traveller** into a **Striker** miniatures game. For details on converting equipment from **Traveller** (or **Fire, Fusion & Steel**) to **Striker** terms, see Appendix A.

Each PC and detailed NPC is represented by a single-figure stand. All these rules are based on the use of the asset of a player character or detailed NPC.

Ground Tactics: If the Ground Tactics asset of the character in charge is higher than unit's asset based on NPC quality, use the Ground Tactics asset for all campaign detection rolls.

Leadership: The Leadership asset is used to avoid adverse moral effects. Whenever a unit suffers a failed morale roll or a forced-back result from fire, a PC or detailed NPC leader can make a roll against his Leadership asset. Success indicates that the morale effect is disregarded; failure indicates that the morale condition takes effect normally; and catastrophic failure indicates that the morale condition becomes one level worse (i.e., Pin becomes Forced Back, Forced Back becomes Rout, Rout becomes Surrender, and Surrender remains Surrender). Difficulty level is based on the morale level that has been reached: Pinned is Easy, Forced Back is Average, Rout is Formidable, and Surrender is Impossible.

Instruction: An instructor works directly with a platoon of soldiers (up to 10 fireteam stands or their equivalents), training them in tactics and basic military skills. An instructor may attempt to raise the troop quality of a platoon by rolling a formidable instruction task. Six consecutive success results mean that the platoon being trained has risen one experience level. The entire training program lasts one month, and all six rolls are made at the end of the month.

Admin/Legal: For each level of skill (not asset), treat the unit as being one hex closer to its supply base for purposes of determining supply.

Mapping: Leaders with mapping skills may roll a Formidable task vs. Mapping each turn to find the best path through terrain for the campaign turn. Outstanding success multiplies the unit's movement allowance by 1.5 (round to the nearest whole number), success adds 1 to the movement rate for the turn, failure has no effect, and Catastrophic Failure subtracts 1 from the turn's movement rate (the unit got lost). Note that leg infantry units get no greater benefit for outstanding success than they do for basic success.

This works only for ground units, and not for lift (contra-grav) units.



Scenario 1

Freedom's Call

Günther had always been very big. When he was taken into the *kommando*, the first words the *kommisar* said were, "*Ach! Ein starker gonef!*" And so they'd assigned him to carry the big 2 cm *Leicht Sturm Geschutz*.

Not that he minded. Everything about the squad LSG bespoke power, from the heavily greased telescoping shoulder stock to the massive muzzle break. For Günther, power meant freedom.

The *Volk* of the Kessel Valley had fought against invaders from the plains and the off-shore islands for over a generation, and had always kept their villages and farmsteads secure. Then, scarcely a year ago, the *Aus-Welten* had come, and everything had changed. They came in starships and floating cars, and they swept away the village *kommandoes* like annoying flies.

They seized every important settlement in little more than a week. They brought in "governors" from the hated islanders and made the *Volk* swear allegiance to a planetary government that was nothing more than a puppet of their *Aus-Welt* empire.

Then they tried to make the *Volk* abandon the old ways. Men's beards were shaved off. New flags were distributed, and the *Volk* were made to hang them from their roof eaves. Worst of all, they outlawed the *Altsprech* and made the school children learn their hated *Anglik*.

And so, one by one, the *kommandoes* slipped away and reformed in the hills. Young men who had never served before slipped away as well, to join them. Günther was one of those young men. Weeks of training followed, weeks whose only purpose had been to prepare him for this day.

Günther leaned the LSG carefully against a fallen log and sat down to rest, while behind him the *kommandant, kommisar* and *schlachtführer* conferred heatedly over an old, faded map. Below him, the valley of the small tributary of the Kessel wound through the rugged hills, a soft green streak through the browns and grays. And at the widest spot in the valley was the village of Brüchenburg, their objective.

The advanced group had already secured the village and reported back by radio to the *schlachtführer*. Collaborators were being dealt with even as the argument went on behind Günther. The popping noise of single pistol shots drifting up from the village sounded strangely harmless from this distance.

The *Aus-Welten* would hear the radio signal from the valley; they were meant to. They would send troops to rescue their lackeys and drive the *kommando* back into the hills. They were meant to do that as well. While the advanced party dealt with the village, the main body of the *kommando* manned the ambush site a kilometer to the north where the valley narrowed.

This was the biggest raid so far. Three of the smaller bands had joined with Günther's *kommando* to make an ambush this large. Many of the *Aus-Welten* would die under the guns of the ambush. Then the ambush party would fall back, and the *Aus-Welten* would pursue, drawn onto the guns of the second ambush party—the one Günther was with.

The *kommissar* had explained the plan in detail. They were to take their first easy shots and then retreat, not try to stand and fight. The object was to bloody the *Aus-Welten* and get experience for the *neusoldaten*, like Günther—not win the war in one battle.

Günther knew all that. But he also knew that today he would kill an *Aus-Welt* soldier, and tonight he would spend the bounty *Fleischgelt* for thick black-barley beer for his squad, and by tomorrow he would be an *altsoldat*.

Günther worked the LSG into a crook between a broken branch and the main part of the tree trunk. He laid the three extra magazines on the trunk in front of him, made sure he had a clear field of fire to the small draw to the north, and waited.

Background

The planet Solee in the Old Expanses was unified in 1196 under the rule of Christen Overtak, since crowned Empress Solee. A major breakthrough in detecting and combatting Virus at about the same time enabled Solee to renovate a wide array of pre-collapse Imperial equipment, including numerous starships. Using these resources, Solee embarked upon a vigorous program of imperialist expansion, invading the two neighboring worlds of Marcena and Hindahl. But neither campaign has gone as smoothly as expected, and the fighting on Marcena has become particularly costly.

The strategy on both worlds was to pick a local warlord and back him with troops and high-tech weaponry, thus gaining a base on the planet as well as valuable local guides and intelligence sources. On Marcena, however, the stubborn farmers of the Kessel valley have proven to be particularly effective guerrilla fighters. The fighting started, as it usually does, with attacks on the local population, not the regular Soleean troops. Occasional robberies and assassinations of local officials soon grew into attacks on police posts, and eventually on small military patrols. In early 1201, the *Blut und Eisen Kommando* of the west valley launched the largest coordinated raid and ambush of the war to date.

DEPLOYMENT

The Defender deploys the advance team in the village and may deploy the rest of the kommando anywhere desired, but not within 20 cm of any table edge.

The Attacker enters the board on turn 1 from the north edge mounted in vehicles.

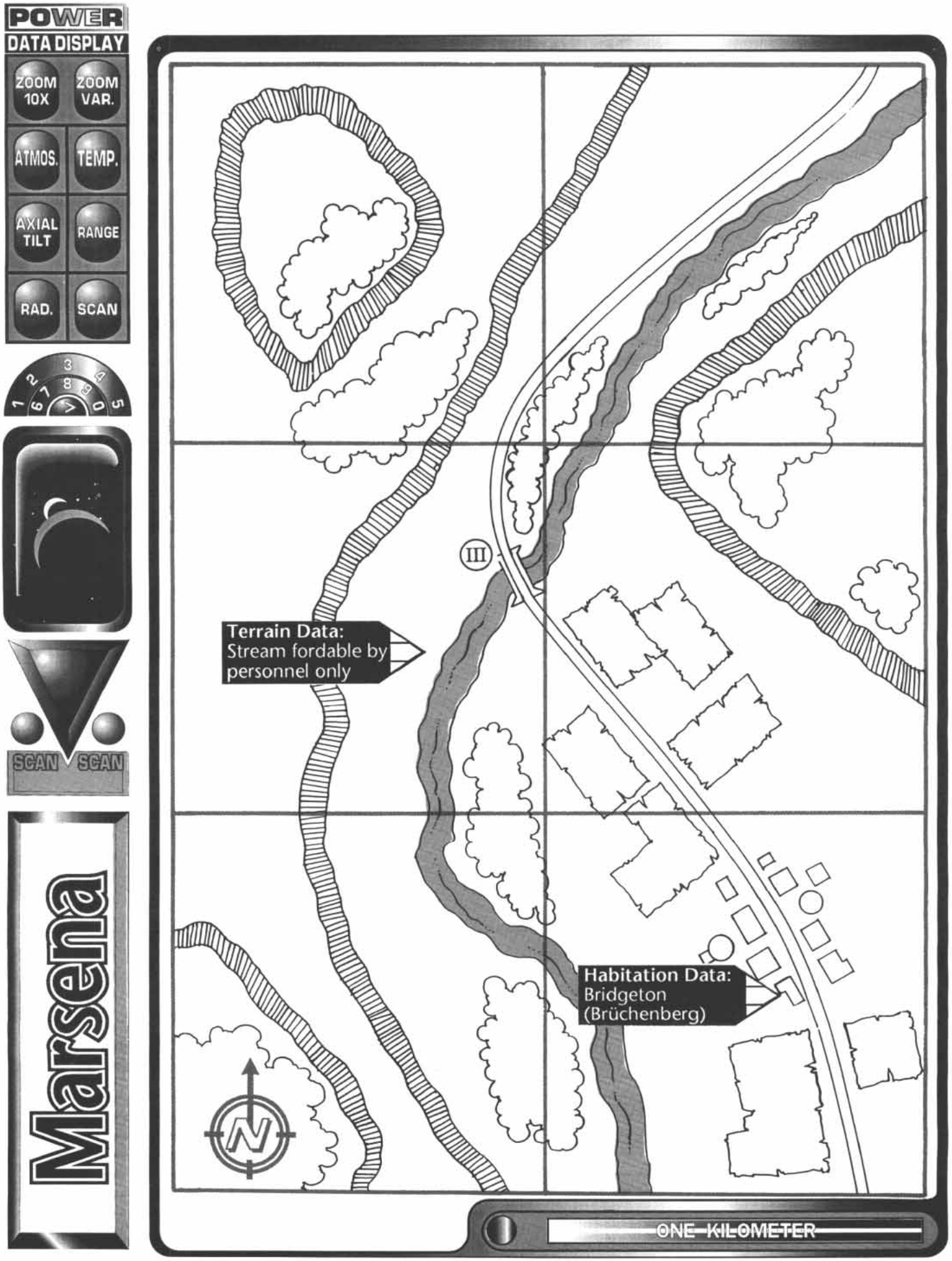
SPECIAL SCENARIO RULES

The *Kommando* may withdraw from any table edge except the northern edge. Individual stands may not withdraw on their own initiative, but must instead be issued a *Disengage* order by either of the two command stands in the *Kommando* headquarters.

VICTORY

The *Kommando* wins if at least half the kommando force escapes and if it inflicts more casualties (hits) on the Soleeans than it suffers. However, it must inflict at least 10 hits on the Soleeans, and at least 10 different *Kommando* stands must fire at a visible Soleean stand during the scenario for the objective of the raid to be achieved.

If the Soleean player denies the *Kommando* its victory conditions, it wins.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ATTACKER

Briefing and Orders

From: Headquarters, 5th District, Military Assistance Command, Marsena.

To: Commander, 4th Company, 17th Imperial Soleean Infantry.

1. Situation: Low-level terrorist activity has been increasing in the Kettle River Valley region. The district has responded by massing company-sized rapid response forces in key positions ready to aggressively seek out terrorist bands whenever they launch a raid. Radio intercepts indicate that the village of Bridgeton *(Brüchenburg* in the local dialect) has been raided by terrorists who may still be in the area. Your company is the closest available rapid response force.

2. Objective: Your company will move to Bridgeton, secure the village, determine the fate of the local police and officials, then engage and destroy the terrorist forces still in the area.

3. Enemy Forces: Radio traffic indicates an enemy force in the village and a smaller command-control element still in the surrounding hills. To avoid detection, terrorist units have not been operating in forces larger than a platoon. While larger forces are considered unlikely, force security remains a high priority.

4. Friendly Forces: No additional reinforcing assets are available for our company. There is a squad-sized element of local police in the village, but they have not reported the attack by phone and so may have defected or been neutralized by the terrorists.

5. Concept of Operation: Lack of combat vehicles will require a motor approach by road. The first priority should be the rapid recapture of the village.

Organization of Forces

4th Company, 17th Imperial Soleean Infantry (Experienced, Morale: 18 except where noted), with:

- **Headquarters (Veteran),** with:
  - 1 operational command stand
  - 1 tactical command/infantry stand
  - 1 self-commanding infantry stand
- **3 Rifle Platoons,** each with:
  - 1 tactical command/infantry stand
  - 5 infantry stands
  - 1 machinegun stand
- **Attached Transport Group (Novice),** with:
  - several requisitioned civilian trucks

Headquarters, with:

- 1 operational command stand
- 1 tactical command/infantry stand
- 1 self-commanding infantry stand

Notes: All stands are equipped with TL10 7mm advanced combat rifles, hand grenades and RAM HEAP grenades. Each soldier wears a helmet and combat environment suit (save number 1).

Troop Quality: Veteran **Morale:** 18 **Initiative:** 4
Armor: Combat Environment Suit **Save:** 1
Movement: 20 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
HE/frag hand grenades-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	



3 Rifle Platoons, with:
1 tactical command/infantry stand
5 infantry stands
1 machinegun stand

Notes: Each infantry and command infantry stand is equipped with TL10 7mm advanced combat rifles, hand grenades and RAM HEAP grenades. Each machinegun stand is equipped with a TL8 7mm rotary gun. Each soldier wears a helmet and combat environment suit (save number 1).

Troop Quality: Experienced **Morale:** 18 **Initiative:** 3
Armor: Combat Environment Suit Save: 1
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
7mm rotary gun-8	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	Tripod -mounted
HE/frag hand grenades-8/9	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Attached Transport Group, with:
Several requisitioned civilian trucks

Notes: The unit has enough requisitioned civilian trucks to mount the unit. A sample truck is listed, but any truck values from TL7 may be used. Each truck has a single-figure crew stand which may dismount (but the vehicle may not move while the driver is dismounted). Each crewmember is armed with a 7mm ACR. They do not wear any body armor.

Medium Truck (TL6)

Troop Quality: Novice **Morale:** 18 **Initiative:** 1
Movement: 110 road (—, +1, +2), 50 cross-country (—, —, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: Open
Belly Armor: 1

Cargo Capacity: 3 or 5 tonnes
Environmental: Unsealed, air breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 10
Mass Class: IV
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

System:	*Short*	*Medium*	*Long*	*Extreme*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	

Notes: Each command stand, command infantry stand and infantry stand is equipped with TL10 7mm ACRs, hand grenades and RAM HEAP grenades. Each machinegun stand is equipped with a TL8 7mm rotary gun. Each soldier wears a helmet and combat environment suit (save number 1). The command stand is an operational commander. The command/infantry stands are all tactical commanders. The unit has enough requisitioned civilian trucks to mount the unit. A sample truck is listed, but any truck values from TL7 may be used.



DEFENDER

Briefing and Orders

From: *Kommandant, Blut und Eisen Kommando.*

To: All element leaders.

1. Situation: We have gradually been building up our cache of weapons and raising recruits. Recently, we established contact with two independent groups and persuaded them to join our *kommando* on this raid. The time has come to strike a crushing blow against the *Aus-Welten* and their collaborators. We have identified the village of Brüchenburg as the bait for an ambush. Our advanced party has already secured the village and transmitted the fact on open channel. The enemy will respond with a rescue force which we will ambush.

2. Objective: Our objective is to inflict maximum casualties on the enemy while preserving our force as the cadre for the growing resistance movement. If possible, our novice troops should experience some combat, although they are very inexperienced, and it is important not to break them in this first battle.

3. Enemy Forces: We expect that the enemy will deploy as much as a company to relieve the village. They are better equipped than our *kommando,* and most of the men are better trained. The closest enemy response force is stationed a few kilometers to the north. There are no troop concentrations to the south for over 100 kilometers.

Enemy air raft troops have a substantial mobility advantage over our own infantry, but there have been no reports of air rafts deployed in the valley (except as liaison craft) for over a month.

4. Friendly Forces: All friendly local forces have been incorporated in the ranks of the *kommando* for this operation.

5. Concept of Operation: While the advanced party secures the village, the other elements of the force will conceal themselves in the woods and broken ground as ambush parties.

Force Organization

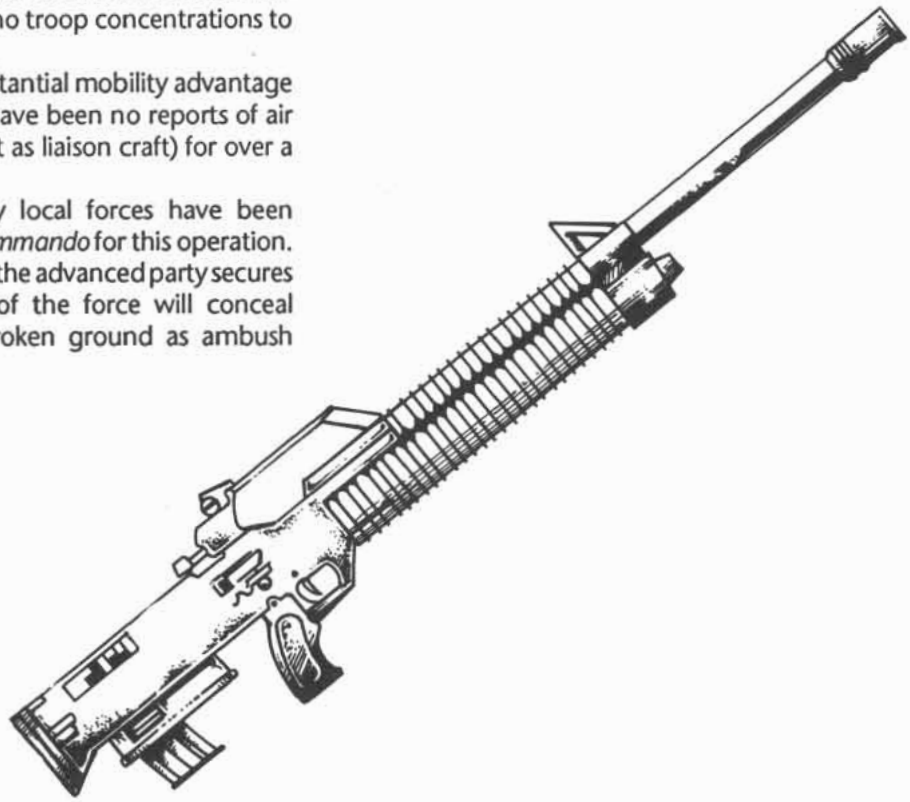
Blut Und Elsen Kommando, with:

Headquarters (Veteran, Morale: 20), with:
- 1 operational command stand
- 1 staff radio stand
- 1 self-ordering infantry stand

Advance Party (Novice, Morale: 16), with:
- 1 tactical command infantry stand
- 1 self-ordering infantry stand
- 4 infantry stands

First Element (Experienced, Morale: 18), with:
- 1 tactical command infantry stand
- 6 infantry stands
- 2 machinegun stands

Second Element (Novice, Morale: 16), with:
- 1 tactical command infantry stand
- 4 infantry stands
- 1 machinegun stand





Headquarters, *Blut Und Eisen Kommando*, with:
1 operational command stand
1 staff radio stand
1 self-ordering infantry stand

Notes: Each stand is equipped with TL7 7mm assault rifles. The soldiers are unarmored.

Troop Quality: Veteran **Morale:** 20 **Initiative:** 4
Armor: None
Movement: 20 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
2cm LAG (DS)	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Advance Party (Novice, Morale: 16), with:
1 tactical command infantry stand
1 self-ordering infantry stand
4 infantry stands

Notes: Each stand is equipped with TL7 7mm assault rifles. Each command infantry and self-ordering infantry (but not plain infantry) stand also has an integral 2cm LAG. The soldiers are unarmored.

Troop Quality: Novice **Morale:** 16 **Initiative:** 1
Armor: Combat environment suit **Save:** 1
Movement: 20 cm

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm LMG-6	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	
2cm LAG (DS)	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	(3 km)	(6 km)	(12 km)	(24 km)	
3km radio	300cm	600cm	1200cm	2400cm	



First Element (Experienced, Morale: 18), with:
1 tactical command infantry stand
6 infantry stands
2 machinegun stands

Notes: Each infantry and command infantry stand is equipped with TL7 7mm assault rifles. Each command infantry stand also has an integral 2cm LAG. Each machinegun stand is equipped with a TL7 7mm light machinegun. The soldiers are unarmored.

Troop Quality: Experienced **Morale:** 18 **Initiative:** 3
Armor: Combat environment suit Save: 1
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm LMG-6	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	
2cm LAG (DS)	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Second Element (Novice, Morale: 16), with:
1 tactical command infantry stand
4 infantry stands
1 machinegun stand

Notes: Each infantry and command infantry stand is equipped with TL7 7mm assault rifles. Each command infantry stand also has an integral 2cm LAG. Each machinegun stand is equipped with a TL7 7mm light machinegun. The soldiers are unarmored.

Troop Quality: Novice **Morale:** 16 **Initiative:** 1
Armor: Combat environment suit Save: 1
Movement: 20 cm

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm LMG-6	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	
2cm LAG (DS)	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Say Good Night

Late 1199 (Imperial calendar)
Vezina (Old Expanses)

Sergeant Borgia took a last look around the airless drop bay. All eight of her people were out on the drop pylons strapping themselves into the reentry kits. Navy types had gone EVA to deploy the ablative foam reentry shields while the jump troops had gotten their final briefing, so there wouldn't be the normal wait while the foam hardened. That was a good idea.

There was talk of a new purpose-built drop capsule coming soon, complete with jammers and decoys and the ability to maneuver enough to maybe throw off a dirt gunner's aim. That sounded good to Borgia, but this jump would still be with the old sport versions. Getting down in one piece was going to rely on Cdr. Ritter keeping the bad guys talking until it was too late. That, and some luck. Then it was up to the grunts.

Borgia pulled herself along the steel cable to the makeshift drop pylon and slipped into the human-sized cavity in the dull black hemisphere of the drop kit. The few idiot lights that the small craft had showed green.

"Lucky, this is Drop Six. Your people all strapped in?"

"That's a roger, Skipper," she answered. "Nine ready to drop."

"Bongo, Can Can, your folks set?"

"Bongo to Drop Six. Nine to drop, Skipper."

"Can Can ready. Nine to drop."

"Okay, we'll salvo drop in 30 from my mark.... Mark."

When they hit the ionosphere in reentry and communications blacked out, Borgia was left alone with her thoughts. How many, she wondered, would come back on line once they broke out into the lower atmosphere? How many then would make it to the ground? The Vezinans had to know they were coming, had to be waiting for them...had to be. Ritter was a great BS artist, but nobody was that good. Nobody could be that stupid. Could they?

They broke through to the lower atmosphere, and Borgia's radio crackled to life. The capsules were tuned to receive on the open channel used for the negotiations, and suddenly Ritter's voice, frustrated and impatient, filled her helmet.

"...Yes, I know, your highness. Er, right. I mean, your divineness. What? Your divine holiness? I.... Right, I.... Right, look.... I.... *Look, Hoss, I don't care who died and made you immortal, but I'm only going to explain this one more time!"*

Borgia grinned as her drogue chute pulled the main chute free and the broad gray canopy spread above her. Minutes later she hit the harness quick release and came out of the still-rocking framework on her feet and in the shuffling trot that was as good an approximation of a run as anyone could manage in battledress. The drop had been good; she was only about 300 meters from the built-up settlement proper. She looked around the DZ and saw collapsing gray chutes and running figures all across it. Everyone was down and moving!

Captain Jeffries, the drop commander, suddenly interrupted the diplomatic argument, breaking in on the clear.

"Ritter, this is Drop Six. I've got dust with all 30. Say again, dust with three-zero. Switching to Tacnet."

"You hear that?" Ritter whooped over the radio to the god-emperor. "Say good night, Hoss!"

BACKGROUND

In 1199, the newly formed Dawn League sent out 12 refitted diplomatic ships to establish peaceful contact with worlds in the Wilds, the former territory of the Third Imperium. None of the ships came back. Follow-on missions by hastily outfitted small warships came back with news of massacres. One of the ships, DLS *Lirgishkhunan,* actually had its own landing party captured on the planet Vezina while trying to discover the fate of the crew of the DLS *Aurora.* With a fresh contingent of jump troops and the battle-seasoned DLS *Ashtabula* in consort, *Lirgishkhunan* returned, looking for trouble.

In this scenario, the Attacker (the Dawn League player) conducts a meteoric assault from orbit, while the defender (the Hastaan player) attempts to defend the capital city of the small country.

DEPLOYMENT

The Hastaan player may set up anywhere in the settlement. All tanks must be parked together in one place. The Blood-Death Tercio, the Emperor and the prisoners (a half-dozen or more unarmed and unarmored single-figure stands) must be placed in the palace.

SPECIAL SCENARIO RULES

Jamming: Orbital jammers in the Dawn League ships are sufficiently powerful that the entire board is in their short range for radio, radar and EMS jamming.

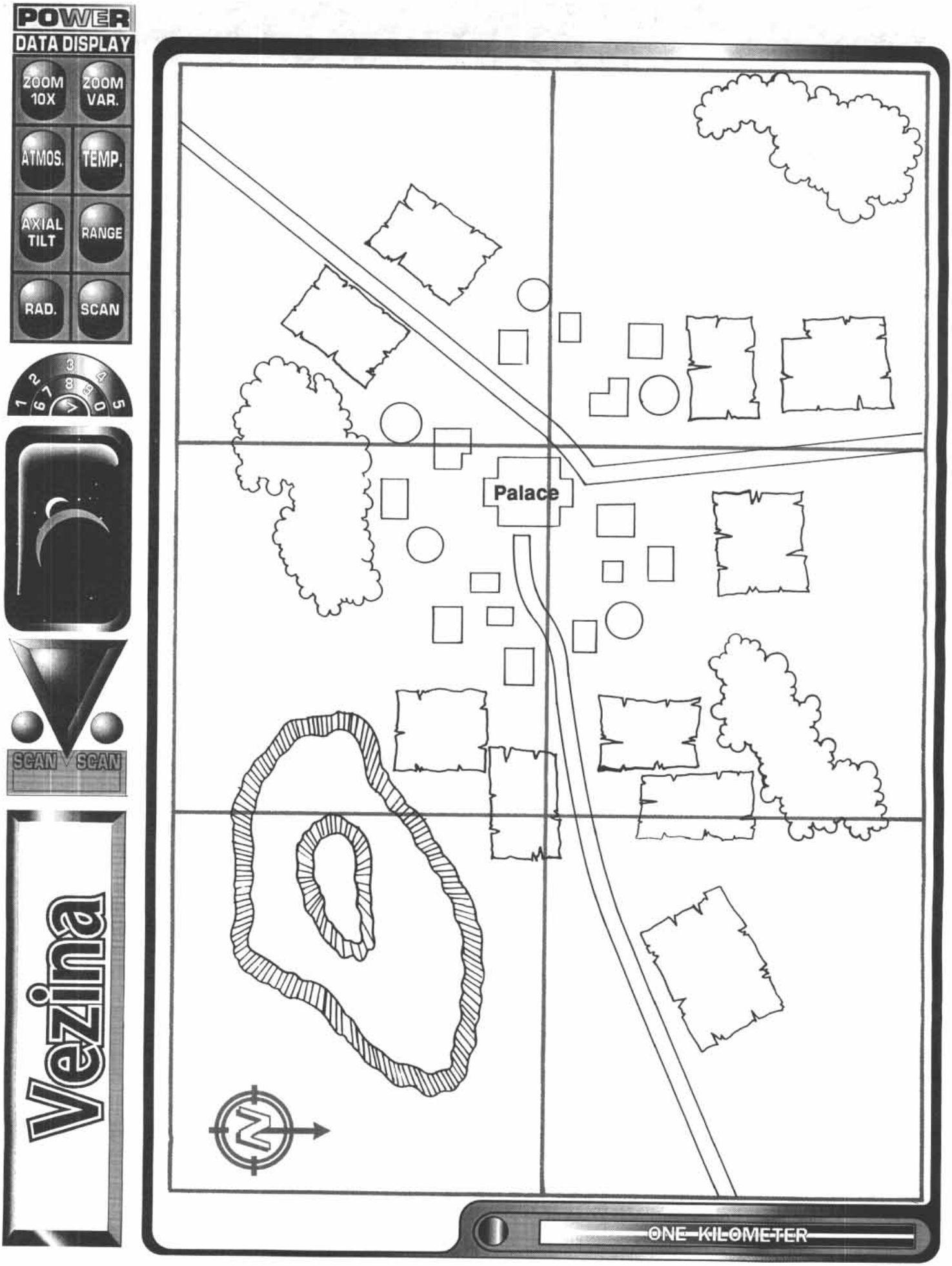
Surprise: Despite ample warning, Hastaan was surprised by the speed and audacity of the assault from orbit. To duplicate this level of surprise, no personnel or vehicle stand may move or fire the first turn. Tanks may not move or fire until they have powered up. Each tank rolls once per turn during the movement phase to see if it is powered up. The roll is treated as an extreme-range task the first turn, a long-range task the second, a medium-range task the third, and a short-range task every following turn.

Drop: The drop may be made anywhere except in the built-up area. Any stand which lands in the built-up area takes a hit and automatically has a P2 marker placed on it, regardless of whether its drop marker is face up or down. The two drop units must form separate sticks. Each unit may be, but need not be, divided further into more sticks.

Prisoners: The prisoners may not be moved from the palace and may not be executed. Once they are in Dawn League control, they may be fired at. Evacuation can be accomplished by arriving at any drop zone not in the field of fire of a Hastaan homing missile.

VICTORY

The Dawn League player wins if over half the prisoners are recaptured and evacuated. The Dawn League wins an overwhelming victory if, in addition to recapturing the prisoners, the emperor is killed, and the jump troops end the scenario in control of the settlement.


POWER
DATA DISPLAY
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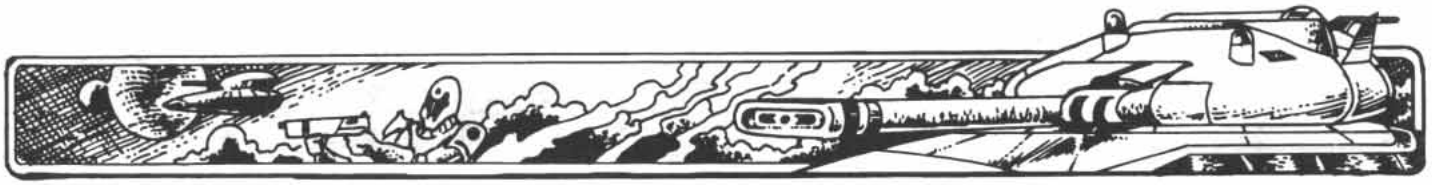


ATTACKER

Briefing and Orders

From: Lt. Cdr. Ritter, pennant aboard DLS *Ashtabula.*

To: All personnel, Task Force Strike Vezina.

1. Situation: On or about 1-VII-1199 DLS, *Aurora* grounded on the planet Vezina, at which time the ship and her crew were seized by a local warlord, the self-styled "God-Emperor of Hastaan." A follow-on landing by DLS *Lirgishkhunan* ended in shots fired and the rescue party being captured by locals. We now have definite proof that *Aurora's* crewmembers have been executed. While *Lirgishkhunan's* troops are believed still alive, the situation is extremely unstable.

2. Objectives: Recover our surviving people.

3. Enemy Forces: Hastaan is a small technologically elevated dictatorship. The troops are nominally well-equipped, but their combat skills are not necessarily as good. Total military personnel is believed to be about 1000, of which about half are actual ground combatants. The local army is called the "Sacred Guard."

4. Friendly Forces: We are currently in orbit with *Ashtabula* and *Lirgishkhunan. Lirgishkhunan* has a new complement of jump troops. Both vessels are available for laser bombardment from orbit, but the potential combat zone is largely filled with civilian settlements, making orbital bombardment impractical.

5. Concept of Operation: The task force commander will continue negotiations with Hastaan from orbit while the drop troops prepare for meteoric assault. The assault sticks will land as close to the settlement as possible and then fight their way quickly in, secure the prisoners held in the palace, then fight their way back out again, relying on shock and surprise to overcome resistance. The task force in orbit will engage in selective jamming of enemy communications to confuse their command network. Extraction will be by assault lander.

Organization of Forces

Dawn League Task Force Strike Vezina, with:

Task Force Command, with:
- 1 operational commander (in orbit)
- 1 staff uplink (in orbit)

Jump Detachment *"Ashtabula"* (Elite, Morale: 22), with:

Command Group, with:
- 1 operational command stand
- 1 tactical command stand
- 1 self-ordering recon stand (single-figure)

3 Squads, each with:
- 1 tactical command stand
- 2 infantry stands

Jump Detachment *"Lirgishkhunan"* (Veteran, Morale: 18), with:

Command Group, with:
- 1 operational command stand
- 1 self-ordering recon stand (single-figure)

2 Squads, each with:
- 1 tactical command stand
- 2 infantry stands





Jump Detachment *"Ashtabula"* (Elite, Morale: 22), with:

Command Group, with:
- 1 operational command stand
- 1 tactical command stand
- 1 self-ordering recon stand (single-figure)

3 Squads, each with:
- 1 tactical command stand
- 2 infantry stands

Notes: All stands are equipped with TL10 7mm advanced combat rifles, hand grenades and RAM HEAP grenades. Each infantry and recon stand has an integral plasma bazooka. Each soldier wears light battledress (save number 6).

Troop Quality: Elite **Morale:** 22 **Initiative:** 4
Armor: Light battledress Save: 6
Movement: 16 cm

System:	*Short (15)*	*Medium (7)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
HE/frag hand grenades-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
10cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Jump Detachment *"Lirgishkhunan"* (Veteran, Morale: 18), with:

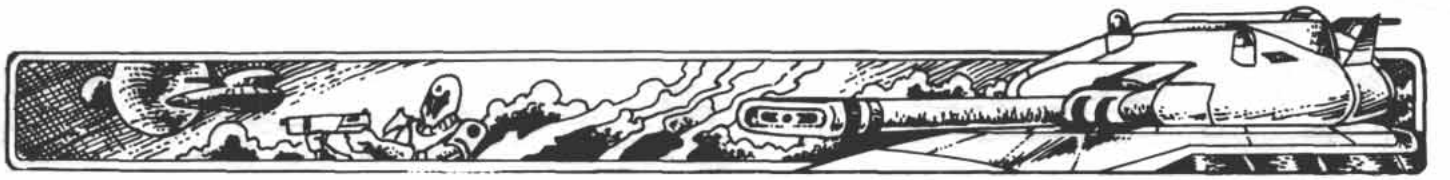
Command Group, with:
- 1 operational command stand
- 1 self-ordering recon stand (single-figure)

2 Squads, each with:
- 1 tactical command stand
- 2 infantry stands

Notes: All stands are equipped with TL10 7mm advanced combat rifles, hand grenades and RAM HEAP grenades. Each infantry and recon stand has an integral plasma bazooka. Each soldier wears light battledress (save number 6).

Troop Quality: Veteran **Morale:** 18 **Initiative:** 3
Armor: Light battledress Save: 6
Movement: 16 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
HE/frag hand grenades-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
10cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	



DEFENDER

Briefing and Orders

From: Supreme Headquarters, Imperial Horde.

To: All Sacred Guard Commanders.

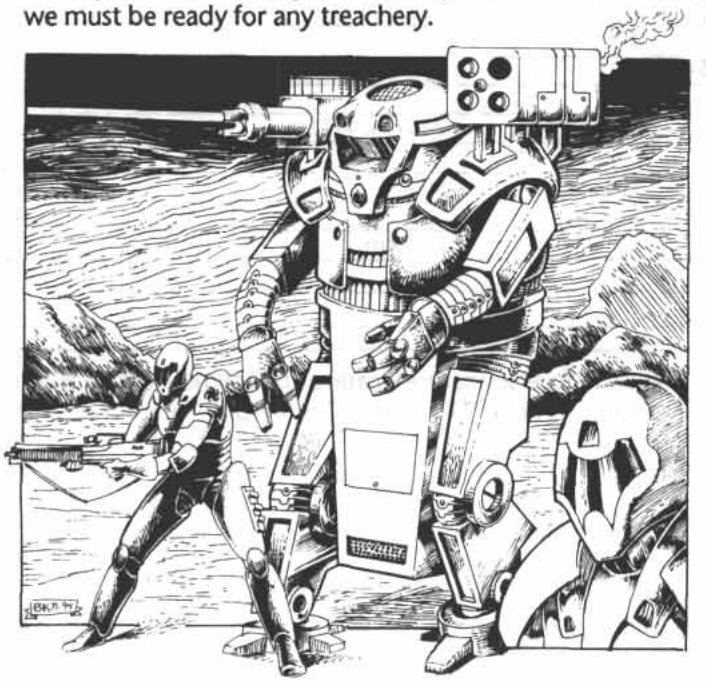
1. Situation: Twice the off-worlders have landed minions to subvert and corrupt our subjects, and twice they have been dealt with. Now another alien force hovers above us, begging for the release of their criminal spies and saboteurs.

2. Objective: Defend the person of the god-emperor at all costs.

3. Enemy Forces: Unknown.

4. Friendly Forces: Although many militia units have not yet mustered from their hamlets, the best units of the Sacred Guard are concentrated at the capital, and additional militia groupments are on their way.

5. Concept of Operation: The enemy is cowardly and unlikely to attack as long as we hold prisoners. Nevertheless, we must be ready for any treachery.



Organization Of Forces

Hastaan Imperial Troops: The Sacred Guard

Supreme Headquarters (Novice, Morale: 14), with:
- 1 operational command stand (the emperor)
- 1 staff radio stand

The Blood-Life Tercio, with:
- **Headquarters,** with:
  - 1 tactical command stand
  - 1 self-ordering infantry stand
  - 1 crew stand
  - 1 VRF gauss gun
- **2 Detachments,** each with:
  - 1 tactical command infantry stand
  - 4 infantry stands

The Tercio of Steel, with:
- **Headquarters,** with:
  - 1 tactical command stand
- **Tank Detachment,** with:
  - 1 tactical command TL8 fast tank
  - 3 TL8 fast tanks
- **2 Mobile Detachments,** each with:
  - 1 tactical command infantry stand
  - 2 infantry stands
  - 1 machinegun stand
  - 1 heavy truck

The Tercio of Fire, with:
- **Headquarters,** with:
  - 1 tactical command stand
- **Missile Detachment,** with:
  - 1 tactical command stand
  - 2 crew stands
  - 2 TL7 TAC missile launchers
- **Mortar Detachment,** with:
  - 1 tactical command stand
  - 1 self-ordering observer stand (single figure)
  - 3 crew stands
  - 3 8cm mortars
- **Air Defense Detachment,** with:
  - 1 tactical command stand
  - 3 crew stands
  - 3 TL7 ADA homing missiles

Militia Groupments, with:

(There are six militia groupments, but most of them are deployed some distance from the capital. Only one or two militia groupments are in the capital when the raid hits. One or two more may be added to the scenario as reinforcements, if desired.)
- **Headquarters,** with:
  - 1 tactical command stand
  - 1 self-ordering infantry stand
  - 1 machinegun stand
- **2 Sections,** each with:
  - 1 tactical command infantry stand
  - 3 infantry stands



The Blood-Life Tercio (Experienced, Morale: 16), with:
- **Headquarters,** with:
  - 1 tactical command stand
  - 1 self-ordering infantry stand
  - 1 crew stand
  - 1 VRF gauss gun
- **2 Detachments,** each with:
  - 1 tactical command infantry stand
  - 4 infantry stands

Notes: All troops in the Blood-Life Tercio wear TL10 battledress. All command, command infantry, self-ordering infantry and plain infantry are equipped with TL10 7mm ACRs firing discarding sabot (DS) ammunition. Each command infantry stand has an integral, TL10 assault rocket launcher (ARL). The crew stand is equipped with TL5 7mm carbines.

Troop Quality: Experienced **Morale:** 16 **Initiative:** 2
Armor: Battledress Save: 6
Movement: 16 cm

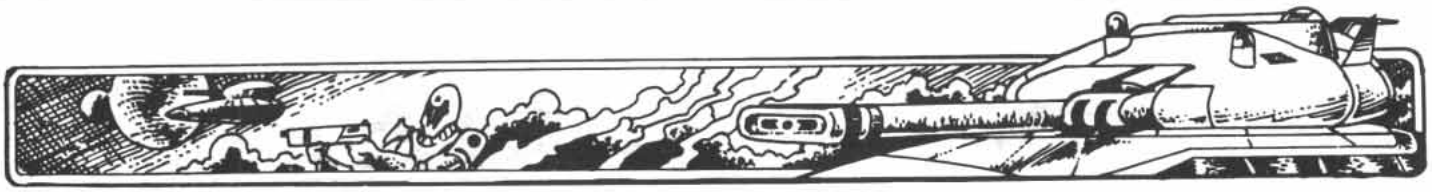
System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
6cm ARL (HE)	20 cm: 2 (2+)	40 cm: 1 (2+)	—	—	P: 6 BR: 4
6cm ARL (HEAP)	20 cm: 2 (6S+)	40 cm: 1 (6S+)	—	—	EP: 5 BR: 3
6cm ARL (flechette)	20 cm: 2* (Nil)	40 cm: 1* (Nil)	—	—	DS: 1 cmx5 cm
4mm VRF gauss gun (dart)	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Supreme Headquarters (Novice, Morale: 14), with:
- 1 operational command stand (the emperor)
- 1 staff radio stand

Notes: All personnel are wearing TL10 combat armor and are equipped with TL10 7mm ACRs firing ball ammunition.

Troop Quality: Novice **Morale:** 14 **Initiative:** 1
Armor: Combat armor Save: 2
Movement: 20 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm ACR-10 (ball)	10 cm: 4 (3)	20 cm: 3 (3)	40 cm: 2 (2)	80 cm: 1 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30km radio	(30 km)	(60 km)	(120 km)	(240 km)	



The Tercio of Steel (Novice, Morale 14), with:
- **Headquarters**, with:
  - 1 tactical command stand
- **2 Mobile Detachments**, each with:
  - 1 tactical command infantry stand
  - 2 infantry stands
  - 1 machinegun stand
  - 1 heavy truck

Notes: Each command, command infantry, and infantry stands is equipped with 7mm assault rifles and HE/frag hand grenades. Each machinegun stand has a 7mm tripod MG. Each command infantry stand has an integral 14.5mm antiarmor rifle (firing ball ammunition). All troops wear ballistic weave body armor and helmets.

Troop Quality: Novice **Morale:** 14 **Initiative:** 1
Armor: Ballistic Weave Body Armor Save: 1
Movement: 20 cm

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm MG	14 cm: 5 (2)	28 cm: 4 (2)	56 cm: 3 (Nil)	112 cm: 2 (Nil)	
HE/Frag Hand Grenades-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
14.5mm AAR (ball)	29 cm: 3 (6)	58 cm: 2 (6)	116 cm: 1 (6)	232 cm: 1 (4)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

The Tercio of Steel (Novice, Morale: 14), with:
- Tank Detachment
  - 1 tactical command TL8 Prairie Fire fast tank
  - 3 TL8 Prairie Fire fast tanks

Prairie Fire Fast Tank (TL8)

Cargo Capacity: —
Environmental: Overpressure, Air breathing
Electronic Warfare: Decoys (5)
Ammunition: 25 shots of 130mm (any combination of above), unlimited shots for both MGs
Maintenance Points: 62
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Ignores 2 Diff Mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Troop Quality: Novice **Morale:** 14 **Initiative:** 1
Movement: 130 road (+1, +2, +2), 100 cross-country (—, +1, +2)
- **Front Armor:** 192
- **Side Armor:** 48
- **Rear Armor:** 24
- **Deck Armor:** 36
- **Belly Armor:** 24

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
130mm L60 Gun-APFSDSDU	67 cm: 1 (207+)	134 cm: 1 (197+)	268 cm: 1 (187+)	536 cm: 1 (167+)	F, S
130mm L60 Gun-HEAP	51 cm: 1 (123+)	102 cm: 1 (123+)	204 cm: 1 (123+)	408 cm: 1 (123+)	F, S, EP: 9, BR: 3 cm
130mm L60 Gun-HE	51 cm: 1 (13+)	102 cm: 1 (13+)	204 cm: 1 (13+)	408 cm: 1 (13+)	F, S, EP: 11, BR: 4 cm
130mm L60 Gun-Flechette	51 cm: 1 (2)	102 cm: 1 (2)	204 cm: 1 (2)	408 cm: 1 (2)	F, S, DS: 3x10 cm
7mm Rotary MG-Ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	F, S
5mm Rotary MG-Ball	15 cm: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	F, S
Sensors:					
3km HRT	300 cm	600 cm	1200 cm	2400 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30km radio	(30 km)	(60 km)	(120 km)	(240 km)	



Militia Groupment (Novice, Morale: 12), with:
(There are six militia groupments, but most of them are deployed some distance from the capital. Only one or two militia groupments are in the capital when the raid hits. One or two more may be added to the scenario as reinforcements, if desired.)

Headquarters, with:
1 tactical command stand
1 self-ordering infantry stand
1 machinegun stand

2 sections, each with:
1 tactical command infantry stand
3 infantry stands

Notes: Each command, command infantry, self-ordering infantry and plain infantry stand is equipped with 7mm assault rifles. The machinegun stand has a 7mm tripod MG.

Troop Quality: Novice **Morale:** 12 **Initiative:** 1
Armor: None
Movement: 20 cm

System:	*Short (9)*	*Medium (4)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm MG	14 cm: 5 (2)	28 cm: 4 (2)	56 cm: 3 (Nil)	112 cm: 2 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

The Tercio of Fire (Novice, Morale: 14), with:

Headquarters, with:
1 tactical command stand

Missile Detachment, with:
1 tactical command stand
2 crew stands
2 TL7 TAC missile launchers

Mortar Detachment, with:
1 tactical command stand
1 self-ordering observer stand (single figure)
3 crew stands
3 8cm mortars

Air Defense Detachment, with:
1 tactical command stand
3 crew stands
3 TL7 ADA homing missiles

Notes: All command, observer and crew stands are equipped with 7mm carbines. Each missile launcher has only three shots worth of ammunition.

Troop Quality: Veteran **Morale:** 14 **Initiative:** 4
Armor: Combat environment suit **Save:** 1
Movement: 20 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
HE/frag hand grenades-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300cm	600cm	1200cm	2400cm	

Strength on Strength

1110 (Imperial calendar)
Efate (Spinward Marches)

It had been very quick and very violent. When it was over, there was some smoke in the command bunker, but no movement, not anymore, and it was suddenly eerily quiet. Even the tacnet chatter died away in the sudden peace.

In front of him, a "Joe" officer's lifeless form sprawled across a workstation. At first it looked like she had been trying to shield the electronics with her body, but when he rolled her over, he saw the primed grenade still clutched in a death grip. She slid to the floor as if in slow motion, her hand relaxing, and the grenade's safety lever flipped up and away, doing lazy cartwheels through the air.

"Grenade!" he yelled, and started to smother it with his own body armor, but as he went down to his knees, his eyes came level with the workstation, and he saw the still-glowing data monitor, covered with the cramped, geometric characters of the Zhodani alphabet.

The grenade wasn't for us, he thought suddenly. *She was trying to kill the machine!*

Instead of falling on the grenade, he picked it up and threw it out the open hatchway.

"Heads up! Grenade comin' out the CP hatch!" he yelled over the tacnet, and heard angry curses in answer. There was an explosion, and more curses, but no cries of pain or calls for medics.

He looked back at the machine. Its screen still glowed a happy orange and blue, line after line of data displayed for anyone with the wisdom to decipher it.

"Hey, El-Tee," he said finally. "You better come over here and look at this."

BACKGROUND

The Fifth Frontier War was the last major conflict fought between the Third Imperium and the Zhodani Consulate.

During the year-long siege of Efate, both sides committed ground troops. Eventually, Imperial forces gained the upper hand, in part due to a major intelligence coup gained on a raid conducted by the crack 4518th Lift Infantry.

In this scenario, the Imperial player will defend a captured Zhodani headquarters compound against a determined Zhodani attack.

DEPLOYMENT

The Zhodani commando company will enter the board by psionic teleportation. First, the Zhodani player decides where each stand will appear. Stands may appear inside buildings. The Zhodani player will know the location of the computer, but not the location of Imperial troops. (Although the unit clairvoyant has that capability, the troops move around, and he can only scan one area at a time. He will not be able to tell where the Imperial troops are at the time of the jump, since at that time he will be occupied telepathically locking destination images into the minds of troops.)

Once the Zhodani player has secretly recorded the arrival points of his troops, the Imperial player sets up. Troops may be played anywhere in or within 40 cm of the compound. Any hidden stands are kept off the table.

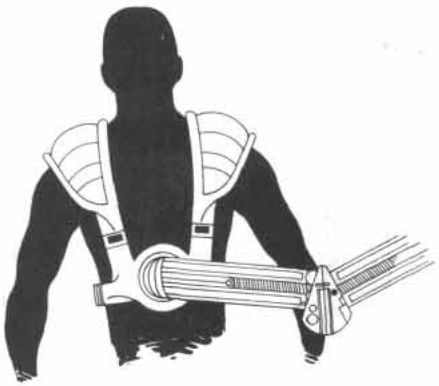
The game begins when the Zhodani commandoes appear. On the same turn, the Zhodani lift infantry company may enter any board edge.

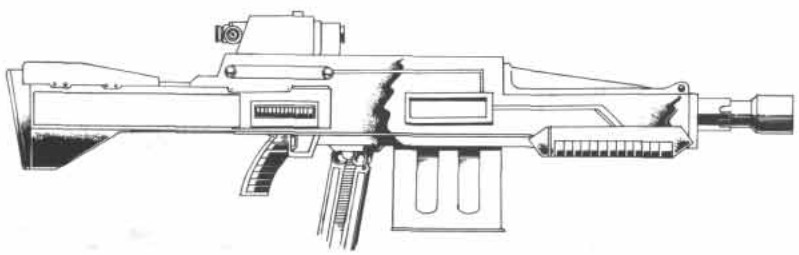
SPECIAL SCENARIO RULES

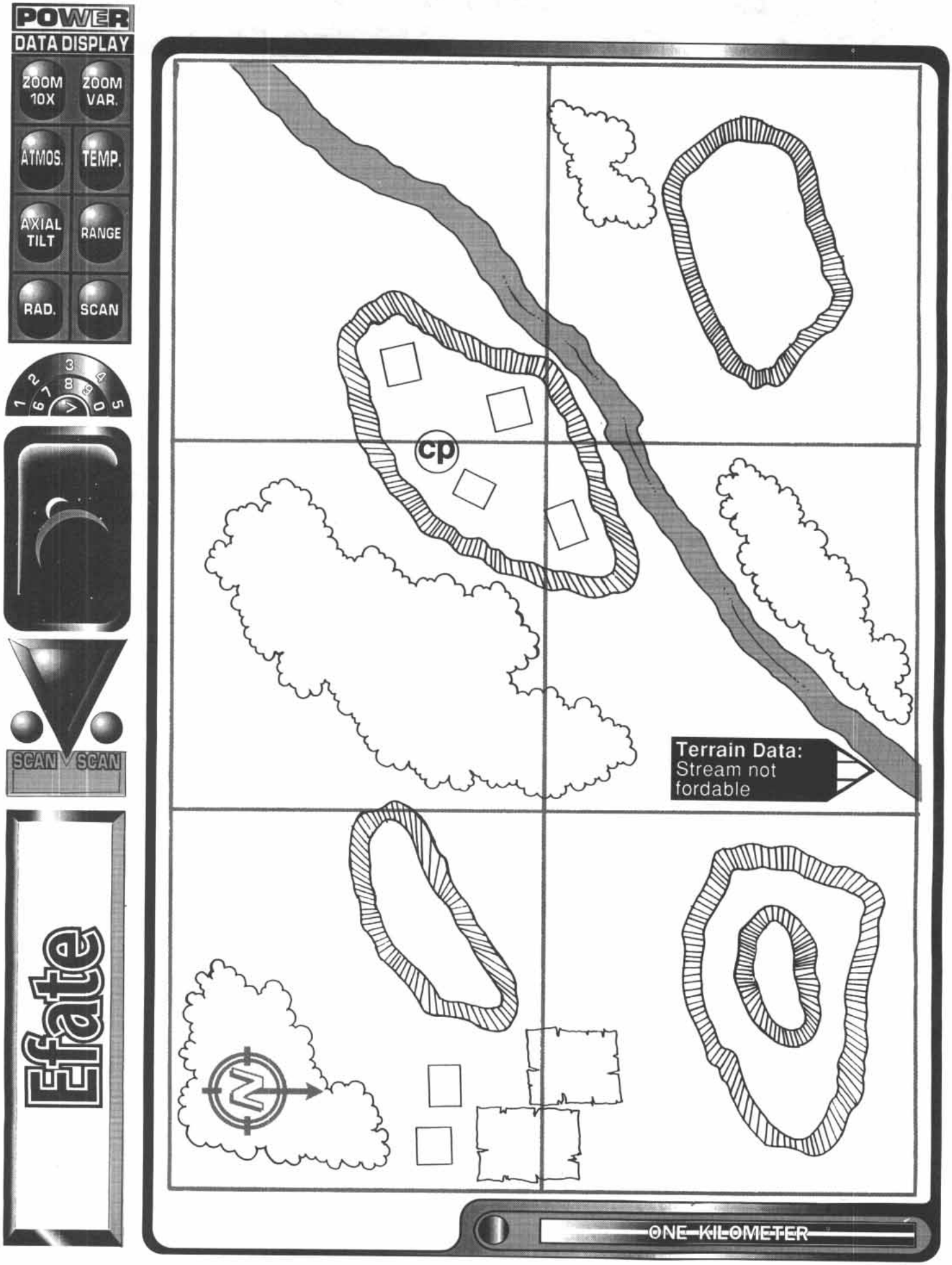
Although a relief force is on its way, it will not arrive soon enough to intervene in this fight. The scenario is essentially a fight to the death between the Imperial company and the two Zhodani companies.

VICTORY

The Zhodani player wins if the computer is destroyed and all three computer intelligence officers are killed and/or captured. Failing this, the Imperial player wins.






POWER
DATA DISPLAY
ZOOM 10X
ZOOM VAR.
ATMOS.
TEMP.
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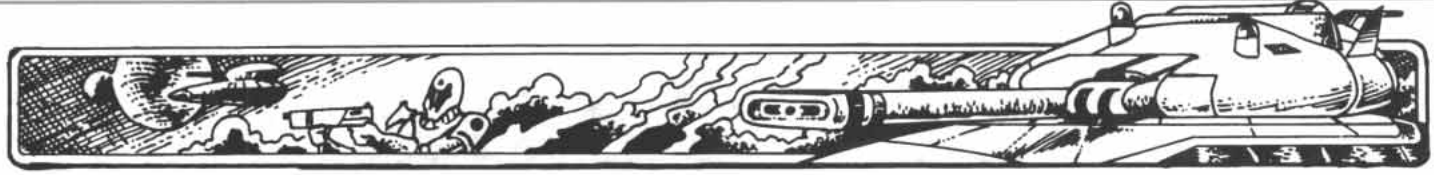


ATTACKER

Briefing and Orders

From: Headquarters, 14th Area Army.

To: 114th Commando Groupment, Consular Guard.

1. Situation: A recent raid by the enemy overran the rear headquarters of the CXII Corps and captured an intact operations computer. Indications are that the headquarters staff did not have time to destroy the encrypted data base, the decoding of which will seriously compromise our operations here on Efate. The tamperproofs of the computer will prevent it from being moved until the encryption has been dealt with, which will require the enemy to hold the site and bring its computer experts there.

2. Objective: Destroy the captured operations computer and its data base. Eliminate any Imperial computer personnel who may have partially decoded the data base.

3. Enemy Forces: The enemy is believed to hold the compound with a company of jump troops, perhaps now reinforced. As the site is well behind our front lines, no heavy units have been deployed there yet, although a major drive is in progress to break through to the compound.

4. Friendly Forces: The only uncommitted unit close enough to intervene immediately is the reserve squadron of your groupment and an understrength lift infantry company.

5. Concept of Operation: While an attached army lift rifle company launches a diversionary assault from outside the compound, the commando company will psionically teleport into the camp compound, relying on surprise to overcome enemy resistance. They will destroy the computer and use telepathic probes to determine the extent of the enemy's knowledge of the operations data base. They will neutralize any personnel with knowledge of the information contained in the data base. They will then exfiltrate back to a rendezvous point to be determined in cooperation with the lift infantry commander.

Organization Of Forces

Commando Squadron, with:
- 1 command teleport stand
- **3 Commando Detachments,** each with:
  - 1 command teleport stand
  - **4 Commando Groups,** each with:
    - 1 command teleport stand
    - 1 teleport support infantry stand
    - 2 teleport infantry stands

Light Infantry Company, with:
- **Headquarters and Weapons Platoon,** with:
  - 1 operational command stand
  - 1 Light Utility Sleds
  - 1 staff radio LMR Sled
- **3 Light Rifle Platoons,** each with:
  - **Headquarters,** with:
    - 1 tactical command stand
    - 1 crew stand
    - 1 TL14 Tac missile launcher
    - 1 Light Utility Sled
  - **3 Rifle Squads,** each with:
    - 1 tactical command stand
    - 1 support infantry stand
    - 2 infantry stands
    - 1 Light Utility Sled





Commando Squadron (Experienced, Morale: 20), with:

1 command teleport stand

3 Commando Detachments, each with:

1 command teleport stand

4 Commando Groups, each with:

1 command teleport stand

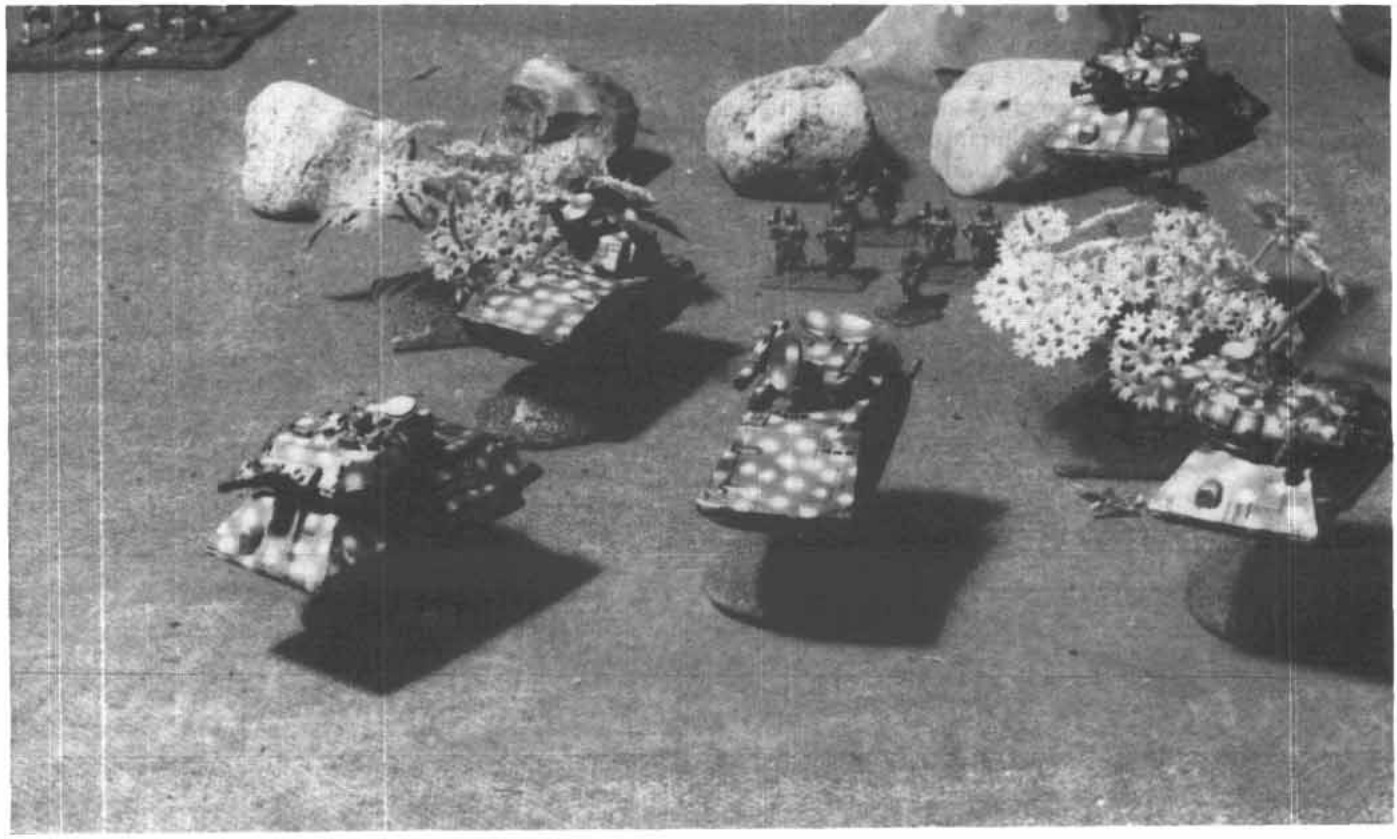
1 teleport support infantry stand

2 teleport infantry stands

Notes: All stands wear TL14 battledress and are armed with TL13 4.7cm noncompensated plasma rifles. Each support infantry stand is armed with TL14 4.7cm noncompensated fusion rifles. Note that Zhodani commando selection is based exclusively on their psionic ability, which accounts for the lower level of combat skills than found in most commando units.

Troop Quality: Experienced **Morale:** 20 **Initiative:** 2
Armor: Battledress **Save:** 8
Movement: 18 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
4.7 cm plasma rifle-13	9 cm: 2 (27+)	18 cm: 1 (27+)	36 cm: 1 (14+)	72 cm: 1 (3+)	
4.7 cm fusion rifle-14	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300 cm	600 cm	1200 cm	2400 cm	





Light Infantry Company (Veteran, Morale: 14), with:
- **Headquarters and Weapons Platoon,** with:
  - 1 operational command stand
  - 1 Light Utility Sled
  - 1 staff radio LMR Sled
- **3 Light Rifle Platoons,** each with:
  - **Headquarters,** with:
    - 1 tactical command stand
    - 1 crew stand
    - 1 TL14 Tac Missile launcher
    - 1 Light Utility Sled
  - **3 Rifle Squads,** each with:
    - 1 tactical command stand
    - 1 support infantry stand
    - 2 infantry stands
    - 1 Light Utility Sled

Notes: All stands wear TL14 combat armor. The command stand and infantry stands are armed with 4mm gauss rifles. The support infantry stands are armed with 4mm gauss SAWs. Both the infantry and support infantry stands have integral TL14 4.7cm compensated fusion rifles. All stands have RAM HEAP grenades.

For the LMR Sled vehicle card, photocopy page 116.

Troop Quality: Veteran **Morale:** 14 **Initiative:** 4
Armor: Combat armor Save: 4
Movement: 20 cm

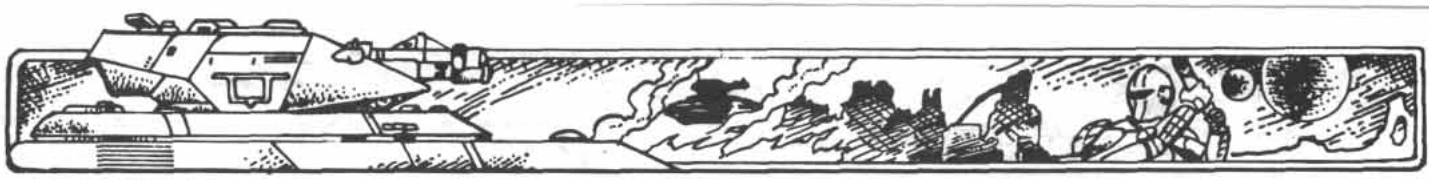
System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
4mm gauss rifle (dart)	10 cm: 4 (4)	20 cm: 3 (4)	40 cm: 2 (2)	80 cm: 1 (Nil)	
4mm gauss SAW (dart)	17 cm: 5 (5)	34 cm: 4 (5)	68 cm: 3 (2)	136 cm: 2 (Nil)	
4.7cm fusion rifle	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
RAM HEAP rifle grenades-9	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 2, BR: 1 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300 cm	600 cm	1200 cm	2400 cm	

Zhodani Light Utility Sled (TL14)

Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 3 or 7.75 tonnes
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM, decoys (5)
Ammunition: None
Maintenance Points: 7

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
None					
Sensors:					
30km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km maser	300 cm	600 cm	1200 cm	2400 cm	
300km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	



DEFENDER

Briefing and Orders

From: Regimental HQ, 4518th Lift Infantry (DROH).

To: Commander, Gamma Company, 6th Battalion.

1. Situation: Early this morning your company conducted a deep penetration raid by meteoric assault from orbit and overran the headquarters of the Zhodani CXII Army Corps. In the course of the mission, an intact operations computer was unexpectedly secured. Your position cannot be substantially reinforced from orbit, although three jump-trained computer intel officers have been sent to the compound to evaluate the information.

Due to renewed Zhodani activity in low orbit, your force cannot be extracted by lander at this time. Instead, an overland attack has been launched to link up with you and evacuate your personnel.

2. Objective: Protect the computer database and the officers evaluating it.

3. Enemy Forces: We believe that the elimination of the corps headquarters has temporarily complicated Zhodani command control in the area, and a large-scale coordinated attack is unlikely in the next several hours. The overland attack is also expected to tie down the heavy Zhodani combat elements in the area. There are light rear-area security elements in the vicinity, and counterattacks can be expected from them. Most of these are believed to be mobile light infantry units.

4. Friendly Forces: Aside from the relief column en route, there are no friendly forces in a position to reinforce your company.

5. Concept of Operation: Hold until relieved.

Organization of Forces

Gamma Company, 6th Battalion, 4518th Lift Infantry Regiment, The Duke of Regina's Own Huscarles, with:

Company Headquarters, with:
- 1 operational command stand

3 Jump Troop Platoons, each with:
- 1 tactical command stand
- 1 support infantry stand

3 Jump Troop Squads, each with:
- 1 tactical command stand
- 2 infantry stands

4518th Lift Infantry



The 4518th Lift Infantry (Duke of Regina's Own Huscarles) has a long history, dating back to the Civil War of 604 to 622 when a cadre of Imperial Marines were left on Regina to support the then Baron of Regina, Caranda. After the conclusion of the war, the Marine cadre was converted into the personal bodyguard of the new Duke Caranda.

The Huscarles have fought in the Third, Fourth, and Fifth Frontier Wars, as well as many other military operations, including the Psionic Suppressions. Although originally organized as a four-battalion regiment, the 4518th Lift now consists of six regiments: three lift infantry, two lift cavalry, and one drop troops (see page 141 for further details).



Gamma Company, 6th Battalion, 4518th Lift Infantry Regiment, The Duke of Regina's Own Huscarles, with:

Company Headquarters, with:
1 operational command stand

3 Jump Troop Platoons, each with:
1 tactical command stand
1 support infantry stand

3 Jump Troop Squads, each with:
1 tactical command stand
2 infantry stands

Notes: Each stand is outfitted with TL14 light battledress. Command and infantry stands are armed with TL14 4.7cm fusion rifles, the infantry stands additionally having an integral 4cm RAM grenade launcher. The support stands are armed with TL-15 30kg "Fire and Forget" missiles and an integral TL15 5.1cm fusion rifle.

Troop Quality: Elite **Morale:** 20 **Initiative:** 4
Armor: Battledress **Save:** 8
Movement: 18 cm

System:	*Short (15)*	*Medium (7)*	*Long (3)*	*Extreme (1)*	*Notes*
4.7cm fusion rifle-14	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
5.1cm fusion rifle-15	18 cm: 2 (37+)	36 cm: 1 (37+)	72 cm: 1 (19+)	144 cm: 1 (4+)	
4cm RAMGL-9 HE	24 cm: 3 (Nil)	48 cm: 2 (Nil)	96 cm: 1 (Nil)	192 cm: 1 (Nil)	EP: 3, BR: 2 cm
30 kg F&F homing HE	(20 km) 1 (5+)	(40 km) 1 (5+)	(54 km) 1 (5+)	—	A10, EP: 8, BR: 5 cm
30 kg F&F homing HEAP	(20 km) 1 (149+)	(25 km) 1 (149+)	—	—	A10, EP: 11, BR: 6 cm
30 kg F&F homing flechette	(20 km) 1* (2)	(40 km) 1* (2)	(54 km) 1* (2)	—	A10, DS: 15x60 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300 cm	600 cm	1200 cm	2400 cm	

Advanced Intel Group, 75th Army (Veteran, Morale 18), with:
3 self-ordering single-figure stands

Notes: All three stands are wearing TL14 combat armor and are equipped with 4mm gauss rifles.

Troop Quality: Veteran **Morale:** 18 **Initiative:** 4
Armor: Combat armor **Save:** 4
Movement: 20 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
4mm gauss rifle (dart)	10 cm: 4 (4)	20 cm: 3 (4)	40 cm: 2 (2)	80 cm: 1 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3km radio	300 cm	600 cm	1200 cm	2400 cm	

Battle Royal

1202 (Imperial calendar), NE 2 (RC calendar)
The planet Marax in the Old Expanses

The Intel kids were very earnest. They wanted to do a great job. Instead, they were just making everyone jumpy as hell. It seemed like every day they'd upload a new batch of TO&E data on "Additional Units Now Believed to be in the Operational Vicinity of the Target." Finally, this morning Cheater turned to him and said, "*Damn*, Bongo, just how many of those guys *are* there down there?"

That, as Hamlet had once remarked, *was the question.*

When he first found out that the crew of the old DLS *Horus* was still alive and held captive on Marax, he'd pulled every string he could to get on the drop team. He wasn't the only one; there were a lot of familiar faces from the "old days" in the drop companies. But now he was beginning to wonder why he had forgotten never to volunteer.

He'd led a squad on the famous Hastaan raid back in '99. Now he was company top soldier, so all the kids had pumped him and the other "old-timers" about what it was going to be like. He could tell them all about Hastaan, but this was beginning to look like a different bucket of eels altogether. Hastaan had about a platoon's worth of troops who knew which end of their weapons got hot. But this Ushugaam character on Marax looked to have a couple *battalions* that good, and more militia than you could shake a stick at. They were armed to the teeth, too: tanks, battledress, helicopters and some pretty scary-looking planetary defense missiles.

And they didn't look like they were going to fall for the old "negotiate until the troops are safe on the ground" trick, either.

On the other hand, the Coalition had a secret weapon. Commodore "Hammer" Lathrop, the head of the RCES, had come back into military rig to personally plan and direct this assault. With Ritter flying his pennant in RCS *Thunderchild* and running the navy end of things, Bongo knew they could count on 100% support from orbit. And if anyone could crack Ushugaam's defenses, The Hammer could. When Bongo got the call to report to Lathrop's cabin, his spirits rose back to their normal level.

Once he got to the cramped office that passed for the flag day cabin, Bongo and Hammer exchanged gossip and pleasantries for a few minutes, renewing their friendship, while Lathrop's aide listened politely and tried to look inconspicuous. Finally, Lathrop leaned forward, serious.

"Bongo," he said, "you been studying all the tacintel on Ushugaam and his people down there?"

"Yes, sir," Bongo answered.

"Good. I tell you the truth—this looks like a real nightmare to me. Thank God we got you along. Best head for tactics I ever saw," he said as an aside to his aide, who smiled and nodded. "So, what do you think, Bongo? How do we skin this guy?"

BACKGROUND

The planet Marax is ruled by Ushugaam III, an unbalanced, despotic overlord. RCES learned in early 1202 that Ushugaam had captured the crew of one of the original 12 Dawn League emissary ships and had been holding the crew for nearly two years. They were imprisoned in his underground stronghold, the former Imperial planetary defense command complex, located in the Cleft of Bagvoot, a rift valley that drains the arid highlands and links them to the lower tropical jungles along the shores of the Mare Maximus.

In this scenario, the Coalition (Star Viking) player will launch a full-scale assault from orbit, while the Marax player attempts to defend the valley and stronghold.

DEPLOYMENT

The Marax troops can deploy initially anywhere in the valley. The ADA launchers must be at least 50 cm apart from each other. Ushugaam II and the prisoners must begin in the stronghold. The prisoners may not be moved during the scenario, but Ushugaam may move out of the stronghold.

SPECIAL SCENARIO RULES

Assault Landers: The first wave of troops arrive by drop capsule. The following waves arrive by assault landers.

Landers must be called down by the ground commander. They arrive five game turns later (the time it takes them to descend from orbit). Each assault lander may carry one vehicle (including its passengers) or three stands. As many assault landers may land in a turn as desired, provided they have all been called down by the ground commander in advance. Each assault lander must land in clear terrain (although the presence of roads and plowed fields do not inhibit landing) and may not land any closer than 30 cm of another assault lander or three meters (kilometers) of an operational ADA missile launcher. (Note that ADA launchers have no effect on drop capsules.)

Ushugaam: As soon as Ushugaam is killed, all surviving Marax troops suffer a permanent morale reduction of 4. Ushugaam may escape from the table, if desired, by exiting by vehicle to the east or west.

Stronghold: The systematic room-by-room reduction of the stronghold is a fascinating battle, but it is virtually a game in itself. It is highly recommended that the main scenario be played only up to the point that the main gate to the stronghold is breached. The main gate is reinforced concrete, with an armor value of 100, and may be breached either by conventional combat damage or by the engineer assault vehicle, which carries a heavy breaching charge especially designed to blow in the main gate.

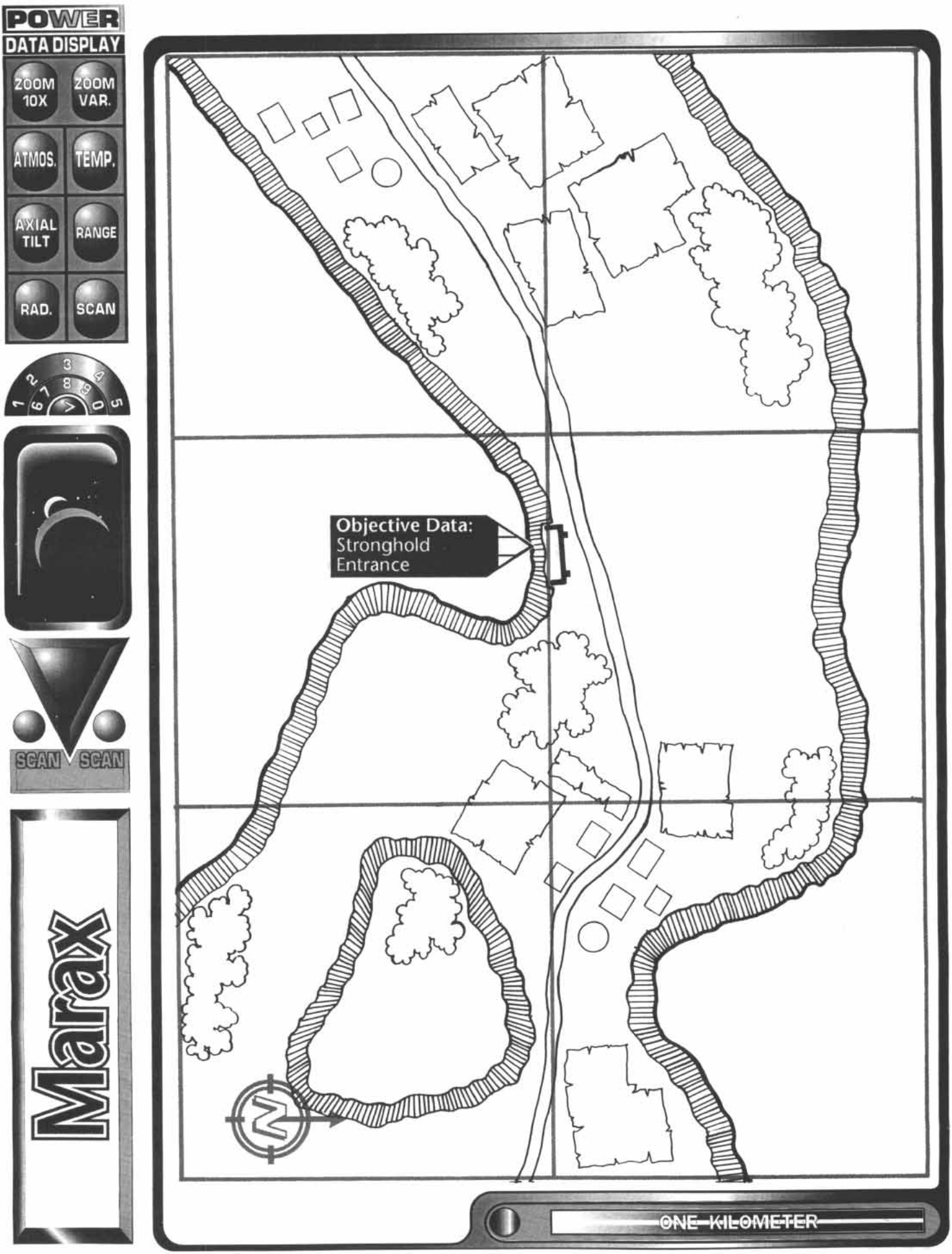
If the fight in the stronghold itself is fought, we recommend fighting it as a separate action using a revised scale. Blow up the stronghold to 10 times its size on the table, using art board or some other large stiff paper to draw the complex. Expand ranges by a factor of 10 as well. Keep movement the same, and treat each turn as 30 seconds instead of five minutes.

Orbital Bombardment: The orbital task force has a total of 20 TL11 planetary strike missiles available at the beginning of the scenario. These may be any mix of guidance and warhead types desired, but the mix must be specified by the Reformation Coalition player before play begins. All battledress stands have 3km short-range laser target designators.

Marax is a size 5 world, and so there will be a five-turn delay from when a missile is requested and when it arrives.

VICTORY

The RCES force must capture the Cleft Bagvoot stronghold and rescue the prisoners. Any other result is a victory for Marax.


POWER
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Marax
Objective Data:
Stronghold
Entrance
N
ONE KILOMETER



ATTACKER

Briefing and Orders

From: Lathrop, flag aboard RCS *Thunderchild.*

To: All personnel, Task Force Strike Marax.

1. Situation: On or about 1-IX-1199 DLS *Horus* departed from its scheduled flight path. It grounded on Marax approximately one month later and was seized by the local government. Why the captain of *Horus* departed from her flight plan is unknown. Recent intelligence discovered the presence of the ship in Marax's navy and later pinpointed the crew as being held in the stronghold at the Cleft of Bagvoot, a steep-walled rift valley connecting the desert highlands, with the jungles around the Mare Maximus.

2. Objective: Rescue our people.

3. Enemy Forces: Ushugaam has several companies of crack bodyguard troops, as well as elements of a mechanized battalion, air-mobile battalion and militia infantry. In addition, there are four TL10 Planetary Aerospace Defense (PAD) missile launchers in the valley. While our assault drop capsules should be immune to these missiles, nothing larger can come down low until they are dealt with:.

4. Friendly Forces: A battalion-sized combat team has been assembled from a variety of sources. Detailed task organization is appended below.

5. Concept of Operation: The jump troops will hit first, with the immediate objective of capturing or neutralizing the PAD launchers. Once sufficient PAD launchers have been neutralized, the lift troops and engineers will land by assault lander. The combined force will then secure the stronghold and rescue our people.

Coalition Assault Organization of Forces

Provisional Jump Company, Reformation Coalition Marine Corps, with:
- **Corps Headquarters,** with:
  - 1 operational command stand
  - 1 staff uplink stand
  - 1 tactical command stand
  - 2 self-ordering scout stands (single figure)
- **2 Rifle Platoons,** each with:
  - 1 tactical command stand
  - **3 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 1 infantry stand

Composite Volunteer Jump Company, with:
- **Headquarters, with:**
  - 1 operational command stand
  - 1 staff uplink stand
  - 1 tactical command stand
  - 2 self-ordering scout stands (single figure)
- **Balduri Platoon,** with:
  - 1 tactical command stand
  - **2 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 2 infantry stands
- **Free Lance Platoon,** with:
  - 1 tactical command stand
  - **4 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 1 infantry stand

Provisional Lift Infantry Company, 9th Oriflammen Marines, with:
- **Headquarters and Headquarters Platoon,** with:
  - **Company Headquarters Section,** with:
    - 1 staff uplink TL9 Grav APC
    - 1 tactical command stand
    - 1 TL9 Grav APC
  - **Weapons Section,** with:
    - 2 TL9 8cmL10 mortar stands
    - 2 LMG stands
    - 2 TL9 Grav APCs
  - **3 Rifle Platoons,** each with:
    - **Platoon Headquarters,** with:
      - 1 tactical command stand
      - 1 LMG stand
      - 1 TL9 Grav APC
    - **3 Rifle Squads,** each with:
      - 1 tactical command infantry stand
      - 3 infantry stands
      - 1 TL9 Grav APC
  - **Tank Platoon (attached),** with:
    - 1 tactical command TL9 Grav Tank
    - 3 TL9 Grav Tanks

Provisional Assault Engineer Platoon, Nimban Army, with:
- **Headquarters,** with:
  - 1 tactical command stand
- **1 Light Squad,** with:
  - 1 tactical command engineer stand
  - 1 engineer stand
  - 1 TL9 Grav APC
- **1 Heavy Squad,** with:
  - 1 assault engineer vehicle



Coalition Assault Force Organization

Provisional Jump Company, Reformation Coalition Marine Corps (Elite, Morale: 22), with:

- **Headquarters,** with:
  - 1 operational command stand
  - 1 staff uplink stand
  - 1 tactical command stand
  - 2 self-ordering scout stands (single figure)
- **2 Rifle Platoons,** each with:
  - 1 tactical command stand
  - **3 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 1 infantry stand

Notes: All personnel are wearing heavy battledress. The scouts are wearing the scout variant. All stands are armed with 4mm gauss rifles and TL9 RAM grenades. Each infantry and command infantry stand has an integral plasma bazooka. The drop capsules each have launch rails for Lyrebird missiles. Each stand can designate for its own missiles. Each fireteam stand has four missile shots, while each single-figure stand has one. Command stands and command infantry stands can designate for any missiles belonging to stands subordinate to them.

Troop Quality: Elite **Morale:** 22 **Initiative:** 4
Armor: Heavy Battledress Save: 12
Movement: 16 cm

System:	*Short (15)*	*Medium (7)*	*Long (3)*	*Extreme (1)*	*Notes*
4mm gauss rifle (dart)	10 cm: 4 (4)	20 cm: 3 (4)	40 cm: 2 (2)	80 cm: 1 (Nil)	
RAM HEAP rifle grenades-9	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 2, BR: 1 cm
10 cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm
Lyrebird tgt desig msl HEAP	—1 (113+)	—1 (113+)	—1 (113+)	—1 (113+)	A3, EP:7, BR:4cm, R: 24km, plng
Lyrebird tgt desig msl DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A3, EP:16, BR:3cm, R:24km, plng
Sensors:					
3 km passive EMS	300 cm	600 cm	1200 cm	2400 cm	
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km radio	300 cm	600 cm	1200 cm	2400 cm	

Composite Jump Company (Veteran, Morale: 18), with:

- **Headquarters,** with:
  - 1 operational command stand
  - 1 staff uplink stand
  - 1 tactical command stand
  - 2 self-ordering scout stands (single figure)
- **Balduri Platoon,** with:
  - 1 tactical command stand
  - **2 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 2 infantry stands
- **Free Lance Platoon,** with:
  - 1 tactical command stand
  - **4 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 1 infantry stand

Notes: All personnel are in Coalition light battledress. All stands are armed with 4mm gauss rifles and TL9 RAM grenades. Each infantry and command-infantry stand has an integral plasma bazooka. The drop capsules each have launch rails for Lyrebird missiles. Each stand can designate for its own missiles. Each fireteam stand has four missile shots, while each single-figure stand has one. Command stands and command infantry stands can designate for any missiles belonging to stands subordinate to them.

Troop Quality: Veteran **Morale:** 18 **Initiative:** 3
Armor: Light Battledress Save: 6
Movement: 16 cm

System:	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
4mm gauss rifle (dart)	10 cm: 4 (4)	20 cm: 3 (4)	40 cm: 2 (2)	80 cm: 1 (Nil)	
RAM HEAP rifle grenades-9	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 2, BR: 1 cm
10 cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm
Lyrebird tgt desig msl HEAP	—1 (113+)	—1 (113+)	—1 (113+)	—1 (113+)	A3, EP:7, BR: 4cm, R:24km, plng
Lyrebird tgt desig msl DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A3, EP:16, BR:3cm, R:24km, plng
Sensors:					
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km radio	300 cm	600 cm	1200 cm	2400 cm	



Provisional Lift Infantry Company, 9th Oriflammen Marine Regiment (Veteran, Morale: 18), with:
- **Headquarters and Headquarters platoon,** with:
  - **Company Headquarters Section,** with:
    - 1 staff uplink grav APC
    - 1 tactical command stand
    - 1 TL9 Grav APC
  - **Weapons Section,** with:
    - 2 TL9 8cmL10 mortar stands
    - 2 LMG stands
    - 2 TL9 Grav APCs
- **3 Rifle Platoons,** each with:
  - **Platoon Headquarters,** with:
    - 1 tactical command stand
    - 1 LMG stand
    - 1 TL9 Grav APC
  - **3 Rifle Squads,** each with:
    - 1 tactical command infantry stand
    - 3 infantry stands
    - 1 TL9 Grav APC
- **Tank Platoon (attached),** with:
  - 1 tactical command TL9 Grav tank
  - 3 TL9 Grav tanks

Notes: All personnel are in Coalition light battledress. All stands are armed with 4 cm gauss rifles and TL10 RAM grenades. Each infantry and command infantry stand has an integral plasma bazooka.

Troop Quality: Veteran **Morale:** 18 **Initiative:** 3
Armor: Light Battledress Save: 6
Movement: 16 cm

Weapons	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
HE/frag hand grenades-8/9	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
RAM HE rifle grenades-9	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm
10 cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm
Sensors:					
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km radio	300 cm	600 cm	1200 cm	2400 cm	

See the vehicle cards for the Oriflamme Grav APC (page 108) and Oriflamme Grav Tank (page 110).

Provisional Assault Engineer Platoon, Nimban Army (Veteran, Morale: 18), with:
- **Headquarters,** with:
  - 1 tactical command stand
- **1 Light Squad,** with:
  - 1 tactical command engineer stand
  - 1 engineer stand
  - 1 TL9 Grav APC
- **1 Heavy Squad,** with:
  - 1 assault engineer vehicle

Notes: All personnel stands are equipped with Reformation Coalition light battledress and armed with TL13 2 cm personal defense lasers and integral plasma bazookas.

Troop Quality: Veteran **Morale:** 18 **Initiative:** 3
Armor: Light Battledress Save: 6
Movement: 16 cm

Weapons	*Short (13)*	*Medium (6)*	*Long (3)*	*Extreme (1)*	*Notes*
2 cm personal defense laser-13	20 cm: 3 (Nil)	40 cm: 2 (Nil)	80 cm: 1 (Nil)	160 cm: 1 (Nil)	
10 cm plasma bazooka-10	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm
Sensors:					
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km radio	300 cm	600 cm	1200 cm	2400 cm	

See the vehicle card for the Oriflamme Grav APC (page 108).



DEFENDER

Briefing and Orders

1. Situation: The Star Vikings have learned that their earlier attempts to plant spies on Marax were frustrated and have now returned to launch a full-scale invasion. Instead, they will be driven back in an ocean of blood. We have massed out best units here at Cleft Bagvoot aznd hold an impregnable position.

2. Objective: Destroy the enemy assault troops.

3. Enemy Forces: Several ships are in orbit, and we must prepare for all manner of attacks.

4. Friendly Forces: The majority of the Life Guard is present, as well as picked troops from the Aero-Dragoons and Cuirassiers, and local militia forces. Some of these troops are dispersed to cover all possible landing sites, but can concentrate at the threatened area as soon as the landing takes place.

5. Concept of Operation: Protect the PAD missile launchers, as they will keep the enemy from landing heavy troop units. Attack the jump troops vigorously as soon as they land. Concentrate all forces at the most threatened sector. Above all, protect the person of the ruler.

Organization of Forces

This is a very large scenario, and the forces available to the defenders are variable, based on the miniatures available to the players. In general, there should be two or three companies of the Life Guard and the TL10 ADA battery. All other forces are optional, and different vehicles can be substituted for those shown on the data cards if desired (provided they are from the correct tech level). RCES intel isn't perfect.

"Most" of the Life Guard is available guarding the stronghold at Cleft Bagvoot. This should certainly include the headquarters and heavy infantry company, along with at least one more company.

"One or more companies" of the Aero-Dragoons are available, either guarding the stronghold at Cleft Bagvoot or as reinforcements. The battalion headquarters is not available, and the attachments listed are optional. If you do not have helicopter models available, treat the Aero-Dragoons as dismounted, their aircraft knocked out on the ground by the preliminary bombardment.

"One or more companies" of the Cuirassiers are available, either guarding the stronghold at Cleft Bagvoot or as reinforcements. The battalion headquarters is not available, and the attachments listed are optional. Either a mechanized or a motorized company may be available (or both). Different armored vehicles may be substituted, if desired.

The four-launcher air defense battery is equipped with surface-to-space missiles. These missiles are not rated for the scenario but are instead covered by the scenario special rules.

Considerable variation in the organization and equipment of militia units is possible, and company-sized detachments should arrive throughout the battle from the east and west ends of the valley.

The Life Guard

("Most" of the life guard is available guarding the stronghold at Cleft Bagvoot. This should certainly include the headquarters and heavy infantry company, along with at least one more company.)

- **Battalion Headquarters,** with:
  - 1 operational command stand
  - 1 staff radio stand
- **Heavy Infantry Company,** with:
  - **Headquarters,** with:
    - 1 operational command stand
    - 2 self-ordering recon stands (single figure)
    - 1 staff radio stand
  - **2 heavy infantry platoons,** each with:
    - 1 tactical command stand
    - **2 squads,** each with:
      - 1 tactical command infantry stand
      - 1 infantry stand
  - **Weapons Platoon,** with:
    - 1 tactical command stand
    - 2 crew stands
    - 2 2-Mj field mount plasma guns (towed, mass I)
    - 2 TL9 Ground APCs
- **Lift Infantry Company,** with:
  - **Headquarters,** with:
    - 1 operational command stand
    - 1 TL10 Open Air Raft
    - 1 staff radio TL12 Enclosed Air Raft
    - 2 self-ordering Grav Bike stands (single figure)
  - **2 lift infantry platoons,** each with:
    - 1 tactical command stand
    - **2 squads,** each with:
      - 1 command infantry stand
      - 2 infantry stands
      - 3 TL10 Open Air Rafts
  - **Lift Weapons platoon,** with:
    - 1 tactical command stand
    - 2 crew stands
    - 2 TL9 tac missile launchers
    - 2 TL10 Open Air rafts
- **2 Infantry Companies,** each with:
  - **Headquarters,** with:
    - 1 operational command stand
    - 1 TL10 Open Air Raft
    - 1 staff radio TL12 Enclosed Air Raft
    - 2 self-ordering Grav Bike stands (single figure)
  - **2 infantry platoons,** each with:
    - 1 tactical command stand
    - **2 squads,** each with:
      - 1 command infantry stand
      - 2 infantry stands
  - **Lift Weapons platoon,** with:
    - 1 tactical command stand
    - 2 crew stands
    - 2 TL9 tac missile launcher



Elements, The Aero-Dragoons

("One or more companies" of the aero-dragoons are available, either guarding the stronghold at Cleft Bagvoot or as reinforcements. The battalion headquarters is not available and the attachment listed is optional.)

1+ Reinforced Aero-Rifle Companis, each with:
- **Headquarters,** with:
  - 1 operational command stand
  - 1 self-ordering infantry stand
  - 1 TL9 Troop Transport Helicopter
  - 1 staff radio TL9 Troop Transport Helicopter
- **3 Aero-Rifle platoons,** each with:
  - 1 tactical command stand
  - **2 squads,** each with:
    - 1 command infantry stand
    - 2 infantry stands
    - 1 TL9 Troop Transport Helicopter
- **Gunship platoon (attached),** with:
  - 1 tactical command TL9 Helicopter Gunship
  - 2 TL9 Helicopter Gunships

Elements, The Cuirassiers

("One or more companies" of the cuirassiers are available, either guarding the stronghold at Cleft Bagvoot or as reinforcements. The battalion headquarters is not available and the attachments listed are optional. Either a mechanized or a motorized company may be available (or both). Different armored vehicles may be substituted, if desired.)

Reinforced Mechanized Company, with:
- **Headquarters,** with:
  - 1 operational command stand
  - 1 self-ordering infantry stand
  - 1 TL9 Ground APC
  - 1 staff radio TL9 Ground APC
- **2 Mechanized platoons,** each with:
  - 1 tactical command stand
  - **2 squads,** each with:
    - 1 command infantry stand
    - 1 infantry stand
    - 1 TL9 "Abomination" Infantry Assault Vehicle
- **Armored car platoon (attached),** with:
  - 1 tactical command stand
  - 1 self-ordering infantry stands
  - 2 infantry stands
  - 3 Charina armored cars/or TL9 ground APCs

(or)

Reinforced Motorized Company, with:
- **Headquarters,** with:
  - 1 operational command stand
  - 1 self-ordering infantry stand
  - 1 TL9 Ground APC
  - 1 staff radio TL9 Ground APC
- **2 Mechanized platoons,** each with:
  - 1 tactical command stand
  - **2 squads,** each with:
    - 1 command infantry stand
    - 1 infantry stand
    - 1 TL9 Ground APC
- **Tank platoon (attached),** with:
  - 1 tactical command TL9 Ground Tank
  - 2 TL9 Ground Tanks

The Militia

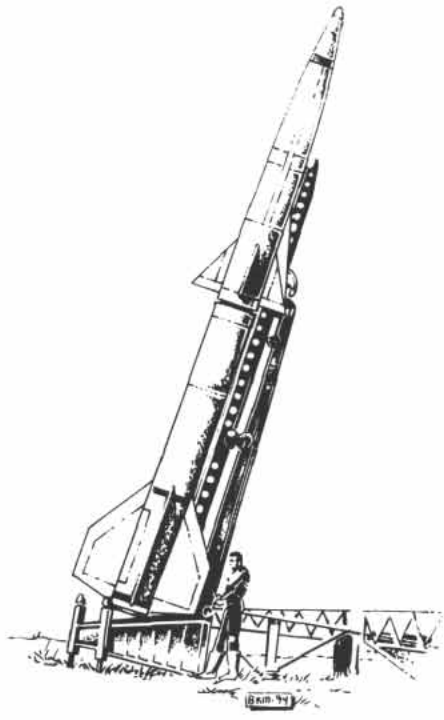
1+ Militia Infantry Company, with:
- **Headquarters,** with:
  - 1 operational command stand
  - 1 self-ordering infantry stand
- **2 Militia platoons,** each with:
  - 1 tactical command stand
  - 1 MG stand
  - 1 rocket launcher stand
  - **2 squads,** each with:
    - 1 command infantry stand
    - 3 infantry stands

Strategic Air Defense Battery

This is a 4-launcher air defense battery equipped with surface-to-space missiles. These missiles are not rated for the scenario, but are instead covered by the scenario special rules.

Headquarters, with:
- 1 operational command stand
- 1 staff radio stand
- 1 infantry stand

2 firing platoons, each with:
- 1 tactical command stand
- 2 crew stands
- 2 infantry stands
- 2 TL10 strategic ADA missile launchers





Life Guard (Heavy Infantry Company)

Troop Quality: Experienced **Morale:** 16 **Initiative:** 1
Armor: Battledress Save: 4
Movement: 14 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
RAM HEAP rifle granades-9	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 3, BR: 1 cm
2-Mj plasma field gun	14 cm: 2 (42+)	28 cm: 1 (42+)	56 cm: 1 (21+)	112 cm: 1 (4+)	EP: 3, BR: 1 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: All personnel stands in the heavy infantry company have TL10 battledress. All command, command infantry and infantry stands are armed with TL10 7mm ACRs (firing DS ammunition) and RAM HEAP grenades. All crew stands have 7mm carbines.

Photocopy vehicle cards for the TL9 ground APC (page 128) and fill in unit values. Initiative of the APCs will be 3 (as it is not reduced by battledress).

Life Guard (Main Body)

Troop Quality: Experienced **Morale:** 16 **Initiative:** 3
Armor: Combat armor Save: 2
Movement: 18 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm ACR-10 (DS)	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
RAM HEAP rifle granades-9	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 3, BR: 1 cm
TL9 Laser desig. Tac msl-HEAP	—1 (113+)	—1 (113+)	—1 (113+)	—1 (113+)	A6, EP: 7, BR: 4 cm, R: 21 km
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: All personnel stands have TL10 combat armor. All command, command infantry and infantry stands are armed with TL10 7mm ACRs (firing DS ammunition) and RAM HEAP grenades. All crew stands have 7mm carbines. All tactical and operational comand stands have 3- km short range laser designtors, as do the Tac missile launch stands themselves.

Photocopy vehicle cards for the TL10 Open Air Raft (page 129) and TL12 Enclosed Air Raft (page 130) and fill in unit values.

The Aero-Dragoons

Troop Quality: Experienced **Morale:** 16 **Initiative:** 3
Armor: Combat Environment Suits Save: 1 (no save vs. lasers)
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7 ball	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
2 cm LAG-8 DS	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: All stands are equipped with helmets and combat environment suits. Command, command infantry, and infantry stands are armed with 7mm assault rifles. All infantry and command infantry stands have integral LAGs.

Photocopy vehicle cards for the TL9 Troop Transport Helicopter (page 128) and TL9 Helicopter Gunship (page 129) and fill in unit values.



The Cuirassiers

Troop Quality: Novice **Morale:** 16 **Initiative:** 1
Armor: Combat environment suits Save: 1 (no save vs. lasers)
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm assault rifle-7 ball	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
2 cm LAG-8 DS	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
7mm rotary gun-8 ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: All dismount stands are equipped with helmets and combat environment suits. Command, command infantry, and infantry stands are armed with 7mm assault rifles. Crew stands are armed with 7mm carbines. All infantry and command infantry stands have integral LAGs. The MG stands have TL8 7mm rotary guns on tripods. Photocopy vehicle cards for the TL9 Ground APC (page 128), TL9 Ground Tank (page 127), and "Abomination" Infantry Assault Vehicle (page 128), and fill in unit values.

The Militia

Troop Quality: Novice **Morale:** 12 **Initiative:** 1
Armor: None
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm rifle-5 ball	6 cm: 3 (2)	12 cm: 2 (2)	24 cm: 1 (Nil)	48 cm: 1 (Nil)	
7mm MMG-5 ball	15 cm: 5 (2)	30 cm: 4 (2)	60 cm: 3 (Nil)	120 cm: 2 (Nil)	
Medium ATRL-6	20 cm: 1 (35+)	40 cm: 1 (35+)	—	—	A3, EP: 4. BR: 3 cm
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: All militia troops are unarmored. All command, command infantry, and infantry stands are armed with TL5 7mm rifles. The MG stands have TL6 7mm tripod MGs. The rocket launcher stand has a TL6 medium antitank rocket launcher.

Strategic Air Defense Battery

Troop Quality: Novice **Morale:** 14 **Initiative:** 1
Armor: None
Movement: 20 cm

System:	*Short (11)*	*Medium (5)*	*Long (2)*	*Extreme (1)*	*Notes*
7mm carbine-5	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km Radio	300 cm	600 cm	1200 cm	2400 cm	

Notes: The command and crew stands all are unarmored and are armed with 7mm carbines.

Appendix A: Converting Traveller to Striker

Equipment rated in **Traveller** or designed using **Fire, Fusion & Steel** may be used in **Striker** games very easily. Use the following guides for filling out the unit data card.

INITIATIVE

Initiative is not an equipment issue, but it is calculated for every unit in the game. Initiative is based on the NPC experience level of the troops making up the unit, as shown below. In the case of player characters, the actual initiative value is used.

Initiative can be reduced due to body armor. This subtraction is made from the numeric initiative value before it is recorded on the unit card.

Level	*Initiative*
Elite	5
Veteran	4
Experienced	3
Novice	1

DIRECT FIRE WEAPONS

Most information on direct fire is contained in the four range columns of the card and the final comments column.

Range: Calculate short range in **Striker** (in centimeters) by dividing the **Traveller/FF&S** range (in meters) by 10, rounding to the nearest whole number. Note that this will mean some weapons with very poor range performance may not have a short range at all. Medium, long and extreme ranges are calculated by progressive doubling of the short range.

Thrown grenades have a short range of 1 cm, medium of 2 cm, long of 3 cm and extreme of 4 cm.

Number of Dice: Each weapon has a specified number of dice which are rolled for it at close range. This number is reduced by 1 for each additional increment of range, but is never reduced to less than 1.

Existing weapons from **Traveller** may be rated using the following table.

ROF	*Dice*
1/2, reload, etc.	1
SS, BA, LA, DAR, SA-1	2
PA, SA, SA-2+	3
5 or 10, hand-held, 3 (all)	4
5 or 10, mounted	5
50+	7

Penetration: The **Striker** penetration is the **Traveller** penetration value. To calculate the penetration value for small arms, divide their damage value by their penetration rating, rounding to the nearest whole number. Note that a separate penetration value is calculated for each range band unless the weapon has constant penetration.

For weapons whose penetration is the printed value plus a 2D6 roll, write a "+" sign after the penetration.

Comments: In this column, write F if the weapon uses the fire control bonus listed on the card and S if the weapon is stabilized, then write the value for the explosion of the warhead (if it is an exploding round).

Explosive Power: The explosive power of a round in **Striker** is twice the square root of its **Traveller/FF&S** concussion value, rounding to the nearest whole number. However, the maximum explosive value allowed in the game is 18.

Burst: To find the **Striker** burst radius in centimeters, divide the **Traveller** primary burst radius (in meters) by 10, rounding all fractions up.

Nuclear Burst: The **Striker** destruction and burst radii in centimeters are calculated by dividing the **Traveller** destruction and primary burst radii in meters by 10. All nuclear explosions have an explosive power of 18 in their burst radius.

Missiles: The missile's agility is the same as that in **Traveller** or calculated from **FF&S**. The missile's range depends on its guidance type. Note that all target memory and target seeker missiles are treated as homing missiles for purposes of **Striker**.

Towed Weapons

Calculate the mass class the same as for vehicles.

INDIRECT FIRE WEAPONS

Range: Indirect fire weapons have only a single range listed (in the comments column) which is its maximum indirect fire range in kilometers. Each kilometer is one meter (100 cm) on the gaming table.

Rocket Salvoes: To find the burst radius of a rocket salvo, multiply the burst radius of a single round by the square root of the number of rounds in the salvo, rounding the final value to the nearest whole number.

Towed Weapons

Calculate the mass class the same as for vehicles.

ELECTRONICS

Sensors

Range is recorded the same as for direct-fire weapons. Some sensors with very long ranges have them listed in kilometers instead of centimeters. Each kilometer is one meter on the table (which will make most detection tasks in the game carried out at close range).

Sensor jammers are listed under other ECM. Sensors with direction finding capability are noted in the comments column.

COMMUNICATORS

Range is recorded the same as for direct-fire weapons. Some communicators with very long ranges have them listed in kilometers instead of centimeters. Each kilometer is one meter on the table. Extreme range of communicators is the maximum distance at which they can be used on the table or when calling fire. Other range bands are used when determining the chance of locating **the communicator with a direction finder.** Communication jammers are listed under communicators.

PERSONNEL

Armor

Note the type of armor and its save number. The save number is the same as for **Traveller** armor. If the armor has two different value, use the lower of the two. If the armor covers only part of the target, average the two values, rounding to the nearest whole number. If it is melee armor only, record its save value in parentheses.

Movement

To find the movement allowance in centimeters for personnel, take the **Traveller** walking speed in meters and multiply by 2.

Some types of body armor reduce the movement allowance due to their agility reductions. Subtract two centimeters from the movement allowance for every agility reduction due to body armor.

VEHICLES

By using the blank vehicle form and examining the sample vehicles

Appendix A: Converting Traveller to Striker

already rated in **Striker**, it should be easy to rate your own **FF&S** or other **Traveller** vehicles. The following notes should answer any questions.

Movement: To find the cross-country movement allowance for ground vehicles, in centimeters, take the safe cross-country combat speed (in meters) and multiply by 2. A vehicle with a cross-country safe combat speed of 10 meters would have a **Striker** cross-country movement allowance of 20 centimeters.

For road speed, follow the same procedure, but use safe road speed instead.

To find the NOE movement allowance in centimeters for flying vehicles, multiply the **Traveller** safe NOE speed in 10-meter grid squares by 20.

To find the high-altitude travel movement for flying vehicles in centimeters, multiply the **Traveller** high altitude movement rating in 10-meter grid squares by 60.

Agility: Agility is also based on the combat movement allowance. To find the cautious advance agility of any movement allowance, find the **Striker Cautious Advance speed on the Agility table below**, and find its corresponding Agility. Double the speed to find the rapid advance agility and triple it to find the travel move agility.

To find the travel movement agility of aircraft, find their high altitude movement allowance in the Striker High Move column of the Agility table and read its corresponding Agility.

See the Agility Table below.

Armor: Vehicle armor is transferred directly from **Traveller** values.

Mass Class: Compare the vehicle's loaded mass to the following table.

Loaded Mass	*Mass Class*
Up to 1.499 tonnes	I
1.50-2.99 tonnes	II
3-8.99 tonnes	III
9-19.99 tonnes	IV
20-35.99 tonnes	V
36+ tonnes	VI

Explosive Damage Modifier: The vehicle's explosive damage modifier is based on the thinnest armor face or the vehicle's mass class, whichever is less. Add 1 to the correct value, and express the result as a negative number: This is the explosive damage modifier. For purposes of this calculation, refigure the mass class of flying vehicles by dividing their mass by 10.

For example, a vehicle has a mass class of III and is open-topped. The lower value of the two is its thinnest armor (which is 0 on the top). Adding 1 results in an explosive damage modifier of –1.

Cargo Capacity: List both the number of fireteam stands carried and the cargo tonnage. The number of stands carried is the total number of passengers divided by 4, rounding down. If the final value is less than 1, record the total number of passengers, but append the note "single-figure stands."

Environment: This covers two criteria: crew life support and power plant. For crew life support, a vehicle is considered to be sealed, overpressure or unsealed. Sealed includes any pressurized vehicle with basic or extended life support; overpressure includes vehicles equipped with an overpressure system; and unsealed includes all other vehicles, including all open-topped vehicles.

Power plants can be listed as air-breathing, nonair-breathing, and filtered air-breathing. Nonair-breathing power plants are fuel cells, nuclear power plants, matter-antimatter power plants, solar arrays, batteries, explosive power generators, rockets and liquid hydrogen burning power plants that have been modified to carry their own liquid oxygen. Air-breathers are all other types of power plants. Air-breathing plants may be designated as equipped with filters during the **FF&S** design sequence.

Electronic Warfare: Note here whether the vehicle is a stealth design or has electro-magnetic masking. If the vehicle has decoys, note that fact. For the number of turns of decoys carried, divide the number of decoys by 15 and round to the nearest whole number.

Ammunition: Note the number of game shots carried for all nonsmall arms (2 cm and larger in bore) weapons.

Game shots are based on the number of rounds carried in **Traveller**.

For missiles, divide the number of missiles carried by 2 to determine game shots.

For heavy weapons with a **Traveller** rate of fire of less than 3, divide the number of rounds carried by 4 to determine the number of game shots.

For heavy weapons with a **Traveller** rate of fire of 3 or more, divide the number of rounds carried by 10 to determine the number of game shots.

Maintenance Points: Maintenance points from **Traveller** and **FF&S** are transferred directly to **Striker**.

NOTES

The following abbreviations are used in the vehicle and equipment data tables in this book:

A: Agility, **BR:** Burst radius, **DR:** Destruction radius, **DS:** Danger space, **ED:** EMS designated, **EP:** Explosive power, **F:** Fire control benefit applies to weapon, **H:** Hull mount weapon, **IFR:** Indirect fire range, **LD:** Laser designated, **N:** Rate of fire varies depending on starship, **R:** Range, **S:** Stabilization benefit applies to weapon.

AGILITY

Traveller Meters per Combat Turn	*kph*	*Striker Cautious Advance*	*Striker High Move*	*Agility*
up to 29	up to 21	up to 119	up to 179	—
30-59	22-42	120-239	180-359	1
60-119	43-85	240-479	360-719	2
120-239	86-171	480-959	720-1439	3
240-479	172-343	960-1919	1440-2879	4
480-959	344-687	1920-3839	2880-5759	5
960-1919	688-1375	3840-7679	5760-11,519	6
1920-3839	1376-2751	7680-15,359	11,520-23,039	7
3840-7679	2752-5503	15,360-30,719	23,040-33,023	8
7680+	5504+	30,720+	33,024+	9

Appendix B: Imperial/Regency Vehicles

Imperial Heavy Grav Tank (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6540 high (+6)
Front Armor: 336
Side Armor: 168
Rear Armor: 168
Deck Armor: 252
Belly Armor: 252
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (16)
Ammunition: 50 shots for fusion gun, unlimited for gauss gun
Maintenance Points: 72

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
175-Mj RF fusion gun	198 cm: 3 (397+)	396 cm: 2 (397+)	792 cm: 1 (198+)	1584 cm: 1 (40+)	F, S, EP: 18, BR: 4 cm
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Imperial Heavy Grav Command Tank (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 8160 high (+6)
Front Armor: 336
Side Armor: 168
Rear Armor: 168
Deck Armor: 252
Belly Armor: 252
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 3 single-figure stands
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (16)
Ammunition: Unlimited shots for gauss gun
Maintenance Points: 72

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
ECM:					
30 km EMS jammer	(30 km)	(60 km)	(120 km)	(240 km)	Area capable

Appendix B: Imperial/Regency Vehicles

Imperial Astrin-type Grav APC (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3,+4), 7260 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 50 shots for fusion gun
Maintenance Points: 34

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
3-Mj RF fusion gun	26 cm: 5 (52+)	52 cm: 4 (52+)	104 cm: 3 (26+)	208 cm: 2 (5+)	F, S, EP: 3, BR: 1 cm
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Imperial Marine Grav APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 9120 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 50 shots for fusion gun, 13 missile shots
Maintenance Points: 39

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
18.5-Mj RF fusion gun	65 cm: 4 (129+)	130 cm: 3 (129+)	260 cm: 2 (65+)	520 cm: 1 (13+)	F, S, EP: 8, BR: 2 cm
Missiles:					
See Imperial TL15 95kg Heavy Tac Missiles chart (page 132)					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix B: Imperial/Regency Vehicles

Imperial Marine Support APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 8580 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2 single-figure stands
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 47 shots for fusion gun, 13 missile shots
Maintenance Points: 40

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
74-Mj RF fusion gun	129 cm: 3 (258+)	258 cm: 2 (258+)	516 cm: 1 (129+)	1032 cm: 1 (26+)	F, S, EP: 16, BR: 3 cm
Missiles: 95kg Heavy Tac Missiles chart (page 132)					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	

Imperial Point Defense APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 7260 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2 single-figure stands
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 400 shots for fusion gun
Maintenance Points: 47

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
18.5-Mj RF fusion gun	65 cm: 5 (129+)	130 cm: 4 (129+)	260 cm: 3 (65+)	520 cm: 2 (13+)	F, S, EP: 8, BR: 2 cm
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
300 km active EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix B: Imperial/Regency Vehicles

Imperial Marine Command APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 9120 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 1
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 50 shots for fusion gun, 3 missile shots
Maintenance Points: 39

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
18.5-Mj RF fusion gun	65 cm: 4 (129+)	130 cm: 3 (129+)	260 cm: 2 (65+)	520 cm: 1 (13+)	F, S, EP: 8, BR: 2 cm
Missiles: See Imperial TL15 95kg Heavy Tac Missiles chart (page 132)					
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
ECM:					
30 km EMS jammer	(30 km)	(60 km)	(120 km)	(240 km)	Area capable

Imperial Nuclear Damper APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 10,140 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (8)
Ammunition: Unlimited
Maintenance Points: 40

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
3000 km nuclear damper	(3000 km) 1	(6000 km) 1	(12,000 km) 1	(24,000 km) 1	F, S, H
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km active EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix B: Imperial/Regency Vehicles

Imperial ND Control APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 7620 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 300 shots for fusion gun
Maintenance Points: 45

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
18.5-Mj RF fusion gun	65 cm: 5 (129+)	130 cm: 4 (129+)	260 cm: 3 (65+)	520 cm: 2 (13+)	F, S, EP: 8, BR: 2 cm
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km active EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Norris Grav Tank (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6540 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 26 shots for fusion gun, unlimited shots for gauss gun
Maintenance Points: 39

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
175-Mj RF fusion gun	198 cm: 3 (397+)	396 cm: 2 (397+)	792 cm: 1 (198+)	1584 cm: 1 (40+)	F, S, EP: 18, BR: 4 cm
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Appendix B: Imperial/Regency Vehicles

Trepida I/Intrepid/74 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3,+4), 5940 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 102 shots for fusion gun, unlimited for gauss gun
Maintenance Points: 40

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
74-Mj RF fusion gun	129 cm: 3 (258+)	258 cm: 2 (258+)	516 cm: 1 (129+)	1032 cm: 1 (26+)	F, S, EP: 16, BR: 3 cm
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Trepida IIA/Intrepid/125-1 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3,+4), 5940 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 42 shots for fusion gun
Maintenance Points: 39

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
125-Mj RF fusion gun	168 cm: 3 (335+)	336 cm: 2 (335+)	672 cm: 1 (168+)	1344 cm: 1 (34+)	F, S, EP: 18, BR: 4 cm
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Appendix B: Imperial/Regency Vehicles

Trepida IIB/Intrepid/125-2 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3,+4), 5640 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 50 shots for fusion gun
Maintenance Points: 40

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
125-Mj RF fusion gun	168 cm: 3 (335+)	336 cm: 2 (335+)	672 cm: 1 (168+)	1344 cm: 1 (34+)	F, S, EP: 18, BR: 4 cm
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Imperial Fire Support Grav APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6300 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 140
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2 single-figure stands
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM, decoys (8)
Ammunition: Unlimited shots for gauss gun, 92 shots of missiles (any combination)
Maintenance Points: 38

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Missiles: See Imperial TL15 30kg Light "Fire and Forget" Tac Missiles chart (page 132)					H
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix B: Imperial/Regency Vehicles

Imperial Grav APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6300 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 140
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 3
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 3 shots of heavy missiles (any combination of above), 15 shots of fire & forget missiles (any combination of above)
Maintenance Points: 37

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Heavy Missiles: See Imperial TL15 95kg Heavy Tac Missiles chart (page 132)					H
Fire & Forget Missiles: See Imperial TL15 30kg Light "Fire and Forget" Tac Missiles chart (page 132)					H
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	

Imperial MRL Artillery Vehicle (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 8940 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 140
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Indirect Fire Control only
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (8)
Ammunition: 10 single shots (any combination) or one single salvo, plus autoloader fitted (one full turn to reload)
Maintenance Points: 45

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Missiles: See Imperial TL15 EMS-Designated MRL "Rockets" table (page 132)					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix B: Imperial/Regency Vehicles

Imperial Utility Sled (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 7 stands or 18 tonnes cargo
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (8)
Ammunition: None
Maintenance Points: 12

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	

Imperial Meson Artillery Vehicle (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6660 high (+6)
Front Armor: 28
Side Armor: 14
Rear Armor: 14
Deck Armor: 14
Belly Armor: 14
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Indirect Fire Control only
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (3)
Ammunition: Unlimited
Maintenance Points: 57

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
663-Mj meson gun	(3000 km) 1 (N/A)				H, EP: 11, BR: 2 cm
		(6000 km) 1 (N/A)			H, EP: 7, BR: 1 cm
			(12,000 km) 1 (N/A)		H, EP: 4, BR: 1 cm
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix B: Imperial/Regency Vehicles

Imperial Recovery Sled (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 280 low (+2, +3), 3360 high (+5)
Front Armor: 11
Side Armor: 7
Rear Armor: 7
Deck Armor: 7
Belly Armor: 7
Mass Class: VI
Explosive Damage Modifier: –4 (unloaded), –7 (loaded)
Fire Control: None
Stabilization: None

Cargo Capacity: 424 tonnes
Environmental: Sealed, nonair-breathing
Electronic Warfare: Stealth (+2 vs. Radar & HRT), decoys (8)
Ammunition: None
Maintenance Points: 6

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	

Imperial Marine FDC APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 9120 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 126
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods, Fire Direction Center (range: 80 km)
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: 50 shots for fusion gun, 3 missile shots
Maintenance Points: 39

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
18.5-Mj RF fusion gun	65 cm: 4 (129+)	130 cm: 3 (129+)	260 cm: 2 (65+)	520 cm: 1 (13+)	F, S, EP: 8, BR: 2 cm
Missiles: See Imperial TL15 95kg Heavy Tac Missiles chart (page 132)					
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix B: Imperial/Regency Vehicles

Imperial FDC Grav APC (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6300 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 140
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Ignores 5 diff mods, Fire Direction Center (range: 80 km)
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 1
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (8)
Ammunition: Unlimited shots for gauss gun
Maintenance Points: 38

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Armed Air Raft (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 6240 high (+6)
Front Armor: 8
Side Armor: 4
Rear Armor: 4
Deck Armor: 4
Belly Armor: 4
Mass Class: III
Explosive Damage Modifier: –2
Fire Control: Ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 1
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for gauss gun, 6 shots of missiles (any combination)
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Missiles: See Imperial TL15 30kg Light "Fire and Forget" Tac Missiles chart (page 132)					H
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
Communications:					
30 km maser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix B: Imperial/Regency Vehicles

Rampart Fighter (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 80 low (—,+1), 49,200 high (+9)
Front Armor: 62
Side Armor: 62
Rear Armor: 62
Deck Armor: 62
Belly Armor: 62
Mass Class: VI
Explosive Damage Modifer: –6
Fire Control: Ignores 5 diff mods
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS)
Ammunition: Unlimited shots for laser

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
144-Mj laser	∞: 1 (300)	N/A	N/A	N/A	
Sensors:					
60,000 km passive EMS	∞	∞	∞	∞	DF capable
300,000 km active EMS	∞	∞	∞	∞	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
1000 AU maser	∞	∞	∞	∞	

Imperial RDM Artillery Vehicle (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 9180 high (+6)
Front Armor: 252
Side Armor: 140
Rear Armor: 126
Deck Armor: 140
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Drone missile control only
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, Nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (8)
Ammunition: 17 shots (any combination)
Maintenance Points: 44

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
TL15 Imperial 0.1-ton remote drone missiles (page 133)					H
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
300 km meson communicator	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix C: Reformation Coalition Vehicles

Intrepid/120 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3,+4), 6000 high (+6)
Front Armor: 258
Side Armor: 129
Rear Armor: 129
Deck Armor: 129
Belly Armor: 129
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 4 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 130 shots for main gun (any of above types) plus unlimited shots for machinegun
Maintenance Points: 47 (at TL12)

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12cmL75 gun-APFSDSDU (9)	78 cm: 3 (331+)	156 cm: 2 (321+)	312 cm: 1 (311+)	624 cm: 1 (291+)	F, S
12cmL75 gun-APFSDSCI (10)	78 cm: 3 (491+)	156 cm: 2 (481+)	312 cm: 1 (471+)	624 cm: 1 (451+)	F, S
12cmL75 gun-APFSDSSD (12)	78 cm: 3 (545+)	156 cm: 2 (535+)	312 cm: 1 (525+)	624 cm: 1 (505+)	F, S
12cmL75 gun-HEAP (9)	58 cm: 3 (137+)	116 cm: 2 (137+)	232 cm: 1 (137+)	464 cm: 1 (137+)	F, S, EP: 9, BR: 4 cm
12cmL75 gun-HE (9)	58 cm: 3 (11+)	116 cm: 2 (11+)	232 cm: 1 (11+)	464 cm: 1 (11+)	F, S, EP: 11, BR: 4 cm
12cmL75 gun-flechette (9)	58 cm: 3* (2)	116 cm: 2* (2)	232 cm: 1* (2)	464 cm: 1* (2)	F, S, DS: 3 cm×12 cm
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	F, S
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Convertible Air Raft (TL12)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Note: Values below separated by a slash are in enclosed/open configurations
Movement: 440 low (+2,+3), 5280 high enclosed configuration (+5), 2520 high open configuration (+4)
Front Armor: 4/4
Side Armor: 2/2
Rear Armor: 2/2
Deck Armor: 2/Open
Belly Armor: 2/2
Mass Class: III
Explosive Damage Modifer: –2/–1
Fire Control: None
Stabilization: None

Cargo Capacity: 1
Environmental: Sealed, filtered air-breathing/Open, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 2

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km laser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix C: Reformation Coalition Vehicles

Pyrrhus Support Sled (TL13)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 480 low (+3,+4), 6000 high (+6)
Front Armor: 60
Side Armor: 8
Rear Armor: 4
Deck Armor: 8
Belly Armor: 4
Mass Class: VI
Explosive Power Modifier: –4
Fire Control: Ignores 4 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: None
Ammunition: 100 shots for fusion gun plus unlimited shots for machinegun and laser designator
Maintenance Points: 7

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12-Mj plasma gun	35 cm: 2 (104+)	70 cm: 1 (104+)	140 cm: 1 (52+)	280 cm: 1 (10+)	F, S, EP: 7, BR: 2 cm
7.5mm LMG-ball	30 cm: 5 (4)	60 cm: 4 (4)	120 cm: 3 (2)	240 cm: 2 (2)	F, S
laser designator	30 cm	60 cm	120 cm	240 cm	F, S
Sensors:					
3 km active EMS	300 cm	600 cm	1200 cm	2400 cm	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km laser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
ECM:					
3- km EMS jammer	300 cm	600 cm	1200 cm	2400 cm	Self only

Mongoose Attack Speeder (TL12)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 440 low (+2,+3), 6660 high (+6)
Front Armor: 21
Side Armor: 16
Rear Armor: 11
Deck Armor: 11
Belly Armor: 11
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: Ignores 4 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: —
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (1)
Ammunition: 75 shots for fusion gun, 4 missile shots (any combination)
Maintenance Points: 16

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
4.75-Mj RF fusion gun	22 cm: 2 (65+)	44 cm: 1 (65+)	88 cm: 1 (33+)	176 cm: 1 (7+)	F, S, EP: 4, BR: 1 cm
Missiles: See the Reformation Coalition TL12 Tac Missiles table (page 132)					H
Sensors:					
300 km active EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	
300 km ladar	(300 km)	(600 km)	(1200 km)	(2400 km)	Designator capable
300 km passive EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
300 km maser	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
ECM:					
3 km EMS jammer	(30 km)	(60 km)	(120 km)	(240 km)	Self only
50 km Area jammer	(50 km)	(100 km)	(200 km)	(400 km)	

Appendix C: Reformation Coalition Vehicles

Ferret Attack Speeder (TL12)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 440 low (+2,+3), 6660 high (+6)
Front Armor: 21
Side Armor: 16
Rear Armor: 11
Deck Armor: 11
Belly Armor: 11
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: Ignores 4 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (1)
Ammunition: 75 shots for fusion gun, 2 missile shots (any combination of above)
Maintenance Points: 16

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
14-MJ RF fusion gun	37 cm: 1 (112+)	74 cm: 1 (112+)	148 cm: 1 (56+)	296 cm: 1 (11+)	F, S, EP: 7, BR: 2 cm
Missiles: See the Reformation Coalition TL12 Tac Missiles table (page 132)					H
Sensors:					
300 km active EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	
300 km ladar	(300 km)	(600 km)	(1200 km)	(2400 km)	Designator capable
300 km passive EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
300 km maser	(300 km)	(600 km)	(1200 km)	(2400 km)	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
ECM					
3 km EMS jammer	(30 km)	(60 km)	(120 km)	(240 km)	Self only
50 km Area jammer	(50 km)	(100 km)	(200 km)	(400 km)	

Thunderchicken Attack Helicopter (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 220 low (+1,+2), 9180 high (+6)
Front Armor: 0
Side Armor: 0
Rear Armor: 0
Deck Armor: 0
Belly Armor: 0
Mass Class: V
Explosive Damage Modifier: 0
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, filtered air-breathing
Electronic Warfare: Stealth (+2 vs. Radar & HRT), decoys (4)
Ammunition: 13 shots of missiles (any combination)
Maintenance Points: 6

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
Missiles only					
Missiles: See the Reformation Coalition TL9 Tac Missiles table (page 132)					H
Sensors:					
3 km radar	300 cm	600 cm	1200 cm	2400 cm	Designator capable
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scopes	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Laser designator	(30 km)	(60 km)	(120 km)	(240 km)	
Communications:					
30 km laser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix C: Reformation Coalition Vehicles

Oriflamme Assault Sled (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 6300 high (+6)
Front Armor: 84
Side Armor: 30
Rear Armor: 30
Deck Armor: 30
Belly Armor: 38
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 4
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: Unlimited shots for HMG
Maintenance Points: 51

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	S
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Oriflamme Grav APC (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 6300 high (+6)
Front Armor: 60
Side Armor: 30
Rear Armor: 30
Deck Armor: 30
Belly Armor: 38
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 4
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: Unlimited shots for HMG
Maintenance Points: 40

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	S
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

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Oriflamme Cavalry Vehicle (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 5880 high (+6)
Front Armor: 48
Side Armor: 33
Rear Armor: 24
Deck Armor: 24
Belly Armor: 34
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Point Defense FC, ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: 50 shots for 7cm gun (any combination), unlimited shots for HMG
Maintenance Points: 24

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
7cm L75 gun-APFSDSDU-9	74 cm: 3 (139+)	148 cm: 2 (129+)	296 cm: 1 (119+)	592 cm: 1 (99+)	F, S
7cm L75 gun-APFSDSCI-10	74 cm: 3 (204+)	148 cm: 2 (194+)	296 cm: 1 (184+)	592 cm: 1 (164+)	F, S
7cm L75 gun-APFSDSSD-12	74 cm: 3 (225+)	148 cm: 2 (215+)	296 cm: 1 (205+)	592 cm: 1 (185+)	F, S
7cm L75 gun-HEAP	55 cm: 3 (77+)	110 cm: 2 (77+)	220 cm: 1 (77+)	440 cm: 1 (77+)	F, S, EP: 5, BR: 2 cm
7cm L75 gun-HE	55 cm: 3 (4+)	110 cm: 2 (4+)	220 cm: 1 (4+)	440 cm: 1 (4+)	F, S, EP: 6, BR: 3 cm
7cm L75 gun-flechette	55 cm: 3* (2)	110 cm: 2* (2)	220 cm: 1* (2)	440 cm: 1* (2)	F, S, DS: 3x11 cm
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	F, S
Sensors:					
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
300 km HRT	(300 km)	(600 km)	(1200 km)	(2400 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Oriflamme Cavalry Missile Vehicle (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 5760 high (+6)
Front Armor: 48
Side Armor: 33
Rear Armor: 24
Deck Armor: 24
Belly Armor: 34
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2 single-figure stands
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: 100 shots of missiles (any combination)
Maintenance Points: 27

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
Missiles only					
Missiles: See the Reformation Coalition TL9 Tac Missiles table (page 132)					H
Sensors:					
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
300 km HRT	(300 km)	(600 km)	(1200 km)	(2400 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

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Oriflamme Grav Tank (TL9)

Troop Quality: _____ **Morale:** ____ **Initiative:** ____
Movement: 360 low (+2, +3), 4860 high (+5)
Front Armor: 204
Side Armor: 72
Rear Armor: 42
Deck Armor: 42
Belly Armor: 57
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: —
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: 200 shots for 7cm gun (any combination), unlimited shots for HMG
Maintenance Points: 71

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
7cm L75 gun-APFSDSDU-9	74 cm: 3 (139+)	148 cm: 2 (129+)	296 cm: 1 (119+)	592 cm: 1 (99+)	F, S
7cm L75 gun-APFSDSCI-10	74 cm: 3 (204+)	148 cm: 2 (194+)	296 cm: 1 (184+)	592 cm: 1 (164+)	F, S
7cm L75 gun-APFSDSSD-12	74 cm: 3 (225+)	148 cm: 2 (215+)	296 cm: 1 (205+)	592 cm: 1 (185+)	F, S
7cm L75 gun-HEAP	55 cm: 3 (77+)	110 cm: 2 (77+)	220 cm: 1 (77+)	440 cm: 1 (77+)	F, S, EP: 5, BR: 2 cm
7cm L75 gun-HE	55 cm: 3 (4+)	110 cm: 2 (4+)	220 cm: 1 (4+)	440 cm: 1 (4+)	F, S, EP: 6, BR: 3 cm
7cm L75 gun-flechette	55 cm: 3* (2)	110 cm: 2* (2)	220 cm: 1* (2)	440 cm: 1* (2)	F, S, DS: 3x11 cm
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	F, S
Sensors:					
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Oriflamme Grav Tank Destroyer (TL9)

Troop Quality: _____ **Morale:** ____ **Initiative:** ____
Movement: 360 low (+2, +3), 4920 high (+5)
Front Armor: 204
Side Armor: 42
Rear Armor: 42
Deck Armor: 42
Belly Armor: 50
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: —
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: 75 shots for 12cm gun (any combination), unlimited shots for HMG
Maintenance Points: 63

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12cmL75 gun-APFSDSDU-9	78 cm: 3 (331+)	156 cm: 2 (321+)	312 cm: 1 (311+)	624 cm: 1 (291+)	F, S
12cmL75 gun-APFSDSCI-10	78 cm: 3 (491+)	156 cm: 2 (481+)	312 cm: 1 (471+)	624 cm: 1 (451+)	F, S
12cmL75 gun-APFSDSSD-12	78 cm: 3 (545+)	156 cm: 2 (535+)	312 cm: 1 (525+)	624 cm: 1 (505+)	F, S
12cmL75 gun-HEAP-9	58 cm: 3 (137+)	116 cm: 2 (137+)	232 cm: 1 (137+)	464 cm: 1 (137+)	F, S, EP: 9, BR: 4 cm
12cmL75 gun-HE-9	58 cm: 3 (11+)	116 cm: 2 (11+)	232 cm: 1 (11+)	464 cm: 1 (11+)	F, S, EP: 11, BR: 4 cm
12cmL75 gun-flechette-9	58 cm: 3* (2)	116 cm: 2* (2)	232 cm: 1* (2)	464 cm: 1* (2)	F, S, DS: 3 cmx12 cm
15mm RC(E) HMG-ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	F, S
Sensors:					
30 km radar	(30 km)	(60 km)	(120 km)	(240 km)	
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

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Oriflamme Grav Sled (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____ .
Movement: 360 low (+2, +3), 4980 high (+5)
Front Armor: 12
Side Armor: 6
Rear Armor: 6
Deck Armor: 6
Belly Armor: 6
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 7 stands or 19.5 tonnes
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: None
Maintenance Points: 18

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Oriflamme Light Utility Sled (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 6660 high (+6)
Front Armor: 12
Side Armor: 6
Rear Armor: 6
Deck Armor: 6
Belly Armor: 6
Mass Class: V
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 1 stand plus 1.875 tonnes or 4.5 tonnes
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: None
Maintenance Points: 11

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

Oriflamme MRL Sled (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 360 low (+2, +3), 4980 high (+5)
Front Armor: 12
Side Armor: 6
Rear Armor: 6
Deck Armor: 6
Belly Armor: 6
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Indirect Fire Control only
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (5)
Ammunition: 13 single shots (any combination) or one single salvo, plus autoloader fitted (one full turn to reload)
Maintenance Points: 32

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
Missiles: See the Oriflammen TL9 Laser-Designated MRL "Rockets" table (page 133)				H	
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scope	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
3000 km radio	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	

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Fury Assault Lander (TL12)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 320 low (+2,+3), 9180 high (+6)
Front Armor: 21
Side Armor: 21
Rear Armor: 21
Deck Armor: 21
Belly Armor: 21
Mass Class: VI
Explosive Damage Modifer: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 3
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS)
Ammunition: Unlimited ammunition for rotary MG
Maintenance Points: 6

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
5mm rotary MG-DS	18 cm: 7 (3)	36 cm: 6 (3)	72 cm: 5 (2)	144 cm: 4 (Nil)	
Sensors:					
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
1000 AU maser	∞	∞	∞	∞	

"Buster" Weapons Carrier (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 130 road (+1, +2, +2), 50 cross-country (—, —, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: Open
Belly Armor: 1
Mass Class: III
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: —
Environmental: Unsealed, filtered air-breathing
Electronic Warfare: None
Ammunition: Unlimited shots for any *one* of weapons below
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
10 cm plasma bazooka	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm
6 cm assault rckt lnchr-HE	20 cm: 1 (2+)	40 cm: 1 (2+)	—	—	EP: 6, BR: 4 cm
6 cm assault rckt lnchr-HEAP	20 cm: 1 (65+)	40 cm: 1 (65+)	—	—	EP: 5, BR: 3 cm
6 cm assault rckt lnchr-WP	20 cm: 1 (Nil)	40 cm: 1 (Nil)	—	—	EP: 3, BR: 2 cm
6 cm assault rckt lnchr-flechette	20 cm: 1* (2)	40 cm: 1* (2)	—	—	DS: 1×5 cm
Squad support laser	30 cm: 5 (Nil)	60 cm: 4 (Nil)	120 cm: 3 (Nil)	240 cm: 2 (Nil)	
Laser sniper weapon	30 cm: 1 (10)	60 cm: 1 (10)	120 cm: 1 (10)	240 cm: 1 (4)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Image converter binoculars	25 cm	50 cm	100 cm	200 cm	
PRIS binoculars	40 cm	80 cm	160 cm	320 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix C: Zhodani Vehicles

Zhodani *Qiknavra* ("Z-80") Mk1 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 6000 high (+6)
Front Armor: 252
Side Armor: 126
Rear Armor: 126
Deck Armor: 126
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for laser and VRF gauss guns
Maintenance Points: 68

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
141-Mj X-ray laser	(300 km):2(300+)	(600 km):1(300+)	(1200 km):1(300+)	(2400 km):1(300+)	F, S
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	S
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	S
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani *Qiknavra* ("Z-80") Mk2 Grav Tank (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 6000 high (+6)
Front Armor: 252
Side Armor: 126
Rear Armor: 126
Deck Armor: 126
Belly Armor: 126
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 35 shots for laser, unlimited shots for both VRF gauss guns
Maintenance Points: 60

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
141-Mj X-ray laser	(300 km):3(300+)	(600 km):2(300+)	(1200 km):1(300+)	(2400 km):1(300+)	F, S
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	S
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	S
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix C: Zhodani Vehicles

Zhodani Grav APC (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 9480 high (+6)
Front Armor: 280
Side Armor: 140
Rear Armor: 112
Deck Armor: 112
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 17 shots of missiles (any combination), unlimited shots for VRF gauss gun
Maintenance Points: 36

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Missiles: See the Zhodani TL14 35kg Tac Missiles table (page 132)					
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani Point Defense Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 8220 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 125 shots for fusion gun
Maintenance Points: 27

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
20-MJ RF fusion gun	67 cm: 5 (134+)	134 cm: 4 (134+)	268 cm: 3 (67+)	536 cm: 2 (13+)	F, S, EP: 8, BR: 2 cm
Sensors:					
3000 km active EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix C: Zhodani Vehicles

Zhodani EW Sled (TL14)

Troop Quality: _____ **Morale:** ____ **Initiative:** ____
Movement: 500 low (+3, +4), 9420 high (+6)
Front Armor: 280
Side Armor: 140
Rear Armor: 112
Deck Armor: 112
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for VRF gauss gun
Maintenance Points: 38

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
ECM:					
300 km EMS jammer	(300 km)	(600 km)	(1200 km)	(2400 km)	Area capable

Zhodani Command Sled (TL14)

Troop Quality: _____ **Morale:** ____ **Initiative:** ____
Movement: 500 low (+3, +4), 9660 high (+6)
Front Armor: 280
Side Armor: 140
Rear Armor: 112
Deck Armor: 112
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 1
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for VRF gauss gun
Maintenance Points: 36

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix C: Zhodani Vehicles

Zhodani Utility Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 7 stands or 17.75 tonnes
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: None
Maintenance Points: 12

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani LMR Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 2
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: None
Maintenance Points: 11

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30,000 km laser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
30,000 km radio	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Zhodani Meson Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: None
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: None
Maintenance Points: 20

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km meson	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix C: Zhodani Vehicles

Zhodani Light Utility Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 3 stands or 7.75 tonnes
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: None
Maintenance Points: 7

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani Recovery Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 280 low (+2, +3), 3360 high (+5)
Front Armor: 5
Side Armor: 4
Rear Armor: 4
Deck Armor: 4
Belly Armor: 4
Mass Class: V (Unloaded), VI (Loaded)
Explosive Damage Modifier: –4 (Unloaded), –5 (Loaded)
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 430 tonnes
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for VRF gauss gun
Maintenance Points: 5

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani FDC Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: Fire Direction Center (range: 80 km)
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: None
Maintenance Points: 11

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30,000 km laser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	
30,000 km radio	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix C: Zhodani Vehicles

Zhodani Gun Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 460 low (+2, +3), 5460 high (+5)
Front Armor: 280
Side Armor: 140
Rear Armor: 112
Deck Armor: 112
Belly Armor: 140
Mass Class: VI
Explosive Damage Modifier: –6
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 100 shots for fusion gun
Maintenance Points: 44

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
125-Mj RF fusion gun	168 cm: 3 (335+)	336 cm: 2 (335+)	672 cm: 1 (168+)	1344 cm: 1 (34+)	F, S, EP: 18, BR: 4 cm
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani Scout Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 21,120 high (+7)
Front Armor: 300
Side Armor: 66
Rear Armor: 66
Deck Armor: 66
Belly Armor: 66
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: 17 shots of missiles (any combination), unlimited shots for VRF gauss gun
Maintenance Points: 15

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Missiles: See the Zhodani TL14 35kg Tac Missiles table (page 132)					
Sensors:					
30 km active EMS	(30 km)	(60 km)	(120 km)	(240 km)	
300 km passive EMS	(300 km)	(600 km)	(1200 km)	(2400 km)	
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	(300 km)	(600 km)	(1200 km)	(2400 km)	
EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix C: Zhodani Vehicles

Zhodani MRL Drop Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 9660 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Point Defense FC, ignore 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 3 remote MRL packs
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+1 vs. Radar & HRT), decoys (5)
Ammunition: Unlimited shots for VRF gauss gun
Maintenance Points: 22

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
VRF gauss gun-needle	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	F, S
Remote MRL Packs: See next data card, below					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani Remote MRL Pack (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: None
Front Armor: 0
Side Armor: 0
Rear Armor: 0
Deck Armor: 0
Belly Armor: 0
Mass Class: V
Explosive Damage Modifier: –1
Fire Control: Indirect Fire FC
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: None
Ammunition: 5 shots of target designated missiles, or may be fired as single ARL salvo
Maintenance Points: 4

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
Target-Designated Artillery Rocket/Missiles: See Zhodani TL14 Remote MRL Packs table (page 133)					
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Zhodani Nuclear Damper Sled (TL14)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 500 low (+3, +4), 10,020 high (+6)
Front Armor: 56
Side Armor: 28
Rear Armor: 28
Deck Armor: 28
Belly Armor: 28
Mass Class: VI
Explosive Damage Modifier: –5
Fire Control: Point Defense FC, ignores 5 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Sealed, nonair-breathing
Electronic Warfare: EMM (+2 vs. Radar & HRT, +1 vs. Passive and Active EMS), decoys (5)
Ammunition: Unlimited shots for nuclear damper
Maintenance Points: 19

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
3000 km nuclear damper	(3000 km) 1	(6000 km) 1	(12,000 km) 1	(24,000 km) 1	F, S
Sensors:					
3000 km active EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
3000 km passive EMS	(3000 km)	(6000 km)	(12,000 km)	(24,000 km)	
WSV goggles	40 cm	80 cm	160 cm	320 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
3 km maser	300 cm	600 cm	1200 cm	2400 cm	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	
30,000 km maser	(30,000 km)	(60,000 km)	(120,000 km)	(240,000 km)	

Appendix E: Other Vehicles

"Pathie" Armored Car (TL5)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 80 road (—, +1, +2), 30 cross-country (—, —, —)
- **Front Armor:** 6
- **Side Armor:** 4
- **Rear Armor:** 4
- **Deck Armor:** 4
- **Belly Armor:** 4

Mass Class: V
Explosive Damage Modifier: –5
Fire Control: None
Stabilization: None

Cargo Capacity: None
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 14

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
7mm MMG-ball	7 cm: 5 (2)	14 cm: 4 (2)	28 cm: 3 (Nil)	56 cm: 2 (Nil)	
7mm MMG-ball	7 cm: 5 (2)	14 cm: 4 (2)	28 cm: 3 (Nil)	56 cm: 2 (Nil)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Heavy Cargo Truck (TL5)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 10 cross-country (—, —, —)
- **Front Armor:** 1
- **Side Armor:** 1
- **Rear Armor:** 1
- **Deck Armor:** open
- **Belly Armor:** 1

Mass Class: III
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 4.5 tonnes
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 5

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
None					

Medium Truck (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 110 road (—, +1, +2), 50 cross-country (—, —, +1)
- **Front Armor:** 1
- **Side Armor:** 1
- **Rear Armor:** 1
- **Deck Armor:** open
- **Belly Armor:** 1

Mass Class: IV
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 3 stands or 5 tonnes
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 5

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix E: Other Vehicles

Self-Propelled Howitzer (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 40 cross-country (—, —, +1)
Front Armor: 11
Side Armor: 7
Rear Armor: 3
Deck Armor: open
Belly Armor: 3
Mass Class: VI
Explosive Damage Modifier: –1
Fire Control: Ignores 1 Diff Mod, plus Indirect Fire Control
Stabilization: None

Cargo Capacity: None
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: 50 shots for 12cm gun (any variety) plus unlimited shots for HMG
Maintenance Points: 26

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12cm L45 gun-HEAP	33 cm: 1 (65+)	66 cm: 1 (65+)	132 cm: 1 (65+)	264 cm: 1 (65+)	F, S, H, EP: 7, BR: 3 cm
12cm L45 gun-HE	33 cm: 1 (11+)	66 cm: 1 (11+)	132 cm: 1 (11+)	264 cm: 1 (11+)	F, S, H, EP: 8, BR: 3 cm
12cm L45 gun-chem	33 cm: 1 (8+)	66 cm: 1 (8+)	132 cm: 1 (8+)	264 cm: 1 (8+)	F, S, H, EP: 3, BR: 2 cm
12cm L45 gun-flechette	33 cm: 1* (2)	66 cm: 1* (2)	132 cm: 1* (2)	264 cm: 1* (2)	F, S, H, DS: 2x6 cm
13mm HMG-ball	16 cm: 5 (4)	32 cm: 4 (4)	64 cm: 3 (2)	128 cm: 2 (2)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Medium Tank (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 40 cross-country (—, —, +1)
Front Armor: 32
Side Armor: 13
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: Ignores 1 Diff Mod
Stabilization: Basic (do not subtract 1 from ROF for a *cautious advance* order)

Cargo Capacity: None
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: 30 shots for 8cm gun (any variety) plus unlimited shots for both LMGs
Maintenance Points: 33

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
8cm L60 gun-APDS	44 cm: 1 (56+)	88 cm: 1 (49+)	176 cm: 1 (42+)	352 cm: 1 (27+)	F, S
8cm L60 gun-HEAP	33 cm: 1 (41+)	66 cm: 1 (41+)	132 cm: 1 (41+)	264 cm: 1 (41+)	F, S, EP: 4, BR: 2 cm
8cm L60 gun-HE	33 cm: 1 (5+)	66 cm: 1 (5+)	132 cm: 1 (5+)	264 cm: 1 (5+)	F, S, EP: 6, BR: 2 cm
7mm LMG-ball	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	F, S
7mm LMG-ball	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	H
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix E: Other Vehicles

Tank Destroyer (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 60 road (—, +1, +1), 50 cross-country (—, —, +1)
Front Armor: 26
Side Armor: 7
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: Ignores 1 Diff Mod
Stabilization: Basic (do not subtract 1 from ROF for a *cautious advance* order)

Cargo Capacity: None
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: 37 shots for 10cm gun (any variety) plus unlimited shots for LMG
Maintenance Points: 30

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
10cm L75 gun-APDS	53 cm: 1 (83+)	106 cm: 1 (73+)	212 cm: 1 (63+)	424 cm: 1 (43+)	F, S
10cm L75 gun-HEAP	39 cm: 1 (53+)	78 cm: 1 (53+)	156 cm: 1 (53+)	312 cm: 1 (53+)	F, S, EP: 6, BR: 3 cm
10cm L75 gun-HE	39 cm: 1 (8+)	78 cm: 1 (8+)	156 cm: 1 (8+)	312 cm: 1 (8+)	F, S, EP: 7, BR: 3 cm
7mm LMG-ball	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	F, S
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

LRV-51 Pandina (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 60 road (—, +1, +1), 40 cross-country (—, —, +1)
Front Armor: 9
Side Armor: 4
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: V
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: Basic (do not subtract 1 from ROF for a *cautious advance* order)

Cargo Capacity: None
Environmental: Unealed, air-breathing
Electronic Warfare: None
Ammunition: 4 shots 3cm, unlimited shots for LMGs
Maintenance Points: 12

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
3cm L70 gun-APDS	47 cm: 5 (8+)	94 cm: 4 (7+)	188 cm: 3 (6+)	376 cm: 2 (4+)	S
3cm L70 gun-APFSDSDU (8)	47 cm: 5 (14+)	94 cm: 4 (12+)	188 cm: 3 (10+)	376 cm: 2 (7+)	S
3cm L70 gun-APFSDSCI (10)	47 cm: 5 (21+)	94 cm: 4 (18+)	188 cm: 3 (15+)	376 cm: 2 (10+)	S
3cm L70 gun-APFSDSSD (12)	47 cm: 5 (23+)	94 cm: 4 (20+)	188 cm: 3 (17+)	376 cm: 2 (11+)	S
3cm L70 gun-HE	35 cm: 5 (Nil)	70 cm: 4 (Nil)	140 cm: 3 (Nil)	280 cm: 2 (Nil)	S, EP: 2, BR: 1 cm
3cm L70 gun-HEAP	35 cm: 5 (11+)	70 cm: 4 (11+)	140 cm: 3 (11+)	280 cm: 2 (11+)	S, EP: 2, BR: 1 cm
3cm L70 gun-chem	35 cm: 5 (Nil)	70 cm: 4 (Nil)	140 cm: 3 (Nil)	280 cm: 2 (Nil)	S, EP: 3, BR: 1 cm
3cm L70 gun-flechette	35 cm: 5* (2)	70 cm: 4* (2)	140 cm: 3* (2)	280 cm: 2* (2)	S, DS: 2×9 cm
7mm LMG-ball	15 cm: 5 (2)	30 cm: 4 (2)	60 cm: 3 (Nil)	120 cm: 2 (Nil)	S
7mm LMG-ball	15 cm: 5 (2)	30 cm: 4 (2)	60 cm: 3 (Nil)	120 cm: 2 (Nil)	
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix E: Other Vehicles

APC (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 40 cross-country (—, —, +1)
Front Armor: 26
Side Armor: 7
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 5
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: Unlimited shots for HMG
Maintenance Points: 27

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
13mm HMG-ball	16 cm: 5 (4)	32 cm: 4 (4)	64 cm: 3 (2)	128 cm: 2 (2)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Command Track (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 40 cross-country (—, —, +1)
Front Armor: 26
Side Armor: 7
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: VI
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 1
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: Unlimited shots for HMG
Maintenance Points: 27

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
13mm HMG-ball	16 cm: 5 (4)	32 cm: 4 (4)	64 cm: 3 (2)	128 cm: 2 (2)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Light Truck (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 160 road (+1, +2, +3), 60 cross-country (—, +1, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: III
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 3 single-figure stands
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 2

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix E: Other Vehicles

Medium Truck (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 110 road (—, +1, +2), 50 cross-country (—, —, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: IV
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 3 stands or 5 tonnes
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 5

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Heavy Truck (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 120 road (+1, +2, +2), 50 cross-country (—, —, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: V
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 8 stands or 12.5 tonnes
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 10

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Ground Car (TL6)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 150 road (+1, +2, +2), 30 cross-country (—, —, —)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: III
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 3 single-figure stands
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 2

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
None					

Appendix E: Other Vehicles

Tracked ATV (TL7)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 50 road (—, —, +1), 40 cross-country (—, —, +1)
Front Armor: 2
Side Armor: 2
Rear Armor: 2
Deck Armor: 2
Belly Armor: 2
Mass Class: V
Explosive Damage Modifier: –3
Fire Control: None
Stabilization: None

Cargo Capacity: 1 stand plus 1.75 tonnes
Environmental: Sealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 9

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
0.3 km HRT	30 cm	60 cm	120 cm	240 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Charina Wheeled APC (TL7)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 90 road (—, +1, +2), 40 cross-country (—, —, +1)
Front Armor: 5
Side Armor: 3
Rear Armor: 3
Deck Armor: 3
Belly Armor: 3
Mass Class: III
Explosive Damage Modifier: –4
Fire Control: None
Stabilization: None

Cargo Capacity: 1
Environmental: Unsealed, air-breathing
Electronic Warfare: None
Ammunition: Unlimited shots for LMG
Maintenance Points: 4

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
7mm LMG-ball	15 cm: 5 (2)	30 cm: 4 (2)	60 cm: 3 (Nil)	120 cm: 2 (Nil)	
Sensors:					
Headlights	3 cm	6 cm	12 cm	24 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Range Truck (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 140 road (+1, +2, +2), 60 cross-country (—, +1, +1)
Front Armor: 1
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: III
Explosive Damage Modifier: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 1 single-figure stand plus 1 tonne
Environmental: Unsealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
None					

Appendix E: Other Vehicles

Wheeled ATV (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 80 road (—, +1, +2), 40 cross-country (—, —, +1)
Front Armor: 2
Side Armor: 2
Rear Armor: 2
Deck Armor: 2
Belly Armor: 2
Mass Class: VI
Explosive Damage Modifier: –3
Fire Control: None
Stabilization: None

Cargo Capacity: 1 stand plus 3 tonnes
Environmental: Sealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 11

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
0.3 km HRT	30 cm	60 cm	120 cm	240 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Voltigeur APC (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 110 road (—, +1, +2), 90 cross-country (—, +1, +2)
Front Armor: 72
Side Armor: 48
Rear Armor: 24
Deck Armor: 48
Belly Armor: 24
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 6 stands plus 1.4 tonnes
Environmental: Overpressure, air-breathing
Electronic Warfare: decoys (5)
Ammunition: Unlimited shots for MG
Maintenance Points: 56

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
5mm rotary MG-ball	15 cm: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	S
Sensors:					
3 km HRT	300 cm	600 cm	1200 cm	2400 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Lancer Missile Carrier (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 100 road (—, +1, +2), 80 cross-country (—, +1, +2)
Front Armor: 72
Side Armor: 48
Rear Armor: 24
Deck Armor: 48
Belly Armor: 24
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: None
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Overpressure, air-breathing
Electronic Warfare: decoys (5)
Ammunition: 15 shots for missiles (any combination), unlimited shots for MG
Maintenance Points: 62

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
5mm rotary MG-ball	15 cm: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	S
Missiles: See TL8 Lancer Tac Missiles table (page 133)					
Sensors:					
3 km HRT	300 cm	600 cm	1200 cm	2400 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	(30 km)	(60 km)	(120 km)	(240 km)	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Appendix E: Other Vehicles

Prairie Fire Fast Tank (TL8)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 130 road (+1, +2, +2), 100 cross-country (—, +1, +2)
Front Armor: 192
Side Armor: 48
Rear Armor: 24
Deck Armor: 36
Belly Armor: 24
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Overpressure, air-breathing
Electronic Warfare: decoys (5)
Ammunition: 25 shots of 13cm (any combination), unlimited shots for both MGs
Maintenance Points: 62

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
13cm L60 gun-APFSDSDU	67 cm: 1 (207+)	134 cm: 1 (197+)	268 cm: 1 (187+)	536 cm: 1 (167+)	F, S
13cm L60 gun-HEAP	51 cm: 1 (123+)	102 cm: 1 (123+)	204 cm: 1 (123+)	408 cm: 1 (123+)	F, S, EP: 9, BR: 3 cm
13cm L60 gun-HE	51 cm: 1 (13+)	102 cm: 1 (13+)	204 cm: 1 (13+)	408 cm: 1 (13+)	F, S, EP: 11, BR: 4 cm
13cm L60 gun-flechette	51 cm: 1* (2)	102 cm: 1* (2)	204 cm: 1* (2)	408 cm: 1* (2)	F, S, DS: 3x10 cm
7mm rotary MG-ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	F, S
5mm rotary MG-ball	15 cm: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	F, S
Sensors:					
3 km HRT	300 cm	600 cm	1200 cm	2400 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km radio	(30 km)	(60 km)	(120 km)	(240 km)	

Ground Tank (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 120 road (+1, +2, +2), 100 cross-country (—, +1, +2)
Front Armor: 204
Side Armor: 54
Rear Armor: 30
Deck Armor: 54
Belly Armor: 30
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: None
Environmental: Overpressure, air-breathing
Electronic Warfare: decoys (5)
Ammunition: 30 shots of 12cm (any combination of above), unlimited shots for 7mm MG
Maintenance Points: 70

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12cm L60 gun-APFSDSDU	67 cm: 3 (289+)	134 cm: 2 (279+)	268 cm: 1 (269+)	536 cm: 1 (249+)	F, S
12cm L60 gun-HEAP	50 cm: 3 (137+)	100 cm: 2 (137+)	200 cm: 1 (137+)	400 cm: 1 (137+)	F, S, EP: 9, BR: 4 cm
12cm L60 gun-HE	50 cm: 3 (11+)	100 cm: 2 (11+)	200 cm: 1 (11+)	400 cm: 1 (11+)	F, S, EP: 11, BR: 4 cm
12cm L60 gun-flechette	50 cm: 3* (2)	100 cm: 2* (2)	200 cm: 1* (2)	400 cm: 1* (2)	F, S, DS: 3x10 cm
7mm rotary MG-ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	F, S
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix E: Other Vehicles

Troop Transport Helicopter (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 220 low (+1,+2), 9000 high (+6)
Front Armor: 0
Side Armor: 0
Rear Armor: 0
Deck Armor: 0
Belly Armor: 0
Mass Class: IV
Explosive Damage Modifier: 0
Fire Control: None
Stabilization: None

Cargo Capacity: 3
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (4)
Ammunition: Unlimited shots for LMGs
Maintenance Points: 4

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
5mm LMG-ball	7 cm: 5 (3)	14 cm: 4 (3)	28 cm: 3 (Nil)	56 cm: 2 (Nil)	
Sensors:					
Image intens scopes	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Abomination Infantry Assault Vehicle (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 130 road (+1, +2, +2), 100 cross-country (—, +1, +2)
Front Armor: 288
Side Armor: 192
Rear Armor: 120
Deck Armor: 192
Belly Armor: 120
Mass Class: VI
Explosive Damage Modifier: –7
Fire Control: Ignores 2 diff mods, TL9 Indirect Fire Control
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2
Environmental: Sealed, nonair-breathing
Electronic Warfare: None
Ammunition: 60 shots of 12cm (any combination)
Maintenance Points: 113

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
12cm L20 gun-HEAP	28 cm: 5 (137+)	56 cm: 4 (137+)	112 cm: 3 (137+)	224 cm: 2 (137+)	F, S, EP: 9, BR: 4 cm, IFR: 11 km
12cm L20 gun-HE	28 cm: 5 (11+)	56 cm: 4 (11+)	112 cm: 3 (11+)	224 cm: 2 (11+)	F, S, EP: 11, BR: 4 cm, IFR: 11 km
12cm L20 gun-flechette	28 cm: 5* (2)	56 cm: 4* (2)	112 cm: 3* (2)	224 cm: 2* (2)	F, S, DS: 2×6 cm
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Ground APC (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 140 road (+1, +2, +2), 110 cross-country (—, +1, +2)
Front Armor: 27
Side Armor: 18
Rear Armor: 18
Deck Armor: open
Belly Armor: 18
Mass Class: VI
Explosive Damage Modifier: –1
Fire Control: Ignores 2 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2 stands plus 1.3 tonnes
Environmental: Overpressure, air-breathing
Electronic Warfare: decoys (5)
Ammunition: 15 shots of 3cm (any combination of above)
Maintenance Points: 22

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
3cm L60 gun-APFSDSDU	60 cm: 4 (21+)	120 cm: 3 (18+)	240 cm: 2 (15+)	480 cm: 1 (8+)	F, S
3cm L60 gun-WP	45 cm: 4 (137+)	90 cm: 3 (137+)	180 cm: 2 (137+)	360 cm: 1 (137+)	F, S, EP: 3, BR: 1 cm
Sensors:					
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix E: Other Vehicles

Helicopter Gunship (TL9)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 220 low (+1,+2), 9060 high (+6)
Front Armor: 0
Side Armor: 0
Rear Armor: 0
Deck Armor: 0
Belly Armor: 0
Mass Class: IV
Explosive Damage Modifier: 0
Fire Control: None
Stabilization: None

Cargo Capacity: None
Environmental: Sealed, filtered air-breathing
Electronic Warfare: decoys (4)
Ammunition: 5 shots of homing missiles and 5 shots of laser designated missiles plus unlimited shots for 7mm MG
Maintenance Points: 4

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
7mm rotary MG-ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	
Missiles: See the Common TL9 Manportable Tac Missiles table (page 133)					
Sensors:					
3 km radar	300 cm	600 cm	1200 cm	2400 cm	Designator capable
30 km HRT	(30 km)	(60 km)	(120 km)	(240 km)	
Image intens scopes	25 cm	50 cm	100 cm	200 cm	
Eyeballs	100 cm	200 cm	400 cm	800 cm	
laser designator	(30 km)	(60 km)	(120 km)	(240 km)	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Open Air Raft (TL10)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 120 low (+1,+2), 3360 high (+5)
Front Armor: 2
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: III
Explosive Damage Modifer: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 1
Environmental: Unsealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix E: Other Vehicles

G-Carrier (TL11)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 420 low (+2,+3), 5280 high (+5)
Front Armor: 16
Side Armor: 16
Rear Armor: 8
Deck Armor: 8
Belly Armor: 8
Mass Class: V
Explosive Damage Modifier: –3
Fire Control: Ignores 3 diff mods
Stabilization: Advanced (treat cautious and rapid advance as *no order* for ROF and sequence of fire purposes)

Cargo Capacity: 2
Environmental: Sealed, filtered air-breathing
Electronic Warfare: None
Ammunition: 50 shots for fusion gun, unlimited shots for LMG
Maintenance Points: 6

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
2-Mj RF plasma gun	14 cm: 2 (42+)	28 cm: 1 (42+)	56 cm: 1 (21+)	112 cm: 1 (4+)	F, S, EP: 3, BR: 1 cm
7.5mm LMG-ball	30 cm: 5 (4)	60 cm: 4 (4)	120 cm: 3 (2)	240 cm: 2 (2)	F, S
Sensors:					
3 km passive EMS	300 cm	600 cm	1200 cm	2400 cm	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Active EMS designator	300 cm	600 cm	1200 cm	2400 cm	
Communications:					
30 km laser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Enclosed Air Raft (TL12)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 440 low (+2,+3), 5280 high (+5)
Front Armor: 2
Side Armor: 1
Rear Armor: 1
Deck Armor: 1
Belly Armor: 1
Mass Class: III
Explosive Damage Modifer: –2
Fire Control: None
Stabilization: None

Cargo Capacity: 3 single-figure stands
Environmental: Sealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km laser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Convertible Air Raft (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Note: Values below separated by a slash are in enclosed/open configurations
Movement: 520 low (+3,+4), 6660 high enclosed configuration (+6), 2520 high open configuration (+4)
Front Armor: 8/8
Side Armor: 4/4
Rear Armor: 4/4
Deck Armor: 4/open
Belly Armor: 4/4
Mass Class: III
Explosive Damage Modifier: –2/–1
Fire Control: None
Stabilization: None

Cargo Capacity: 1
Environmental: Sealed, filtered air-breathing/open, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
30 km passive EMS	(30 km)	(60 km)	(120 km)	(240 km)	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
30 km maser	(30 km)	(60 km)	(120 km)	(240 km)	
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Appendix E: Other Vehicles

Speeder (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 520 low (+3,+4), 10,020 high (+6)
Front Armor: 2
Side Armor: 1
Rear Armor: 1
Deck Armor: 1
Belly Armor: 1
Mass Class: III
Explosive Damage Modifer: –2
Fire Control: None
Stabilization: None

Cargo Capacity: 3 single-figure stands
Environmental: Sealed, filtered air-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
3 km passive EMS	300 cm	600 cm	1200 cm	2400 cm	DF capable
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
300 km radio	(300 km)	(600 km)	(1200 km)	(2400 km)	

Grav Bike (TL15)

Troop Quality: _____ **Morale:** _____ **Initiative:** _____
Movement: 120 low (+1,+2), 3360 high (+5)
Front Armor: 2
Side Armor: 1
Rear Armor: 1
Deck Armor: open
Belly Armor: 1
Mass Class: I
Explosive Damage Modifer: –1
Fire Control: None
Stabilization: None

Cargo Capacity: 1 single-figure stand
Environmental: Unsealed, nonair-breathing
Electronic Warfare: None
Ammunition: None
Maintenance Points: 1

System:	*Short ( )*	*Medium ( )*	*Long ( )*	*Extreme ( )*	*Notes*
None					
Sensors:					
Eyeballs	100 cm	200 cm	400 cm	800 cm	
Communications:					
None					

Appendix F: Missiles

Imperial TL15 95kg Heavy Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
0.1 kt homing msl	(20 km) 1 (notes)	(40 km) 1 (notes)	(70 km) 1 (notes)	—	A4, DR: 3 cm, EP 18, BR: 10 cm
0.1 kt homing msl	(40 km) 1 (notes)	(70 km) 1 (notes)	—	—	A6, DR: 3 cm, EP 18, BR: 10 cm
0.1 kt homing msl	(40 km) 1 (notes)	(80 km) 1 (notes)	(133 km) 1 (notes)	—	A10, DR: 3 cm, EP 18, BR: 10 cm
0.1 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A4, DR: 3 cm, EP 18, BR: 10 cm, 70 km
0.1 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A8, DR: 3 cm, EP 18, BR: 10 cm, 133 km
0.1 kt command guided msl	(70 km) 1 (notes)	—	—	—	A4, DR: 3 cm, EP 18, BR: 10 cm
0.5 kt homing msl	(20 km) 1 (notes)	(40 km) 1 (notes)	(65 km) 1 (notes)	—	A4, DR: 3 cm, EP 18, BR: 15 cm
0.5 kt homing msl	(40 km) 1 (notes)	(65 km) 1 (notes)	—	—	A6, DR: 3 cm, EP 18, BR: 15 cm
0.5 kt homing msl	(40 km) 1 (notes)	(80 km) 1 (notes)	(124 km) 1 (notes)	—	A10, DR: 3 cm, EP 18, BR: 15 cm
0.5 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A4, DR: 3 cm, EP 18, BR: 15 cm, 65 km
0.5 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A8, DR: 3 cm, EP 18, BR: 15 cm, 124 km
0.5 kt command guided msl	(65 km) 1 (notes)	—	—	—	A4, DR: 3 cm, EP 18, BR: 15 cm
1 kt homing msl	(20 km) 1 (notes)	(40 km) 1 (notes)	(62 km) 1 (notes)	—	A4, DR: 3 cm, EP 18, BR: 21 cm
1 kt homing msl	(40 km) 1 (notes)	(62 km) 1 (notes)	—	—	A6, DR: 3 cm, EP 18, BR: 21 cm
1 kt homing msl	(40 km) 1 (notes)	(80 km) 1 (notes)	(118 km) 1 (notes)	—	A10, DR: 3 cm, EP 18, BR: 21 cm
1 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A4, DR: 3 cm, EP 18, BR: 21 cm, 62 km
1 kt target desig msl	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A8, DR: 3 cm, EP 18, BR: 21 cm, 118 km
1 kt command guided msl	(62 km) 1 (notes)	—	—	—	A4, DR: 3 cm, EP 18, BR: 21 cm

Imperial TL15 30kg Light "Fire-and-Forget" Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
30kg F&F tgt desig HE	— 1 (5+)	— 1 (5+)	— 1 (5+)	— 1 (5+)	ED, A8, EP: 8, BR: 5 cm, 54 km
30kg F&F homing HE	(20 km) 1 (5+)	(40 km) 1 (5+)	(54 km) 1 (5+)	—	A10, EP: 8, BR: 5 cm
30kg F&F tgt desig flechette	— 1* (2)	— 1* (2)	— 1* (2)	— 1* (2)	ED, A8, DS: 15x60 cm, 54 km
30 kg F&F homing flechette	(20 km) 1* (2)	(40 km) 1* (2)	(54 km) 1* (2)	—	A10, DS: 15x60 cm
30kg F&F tgt desig HEAP	— 1 (149+)	— 1 (149+)	— 1 (149+)	— 1 (149+)	ED, A8, EP: 11, BR: 6 cm, 25 km
30kg F&F homing HEAP	(20 km) 1 (149+)	(25 km) 1 (149+)	—	—	A10, EP: 11, BR: 6 cm

Reformation Coalition TL12 Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Skybird tgt desig msl	— 1 (26+)	— 1 (26+)	— 1 (26+)	— 1 (26+)	ED, A10, EP: 18, BR: 12 cm, 382 km
Skybird homing msl	(40 km) 1 (26+)	(80 km) 1 (26+)	(160 km) 1 (26+)	(320 km) 1 (26+)	A10, EP: 18, BR: 12 cm
Firebird tgt desig msl	— 1 (137+)	— 1 (137+)	— 1 (137+)	— 1 (137+)	ED, A8, EP: 10, BR: 5 cm, 32 km
Firebird homing msl	(32 km) 1 (137+)	—	—	—	A8, EP: 10, BR: 5 cm
Thunderbird tgt desig msl	— 1 (281+)	— 1 (281+)	— 1 (281+)	— 1 (281+)	ED, A8, EP: 18, BR: 10 cm, 36 km
Thunderbird homing msl	(36 km) 1 (281+)	—	—	—	A8, EP: 18, BR: 10 cm
Songbird tgt desig msl	— 1 (26+)	— 1 (26+)	— 1 (26+)	— 1 (26+)	ED, A10, EP: 18, BR: 12 cm, 440 km
Songbird homing msl	(40 km) 1 (26+)	(80 km) 1 (26+)	(160 km) 1 (26+)	(320 km) 1 (26+)	A10, EP: 18, BR: 12 cm
Jailbird tgt desig msl	— 1 (38+)	— 1 (38+)	— 1 (38+)	— 1 (38+)	ED, A10, EP: 18, BR: 16 cm, 62 km
Jailbird homing msl	(40 km) 1 (38+)	(62 km) 1 (38+)	—	—	A10, EP: 18, BR: 16 cm
Butcherbird tgt desig msl	— 1* (2)	— 1* (2)	— 1* (2)	— 1* (2)	ED, A8, DS: 6x28 cm, 23 km
Butcherbird	(20 km) 1* (2)	(23 km) 1* (2)	—	—	A8, DS: 6x28 cm

Reformation Coalition TL9 Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Nail tgt desig msl HE	— 1 (8+)	— 1 (8+)	— 1 (8+)	— 1 (8+)	LD, A5, EP: 9, BR: 5 cm, R: 600 cm
Nail tgt desig msl HEAP	— 1 (113+)	— 1 (113+)	— 1 (113+)	— 1 (113+)	LD, A5, EP: 7, BR: 4 cm, R: 600 cm
Nail tgt desig msl WP	— 1 (Nil)	— 1 (Nil)	— 1 (Nil)	— 1 (Nil)	LD, A5, EP: 3, BR: 4 cm, R: 600 cm
Nail SAM homing msl HE	600 cm: 1 (8+)	—	—	—	LD, A5, EP: 9, BR: 5 cm
Nail SAM homing msl HEAP	600 cm: 1 (113+)	—	—	—	LD, A5, EP: 7, BR: 4 cm
Nail ARM homing msl	600 cm: 1 (8+)	—	—	—	LD, A5, EP: 9, BR: 5 cm
Lyrebird tgt desig msl HE	— 1 (8+)	— 1 (8+)	— 1 (8+)	— 1 (8+)	LD, A3, EP: 9, BR: 5 cm, R: 24 km, plunge
Lyrebird tgt desig msl HEAP	— 1 (113+)	— 1 (113+)	— 1 (113+)	— 1 (113+)	LD, A3, EP: 7, BR: 4 cm, R: 24 km, plunge
Lyrebird tgt desig msl WP	— 1 (Nil)	— 1 (Nil)	— 1 (Nil)	— 1 (Nil)	LD, A3, EP: 3, BR: 4 cm, R: 24 km, plunge
Lyrebird tgt desig msl Submun	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	LD, A3, EP: 16, BR: 3 cm, R: 24 km, plunge
Lyrebird tgt desig msl DP Submun	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	LD, A3, EP: 16, BR: 3 cm, R: 24 km, plunge
Lyrebird tgt desig msl Hmg Submun	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	LD, A3, EP: 20/10, BR: 2 cm, R: 24 km, plunging

Zhodani TL14 35kg Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Tgt desig HE	— 1 (5+)	— 1 (5+)	— 1 (5+)	— 1 (5+)	ED, A8, EP: 8, BR: 5 cm, R: 55 km
Tgt desig flechette	— 1 (2)	— 1 (2)	— 1 (2)	— 1 (2)	ED, A8, DS: 15x60 cm, R: 55 km
Homing HE	(20 km) 1 (5+)	(40 km) 1 (5+)	(55km) 1 (5+)	—	A10, EP: 8, BR: 5 cm
Homing flechette	(20 km) 1 (2)	(40 km) 1 (2)	(55km) 1 (2)	—	A10, DS: 15x60 cm
Homing ARM HE	(20 km) 1 (5+)	(40 km) 1 (5+)	(55km) 1 (5+)	—	A10, EP: 8, BR: 5 cm
Homing ARM flechette	(20 km) 1 (2)	(40 km) 1 (2)	(55km) 1 (2)	—	A10, DS: 15x60 cm
Tgt desig 0.1 kt	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	ED, A8, DR: 3 cm, EP: 18, BR: 10 cm, R: 55 km
Homing 0.1 kt	(20 km) 1 (notes)	(40 km) 1 (notes)	(55km) 1 (notes)	—	A10, DR: 3 cm, EP: 18, BR: 10 cm
Homing ARM 0.1 kt	(20 km) 1 (notes)	(40 km) 1 (notes)	(55km) 1 (notes)	—	A10, DR: 3 cm, EP: 18, BR: 10 cm

Imperial TL15 EMS-Designated MRL "Rockets"

Missiles:	Short	Medium	Long	Extreme	Notes
HE "rocket"	— 10 (38+)	— 10 (38+)	— 10 (38+)	— 10 (38+)	ED, A9, EP: 18, BR: 16 cm, R: 650 km
HEAP "rocket"	— 10 (353+)	— 10 (353+)	— 10 (353+)	— 10 (353+)	ED, A9, EP: 18, BR: 13 cm, R: 650 km
Submunition "rocket"	— 10 (notes)	— 10 (notes)	— 10 (notes)	— 10 (notes)	ED, A9, EP: 16, BR: 23, R: 650 km
DP submunition "rocket"	— 10 (notes)	— 10 (notes)	— 10 (notes)	— 10 (notes)	ED, A9, EP: 16, BR: 23, R: 650 km
Homing submunition "rocket"	— 10 (notes)	— 10 (notes)	— 10 (notes)	— 10 (notes)	ED, A9, EP: 20/10, BR: 12, R: 650 km
ARL salvo, HE	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	A9, EP: 18, BR: 72 cm, R: 650 km
ARL salvo, HEAP	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	A9, EP: 18, BR: 58 cm, R: 650 km
ARL salvo, submunition	— 1 (notes)	— 1 (notes)	— 1 (notes)	— 1 (notes)	A9, EP: 16, BR: 103, R: 650 km

Missiles	Short	Medium	Long	Extreme	Notes
ARL salvo, DP submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 16, BR: 103, R: 650 km
ARL salvo, homing submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 20/10, BR: 54, R: 650 km

Oriflammen TL9 Laser-Designated MRL "Rockets"

Missiles:	Short	Medium	Long	Extreme	Notes
HE "rocket"	—13 (38+)	—13 (38+)	—13 (38+)	—13 (38+)	LD, A9, EP: 18, BR: 14 cm, R: 650 km
HEAP "rocket"	—13 (353+)	—13 (353+)	—13 (353+)	—13 (353+)	LD, A9, EP: 18, BR: 11 cm, R: 650 km
Submunition "rocket"	—13 (notes)	—13 (notes)	—13 (notes)	—13 (notes)	LD, A9, EP: 16, BR: 23, R: 650 km
DP submunition "rocket"	—13 (notes)	—13 (notes)	—13 (notes)	—13 (notes)	LD, A9, EP: 16, BR: 23, R: 650 km
Homing submunition "rocket"	—13 (notes)	—13 (notes)	—13 (notes)	—13 (notes)	LD, A9, EP: 20/10, BR: 12, R: 650 km
ARL salvo, HE	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 18, BR: 73 cm, R: 650 km
ARL salvo, HEAP	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 18, BR: 57 cm, R: 650 km
ARL salvo, submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 16, BR: 120, R: 650 km
ARL salvo, DP submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 16, BR: 120, R: 650 km
ARL salvo, homing submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 20/10, BR: 62, R: 650 km

Zhodani TL14 Remote MRL Packs

Missiles:	Short	Medium	Long	Extreme	Notes
HE "rocket"	—5 (38+)	—5 (38+)	—5 (38+)	—5 (38+)	ED, A9, EP: 18, BR: 16 cm, R: 650 km
HEAP "rocket"	—5 (353+)	—5 (353+)	—5 (353+)	—5 (353+)	ED, A9, EP: 18, BR: 13 cm, R: 650 km
Submunition "rocket"	—5 (notes)	—5 (notes)	—5 (notes)	—5 (notes)	ED, A9, EP: 16, BR: 23, R: 650 km
DP submunition "rocket"	—5 (notes)	—5 (notes)	—5 (notes)	—5 (notes)	ED, A9, EP: 16, BR: 23, R: 650 km
Homing submunition "rocket"	—5 (notes)	—5 (notes)	—5 (notes)	—5 (notes)	ED, A9, EP: 20/10, BR: 12, R: 650 km
ARL salvo, HE	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 18, BR: 51 cm, R: 650 km
ARL salvo, HEAP	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 18, BR: 41 cm, R: 650 km
ARL salvo, submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 16, BR: 73, R: 650 km
ARL salvo, DP submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 16, BR: 73, R: 650 km
ARL salvo, homing submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	A9, EP: 20/10, BR: 38, R: 650 km

Common TL7 Manportable Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing msl-HE	1074 cm: 1 (1+)	—	—	—	A5, EP: 4, BR: 3 cm
Cmd guided msl-HEAP	758 cm: 1 (57+)	—	—	—	A4, EP: 5, BR: 3 cm

TL8 Lancer Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing msl-HEAP	(20 km): 1 (193+)	—	—	—	A6, EP: 14, BR: 7 cm
Laser desig msl-HEAP	—1 (193+)	—1 (193+)	—1 (193+)	—1 (193+)	LD, A6, EP: 14, BR: 7 cm, R: 21 km

Common TL9 Manportable Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing msl-HE	1056 cm: 1 (2+)	—	—	—	A6, EP: 5, BR: 3 cm
Laser desig msl-HEAP	—1 (101+)	—1 (101+)	—1 (101+)	—1 (101+)	LD, A4, EP: 7, BR: 4 cm, R: 12 km

Common TL11 Manportable Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing msl-HE	1584 cm: 1 (2+)	—	—	—	A7, EP: 6, BR: 4 cm
Laser desig msl-HEAP	—1 (113+)	—1 (113+)	—1 (113+)	—1 (113+)	LD, A6, EP: 8, BR: 5 cm, R: 15 km

Common TL13 Manportable Tac Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing msl-HEAP	890 cm: 1 (53+)	—	—	—	A8, EP: 4, BR: 3 cm
Laser desig msl-HEAP	—1 (125+)	—1 (125+)	—1 (125+)	—1 (125+)	LD, A6, EP: 9, BR: 5 cm, R: 14 km

Reformation Coalition TL11 Planetary Strike (Orbital Bombardment) Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
Homing-HE	(40 km) N (38+)	(80 km) N (38+)	(160 km) N (38+)	(320 km) N (38+)	EP: 18, BR: 16 cm
Homing ARM-HE	(36 km) N (38+)	(72 km) N (38+)	(144 km) N (38+)	(288 km) N (38+)	EP: 18, BR: 16 cm
EMS desig-HE	— N (38+)	— N (38+)	— N (38+)	— N (38+)	ED, EP: 18, BR: 16 cm, R: 1483 km
Homing-HEAP	(40 km) N (353+)	(80 km) N (353+)	(160 km) N (353+)	(320 km) N (353+)	EP: 18, BR: 13 cm
Homing ARM-HEAP	(36 km) N (353+)	(72 km) N (353+)	(144 km) N (353+)	(288 km) N (353+)	EP: 18, BR: 13 cm
EMS desig-HEAP	— N (353+)	— N (353+)	— N (353+)	— N (353+)	ED, EP: 18, BR: 13 cm, R: 1483 km
Homing-submunition	(40 km) N (notes)	(80 km) N (notes)	(160 km) N (notes)	(320 km) N (notes)	EP: 16, BR: 23 cm
Homing ARM-submunition	(36 km) N (notes)	(72 km) N (notes)	(144 km) N (notes)	(288 km) N (notes)	EP: 16, BR: 23 cm
EMS desig-submunition	— N (notes)	— N (notes)	— N (notes)	— N (notes)	ED, EP: 16, BR: 23 cm, R: 1483 km
Homing-DP submunition	(40 km) N (notes)	(80 km) N (notes)	(160 km) N (notes)	(320 km) N (notes)	EP: 16, BR: 23 cm
Homing ARM-DP submunition	(36 km) N (notes)	(72 km) N (notes)	(144 km) N (notes)	(288 km) N (notes)	EP: 16, BR: 23 cm
EMS desig-DP submunition	— N (notes)	— N (notes)	— N (notes)	— N (notes)	ED, EP: 16, BR: 23 cm, R: 1483 km
Homing-homing submunition	(40 km) N (notes)	(80 km) N (notes)	(160 km) N (notes)	(320 km) N (notes)	EP: 20/10, BR: 12 cm
Homing ARM-homing submunition	(36 km) N (notes)	(72 km) N (notes)	(144 km) N (notes)	(288 km) N (notes)	EP: 20/10, BR: 12 cm
EMS desig-homing submun	— N (notes)	— N (notes)	— N (notes)	— N (notes)	ED, EP: 20/10, BR: 12 cm, R: 1483 km

Reformation Coalition TL11 Mjolnir Advanced ARM

Missiles:	Short	Medium	Long	Extreme	Notes
Homing ARM-HE	(36 km) 1 (38+)	(52 km) 1 (38+)	—	—	EP: 18, BR: 16 cm
EMS desig-HE	—1 (38+)	—1 (38+)	—1 (38+)	—1 (38+)	ED, EP: 18, BR: 16 cm, R: 52 km
Homing ARM-submunition	(36 km) 1 (notes)	(52 km) 1 (notes)	—	—	EP: 16, BR: 23 cm
EMS desig-submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 23 cm, R: 52 km
Homing ARM-DP submunition	(36 km) 1 (notes)	(52 km) 1 (notes)	—	—	EP: 16, BR: 23 cm
EMS desig-DP submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 23 cm, R: 52 km
Homing ARM-homing submunition	(36 km) 1 (notes)	(52 km) 1 (notes)	—	—	EP: 20/10, BR: 12 cm
EMS desig-homing submunition	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 20/10, BR: 12 cm, R: 52 km

TL15 Imperial 0.1-ton Remote Drone Missiles

Missiles:	Short	Medium	Long	Extreme	Notes
RDM HE	1236 cm: 10 (38+)	—	—	—	A9 (+5), EP: 18, BR: 16 cm, Move 560 (+3, +4)
RDM HEAP	1236 cm: 10 (353+)	—	—	—	A9 (+5), EP: 18, BR: 13 cm, Move 560 (+3, +4)
RDM submunition	1236 cm: 10 (notes)	—	—	—	A9 (+5), EP: 16, BR: 23 cm, Move 560 (+3, +4)
RDM DP submunition	1236 cm: 10 (notes)	—	—	—	A9 (+5), EP: 16, BR: 23 cm, Move 560 (+3, +4)
RDM homing submunition	1236 cm: 10 (notes)	—	—	—	A9 (+5), EP: 20/10, BR: 12 cm, Move 560 (+3, +4)

Appendix G: Infantry Equipment

Slug Pistols

System:	Short	Medium	Long	Extreme	Notes
9mm revolver-4 ball	1 cm: 2 (Nil)	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
5mm revolver-5 ball	1 cm: 2 (Nil)	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
7mm revolver-5 ball	1 cm: 2 (Nil)	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
9mm revolver-5 ball	1 cm: 2 (Nil)	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
9mm magnum revolver-5 ball	1 cm: 2 (2)	2 cm: 1 (2)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
10mm snub revolver-8 HE	—	1 cm: 1 (Nil)	—	2 cm: 1 (Nil)	
10mm snub revolver-8 HEAP-9	—	1 cm: 1 (2)	—	2 cm: 1 (2)	
10mm snub auto-8 HE	—	1 cm: 2 (Nil)	—	2 cm: 1 (Nil)	
10mm snub auto-8 DS	1 cm: 3 (2)	—	3 cm: 1 (Nil)	6 cm: 1 (Nil)	
10mm snub auto-8 HEAP-9	—	1 cm: 2 (2)	—	2 cm: 1 (2)	
5mm body pistol-8 DS	—	1 cm: 2 (Nil)	—	2 cm: 1 (Nil)	
7mm autopistol-6 ball	1 cm: 3 (Nil)	2 cm: 2 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
9mm autopistol-6 ball	1 cm: 3 (Nil)	2 cm: 2 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
4mm gauss pistol-13 dart	1 cm: 4 (Nil)	2 cm: 3 (Nil)	4 cm: 2 (Nil)	8 cm: 1 (Nil)	
4mm gauss pistol-13 HEAP	1 cm: 4 (2)	2 cm: 3 (2)	4 cm: 2 (2)	8 cm: 1 (2)	
7.6mm RC(E) autopistol-9 ball	1 cm: 3 (2)	2 cm: 2 (2)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	
7.6mm RC(E) autopistol-9 DS	1 cm: 3 (2)	2 cm: 2 (2)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	
7.6mm RC(E) autopistol-9 HEAP	1 cm: 3 (2)	—	3 cm: 1 (2)	6 cm: 1 (2)	
9mm autopistol-6 ball	1 cm: 3 (Nil)	2 cm: 2 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	
9mm autopistol-6 DS-8	2 cm: 3 (2)	3 cm: 2 (2)	6 cm: 1 (Nil)	13 cm: 1 (Nil)	
5.5mm Ithklur gauss pistol-14 dart	3 cm: 3 (4)	6 cm: 2 (4)	12 cm: 1 (2)	24 cm: 1 (Nil)	
5.5mm Ithklur gauss pistol-14 HEAP	2 cm: 3 (3)	4 cm: 2 (3)	8 cm: 1 (3)	16 cm: 1 (3)	

Submachineguns

System:	Short	Medium	Long	Extreme	Notes
9mm SMG-5	4 cm: 4 (2)	8 cm: 3 (2)	16 cm: 2 (Nil)	32 cm: 1 (Nil)	
9mm SMG-6	4 cm: 4 (2)	8 cm: 3 (2)	16 cm: 2 (Nil)	32 cm: 1 (Nil)	
7.6mm RC(E) SMG-9 ball	8 cm: 4 (2)	16 cm: 3 (2)	32 cm: 2 (Nil)	64 cm: 1 (Nil)	
7.6mm RC(E) SMG-9 DS	9 cm: 4 (2)	18 cm: 3 (2)	36 cm: 2 (Nil)	72 cm: 1 (Nil)	
7.6mm RC(E) SMG-9 HEAP	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (2)	48 cm: 1 (2)	
9mm deck sweeper-5 ball	7 cm: 4 (2)	14 cm: 3 (2)	28 cm: 2 (Nil)	56 cm: 1 (Nil)	
9mm deck sweeper-5 DS-8	8 cm: 4 (2)	16 cm: 3 (2)	32 cm: 2 (1)	64 cm: 1 (Nil)	
9mm deck sweeper-5 HEAP-7	5 cm: 4 (2)	10 cm: 3 (2)	20 cm: 2 (2)	40 cm: 1 (2)	

Autoguns

System:	Short	Medium	Long	Extreme	Notes
7mm MMG-5 ball	15 cm: 5 (2)	30 cm: 4 (2)	60 cm: 3 (Nil)	120 cm: 2 (Nil)	
7mm LMG-6 ball	10 cm: 5 (2)	20 cm: 4 (2)	40 cm: 3 (Nil)	80 cm: 2 (Nil)	
13mm HMG-6 ball	16m: 5 (4)	32 cm: 4 (4)	64 cm: 3 (2)	128 cm: 2 (2)	
5mm LMG-7 ball	7 cm: 5 (3)	14 cm: 4 (3)	28 cm: 3 (Nil)	56 cm: 2 (Nil)	
5mm rotary-7 ball	12 cm: 7 (3)	24 cm: 6 (3)	48 cm: 5 (Nil)	96 cm: 4 (Nil)	
7mm rotary-7 ball	23 cm: 7 (2)	46 cm: 6 (2)	92 cm: 5 (2)	184 cm: 4 (Nil)	
5mm rotary-8 ball	15m: 7 (3)	30 cm: 6 (3)	60 cm: 5 (Nil)	120 cm: 4 (Nil)	
7mm rotary-8 ball	27 cm: 7 (3)	54 cm: 6 (3)	108 cm: 5 (2)	216 cm: 4 (Nil)	
VRF gauss gun-10 dart	30 cm: 7 (6)	60 cm: 6 (6)	120 cm: 5 (2)	240 cm: 4 (1)	
VRF gauss gun-10 HEAP	23 cm: 7 (4)	46 cm: 6 (4)	92 cm: 5 (4)	184 cm: 4 (4)	
7mm CMWS SAW-10 ball	12 cm: 4 (3)	24 cm: 3 (3)	48 cm: 2 (2)	96 cm: 1 (Nil)	
7mm CMWS SAW-10 DS	16 cm: 4 (5)	32 cm: 3 (5)	64 cm: 2 (3)	128 cm: 1 (2)	
7mm CMWS SAW-10 HEAP	9 cm: 4 (3)	18 cm: 3 (3)	36 cm: 2 (3)	72 cm: 1 (3)	
7mm CMWS GPMG-10 ball	20 cm: 4 (3)	40 cm: 3 (3)	80 cm: 2 (2)	160 cm: 1 (Nil)	
7mm CMWS GPMG-10 DS	24 cm: 4 (5)	48 cm: 3 (5)	96 cm: 2 (3)	192 cm: 1 (2)	
7mm CMWS GPMG-10 HEAP	15 cm: 4 (3)	30 cm: 3 (3)	60 cm: 2 (3)	120 cm: 1 (3)	
4mm gauss SAW-12 dart	17 cm: 5 (5)	34 cm: 4 (5)	68 cm: 3 (2)	136 cm: 2 (Nil)	
4mm gauss SAW-12 HEAP	13 cm: 5 (3)	26 cm: 4 (3)	52 cm: 3 (3)	104 cm: 2 (3)	
5.5mm Ithklur gauss SAW-14 dart	25 cm: 5 (7)	50 cm: 4 (7)	100 cm: 3 (4)	200 cm: 2 (2)	
5.5mm Ithklur gauss SAW-14 HEAP	19 cm: 5 (4)	38 cm: 4 (4)	76 cm: 3 (4)	152 cm: 2 (4)	
7.5mm RC(E) MMG-9 ball	30 cm: 5 (4)	60 cm: 4 (4)	120 cm: 3 (2)	240 cm: 2 (2)	
7.5mm RC(E) MMG-9 DS	30 cm: 5 (7)	60 cm: 4 (7)	120 cm: 3 (4)	240 cm: 2 (2)	
7.5mm RC(E) MMG-9 HEAP-11	28 cm: 5 (4)	56 cm: 4 (4)	112 cm: 3 (4)	224 cm: 2 (4)	
15mm RC(E) HMG-9 ball	30 cm: 7 (8)	60 cm: 6 (8)	120 cm: 5 (8)	240 cm: 4 (8)	
15mm RC(E) HMG-9 DS	30 cm: 7 (16)	60 cm: 6 (16)	120 cm: 5 (16)	240 cm: 4 (16)	
7mm RC(E) rotary-9 ball	22 cm: 7 (3)	44 cm: 6 (3)	88 cm: 5 (2)	176 cm: 4 (Nil)	
7mm RC(E) rotary-9 DS	27 cm: 7 (5)	54 cm: 6 (5)	108 cm: 5 (3)	216 cm: 4 (2)	
7mm RC(E) rotary-9 HEAP	17 cm: 7 (3)	34 cm: 6 (3)	68 cm: 5 (3)	136 cm: 4 (3)	

Slug Rifles and Carbines

System:	Short	Medium	Long	Extreme	Notes
7mm carbine-5 ball	5 cm: 3 (2)	10 cm: 2 (2)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
7mm rifle-5 ball	6 cm: 3 (2)	12 cm: 2 (2)	24 cm: 1 (Nil)	48 cm: 1 (Nil)	
9mm rifle-7 ball	9 cm: 3 (2)	18 cm: 2 (2)	36 cm: 1 (1)	72 cm: 1 (Nil)	
9mm rifle-7 DS-8	10 cm: 3 (4)	20 cm: 2 (4)	40 cm: 1 (2)	80 cm: 1 (1)	
9mm rifle-7 HEAP-9	6 cm: 3 (3)	12 cm: 2 (3)	24 cm: 1 (3)	48 cm: 1 (3)	
12mm rifle-5 ball	15 cm: 2 (2)	30 cm: 1 (2)	60 cm: 1 (Nil)	120 cm: 1 (Nil)	
7mm autorifle-6 ball	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
4mm gauss rifle-12 dart	10 cm: 4 (4)	20 cm: 3 (4)	40 cm: 2 (2)	80 cm: 1 (Nil)	
4mm gauss rifle-12 HEAP	7 cm: 4 (2)	14 cm: 3 (2)	28 cm: 2 (2)	56 cm: 1 (2)	
5mm assault rifle-7 ball	5 cm: 4 (3)	10 cm: 3 (3)	20 cm: 2 (Nil)	40 cm: 1 (Nil)	
5mm assault rifle-7 DS-8	6 cm: 4 (3)	12 cm: 3 (3)	24 cm: 2 (2)	48 cm: 1 (Nil)	
5mm assault rifle-7 HEAP-8	4 cm: 4 (2)	8 cm: 3 (2)	16 cm: 2 (2)	32 cm: 1 (2)	
7mm assault rifle-7 ball	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm assault rifle-7 DS-8	7 cm: 4 (4)	14 cm: 3 (4)	28 cm: 2 (2)	56 cm: 1 (Nil)	
7mm assault rifle-7 HEAP-9	5 cm: 4 (2)	10 cm: 3 (2)	20 cm: 2 (2)	40 cm: 1 (2)	
7mm ACR-10 ball	10 cm: 4 (3)	20 cm: 3 (3)	40 cm: 2 (2)	80 cm: 1 (Nil)	
7mm ACR-10 DS	12 cm: 4 (5)	24 cm: 3 (5)	48 cm: 2 (3)	96 cm: 1 (2)	
7mm ACR-10 HE	8 cm: 4 (Nil)	16 cm: 3 (Nil)	32 cm: 2 (Nil)	64 cm: 1 (Nil)	
7mm ACR-10 HEAP	8 cm: 4 (3)	16 cm: 3 (3)	32 cm: 2 (3)	64 cm: 1 (3)	
2 cm LAG-8 DS	25 cm: 3 (6)	50 cm: 2 (6)	100 cm: 1 (2)	200 cm: 1 (1)	
2 cm LAG-8 HE	16 cm: 3 (Nil)	32 cm: 2 (Nil)	64 cm: 1 (Nil)	128 cm: 1 (Nil)	
2 cm LAG-8 HEAP-9	16 cm: 3 (5)	32 cm: 2 (5)	64 cm: 1 (5)	128 cm: 1 (5)	
2 cm LAG-8 flechette	7 cm: 3* (Nil)	14 cm: 2 (Nil)	28 cm: 1 (Nil)	—	
7mm autorifle-6 ball	6 cm: 4 (2)	12 cm: 3 (2)	24 cm: 2 (Nil)	48 cm: 1 (Nil)	
7mm autorifle-6 DS-8	7 cm: 4 (4)	14 cm: 3 (4)	28 cm: 2 (2)	56 cm: 1 (Nil)	
7mm autorifle-6 HEAP-8	5 cm: 4 (2)	10 cm: 3 (2)	20 cm: 2 (2)	40 cm: 1 (2)	
5.5mm RC(E) assault rifle-9 ball	9 cm: 4 (3)	18 cm: 3 (3)	36 cm: 2 (2)	72 cm: 1 (Nil)	
5.5mm RC(E) assault rifle-9 DS	11 cm: 4 (5)	22 cm: 3 (5)	44 cm: 2 (3)	88 cm: 1 (Nil)	
5.5mm RC(E) assault rifle-9 HEAP	7 cm: 4 (3)	14 cm: 3 (3)	28 cm: 2 (3)	56 cm: 1 (3)	
13mm sniper rifle-6 ball	30 cm: 3 (5)	60 cm: 2 (5)	120 cm: 1 (3)	240 cm: 1 (2)	
13mm sniper rifle-6 DS-8	30 cm: 3 (9)	60 cm: 2 (9)	120 cm: 1 (5)	240 cm: 1 (3)	
13mm sniper rifle-6 HEAP-9	27 cm: 3 (5)	54 cm: 2 (5)	108 cm: 1 (5)	216 cm: 1 (5)	
14.5mm AAR-5 ball	29 cm: 3 (6)	58 cm: 2 (6)	116 cm: 1 (6)	232 cm: 1 (4)	
14.5mm AAR-5 DS-8	30 cm: 3 (12)	60 cm: 2 (12)	120 cm: 1 (12)	240 cm: 1 (6)	
7mm CMWS carbine-10 ball	8 cm: 4 (3)	16 cm: 3 (3)	32 cm: 2 (2)	64 cm: 1 (Nil)	
7mm CMWS carbine-10 DS	10 cm: 4 (5)	20 cm: 3 (5)	40 cm: 2 (3)	80 cm: 1 (2)	
7mm CMWS carbine-10 HEAP	6 cm: 4 (3)	12 cm: 3 (3)	24 cm: 2 (3)	48 cm: 1 (3)	
7mm CMWS rifle-10 ball	9 cm: 4 (3)	18 cm: 3 (3)	36 cm: 2 (2)	72 cm: 1 (Nil)	
7mm CMWS rifle-10 DS	11 cm: 4 (5)	22 cm: 3 (5)	44 cm: 2 (3)	88 cm: 1 (2)	
7mm CMWS rifle-10 HEAP	7 cm: 4 (3)	14 cm: 3 (3)	28 cm: 2 (3)	56 cm: 1 (3)	
5.5mm Ithklur gauss rifle-14 dart	12 cm: 4 (6)	24 cm: 3 (6)	48 cm: 2 (2)	96 cm: 1 (1)	
5.5mm Ithklur gauss rifle-14 HEAP	9 cm: 4 (4)	18 cm: 3 (4)	36 cm: 2 (4)	72 cm: 1 (4)	

Archaic Firearms

System:	Short	Medium	Long	Extreme	Notes
Wall gun-2 shot	1 cm: 1* (Nil)	2 cm: 1 (Nil)	—	—	
Wall gun-2 ball	3 cm: 1 (1)	6 cm: 1 (1)	12 cm: 1 (Nil)	24 cm: 1 (Nil)	
Blunderbuss-2M shot	3 cm: 1* (Nil)	6 cm: 1 (Nil)	—	—	
Blunderbuss-2M ball	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	
Blunderbuss pistol-2M shot	1 cm: 1* (Nil)	2 cm: 1 (Nil)	—	—	
Horse pistol-3	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	
Smoothbore flintlock musket-3	3 cm: 1 (Nil)	6 cm: 1 (Nil)	12 cm: 1 (Nil)	24 cm: 1 (Nil)	
Flintlock rifle-musket-3	8 cm: 1 (3)	16 cm: 1 (3)	32 cm: 1 (Nil)	64 cm: 1 (Nil)	
Rifled musket-3M	8 cm: 1 (3)	16 cm: 1 (3)	32 cm: 1 (Nil)	64 cm: 1 (Nil)	

Bow Weapons

System:	Short	Medium	Long	Extreme	Notes
Short bow-0	2 cm: 1 (Nil)	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	
Long composite bow-1	3 cm: 1 (Nil)	6 cm: 1 (Nil)	12 cm: 1 (Nil)	24 cm: 1 (Nil)	
Light crossbow-2	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	

Shotguns

System:	Short	Medium	Long	Extreme	Notes
18mm double-barreled shotgun-4 slug	5 cm: 2 (1)	10 cm: 1 (1)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
18mm double-barreled shotgun-4 shot	3 cm: 2* (Nil)	6 cm: 1 (Nil)	—	—	
18mm sawed-off shotgun-4 slug	—	—	1 cm: 1 (Nil)	—	
18mm sawed-off shotgun-4 shot	—	—	1 cm: 1* (Nil)	—	
18mm pump shotgun-4 slug	5 cm: 3 (1)	10 cm: 2 (1)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	
18mm pump shotgun-4 shot	3 cm: 3* (Nil)	6 cm: 2 (Nil)	—	—	
18mm auto shotgun-7 slug	8 cm: 3 (1)	16 cm: 2 (1)	32 cm: 1 (Nil)	64 cm: 1 (Nil)	
18mm auto shotgun-7 shot	5 cm: 3* (Nil)	10 cm: 2 (Nil)	—	—	
18mm RCAAS-10 slug	3 cm: 4 (2)	6 cm: 3 (2)	12 cm: 2 (1)	24 cm: 1 (Nil)	

System:	Short	Medium	Long	Extreme	Notes
18mm RCAAS-10 shot	2 cm: 4* (2)	4 cm: 3 (Nil)	—	—	
18mm RCAAS-10 DS	4 cm: 4 (3)	8 cm: 3 (3)	16 cm: 2 (2)	32 cm: 1 (1)	
18mm RCAAS-10 HEAP	2 cm: 4 (4)	4 cm: 3 (4)	8 cm: 2 (4)	16 cm: 1 (4)	

Lasers

System:	Short	Medium	Long	Extreme	Notes
10 cm DEI Carbine-8	20 cm: 2 (Nil)	40 cm: 1 (Nil)	80 cm: 1 (Nil)	160 cm: 1 (Nil)	
5 cm DEI pistol-9	9 cm: 3 (Nil)	18 cm: 2 (Nil)	36 cm: 1 (Nil)	72 cm: 1 (Nil)	
8 cm DEI rifle-9	16 cm: 3 Nil)	32 cm: 2 (Nil)	64 cm: 1 (Nil)	128 cm: 1 (Nil)	
2 cm CLC pistol-13	9 cm: 3 (Nil)	18 cm: 2 (Nil)	36 cm: 1 (Nil)	72 cm: 1 (Nil)	
2 cm personal defense laser-13	20 cm: 3 Nil)	40 cm 2 (Nil)	80 cm: 1 (Nil)	160 cm: 1 (Nil)	
3 cm CLC carbine-13	30 cm: 3 (Nil)	60 cm: 2 (Nil)	120 cm: 1 (Nil)	240 cm: 1 (Nil)	
4 cm CLC rifle-13	30 cm: 3 (Nil)	60 cm: 2 (Nil)	120 cm: 1 (Nil)	240 cm: 1 (Nil)	
6 cm CLC SSL-13	30 cm: 5 (Nil)	60 cm: 4 (Nil)	120 cm: 3 (Nil)	240 cm: 2 (Nil)	
6 cm laser Sniper Weapon-13	30 cm: 1 (10)	60 cm: 1 (10)	120 cm: 1 (10)	240 cm: 1 (4)	

High-Energy Weapons

System:	Short	Medium	Long	Extreme	Notes
4.3 cm plasma rifle-12	8 cm: 2 (23+)	16 cm: 1 (23+)	32 cm: 1 (12+)	64 cm: 1 (2+)	
4.7 cm plasma rifle-13	9 cm: 2 (27+)	18 cm: 1 (27+)	36 cm: 1 (14+)	72 cm: 1 (3+)	
4.1 cm plasma rifle-14 comp	9 cm: 2 (27+)	18 cm: 1 (27+)	36 cm: 1 (14+)	72 cm: 1 (3+)	
4.7 cm fusion rifle-14	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
4.7 cm fusion rifle-14 comp	16 cm: 2 (33+)	32 cm: 1 (33+)	64 cm: 1 (17+)	128 cm: 1 (3+)	
5.1 cm fusion rifle-15 comp	18 cm: 2 (37+)	36 cm: 1 (37+)	72 cm: 1 (19+)	144 cm: 1 (4+)	

Heavy Weapons

System:	Short	Medium	Long	Extreme	Notes
6 cm assault rckt lnchr-HE	20 cm: 2 (2+)	40 cm: 1 (2+)	—	—	EP: 6, BR: 4 cm
6 cm assault rckt lnchr-HEAP	20 cm: 2 (65+)	40 cm: 1 (65+)	—	—	EP: 5, BR: 3 cm
6 cm assault rckt lnchr-WP	20 cm: 2 (Nil)	40 cm: 1 (Nil)	—	—	EP: 3, BR: 2 cm
6 cm assault rckt lnchr-flechette	20 cm: 2* (2)	40 cm: 1* (2)	—	—	DS: 1x5 cm
10 cm plasma bazooka	17 cm: 1 (51+)	34 cm: 1 (51+)	68 cm: 1 (26+)	136 cm: 1 (5+)	EP: 3, BR: 1 cm

Grenade Launchers

System:	Short	Medium	Long	Extreme	Notes
4 cm low-vel GL-8 HE	10 cm: 2 (Nil)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	—	EP: 3, BR: 2 cm, IFR: 40 cm
4 cm low-vel GL-8 HEAP	10 cm: 2 (33+)	20 cm: 1 (33+)	40 cm: 1 (33+)	—	EP: 3, BR: 1 cm, IFR: 40 cm
4 cm low-vel GL-8 WP	10 cm: 2 (Nil)	20 cm: 1 (Nil)	40 cm: 1 (Nil)	—	EP: 3, BR: 1 cm, IFR: 40 cm
4 cm low-vel GL-8 flechette	1 cm: 2* (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	—	
4cm RAMGL-9 HE	24 cm: 3 (Nil)	48 cm: 2 (Nil)	96 cm: 1 (Nil)	192 cm: 1 (Nil)	EP: 3, BR: 2 cm, IFR: 360 cm
4cm RAMGL-9 HEAP	24 cm: 3 (41+)	48 cm: 2 (41+)	96 cm: 1 (41+)	192 cm: 1 (41+)	EP: 3, BR: 1 cm, IFR: 360 cm
2.5 cm low-vel GL-10 HE	10 cm: 3 (Nil)	20 cm: 2 (Nil)	40 cm: 1 (Nil)	—	EP: 3, BR: 2 cm, IFR: 40 cm
2.5 cm low-vel GL-10 HEAP	10 cm: 3 (23+)	20 cm: 2 (23+)	40 cm: 1 (23+)	—	EP: 2, BR: 1 cm, IFR: 40 cm

Rifle Grenades

System:	Short	Medium	Long	Extreme	Notes
6 cm rifle grenade-5 HE	— 1 (2+)	— 1 (2+)	— 1 (2+)	— 1 (2+)	EP: 4, BR: 2 cm, IFR: 18 cm
6 cm rifle grenade-5 HEAP	— 1 (17+)	— 1 (17+)	— 1 (17+)	— 1 (17+)	EP: 3, BR: 2 cm, IFR: 18 cm
4 cm RAM rifle grenade-8 HE	3 cm: 1 (Nil)	6 cm: 1 (Nil)	12 cm: 1 (Nil)	24 cm: 1 (Nil)	EP: 3, BR: 2 cm, IFR: 50 cm
4 cm RAM rifle grenade-8 HEAP	3 cm: 1 (33+)	6 cm: 1 (33+)	12 cm: 1 (33+)	24 cm: 1 (33+)	EP: 3, BR: 1 cm, IFR: 50 cm
4 cm RAM rifle grenade-9 HE	4 cm: 1 (Nil)	8 cm: 1 (Nil)	16 cm: 1 (Nil)	32 cm: 1 (Nil)	EP: 3, BR: 2 cm, IFR: 50 cm
4 cm RAM rifle grenade-9 HEAP	4 cm: 1 (41+)	8 cm: 1 (41+)	16 cm: 1 (41+)	32 cm: 1 (41+)	EP: 3, BR: 1 cm, IFR: 50 cm

Hand Grenades

System:	Short	Medium	Long	Extreme	Notes
HE/frag-4&5	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: 1 cm
HE/frag-6&7	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: 2 cm
HE/frag-8+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: 2 cm
HEAP-5	1 cm: 1 (11+)	2 cm: 1 (11+)	3 cm: 1 (11+)	4 cm: 1 (11+)	EP: 3, BR: 1 cm
HEAP-6	1 cm: 1 (20+)	2 cm: 1 (20+)	3 cm: 1 (20+)	4 cm: 1 (20+)	EP: 3, BR: 1 cm
HEAP-7	1 cm: 1 (29+)	2 cm: 1 (29+)	3 cm: 1 (29+)	4 cm: 1 (29+)	EP: 3, BR: 1 cm
HEAP-8	1 cm: 1 (38+)	2 cm: 1 (38+)	3 cm: 1 (38+)	4 cm: 1 (38+)	EP: 3, BR: 1 cm
HEAP-9+	1 cm: 1 (47+)	2 cm: 1 (47+)	3 cm: 1 (47+)	4 cm: 1 (47+)	EP: 3, BR: 1 cm
Chemical/smoke-4+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: 1 cm
WP-4+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: 1 cm
Thermite-4+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: 1 cm
Concussion-4&5	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 3, BR: —
Concussion-6&7	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 4, BR: —
Concussion-8&9	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 5, BR: —
Concussion-10+	1 cm: 1 (Nil)	2 cm: 1 (Nil)	3 cm: 1 (Nil)	4 cm: 1 (Nil)	EP: 6, BR: —

Black Powder Cannons

System:	Short	Medium	Long	Extreme	Notes
13.5 cm heavy field gun-2 shot	14 cm: 1 (9+)	28 cm: 1 (8+)	56 cm: 1 (7+)	112 cm: 1 (4+)	
13.5 cm heavy field gun-2 cann	—1* (2)	—	—	—	DS: 2x7 cm from barrel
9.5 cm light field gun-3 shot	13 cm: 1 (5+)	26 cm: 1 (4+)	52 cm: 1 (4+)	104 cm: 1 (2+)	
9.5 cm light field gun-3 cannister	—1* (2)	—	—	—	DS: 2x7 cm from barrel
7.5 cm rifled field gun-3 shot	26 cm: 1 (7+)	52 cm: 1 (6+)	104 cm: 1 (6+)	208 cm: 1 (4+)	
7.5 cm rifled field gun-3 shell	26 cm: 1 (1+)	52 cm: 1 (1+)	104 cm: 1 (1+)	208 cm: 1 (1+)	EP: 3, BR: 2 cm
7.5 cm rifled field gun-3 cannister	—1* (2)	—	—	—	DS: 3x13 cm from barrel
7.5 cm rifled field gun-3 shrapnel	26 cm: 1 (Nil)	52 cm: 1 (Nil)	104 cm: 1 (Nil)	208 cm: 1 (Nil)	EP: 3, BR: 3 cm
12 cm howitzer-3 shot	8 cm: 1 (3+)	16 cm: 1 (3+)	32 cm: 1 (3+)	64 cm: 1 (2+)	
12 cm howitzer-3 shell	8 cm: 1 (5+)	16 cm: 1 (5+)	32 cm: 1 (5+)	64 cm: 1 (5+)	EP: 4, BR: 2 cm
12 cm howitzer-3 cannister	—1* (2)	—	—	—	DS: 1x4 cm from barrel

Mortars

System:	Short	Medium	Long	Extreme	Notes
TL6 8 cmL10 mortar-HE	—1 (5+)	—1 (5+)	—1 (5+)	—1 (5+)	EP: 6, BR: 3 cm, IFR: 441 cm
TL6 10 cmL15 mortar-HE	—1 (8+)	—1 (8+)	—1 (8+)	—1 (8+)	EP: 7, BR: 4 cm, IFR: 699 cm
TL8 8 cmL10 mortar-HE	—1 (5+)	—1 (5+)	—1 (5+)	—1 (5+)	EP: 7, BR: 4 cm, IFR: 515 cm
TL8 8 cmL10 mortar-HEAP	—1 (73+)	—1 (73+)	—1 (73+)	—1 (73+)	LD, EP: 5, BR: 3 cm, IFR: 515 cm
TL8 8 cmL10 mortar-submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 2 cm, IFR: 515 cm
TL8 8 cmL10 mortar-DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 2 cm, IFR: 515 cm
TL9 8 cmL10 mortar-HE	—1 (5+)	—1 (5+)	—1 (5+)	—1 (5+)	EP: 7, BR: 3 cm, IFR: 552 cm
TL9 8 cmL10 mortar-HEAP	—1 (89+)	—1 (89+)	—1 (89+)	—1 (89+)	LD, EP: 6, BR: 3 cm, IFR: 552 cm
TL9 8 cmL10 mortar-submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 2 cm, IFR: 552 cm
TL9 8 cmL10 mortar-DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 2 cm, IFR: 552 cm
TL9 8 cmL10 mortar-hmg submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 20/10, BR: 1 cm, IFR: 552 cm
TL9 12 cmL10 mortar-HE	—1 (11+)	—1 (11+)	—1 (11+)	—1 (11+)	EP: 11, BR: 6 cm, IFR: 675 cm
TL9 12 cmL10 mortar-HEAP	—1 (137+)	—1 (137+)	—1 (137+)	—1 (137+)	LD, EP: 9, BR: 5 cm, IFR: 675 cm
TL9 12 cmL10 mortar-submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 4 cm, IFR: 675 cm
TL9 12 cmL10 mortar-DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 16, BR: 4 cm, IFR: 675 cm
TL9 12 cmL10 mortar-hmg submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	LD, EP: 20/10, BR: 3 cm, IFR: 675 cm
TL12 8 cmL10 mortar-HE	—1 (5+)	—1 (5+)	—1 (5+)	—1 (5+)	EP: 8, BR: 5 cm, IFR: 662 cm
TL12 8 cmL10 mortar-HEAP	—1 (89+)	—1 (89+)	—1 (89+)	—1 (89+)	ED, EP: 7, BR: 4 cm, IFR: 662 cm
TL12 8 cmL10 mortar-submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 2 cm, IFR: 662 cm
TL12 8 cmL10 mortar-DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 2 cm, IFR: 662 cm
TL12 8 cmL10 mortar-hmg submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 20/10, BR: 1 cm, IFR: 662 cm
TL15 8 cmL10 mortar-HE	—1 (5+)	—1 (5+)	—1 (5+)	—1 (5+)	EP: 8, BR: 5 cm, IFR: 772 cm
TL15 8 cmL10 mortar-HEAP	—1 (89+)	—1 (89+)	—1 (89+)	—1 (89+)	ED, EP: 7, BR: 4 cm, IFR: 772 cm
TL15 8 cmL10 mortar-submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 2 cm, IFR: 772 cm
TL15 8 cmL10 mortar-DP submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 16, BR: 2 cm, IFR: 772 cm
TL15 8 cmL10 mortar-hmg submun	—1 (notes)	—1 (notes)	—1 (notes)	—1 (notes)	ED, EP: 20/10, BR: 1 cm, IFR: 772 cm

Antitank Rocket Launchers

System:	Short	Medium	Long	Extreme	Notes
TL6 medium ATRL	20 cm: 1 (35+)	40 cm: 1 (35+)	—	—	A3, EP: 4, BR: 3 cm
TL7 medium ATRL	20 cm: 1 (49+)	40 cm: 1 (49+)	—	—	A4, EP: 5, BR: 3 cm
TL8 light ATRL	20 cm: 1 (63+)	40 cm: 1 (63+)	—	—	A5, EP: 6, BR: 3 cm
TL9 light ATRL	20 cm: 1 (77+)	40 cm: 1 (77+)	—	—	A5, EP: 8, BR: 3 cm

Armor

TL	Type	Armor Value (Save)	Notes
5	Flak jacket	1	No save vs. lasers, –2 cm move
5	helmet	1	No save vs. lasers
7	Flak jacket	1	No save vs. lasers, –2 cm move
7	Ballistic cloth vest	1	No save vs. lasers
7	Ballistic cloth body suit	1	No save vs. lasers, –2 cm move
8	Ballistic weave helmet	1	No save vs. lasers
8	Ballistic weave vest	1	No save vs. lasers
8	Ballistic weave body suit	1	No save vs. lasers, –2 cm move
9	Combat environment suit	1	No save vs. lasers
10	Combat armor	1	–2 cm move
10	Battle dress	4	–6 cm move, –2 Initiative
12	Combat armor	2	–2 cm move
12	RC light battle dress	6	WSV goggles (40 cm), 3 km radio, 3 km laser designator, –4 cm move, –1 Initiative
12	RC heavy battle dress	12	WSV goggles (40 cm), 3 km radio, 3 km laser designator, –6 cm move, –2 Initiative
12	RC heavy scout battle dress	12	WSV goggles (40 cm), 3 km Passive EMS, 3 km radio, 3 km laser designator, –6 cm move, –2 Initiative
14	Combat armor	4	–2 cm move
14	light battle dress	8	WSV goggles (40 cm), 30 km radio, 3 km laser designator, –2 cm move, –1 Initiative
14	Heavy battle dress	16	WSV goggles (40 cm), 30 km radio, 3 km laser designator, –4 cm move, –1 Initiative

Grav Belts

Type	Movement
TL12-15 Grav Belt	120 low (+1,+2), 2520 high (+4)
TL12 Grav Rail	120 low (+1,+2), 2520 high (+4)

Appendix H: Unit Organizations

The following organizations represent military units from the pre-collapse Final Imperium, the Zhodani Consulate, the Reformation Coalition, and two worlds in the Wilds of the New Era. They are presented for use in **Striker** scenarios and as samples to assist players in the design of additional units. None of these units need be used in their entirety; in fact it is not intended for them to be, especially in the case of regiments like the Duke of Regina's Huscarles.

Rather, representative "slices" of these units can be modelled and placed on the gaming table. For example, the Branatian rifle regiment will likely be more than can be purchased, assembled, and painted by the average gaming group. However, a company or battalion-sized slice of the unit could be portrayed, for example, a rifle battalion plus a platoon of tanks and the antitank battery. These slices will often retain the same overall proportions as the whole unit, but need not in all cases. Players and referees should modify, mix, and match the following organizations to suit the needs and interests of their campaigns.

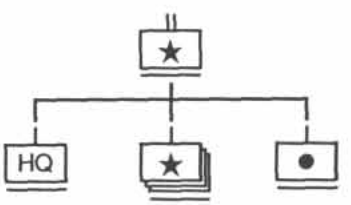
Italicized units are included for realism, but as they have no impact on play, can routinely be omitted from tabletop armies.

Imperial Marine Task Force

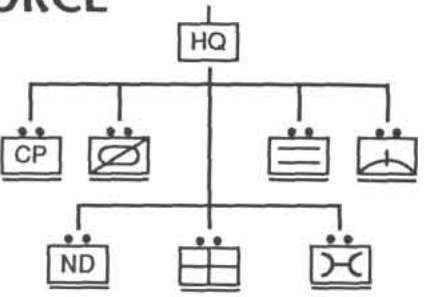
Imperial Marine Task Force, with:
- **Force Command Headquarters**, with:
  - **Command Post Section**, with:
    - 1 operational command stand
    - 1 Imperial Marine Command APC
    - 1 staff uplink Imperial Marine Command APC
  - **Communications Section**, with:
    - 1 staff uplink Imperial Marine Command APC
    - 1 staff radio Imperial Marine Command APC
  - **Point Defense Section**, with:
    - 1 tactical command TL15 Convertible Air Raft
    - 3 TL15 Point Defense APCs
  - **Nuclear Damper Section**, with:
    - 3 tactical command ND Director APCs
    - 4 TL15 Nuclear Damper APCs
  - **Scout Section**, with:
    - 1 tactical command TL15 Armed Air Raft
    - 4 self-ordering TL15 Armed Air Rafts
  - ***Medical Section, with:***
    - *1 tactical command stand*
    - *1 TL15 Hospital APC*
    - *1 TL15 Utility Sled*
    - *3 TL15 Ambulance APCs*
  - ***Maintenance Section, with:***
    - *1 tactical command stand*
    - *2 TL15 Recovery Sleds*
    - *2 TL15 Utility Sleds with maintenance shops*
    - *2 TL15 Utility Sleds*
    - *1 TL15 Convertible Air Raft*
  - ***Mess and Transport Section, with:***
    - *1 tactical command stand*
    - *1 TL15 Utility Sled*
    - *4 TL15 Utility Sleds with field kitchens*
    - *1 TL15 Convertible Air Raft*
- **3 Line Marine Companies**, each with:
  - **Command Post Section**, with:
    - 1 operational command stand
    - 1 staff uplink Imperial Marine Command APC
    - 1 infantry stand
  - **4 Marine Platoons**, each with:
    - **Platoon Headquarters**, with:
      - 1 tactical command stand
      - 1 Imperial Marine Support APC
    - **5 Marine Squads**, each with:
      - 1 tactical command stand
      - 2 infantry stands
      - 1 Imperial Marine APC
- **Meson Battery**, with:
  - **Battery Headquarters Section**, with:
    - 1 operational command Imperial Marine Command APC
    - 1 Imperial Marine FDC APC
    - 3 self-ordering FO TL15 Convertible Air Rafts
  - **Battery Security Section**, with:
    - **Section Headquarters**, with:
      - 1 tactical command TL15 Armed Air Raft
    - **2 Marine Squads**, each with:
      - 1 tactical command stands
      - 2 infantry stands
      - 1 Imperial Marine APC
  - **4 Firing Sections**, each with:
    - 1 Imperial Meson Sled

Notes: All personnel stands are equipped with TL14 light battle dress. All infantry stands are armed with TL14 4.7cm fusion rifles with an integral TL15 5.1cm fusion rifle. Single figure command stands are also armed with TL14 4.7cm fusion rifles.

IMPERIAL MARINE TASK FORCE



TYPICAL TASK FORCE CONFIGURATION



TASK FORCE HEADQUARTERS COMPANY BREAKDOWN

Appendix H: Unit Organizations

Imperial Guard Jump Infantry Regiment

Imperial Guard Jump Infantry Regiment, with:
- **Regimental Headquarters &Headquarters Company,** with:
  - **Headquarters Platoon,** with:
    - **Command Post Section,** with:
      - 1 operational command stand
      - 1 Imperial Command Grav APC
      - 1 staff uplink Imperial Command Grav APC
    - **Communications Section,** with:
      - 1 staff uplink Imperial Command Grav APC
      - 1 staff radio Imperial Command Grav APC
    - **Point Defense Section,** with:
      - 1 tactical command TL15 Convertible Air Raft
      - 3 TL15 Point Defense APCs
    - **Nuclear Damper Section,** with:
      - 3 tactical command ND Director APCs
      - 4 TL15 Nuclear Damper APCs
    - **Scout Section,** with:
      - 1 tactical command TL15 Armed Air Raft
      - 4 self-ordering TL15 Armed Air Rafts
  - ***Medical Platoon, with:***
    - *1 tactical command stand*
    - *1 TL15 Hospital APC*
    - *1 TL15 Utility Sled*
    - *3 TL15 Ambulance APCs*
  - ***Maintenance and Support Platoon, with:***
    - *1 tactical command stand*
    - *2 TL15 Recovery Sleds*
    - *2 TL15 Utility Sleds with maintenance shops*
    - *2 TL15 Utility Sleds*
    - *1 TL15 Convertible Air Raft*
- **Grav Tank Battalion,** with:
  - **Headquarters Section,** with:
    - 1 operational command Heavy Command Grav Tank
    - 2 self-ordering Heavy Grav Tanks
  - **3 Grav Tank Companies,** each with:
    - **Company Headquarters,** with:
      - 1 tactical command Heavy Command Grav Tank
      - 2 self-ordering Heavy Grav Tanks
    - **3 Grav Tank Platoons,** each with:
      - 1 tactical command Heavy Grav Tank
      - 4 self-ordering Heavy Grav Tanks
- **Artillery Battery,** with:
  - **Battery Headquarters,** with:
    - 1 operational command stand
    - 1 Imperial FDC Grav APC
  - **2 MRL Sections,** each with:
    - 1 tactical command MRL Artillery Vehicle
    - 3 MRL Artillery Vehicles
  - **Drone Missile Section,** with:
    - 1 operational command RDM Artillery Vehicle
    - 3 RDM Artillery Vehicles
- **3 Jump Troop Battalions,** each with:
  - **Battalion Headquarters,** with:
    - 1 operational command stand
    - 1 Imperial Command Grav APC
    - 1 staff uplink Imperial Command Grav APC
    - 1 staff radio Imperial Command Grav APC
  - **3 Jump Troop Companies,** each with:
    - **Command Post Section,** with:
      - 1 operational command stand
      - 1 staff uplink Imperial Command Grav APC
    - **3 Jump Troop Platoons,** each with:
      - **Platoon Headquarters,** with:
        - 1 tactical command grav belt stand
        - 1 grav belt support infantry stand
      - **3 Jump Troop Squads,** each with:
        - 1 tactical command grav belt stand
        - 2 grav belt infantry stands
- **Grav Tank Company,** with:
  - **Company Headquarters,** with:
    - 1 tactical command Heavy Command Grav Tank
    - 2 self-ordering Heavy Grav Tanks
  - **3 Grav Tank Platoons,** each with:
    - 1 tactical command Heavy Grav Tank
    - 4 self-ordering Heavy Grav Tanks
- **Artillery Platoon,** with:
  - 1 tactical command stand
  - 1 Imperial FDC Grav APC
  - 4 MRL Artillery Vehicles
- ***Support Platoon, with:***
  - *3 TL15 Utility Sleds*
  - *1 command stand*
  - *6 support stands*

Notes: All personnel stands are equipped with TL14 heavy battle dress. All infantry and single-figure command stands are also equipped with grav belts. Infantry stands are armed with TL14 4.7cm fusion rifles, TL15 portable Tac missiles, and integral TL15 5.1cm fusion rifles. Single figure command stands are also armed with TL14 4.7cm fusion rifles.

Support infantry stands are armed with TL15 portable Tac missiles and an integral TL15 5.1cm fusion rifle.

The Imperial Command Grav APC is identical to the Imperial FDC APC but without the FDC fitted.

Imperial Guard Regiments

There were 11 Imperial Guard regiments which served on Capital, or as Imperial shock troops where needed. In order of seniority (dates of establishment according to the Imperial calendar are given in parentheses), these were:

The Sylean Guard (0)
The Vland Guard
The Gateway Guard
The Ilelish Guard
The Antares Guard
The Imperial Artillery (250)
The Household Cavalry (250)
The Aslan Guard (350)
The Spinward Marches Guard (550)
The Marine Guard (629)
The Solomani Guard (1050)

All but the Imperial Artillery and Household Cavalry were jump troop regiments.

Appendix H: Unit Organizations

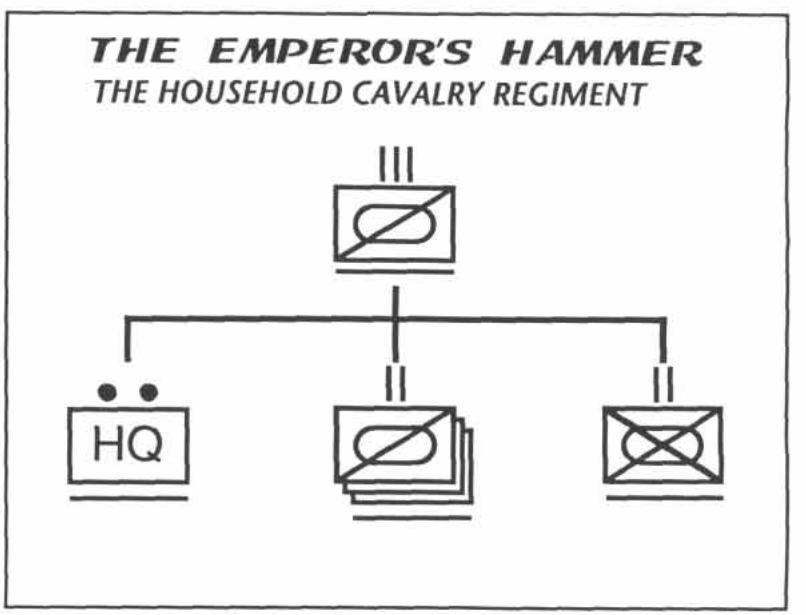
Household Cavalry Regiment: "The Emperor's Hammer"

Household Cavalry Regiment, with:
- **Regimental Headquarters and Headquarters Company**, with:
  - **Headquarters Platoon**, with:
    - **Command Post Section**, with:
      - 1 operational command stand
      - 1 Imperial Command Grav APC
      - 1 staff uplink Imperial Command Grav APC
    - **Communications Section**, with:
      - 1 staff uplink Imperial Command Grav APC
      - 1 staff radio Imperial Command Grav APC
    - **Point Defense Section**, with:
      - 1 tactical command TL15 Convertible Air Raft
      - 3 TL15 Point Defense APCs
    - **Nuclear Damper Section**, with:
      - 3 tactical command ND Director APCs
      - 4 TL15 Nuclear Damper APCs
    - **Scout Section**, with:
      - 1 tactical command TL15 Armed Air Raft
      - 4 self-ordering TL15 Armed Air Rafts
  - *Medical Platoon, with:*
    - *1 tactical command stand*
    - *1 TL15 Hospital APC*
    - *1 TL15 Utility Sled*
    - *3 TL15 Ambulance APCs*
  - *Maintenance and Support Platoon, with:*
    - *1 tactical command stand*
    - *2 TL15 Recovery Sleds*
    - *2 TL15 Utility Sleds with maintenance shops*
    - *2 TL15 Utility Sleds*
    - *1 TL15 Convertible Air Raft*
- **3 Grav Tank Battalions**, each with:
  - **Headquarters Section**, with:
    - 1 operational command Heavy Command Grav Tank
    - 2 self-ordering Heavy Grav Tanks
  - **3 Grav Tank Companies (Alpha, Beta, Gamma)**, each with:
    - **Company Headquarters**, with:
      - 1 tactical command Heavy Command Grav Tank
      - 2 self-ordering Heavy Grav Tanks
    - **3 Grav Tank Platoons**, each with:
      - 1 tactical command Heavy Grav Tank
      - 4 self-ordering Heavy Grav Tanks
  - **Fire Support Company (Delta)**, with:
    - **Company Headquarters**, with:
      - 1 operational command stand
      - 1 staff uplink Imperial Command Grav APC
    - **3 Fire Support Platoons**, each with:
      - 1 tactical command stand
      - 3 Imperial Fire Support APCs
- **Lift Infantry Battalion**, with:
  - **Battalion Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial Command Grav APC
    - 2 staff uplink Imperial Command Grav APCs
    - 1 staff radio Imperial Command Grav APC
  - **3 Lift Infantry Companies**, each with:
    - **Command Post Section**, with:
      - 1 operational command stand
      - 1 staff uplink Command Grav APC
      - 1 TL15 Convertible Air Raft
    - **3 Lift Infantry Platoons**, each with:
      - 1 tactical command stand
      - 1 Imperial Command Grav APC
      - **3 Infantry Squads**, each with:
        - 1 tactical command stand
        - 2 infantry stands
        - 1 Imperial Grav APC
- **Grav Tank Company**, with:
  - **Company Headquarters**, with:
    - 1 tactical command Heavy Command Grav Tank
    - 2 self-ordering Heavy Grav Tanks
  - **3 Grav Tank Platoons**, each with:
    - 1 tactical command Heavy Grav Tank
    - 4 self-ordering Heavy Grav Tanks
- **Artillery Battery**, with:
  - **Battery Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial FDC Grav APC
  - **2 MRL Sections**, each with:
    - 1 tactical command MRL Artillery Vehicle
    - 3 MRL Artillery Vehicles
  - **Drone Missile Section**, with:
    - 1 operational command RDM Artillery Vehicle
    - 3 RDM Artillery Vehicles

Notes: All personnel stands are equipped with TL14 heavy battle dress.

Infantry stands are armed with TL14 4.7cm fusion rifles, TL15 portable Tac missiles, and integral TL15 5.1cm fusion rifles. Single figure command stands are also armed with TL14 4.7cm fusion rifles.

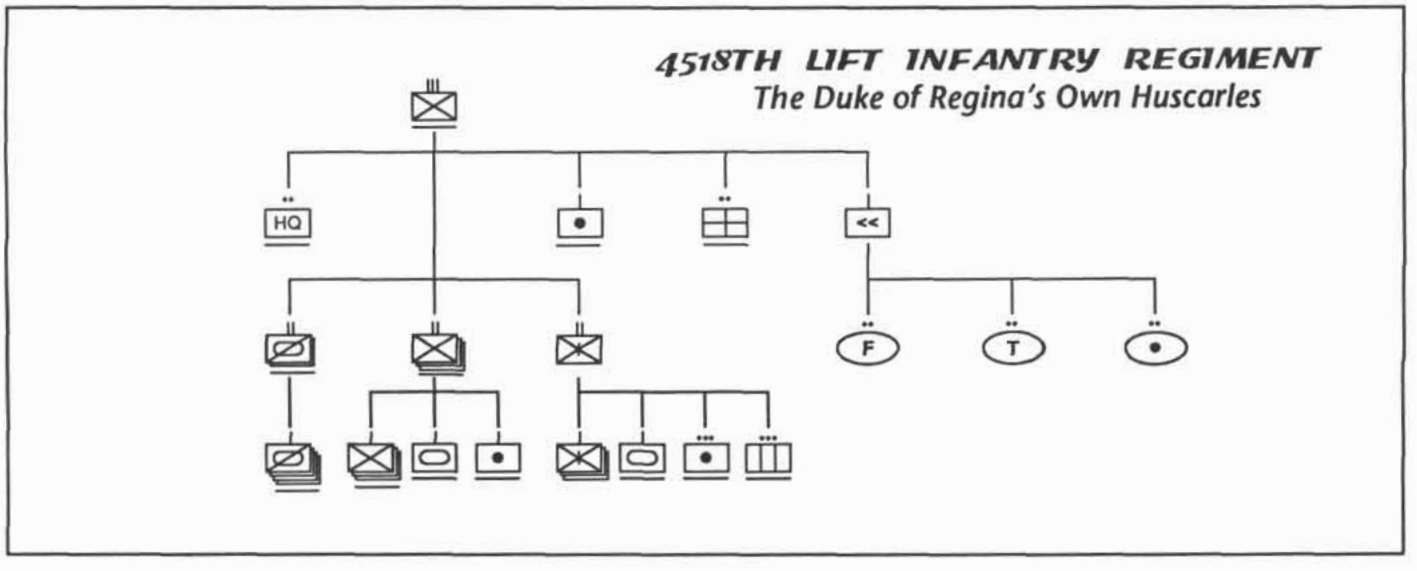
The Imperial Command Grav APC is identical to the Imperial FDC APC but without the FDC fitted.



Appendix H: Unit Organizations

4518th Lift Infantry Regiment (The Duke of Regina's Own Huscarles), circa 1116

Lift Infantry Regiment, with:
- **Regimental Headquarters**, with:
  - 1 operational command stand
  - 1 Imperial Command Grav APC
  - 2 staff uplink Imperial Command Grav APCs
  - 1 Rampart two-seat fighter
- **Regimental Artillery Battery**, with:
  - **Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial FDC Grav APC
  - **MRL Section**, with:
    - 1 tactical command MRL Artillery Vehicle
    - 3 MRL Artillery Vehicles
  - **Drone Missile Section**, with:
    - 1 tactical command RDM Artillery Vehicle
    - 4 RDM Artillery Vehicles
- ***Regimental Medical Section, with:***
  - *1 tactical command stand*
  - *4 APCs*
- **Flight Wing**, with:
  - **Wing Headquarters**, with:
    - 1 operational command Rampart two-seat fighter
    - 1 Rampart two-seat fighter
  - **Fighter Squadron**, with:
    - 10 Rampart single-seat fighters
  - ***Transport Squadron, with:***
    - *Varies with mission*
  - ***Ortillery Squadron, with:***
    - *3 System Defense Boats*
- **1st, 2nd, and 4th Lift Infantry Battalions**, each with:
  - **Battalion Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial Command Grav APC
    - 2 staff uplink Imperial Command Grav APCs
    - 1 staff radio Imperial Command Grav APC
  - **3 Lift Infantry Companies (Alpha, Beta, Gamma)**, each with:
    - **Company Headquarters**, with:
      - 1 operational command stand
      - 1 Fire Support APC
      - 1 infantry stand
    - **Three Lift Infantry Platoons**, each with:
      - **Platoon Headquarters**, with:
        - 1 tactical command stand
        - 1 Fire Support APC
      - **3 Infantry Squads**, each with:
        - 1 tactical command stand
        - 2 infantry stands
        - 1 Imperial Grav APC
- **Grav Tank Company (Delta)**, with:
  - **Company Headquarters**, with:
    - 1 operational command Heavy Grav Command Tank
  - **3 Tank Platoons**, each with:
    - 1 tactical command Heavy Grav Command Tank
    - 3 self-ordering Imperial Heavy Grav Tanks
- **Artillery Battery (Epsilon)**, with:
  - **Battery Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial FDC Grav APC
  - **MRL Section**, with:
    - 1 tactical command MRL Artillery Vehicle
    - 3 MRL Artillery Vehicles
  - **Drone Missile Section**, with:
    - 1 tactical command RDM Artillery Vehicle
    - 3 RDM Artillery Vehicles
- ***3rd and 5th Lift Cavalry Squadrons***, each with:
  - **Squadron Headquarters**, with:
    - 1 operational command stand
    - 1 Imperial Command Grav APC
    - 1 staff uplink Imperial Command Grav APC
    - 1 staff radio Imperial Command Grav APC
  - **4 Lift Cavalry Troops (Alpha, Beta, Gamma, Delta)**, each with:
    - **Troop Headquarters**, with:
      - 1 operational command tank
    - **3 Lift Cavalry Platoons**, each with:
      - **Headquarters and Fire Support Squad**, with:
        - 1 tactical command Fire Support APC
      - **2 Tank Squads**, each with:
        - 1 self-ordering Imperial Heavy Grav Tanks



Appendix H: Unit Organizations

Rifle Squad, with:
1 tactical command stand
2 infantry stands
1 Imperial Grav APC

6th Jump Troop Battalion, with:
Battalion Headquarters, with:
1 operational command stand
1 Imperial Command Grav APC
1 staff uplink Imperial Command Grav APC
1 staff radio Imperial Command Grav APC
3 Jump Troop Companies (Alpha, Beta, Gamma), each with:
Company Headquarters, with:
1 operational command stand
1 staff uplink Imperial Command Grav APC
3 Jump Troop Platoons, each with:
Platoon Headquarters, with:
1 tactical command stand
1 support infantry stand
3 Jump Troop Squads, each with:
1 tactical command stand
2 infantry stands
Grav Tank Company (Delta), with:
Company Headquarters, with:
1 operational command Heavy Grav Command Tank
3 Tank Platoons, each with:
1 tactical command Heavy Grav Command Tank
3 self-ordering Imperial Heavy Grav Tanks
Artillery Platoon, with:
1 tactical command stand
1 Imperial FDC Grav APC
4 MRL Artillery Vehicles
Support Platoon, with:
3 TL15 Utility Sleds
1 command stand
6 support stands

4518th Lift Infantry



Notes: All personnel stands are equipped with TL14 heavy battle dress. All infantry stands are armed with TL14 4.7cm fusion rifles, TL15 portable Tac missiles, and integral TL15 5.1cm fusion rifles. Single figure command stands are also armed with TL14 4.7cm fusion rifles. Support infantry stands are armed with TL15 portable Tac missiles and an integral TL15 5.1cm fusion rifle. The Imperial Command Grav APC is identical to the Imperial FDC APC but without the FDC fitted.

Imperial Marine Armored Cavalry Regiment

MArCav Regiment, with:
Regimental Headquarters, with:
Command Post Section, with:
1 operational command stand
1 Imperial Marine Command APC
1 staff uplink Imperial Marine Command APC
Communications Section, with:
1 staff uplink Imperial Marine Command APC
1 staff radio Imperial Marine Command APC
Point Defense Section, with:
1 tactical command TL15 Convertible Air Raft
3 TL15 Point Defense APCs
Nuclear Damper Section, with:
3 tactical command ND Director APCs
4 TL15 Nuclear Damper APCs
3 Armored Cavalry Squadrons, each with:
Squadron Headquarters and Headquarters Troop, with:
1 operational command stand
1 Imperial Marine Command APC
1 staff uplink Imperial Marine Command APC
1 staff radio Imperial Marine Command APC
1 Imperial FDC Grav APC
1 ND Director APC
1 TL15 Nuclear Damper APC
2 self-ordering Imperial Marine Support APCs
3 Armored Cavalry Troops, each with:
Troop Headquarters &Headquarters Platoon, with:
1 operational command stand
1 Imperial Marine Command APC
1 staff radio Imperial Marine Command APC
2 self-ordering Heavy Grav Tanks
3 Armored Cavalry Platoons, each with:
Tank Section, with:
2 self-ordering Heavy Grav Tanks
Rifle Squad, with:
1 tactical command stand
2 infantry stands
1 Imperial Marine Grav APC
Scout Section, with:
2 self-ordering TL15 Armed Air Rafts
Combat Support Squadron, with:
Squadron Headquarters, with:
1 operational command stand
1 Imperial Marine Command APC
1 staff uplink Imperial Marine Command APC
1 staff radio Imperial Marine Command APC
1 ND Director APC
1 TL15 Nuclear Damper APC
2 self-ordering TL15 Armed Air Rafts

Appendix H: Unit Organizations

Artillery Battery, with:
- **Battery Headquarters Section**, with:
  - 1 operational command Imperial Marine Command APC
  - 1 Imperial Marine FDC APC
  - 3 self-ordering FO TL15 Convertible Air Rafts
- **Battery Security Section**, with:
  - **Section Headquarters**, with:
    - 1 tactical command TL15 Armed Air Raft
  - **2 Marine Squads**, each with:
    - 1 tactical command stand
    - 2 infantry stands
    - 1 Imperial Marine APC
- **4 Firing Sections**, each with:
  - 1 Imperial Meson Sled

Fire Support Battery, with:
- **Battery Headquarters &Headquarters Platoon**, with:
  - 1 operational command stand
  - 1 Imperial Marine Command APC
  - 1 staff radio Imperial Marine Command APC
- **3 Firing Platoons**, each with:
  - 1 tactical command Imperial Marine Support APC
  - 3 Imperial Marine Support APCs

Combat Engineer Company, with:
- **Headquarters and Headquarters Platoon**, with:
  - 1 operational command stand
  - 1 TL15 Convertible Air Raft
- **3 Engineer Platoons**, each with:
  - **Headquarters**, with:
    - 1 tactical command stand
    - 1 Imperial Marine Command APC
    - 2 Imperial Engineer Vehicles
  - **3 Engineer Squads**, each with:
    - 1 tactical command stand
    - 2 engineer stands
    - 1 Imperial Marine Grav APC

Medical Platoon, with:
- *1 tactical command stand*
- *1 TL15 Hospital APC*
- *1 TL15 Utility Sled*
- *3 TL15 Ambulance APCs*

Maintenance and Support Platoon, with:
- *1 tactical command stand*
- *2 TL15 Recovery Sleds*
- *2 TL15 Utility Sleds with maintenance shops*
- *2 TL15 Utility Sleds*
- *1 TL15 Convertible Air Raft*

Mess and Transport Platoon, with:
- *1 tactical command stand*
- *1 TL15 Utility Sled*
- *4 TL15 Utility Sleds with field kitchens*
- *1 TL15 Convertible Air Raft*

Notes: All infantry and single-figure command stands are equipped with TL14 light battle dress. All infantry stands are armed with TL14 4.7cm fusion rifles, TL15 portable Tac missiles and integral TL15 5.1cm fusion rifles. Single-figure command stands are also armed with TL14 4.7cm fusion rifles.

Engineer stands and their command stands are equipped with TL14 heavy battle dress and armed with 4mm gauss rifles and integral TL15 5.1 cm fusion rifles.

Branatian Motorized Rifle Regiment

Rifle Regiment, with:
- **Regimental Headquarters**, with:
  - **Command Post Platoon**, with:
    - 1 operational command stand
    - 1 TL6 Light Truck
    - 2 staff radio TL6 Command Tracks
- **Regimental Direct Support Artillery Battery**, with:
  - **Battery Headquarters**, with:
    - 1 tactical command TL6 FDC Heavy Truck
    - 3 self-ordering FO stands
    - 3 TL6 Light Trucks
  - **3 Firing Sections**, each with:
    - 3 TL6 SP Howitzer-guns
    - 3 ammunition TL6 Heavy Trucks
- **Tank Company**, with:
  - **Company Headquarters**, with:
    - 1 tactical command TL6 Medium Tank
  - **3 Tank Platoons**, each with:
    - 4 TL6 Medium Tanks
- **Antitank Artillery Battery**, with:
  - **Battery Headquarters**, with:
    - 1 tactical command TL6 Tank Destroyer
  - **3 Tank Destroyer Sections**, each with:
    - 3 TL6 Tank Destroyers
- **3 Rifle Battalions**, each with:
  - **Headquarters and Headquarters Platoon**, with:
    - **Battalion Headquarters**, with:
      - 1 operational command stand
      - 1 staff radio TL6 Command Track
      - 1 TL6 Light Truck
    - **Machinegun Section**, with:
      - 4 HMG stands
      - 2 TL6 Medium Trucks
    - **Mortar Section**, with:
      - 4 TL6 10cmL15 mortar stands
      - 4 TL6 Medium Trucks
      - 1 self-ordering FO stand
      - 1 light truck
  - **Transportation Company**, with:
    - **Company Headquarters**, with:
      - 1 tactical command TL6 Light Truck
    - **4 Truck Platoons**, each with:
      - 11 TL6 Medium Trucks
  - **4 Rifle Companies**, each with:
    - **Headquarters and Headquarters Platoon**, with:
      - **Company Headquarters Section**, with:
        - 1 command infantry stand
        - 1 TL6 Light Truck
      - **Weapons Section**, with:
        - 2 TL6 8cmL10 mortar stands
        - 2 TL6 Light Trucks
        - 2 LMG stands
    - **3 Rifle Platoons**, each with:
      - **Platoon Headquarters**, with:
        - 1 LMG stand
      - **3 Rifle Squads**, each with:
        - 1 support infantry stand
        - 2 infantry stands

Notes: Infantry stands are equipped with TL5 helmets and TL6 7mm autorifles (firing ball ammunition) plus TL5 rifle grenades and TL6 hand grenades. Command infantry and support infantry stands have integral TL6 ATRLs. LMG stands are equipped with tripod-mounted TL6 7mm LMGs, and HMG stands are equipped with TL6 13mm HMGs. The TL6 FDC has a range of 25 km.

Appendix H: Unit Organizations

Kidan Armored Cavalry Battalion

Armored Cavalry Battalion, with:
- **Headquarters**, with:
  - **Command Post Section**, with:
    - 1 operational command stand
    - 1 TL8 Voltigeur APC
    - 1 staff radio Voltigeur APC
- **3 Armored Cavalry Companies**, each with:
  - **Headquarters and Headquarters Platoon**, with:
    - 1 operational command stand
    - 1 staff radio Voltigeur APC
    - 1 Range Truck
    - 2 TL8 Voltigeur APCs with TL8 8cmL10 mortars
    - 2 TL8 Lancer Missile Carriers
  - **3 Armored Cavalry Platoons**, each with:
    - **Headquarters Section**, with:
      - 1 tactical command TL8 Prairie Fire Fast Tank
    - **Tank Squad**, with:
      - 2 TL8 Prairie Fire Fast Tanks
    - **Direct Fire Squad**, with:
      - 2 TL8 Lancer Missile Carriers
    - **Rifle Squad**, with:
      - 4 infantry stands
      - 1 MG stand
      - 1 ATRL stand
      - 1 TL8 Voltigeur APC
    - **Scout Squad**, with:
      - 4 self-ordering Range Trucks with 5mm Rotary MGs

Notes: All personnel stands are equipped with TL8 ballistic weave helmets and body suits. Infantry stands are armed with TL7 9mm rifles firing TL8 DS ammunition, with hand grenades, TL8 RAM grenades and integral TL8 ATRLs.

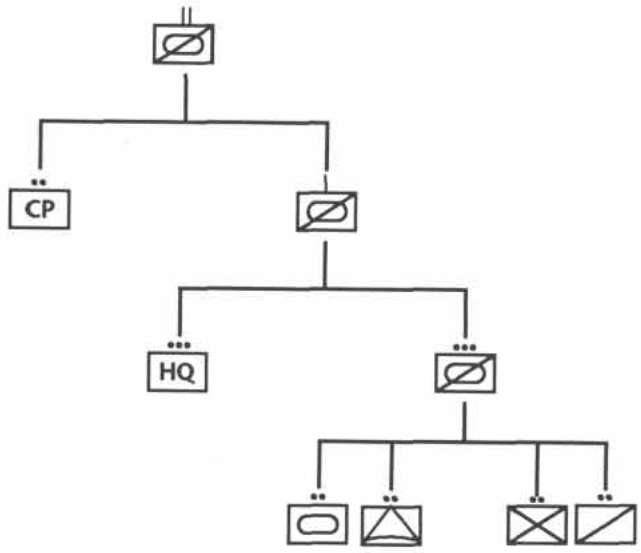
MG stand is equipped with TL8 7mm rotary gun, and ATRL stand is equipped with TL8 ATRLs.

1st Marine Brigade, RCMC

Marine Brigade, with:
- **Brigade Headquarters**, with:
  - **Command Post Platoon**, with:
    - 1 operational command stand
    - 1 TL12 Convertible Air Raft
    - 2 staff uplink TL11 G-Carriers
- **1st Marine Battalion**, with:
  - **Headquarters and Headquarters Company**, with:
    - **Battalion Headquarters**, with:
      - 1 operational command stand
      - 1 staff radio TL11 G-Carrier
      - 1 TL12 Convertible Air Raft
  - **3 Light Lift Companies**, each with:
    - **Headquarters and Headquarters Platoon**, with:
      - **Company Headquarters Section**, with:
        - 1 operational command grav belt stand
        - 1 staff radio TL11 G-Carrier
        - 1 TL12 Convertible Air Raft
      - **Fire Support Section**, with:
        - 1 tactical command TL12 Convertible Air Raft with TL9 13mm HMG
        - 1 TL12 Convertible Air Raft with TL9 13mm HMG
        - 2 TL12 Convertible Air Rafts with TL12 8cmL10 mortars
    - **3 Line Platoons**, each with:
      - **Platoon Headquarters**, with:
        - 1 tactical command grav belt stand
        - 1 ARL stand
        - 1 SSL stand
        - 2 TL12 Convertible Air Rafts
      - **3 Rifle Squads**, each with:
        - 1 command grav belt infantry stand
        - 2 grav belt infantry stands
        - 3 TL12 Convertible Air Rafts
- **2d Marine Battalion**, with:
  - **Headquarters and Headquarters Company**, with:
    - **Battalion Headquarters**, with:
      - 1 operational command stand

KIDAN ARMORED CAVALRY BATTALION

Apparently the Kidan military tradition does not call for using the traditional terms "squadron" and "troop" for cavalry units.

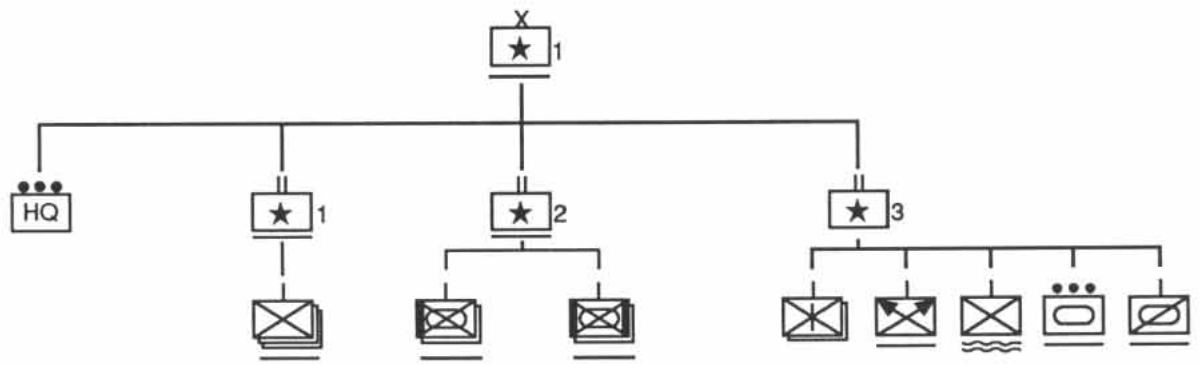


Appendix H: Unit Organizations

1 staff radio TL11 G-Carrier
1 TL12 Convertible Air Raft
2 Medium Companies, each with:
Headquarters and Headquarters Platoon, with:
Company Headquarters Section, with:
1 operational command stand
1 staff radio TL11 G-Carrier
1 TL12 Convertible Air Raft
Fire Support Section, with:
1 tactical command TL13 Pyrrhus Support Sled
1 TL13 Pyrrhus Support Sled
2 TL12 Convertible Air Rafts with TL12 8cmL10 mortars
3 Line Platoons, each with:
Platoon Headquarters, with:
1 tactical command stand
1 ARL stand
1 SSL stand
2 TL12 Convertible Air Rafts
3 Rifle Squads, each with:
1 command infantry stand
3 infantry stands
1 TL9 Grav APC
2 Heavy Companies, each with:
Headquarters and Headquarters Platoon, with:
Company Headquarters Section, with:
1 operational command stand
1 staff radio TL11 G-Carrier
Fire Support Section, with:
1 tactical command TL14 Intrepid/125 Grav Tank
1 TL14 Intrepid/125 Grav Tank
2 TL12 Convertible Air Rafts with TL12 8cmL10 mortars
3 Line Platoons, each with:
Platoon Headquarters, with:
1 tactical command stand
1 TL11 Tac missile stand
1 Plasma stand
2 TL12 Convertible Air Rafts
3 Heavy Rifle Squads, each with:
1 command heavy infantry stand
3 heavy infantry stands
1 TL9 Grav APC
3d Marine Battalion, with:
Headquarters and Headquarters Company, with:
Battalion Headquarters, with:
1 operational command stand
1 staff radio TL11 G-Carrier
1 TL12 Convertible Air Raft
2 Drop Companies, each with:
1 operational command stand
1 SSL stand
1 TL11 Tac missile stand
1 Plasma stand
3 Drop Platoons, each with:
1 tactical command stand
3 Drop Squads, each with:
1 tactical command infantry stand
2 infantry stnads
1 Transport Platoon, with:
1 tactical command stand
9 TL9 Grav APCs *or*
9 TL12 Fury Assault Landers
1 Special Operations Group, with:
1 operational command grav belt stand
1 TL12 Convertible Air Raft
Insertion Section, with:
1 tactical command grav belt stand
3 Astrin Grav APCs
3 TL12 Convertible Air Rafts
3 Fury Assault Landers
Tactical Section, with:
1 tactical command stand
3 LSW stands
6 self-ordering grav belt Sniper stands (single figure)
3 self-ordering grav belt FO stands
3 self-ordering grav belt sensor stands
6 self-ordering grav belt infantry stands

1ST MARINE BRIGADE, REFORMATION COALITION MARINE CORPS

"Semper Out Front, Baby"



Appendix H: Unit Organizations

1 Aquatic Company, with:
Company Headquarters, with:
1 Schalli operational command stand
2 Schalli weapons stands
2 self-ordering Schalli infiltration stands
3 Aquatic Platoons, with:
1 Schalli tactical command stand
2 Wet Squads, each with:
1 Schalli command infantry stand
2 Schalli infantry stands
Powered Squad, with:
1 Schalli command powered infantry stand
2 Schalli powered infantry stands

Armored Platoon, with:
1 tactical command TL14 Intrepid/120 Grav Tank
2 TL14 Intrepid/120 Grav Tanks
2 TL14 Intrepid/125 Grav Tanks

Speeder Troop, with:
Troop Headquarters, with:
1 operational command Mongoose Attack Speeder
1 staff radio TL11 G-Carrier
Heavy Platoon, with:
1 tactical command Mongoose Attack Speeder
2 self-ordering Mongoose Attack Speeders
Light Platoon, with:
1 tactical command Ferret Attack Speeder
2 self-ordering Ferret Attack Speeders

Notes: This unit does not deploy tactically. Rather, elements of squad, platoon or company size are detached for specific operations. The three battalions are specialized by mission: 1st Battalion for light lift infantry, 2nd Battalion for protected (battle dress) infantry, and 3rd Battalion for special missions, including specialized vehicles.

1st Battalion: All grav belt stands are equipped with grav belts and TL9 combat environment suits. All single-figure command stands are armed with TL13 personal defense lasers, while infantry stands are equipped with TL13 4cm CLC laser rifles, TL9 RAM grenades and hand grenades.

ARL and SSL stands are equipped with TL13 personal defense lasers as secondary weapons.

2nd Battalion: Medium infantry stands are equipped with TL12 Reformation Coalition Light Battle Dress, and heavy infantry stands are equipped with TL12 Reformation Coalition Heavy Battle Dress.

Medium infantry stands are armed with TL10 7mm ACRs, TL9 RAM grenades and hand grenades, with an integral 4mm gauss SAW. Command medium infantry stands have an integral ARL in place of the SAW.

Heavy infantry stands are armed with TL12 4.3cm plasma rifles and disposable TL9 Nail Tac missiles with integral ARLs. Command heavy infantry stands have an integral TL14 4.7cm fusion rifle. Tac missile stands are armed with TL11 manportable Tac missiles; plasma stands are armed with 10cm plasma bazookas.

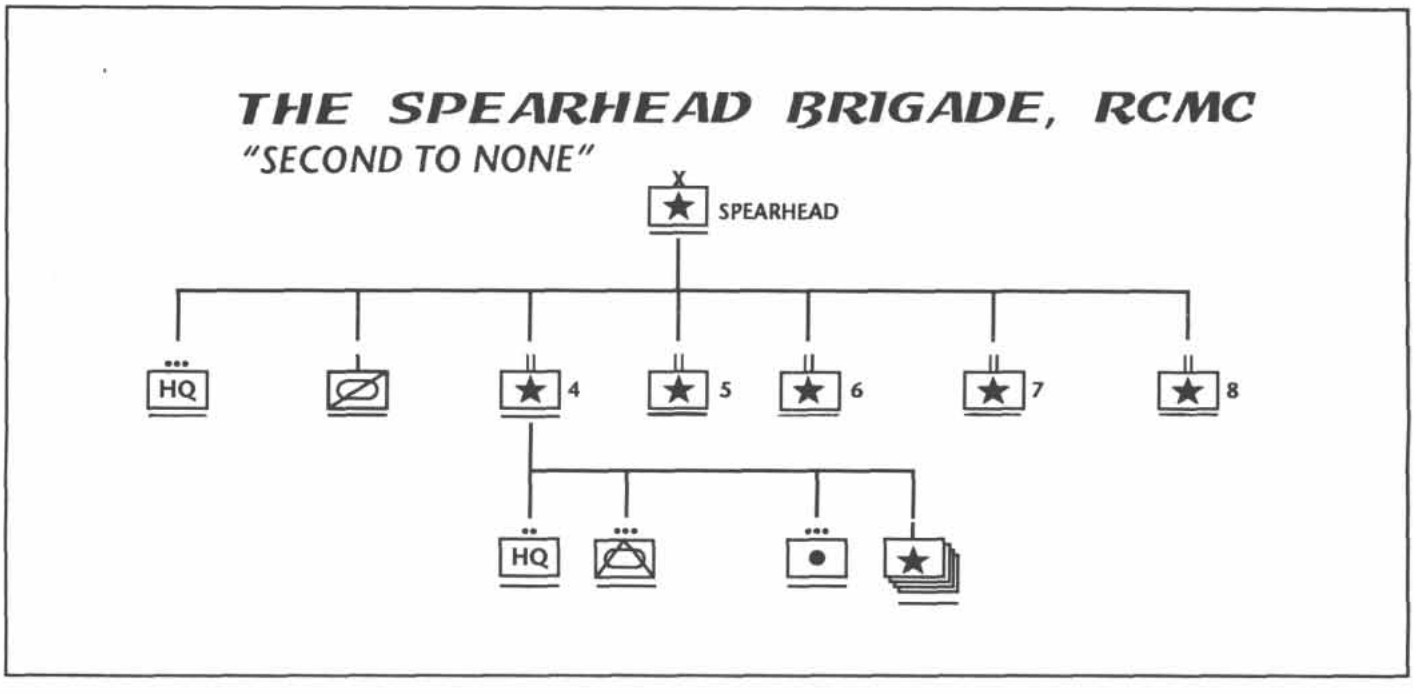
All personnel stands are drop-trained. When dropped into combat, they enter without their vehicles, but each stand additionally carries four shots of TL9 Lyrebird Tac missiles into combat with it (each single-figure stand carries one shot of Lyrebirds).

3rd Battalion: All personnel stands in the drop companies are equipped with TL12 Reformation Coalition Light Battle Dress. They are armed with TL10 7mm ACRs, TL9 RAM grenades, hand grenades, and integral 2cm LAGs. Command Infantry Stands are armed with integral ARLs.

Tac missile stands are armed with TL11 manportable Tac missiles; plasma stands are armed with 10cm plasma bazookas.

All personnel stands in the drop companies are drop-trained. When dropped into combat, they enter without their vehicles, but each stand additionally carries four shots of TL9 Lyrebird Tac missiles into combat with it (each single-figure stand carries one shot of Lyrebirds).

Personnel stands in the Special Operations Group are equipped with TL9 combat environment suits. Sniper stands are equipped with TL12 grav belts and WSV goggles (40cm) and are armed with TL6 13mm sniper rifles. FO stands are equipped with grav belts, WSV goggles, 3km laser designators, 30km radios and TL13 personal defense lasers. Sensor stands are equipped with grav belts, 3km passive EMS sensors, 3km maser communicators, and TL13 personal defense lasers. Grav belt infantry stands are equipped with grav belts, WSV goggles (40cm), 4cm CLC laser rifles and TL9 RAM grenades.



Appendix H: Unit Organizations

(2d) "Spearhead" Marine Brigade, Reformation Coalition Marine Corps

Marine Brigade, with:
- **Brigade Headquarters**, with:
  - **Command Post Platoon**, with:
    - 1 operational command stand
    - 1 TL9 Grav APC
    - 2 staff uplink TL9 Grav Sleds
- **Brigade Scout Troop**, with:
  - **Troop Headquarters**, with:
    - 1 operational command Mongoose Attack Speeder
    - 1 staff radio TL9 Grav Sled
  - **3 Cavalry Platoons**, each with:
    - 1 tactical command Mongoose Attack Speeder
    - 2 self-ordering Mongoose Attack Speeders
    - 2 self-ordering Ferret Attack Speeders

The Spearhead Brigade

Although part of the RCMC, the Spearhead Brigade is made up entirely of Oriflammen personnel, drawn from the ranks of the five Oriflammen Marine divisions. The vehicles of the brigade are marked not with the RC man-wheel, but rather the Oriflammen Marine Corps Insignia. This insignia consists of a black lightning bolt, symbolizing stealth, speed and violence, horizontally bisecting a circle. The upper half of the circle is blue, symbolizing the cold of space, from whence the unit strikes, while the lower half is red, representing the heat of ground combat into which the unit is deployed.

The vehicles of the unit are painted with shark's mouth motifs, and are given suitably toothy names, such as "Tiger Shark," "Dragon Breath," etc. Vehicles are also given three-digit tactical codes within each battalion. The first digit is the number of the company in the battalion (with the headquarters company being 0 and the line companies being 1-4); the second digit is the platoon number within the company (with the tank platoon being 0, the headquarters platoon being 1, and the rifle platoons being 2-4); and the third digit is the vehicle number within the platoon.

Although only authorized a strength of three Intrepids per tank platoon, several of the brigade's platoons boast unauthorized levels of four grav tanks, in keeping with the long-standing Oriflammen doctrine of firepower superiority.

Although the Spearhead's battalions are numbered 4 through 8 as compared to 1 to 3 in the RCMC 1st Marine Brigade, no member of the brigade ever refers to the brigade as anything other than "The Spearhead Brigade." The unit's motto is "Second to None."



4th, 5th, 6th, 7th, and 8th Marine Battalions, each with:
- **Headquarters and Headquarters Company**, with:
  - **Battalion Headquarters**, with:
    - 1 operational command stand
    - 1 staff radio TL9 Grav Sled
    - 1 TL12 Convertible Air Raft
  - **Tank Destroyer Platoon**, with:
    - 1 tactical command TL14 Intrepid/120 Grav Tank
    - 3 TL14 Intrepid/120 Grav Tanks
  - **Indirect Fire Platoon**, with:
    - 1 tactical command stand
    - 1 FDC TL9 Grav Sled
    - 1 TL12 Convertible Air Raft
    - 4 TL12 Convertible Air Rafts with TL12 8cmL10 mortars
    - 2 self-ordering FO TL12 Convertible Air Rafts
- **4 Line Companies**, each with:
  - **Headquarters and Headquarters Platoon**, with:
    - **Company Headquarters Section**, with:
      - 1 operational command stand
      - 1 staff radio TL9 Grav Sled
      - 1 TL12 Convertible Air Raft
    - **Fire Support Section**, with:
      - 1 tactical command TL13 Pyrrhus Support Sled
      - 1 TL13 Pyrrhus Support Sled
      - 2 TL12 Convertible Air Rafts w/TL12 8cmL10 mortars
  - **Tank Platoon**, with:
    - 1 tactical command TL14 Intrepid/125 Grav Tank
    - 2 or 3 TL14 Intrepid/125 Grav Tanks
  - **3 Rifle Platoons**, each with:
    - **Platoon Headquarters**, with:
      - 1 tactical command stand
      - 1 TL12 Convertible Air Raft with ARL
      - 1 TL12 Convertible Air Raft with SSL
    - **2 Rifle Squads**, each with:
      - 1 command infantry stand
      - 3 infantry stands
      - 1 TL9 Grav APC
    - **1 Heavy Rifle Squad**, with:
      - 1 command heavy infantry stand
      - 3 heavy infantry stands
      - 1 TL9 Assault Sled

Notes: Heavy infantry stands are equipped with TL12 Reformation Coalition Heavy Battle Dress. All other personnel stands are equipped with TL12 Reformation Coalition Light Battle Dress.

Heavy infantry stands are armed with 4mm gauss rifles, TL9 RAM rifle grenades and disposable TL9 Nail Tac missiles. Each heavy infantry stand has an integral 4mm gauss SAW, while each command heavy infantry stand has an integral TL12 4.3cm plasma rifle.

Normal (nonheavy) infantry stands are armed with TL10 7mm ACRs, TL9 RAM rifle grenades and TL9 hand grenades, and an integral 2.5cm low-velocity grenade launcher. Command infantry stands have integral 10cm plasma bazookas in place of the GLs.

All personnel stands are drop-trained. When dropped into combat, they enter without their vehicles, but each stand additionally carries four shots of TL9 Lyrebird Tac missiles into combat with it (each single-figure stand carries one shot of Lyrebirds).

TL9 FDCs have a range of 40 km.

Appendix H: Unit Organizations

3d Marine Brigade, RCMC

Marine Brigade, with:
- **Brigade Headquarters**, with:
  - **Command Post Platoon**, with:
    - 1 operational command stand
    - 1 TL12 Convertible Air Raft
    - 2 staff uplink TL11 G-Carriers
- **Brigade Scout Troop**, with:
  - **Troop Headquarters**, with:
    - 1 operational command Mongoose Attack Speeder
    - 1 staff radio TL11 G-Carrier
  - **3 Cavalry Platoons**, each with:
    - 1 tactical command Mongoose Attack Speeder
    - 2 self-ordering Mongoose Attack Speeders
    - 2 self-ordering Ferret Attack Speeders
- ***11th Marine Battalion (Training Cadre)**, with:*
  - *Training unit only, no tactical units*
- **9th and 10th Marine Battalions**, each with:
  - **Headquarters and Headquarters Company**, with:
    - **Battalion Headquarters**, with:
      - 1 operational command stand
      - 1 staff radio TL11 G-Carrier
      - 1 TL12 Convertible Air Raft
    - **Tank Destroyer Platoon**, with:
      - 1 tactical command TL14 Intrepid/120 Grav Tank
      - 3 TL14 Intrepid/120 Grav Tanks
    - **Indirect Fire Platoon**, with:
      - 1 tactical command stand
      - 1 FDC TL11 G-Carrier
      - 1 TL12 Convertible Air Raft
      - 4 TL12 Convertible Air Rafts with TL12 8cmL10 mortars
      - 2 self-ordering FO TL12 Convertible Air Rafts
  - **4 Line Companies**, each with:
    - **Headquarters and Headquarters Platoon**, with:
      - **Company Headquarters Section**, with:
        - 1 operational command stand
        - 1 staff radio TL11 G-Carrier
        - 1 TL12 Convertible Air Raft
      - **Fire Support Section**, with:
        - 1 tactical command TL13 Pyrrhus Support Sled
        - 1 TL13 Pyrrhus Support Sled
        - 2 TL12 Convertible Air Rafts w/TL12 8cmL10 mortars
    - **Tank Platoon**, with:
      - 1 tactical command TL14 Intrepid/125 Grav Tank
      - 2 TL14 Intrepid/125 Grav Tanks
    - **3 Line Platoons**, each with:
      - **Platoon Headquarters**, with:
        - 1 tactical command stand
        - 1 TL12 Convertible Air Raft with ARL
        - 1 TL12 Convertible Air Raft with SSL
      - **2 Rifle Squads**, each with:
        - 1 command infantry stand
        - 3 infantry stands
        - 1 TL9 Grav APC
      - **1 Heavy Rifle Squad**, with:
        - 1 command heavy infantry stand
        - 3 heavy infantry stands
        - 1 TL9 Grav APC

Notes: Heavy infantry stands are equipped with TL12 Reformation Coalition Heavy Battle Dress. All other personnel stands are equipped with TL12 Reformation Coalition Light Battle Dress.

Heavy infantry stands are armed with 4mm Gauss Rifles, TL9 RAM rifle grenades and disposable TL9 Nail Tac missiles. Each heavy infantry stand has an integral 4mm gauss SAW, while each command heavy infantry stand has an integral TL12 4.3cm plasma rifle.

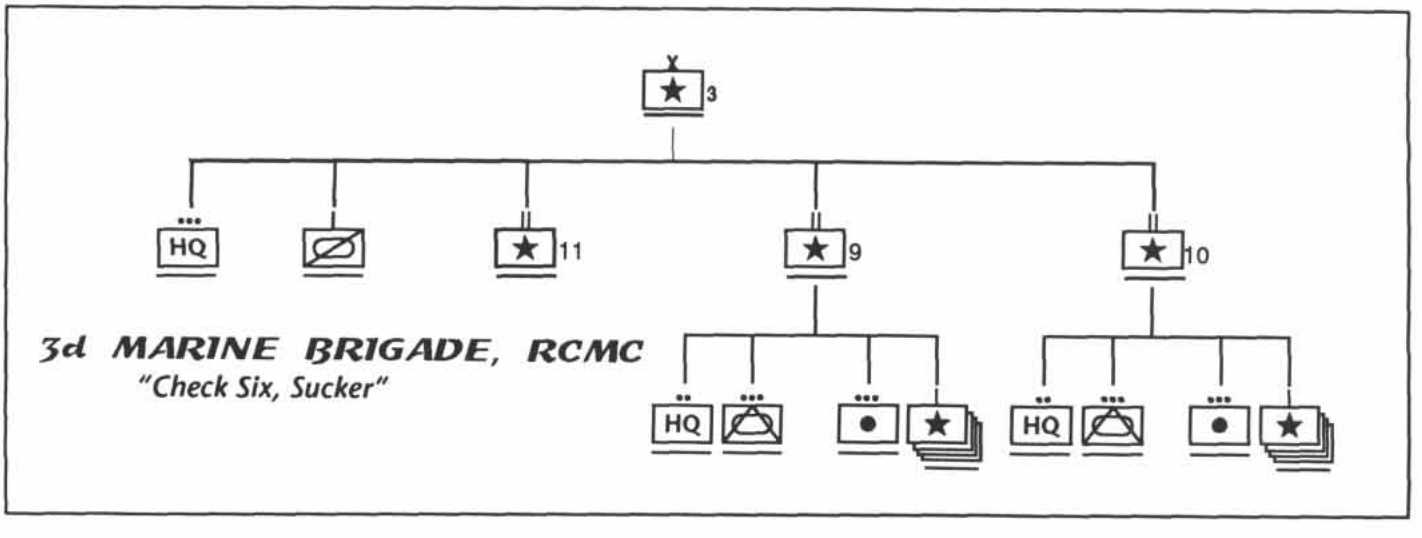
Normal (nonheavy) infantry stands are differently armed depending upon their battalion. Infantry stands of the 9th Marine Battalion are armed with the TL10 7mm ACR with hand grenades, TL9 RAM grenades and integral 2.5cm low-velocity grenade launchers.

Infantry stands of the 10th Marine Battalion are armed with the TL10 7mm CMWS rifle and hand grenades, TL9 RAM grenades and integral 7mm CMWS SAWs.

Command infantry stands in the 9th Battalion have integral TL9 Nail Tac missiles, while command infantry stands in the 10th battalion have integral 10mm plasma bazookas.

All separate command stands in the brigade are armed with the TL10 7mm CMWS carbine.

All personnel stands are drop-trained. When dropped into combat, they enter without their vehicles, but each stand additionally carries four shots of TL9 Lyrebird Tac missiles into combat with it (each single-figure stand carries one shot of Lyrebirds).



Appendix H: Unit Organizations

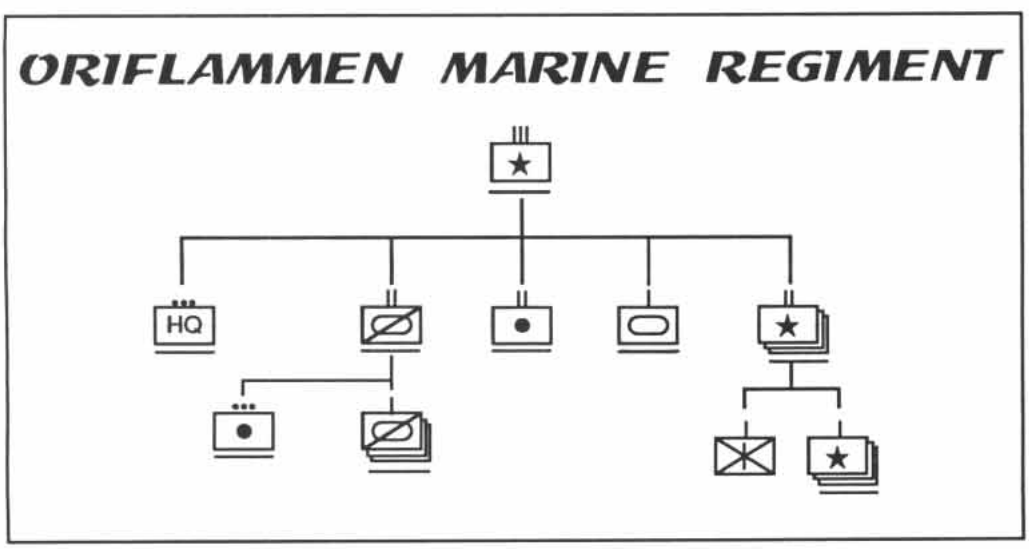
Oriflamme Marine Regiment

Marine Regiment, with:
- **Regimental Headquarters**, with:
  - **Command Post Platoon**, with:
    - 1 operational command stand
    - 1 TL9 Grav APC
    - 2 staff uplink TL9 Grav APC
- **Regimental Cavalry Squadron**, with:
  - **Squadron Headquarters**, with:
    - 1 operational command TL9 Grav Tank
    - 1 staff uplink TL9 Grav APC
  - **Rocket Platoon**, with:
    - 1 operational command stand
    - 1 FDC TL9 Grav APC
    - 3 self-ordering FO TL9 Cav Vehicles
    - 3 TL9 MRL Sleds
    - 3 ammunition TL9 Grav Sleds
  - **3 Cavalry Troops**, each with:
    - **Troop Headquarters**, with:
      - 1 operational command TL9 Grav Tank
      - 1 staff radio TL9 Grav APC
    - **3 Cavalry Platoons**, each with:
      - 1 tactical command TL9 Grav Tank
      - 1 self-ordering TL9 Grav Tank
      - 2 self-ordering TL9 Cav Vehicles
      - 2 self-ordering TL9 Cav Missile Vehicles
- **Regimental Rocket Battery**, with:
  - **Battery Headquarters**, with:
    - 1 operational command stand
    - 1 TL9 Light U Sled
    - 1 FDC TL9 Grav APC
    - 3 self-ordering FO TL9 Cav Vehicles
  - **3 Firing Sections**, each with:
    - 1 tactical command TL9 MRL Sled
    - 2 TL9 MRL Sleds
    - 3 ammunition TL9 Grav Sleds
- **Tank Company**, with:
  - **Company Headquarters**, with:
    - 1 operational command TL9 Grav Tank
    - 1 staff radio TL9 Grav APC
  - **3 Tank Platoons**, each with:
    - 1 tactical command TL9 Grav Tank
    - 3 TL9 Grav Tanks
  - **Tank Destroyer Platoon**, with:
    - 1 tactical command TL9 Grav Tank Destroyer
    - 3 TL9 Grav Tank Destroyers
- **3 Marine Battalions**, each with:
  - **Headquarters and Headquarters Company**, with:
    - **Battalion Headquarters**, with:
      - 1 operational command stand
      - 1 staff radio TL9 Grav APC
      - 1 TL9 Light U Sled
    - **Direct Fire Platoon**, with:
      - 1 command infantry stand
      - 1 TL9 Light U Sled
      - 4 HMG stands
      - 4 TL9 Light U Sleds
    - **Indirect Fire Platoon**, with:
      - 1 command infantry stand
      - 1 TL9 Light U Sled
      - 4 TL9 12cmL10 mortar stands
      - 4 TL9 Light U Sleds
      - 2 self-ordering TL9 Cav Vehicles
  - **4 Line Companies**, each with:
    - **Headquarters and Headquarters Platoon**, with:
      - **Company Headquarters Section**, with:
        - 1 operational command stand
        - 1 staff radio TL9 Grav APC
        - 1 TL9 Light U Sled
      - **Weapons Section**, with:
        - 2 TL9 8cmL10 mortar stands
        - 2 LMG stands
        - 4 Nail stands
        - 8 TL9 Light U Sleds
    - **3 Line Platoons**, each with:
      - **Platoon Headquarters**, with:
        - 1 command infantry stand
        - 1 Nail stand
        - 2 TL9 Light U Sleds
      - **3 Rifle Squads**, each with:
        - 1 support infantry stand
        - 3 infantry stands
        - 1 TL9 Assault APC

Notes: All personnel stands are equipped with TL12 Reformation Coalition Light Battle Dress. Infantry stands are armed with TL10 7mm ACRs, TL9 RAM rifle grenades and TL9 hand grenades, and an integral 2cm LAG. Support infantry and command infantry stands have integral 10cm plasma bazookas in place of the LAGs.

LMG stands are armed with TL9 7.5mm MMGs, and HMG stands are armed with TL9 15mm HMGs. Nail stands are armed with TL9 Nail Tac missiles. Mortar, LMG, HMG and Nail stands all have TL9 7.6mm SMGs as secondary weapons.

All personnel stands are drop-trained. When dropped into combat, they enter without their vehicles, but each stand additionally carries four shots of TL9 Lyrebird Tac missiles into combat with it (each single-figure stand carries one shot of Lyrebirds).

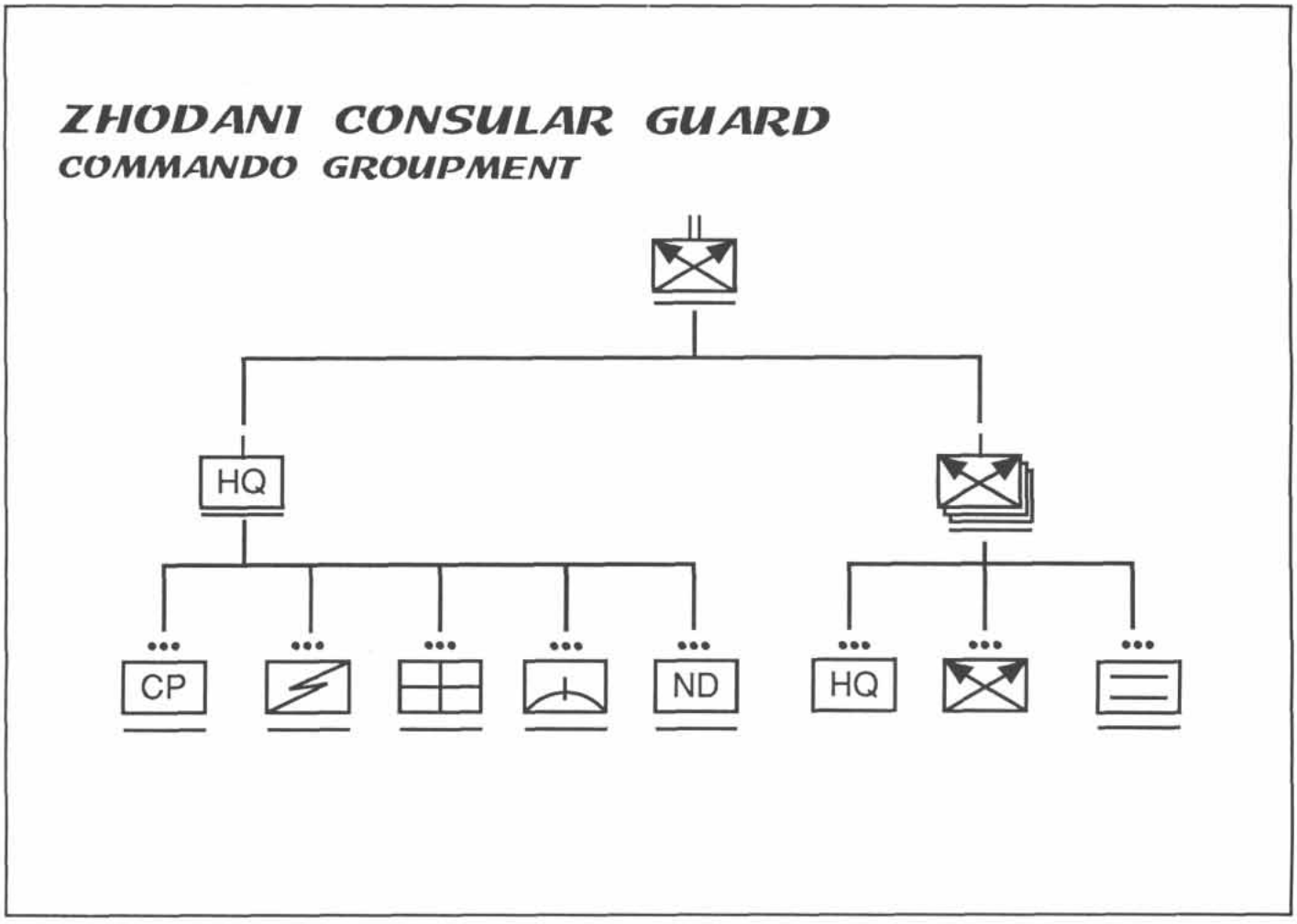


Appendix H: Unit Organizations

Zhodani Commando Groupment

Commando Groupment, with:
- **Headquarters and Headquarters Squadron**, with:
  - **Command Post Detachment**, with:
    - **Headquarters Group**, with:
      - 1 operational command stand
      - 1 Command Sled
      - 1 staff uplink Command Sled
    - **Intelligence Section**, with:
      - 1 self-ordering psionic intel stand
      - 1 Command Sled
    - **Communications Team**, with:
      - 1 staff uplink LMR Sled
    - **Computer Team**, with:
      - 1 staff uplink Command Sled
    - **Electronic Warfare Team**, with:
      - 1 self-ordering EW Sled
  - **Communications Platoon**, with:
    - 1 staff uplink Meson Sled
    - 1 staff uplink LMR Sled
    - 1 staff radio LMR Sled
  - *Medical Detachment, with:*
    - *1 tactical command stand*
    - *1 Hospital Sled*
    - *3 self-ordering Ambulance Sleds*
  - **Nuclear Damper Detachment**, with:
    - 1 tactical command stand
    - 1 Light Utility Sled
    - 2 Nuclear Damper Sleds
  - **Point Defense Detachment**, with:
    - 1 tactical command Point Defense Sled
    - 3 Point Defense Sleds
- **3 Commando Squadrons**, each with:
  - **Squadron Headquarters**, with:
    - 1 operational command psionic teleport stand
  - **Transport Detachment**, with:
    - 1 tactical command stand
    - 12 Grav APCs
    - 1 staff uplink Command Sled
  - **3 Commando Detachments**, each with:
    - 1 tactical command psionic teleport stand
    - **4 Commando Groups**, each with:
      - 1 tactical command psionic teleport stand
      - 1 psionic teleport support infantry stand
      - 2 teleport infantry stands

Notes: All stands are equipped with TL14 battle dress. Each stand is equipped with TL13 4.7cm noncompensated plasma rifles. Each support infantry stand additionally has an integral TL14 4.7cm noncompensated fusion rifle.



Appendix H: Unit Organizations

Zhodani Lift Infantry Battalion

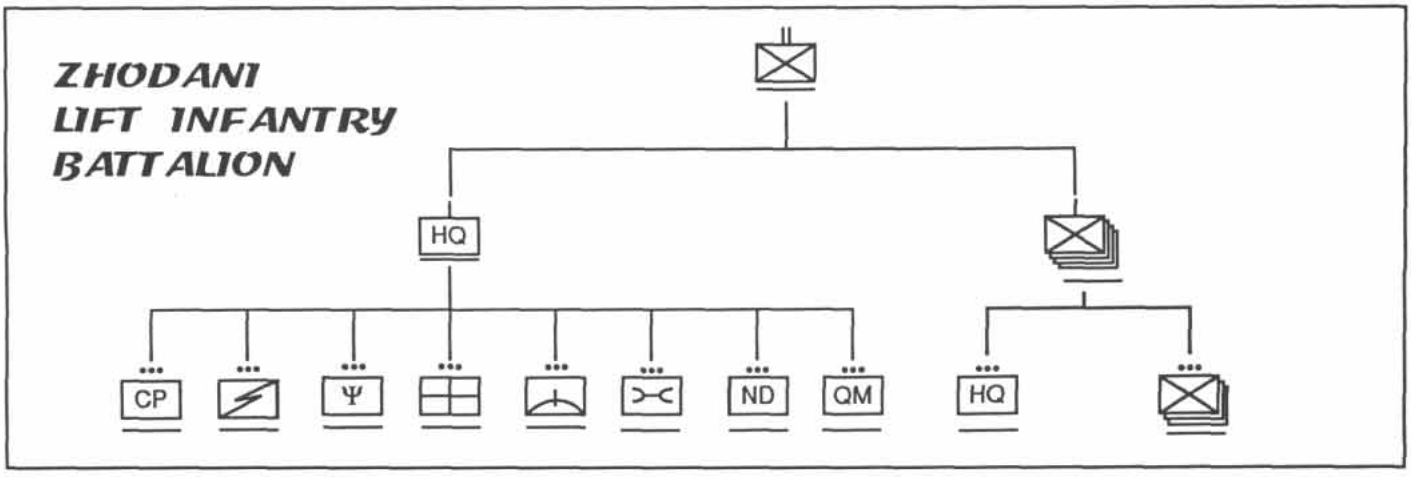
Lift Infantry Battalion, with:
- **Headquarters and Headquarters Company,** with:
  - **Command Post Platoon,** with:
    - **Headquarters Group,** with:
      - 1 operational command stand
      - 1 Command Sled
      - 1 staff uplink Command Sled
    - **Intelligence Section,** with:
      - 1 self-ordering psionic intel stand
      - 1 Command Sled
    - **Communications Team,** with:
      - 1 staff uplink LMR Sled
    - **Computer Team,** with:
      - 1 staff uplink Command Sled
    - **Electronic Warfare Team,** with:
      - 1 self-ordering EW Sled
  - **Communications Platoon,** with:
    - 1 staff uplink Meson Sled
    - 1 staff uplink LMR Sled
    - 1 staff radio LMR Sled
  - **Psion Detachment,** with:
    - **Command Group,** with:
      - 1 operational command stand
      - 2 Utility Sleds
      - 1 Light Utility Sled
    - **Scout Group,** with:
      - 1 tactical command psionic recon Scout Sled
      - 3 self-ordering psionic recon Scout Sleds
    - **Recon Group,** with:
      - 1 tactical command stand
      - 8 self-ordering psionic recon stands
    - **Assault Group,** with:
      - 1 tactical command stand
      - 6 psionic scrambler stands
  - *Medical Detachment, with:*
    - *1 tactical command stand*
    - *1 Hospital Sled*
    - *3 self-ordering Ambulance Sleds*
  - **Nuclear Damper Detachment,** with:
    - 1 tactical command stand
    - 1 Light Utility Sled
    - 2 Nuclear Damper Sleds
  - **Point Defense Detachment,** with:
    - 1 tactical command Point Defense Sled
    - 3 Point Defense Sleds
- **4 Rifle Companies,** each with:
  - **Headquarters and Weapons Platoon,** with:
    - **Headquarters Team,** with:
      - 1 operational command stand
      - 1 staff uplink Command Sled
      - 1 self-ordering FO stand
    - **Electronic Warfare Team,** with:
      - 1 self-ordering EW Sled
    - **Recovery Team,** with:
      - 1 self-ordering Recovery Sled
    - **Fire Direction Center Team,** with:
      - 1 self-ordering FDC Sled
    - **Indirect Fire Team,** with:
      - 1 self-ordering MRL Drop Sled
    - **Direct Fire Team,** with:
      - 1 self-ordering Gun Sled
  - **3 Line Platoons,** each with:
    - **Headquarters Team,** with:
      - 1 tactical command stand
      - 1 Command Sled
    - **Point Defense Team,** with:
      - 1 Point Defense Sled
    - **3 Rifle Squads,** each with:
      - 1 tactical command stand
      - 1 support infantry stand
      - 1 infantry stand
      - 1 Grav APC

Notes: Two configurations are listed below—the standard, most common level of equipment, and an upgraded level of equipment, issued to lift infantry battalions that are organic to grav tank, mechanized and lift cavalry regiments.

Standard Level: All stands are equipped with TL14 combat armor. Each stand is equipped with 4mm gauss rifles with RAM HEAP grenades. Each support infantry stand additionally has an integral TL14 4.7cm compensated fusion rifle.

Upgraded Level: All stands are equipped with TL14 battle dress. Each stand is equipped with TL13 4.7cm noncompensated plasma rifles. Each support infantry stand additionally has an integral TL14 4.7cm noncompensated fusion rifle.

Scrambler stands have range bands and rates of fire of 100 cm: 3 (short), 200 cm: 2 (medium), 400 cm: 1 (long), and 800 cm: 1 (extreme). Psionic recon (clairvoyant) stands have clairvoyant "sensor" range bands identical to scramblers above, but no ROF.



Appendix I: Design Sequence Upgrades

When designing vehicles for **Striker II** using the design sequences in **Fire, Fusion & Steel**, the **Traveller** technical architecture sourcebook, the following additional guidelines should be used.

GRAV VEHICLE DENSITY AND G RATING

When determining lift vehicle movement, thrust is usually divided by 10 times the vehicle's volume in displacement tonnes to determine G rating. However, this procedure should not be used for very dense grav vehicles, those massing 15.5 or more mass tonnes per displacement ton.

Divide the grav vehicle's loaded mass by its volume in displacement tonnes. If the result is less than 15.5, use the normal procedure described above. If the result is 15.5 or more, G rating is determined by dividing thrust in tonnes by the vehicle's loaded mass in tonnes.

TURRET SIZE

In some cases, designating a turret as a small turret (and therefore requiring its components to take up 10 times their volume) results in the turret being larger than the maximum 10% of vehicle volume. However, when recalculating the turret's volume as a main turret (usually requiring its components to take up 2 times their volume), the turret then falls below the 10% threshold and becomes classified as a small turret again. In such cases, threat the turret as a main turret (using the main turret volume multiplier), but this turret must be the only turret on that vehicle, and the vehicle is then classified as having a *small turret* for purposes of target type in the vehicle damage sequence.

DIRECT ENERGY INPUT LASER HOMOPOLAR GENERATORS

Large direct energy input lasers with trainable focal arrays may be designed for turret mounting in ground vehicles. When fitting these weapons to the vehicles, the laser' homopolar generator need not be placed in the turret, nor have its mass accounted for in the weapon stabilization calculations.

NUCLEAR DAMPERS

The design sequence in **Fire, Fusion & Steel** is based on the assumption that the dampers will be used for space combat, and assumes a rate of fire of one shot per three minutes (10 shots each 30 minutes). Higher rates of fire require a larger power input and a larger nuclear damper. Choose the ground combat rate of fire desired from the table below, and find the volume multiplier that corresponds to it. This volume multiplier is applied to the volume value derived from the Nuclear Damper Design table on page 57 of **Fire, Fusion & Steel.**

The input multiplier is applied to the MW required by the damper from the power plant. Note that this power multiplier is applied *after* the volume multiplier above is applied, and not in combination with it.

If the nuclear damper is to be fitted with weapon stabilization, only its basic mass (before the volume multiplier is applied) is counted against the stabilization requirement.

For example, a TL15 3000km short-range nuclear damper with a ground ROF of SA1 has a volume of 13.2 m^3, draws 10.8 MW, and costs 16.8 MCr (exclusive of beam pointer and workstation). For purposes of fitting weapon stabilization, it has a stabilized mass of 3.3 tonnes (plus its beam pointer mass of 0.15 tonnes).

This procedure may also be used to design starship-mounted nuclear dampers. In this case the increased rate of fire is reflected in –Diff Mods to nuclear damper task rolls in space combat.

Space Cbt ROF	*Ground Cbt ROF*	*Vol Mult*	*Input Mult*	*Space –Diff Mods*
10	1/36	×1	×1	—
30	1/12	×1	×3	—
(50)	N/A	N/A	N/A	–1
60	1/6	×1	×6	–1
90	1/4	×1	×9	–1
(100)	N/A	N/A	N/A	–2
120	1/3	×2	×12	–2
180	1/2	×2	×18	–2
(200)	N/A	N/A	N/A	–3
360	SA1	×4	×36	–3
(400)	N/A	×4	N/A	–4
720	SA2	×8	×72	–4
(800)	N/A	×8	N/A	–5

STABILIZED MISSILE LAUNCHERS

Missile launchers need not be stabilized so long as their sights and control units and designators are, except that missile launchers in turrets do require stabilization.

DRONE MISSILES

Drone missiles are remotely piloted "kamikaze" grav vehicles that use contra-grav lifters for movement through most of their mission, but accelerate to their maximum speed for the final flight into their targets.

Drone missiles are constructed partially as grav vehicles and partially as missiles. Although they are designed based on volume like grav vehicles, they do not require hull material volume or armor to be allocated, and they do not suffer volume losses to waste volume or hull slope. However, although they do not have material allocated for their airframes, like missiles, they are assumed to have airframe structures abstracted into the other materials purchased.

Each drone missile consists of a drone brain, one or more communicators, a warhead, contra-grav lifters, a mode of propulsion (usually a jet engine), batteries to power the lifters and communicators if the propulsion does not meet these needs, and fuel for the propulsion system.

The missile's maximum speed is calculated as if it were a grav vehicle, by dividing its thrust by its volume or mass (see grav vehicle density, above). Its cruising speed is one-quarter this speed, or 200 kph, whichever is less. This is the speed at which the missile always flies until it attacks its target. This speed is considered to be flown at NOE.

Drone Missile Brains

TL	*Mass (kg)*	*Vol (m^3)*	*MCr*	*Agility Bonus*
13	20	0.02	0.1	+3
14	10	0.01	0.1	+4
15	5	0.005	0.1	+5

Drone missiles are launched from Tac missile launchers designed using the normal procedures, although the launcher need not contain any particular control units. Drone missiles do require control stations, usually fitted within the launch vehicle.

A remote drone missile control station consists of a normal workstation, a flight computer of the same tech level as the drone brain, and one each of all communicator types installed on the drone missile. Flight computers and communicators may not be shared among multiple control stations. A single drone missile control stations may control a certain number of missiles per turn depending upon tech level.

Appendix I: Design Sequence Upgrades

TL	Missiles per Turn
9	2
10-11	3
12-13	4
14	5
15-16	6
17-18	7
19+	8

DIRECT FIRE ROCKET LAUNCHERS

Unguided rockets are inherently inaccurate at long ranges. The short and medium range bands for direct fire rockets are calculated normally. However, direct fire rockets have no long or extreme range bands, so may not be fired in direct fire mode at longer than medium range.

PUTTING THE HEAT BACK INTO PLASMA

One of the most consistent requests we receive with respect to the equipment in **Traveller® the New Era** is to increase the effectiveness of high energy weapons. Although we're reluctant to tinker with design sequences and published equipment, the pressure for tougher fusion and plasma rifles has been almost irresistible.

Never let it be said that we don't listen to customers. In fact, the well-known third law of retail sales is "Always listen to your customers." (The first law is "Never kill a customer." The second law is "You break it, you buy it.") So we took a good look at man-portable high energy weapons and concluded that, although they weren't as good as grenade launchers, at least they were real expensive. Hmmm. Perhaps, we decided, there was something to all those annoying complaints after all. The following modifications refer to pages in the **Fire, Fusion, & Steel** high energy weapon design sequences.

Page 67 (Explosive Power Generation)

Change the mass of EPG cartridges to volume x4 (instead of volume x8).

Page 121 (High Energy Weapons)

Range: Short range for plasma guns is now *100 x the square root of pulse energy in Megajoules* (instead of 30 x pulse energy).

Short range for fusion guns is now *150 x the square root of pulse energy in Megajoules* (instead of 50 x pulse energy)

Damage: Damage value (D) is now *30 x the square root of pulse energy in Megajoules* (instead of 11.5 x the square root of pulse energy)

Page 122 (High Energy Weapons)

Penetration: The penetration rating for *both* plasma and fusion guns is now 1-2-10.

Price: The revised component price multipliers for plasma and fusion guns are shown below.

Component	Plasma	Fusion
Firing Unit	600	1000
Support Hardware	600	1000
Gyro-Compensator*	600	600
Inertial Compensator*	1000	1000
Recoil Cradle	25	25
Towing Carriage	2	2
Autoloader	10	10
Gun Shield	1	1

All plasma and fusion weapons appearing in **Striker 2** have been rated according to this upgraded standard. The charts below will allow owners of **Traveller: the New Era, Smash & Grab,** and the **Reformation Coalition Equipment Guide** to update the values for previously published high energy weapons.

				Weight				Price	
Weapon	TL	Pulse	Ammo	Empty	Ldd	BP	Mag	Wpn	Ammo
4.3 cm Plasma Rifle	12	0.6	4.3 PPC	2.4	15.65	4.8	10	4320	15/211
4.7 cm Plasma Rifle	13	0.8	4.7 PPC	3.2	36.2	4.8	20	4800	20/539
4.7 cm Fusion Rifle	14	1.2	4.7 PFC	4.8	37.8	4.8	20	9600	9.6/331
4.1 cm Plasma Rifle/cmp	14	0.8	4.1 PFC	3.2	12.9	6.4	8	10,880	6.4/98
4.7 cm Fusion Rifle/comp	14	1.2	4.7 PFC	4.8	19.4	9.6	8	24,000	9.6/147
5.1 cm Fusion Rifle/comp	15	1.5	5.1 PFC	3	21.2	6	8	15,000	12/183
10cm Plasma Bazooka	10	2.88	10 PFC	34.6	45	—	1i	20,736	518.4
4cm Fusion Rifle/c (Droyne)	15	0.75	4.0 PFC	1.7	12.74	3	10	9500	6/111

Weapon	ROF	Dam	C-B	Pen Rtg	Pen Val	Blk	Mag	Recoil	Range
4.3cm Plasma 12	SA1	23	—	1-2-10	23-23-12-2	5	10	11	80
4.7cm Plasma 13	SA1	27	1-5	1-2-10	27-27-14-3	5	20	8	90
4.7cm Fusion 14	SA1	33	1-5	1-2-10	33-33-17-3	5	20	8	160
4.1cm Plasma 14c	SA1	27	1-5	1-2-10	27-27-14-3	4	8	5	90
4.7cm Fusion 14c	SA1	33	1-5	1-2-10	33-33-17-3	5	8	5	160
5.1cm Fusion 15c	SA1	37	1-5	1-2-10	37-37-19-4	3	8	4	180
10cm Plasma Bazooka	SS	51	3-5	1-2-10	51-51-26-5	5	1i	—	170
4cm Fusion 15c (Droyne)	SA1	26	1-5	1-2-10	26-26-13-3	2	10	5	130
125-Mj Fusion Gun (Intrepid)	SA2	335	112-35	1-2-10	335-335-168-34	—	200	—	1680
4.75-Mj Plasma (Mongoose)	SA1	65	4-5	1-2-10	65-65-33-7	—	300	—	220
14-Mj Plasma (Ferret)	1/2	112	13-15	1-2-10	112-112-56-11	—	300	—	370
12-Mj Plasma (Pyrrhus)	SA1	104	11-15	1-2-10	104-104-52-10	—	400	—	350
76-Mj Plasma (Victrix)	SA5	262	69-25	1-2-10	262-262-131-26	—	100	—	1310
2-Mj Plasma (G-Carrier)	SA1	42	2-5	1-2-10	42-42-21-4	—	200	—	140



Troop Quality: _____ Morale: _____ Initiative: _____
Armor: _____
Movement: _____ cm
System: *Short ( )* *Medium ( )* *Long ( )* *Extreme ( )* *Notes*



Troop Quality: _____ Morale: _____ Initiative: _____
Armor: _____
Movement: _____ cm
System: *Short ( )* *Medium ( )* *Long ( )* *Extreme ( )* *Notes*

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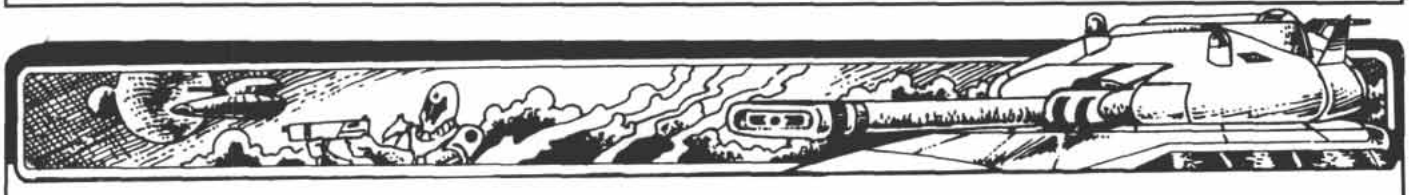
Troop Quality: _____ Morale: ____ Initiative: ____
Movement:
Front Armor:
Side Armor:
Rear Armor:
Deck Armor:
Belly Armor:
Mass Class:
Explosive Damage Modifier:
Fire Control:
Stabilization:

Cargo Capacity:
Environmental:
Electronic Warfare:
Ammunition:

Maintenance Points:

System: *Short ( )* *Medium ( )* *Long ( )* *Extreme ( )* *Notes*



Troop Quality: _____ Morale: ____ Initiative: ____
Movement:
Front Armor:
Side Armor:
Rear Armor:
Deck Armor:
Belly Armor:
Mass Class:
Explosive Damage Modifier:
Fire Control:
Stabilization:

Cargo Capacity:
Environmental:
Electronic Warfare:
Ammunition:

Maintenance Points:

System: *Short ( )* *Medium ( )* *Long ( )* *Extreme ( )* *Notes*

*GDW grants permission to owners of **Striker II** to photocopy these vehicle cards for their personal use.*

Quick Reference Chart

Sequence of Play

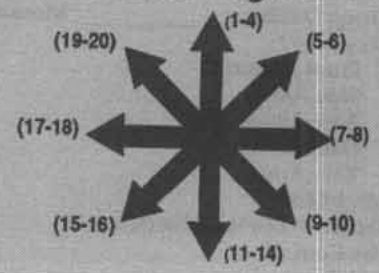
Command Phase
Movement Phase
Fire Phase
- Opportunity Fire sub-phase
- General Fire sub-phase
- Final Fire sub-phase

Morale Phase
Melee Phase

Orbital Range Bombardment

Altitude	*Range for Accuracy*
0-10 cm	Short
11-50 cm	Medium
51-100 cm	Long
101+ cm	Extreme

Scatter Diagram



Terrain Effects

Terrain Type	*Personnel*	*Wheeled Vehicle*	*Tracked Vehicle*	*Air Cushion Vehicle*
Broken	×2	P	×4	×2
Cliff	P	P	P	P
Contour line	—	–10 cm†	–5 cm†	–20 cm†
Creek/ford (cross)	×2	×2*	×2	—
Dense vegetation (Jungle)	×2	P	P	P
Light vegetation (open woods)	—	—	—	×2
Moderate vegetation (woods)	—	×4	×2	P
Railway embankment (cross)	—	P	–10 cm†	-20 cm†
Rubble	×2	P	P	×4
Sand	—	×2	—	—
Sand dune	×2	×4	×2	—
Settlement	×2	×2	×2	×4
Steep slopes	×2	P	P	P
Swamp/marsh	×2	P	P	—

*Only at fords.
†Per line crossed.
P: Prohibited.
—: Normal movement.
This chart does not include terrain types discussed in the Advanced Rules.

Cover Saving Throw Numbers

Cover	*Save Number*
Wood building	1
Entrenchment, stone or masonry structure	2
Reinforced concrete structure	3
Crew or passengers in open armored vehicle	3

Cover Explosive Power Modifier

Terrain	*Modifier*
Wooden building	–4
Entrenchment	–6
Entrenchment with overhead cover	–8
Stone or cement building	–8
Pillbox	–10

Counter Summary


Cautious advance


Rapid advance



Disengage



No order



Rally



Take command


Travel



Regroup

Spotting Difficulty Modifiers

Spotting Stand is	*Diff Mod*
Recon	–1
Elite	–2
Veteran	–1
Green	+1
Moving	+1
Enclosed vehicle spotting to front	+1*
Enclosed vehicle spotting to flank	+2*

Target Stand is	*Modifier*
Moving	–1
Firing	–1
Stationary under cover	+1
Personnel	+1

*Modifiers apply only when conducting naked eye spots; they do not apply when using any sort of electronic sensor or vision enhancement equipment.

Quick Reference Chart

Morale Modifiers

Condition	Modifier
Each stand/vehicle in the group hit this turn*	–1
Each stand/vehicle in group eliminated/ destroyed this turn	–2
Stand is pinned	–2
Each friendly group within sight eliminated this turn	–2
Any enemy stand/armed vehicle within 25 cm	–3
Unit is operating under a travel order	–4
Any permanent morale modifiers	–1, –2, –3 or –4
Stand is under cover	+4

*If the stand is hit more than once in the same turn, the modifier remains –1, regardless of the total number of hits taken by the stand.

Morale Effects

Roll	Effect
+1, 2, 3	Pin
+4, 5, 6	Forced back
+7, 8, 9	Demoralized
+10	Eliminated

Vehicle Penetration

Pen	Effect
+1, 2, 3	1 hit
+4, 5, 6	2 hits
+7	Destroyed

Wind (roll twice per turn)

Roll	Direction	Intensity
1-2	No change	Light unchanged, moderate becomes light, high becomes moderate
3-16	No change	No change
17-18	Shift 1 clockwise	No change
19-20	Shift 1 counterclockwise	Light becomes moderate, moderate becomes high, high is unchanged

Miring

Vehicle Type	Miring Roll Medium Mud	Miring Roll Heavy Mud
Wheeled vehicle on dirt road	—	2
Wheeled vehicle off road	4	8
Tracked vehicle off road	2	4

Meteoric Assault Drop Height

Type	Height
Elite	15 cm
Veteran	30 cm
Experienced	60 cm
Novice	120 cm

Orders Summary

Order	Opportunity	General	Final
No order	Yes	—	—
Take command	Yes	—	—
Cautious advance	—	Yes	—
Rapid advance	—	—	Yes
Disengage	—	—	Yes
Travel	—	—	—
Rally	—	—	—
Regroup	—	—	—

Melee Modifiers

Stand Type	Modifier
Single-figure stand	–5
Heavy weapon crew stand	–5
Cavalry stand	+5
Each additional stand	+5
Melee only*	+2
Carrying shield	+2
Melee armored**	+save number
Regular armored	+twice save number
Higher morale	+difference

*Melee-only troops are those which are without firearms and are equipped exclusively for melees, such as low-tech armored knights or primitive spearmen.

**Melee armored troops are those wearing armor useful against melee weapons but not useful against firearms. Melee weapon armor value is shown on the unit card in parentheses and does not provide a saving throw versus small arms.

Fortification Fire Modifiers

Type	Direct Fire Save No.	Explosive Modifier
Entrenchment	2	–6
Weapons pit	2	–6
Bunker	2	–8
Pillbox	3	–10

Submunition Fire Modifiers

Target is:	Modifier
Armored vehicle*	–12/–8

Terrain is:	Modifier
Light vegetation**	–6
Moderate vegetation**	–10
Dense vegetation**	NE (–16)
Entrenchment	–12
Weapons pit	–8
Building	–14
Bunker, pillbox	NE (–16)
Open water	NE (–16)

*Only counts as armored if it has top armor of 2 or more. Lower modifier is used versus DP submunitions.

**Vegetation must include some overhead canopy of branches and leaves to provide modifiers.

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HIGH SPEED COMBAT

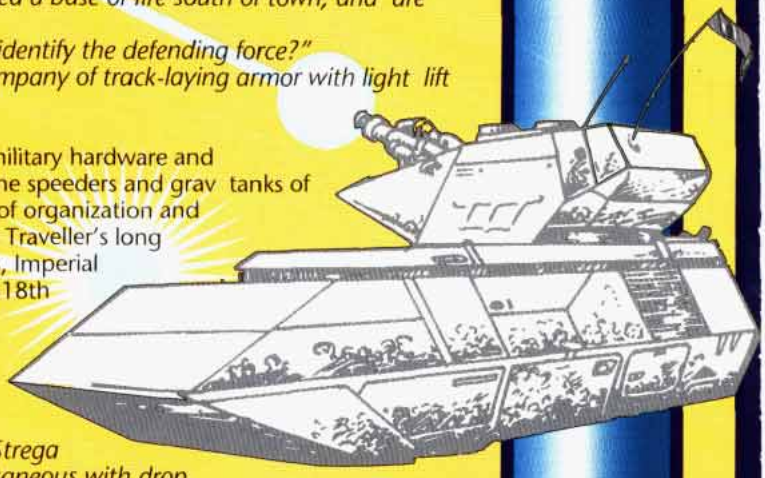
"Six, Go."
"Objective in sight. Gun sleds in overwatch, taxis going in."
"Roger. Get the boys out of the taxis and back in fast; we can't spend too much time in this one-horse burg."

Striker II is the miniatures combat rules of 58th century warfare, for use with **Traveller: The New Era**. Now the epic planetary engagements of the New Era, the Final War, or the Frontier Wars are under your control, allowing you to command battalions of lift infantry, drop troops, and grav armor. These rules are fully compatible with **Traveller**, and so also allow miniatures resolution of roleplaying adventures.

"Dagger Six, am receiving heavy direct fire from terrain east of objective, one taxi is down and one damaged. Sleds are setting up perimeter for crew recovery, request additional direct fire support, over."
"Roger, One-six, am releasing TD platoon to your control, ETA at high-speed transit is 90."
"90, roger. We can hold on for a minute and a half."

Combat in the 58th century is fast-moving, and so is **Striker II**. Based on the award-winning **Command Decision** miniatures rules, Striker II allows rapid play which replicates the rapid tempo and quick reactions of advanced technology warfare. These straight-forward rules allow players to concentrate on the mental dilemmas of tactics and command, not the interpretation of complicated rules mechanics.

"This is Dagger One-six. Situation is stabilized. We have established a base of fire south of town, and are sending dismounts to secure the town center."
"Dagger Two-six reports resistance in his sector as well. Can you identify the defending force?"
"Roger, I estimate a dismounted rifle battalion supported by a company of track-laying armor with light lift recon."



Striker II is more than just rules, it is also an extensive resource of military hardware and organizations—from the jeeps and tracked vehicles of Wilds units to the speeders and grav tanks of a Reformation Coalition Marine Brigade. Striker II also includes tables of organization and equipment listings for some of the most important military units from Traveller's long history: Zhodani Lift Infantry Battalions and Commando Groupments, Imperial Marine Task Forces, Imperial Guard Regiments, and the legendary 4518th Lift Infantry Regiment—"The Duke of Regina's Own Huscarles."

"Dagger One-six to Dagger Six. Objective is neutralized, infantry is reembarking, casualties minimal. Will be ready to redeploy in 300."
"Roger. Good work, One-six. Orbital bombardment of Objective Strega begins in 240, duration 600. Lifting of bombardment will be simultaneous with drop troop insertion. You will be blocking avenues of approach to North and East of Strega, am sending coordinates now."

Striker II provides the full science fiction combat experience with rules on orbital bombardment, drop troops, antimissile fire control, planetary environment, and orbital superiority. Campaign rules allow a sophisticated strategic gaming experience by adding the effects of combat engineers, maintenance, and quality of food and medical care.

"Dagger Six from One-six, lead elements lifting now. Will be on blocking positions in 180."
"Roger. On my order, prepare to execute ConPlan Brooke from blocking positions."
"Will do, Six, we're on our way."
"Godspeed, One-six. Dagger Six out."

STRIKER II™

COMMAND THE BATTLEFIELD OF THE FUTURE

GDW: 0313 $20.00

0 86079 00313 5

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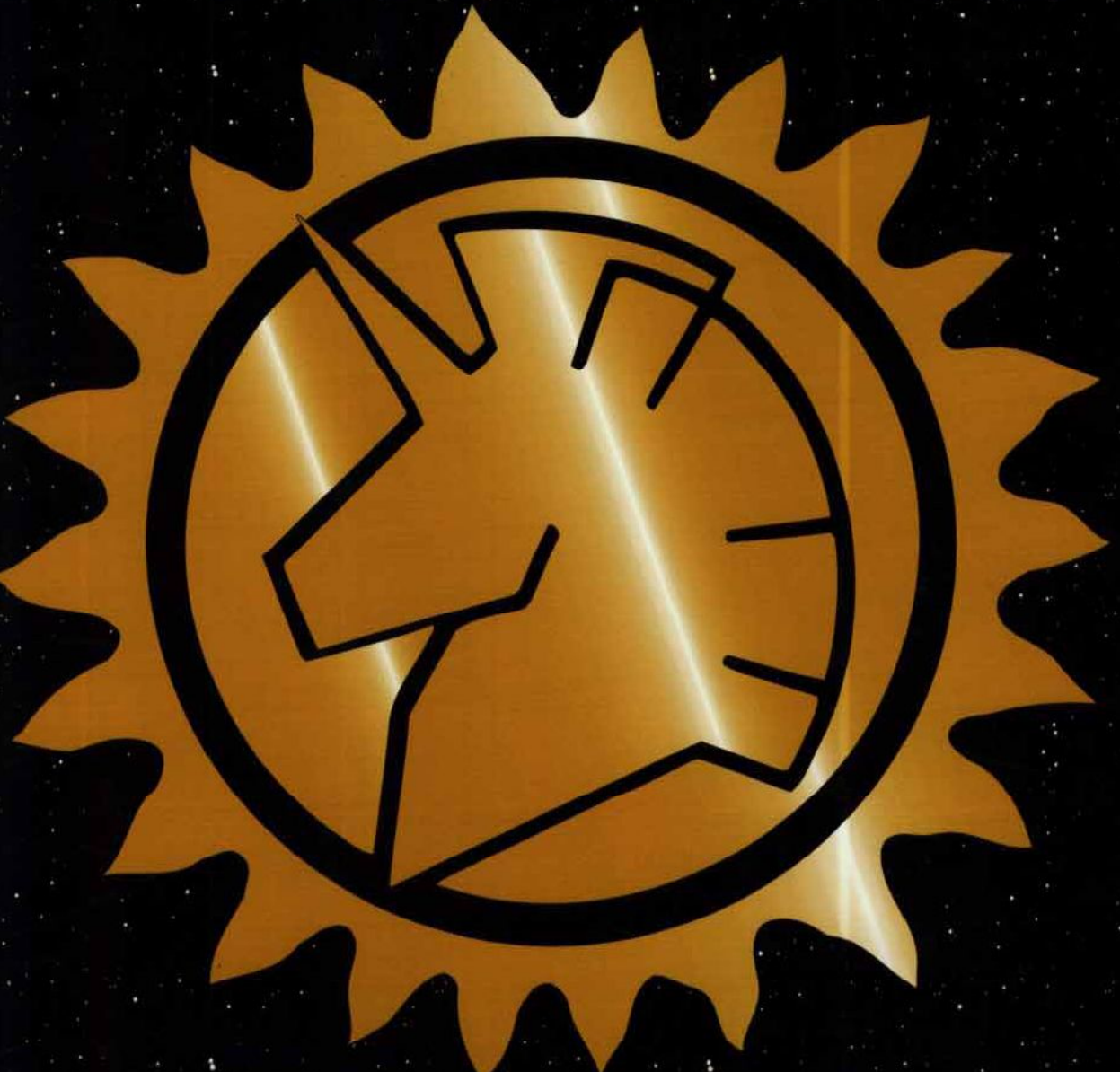
Science Fiction Roleplaying Game

TRAVELLER®

The New Era

0314

THE REGENCY SOURCEBOOK:™



KEEPERS OF THE FLAME

GDW

1 Regency Manual

Science Fiction Roleplaying Game

TRAVELLER The New Era

The Regency Sourcebook:™ Keepers of the Flame

For my wife, Devon, because that's the way it should be, and for

Mickey Mantle, who embedded in me at an early age lessons about understanding, believing, and the difficulty of being, in ways that I have only recently been reminded (but you died before I could give this to you—even second chances are fleeting precious...), and for

Joseph J. Kruzel, Professor, Pragmatist, Peacemaker, and Patriot. May your example and panache continue to inspire those who will miss you.

And finally, to The Girls, for reasons that you taught me to understand.

Thanks to the members of the AWWC, because it's time for people to admit once and for all that it is fiction which imitates reality and not the other way around, for that is the only way that fiction attains any dignity, value or relevance. All is biography, yours and mine.

Soli Deo Gloria.

Design: "B." Dave Nilsen
Baseline Sector Data Upgraded By: Mike Mikesh, Mark "Geo" Gelinas, Clay Bush, Leroy Guatney, Dave Johnson
Starship Design Assistance: Mark "Geo" Gelinas
This book draws on an extensive corpus of material created for previous editions of the Traveller system. Any list I make will unavoidably be incomplete, and I offer my apologies to anyone whom I have inadvertently excluded. Thanks is therefore extended to the following persons I can identify as having made a probable contribution to material presented in the Regency Sourcebook: Marc Miller (*Duh!*), Jay Adan, Philip Athans, Anders Blixt, Tim Brown, Clay Bush, Rob Caswell, Frank Chadwick, William W. Connors, Lyle Dundek, Ed Edwards, Joe Fugate, Thom Gressman, John Harshman, James Holden, Mike Jackson, Charles P. Kalina, J. Andrew Keith, William H. Keith, Jr., James Maliszewski, John Marshal, John Meyers, Mike Mikesh, Roger Moore, Nancy Parker, Robert Parker, Chris Purcell, Chad Russell, Lawrence Schick, Greg Videll, Loren Wiseman, Deb Zeigler
If You Like This Book: Blame God
If You Don't Like This Book: Blame God for creating Dave
Credits are Still For: People like me to entertain themselves and hopefully some small number of other comparably demented people.
One Full Week: "What is the amount of time it takes, doing nothing else, to simply format, never mind update or proof, the Regency's UWP data, Alex."
Did You Know: Alex Trebek writes all the questions for Jeopardy all by himself? That's why he's always so pissy and condescending when people miss them. It's true!
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Believe. Always Believe.

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Introduction

The Regency Sourcebook is the first step of **Traveller: The New Era**'s return to **Traveller**'s birthplace, the venerable Spinward Marches. Like the rest of the campaign background, the Marches underwent an updating and expansion of scope with each new edition of **Traveller**. Original **Traveller**'s Spinward Marches grew to become **MegaTraveller**'s Domain of Deneb, and in **TNE** the Domain is no longer one small part of a larger Imperium, but is the sole repository of that society's hopes and dreams. And now that the Regency is poised to remake interstellar space in its own image, it functions as a microcosm, like DNA tightly coiled in a zygote, of the new Imperium that it will conceive.

When you consider that the Spinward Marches were the primary focus of **Traveller** support for 10 years, it becomes apparent that the amount, complexity and subtlety of its detail is staggering, much more than could fit into a 96-page book. (I could have made it a 400-page book so it could cover everything, but then you'd have to wait another couple of years to read it.) **RSB**, therefore, only scratches the surface of this rich, full-bodied concoction, which is all the more enjoyable because it has been aged and blended for as long as 18 years (sudden desires to quaff a scotch are forgiven). And when you realize the purpose for which the Spinward Marches sector (which itself is only one of the four sectors making up the Regency) was created, its detail becomes even more impressive.

For what are the Marches, after all, if not a mini-Imperium? In 1979 one single sector was designed to have the same multi-faceted environment that the Imperium as a whole was later developed to display. The Third Imperium was a macrocosm of the Spinward Marches, with its K'kree, Hivers and Solomani playing the same role on a larger scale as the Zhodani, Darrians, Sword Worlders, etc., played on the smaller stage of the Marches. The great historical events of the Imperium were only the five Frontier Wars writ large, and the socio-cultural details of the Third Imperium were simply the more defined rendering of the same multi-cultural influences that we had already come to know "behind the claw."

So it was inevitable that **TNE** would return to the Marches, the birthplace and laboratory in which all the concepts of the later, larger **Traveller** incarnations first saw light.

Due to the nature of this task and the shortness of 96 pages, a large amount (what Frank likes to call "great, steaming heaps") of material is left that could not be fit into this book, so without further ado, I present:

Future Developments

The release of this book constitutes GDW's commitment to support the Regency as a fully developed campaign background for use with **Traveller: The New Era**. This does *not* signify the abandonment of the Reformation Coalition campaign. Both the Regency and Reformation Coalition will continue to be supported and developed as official **TNE** campaign backgrounds, because as you have probably guessed, they are going to meet each other some day.

Regency support will be provided via further sourcebooks, Epic adventure campaigns and articles on the following topics:

- Further social/political/historical background on the Regency and other Spinward States.
- In-depth examinations of the other Spinward States and alien races, to include character generation, their own histories, attitudes, approaches to the use of technology, etc.
- Collections of Regency-centered equipment, weapons, vehicles and starships, primarily at the TL15 and -16 level, as well as lower-tech variants used by other Spinward States.
- **Challenge** magazine, which will feature the good old "Traveller News Service" in each issue, plus Regency coverage in the form of adventures and articles covering the areas listed above.

Cross-References

Unlike any previous **TNE** products, **RSB** will make the occasional reference to pre-**TNE Traveller** products. This is again because of the sheer depth and breadth of the existing Spinward Marches background which **RSB** can only lightly touch upon. Using standard GDW style, GDW-published products will be noted **in bold face**, and official material published by non-GDW sources will be noted *in italics*. GDW has no responsibility for the availability of non-GDW material, and there exist no stocks of the Digest Group **MegaTraveller** products outside the hands of collectors and out-of-print specialty shops. However, a number of old original **Traveller** and **MegaTraveller** products remain in the GDW warehouse and can be purchased direct from GDW. A list of these and their prices can be obtained by writing or calling GDW. When I make reference to GDW products, I will parenthetically note whether they are out of print and gone forever (OP) or still available via GDW (SA) *at the time of this printing* (some of these products remain in very small quantities, say two or three). Note: **JTAS** (1-24) indicates GDW's **Journal of the Travellers' Aid Society, Ch** (25-77+) indicates GDW's **Challenge** magazine, *TD* (1-21) indicates DGP's ***Travellers'*** *Digest*, and *MTJ* (1-4) indicates DGP's ***MegaTraveller*** *Journal*.

Library Data

RSB includes a very broad library data section. This is the first installment of what will hopefully someday be a comprehensive collection of jargon, concepts, terminology and ideas common to the entire **TNE** universe, and not exclusive to the Regency campaign. Many of these concepts will be visited in more detail in future products.

Conclusion and Statement of Culpability

This was a difficult book to assemble. I had originally hoped for more space to devote to sheer prose, i.e., the descriptive text that fills up pages 5 to 34 of this book. But the more I spoke with **Traveller** players, the more I found that they wanted the entire Regency *now*, not just one or two sectors with more to follow. Because this meant half the book would be given over to dry UWP data, I struggled before deciding on that path. I also considered more efficient (i.e., compact) presentations of the UWPs, like using a single sector map accompanied by a single list of its worlds, unsorted by subsector. However, *efficiency* is not the same as *effectiveness*, and I believe the old one-subsector-per-page format is the most useful format for referees and players alike. So although I compensated for the dryness of 40 continuous pages of subsector UWPs by pruning the repetitive format and packing the pages with world information, the big hurdle was to simply "bite my lip and close my eyes" and get on with it.

Remembering that **Supplement 3, The Spinward Marches** (OP) predated the conclusion of **Library Data (N-Z) in Supplement 11** (OP) by three years, I reasoned that the full panorama of the 45 subsectors of the Regency and its frontiers exist as little numerological ends in themselves, and that I could add deep layers of description, updating and whiny temporizing to their foundation in future products. Besides, if I didn't put them all in I would be apologizing for it to **Traveller** fans for at *least* three years.

Because I had to navigate as through Scylla and Charybdis among the vast amount of established historical, astrographic and political-cultural "facts" of the Spinward Marches/Domain of Deneb, I could not simply work rapidly and with a clean slate and write about a new era of worlds and their inhabitants. This fact made this book more time-consuming and more frustrating, but also more potentially rewarding. These rewards will not all be immediately evident, but will emerge as continued Regency source material bubbles forth.

Any violence I may have done to pre-**TNE** "facts" is my fault alone. (But I'll bet I know more about inconsistencies within original **Traveller** and **MegaTraveller** than anyone *left* alive, and only I know where the bodies are buried.) Please note the thanks in the credits to those who made the Spinward Marches, Domain of Deneb and now the Regency what they have become. It goes without saying that without them, well, you know, it goes without saying.

Keep the Flame.

Keep the Flame

KEEP THE FLAME

My brothers and sisters of the Regency, sons and daughters of the Imperium,

These are the last words I will speak to you.

Please do not mourn me, but be filled with joy in knowing that my greatest joy has been to be your servant. You need not miss me, for it is I who will miss you, and you will still have each other.

We will meet again, of that I have a certainty that goes beyond mere fragile facts,

And in that meeting we will understand all that has brought us here.

You are alone, a solitary outpost of light in an ocean of wild darkness.

But yours is not the loneliness of fear and isolation, darkness and extinction.

It is the elevation of the undying Flame which rises above fog, cloud and rain,

Of beacons which call to the great ships and keep the beaches shipwreck free,

Of the light across the bay which guides the seafarer home.

You carry a heavy responsibility in your solitude, for if you let the Flame go out,

Who else will shoulder the burden?

Who else will make the sacrifice of love for this great creation we call humanity?

So my words to you are,

"Keep the Flame."

For those who came before us and passed it on to us,

For those who live with us today who need to stand in its glow,

For those who come after us,

Keep the Flame.

For the simple knowledge that the Flame is the greatest thing that we will ever know, and is more important than we are,

Keep the Flame.

The Flame is you and me and everyone we have ever known.

The Flame is those who came before us down the long millennia and left for us what they learned.

The Flame is the promise of those who will come after us and profit or suffer by what we have done.

The Flame is truth,

The Flame is honor.

The Flame is duty.

The Flame is selfless service to others.

The Flame is mothers and fathers, husbands, wives and children, teachers and students.

The Flame is relationships.

The Flame is Love:

Our love for each other, our past, and our future is the tiny spark of the Flame that lives in all of us.

The Flame is death, and the knowledge that there is something greater that waits for us on the other side of death.

The Flame is courage, faith and commitment, even though we will die.

The Flame is the pyre on which all fear dies and is consumed for all eternity.

The Flame is within us as we are within the Flame.

The Flame is not a burden to be lifted lightly.

The Flame can burn and hurt and frighten,

Because it is nothing but the pure immanent force that drives this universe,

Beautiful and terrible to behold.

But although the Flame can kill you,

If you do not have the Flame you are dead already, and none can save you.

The Flame does not belong to you,

It is not yours to change or modify.

You are the vessel, the conduit, the custodian of the Flame.

The Flame will change you, purify you, burn away what is unworthy in you,

Leaving only the best in you, what is eternal, stainless and unbending.

And once it has exposed those things, it will burnish them until you gleam in the light of that Flame,

A beacon, a guide in the dark night of the soul for all who need it.

And if you die keeping this Flame you will never die.

You will live on, forever, in the hearts of all who have seen you.

For those who have never seen it,

Keep the Flame.

For those who would never see it were it not for us,

For those who have seen it but do not believe,

For those who have seen only fraudulent imitations which led them to scorn it,

For the countless souls who were defeated by their dreams,

And for those who do not yet know how to dream,

I charge you now and to your death:

Keep the Flame.

When it is dark,

Keep the Flame.

When you are weak,

Keep the Flame.

When you are afraid,

Keep the Flame.

No matter how much it hurts,

Keep the Flame.

With your last gram of strength,

Keep the Flame.

When those around you scorn you,

Keep the Flame.

Although it may kill you,

Keep the Flame.

Even if you are the only one,

Especially if you are the only one,

Keep the Flame.

Because you are not the only one—you will never be the only one,

But the Flame that you hold will shine out to those others who also thought they were alone,

And encourage them to hold theirs stronger and higher,

And together you will save those whose Flames have gone out.

Because we belong to each other, you and I,

Keep the Flame.

For I belong to you, and you belong to me,

United in keeping the Flame that gives us life and hope and purpose.

And although I am leaving you,

I swear to you that wherever I go,

To help light our way, my only cause, my only joy, will be to

Keep the Flame, now and forever.

The Last Address of
Norris Aella Aledon (1063-1157)
The First Regent

The Regency in 1202

THE REGENCY

The Regency is a society in flux, challenged by its difficult surroundings and beset by the contradictions between its past and its chosen future. Regency citizens have a clear belief of their role in the universe: They are the guardians of the Imperial values and are also the best hope of the universe to again have a viable multi-species interstellar culture. Less clear is their understanding of specifically how they will bring these gifts back to the universe. The unspoken assumption seems to be that the universe will welcome them back as liberators from the darkness. The possibility that the Regency might have to fight wars for the hearts and minds and real estate of those they would liberate has not been rigorously examined.

Keepers of the Flame

On the one hand the average Regency citizens (who still call themselves "Imperials") believe that the Regency is the steward of the Imperial values that will someday be spread again among the Wilds of the ruined Third Imperium. They continue to observe Imperial holidays and commemorate Imperial history. As the only survivors of this once-great polity, it is natural for them to feel this way; they share an understandable "survivors' guilt" which drives them to try to justify and redeem the deaths of their Imperial brethren. But since it was the Imperium on its own which consumed and destroyed itself, how rational is this veneration of all things Imperial? Is it just a harmless conceit, or is it a deep cleavage plane which under stress will eventually split, scattering all the accomplishments of the past 70 years?

Survival has been paramount for the Regency during the "Dream Time," so certain contradictions are inescapable. In fact, the Regency has not been marked by the kind of cynical "necessities" that are typical of hard-pressed societies, such as martial law, committees of "public safety" and the like. This in itself is remarkable.

Tenders of the Refiner's Fire

On the other hand, the Regency is committed to sweeping changes, broad in scope, deep in political and social effect, and quite un-Imperial in nature. Regency citizens proudly proclaim their status as true Imperials, and continue on to profess their commitment to the phasing out of the nobility with democratic and land reforms. The fact that this dichotomy is not often publicly articulated comes in part from an unwillingness to face up to real difficulties of overhauling a structure of feudal privilege, power and insularity.

Another source of this schizophrenia is the style of leadership used by the Regency's most influential leader, Norris Aledon, the first regent. While exhorting his citizens to modify their culture in areas of democratic reform, group consciousness rather than local consciousness, acceptance of psionics, and the accommodation of unassimilable political groupings within the Regency boundaries, he always used the inducement that these were the best ways to preserve and propagate the Imperial values that his listeners held in common. The fact that these new principles were perhaps not Imperial values after all was infrequently noticed, and discussed even less. If one uses non-Imperial values to perpetuate the Imperium, at what point does it cease to remain the same Imperium? When powerful nobles, formerly the backbone of Imperial leadership, are ejected from office and removed from their ancestral lands in local referenda, how exactly does one perpetuate the Imperial traditions?

Those who do think about the Regency's contradictions speak in terms of "the refiner's fire," in which the challenges and tragedies surrounding the Regency will relentlessly burn away the dross of unworthy institutions and leave only the pure, tempered metal of timeless values. Contradictory paths will be adjudicated by this ongoing process, and only those worthy of survival will remain.

What is the Flame?

Although Norris and other Regency leaders spoke, and still speak, of "the Flame" that is kept burning by the Regency, the exact composition of this flame has been left open. This is certainly part of the reason for the appeal of the image, as each person can customize the concept to best meet his, her or its belief structure. However, the following characteristics are commonly accepted as central values of the Flame.

Courage: The ability to stand alone in the face of adversity and to hold fast to transcendent values even when surrounded by those who would tear them down.

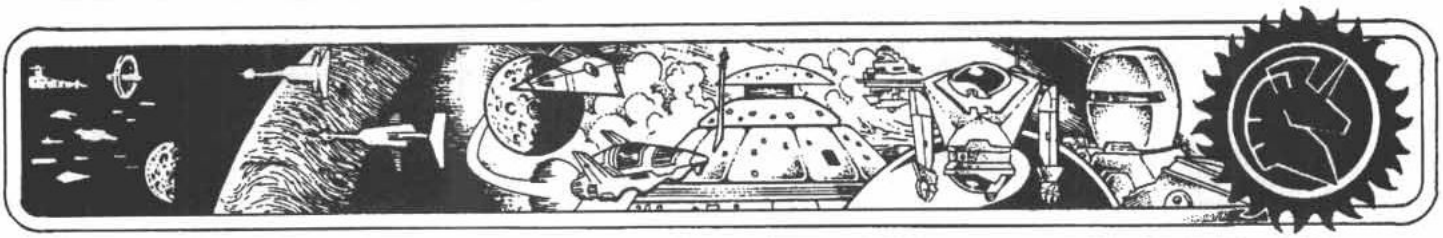
Stewardship: An appreciation of the physical assets (worlds, starships, high-tech industry), intellectual assets (literacy, education, technological and scientific training), social assets (adaptive political institutions, culture, art, literature, common history) and spiritual assets (traditions of service, loyalty, duty, justice and the well-being of one's fellow citizens) that have been saved and nurtured by the Regency, and a sober awareness of their fragility. Stewardship is manifested by the willingness to protect these assets, the understanding that these assets belong not to the Regency, but to the universe at large, and the commitment to someday assist in the dissemination of these assets back into the universe which has need for them.

Selfless Service: Another aspect of courage and stewardship is the belief that individuals achieve their greatest value when they combine their efforts with others to create something larger than they are, which will live long after they as individuals have disappeared. No person, nation, or world is an island; all of the Spinward States would have died had they not all cooperated with and trusted each other.

Inclusiveness: Despite the rhetoric of other major interstellar powers, Imperials can justly say that theirs was a remarkably integrated multi-racial society. Although no society is free of prejudice and expressions of groupism, the Imperium contained very few racial barriers to the achievement of its nonhuman members (although certain *behavioral* barriers, such as anti-psionic prejudice, ended up functioning as pseudo-racial barriers). Examples of Imperial inclusiveness included the appointment of the Vargr Brzk as archduke of the Antares Domain and the actual *changing* of the Imperial Sunburst insignia in 247 to make it visible to a newly joined minor race. The preponderance of human culture and leadership was a by-product of the tremendous numerical advantage of Imperial humans. Even the much-celebrated competition between humans of Vilani and Solomani descent was observed more in the breach than in practice. For its last 500 years, the bloodlines of Imperial leadership were so completely mixed between Vilani, Solomani and Sylean lineage that racial distinctions were nonsensical.

The Regency is heir to this tradition. In addition to its well-known Aslan and Vargr inhabitants, the Regency contains small communities of Droyne, Chirpers, Hivers and even K'kree (see page 50), plus numerous minor and geneered human races. All these are fully able to participate in government and to serve in governmental agencies. However, it is clear that the Imperium was, and the Regency remains, a predominantly human institution. On a simply descriptive level that simply means that the greatest percentage of Imperial subjects were human, and that they naturally and not unreasonably created institutions based on human traditions and assumptions.

On an idealistic level, the concept of the Imperium and Regency being human means that they incorporate human or humane values, the most important of which are respect for the individual and his, her, or its right to a meaninful and fulfilling existence.





Symbol of the Regency

The Regency insignia was originally proclaimed by Norris as the symbol of the Domain of Deneb on 280-1128 by superimposing Norris' unicorn device on the Imperial Sunburst, symbol of the Third Imperium. The unicorn, representing the "Bridled Steed" constellation which spans the Cronor and Jewell subsectors (A and B/Spinward Marches), has long been the heraldic device of Norris' family and thereby became the symbol of the Spinward Marches and Domain of Deneb.

Since the proclamation of the Regency in 1132, the sunburst portion of the insignia has been taken by tradition to symbolize "the Flame," rather the Third Imperium. The placement of the Domain's unicorn symbol within this flame captures the concept of "the refiner's fire."

STRUCTURE OF THE REGENCY

For most purposes, the establishment of the Regency was simply the renaming of the Domain of Deneb, a step which was accomplished in 1132 by Archduke Norris. Its structure is based on that of the Imperium and naturally retains many of the same institutions and processes.

The major departure from the Imperial structure began in 1152 when Norris announced the Representational Reforms. These reforms were instituted to eventually replace government based on the nobility with government based on popular elections. Because of the tremendous implications of these reforms, they were intended to be undertaken in a gradual manner, and many of the attendant changes are still only being instituted 50 years later. In fact, the current form of Regency government with its parallel networks of noble and popular government is viewed as still only a transitional form rather than the desired endstate.

Levels of Government

There are four basic levels of government in the Regency: local, planetary, subsector and Regency.

Local government actually covers many potential sublevels of government by which people rule themselves close to home. These can include government at the level of town, city, district, shire, county, parish, borough and a profusion of other local terms, all of which are nested one within the other below the planetary level.

The planetary level is largely self-explanatory, except that it might more accurately be described as "star system" level rather than planetary level. Many star systems contain more than one inhabited world, but Imperial tradition has long stipulated that each star system has one primary world, to which the others are all subordinated in some fashion, as colonies, raw materials resources, bases, etc. Thus, the planetary level integrates these other worlds in much the same fashion as multiple nations on a balkanized world are handled.

The subsector level is the same as the old Imperial system, except that the Regency has folded certain sparsely populated subsectors, such as those along the frontier or Great Rift, into a single group which is treated as a subsector although its astrographic area is larger.

The Regency level is the highest level of government, and corresponds to the former Domain of Deneb government in area of extent as well as to the former Imperial government in terms of absolute accountability. A great many governmental functions are reserved to the Regency level, such as foreign policy and the armed forces. While these areas can exert their function at the local level, they are not controlled by the local level of government. Rather, they are controlled by local authority via their own internal chain of command which extends down from the Regency level.

One level of former Imperial government that is missing is the sector level. Because the Regency only comprises major portions of two sectors and small bits of two more, this level would have been duplicative, and the Regency level has taken over the tasks formerly association with sector-level government. However, sector remnants of the noble hierarchy persist in their unempowered advisory role.

Parallel Governments

One of the explicit results of the Representational Reforms is the establishment of two hierarchies of government at the local, planetary and subsector level, and at the interface with the Regency level. There is of course only one administrative and bureaucratic hierarchy at the Regency level, and all these hierarchies terminate in the single person of the regent.

It is the conduits that run up and down between the citizens and the Regency that are duplicated. Each subsector, each world and each of a world's local political divisions are represented by nobles, in the feudal tradition of the Imperium, and also by popularly determined representatives.

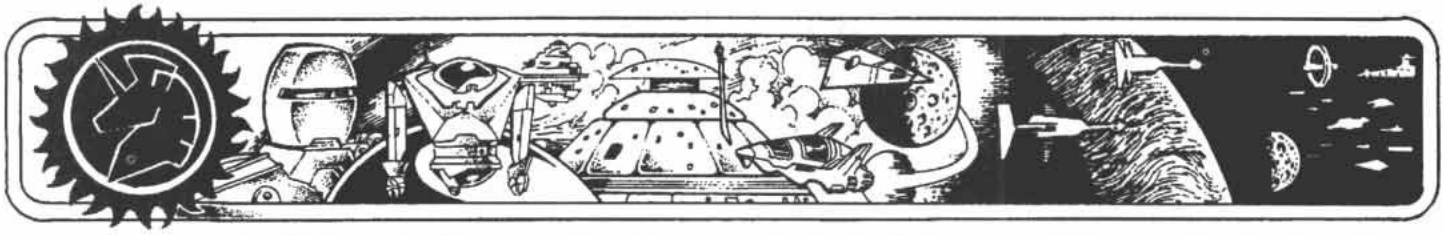
Popular Hierarchy: The popular hierarchy is the "true" form of Regency government, in that it is invested with the actual ruling powers that used to belong to the nobility. This also means that the administrative bureaucracies that used to answer to planetary and subsector nobles have been transferred to the control of the popular hierarchy and are now answerable to planetary and subsector governors.

The Representational Reforms require that each world and each subsector have a single executive officer, in both cases titled the "governor." The governor is the key conduit of power both upward and downward: The governor passes legitimacy up from his or her constituents to the Regency government, and passes the Regency's laws, programs and fiscal requirements downward from the Regency government to the citizens. Sector and plan-

"Popularly Determined"

The concept of "popularly determined" representatives, mandated by the Representational Reforms, actually covers a wide variety of procedures, not all of which are literally "popular." While many worlds do practice regular popular elections to determine their leaders and representatives, other worlds do not. Some do choose leaders by popular election, but these leaders are dictators who serve for life, effectively elected nobles. Other worlds periodically elect a single leader, who then appoints all the other members of the local government, as well as its representatives to higher levels of government. Other worlds choose their leaders by lot, or some other random means, or only elect individuals from a small, self-selecting group. Some worlds have planetary representatives who are elected by high officials who were not themselves popularly chosen, or who are members of a secret "star chamber." These systems all grow out of local custom, traditions and assumptions.

Although not all these systems live up to the classic image of home rule, democratic election and elective representation, they do meet the primary implicit requirement of the reforms, which is that they are locally rather than externally imposed, and do represent something of the true character of the individual citizen, the most basic level of Regency society.



etary governors are also able to use local Regency military forces under certain circumstances.

A second requirement of the reforms is that each world send a number of representatives to the Regency Senate, the Regency's primary legislative body. Each world sends a number of senators equal to its UWP population code, which means that a world's senators may range from 0 to 10. This logarithmic scale was the answer to the conflicting needs of greater representation for high population worlds and the requirement of a reasonable voice for all worlds, no matter how small their populations. For example, when comparing a world with a population of 100,000 (code 5) to a world with a population of 900,000,000 (code 8), the smaller world would only be out-represented 8 senators to 5, while the larger world actually has 9000 times the population of the smaller.

The Senate makes the Regency's fiscal decisions, and is also its deliberative and legislative body.

The term of office in the Senate is three years, although in practice a sitting senator's term does not end until his or her replacement arrives. Given the wide variety of travel times from homeworlds to the Regency capital at Mora, senators are replaced on a more or less continuous basis.

Noble Hierarchy: Also called "the old government," the noble hierarchy extends down to the lowest of the peerage, the barons, at the local level, all the way up through the planetary and subsector level to the Regency Moot at the highest level. Because the popular hierarchy holds the real governmental power, nobles exercise influence rather than actual power, but because of their history, personal stature, and abilities, this influence is no small matter. They exercise their influence primarily in the moots—the unofficial planetary moots, and the official subsector moots and the Regency Moot. Here they can discuss current needs and initiatives, and can bring their power to bear in support of Regency legislation which is officially sent down through the popular hierarchy.

The noble hierarchy was established to serve three main purposes. The first is the continuation of the Imperial peerage, important for historical and cultural reasons: The laudable and emulatable accomplishments of past nobles are more tangible and serve as better modern role models if their lines are perpetuated in their ancient ceremony and grandeur.

The second is their function in a statesmanlike advisory role to back up the popular hierarchy—an "impartial" check on the progress of popularly elected government. Because nobles do not worry about the need to be continually re-elected, they are thought to be able to take the long view on important or unpopular issues that elected officials may be tempted to ignore. They also function as a back-channel means of appeal or communication. For example, a minority group which believes it is being abused and ignored by majority-elected leaders may take its grievances to the noble, who will represent these concerns at higher levels, usually by presenting them at the subsector or Regency Moot. Issues presented at the subsector level will become known to the subsector governor who can act upon them, and issues presented at the Regency Moot can be acted upon by the Regency Moot or Senate, as appropriate.

The third purpose is both cynical and crucial: it gives the nobles something to do. The sudden and radical disenfranchisement of a powerful ruling class is a recipe for disaster. By giving the nobility a role to grow into, Norris hoped to gain their cooperation in the Reforms.

Administration

As in the Imperium, the Regency government exercises authority over various subject areas via governmental ministries. All ministries are headed by high regents, which are appointed positions. These appointments are made by the office of the regent and must be confirmed by the Regency Senate and Moot. Ministries have mandated subject area responsibilities that are defined by the regent and Regency Senate.

For example, the XWeb (see page 21) is jointly overseen by the Communications Ministry and the Scout Ministry. The Communications Ministry sets and monitors standards of information dissemination throughout the Regency, while the Scout Service is responsible for operating the Xboats and their support structure. Thus funding for the XWeb comes from the Scout Ministry's budget, but it must meet the standards set by the Communications Ministry.

Taxation

All planets are responsible for their own internal taxation, within certain broad guidelines established by the Regency.

The Regency does not directly tax any of its citizens. Instead, it taxes *worlds* (which are then responsible for raising these taxes from their citizens) and *activities*.

Taxation of worlds is usually based on an equitable assessment of a world's ability to produce revenue (based on population, technology, manufacturing capacity, etc.), but this can be revised up or down for a variety of reasons. For example, a world which has suffered a natural disaster can have its tax burden reduced, while a world which has been the major beneficiary of a new Regency facility or activity could have its tax burden increased. Subsector governors are also given some authority to realign tax burdens within a subsector, so long as that subsector's total tax obligation is met.

Among those activities which are taxed are interstellar trade and travel. Every starship requires licensing, registration and annual certification which is a form of tax, and the sale of all starship cargos and passenger tickets produce a tax paid to the Regency (these taxes are subsumed within the normal price of these items, so this effect is not seen in game terms). When an interstellar business is formed, registration and licensing fees are also paid to the Regency. The berthing fees paid at starports are the means by which the starports recoup the taxes levied on them by the Regency government. The statement behind all these activity taxes is that the Regency is the guarantor of interstellar society.

Armed Forces

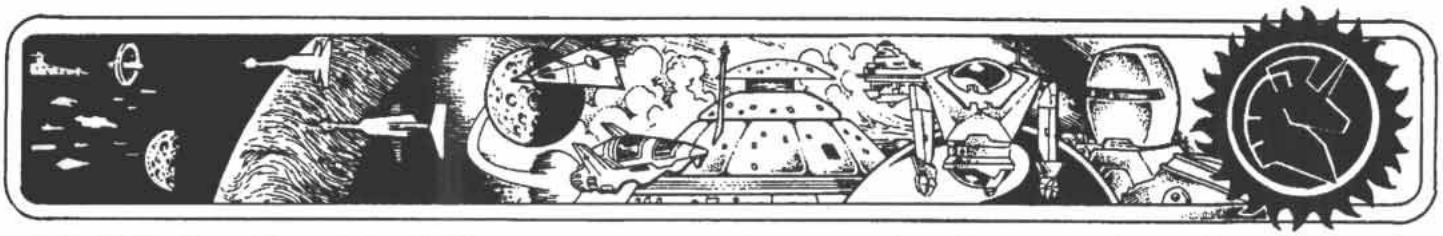
The Regency's armed forces include the Regency Navy, Scout Service, Quarantine Service, Marines and Army. All these are administered by various ministry areas, but are under the supreme command of the regent. Each of these organizations has a parallel civil and military command structure. The civil structure consists of the high regent in charge of the Navy Ministry, Scout Ministry, etc., and the ministry office.

The ministry interacts with the Senate and other ministries, and handles all budgetary and fiscal requirements, including procurement, pay and benefits, etc.

The military command structure consists of the military's own hierarchy and controls operational, training and personnel issues, and makes procurement and budgetary recommendations to the ministry.

Both the military and civil hierarchies terminate with the regent, who is the commander-in-chief of the armed forces.

The Regency continues the Imperial policy of maintaining parallel structures of active and reserve fleets in its subsector. Although subsector governors have no authority over active naval forces, they are permitted to make use of reserve forces under certain circumstances.



HISTORY OF THE REGENCY

Although the Regency dates to 1132, its story properly begins in 1123 with the dispatch of the *Arrival Vengeance* mission. In 1123 the Domain of Deneb had been cut off from the Imperium for six years, and Archduke Norris had to decide whether the Domain's future was tied to eventual reunification with the Imperium or if it would have to chart its own course. To this end, he dispatched, in greatest secrecy, a recommissioned cruiser to cross the Great Rift and contact the factions of the warring Imperium. This story is told in greater detail elsewhere (***Arrival Vengeance*: The Final Odyssey**, SA). The answer of the mission upon its completion in 1126 was quite simple: The fragments of the Imperium were in no shape to be reunified, and the Domain of Deneb would have to stand or fall on its own.

In 1127, speaking from the Domain capital at Mora, Norris announced this reality to the Domain, that "We in the spinward extents must chart our own future." (See **Survival Margin** page 53, or ***Arrival Vengeance***, SA.)

Many of Norris' initiatives which later saw light as Regency policies were undoubtedly begun at this time, particularly the Psionic Reforms and perhaps the Representational Reforms. However, the release of the AI Virus in 1130 soon presented the Domain with a more burning issue than any social restructuring.

Regency Timeline

1098	Norris Aella Aledon becomes Duke of Regina.
1107	Fifth Frontier War begins, accompanied by great enemy success.
1109	Norris sacks Admiral Santanocheev. Tide of war begins to turn in Imperium's favor.
1110	Fifth Frontier War ends in return to almost all pre-war boundaries.
1111	Border Worlds established as Imperial client state.
1116	Emperor Strephon's ceremonial double murdered at Core.
1117	Imperium breaks into factions for a Civil War. Vargr cut Corridor in two. Domain of Deneb cut off from Imperium.
1119	Intrusion of Aslan *ihatei* fleets in Domain become stronger and more numerous.
1123	Norris orders *Arrival Vengeance* mission to contact remains of shattered Imperium.
1126	*Arrival Vengeance* returns from its mission, carrying future High Regent Avery Alkhalikoi.
1127	Norris announces that Domain must seek its own path without the Imperium.
1130	Release of AI Virus in Core Sector. Collapse begins. First warnings of Virus arrive along trailing frontiers of Domain.
1131	Quarantine completed. Joint Aslan-Domain fleets destroy vampire fleets attempting to cross Great Rift.
1132	Regency proclaimed. Spinward States Accord signed. Sword Worlds attempt land-grab.
1133	Regency Frontier created. Abandonment begins. Border Worlds and Gram are absorbed into Regency. Norris declares the Psionic Reforms under High Regent Dilgaadin. Psionic Renaissance begins.
1139	Rape of Trin.
1140	Regency annexes Islands subsectors, assumes peacekeeping presence.
1152	Norris announces the beginning of the Representational Reforms.
1157	Norris dies, succeeded by Seldrian as regent.
1190	Seldrian dies, succeeded as regent by her son, Caranda Aledon Alkhalikoi.
1196	First Regency referendum on re-opening borders voted down.
1201	Zhodani Exodus begins.
1202	Regency Frontier is opened.

Virus and Quarantine

Advance warning of Virus from couriers that crossed the Great Rift enabled local naval commanders to take steps to prevent Virus infection, and quick ratification from Mora permitted these steps to be replicated all along the Domain's frontier. Under centralized leadership, these steps soon became codified as the Quarantine, which extended all along the Domain's trailing frontier and along the trailing portion of its coreward frontier.

Quarantine consisted of the isolation of all communications and data transmission systems so that Virus could not be transmitted along its fundamental path, and the closing of the Domain's borders to all interstellar traffic. Incoming traffic, if cooperative, would be inspected for Virus, usually involving a lengthy layover as all starship systems, personnel, cargo and equipment were inspected. Quarantine Transient Camps were hastily assembled all along the frontier to house these persons, who were detained as long as several years in some cases, because the flood of incoming traffic overwhelmed the shipping available to carry them deeper into the Domain.

Allies: It quickly became evident that the Domain could not create a Virus-proof barrier along all of its frontiers and that it must cooperate with its neighbors in order to keep Virus from overwhelming them all. Negotiations with the Aslan were the most pressing, as the Aslan's frontier with Virus was contiguous with the Domain's. However, Domain-Hierate relations had been quite sour since the onslaught of the *ihatei* fleets in 1119, and these overtures were initially met with suspicion and hostility. With time running short and in the absence of concrete Aslan cooperation, the Domain extended the Quarantine rimward into some frontier Aslan worlds, just in time to meet infected ships crossing the Great Rift via the mid-rift calibration points.

Desperate diplomacy, and last-minute assurances that the Domain would respect the integrity of Aslan populations within its borders, finally cemented the shotgun Domain-Hierate wedding, and joint Aslan-Domain forces were formed to defend the spinward termini of the great trans-rift trade routes in the Riftspan Reaches.

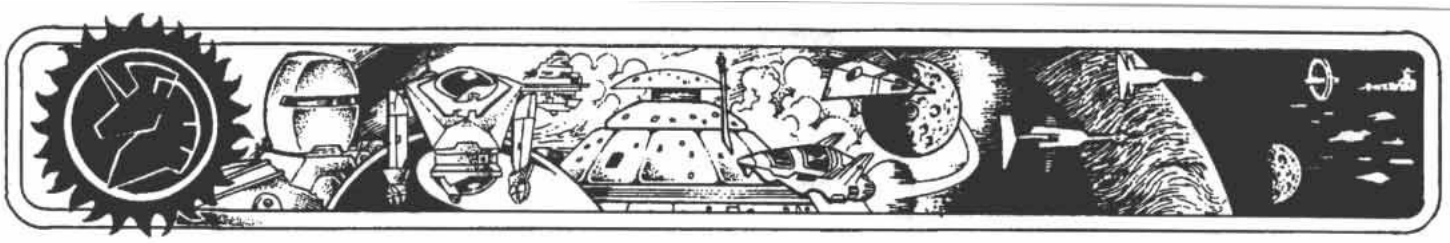
As it did with the Aslan, the Domain shared its knowledge and antiviral techniques with its other neighbors, most notably the Zhodani and Darrians. Although this information was also shared with the Vargr, the Domain never really trusted the fragmented and divisive Vargr to help maintain the Quarantine, and was forced to extend the Quarantine along its entire coreward borders.

By the end of 1131, the Quarantine had essentially assumed its current form, although a great number of procedures and protocols, especially between the neighboring powers of the Quarantine, had yet to be established. These protocols, and the rights and responsibilities of all those participating, were formalized in 1132 with the signing of the Spinward States Accords.

Regency Proclaimed

While the Spinward States Accords were being finalized, the Domain of Deneb became the Regency. Although in many ways this event was merely a cosmetic change, the very real significance of cosmetic changes in human affairs cannot be ignored.

The proclamation of the Regency served psychological and emotional notice to Domain residents that they had entered a new epoch of history, that things were no longer the same. This allowed them to make the kind of mental and social adjustments required for this new epoch. And by redefining the Domain's identity in a positive, independent way, connected to a cause, its citizens learned to no longer regard themselves as a small backwater province, cut off from and abandoned by the larger society that gave it meaning. Rather,



Norris Aella Aledon
The First Regent
Archduke of the Domain of Deneb, ***surrendered***
Duke of Regina, ***ceremonio vita***
Count Aledon, ***ceremonio perpetua***
Marquis of Regina, ***ceremonio perpetua***
Baron Yori, ***ceremonio perpetua***
OEG, OC, ODM

For most purposes, the story of the Regency is the story of Norris Aledon, both literally and allegorically. Norris was its guiding light, its conscience and voice for its first 25 years, and his vision has been maintained by his successors. Furthermore, his unassuming origins and his ability to shoulder unimaginable responsibilities when catapulted into a position out of keeping with any planned preparation parallels the way the Domain of Deneb was thrust in time of desperate war into the role of sole keeper of the Imperial legacy.

Born as the second son of the Duke of Regina, Norris was never trained for political leadership, and instead joined the Imperial Navy where he began a promising career in Imperial Naval Intelligence. However, the death of his older brother William in 1097, followed a year later by the death of his father, the duke, thrust Norris into a position he neither expected nor desired, but which would prove again the truth of the ancient wisdom, "There is no more fitting preparation for a king than to have been trained in the navy."

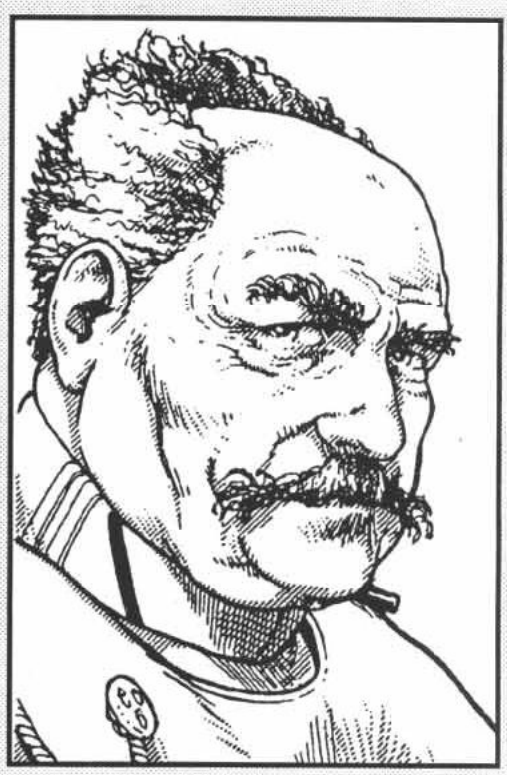
He proved himself a competent administrator, but it was not until the Fifth Frontier War (1107-1110) that his genius as both a strategic and operational leader became evident. Successfully anticipating the outbreak of war, Norris requisitioned naval reinforcements from Emperor Strephon which arrived in time to turn the tide. But before these forces could arrive, and in the face of disastrous early reversals for Imperial forces, Norris relieved Admiral Santanocheev, the incompetent Imperial commander, and took personal control of the Imperial campaign, setting up the final Imperial victory at the decisive Battle of Rhylanor (see **The Spinward Marches Campaign**, OP). Norris' ability to correctly anticipate and take confident, powerful measures, so amply demonstrated here, was to be tested again.

In 1116, receiving advance word of Strephon's popularly accepted murder, Norris took advantage of Imperial protocols and, in Strephon's name, elevated himself to archduke of the Domain of Deneb, thus ensuring clear, unified and foresightful leadership to meet the challenges ahead. This appointment was later confirmed by Emperor Strephon in 1126 (see **Survival Margin** page 52). This position allowed him to act decisively upon advance word of the Virus release, and he was able to organize the Domain to enact measures to meet and exclude this threat. Demonstrating his diplomatic talents, he was also able to recruit the neighboring Zhodani and Aslan governments to support the Quarantine which preserved the region now known as the Spinward States.

In 1132, following the successful completion of the Quarantine, Norris reorganized the Domain of Deneb as the Regency, a body which would continue on in the name of the Imperium until such time as the Imperium could be re-established. His attention was now focused on organizing the Regency to withstand the incessant attacks of Virus in the new form of sophisticated vampire fleets, as well as redressing the flaws of the Imperium which caused its ultimate fall.

Norris championed the values of honor, dedication and selflessness, and decreed that the Regency would move from a feudal polity to a more democratically based polity. He also repealed the psionic suppressions, opening the way for Regency psionics to provide additional help in maintaining the balance of power with the Regency's Zhodani neighbors.

Norris never married, and his unsuccessful attempts to find a partner and mother for his heirs became an increasingly sad story in the Regency news media. This eventually only added to Norris' legend by making him the father-figure who unselfishly gave up his own personal happiness for the sake of serving his people.



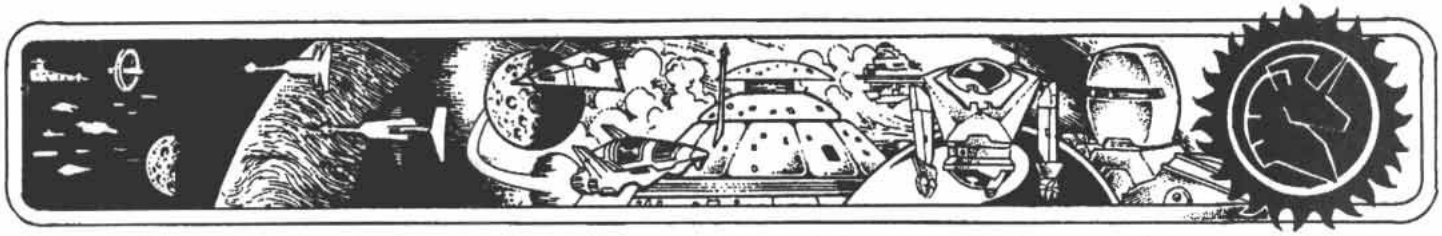
Norris never really recovered from the death of his trusted advisor Branj Dilgaadin in 1146, and it is believed that the long and close psionic relationship he had with his seneschal made it that much more difficult for him to form relationships later in life, most of all with marriageable women. Norris wrote an ode to Dilgaadin ("Ode to Old Chrome Dome") that was read at the private funeral service, a passage of which encapsulates these sentiments.

I never ruled alone through all the trials that we fought,
For you were there beside me; you knew my every thought.
Amid challenges and crises more than one man could withstand,
You were my second body; my unseen mind and hand.
But now your place stands empty, both without me and within,
And to rule alone is something I don't know how to begin.
I would find a queen, who like you, shares my purpose and my thought,
But how can I know another, when I know that she could not?

After the death of Avery in 1149, Norris lived out his final years with Seldrian on Mora and assisted in the upbringing of his "true grandson," Caranda.

Norris died in 1157, only hours after delivering his final address to the Regency (see page 4). He was succeeded as Regent by his true daughter Seldrian, whose succession was passed unanimously by the Imperial Senate.

Norris, much respected and loved while alive, became a mythic figure after his death. The name Norris and its variants (Nora, Norine) are extremely common among Regency citizens, especially those less than 45 years of age. All Regency worlds ever visited by Norris commemorate these visits by historical markers, Norris hotels, Norris streets, museums and "Norris slept/ate here" placards. Although technically the title "first regent" was intended to be used by all holders of Norris' office, to distinguish it from other high regents, etc., this title was not used by either of Norris' successors, allowing it to remain uniquely linked with the singular figure who created the office.



they now were the heart and soul of that larger society, and had a mission that ennobled their existence and exertions.

Finally, the redefinition of a domain of a larger Imperium as a separate regency would make it easier to institute the cultural and political changes necessary to adapt in this new environment. The change of name empowered Regency citizens to take hold of their destiny and make their own decisions without having to ask themselves if these decision were "proper" within the externally imposed Imperial framework.

"Starship"

"Starship" is a poem which achieved a great deal of popularity in the Regency during the Dream Time. It was written by then 2d Class Petty Officer Omar Assad following the Battle of Calibration Point Charlie in 1144. Assad was a sensors operator aboard the battlecruiser *Saratoga* and was inspired to write the poem by the sight of the destroyed Regency vessels that were left behind at the end of this deep interstellar space battle.

To devotees of poetry it was clear that Assad had been reading rather too much William Blake when he wrote this poem, but to most Regency citizens, who had never heard of Blake's 3900-year-old work, the piece captured the sadness, poignancy and fear felt by those living in the last surviving pocket of civilization, surrounded by, and daily threatened by, the yawning chaos that surrounded them.

Starship, starship, burning dim on the fringe of the outrim
Did you crew have some last word? A final plea we never heard?
Your fusion-blackened hull betrays no sign of life from former days
We stand away to jump for base, leaving you alone in space
Your corpse a monument for some, for some a crematorium.

Starship, starship, spewing fuel, your twisted wreckage growing cool
Did your captain try to shout before your engine decks blew out?
Or did some practiced watchman's eye discern that he was soon to die?
We wish to know what you could tell of when your crew was blown to hell
Some simple message we would find, to pass to those they leave behind.

Starship, starship, drift away into a place that knows no day
We wonder on the men you bore who fought beside us in this war
It would be simple to forget your crewmen whom we never met
But we'll remember, as we should, our comrades in this brotherhood
of quick cold death between the stars, for their sad fate will soon be ours.

Starship, starship, save a berth for us, lost children of the Earth
You drift from sight but not from mind, for someday we'll be left behind
to seek an entrance to the home where now our missing comrades roam
We'll burn with pale fire—wan and thin
Please guard the door, and let us in.

The popular success of "Starship" allowed Assad to retire from the navy and pursue a career as a popular poet, publishing such best-selling collections as *The Watson Weddings, Battleline Ballads and Divisional Ditties, Islands in the Creek* and *Leaves of Sassafras*, which again raised the hackles of critics, who began referring to him as, "The Rod McKuen of the 57th century." This is because the one thing that critics like better than running people down is making obscure references that no one but they can understand.

Final Adjustments: Another accomplishment of the renaming of the Domain was the opportunity to redefine the status of disputed or Border Worlds and client states starting from "a clean slate." Rather than carrying over generations-old Imperial territorial disputes into the new regime, Domain worlds and all worlds on its borders were given the "option" to join the new organization. Although key border areas were given as much freedom as possible in this area, in some cases the Domain resorted to subtle or overt arm-twisting. In extreme cases the Domain/Regency simply incorporated unwilling worlds as "Unintegrated Territories," meaning that the worlds were nominally independent but that the Regency exercised the principle of eminent domain to take the world within its defensive perimeter. In other words, given the clear and present danger to civilization presented by Virus, someone had to take the responsibility of integrating Border Worlds into an effective protective regime, for the good of all intelligent life. In cases where recalcitrant worlds were unable to see to these requirements on their own, it fell upon the Regency to do what needed to be done, for, as Regency leaders were fond of repeating, "the Quarantine is only as strong as its weakest link."

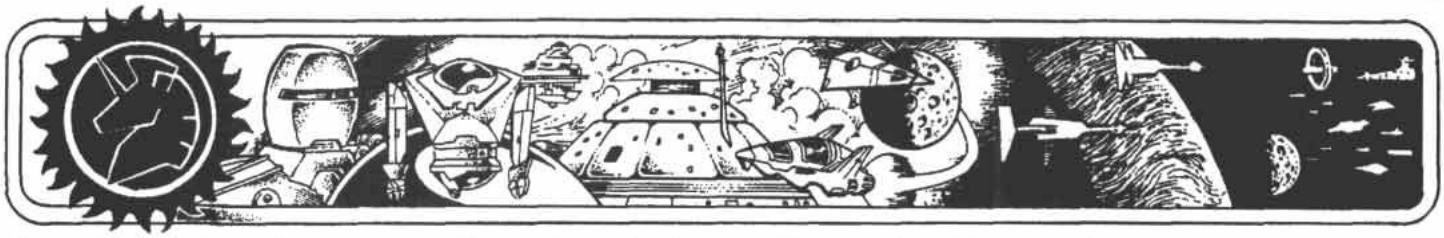
One of the most powerful inducements that the Domain/Regency could offer was its anti-viral expertise, and its offer to include a world under this umbrella was an opportunity that could not be passed over lightly. This was especially true when envoys pointed out that the alternative was to be left outside the Quarantine to fend for oneself. Another factor that ironically strengthened the Regency's bargaining position was its simple desperation for success. This desperation led the Regency to grant favorable terms to prospective members that made membership much more attractive to worlds which had repeatedly declined Imperial allegiance. The clearest example of this was the incorporation of worlds that contained significant groups of Vargr invaders or Aslan "squatters," still fighting for control of the world with its rightful Imperial inhabitants. Since approaching Virus allowed neither the time for lengthy settlement of these disputes nor the luxury of leaving embattled worlds as the weak links on the Quarantine frontier, the Regency was obliged to "agree to disagree" and accept the Vargr and Aslan territorial gains as a *fait accompli*. This acceptance legitimized these gains and obligated the Regency to extend the former invaders the same rights and support as any other Regency citizen. This would eventually put the Regency in the distasteful position of defending the newly legal Vargr and Aslan gains against the very Imperials who had been displaced from them.

Spinward Border

During this same period the Sword Worlds observed the Regency's forthcoming policy toward already entrenched rivals and attempted to take advantage of this opportunity by launching invasions on a number of worlds on the Imperial frontier, including the Border Worlds, Entropic Worlds and several Imperial worlds. These invasions were small and were intended get the Sword Worlds' "foot in the door" on these worlds so that the Domain would be obliged to recognize and accept these claims in perpetuity.

The Domain was hoping to incorporate the Border Worlds into the new Regency, but at the time of the land-grab these details had not been finalized. Keeping the Border Worlds under Domain/Regency control would greatly simplify the defense of the frontier and allow better connection with Darrian holdings, but incorporating former Sword Worlds territory into the Regency was dangerous, as it would attract internal conflict. This perception was both confirmed and rendered irrelevant by the land-grab.

Recognizing the Sword Worlds' act as one of crass opportunism based on their interpretation of Domain weakness, the Domain determined that a clear show of resolve was necessary and decided that it was time to slap the Sword Worlds down hard. Improved Domain-Zhodani relations since 1123 made this act possible, as



Imperial forces in the past had been deterred from acting against the Sword Worlds by the Sword Worlds' ties to the Consulate as members of the Zhodani-led Outworlds Coalition.

Acting with the assistance of Darrian forces, and after dispatching guarantees to the Zhodani that no acts would be taken against them, Domain naval and Marine forces crushed the Sword Worlds forays and occupied an additional seven of the Sword Worlds, including the entire Gram arm (see page 45). Reasoning that since the Sword Worlders would cause trouble no matter what and it would therefore be best to keep a close eye on them, the Domain elected to incorporate all the occupied Sword Worlds and Border Worlds into the Regency.

War of the Quarantine, 1131-1201

The War of the Quarantine was the constant background that accompanied all other events of the Regency's history and underscored the precarious nature of the Regency's existence. Just as Virus caused the founding of the Regency, its continued influence on it in the form of the Quarantine War was the major shaping influence on the Regency in its first 70 years. The lives of almost all Regency citizens were touched by it in some way, either by family service along the Quarantine line or a career spent building the tools of the Quarantine: starships, spacecraft and their systems. And although the Quarantine War gradually became business as usual, something the average citizen could take for granted, the total number of Regency dead after 70 years of unremitting diligence was staggering—more than all five Frontier Wars combined.

Starship Shortage: One of the most shocking revelations of the early Quarantine was the tremendous shortfall in spacecraft required to maintain it. Warships and system defense boats were required to guard each of the refueling points in each of the systems along the frontier, in sufficient force to at least slow down incoming vampire ships. Starships were required to make pre-emptive sweeps through the Wilds. Ships were also needed to man the less dangerous but still necessary borders with the Regency's Spinward State neighbors. Couriers and Xboats were required to maintain communications among the Quarantine force and maintain timely communications within the Regency so that worlds would not be surprised by vampire breakthroughs. Furthermore, wartime losses to all of the above forces needed to be constantly made up in a timely fashion. Finally, in spite of these drains on available shipping, large numbers of merchant vessels were needed to maintain the Regency's commerce.

These needs were met in several ways. First, most privately owned military vessels, such as the famed "Route Protectors" of the Al Morai shiplines (**The Spinward Marches Campaign**, OP), were nationalized. These were either taken over by Navy and Scout crews or retained their former crews, now direct-commissioned into the Domain armed services.

Second, the Regency's shipbuilding industry was carefully organized and husbanded by the new Ministry of Shipping. The ministry identified existing construction capabilities that could be rapidly converted to useful projects without the delay and waste necessitated by wholesale redirection of industry from the ground up.

Two examples of this approach are the *Cuspid*-type gunboat and the jump-capable boat (pages 90 and 88). The *Cuspid*-type gunboats were adaptations of the standard 10-ton launch, already in production in vast numbers by many Regency yards. Rather than taking years to convert these yards to the production of expensive, time-consuming, and labor-intensive purpose-built fighters such as the Rampart (see **Brilliant Lances Technical Manual**, page 48), these yards were able to begin manufacturing *Cuspid* components almost immediately, and existing stocks of launch spares could be used for the new gunboat type. The jump-capable boat was similarly derived from a standard small craft, the 30-ton ship's boat. The use of the jump boat to supplement and replace the admittedly more capable Xboats allowed shipyard capacity previously used for the larger Xboats to be used for needed warship construction.

Another ministry policy was to carefully *limit* the pace and extent of modernization of the Regency's shipbuilding industry. While decades of advancing Regency technology would have permitted the upgrading of many TL15 shipyards to produce TL16 vessels, these upgrades would have caused a serious disruption in output, and the new high-tech vessels would have been technologically incompatible with the Regency's nearly homogeneous TL15 forces, and would have required the creation of a new TL16 maintenance and support infrastructure in addition to the existing TL15 facilities. Furthermore, the production of the innumerable one-off TL16 prototypes required to learn how to properly manufacture and use this new technology would have been wasteful and duplicative. Modernization efforts were instead focused on bringing worlds up to TL15 levels rather than further advancing existing TL15 facilities.

Small-scale TL16 programs were undertaken, both to ensure technological supremacy and to discover useful TL16 systems that could be adapted to other platforms, but these were carefully managed. These were typically joint Darrian-Regency programs, using known-successful Darrian TL16 artifacts as goals, rather than requiring Regency engineers to conduct time-consuming TL16 basic research. The highly successful 500-ton Darrian patrol cruiser (page 92) is a prime example. The DPC is based on long-established Darrian designs and is also produced under license in the Regency for the Regency Navy and Quarantine Service.

Finally, the Regency has made extensive use of reserve forces, primarily via the RQS. The RQS offers subsidies for the private construction of military-capable starships (usually armed or upgraded merchant types), and thereby can call up these vessels and their crews for temporary RQS duty (see page 19). The RISS also maintains its long-standing policy of maintaining an operational reserve force of detached duty scout/couriers. Finally, all personnel who have served in the Regency Navy or Scouts can expect to be recalled for Quarantine duty.

The effects of the starship shortage continue to this day and can be seen in the rarity of TL16 starships and shipyards in the Regency, as well as the great age of the Regency starship fleet. Most starships not destroyed in the past 70 years are still in service, and a large portion of these are still committed to supporting the Quarantine.

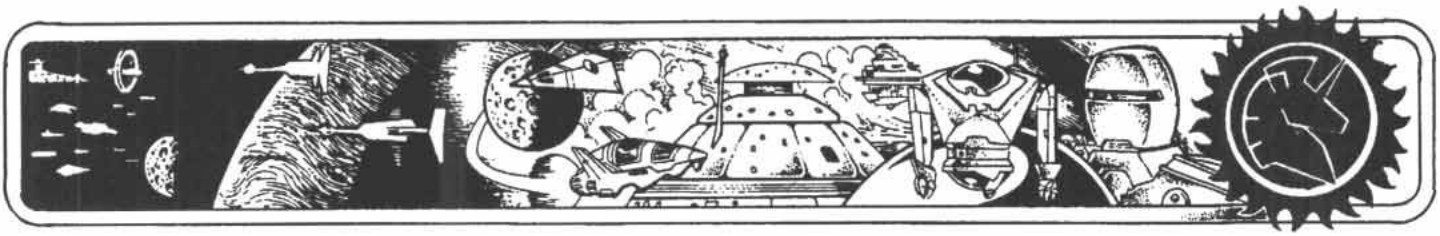
Regency Frontier: A Virus-tight Quarantine cannot be maintained along a single thin line. The ability of starships to jump over defending lines requires a defense in depth. This defense in depth was achieved by the creation of the Regency Frontier, which was largely in place by the end of 1133.

The Frontier has an average depth of three to four parsecs, with the outer edge being the beginning of the Wilds proper and the inner edge being the actual Regency boundary, what is referred to as the Regency Safe Area, or "Regency Safe" for short.

The outer edge is the limit of permanently stationed RQS pickets, not the limit of RQS patrols. RQS "deep sweeps" routinely range several parsecs into the Wilds, flushing out known and likely avenues of approach and sometimes planting ambushes at key refueling points.

Abandonment: The principle side effect of the establishment of the Frontier was the Abandonment. Because the worlds beyond the safe boundary could not have their safety guaranteed, a massive evacuation of their populations began in 1133 and had reached its peak by 1136. The Abandonment was supported by the Regency Navy, which organized convoys of troop transports to bring the emigrés to safety within the Regency.

Here they were initially deposited on a number of Regency-designated "Refugee Worlds" in the trailing subsectors of the Regency. Many millions of them were relocated by the Regency to other worlds, notably the former Border Worlds of the Sword Worlds subsector (page 45), and the *ihatei*-settled worlds along the thinrim. Here they provided a loyal counterbalance to the volatile Sword



World and Aslan populations.

Although in this and other ways the emigrés were encouraged to seek lives throughout the Regency, it was inevitable that a large percentage of them never made it beyond the Refugee Worlds. Even in 1202, millions still live in the maze-like warrens of refugee shantytowns on the Refugee Worlds, where Vargr organized crime (see page 29) maintains a firm foothold.

Rape of Trin: The Rape of Trin in 1139 (see pages 51 and 80) brought home the danger of Virus and the importance of maintaining the Quarantine and close relations with the neighboring Aslan and Zhodani. It also contributed directly to the Regency's annexation of the Islands subsectors the following year.

Annexation of the Islands: The Islands subsectors (see pages 33-34 and 72) had been a source of concern to the Quarantine since its establishment. However, its eight-parsec separation from the contiguous Imperial Wilds were thought to make it relatively safe from vampire attack, and its further seven-parsec separation from the Regency frontier in the Usher subsector made it possible for any infestation to be sealed off by Regency forces.

However, the sophistication demonstrated by the *Kishkii* attack of Trin called these assumptions into question. A vampire fleet could clearly mount a multi-staged crossing of the Great Rift and, once established in an area the size of the Islands, would be difficult to eradicate. Vampire fleets could then use the Islands as a staging area right on the doorstep of the Regency to launch regular incursions into Usher subsector. The fact that the Islands had been engaged in more or less continuous warfare since 1106 made it unlikely that its worlds could mount a united front against a vampiric attack and made the worlds that much more susceptible to infection.

For this reason, the Regency annexed the Islands in 1140, occupying them with Navy and RQS forces and declaring an end to the so-called Consolidation Wars. Regency forces remain in the Islands in 1202, both to maintain the Quarantine and to enforce peace in the Islands.

Psionic Renaissance

Norris had long been committed to at least the partial repeal of the Psionic Suppressions. This was clear from his close relationship with his telepathic seneschal, Branj Dilgaadin, but these sympathies date back to his naval intelligence career. The Imperial Navy prudently maintained psionic research at several points in the Imperium, including at least two points in the Domain of Deneb, and Norris became aware of the capabilities that could be provided by a psionic program.

This awareness became even more acute after he became sector duke, as he had to contemplate political relations and even war with the Zhodani Consulate just a few short parsecs away. Facing an opponent that had mastered its psionic potential, the Imperium could ill-afford its continued disregard of psionic power.

However, introducing psionic programs into the anti-psionic Imperial culture would be difficult, and it was only after Norris had begun the recasting of the Domain's self-image as the new Regency that he felt it was possible to take the step of psionic reform. The indispensable feature of any such effort would be to somehow circumvent generations of mistrust and suspicion of psionics. Norris believed that only a program of radical openness would achieve that goal, and he assigned Dilgaadin the task of fleshing out the concept. The plan was announced as Regency policy in 1133 as the Psionic Reforms. See page 14.

Representational Reforms

The rapidity with which the Imperium split into warring factions demonstrated that the Imperial culture had ceased to be a sufficiently unifying force in 1117. The message to Norris was clear: A healthy interstellar society required strong forces of loyalty that ran both up and down through the political hierarchy. Notions of democratic reforms and home rule had attained some currency among the nobility in the Imperium's last years and were particularly championed by Dulinor the Black before he touched off the Civil War.

Some progress had been made in that area, with Strephon's resurrection of the domains and their archdukes. Norris' own experience with the importance of being free to wield unified power in response to local conditions ratified the principle of the domains, and the Collapse only seemed to make these principles more relevant. The speed and destructiveness of Virus would not allow slow, centralized, coordinated responses to succeed. Success against Virus required that local leaders have the authority to act quickly and decisively, but it was even more important that local groups of worlds have the cohesion and unity to act in common cause without hesitation. Such cohesion could only grow from the ground up and could not be imposed by the nobility. This meant democratic reforms, and on a more basic level than even Dulinor had contemplated.

The need for democratic reforms was intensified by the Vargr and Aslan *faits accompli* of 1132. The lavish concessions to the invaders demanded some compensation to these worlds' original rulers. The granting of popular political representation would provide some of this compensation and would be a mechanism for the venting of some social pressures.

These changes would be even more difficult than the Psionic Reforms because they would challenge the entire Regency noble class, accustomed to privilege, comfort and power, and entrenched in these patterns by centuries of tradition. Norris quietly began negotiations with key nobles, and slowly and painfully developed a plan for the transfer of power and a coalition of nobles which would support it.

Finally, almost 20 years after the dramatic Psionic Reforms, Norris' coalition was in place, and the last major achievement of his life, the Representational Reforms, were underway. See page 16.

Succession

Five years after beginning the Representational Reforms, Norris died at the age of 94. He had seen his Spinward Marches, his Domain of Deneb, and finally his Regency through what were probably the most sweeping changes witnessed by a single leader and his subjects over a span of years.

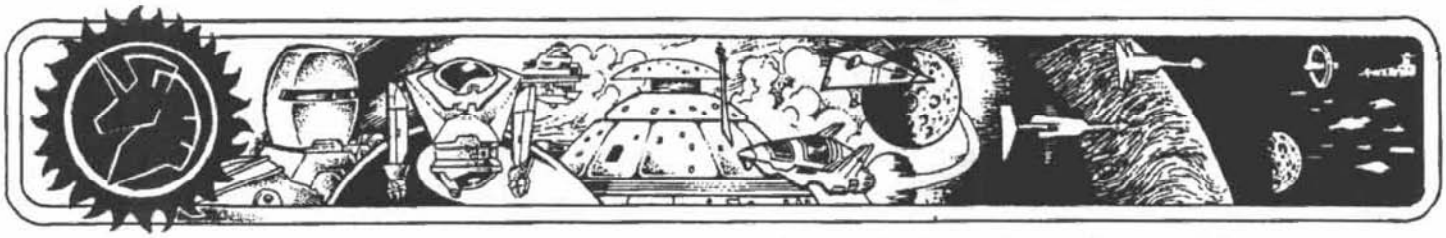
One of the major themes of Norris' long rule was speculation over when he would finally get himself a proper heir. As it turned out, Norris never married, and his heir remained his "true daughter" (clone) Seldrian.

However, in the late 1130s, public anticipation began to mount that there might in fact be a dramatic development in the succession issue. The boy Avery, who had been brought back from Strephon's stronghold aboard *Arrival Vengeance* in 1126 and adopted by Norris, was long thought to be someone special. This was confirmed in 1139 on his 21st birthday when it was revealed that he was the son of Strephon, last emperor of the Imperium, and Avery took his rightful family name, Alkhalikoi, replacing the Aledon he had used as Norris' adopted son. The news that the rightful heir to the Iridium Throne of the Third Imperium lived in the Regency and had ties to the family of the First Regent was met with almost child-like excitement throughout the Regency.

The public's fondest hopes were realized in 1144 when Seldrian Aledon and Avery Alkhalikoi were married, bringing the Alkhalikoi and Aledon lineages together. However, after only two years it was clear that this marriage of state was not in fact a true marriage on the personal level. Nonetheless, in 1147 Seldrian and Avery produced a son, Caranda, who, as both an Aledon and Alkhalikoi, tied up the literal and figurative natures of the Regency and Imperium into one neat package.

Norris was succeeded upon his death by Seldrian, who ruled alone. Avery did not live to serve as regent consort, regent, or even emperor as many had speculated, as he had died in 1149.

Seldrian served until 1190 when she died at the age of 93. She was succeeded as Regent by her only son, Caranda Aledon Alkhalikoi.



Trepidation

Responding to signs that the Regency had done just about all it could do as a closed economy and was beginning to stagnate behind its walls of Quarantine, Caranda began preparing his subjects to face their inevitable return to the Wilds. The culmination of this effort was the 1196 referendum on opening the outrim frontier to allow exploration and expansion into Corridor. The issue was voted down by a solid majority, but the referendum had the intended effect of opening public debate, which was not stilled by the end of the voting.

Zhodani Exodus

Although the Zhodani were the traditional bogeymen of the spinward Imperium, events since the Civil War and Collapse brought a dramatic reversal in this relationship.

Successful talks between Domain and Consulate leaders in the pre-Collapse period reassured the Imperials that they did not have to fear a Zhodani deathstroke that would finish them off in their weakness and isolation. In fact, the Consulate was comfortable with its Domain-sized neighbor and had only fought five wars as an effort to forestall the Imperium's seemingly unquenchable thirst for expansion.

With the establishment of the Spinward States protocols, the Zhodani were the Regency's second most cordial neighbors, ranking only after the long-friendly Darrians.

However, all this changed in 1201, along with the Consulate's status as the most stable (almost fossilized in its well-adjustedness) of the Spinward States. Regency leaders now openly refer to the once-feared and always respected Consulate as the "sick man" of the Marches.

In 1201, quite without warning, the Exodus began. Since then an estimated 30 billion Zhodani refugees have poured into Regency space, still without an explanation from the Consulate's leaders. This influx is placing a great strain on resources in the core-spinward corner of the Imperium, particularly in the Jewell, Regina and Vilis subsectors. Small worlds are being overwhelmed by the continuing flood of hungry mouths to feed. These refugees jump right over the Zhodani-Regency frontier, violating the Quarantine protocols long respected by both sides.

The Regency's current policy is humanitarian and committed to caring for the obviously genuinely suffering people. But the questions remain: How many displaced Zhodani can the Regency absorb? What is causing this? And when will it end? Regency leaders have thus far been unable to determine if local Zhodani authorities are concealing the details of this upheaval or if they themselves are also in the dark.

Biting the Bullet

Six years of debate since the first referendum and the impetus of the Zhodani Exodus caused the Senate and Moot to approve, on 191-1202, a limited opening of the Regency Frontier in the Antra, Namidshur, and Usani subsectors of Deneb (pages 54, 58, and 62). This opening is one-way only: Traffic can move out, but is still carefully controlled coming back in by full Quarantine procedures.

The joint Senate-Moot act required the RQS to respond with a plan within 60 days and to begin implementing the final approved plan within 120 days, by 311-1202.



Avery Aledon/Alkhalikoi

For the first few years after his arrival in the Domain aboard *Arrival Vengeance*, (see ***Arrival Vengeance*: The Final Odyssey**, SA, and **Survival Margin**) Avery's identity was a mystery. He was duly adopted by Norris, and assumed the name Aledon. On his 21st birthday, however, his identity as the son of Strephon and Iolanthe (the latter posthumously, via frozen ova stored aboard Strephon's entourage fleet) was announced, and he took on his rightful family name, Alkhalikoi, the line of Imperial emperors from 629.

At that time Avery had already been serving for two years as High Regent for Technological Assessment, as he had a facility and consuming passion for such topics as psionics and artificial intelligence. In 1144 he additionally became the Heir Consort upon his marriage to Seldrian Aledon. The marriage was not a success on a personal level, and Avery spent most of his time away from Mora, involved in his duties as High Regent until 1149. In that year, while participating in a demonstration of computer-enhanced artificial psionics, Avery was killed by a hardware failure.

Following his death, the following document was leaked to the press. It was said to be a note from Strephon given to Seldrian for safekeeping during the *Arrival Vengeance* visit to Usdiki in 1126.

My Son,

How can I atone for the sin I have committed? You, my only son, the gift from beyond the grave of your beautiful mother, how could I do this to you?

I can only answer, "How could I not?" Only my son could understand in the same way what I have seen, and carry this understanding to where it will be needed.

Perhaps someday you can understand that I have only used you as I have used myself, to be the instrument of the salvation of these people. I am nothing, Avery, if I am not the servant of these people, the children of my Imperium. Eleven centuries of history and untold trillions of lives spent in its creation have made me transparent. And you, unfortunate heir to my burdens, have become transparent as well, and at my hand. Please forgive me for loving you as only an emperor could love the son to which he entrusted the future.

Psionics in the Regency

Psions and psionic talents are now an accepted part of Imperial society in the Regency. Regency psions are still relatively few in number, but this is not because of latent anti-psionic prejudice. It is simply the result of the newness of the field in Imperial society and the lack of any traditions of psionic development and pursuits. Psions can be found everywhere in the Regency, and most worlds with starport class B+ or a population code of 8+ have at least one psionic school. Unlike the old Imperial Psionic Institute, these psionic schools are well-known public institutions.

Psionic Registration and Regulation

Regency law does not require psionics to be registered or licensed, but Branj Dilgaadin's leadership of the Psionic Renaissance established a code of honor and personal responsibility among Regency psions that demanded voluntary registration and licensing. For the Regency to have required such measures would have merely perpetuated Imperial anti-psionic prejudices and kept the psionic movement underground. But universal voluntary registration reinforces the public trust of psions that is necessary for them to exist in Imperial society.

Registration simply means that the psion is officially registered with the Regency government as a psionic talent (these records are maintained by the Ministry of Psionics at its main and local offices, and are freely available to anyone who requests them). However, in practice psions extend this principle to make sure that their behavior or appearance makes it clear to all they meet that they are psions.

There are three types of licences—basic, advanced and special.

Basic Licenses: The basic licenses consist of the five basic psionic cascade skills (TNE page 248)—Telepathy, Teleperception, Telephysics, Teleportation and Self—plus specific licenses for each Arcana area, such as Computer Empathy, Psionic Healing, Prescience, etc. These licenses document that the psion has a basic ability in the licensed area and is pledged to only use them in permitted ways.

All basic licences automatically include the pledge to not use these talents improperly. (For example, telepaths are prohibited from reading thoughts of those who have not requested this, but may freely use the life detection cascade. Teleperceptives are not allowed to spy within private areas, but are allowed to look forward to determine traffic conditions, see if one's co-worker has arrived at the public office, and so on.) It is a testament to the quality of Dilgaadin's leadership and the mettle of his disciples that these pledges are widely accepted and trusted throughout the Regency.

Advanced Licenses: Advanced licences document that the psion has achieved a higher level of proficiency in the licensed area, and authorizes the use of that skill in established procedures at the professional level.

For example, a psion must have an advanced license in Psionic Healing in order to practice psionic medicine; a psion with only a basic license is not sufficiently qualified to do this safely. However, a basic license does allow a psion to use Psionic Healing in emergencies or when requested by another.

As another example, professional psionic interrogators working for police departments are required on most worlds to have an advanced license in Telepathy, while basic licenses are widely used by psionic journalists to psionically interview subjects who have given them permission to do so.

Special Licenses: These generally allow the psion broader latitude in using a psionic skill under certain specific circumstances. Special licenses have very clearly defined intents and particulars, and the psion is bound to obey both the letter and the spirit of the rule.

Police departments and military units employ telepaths and teleperceptives to hunt for criminals or enemy forces, or in routine patrols to check to see that nothing is amiss. These tasks require the psion to hold a *current* special license for this use, and this license clearly prohibits the psion from spying on his neighbors outside of the line of duty. Special licenses are subject to periodic review and renewal, and can be revoked for misuse or upon the termination of an assignment when it is required.

Telephysics is often used by psionic healers to manipulate internal organs or destroy tumors or diseased tissue by pyro- or cryokinesis. However, this use requires a special license which must be periodically renewed by demonstrating continued facility with these tasks (in this case, Telephysics *asset* of 10+).

Some elite military units include psionic "snipers" who use pyrokinesis or assault in a lethal or disabling manner against enemy soldiers. These snipers require a special license to allow them to use these powers in a harmful manner against other persons. These licenses are automatically rescinded at the conclusion of the combat tour or term of duty.

Official RQS Virus inspectors require a special license in Computer Empathy to declare electronic equipment clean of Virus; an advanced license is not good enough for RQS standards. This license must also be tested for renewal (requiring success at a series of Computer Empathy tasks on appropriately configured test equipment). The lack of such a license does not prohibit a psion from *attempting* to scan for Virus; it simply prevents him from holding such a highly responsible job.

Referees can use the above examples to define their special licenses.

Game Effects: In game terms a basic license is granted for skill level 1 in a psionic skill. In game terms, an advanced license is granted for skill level 3+ in a psionic skill. Special licenses are granted as required by a psion's duties (referee's discretion; this will also be discussed in detail with the future publication of detailed psion character generation procedures).

As part of the psi reforms, the Regency has instituted severe penalties for the misuse of psionic talents down to the level of simple nuisance eavesdropping and peeping-tomism using the Telepathy and Teleperception skills. Although such misuse is difficult for nonpsions to detect, psions find it easier to notice these things, and are oath-bound to prevent, report and correct such actions (*referees only: see page 83*).

Psion's Oath

I am a human, I am a Regency citizen, I am a psion. I am a person to be trusted.

I possess a gift that is not easily understood and which would be easy to abuse. While this gift does not make me greater than anyone else, it does require me to abide by a higher standard which forever binds me to defend my society from any who would abuse these gifts.

If any psion lies, we are all liars. If any psion abuses society's trust or misuses his gifts, we are all guilty. I am my brother's keeper, as well as the guarantor of his freedom.

I will not lie nor take false vows, and I will not tolerate those who do. I will not use these gifts for personal gain or amusement, and I will not tolerate those who do. I will not exceed the bounds rightly placed on me by my society, and I will not tolerate those who do. I will not condone dishonest acts by silence or willful ignorance.

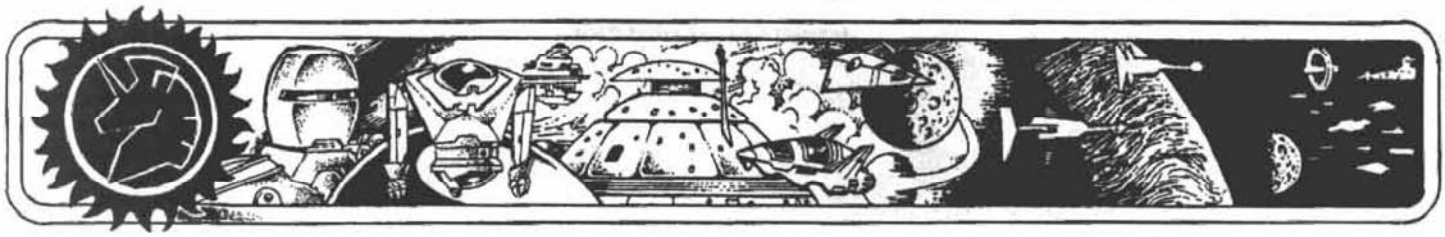
I will use this gift for the benefit of humanity, of all persons, of society, and of all life. I will treat all life, in my own person or that of any other, with compassion. I will gladly die rather than betray a rightful trust. I will gladly die rather than give up my honor, or needlessly destroy that of another. I will gladly die rather than forget this oath.

I am a psion, I am a Regency citizen, I am a human.

I am a person who can be trusted, or I am nothing.

Appearance

Virtually all human Regency psions maintain the style of a completely bald or mostly bald head (by shaving, depilatories or permanent electrolysis), decorated by numerous intricate tattoos. "Mostly bald" includes such variations as tonsures,



topknots, sidelocks or ponytails. Some of these variations are the unique "uniform" of certain psionic schools, while others are simple self-expression. The exceptions to the rule of baldness include criminal psions, nonhuman psions such as Droyne, and military and covert special operations psions who are required to be unidentifiable. Elderly psions whose psionic strength attribute has fallen to ineffectiveness will often grow their hair back (although this is not always possible...) to demonstrate the loss of their gift.

The tradition of baldness serves four purposes. The first is to make psions immediately recognizable to society at large. This openness serves as a "lightning rod" for popular fear, as people who are so up front about who and what they are can hardly be up to anything devious.

Second, the bald tradition is a deliberate tribute to Branj Dilgaadin, the founder of Regency psionic culture, who was naturally bald.

Third, the bald head is a source of pride. By calling attention to the braincase, the style says the psion has tapped into mental powers that most people cannot access. It is believed that the turbans worn by Zhodani nobles accomplish the same purpose by exaggerating the size of the head.

Finally, the bald head is necessary to allow the tattoos to be visible to society at large.

The tattoos are graphic and artistic forms of the licenses which the psion has obtained, plus some personal embellishment. This serves the same purpose as the baldness itself, but in a more detailed way, by allowing strangers to assess for themselves the significance of being in the same room as a psion. For example, a person embarrassed to have his mind read would be reassured to see that the psion in the elevator with him only held Teleportation and Self licenses. By the same token, the presence of an advanced Telepathy license proclaims that the psion is not attempting to conceal his ability and has taken oaths to not spy on his neighbors, and this provides some reassurance. Finally, the presence of the special license for a police department Telepathic scanner could be comforting to law-abiding citizens who know they have nothing to hide and who appreciate knowing the psion will be able to detect the intentions of any criminals in the area before they have a chance to commit a crime.

The association of certain combinations of licences with certain schools often allows the informed observer to determine the school to which a psion belongs by the pattern of tattoos. For example, devotees of the School of Listening would most often have Telepathy and Teleperception license tattoos, and hardly ever have Teleportation or Arcana licenses. Many schools also use distinctive variations or distinctive placement of the license tattoos to increase their identifiability and *esprit*. Some special licenses are accompanied by tattoos, while some are not. Special licenses of explicitly temporary validity are usually not tattooed, while those expected to last for the duration of a career usually are.

On the other hand, some temporary special licenses are of such social significance that tattoos are required. These include the special license for telepathic or teleperceptive surveillance, and the medical and lethal military use of Telephysics. (Permissible exceptions to this include certain special Regency military and intelligence personnel. An undercover agent bears no tattoos and grows his or her hair normally for obvious reasons. In addition, in wartime some military special licenses are not tattooed as they can make their owner subject to execution, mistreatment or extensive interrogation if captured.)

Special license tattoos are not removed when invalidated, but are instead modified by a cancellation tattoo. In this way ex-military psions are easily recognized by their cancelled military psionic specialties.

As with the baldness, the tattoos serve a social purpose in the Regency: to defuse popular fear and suspicion of these mysterious talents by not hiding them.

Psionic Training in the Regency

Because each nonhuman race handles psionic powers differently, the guidelines below refer specifically to human characters. Referees can combine these with TNE alien psionic rules to allow the training of alien psions in the Regency.

To simulate the number of new schools of psionic discipline in the Regency, psionic training is handled in a slightly more detailed fashion. Rather than using the generalized psionic institute training beginning on TNE page 247, Regency PCs may choose a specialized school of psionics at which to take their training. Because each school specializes in certain aspects of psionic pursuit, certain talents will be easier to obtain in some schools and harder in others. Thus the aspiring psion will wish to choose a school with a curriculum in line with his or her desires.

Each psionic school has a total 1D6 *adjustments* which can be made to the normal rolls for psionic talents found on the table on TNE page 248. Each adjustment allows the target number for a given psionic talent roll to be decreased by one. Multiple adjustments can allow reductions in several target numbers or allow a single target number to be reduced several points. However, each point of downward adjustment on a target number must be balanced by the one point *increase* of another target number. Thus the total of all six target numbers must always equal 42.

No target number can be increased above 12, nor reduced below 1.

Presented on the table below are the normal target numbers from TNE page 248 and those of three sample psionic schools: the School of Listening (3 adjustments), the School of Self Awareness (5 adjustments), and the Regina Circle of Mysteries (6 adjustments).

The cost for this specialized training is adjusted accordingly, by increasing the cost by 10% for each point of adjustment offered by the school. Thus training at the School of Listening in our example would be Cr130,000, the School of Self Awareness would be Cr150,000, and the Regina Circle of Mysteries would be Cr160,000.

Talents	*Normal*	*SL (3)*	*SSA (5)*	*RCM (6)*
Telepathy	5+	3+	7+	7+
Teleperception	6+	5+	7+	8+
Telephysics	6+	7+	8+	8+
Self	7+	7+	6+	5+
Teleportation	9+	10+	7+	9+
Arcana	9+	10+	7+	5+
TOTAL	42	42	42	42

No roll is required to find a psionic school ("institute" in TNE basic rules) in the Regency as they are no longer secret. Psionic schools exist on almost all high population worlds and those with starports A or B.



Nobility in the Regency

DECLINE OF THE NOBILITY, RISE OF DEMOCRACY

An ironic aspect of the Representational Reforms is that these reforms, which began the end of noble rule in the Regency, were declared by Norris using the vestiges of his noble office. These reforms were not created by Regency-wide referenda, but by Norris' *fiat*, behaving in a manner consistent with his former status as archduke.

Noblesse Oblige

For the best of the nobles, the reforms have created no problem. They have been raised in the tradition of service, and it is for this reason only that they have had life-long advantages of education, wealth, etc. Even in a post-noble environment they know that they are above the average person in intelligence, education and skills, and will have no difficulty competing in an open meritocracy. What's more, the fact that now they will receive remuneration as compensation for public service instead of being obligated to a life of public service in response to being born into a life of automatic remuneration is a distinction without a difference to these finest nobles.

Anagath B and the Ghouls

One of the most visible symbols of the disenfranchised nobility are the so-called "Ghouls," young (by apparent age anyway), nihilistic, disenfranchised nobles who spend their dissipated lives and what remains of their noble fortunes by seeking excitement in personal and vicarious near-death experiences.

The Ghouls owe their existence entirely to the creation of the drug "Anagathic B."

Anagathic B, also known as Anagath B or "Beth," was developed in the antebellum period by researchers at the Imperial megacorporation SuSAG, LIC. These researchers were looking for an alternative to the standard anagathic drug used in the Imperium (and described on TNE pages 33-34) that would accomplish the same purpose but without the ultimate side-effects.

They seemed to have discovered this alternative, which they named Anagathic B, making the earlier drug Anagathic A. Anagath B produced none of the side effects of Anagath A, but it was eventually determined that Anagath B caused the development of radical jumpspace intolerance in its users.

Jumpspace intolerance is a fortunately rare hereditary condition that has long been known to Imperial medicine (see **Lady Elise**, included in the **Traveller Referee's Screen**). Instead of the typical moment of nausea and disorientation experienced by most passengers at the moment of jump translation, sufferers of jumpspace intolerance become seriously ill. A sufferer who is repeatedly exposed to j-translation falls victim to increasingly debilitating symptoms and eventually dies from their effects.



Unlike hereditary intolerance, anagathic-derived intolerance is not accompanied by progressive debilitation but has an all-or-nothing effect. Either the user dies immediately from massive brain hemorrhaging or else suffers no ill effects. However, also unlike hereditary intolerance, derived intolerance can be fatal upon the very first exposure to jump translation. This chance is low for beginning users, but gradually increases over years of continuous use. (Roll D100 each time the character enters jumpspace aboard a starship. If the target number, which is equal to the number of years the character has been taking Anagath B, or less is rolled, the character dies immediately. If any other number is rolled there is no effect.)

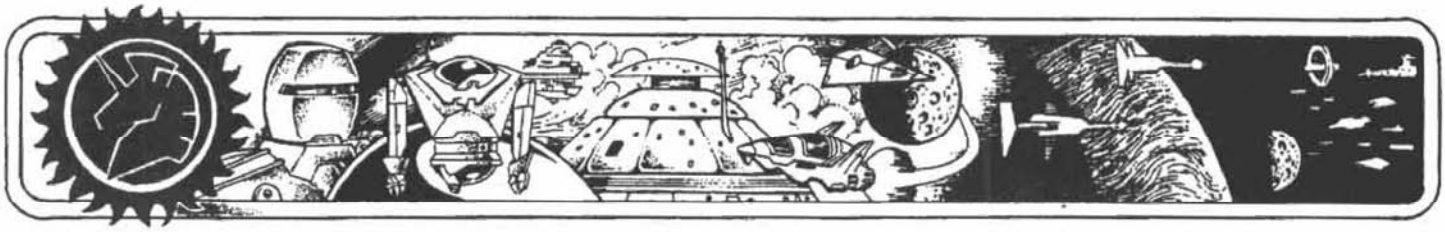
This is a serious side-effect, essentially confining its long-lived users to imprisonment in one star system for the remainder of their lives. For most Imperial citizens this was an unacceptable trade-off, and Anagath B's use was limited accordingly.

However, this trade-off appealed to certain bored, embittered, thrill-seeking terminal nobles, and these habitual Anagath B users became known as Ghouls because rather than avoiding interstellar travel they became dedicated wanderers. They would prepare for the moment of truth at jump entry by attempting to engineer some "peak experience" which would reach its climax at the scheduled moment of jumpspace entry. Thus at worst they would die in a moment of intense pleasure, and if not, would be thumbing their noses at the universe and laughing at death.

As befits wealthy individuals who do not age, Ghouls are usually attractive (except for those who deliberately make themselves unsightly for reasons known to themselves), and dress in ornate, exotic outfits, giving them an effete, foppish air.

Ghouls are narcissists, and this is not limited to their preoccupation with youth, pleasure and ostentatious appearance. They are endlessly fascinated by their reactions to events, and are especially absorbed in exploring their own so-called "dark sides" or "shadow natures." They like to think of themselves as jaded connoisseurs of depravity and debasement, things that are feared by the timid souls of most people. These explorations eventually become interwoven with their peak experiences, making these experiences more and more bizarre, and often dangerous in and of themselves, never mind the chance of dying at jump.

Sadly, Ghouls are a danger to more than just themselves. When they tire of the typical drunken orgy while anticipating death at j-translation (predictably, Ghouls prefer the term "penetration"), they try more daring experiences, often involving violence. For example, a group of Ghouls might decide that their peak experience would be to hijack the starship just as it entered jump.



However, not all nobles are able to find this path. Many have found that the notion of a meritocracy of public service is a fraud, as elective politics often amounts to a popularity contest which pays little attention to talent and rather more attention to empty or even deceitful promises. Even well-disposed nobles can become disillusioned when their attempts to take the best possible care of their constituents run up on the rocks of unrealistic public demands created by the seductive and voluptuous fantasy worlds promised by professional politicians in their sluttish relationship with immature voters.

Noblesse N'Oblige Plus, or *Après Nous, le Déluge,* Sucker

While some nobles of goodwill are defeated by the reality of the "mobocracy," others were never engaged in the process to begin with. There had always been a constituency of "underclass" nobles: selfish, corrupt and drunk with the privileges they regarded as birthrights. The Representational Reforms served notice that the free ride was about to end and it was time to squeeze every last thrill out of it before it was over. For terminal nobles (see below) they had the rest of their lives to spend as much of their allocation as possible, and no desire to do anything else.

These nobles are collectively known as the disenfranchised nobility, although it is important to realize that disenfranchisement is their own response to the situation. Many of the disenfranchised noble class have actually not been disenfranchised by their homeworlds; they have simply quit acting out a life to which they are no longer connected or with which they were never engaged.

There are two main paths for disenfranchised nobles: immersion and resistance. Immersion means the surrender of any pretense of service accompanied by immersing oneself in self-gratification. Underclass nobles provide the bulk of those choosing immersion. An extremely pathological example of immersion are the Ghouls (see sidebar).

Resistance is more damaging to society and is tragically the path more likely to be chosen by embittered nobles originally of good will. Embittered nobles resent their exclusion and seek revenge. Sometimes this is revenge against the new officials who have assumed power, sometimes against the public that abandoned them, sometimes against the Regency government itself. While many of these nobles claim to be selflessly working for a return to the better form of government that was wrongly repudiated, they have given up on truly constructive efforts, and their path is simply destructive.

Local Status of Nobility

Although Regency policy is to move the nobility aside to make room for local democratic rule, in accordance with Imperial tradition, each world has a great deal of latitude in the details of this transition process and their timing of implementation. The number and combination of these possibilities, plus the personalities involved, means that each world's solution is unique. In general terms, however, referees can find the general policies of individual worlds by adding the world's government code (reconvert letters back to numerals, i.e., A=10, B=11, etc.) to the result of a D10 roll and consulting the table.

Result	*Transition*
1-5	Revocation
6-10	Disenfranchisement
11-15	Termination
16-20	Conversion
21-25	Continuance

Note that there is considerable overlap between these types of transition, described below.

Revocation: Nobles have all of their noble rights, titles, privileges, possessions, powers and responsibilities (known collectively as "noble appurtenances") removed. This includes the loss of income from all fiefs, the loss of all voice in government, and any special exemptions from local laws and social practices. Note that most nobles maintain a distinction between their personal wealth and possessions and those that accrue to the noble position. In most cases their personal possessions are safe, and only those assets belonging to the "seat" are withdrawn. However, in cases where this division might be unclear, further conflict and hard feelings are inevitable.

Most worlds allow a transition period for the gradual withdrawal of the appurtenances to which their nobles have become accustomed. Roll 2D6 and consult the table.

2D6	*Trans. Period*
2-3	Immediate
4-5	Six months
6-7	One year
8-9	1D6 years
10-12	2D6 years

Disenfranchisement: In this case nobles retain their properties, incomes and social and legal privileges, but lose their power and responsibilities. Many worlds further stipulate that such nobles may not enter politics or government without relinquishing their noble income and privileges. On some worlds this is a one-time irrevocable selection, while on others the income and privileges are merely suspended during the term of office.

Disenfranchisement is typically an honor granted to nobles who have served long and well. Their titles then primarily confer social and ceremonial status. The length of retention of the property, income and privileges will vary. The term is usually for the remainder of the noble's life, at which point the noble seat ceases to be. Sometimes the noble is allowed to bequeath this title to his or her heirs, subject to confirmation by popular vote.

Nobles who have been thus disenfranchised have the qualifier *ceremonio* placed after their titles to reflect that their titles confer no power. Those whose titles will lapse upon their death use the qualifier *ceremonio vita,* and those who can pass their titles on to their descendants with popular ratification use the qualifier *ceremonio perpetua.*

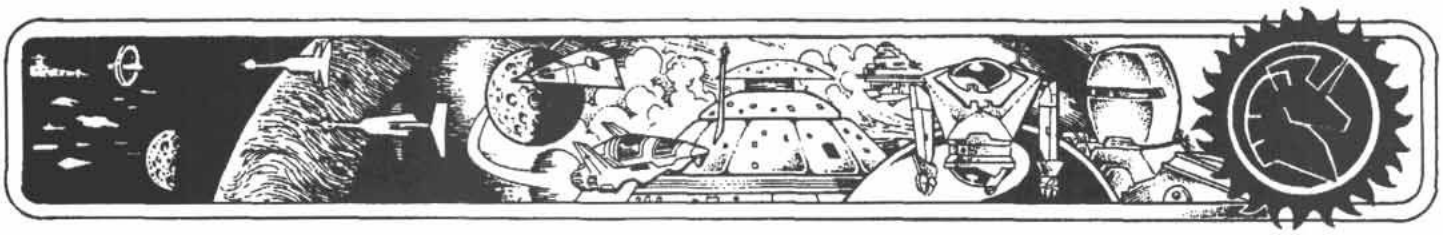
Note that the procedural meaning of disenfranchisement in this section is different from the attitudinal disenfranchisement discussed in the "*Noblesse N'Oblige Plus*" section.

Termination: This is the same as revocation above, except that it goes into effect at the end of the life of the current office-holder. Termination is often used to shunt aside difficult nobles. Allowing them and their families to retain their benefits for the remainder of their lives is a way of "buying out their contracts."

Nobles who have had their patents terminated as above retain their titles, but the qualifier *terminal* is placed afterwards.

Conversion: The noble retains all or some rights and privileges, but the scope of his or her governmental powers are reduced to some specific area of responsibility and power. This area of responsibility is typically some sort of appointed administrative, bureaucratic or judicial position, presumably one which accords with the noble's talents or expertise. Such a position may be a life-time appointment, or may be of limited duration or subject to renewal based on performance reviews, depending upon local circumstances.

This position could also be one which will henceforth be subject to popular election after some period of time. This allows an orderly transfer of power, knowledge and experience from the incumbent nobles to the future elected leaders. In most cases these nobles are permitted to stand for re-election or election to other posts, within local term limit restrictions. Because of the possibility of conflict of interest, most worlds have restrictions on the ability of former



nobles to retain their noble incomes while holding certain offices. In some cases the income is forfeited for the duration of the term of office; in others it is placed in a trust fund; and sometimes the noble is simply monitored so that he or she can be impeached if found to be engaging in self-benefiting acts while holding elected office.

Continuance: The noble retains all rights, privileges and responsibilities. However, when the title is passed to a descendant, this inheritance of the title must be confirmed by popular vote. Upon a successful vote, the new holder of the title holds the patent for life.

Other: The above categories are only a broad description of typical solutions. Variations or combinations of the above are possible, as are bizarre and unusual alternatives, such as banishment, expulsion, ostracism, out-lawing (i.e., placing nobles outside of the protection of the law), execution, branding, tarring and feathering, etc. Such results are the outcome of pre-existing local circumstances between the noble(s) and the citizenry.

Safety Net

Norris knew that the creation of a class of impoverished nobles with nothing left to lose would be a grave threat to the Regency. Therefore the Representational Reforms declared that no noble would be deprived of the means to continue living at a level "equivalent to" the level to which he or she was accustomed, although naturally the reality of this guarantee varies.

Displaced nobles who are left without property or income will be granted a stipend from the Regency government for the remainder of their lives. The size of this stipend varies with need, the noble's other means and the noble's original station. The money for these stipends comes in part from government appropriations and also from the sale of relinquished noble holdings in the Regency. Naturally nobles who have retained most or all of their property and income have no need of this service, and it is not provided to them.

Some worlds have more bizarre arrangements. Some worlds directly collect the noble stipends and operate "Service Estates," essentially the equivalent of an old soldiers' home for disenfranchised nobles. Some such estates are nice, some are crimes against decency, and life goes on.

Note that not all nobles suffer from having to give up their property and privileges. Some nobles have fiefs that are net financial drains because of low productivity or excessive upkeep on old, run-down infrastructure. The opportunity to get out from under such responsibilities is a welcome one.

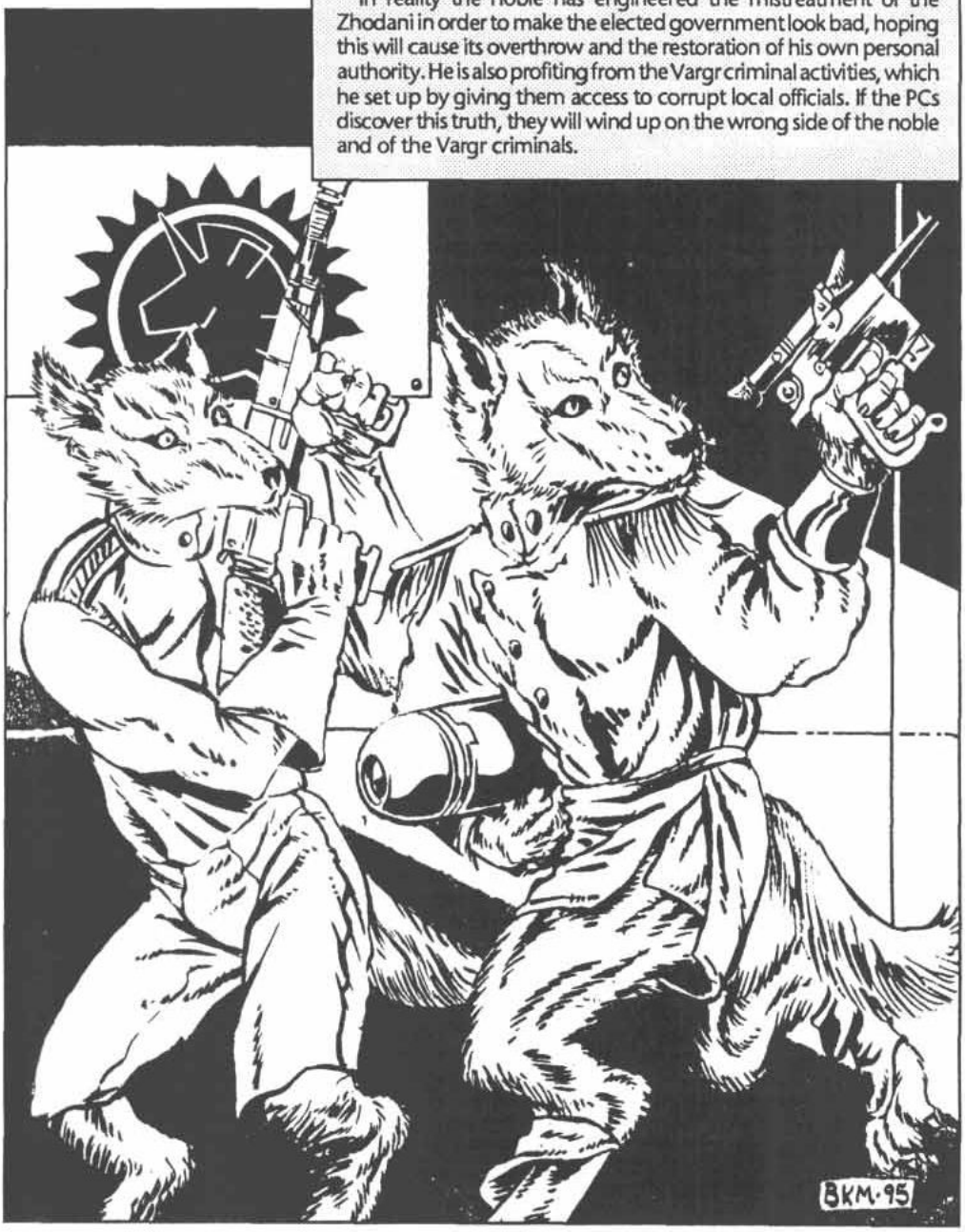
Adventure Hook

An embittered noble from a world overrun by Zhodani refugees is seeking to discredit the current elected government for their mishandling of the refugee crisis, and hires the PCs to document the "criminal conditions" under which the refugees live.

The refugees are underfed and are crammed into the unhealthful conditions of a tent city-cum-shantytown up against the starport's perimeter fence. Dedicated Zhodani nobles and intendants are valiantly trying to maintain the Zhodani social structure to maintain the well-being of their people, but the lack of cooperation from the local Regency leaders is making this difficult.

What is worse, the Zhodani are being preyed upon by Vargr organized crime, which charges extortionate prices for the food and medicine they have stolen from the refugee relief facilities.

In reality the noble has engineered the mistreatment of the Zhodani in order to make the elected government look bad, hoping this will cause its overthrow and the restoration of his own personal authority. He is also profiting from the Vargr criminal activities, which he set up by giving them access to corrupt local officials. If the PCs discover this truth, they will wind up on the wrong side of the noble and of the Vargr criminals.



Important Regency Developments

> **None Shall Pass**
> RQS motto

The following are some significant Regency organizations and developments in 1202.

RQS

The Regency Quarantine Service is a unique organization. Since the Collapse, RQS has done more than any other organization of any race or government to ensure the survival of interstellar civilization. The spectacle of destruction that is the former Imperial Wilds makes it clear that the Spinward States would not have simply survived anyway. Although its tradition is therefore something along the "so much owed by so many to so few" lines, the reality is actually much more inspiring than that stereotype.

The wonder is not that so few have accomplished so much, but that so many have come together and cooperated harmoniously for the good of all. That such a circumstance would arise at the end of the civil war which destroyed the largest society ever seen is not merely stirring—it is an affirmation of every piece of faith that one sapient has ever shown for another and an encapsulation of the true corporate meaning of "Keepers of the Flame" (see page 4).

As befits its unique and crucial mission, RQS has a unique organization. It is empowered to call on the best that the Regency has to offer, from any and all walks of life and professions. Although the RQS is a distinct and independent service, it draws on all other Regency organizations and exercises supreme command over the tasks needed to ensure the survival of human civilization.

TNE PCs will come into contact with the RQS in two main capacities: serving in it and interacting with it as private citizens.

Serving In the RQS

There are three different paths of RQS service—the active force, the reserve force and the RQS Auxiliary.

Active Force: This is the RQS proper. Like the navy or scouts, this is a full-time job. **Traveller** characters will normally not be members of the active force as this portion of a character's life is normally handled during character generation and as play begins with the characters as "free agents" ready for adventure. However, referees and players who so desire may play **TNE** campaigns which feature a PC group on active duty. Naturally the command structure and rewards received in such a campaign would be different from the more typical campaign style.

Reserve Force: Unlike the Ready Reserve below, the RQS Reserve is an individual reserve force and serves as a "holding box" that draws on personnel from many Regency services, including the navy, scouts, army, marines, civil service (bureaucrat career), foreign service (diplomat career), Ministry of Justice (law enforcement career), and other military careers (aviation, wet navy) in addition to the RQS proper.

Navy, scout, and RQS personnel are usually recalled to man spacecraft, while army and marine personnel are recalled to serve in shipboard or ground-based security detachments ("SecDets"). SecDets conduct in-system boarding and inspection operations, and also help man the RQS Inspection Offices that monitor the frontiers with the other Spinward States.

Civil service, foreign service, and MoJ personnel staff the inter-Spinward State Inspection Offices and on investigative task forces to track down and bust violators of Quarantine restrictions, such as the Vargr "Pack."

The RQS Reserve, unlike the RQS Auxiliary below, does not provide crewed ships, as reservists are called up as individuals. Instead it provides personnel only who are assigned to ships already controlled by the RQS or Regency Navy.

TNE Referees can use the RQS Reserve as a plot driver. PCs who served in any of the careers above may be periodically called up for active duty. Referees may rule that this has happened when they have a nice RQS adventure set up for their players, or they may do this randomly. For each term spent in an eligible career (as described above) there is a 2% annual chance that the character will be recalled to active duty. For example, a PC who had spent three terms in the navy, one in law enforcement, and one as a bureaucrat would have a 10% cumulative chance of recall. This is rolled once per year with D100. The duration of the recall is 2D6 months.

Ready Reserve: The Ready Reserve is not a part of the RQS, but it is discussed here for the sake of completeness. The Ready Reserve is standard reserve duty, in which the member trains on a regular basis with an established unit, usually two to four days a month plus one full month a year. When the Ready Reserves are activated, they are called up as complete units, not as individuals. Since this commitment requires some stability, PCs are unlikely to be members of the Ready Reserve.

Auxiliary Force: The RQS Auxiliary is the means by which the RQS gains access to civilian-crewed ships which can be used to augment and support the Quarantine. This is done by offering financial assistance to persons who purchase starships. The RQS will put up a portion of the purchase price in return for a percentage share in the ship. The size of this share determines how often the RQS can take this ship (and its crew) into active duty. These subsidies are most often provided for Quarantine cutters and inspection launches (pages 88, 89, and 91) but may be offered for most any type of ship (referee's discretion, although the RQS is unlikely to subsidize luxury yachts). Not all RQS Auxiliary ships are Quarantine patrollers. An RQS Auxiliary could be a far trader assigned to carry supplies between frontier outposts, or a passenger liner transporting PKF ground troops to or from their stations in the Islands.

As described on **TNE** pages 38-39, value modifiers can be taken as RQS ownership, with each point being equivalent to a 12.5% RQS share of the ship. This means that the RQS will want to use the ship 12.5% of the time (or 25% of the time with two value modifiers, etc.). However, this is not as simple as just saying that 12.5% of each year, month or week is given over to RQS duties. The time-consuming nature of interstellar travel means that there are minimum blocks of time required for useful service. For gaming purposes, assume that six months is the minimum block, although longer tours could be served.

Thus, in the case of a PC group which crews a Quarantine cutter with a 25% RQS load, six months is 25% of two years, so they can expect to serve a six-month tour once every couple of years. If the referee prefers, this could instead be a one-year tour every four years, an 18-month tour every six years, and so on.

Referees can allow these tours to be scheduled in advance, or may roll randomly to spring them on the PCs at inopportune times. Note that the RQS Auxiliary regulations are clear that RQS call-ups can be extended indefinitely at the pleasure of the service, and the ship owners have no recourse to get out of these. Thus a supposed six-month tour could be extended because of some kind of crisis, then extended again because their scheduled replacement blew its jump drive while in transit to the patrol station and requires repairs, and so on.

RQS Character Generation: For purposes of character generation, RQS service can be represented by terms in the navy and/or scouts. Service in the RQS Auxiliary is handled with terms in the merchants with increased chances for special duty.

Meeting the RQS

Aside from the likelihood that they are already associated with its operations in some way (above), PCs will meet the RQS in several routine ways.

Annual Inspection and Certification: All spacecraft and starships in the Regency are required to be inspected annually by the RQS or Regency Navy, and recertified for another year of operations. These inspections serve the main purpose of confirming that ships are free of Virus and meet all current standards of anti-viral countermeasures. (These include properly configured communications systems and databanks, as well as provision of the latest versions of Virus-detection/protection software, canaries, etc.) Additionally, these inspections are used to ensure the safety of the Regency merchant fleet. Checks include hull and fuel tank integrity, wiring and control systems, power plant and drive calibration, life support servicing, and the provision of emergency equipment such life boats, life rafts (see **Reformation Coalition Equipment Guide** pages 146-7), emergency vac suits, and rescue balls. Any deficiencies must be corrected for licensing or recertification to occur.

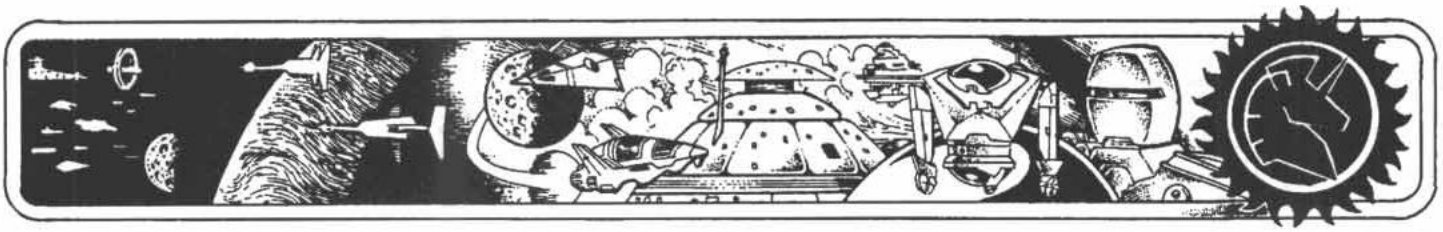
Adventure Hooks

Reserve Duty "On the Line": The PCs are called up for reserve duty on the Regency frontier, patrolling gas giants and asteroid belts for infiltrating ships, or manning an inspection post on the frontier with another Spinward State. The former allows the chance for space combat. The latter allows opportunities for mysteries: smuggling rings, Vargr organized crime or espionage.

Clever referees can see to it that all the members of the PC group are assigned reserve duty together by stipulating that they are in the same "call-up cadre." This is done by ensuring that all the PCs spend their last character generation term in the same service, preferably the navy or scouts. The referee can then rule that they served together (which assists in establishing how they all met) and were therefore assigned to the same reserve cadre and will be called up as a group to serve on the same crew.

Deep Space Sweeps: The RQS must make sure that vampire forces are not setting up their own calibration points (see Library Data) to stage their way across the Great Rift. This requires deep space sweeps, sometimes accomplished by ships with multiple-stage drop or auxiliary tanks, or sometimes rendezvous with pre-scheduled tanker support.

One effective method uses old *Azhanti High Lightning*-class cruisers converted to mobile base ships. These high-jump mother ships jump out several parsecs into deep space carrying several subsidiary starships, which jump from that central location to survey the surrounding area, then return to the mother ship for refueling. PCs with their own quarantine cutter can serve their reserve duty based on one of these ships, sweeping deep space for vampire infiltrations, on the lookout for "swift cold death between the stars."



Referees can determine the ability of a PCs' ship to pass inspection based on its wear value, level of maintenance and damage it may have sustained with the rules on TNE pages 241-244. These inspections generally take 2D6 days (during which time the crew must pay berthing costs, etc.), but the time required can be reduced by the use of Admin/Legal skill, simulating the fact that good administrative procedures and records enable the inspectors to work more quickly.

These inspections are generally performed at the same time as the starship's annual maintenance (TNE page 222).

Spinward States Interfaces: PCs who cross the interface frontiers between one Spinward State and another will meet up with the RQS in the form of the Spinward States Interface Inspection Office (SSIIO). These are similar in concept to traditional international customs procedures, but are more comprehensive to prevent the introduction of Virus across borders.

It is illegal for starships to attempt frontier refueling (at gas giants, asteroid belts, etc.) in interface frontier systems, and in fact these refueling sites are heavily defended, mined, etc. All ships crossing from one Spinward State to another must stop and refuel at the starport, where they will do one of two things.

The majority of ships do not intend to cross into the neighboring state. Instead, they unload their passengers and cargo at the SSIIO. Here the passengers and cargo are inspected for entry, and if they pass inspection are transferred to another starship already inspected and certified for operations in the neighboring state. The original ship, now unloaded, will pick up passengers and cargo outbound from the neighboring state seeking transport into the Regency.

Ships which do intend to cross into the neighboring state must undergo inspection to allow certification for operations in that state. This is time consuming (2D6 days, as above) and is essentially like the standard annual RQS recertification inspection, except that it is conducted by the foreign state's RQS counterparts, thus often requiring Liaison and Language enabling tasks to allow Admin/Legal tasks to reduce the required time. Any passengers and cargo carried are inspected at the same time.

Upon crossing back into the Regency this entire process must be repeated for Regency recertification, which explains why so few ships select this option.

A rare alternative to this is the carriage of sealed cargoes, usually reserved for Regency government business. At its point of origin the cargo in question is inspected by RQS inspectors and securely sealed. The cargo is then accompanied by an RQS SecDet which ensures that no tampering occurs. The ship must still call at the SSIIO, but need not be inspected as it is travelling under RQS jurisdiction. (Reciprocity agreements among the Spinward States Accords signatories allow them all comparable rights under certain prescribed conditions.) This is the procedure used for carrying cargo to Regency facilities, such as embassies, in other states. (See also "Four Corners," page 40.)

Standard Patrolling: Ships which operate in or near the Regency frontier will interact with RQS vessels on an almost daily basis. These vessels will be encountered near inhabited worlds and refueling points in the worlds along the Regency Safe border and in the Regency frontier.

If the PCs' vessel is a regular visitor to the area and is known to the local RQS patrols, simple radio contact will often suffice. If not, or if the RQS has reason to be suspicious, a boarding inspection is the routine procedure. The inspection is intended to ensure that a ship is not carrying Virus or contraband, or Virus-infected cargoes from beyond the frontier, but evidence of any other illegal activity (piracy, smuggling, etc.) will also be pursued. This will include routine examination and diagnostics on the ship's computer and electronic control systems, plus inspection of cargoes, passengers and other ship areas. Safety inspections will also be made.

OPENING THE FRONTIER

The impending opening of the trailing frontier has highlighted the lack of preparation for such a momentous event. With the firm rejection of the 1196 referendum there was no reason to lay the groundwork for an organized approach, and it is commonly accepted that the 1202 joint Senate-Moot act was inspired mostly by the unexpected and still uncontrolled Zhodani Exodus (see page 24).

Contrary to its record of careful and well-considered steps, the Regency seems to be lurching unprepared into the Wilds. The long-awaited triumphal return of the Keepers of the Flame, the stewards of all that was best of the Imperium, will apparently be a come-as-you-are affair.

Oklahoma Land Rush

The RQS anticipates an all-out race for the Wilds on 311-1202, the day the frontier is scheduled to be opened, as would-be explorers compete to get deep into the Wilds and get the first crack at choice territory and salvage sites.

The Regency government intends to implement a system for the registration of legal claims to unoccupied land, facilities and salvage sites, but publicly admits that these claims will be difficult to enforce, if not impossible. The Regency does not have the resources to enforce the administrative legalities of external settlement and resource recovery, nor does it have a bureaucracy with oversight in that area, having disestablished the Ministry of Colonization as part of the Consolidation Act of 1135.

It is expected that the wildside environment will be a complete power vacuum and a frontier in the classic sense—an area with no infrastructure and no order save that which explorers impose upon it. Might will often make right; more or bigger guns will doubtless outweigh technically legal claims; and frontier citizens will have to band together to create legal systems, either by vigilantism or by the hiring of mercenary law enforcement personnel.

It is not the Regency's intent to disown these governmental responsibilities and wink at lawlessness, but there is insufficient organization in place to do anything other than admit that Regency authority will remain behind the curve on the wildside for the foreseeable future.

No Back-Flow

The Regency frontier will be defended just as it has been for the past 70 years. In other words, for the near term, any Regency ship which heads outbound across the frontier makes a one-time irrevocable election, as it will not be allowed back in. Vessels attempting to return will be stopped by the RQS at the frontier just as refugee and vampire ships have been stopped. However, although the RQS impounds and inspects these vessels to see if they can be returned to service within the Regency, it will not offer this service to returning explorers, as the number of ships involved would quickly overwhelm RQS capacities.

More than the courage to accept this bargain is required to "go wildside." Those desiring to take advantage of the opening of the frontier must apply to the RQS for licensing to do so.

Among these restrictions are the following:

- No starship with a current RQS ownership share will be allowed to cross out of the frontier on private business. (Naturally RQS Auxiliaries on active duty are allowed to do so as part of their assignments.)
- Ships judged to be "uniquely valuable" by the RQS and Ministry of Shipping will not be allowed to depart the frontier.
- No ship deficient in standard anti-viral measures may cross out of the frontier.
- Ships or individuals deemed to be poor risks, such as known criminals, those believed to be connected with past violations of Quarantine regulations, etc., may be denied permission to cross out of the frontier.

The requirement to maintain the Quarantine while allowing meaningful contact with the expansion will be met by a combination of designated frontier trading worlds and a fleet of officially licensed interface transports.

Frontier Trading Worlds: Because of the need to prevent incoming Virus infection, the RQS will exercise strict control of all transits across the frontier. This will be achieved by allowing only a small number of wildside and safeside termini for such transits, all of which will be operated by the RQS.

The wildside termini will be established on or just beyond the Regency frontier, and will be gradually extended to trailing as circumstances warrant. Cargoes and passengers shipped into the Regency from these wildside termini will be first inspected and approved for import, then carried exclusively by a fleet of RQS-approved interface transports.

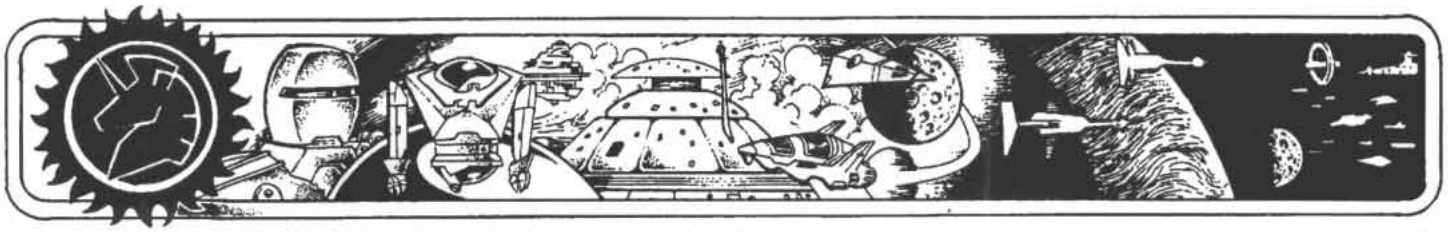
Thus all trade of recovered goods will take place outside of the Regency frontier on the wildside termini worlds where goods bound for Regency markets will be sold to the agents who will bring them into the Regency for ultimate sale. See pages 54, 58, 62 for the designated locations of these frontier trading worlds.

The Regency facilities on frontier trading worlds will consist of starport services for the interface transports, separate starport facilities for the wildside shipping (these will be operated by wildside organizations and will be self-sustaining, not requiring Regency investment), and the RQS inspection offices where all inbound cargoes and personnel will undergo rigorous inspection. The inspection offices will also include extensive secure warehousing to allow for the accumulation of goods awaiting inspection and certification for import.

Because of personnel limitations, the RQS control teams will not be able to conduct law-and-order operations outside of the designated RQS inspection offices.

Regency Licensed Interface Vessels: These are the only civilian vessels (these restrictions obviously do not apply to Regency military vessels) which will be allowed to cross the frontier inbound to the safe area. They will be rigorously inspected before being licensed and painstakingly recertified on a regular basis to ensure that they are free from viral infection or any other dangers.

These are not ideal ships for PCs to own, as there is no chance for adventure of any kind. The whole idea behind the Regency licensed interface vessels (RLIVs, pronounced "Arlivs") is that their operation is dull, routine, absolutely predictable and absolutely safe. RLIVs are large vessels with jump-2 or better performance to reduce the required number of sorties and the duration of trips across the frontier. (See **World Tamers Handbook** pages 107 and 109 for the Tukera freighter and



frontier transport, both ideal for this role.) PCs who must book passage to cross the frontier will travel on such vessels.

These vessels are clean, frequently inspected, and well-maintained. They all contain RQS security detachments ("SecDets"), consisting of half a dozen or more ship's troops trained in cargo inspection and shipboard security. Some SecDets contain special license telepathic or teleperceptive surveillance psions (see page 14). Passengers may not carry weapons of any kind. All weapons are confiscated and inventoried when brought aboard and transported under lock and key. They are only returned to their owners upon arrival at the interior terminus.

Cargo shipping costs and passenger tickets aboard RLIVs are twice those given on TNE pages 219-240. This is because of the additional expenses and difficulties of operating RLIVs and also because interface transport is a seller's market.

THE XWEB

The lessons of the Final War and the Collapse have led to the downfall of the old express boat (Xboat) routes and their replacement by the XWeb, a more comprehensive and effective system.

Public outrage at the blatant cynicism of the Third Imperium's maintenance of parallel jump-6 routes for the noble elite and jump-4 routes for the Great Unwashed spelled the end of the jump-4 system. When everyone was equal in their vulnerability to being snuffed out by Virus, there was no longer any excuse for separate and unequal access to information.

In addition, the governing concepts behind the old Xboat network were long since obsolete. First of all, the system was too hierarchical. It made judgments that certain worlds were more important than others and established routes to cover those worlds. Worlds off these routes were penalized by receiving their information later. The Xboat network also assumed a linearity to the dissemination of information, i.e., that information was pushed from a central location out to the Imperial periphery in the same way that constant pressure is maintained in a water distribution system. Both models were completely wrong-headed.

The Xboat network was therefore never a true information network. Rather, it was a *control* system rather than a *communication* system—it efficiently pushed instructions from the Imperial capital out to the domain, sector and subsector capitals where they could be carried out. The ability of one subsector duke to communicate with another was not addressed by the system, and that distinctively Imperial principle of centrally held absolute power was forever discredited by the Civil War and the Collapse. Power must be distributed. Local leaders must be empowered to do what needs to be done, not hamstrung by waiting for instructions from above. And information is power, a truth that the Imperium recognized, but it nonetheless managed only to covet and squander it.

The fact of the matter is that it is impossible to determine in advance where crucial information will come from and where it will be most quickly needed. Information cannot be anticipated. It arises where it will, according to its own rules. Humans "manage" information in the same way that real estate collects rainwater. Neither can move around to catch only the portions they need. Both are reactive and depend on spreading as far as possible to increase the odds of catching whatever happens to come their way.

Information systems cannot be hierarchical. Their organizations must be "flat"—every information collection node is also an information transmission node is also an information receiving node. All information must be passed in *all* directions, for only the recipient of information can judge its value, not its sender. Thus there is not a direction of information flow—information flows in all directions at all times.

The XWeb is organized according to these principles. Regency maps no longer display Xboat routes; all worlds are coequal recipients and transfer points of information, and information flows as readily toward leadership centers as it can be sent out from them.

There are now no longer any information backwaters in the Regency, for the simple reason that post-Virus society cannot afford them. Virus uses ignorance and gaps in situational awareness to worm its way into a society. By the time it reveals itself and strikes, it is too late—the society has already been fatally compromised.

The new XWeb is a unique partnership of Regency government and business. The need to *rapidly* establish a *comprehensive* system at an *affordable* cost meant the government could not do it alone. However, avoiding a profusion of independent, duplicative, privately owned systems required unified oversight, which required government involvement. The compromise is that although the Regency operates the XWeb (through the Scout Service's Communications Office), its costs are covered by the commercial sector which subscribes to the XWeb.

All business requires communications. Corporations require means of internally disseminating data on production, market changes, personnel, payroll, etc. The news media deals directly in information of all kinds and requires access to it. Universities and other research organizations need access to findings and journals. Individuals require the means to send messages to loved ones, and to gain access to consumer goods and services. All these are willing to pay for the capabilities.

All the XWeb couriers, Xboat, Dboats (dispatch boats, military-configured Xboats), and Jboats (jump-capable boats, see page 88) have their operational costs subsidized by the commercial market. Companies, news agencies and entertainment distributors rent blocks of electronic databanks and use these to "ship" information the same way a parcel service ships physical goods. Individuals pay for the carriage of their message on a piece-by-piece basis. But all couriers retain databank space for "public service" information: official communications between government agencies, military forces, or law-enforcement bodies, addresses from political or government leaders, diplomatic "virtual pouches" of the Regency Foreign Service, public interest announcements from consumer watchdog groups, traveller's advisories and simple, raw, nonproprietary news collected from each world's XWeb nexus. The volume of this last category is staggering, including information rippling its way from one end of the Regency to the other, reflected, refracted and modified as it comes into contact with other information ripples.

So what is the difference between this free public access news and the reporting and journalism that news agencies pay to bring in and sell in newspapers, magazines, cable and direct-broadcast services? The same as the difference between raw materials and manufactured goods. The news media sell the added value that comes from synthesis, interpretation, presentation and organization. People pay for this because they can't afford to wade through raw data all day to net the few nuggets they need.

The XWeb uses most of the same resources as the old network: Xboats, Xboat tenders, way stations where the ships undergo maintenance, and scout service pilots and support personnel. Added to the old mix, however, are military construction jump-6 Dboats to speed up the rate of information flow and small Jboats that fill in the small gaps where the extra range of high-jump craft would be wasted. The stated goal of "one Xboat arriving every day at every world from every world within six parsecs" is not always achieved, but the tempo of XWeb data deliveries is much higher than was ever achieved by the Imperium's Xboat network.

Adventure Hook

PC groups do not have to head into the Wilds to be involved in the opening of the frontier. The PCs might elect to become speculative purchasers on the frontier trading worlds. They will interact with Wilds traders, negotiating to purchase their cargoes, then, as the new owners, pay for their shipment into the Regency for ultimate sale. This sort of trading is not handled by random rolls on tables like those on TNE pages 236-240. These sales involve unusual objects and interaction with various unique and colorful Wilds explorers. They should be roleplayed with various interaction tasks such as Bargain, Marketing, Persuasion, etc.

Items rejected by the RQS inspection are impounded and destroyed, with no compensation for the owner, and the current owner takes the financial risk of inspection. Explorers are eager to sell goods to purchasing agents before inspection, though they cannot ask as much for uninspected goods as they can for those already cleared for shipment. PCs will therefore want Virus inspection skills to enable them to negotiate wisely.

DROYNE AND CHIRPER ACTIVITIES

Unlike the races that are described in the Spinward States section, the Droyne and Chirpers do not constitute a separate state. Distributed widely but sparsely throughout the territory of the former Imperium, the Droyne and Chirpers at no point achieve sufficient population density or mass to exercise power beyond the planetary level. And without a unifying racial cause to draw their widely separated communities into a single voice, they constitute a quiet minority taken for granted by most humans. In fact, to those who devote thought to the subject, this lack of racial ambition seems quite unusual. Humans, Aslan, Vargr, K'kree and Hivers all demonstrate the kind of "fire in the belly" that allows a race to beat the odds and spread across wide areas of interstellar space. This fire seems to be absent from the Droyne, which makes their wide distribution something of an anomaly.

Nonetheless, the Regency's Droyne and Chirper citizens are participating in significant ways in the Regency's development.

One remarkable example of bootstrapping within the Regency is the Droyne uplift program for Chirpers. Chirpers are simply "degenerate" (or, more politely, *uncasted*) Droyne, and can therefore be raised up into Droyne simply by reintroducing them to the *Iskyar* ritual (see TNE page 72 and **Path of Tears** pages 118-19).

Chirpers and particularly Droyne are also extensively involved in the Psionic Renaissance which began in 1133.

The Spinward States

Spinward States Timeline

Imperial	*Terran*	*Zhodani*	*Aslan*	*Event*
-4000	AD 518	1211.1	-2186	First Zhodani core expedition.
-2800	AD 1718	1741.3	-817	First Zhodani contact with Vargr.
-2000	AD 2518	2095.2	95	First Zhodani contact with Vilani traders.
-1776	AD 2742	2194.2	350	Rule of Man collapses. Long Night begins.
-1000	AD 3518	2537.2	1235	Zhodani Consulate reaches present size.
-924	AD 3594	2571.1	1322	Darrians reach TL16. Sun destabilizes.
-630	AD 3888	2701.1	1658	Island subsectors colonized.
-399	AD 4119	2803.1	1921	Sword World colonization begins.
-186	AD 4332	2897.2	2164	First Sword World Confederation.
50	AD 4568	3001.3	2443	First Zhodani contact with Imperial traders.
60	AD 4578	3006.1	2445	Imperial colonization of Spinward Marches begins.
148	AD 4666	3045.1	2545	Imperial scouts recontact Darrians.
461	AD 4979	3183.2	2902	First Aslan contact with Zhodani.
500	AD 5018	3200.3	2947	Imperial explorations into Zhodani territory.
589	AD 5107	3240.1	3048	First Frontier War begins.
604	AD 5122	3246.3	3065	First Frontier War ends. Imperial Civil War begins.
615	AD 5133	3251.2	3078	Second Frontier War begins.
620	AD 5138	3253.3	3083	Second Frontier War ends.
622	AD 5140	3254.3	3086	Imperial Civil War ends.
718	AD 5236	3297.1	3195	Xboat system covers entire Imperium.
750	AD 5268	3311.1	3232	Seventh Zhodani core expedition.
800	AD 5318	3333.2	3289	Imperial Psionics Suppressions begin.
826	AD 5344	3344.3	3318	Psionics Suppressions end.
979	AD 5497	3412.2	3493	Third Frontier War begins.
986	AD 5504	3415.2	3501	Third Frontier War ends.
1082	AD 5600	3458.1	3610	Fourth Frontier War ("False War") begins.
1084	AD 5602	3458.3	3613	Fourth Frontier War ("False War") ends.
1107	AD 5625	3469.1	3639	Fifth Frontier War begins.
1110	AD 5628	3470.2	3642	Fifth Frontier War ends.
1116	AD 5634	3473.1	3649	Strephon murdered. Third Imperium begins to fragment.
1117	AD 5635	3473.2	3650	Corridor severed by Vargr. Domain of Deneb isolated.
1119	AD 5637	3474.2	3652	Aslan *ihatei* incursions into Domain of Deneb increase in strength.
1130	AD 5648	3479.1	3665	AI Virus released. Collapse begins.
1131	AD 5649	3479.3	3666	Quarantine completed. Joint Aslan-Domain fleets destroy vampire fleets attempting to cross Great Rift.
1132	AD 5650	3480.1	3667	Regency established with Norris as First Regent. Sword Worlds attempt land-grab. Spinward States Accords signed.
1133	AD 5651	3480.2	3668	Regency Frontier created. Abandonment begins. Border Worlds and Gram arm absorbed into Regency.
1139	AD 5657	3483.1	3675	Rape of Trin.
1140	AD 5658	3483.3	3677	Regency annexes Islands subsectors.
1149	AD 5667	3487.2	3687	Eighth Zhodani core expedition.
1157	AD 5675	3491.1	3696	First Regent Norris dies.
1196	AD 5712	3508.2	3741	First Regency referendum on re-opening borders voted down.
1201	AD 5717	3510.2	3746	Zhodani Exodus begins.
1202	AD 5718	3511.1	3748	Outrim Regency frontier is opened.

The Spinward States consist of all of the surviving interstellar governments spinward of the Great Rift in the post-Collapse period. By signing the 1132 Spinward States Accords these states cooperated in the founding of the Quarantine, which is the mechanism by which they have all survived. Chief among these are the Regency, Zhodani Consulate and Aslan Hierate. Other significant groups are the Darrian Confederation, Sword Worlds and Vargr splinters.

Many of these states were mutual enemies for centuries before the Collapse. Their current cooperation is not a collective change of heart, but is rather the pragmatic recognition that if any of them were to survive, they all had to cooperate, because Virus has no allies, only victims. As the threat of Virus recedes, it is assumed that old rivalries, held in check by the threat of Virus, will reassert themselves.

But for now, the Spinward States are at peace.

Character Generation

The **Regency Sourcebook** has insufficient space to present fully developed character generation systems for each of the races and societies of the Spinward States. Future **TNE** products will cover the complex interactions of social details, unique careers and advancement structures of these fully developed societies and how these affect character generation.

For the time being, **RSB** provides sidebars on how the basic **TNE** character generation procedure can be modified to provide more distinctively alien characters.



ZHODANI

The Zhodani are basically a human society that has embraced the use of psionic powers. All other distinctions between Zhodani and Imperial society either derive from this or are irrelevant hair-splitting.

History, Society and Government

The Zhodani are a major human race, transplanted by the Ancients to the world Zhdant (usually called "Zhodane" in the Imperial period). During their early history they were one of the few human races to actually develop in parallel with another intelligent race, the Chirpers of the Qiknavra continent.

As can be seen from the Zhodani timeline, their society is both old and remarkably stable. No other power can claim one uninterrupted form of government for the past 7000 years. This can be understood by the stabilizing and unifying way in which they have used psionics, which they embraced early in their history.

Zhodani society is divided into three classes: proles (SOC 9–), intendants (SOC A), and nobles (SOC B+). The society is democratic, but the right to vote is only extended to nobles. It is used to elect fellow nobles to Councils, which exist from the local level all the way to the top of Zhodani society. The government (in Zhodani, *Driantia Zhdantia*) is essentially a hierarchy of Councils, each of which elects a certain number of its own members, called *Consuls*, to the next higher Council and so on, all the way up to the Supreme Council which is the ultimate authority of the Zhodani Consulate.

Noble status is conferred by heredity, but nobles are also created as a reward for service. The most significant route to the nobility comes from success in the Psionic Games, held once every olympiad (three Zhodani years or 2.25 Imperial standard years). Intendant status is gained by being elevated from the proles in recognition of psionic talent, and intendants can then compete in the psionic games to ascend to the nobility. Proles have no psionic capabilities, but they are not regarded as lesser persons because of it. Not everyone has psionic powers: Proles may be elevated to the nobility through service, and many hereditary nobles have no psionic powers either. Despite these exceptions, Zhodani society functions to pull psionic talent up to leadership roles. Thus the Zhodani are ruled by an aristocracy/meritocracy of psions, and every aspect of their society reflects this reality.

Zhodani Psychology and Sociology

Thought Police: No aspect of Zhodani society is so misunderstood by the Imperial mind as the infamous Zhodani Thought Police, the *Tavrchedl'*. While Imperials picture a secret gestapo which uses psionics to spy on the population for signs of incorrect thinking, which they then correct by brainwashing or worse, the Zhodani are reassured by the *Tavrchedl'*, which means "Guardians of Our Morality."

To the Zhodani, the psychological discomfort that causes one to lie, cheat,



steal, commit adultery, murder or even simply *to be unhappy with one's lot in life* is no different than the physical discomfort associated with physical illness. Just as Imperial society uses medicine to heal physical ailments so that no stigma is attached to the innocent sick person, Zhodani society uses psionic techniques to detect, diagnose and treat psychological ailments to heal people from unhappiness or antisocial sentiments, again with no stigma attached to the once psychologically sick but now healthy and happy person.

The *Tavrchedl'* merely identify those who would benefit from psychological treatment, called *re-education*, much the same as an itinerant doctor spots early stages of illness among those he visits and treats them. In both cases society benefits from this service, and no one's privacy or personal dignity is compromised by being given the opportunity to feel better.

Because a Zhodani psionic psychiatrist can actually see, hear and feel what is going on in the patient's mind, then psionically treat those things directly, Zhodani psychiatric treatment is quick and much more successful than Imperial methods which rely on years of guesswork, groping and allegorical mental models.

The full integration of psionics into society has other far-reaching effects as well.

Dirty Little Secrets: It has been said that "we are only as sick as our secrets." By its nature, Zhodani society permits fewer secrets than Imperial society and is arguably healthier.

An Imperial man, for example, might be embarrassed if others knew he found the wife of a colleague to be very attractive. He might even feel guilty he is having such thoughts, and this guilt might hurt his working relationship with his colleague. A psionic Zhodani, on the other hand, would not be threatened by this fact at all, because he or she would know full well that all people have similar feelings, and that these feelings in and of themselves are harmless. What is more, all of Zhodani society, the psionic and nonpsionic alike, would know this to be the case because of the broad public awareness of human mental functions. They would know which feelings are common and harmless, and which feelings would benefit from treatment. Either way, they would not find these thoughts to be threatening.

Because Imperials are accustomed to keeping such thoughts and feelings private, they find it hard to assess their significance. Does thinking something mean that you really want to do it? That you will do it? Does admitting to it give it more control over you, or less? They can insecurely imagine that others are not bothered by these experiences and that they are alone in having these "bad thoughts," which they dare not admit for fear of being unkindly judged.

Returning to our example, if the colleague found out about the man's feelings for his wife, he might become angry, because, not being able to read the other man's mind, he would have no way of knowing how trivial or serious the attraction was, and might fear it to be worse than it really was. Or perhaps he is afraid his wife is bored with him and she might be tempted by the other man's feelings.

Our Imperial man might also find that the longer he kept this secret, fearing what others would think of him, the more power it gained over him until it became an obsession that would hurt him, his colleague and the wife. On the other hand, the man might find that if the truth came out, everyone could have a good laugh about his harmless "crush," and he would realize there was nothing so terrible about his dirty little secret after all, thereby disposing of his guilt.

The key theme in these scenarios is the dysfunctional situations that can be created by a small, simple secret in a society that perpetuates barriers between people, and the way simple disclosure can defuse these things in a society that allows people to share their feelings without fear.

Another dirty little secret comes from the Imperial tradition of "emotional sovereignty." Imperials like to be able to conceal from each other the fact that their feelings have been hurt or that they are afraid of things. This, they believe, makes them less vulnerable to others. Allowing others to know where your emotional weak spots lie gives them weapons to use against you. Keeping these secret is assumed to allow you more maneuvering room, and more psychological safety.

On the other hand, Zhodani psionic abilities makes all of Zhodani society well aware of the vast number of fears and sources of hurt feelings that are shared by all humans. Because these tendencies are shared by all, they are not a source of vulnerability, but are things that can be handled by a corporate response. Zhodani society is therefore invariably more polite than Imperial society.

What is the difference between these two attitudes? Only one: that of awareness. Imperials are not aware of how much all humans are alike and are prone to imagine that they have unique weaknesses, i.e., "I must be the only one who feels this way, so I must keep it a secret."

Zhodani society, on the other hand, has empirical knowledge that people in a given society are all pretty much the same. This lack of emotional loneliness gives Zhodani fewer reasons to fear each other. Zhodani society is therefore warmer than Imperial society, as Zhodani are more likely to make themselves emotionally vulnerable than are Imperials, and drastically more likely to do so than members of the sociopathically status-driven Aslan, Vargr and Sword World societies.

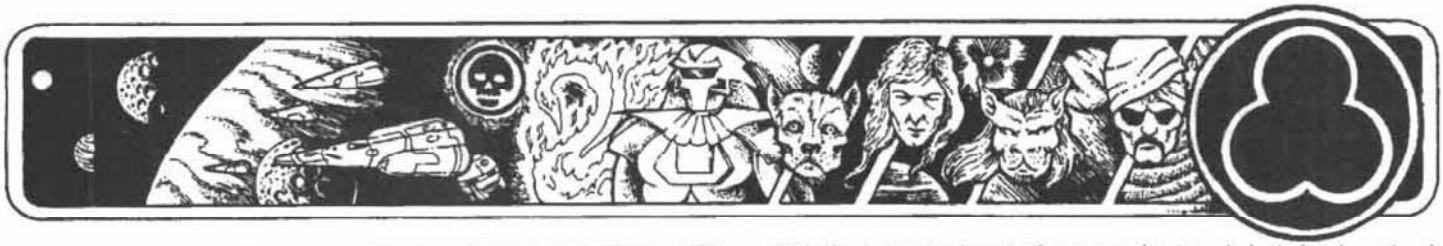
Zhodani Privacy: Although it is true that Zhodani are more likely to make themselves emotionally vulnerable than Imperials, this does not mean Zhodani society is a miserable soup of teary, warm-and-fuzzy soul-baring. On the contrary, such behavior is seen in Imperial society only as a reaction to the rigid rules of emotional sovereignty. This sort of behavior is unheard-of in Zhodani society for the simple reason that it is unnecessary.

Weepy soul-baring of the type seen on many Imperial holovid "talk shows" is the result of the build-up of psychological pressure required by emotional sovereignty. A lifetime of keeping secrets about one's true feelings out of fear that others might learn the truth causes tremendous spiritual distress. The most common ways in Imperial society to deal with this stress are to turn it inward so that it ultimately damages the self, or to periodically purge the system by pouring it out before a group of witnesses.

In Zhodani society, where no one is afraid of the psychological and emotional truths about themselves, there is no need to gush about them, because there is no need to keep them a deep dark secret in the first place.

Zhodani Timeline

Imperial	*Zhodani*	*Event*
-400,000	-170,000	Ancients transplant humans onto Zhdant.
-299,700	-126,600	Ancients' final war strikes Zhdant.
-200,000	-85,000	*Homo zhdotlas* arises on Zhdant (195,000 BC).
-15,000	-3500	Rise of modern *Homo sapiens* on Terra (10,500 BC).
-8590	-817.3	Zhodani invent printing press (4072 BC).
-8540	-795.1	Zhodani first encounter Qiknavrats (Chirpers).
-8500	-778.1	Zhodani discover psionics.
-7980	-548.1	First Zhodani space exploration (3462 BC).
-7959	-538.3	First expedition to Viepchakl.
-7950	-534.3	Viepchakl base established. First encounter with Viepchaklts (Chirpers).
-7949	-534.2	First meeting between Qiknavrats and Viepchakl. Plague.
-7948	-534.1	Viepchaklts and Qiknavrats extinct.
-7945	-532.3	Plague spreads to Zhdant. Two-thirds of Zhodani population killed.
-7940	-530.2	Second Dark Age.
-6800	-25.2	Zhodani recovery.
-6731	1.1	First Psionic Games, Zhodani calendar begins (2213 BC).
-6200	238.3	First Zhodani planetary missions (1682 BC).
-6000	327.1	First Zhodani sublight interstellar flights (1482 BC).
-5823	405.2	Zhodani Consulate established (1305 BC).
-5415	585.3	Zhodani discover jump drive (897 BC).
-4000	1211.1	First core expedition launched (AD 518).
-2800	1741.3	First Zhodani contact with Vargr.
-2000	2095.2	First Zhodani contact with Vilani traders.
-1000	2537.2	Zhodani Consulate reaches present size.
50	3001.3	First Zhodani contact with Imperial traders.
60	3006.1	Imperial colonization of Spinward Marches begins.
461	3183.2	First Aslan contact with Zhodani.
500	3200.3	Imperial explorations into Zhodani territory.
589	3240.1	First Frontier War begins.
604	3246.3	First Frontier War ends.
615	3251.2	Second Frontier War begins.
620	3253.3	Second Frontier War ends.
750	3311.1	Seventh core expedition launched.
800	3333.2	Psionic Suppressions in Imperium begin.
826	3344.3	Psionic Suppressions completed.
979	3412.2	Third Frontier War begins.
986	3415.2	Third Frontier War ends.
1082	3458.1	Fourth Frontier War begins.
1084	3458.3	Fourth Frontier War ends.
1107	3469.1	Fifth Frontier War begins.
1110	3470.2	Fifth Frontier War ends.
1119	3474.2	First evidence of Zhodani troubles seen by Domain.
1132	3480.1	Spinward States Accords signed.
1201	3510.2	Exodus begins.



Adventure Hook

Regency psions are being recruited to help assist Zhodani refugee groups. Their nature as psions will give them common ground with the Zhodani and help in establishing trust. The psions are to teach the Zhodani how to live in Imperial society, but this is difficult when the Zhodani do not live in Imperial society but instead are crammed into camps with tents and shipping crates for houses. Food and medicine are in short supply, and there is no shortage of opportunists attempting to bilk the Zhodani out of their meager savings and few possessions. Even worse, local groups suspect that the Zhodani are up to something (see sidebar, "Reasons to Hate the Joes") and are organizing a campaign to kick the filthy aliens off the world.

Reasons to Hate the Joes

The Zhodani, or "Joes" as they are pejoratively called by imperials, have been hated for a long time by residents of the Domain of Deneb, so there is little need to come up with new reasons. However, the Exodus has presented the following, adopted by many Regency citizens.

- They suck up relief funds that could go to developing this world's real needs. Plus they provide cheap labor and will take our jobs.
- There goes the neighborhood. Refugee camps don't raise property values. They merely attract more refugees, flies, disease, squalor, and crime.
- The refugees are merely squatters, just like those damn Toons (page 81). It will be impossible to get them off this world once they become established. They'll set up Joe ghettos and be here forever.
- This is an invasion, in the ecological/social-Darwinism sense: "history is the story of the migration of peoples." Warfare is warfare, and imperial humans can not allow themselves to get pushed out of their territory.
- This is the prelude to an invasion. The so-called refugees are either fifth-columnists preparing the way for the military formations, or are a smoke screen which will mask the coming of the real invasion fleets.



With Zhodani society keeping few secrets about psychological and emotional issues, there has arisen a custom of compensating for this by maintaining boundaries around other areas of life.

Family life, for example, is kept private. Not because anything there is secret, but because there is great dignity in things done for their own sake, not for the consumption of society at large. Such family acts include daily rituals between spouses, between parents and children, between siblings, and between children and their pets.

In a similar way, Zhodani dress is more "modest" than most Imperial fashions. Imperial fascination with the covered and uncovered nature of the body is a further manifestation of their difficulty with the strictures of emotional sovereignty. Imperials are usually thwarted from attaining true emotional connectedness, and they have learned to fill this emptiness by increasing emphasis on the physical portion of personal contact. Their dress shows this by often functioning to advertise one's suitability and availability for physical contact. From the Zhodani point of view, placing the burden of true personal connectedness on merely physical concepts is ludicrous. For example, there is no analog to the Imperial "string bikini" in Zhodani culture. Zhodani have no need to compensate for an emotional isolation they do not experience by focusing attention on physical appearance and inflammatory anatomical details. A Zhodani who wished to go about naked would simply go about naked, while one who wished to remain clothed would remain clothed. Zhodani find no titillation in "clothing" which does not cover, or in pretending to be "dressed" while being as undressed as possible. Such clothing is thought by the Zhodani to be childish and prurient.

Sheep Among the Wolves

Pity the poor prole, displaced from his home, ripped from his well-adjusted, stable, dignified society, and plopped onto an Imperial world, bastion of anti-psionic prejudice and home to a race of constitutional liars, incapable of even learning the truth about their own minds. This is the reality of the Exodus for its most numerous constituents. What will they do? Where will they go? How will they find satisfying lives, or even food and shelter, surrounded by people who have fought them for 600 years?

The Zhodani are trusting, because they lived in one of the few societies that allowed them to be. They don't know how to defend themselves from lies and deceit because they have never had to. They are easy marks for the most transparent charlatan, let alone the professional swindlers, con artists, carpet-baggers, junk bond kings, divorce lawyers, used car salesmen and politicians.

Fortunately the proles are not alone. All groups of Zhodani refugees are shepherded by the intendants and nobles from their community, who do their best to protect their charges from the injustice the universe has to offer. They protect their proles from criminals and dishonesty by interviewing and psionically reading the non-Zhodani who come into contact with the group. They represent their proles in their dealings with local authorities and accompany them when they go to Regency welfare offices and courts in order to lend their legal knowledge, authority, and the moral support of their presence. By these examples, the Zhodani nobility are noble indeed.

Why the Exodus?

No one in the Regency understands the reasons for the Exodus, but there is no shortage of speculation, including the signs as early as 1119 of internal unrest in the Consulate (**Survival Margin** pages 22-23). What is surprising is that even the refugees themselves are of little help, as many appear to have taken flight without first-hand experience of whatever it was that was causing them to flee.

The Zhodani are unanimous in their belief that their society is in danger of being destroyed from within. References to internal strife and Zhodani-on-Zhodani violence and even warfare are common. But when asked how much of this took place on their homeworld before they were forced to flee, refugees admit, reluctantly it seems, that they saw none of this themselves. When pressed they will point out that very strong "intimations of doom" were felt by almost all Zhodani, proles, intendants and nobles alike, but the specifics and importance of these motivations are hard for them to express now, the way a dream fades from memory after awakening. When this kind of questioning forces its Zhodani subjects to come face to face with the strange vagueness of their reasons, the best they can do is to assure the questioner that it all made sense at the time.

Creating Zhodani Characters

Zhodani characters may be created using the character generation procedures presented in **TNE** with the following modifications.

Attributes: These are as described in **TNE** except for PSI and SOC (see below).

Psionics: Zhodani receive their psionic training at age 17 during character generation before any career terms are resolved. This means that Zhodani



characters roll 2D6-1, guaranteeing at least PSI 1. It impossible to create a prole character using this method, which is the whole point really, because why would you want to create a Zhodani character who was not psionic?

Just for the sake of discussion, see the note on Psionic Frequency on TNE page 246.

A	(10)	-iepr
B	(11)	-atl
C	(12)	-stebr
D	(13)	-tlas
E	(14)	-tlasché
F	(15)	-iashav

Social Standing: Because of the psionic effect above, all such characters will be intendants at least, so simply give Zhodani characters a beginning SOC of A.

Careers: Referees should modify TNE careers to allow improvement of psionic skills during term resolution.

Naming: When naming Zhodani characters, note that they add standardized suffixes to their names (family names for intendants; nobles have only one name) based on their SOC attribute, seen in the box above. This suffix changes with changed social status.

ASLAN

Of all of the former Imperium's neighbors, the Aslan had the widest distribution, being adjacent to both the Solomani Rim far to rimward and the Spinward Marches, at the Imperium's spinward extreme.

The Aslan resemble large Terran felines of the lion family, but the resemblance is merely coincidental. Aslan are larger than humans, averaging about two meters in height. They are all equipped with an integral weapon, called the *aisai* or dewclaw, on each hand which they instinctively and effectively use in combat. Incidentally, Aslan have only four manipulative digits on each limb, with the result that their math uses base 8 rather than the base 10 of five-fingered humans.

Aslan Hierate

The Aslan Hierate formerly stretched from the Solomani Rim across the Great Rift to the Spinward Marches. However, like the Imperium, its area trailing the Rift was ravaged by Virus and is now Wilds, leaving only the areas across the Rift to survive into the post-Collapse era. This area was formerly called the Aslan Colonies or trans-rift colonies, but is now all that remains of the Aslan Hierate itself.

Aslan society is organized along family lines, with the family (*ekho*) of two to 12 Aslan as the basic unit. Families are organized into "prides" (*ahriy*) with one dominant family. Finally, prides are organized into a clan (*huiha*), again with one dominant pride. All subordinate members of that clan owe fealty to the clan and to its single clan leader. Family/pride/clan loyalty is very important among the Aslan. In fact, the phrase *Sihouwelilyiuahryi*, "Your pride calls to you," is an invocation that will not be denied by any Aslan blood relative.

The Hierate is "ruled" by the *Tlaukhu*, or "29," the ruling body of the 29 dominant Aslan clans. The *Tlaukhu* exercises no real authority over individual Aslan, as only the clan leaders can call on the loyalty of their clan members, and each clan has its own laws and traditions. The *Tlaukhu* owns no military forces or bases, these all belong to the clans. But as the council of the 29 most powerful clans, and the only forum for the handling of inter-clan business and issues that involve the Aslan as a whole, the *Tlaukhu* is the highest focal point of Aslan policy and power.

Clans rise and fall in relative power and can be replaced on the *Tlaukhu*. Inter-clan arguments are solved by highly organized "clan wars," essentially the equivalent of a duel of honor, but on a national scale. Clans can rise or fall in power and prestige as a result of these wars, and can become vassal clans to other more powerful clans.

Aslan Society

The Aslan are a competitive and, by human standards, touchy and violent race. Their society is based on many strict codes of behavior and propriety, all lumped under the general heading of "honor," although the Aslan like to point out that they have 15 different words for honor, unlike the dishonorable humans. To humans, honor is but one concept among many, but to the Aslan it is *everything*, which makes them regard humans with suspicion, if not outright contempt. Misunderstandings are common between cultural Aslan and Imperial culture humans. Although Aslan populations have been able to assimilate themselves more or less within Imperial and also Darrian culture, they are then rejected by many cultural Aslan for having betrayed their race's values.

One important feature of Aslan society is the strict division of labor between male and female Aslan. Males are warriors, concerned with political and military leadership and the aquisition of land—their passion and reason for being. Females, which outnumber males by 3:1, are responsible for trade, industry, and commerce, education, scientific and technical knowledge, and the accumulation and management of wealth—in short, the real work of making society work while

Aslan Timeline

Imperial	*Aslan*	*Event*
-2190	-123	Aslan First World War.
-2160	-88	Aslan Second World War escalates to massive nuclear exchange.
-2136	-59	First Aslan space explorations.
-2198	-18	Aslan Third World War.
-2083	0	*Tlaukhu* formed. Aslan calendar begins.
-2013	80	Terran exploration ship *Pathfinder* misjumps, crash-lands on Kusyu.
-1999	94	Aslan build first starship *Ukhtai*, based on *Pathfinder* technology.
-1980	117	First Aslan contact with Solomani humans.
-1776	350	Rule of Man collapses. Long Night begins.
-1719	415	Aslan *Tralyeaeawi* clan purchases starships from Solomani traders.
-1118	1101	First Aslan Border War begins.
-1104	1185	Aslan first cross Great Rift.
-63	2304	Great Conclave (*Sakolusalo*) begins.
-56	2312	Cultural Purge (*Uwaralyekose*) begins.
-7	2368	Great Conclave concluded. "Codices of Sakolusalo" mandates primogeniture and other standard items of Aslan culture.
49	2432	Cultural Purge ends.
212	2618	Peace of Dark Nebula signed between Imperium and Aslan.
374	2805	Flyflyalr War begins between Old Earth Union and Hierate. Imperium pulled into war. Aslan and Imperial envoys agree on a duel war, which is won by the Imperium.
380	2810	Peace of Ftahalr. Imperial-Aslan border established with Reaver's Deep as buffer zone. Aslan prohibited in making investments in Imperial worlds.
454	2894	Aslan traders begin shipping dustspice from Romar.
461	2902	Aslan dustspice traders first contact Zhodani.
585	3043	Aslan *ihatei* offer to fight for Darrians in exchange for land.
1109	3641	Human visitors discover wreck of *Pathfinder* on Kusyu.
1116	3649	Dulinor assassinates Strephon and Tokeaias, the Yerlyaruiwo ambassador.
1117	3650	Assassin's Guild "Brotherhood of Tokeaias" dispatches duel-assassins across Great Rift to make Dulinor pay for his dishonorable act. First *ihatei* forays into the Domain of Deneb.
1119	3652	Growing *ihatei* incursions into Domain lead to armed conflict between Imperial and Hierate forces.
1120	3654	Domain of Deneb establishes the Patrol, or *Trekhyair*.
1131	3666	Domain forces occupy the Football as part of the Quarantine. Joint Domain-Aslan forces destroy vampire fleets crossing Great Rift in the Riftspan Reach.
1132	3667	Regency established and Spinward States Accords signed. Aorlakht and Football worlds incorporated into Regency.

Good Neighbors

When dealing with Aslan, even Regency Aslan, you have to remember that you are dealing with a pack of hormone-addled adolescents. Before you say anything, before you respond to a provocation, remember what it was like when you were a teenager. Remember what it was like to move in packs, all horribly bound up in your group's nonexistent status and honor, imagining a slight or an insult behind every remark or expression. Remember what it was like to be part of that fascism called adolescence, where there was a simple answer for everything, everything was black and white, and everyone who was not for you was the enemy and deserved no better than to be crushed. Then, and only then, compose your remark. And when you smile, be careful to not show too many teeth, unless you have a weapon in your hand and outnumber them.

Ambassador Celine Richtor from a lecture at the Regency Foreign Service University, Regina



the males concentrate on single-combat glory. For example, only males may serve as pilots and gunners aboard Aslan starships, and only females may serve as navigators, pursers, engineers, medics, and stewards.

By human standards these divisions are taken to ludicrous extremes. High-status Aslan males are literally helpless with concepts of money and finance. While they have an obsession for obtaining land of their own, they seek it for its own sake; it takes the female members of their families to figure out what to do with it so that it can be of any use to anyone.

Even Aslan military units follow this model. The combat leader and close combat troops are male, but all support, logistical, technical, staff, and intelligence personnel are female. This includes combat engineers and artillery personnel,all the way up to the true commander, the female who organizes the unit and sees to its day-to-day operations.

With the cultural imperialism typical of Aslan, they project these gender differences onto non-Aslan as "perceived gender." In other words, a human male in a "female" role will be treated by the Aslan as a female, and vice versa. This means that Aslan will not discuss business (a female task) with a human who pilots a starship (a male task), regardless of whether that human is really male or female. In some cases Aslan will simply not be able to tell the difference between male and female humans, but even if they do, their cultural predisposition requires them to impose their Aslan standards.

ASLAN IN THE REGENCY: THE HUMAN POINT OF VIEW

To the human perspective, there are two types of Aslan who are citizens of the Regency—those who adapt to human values and culture (referred to as "Regency Aslan") and those who adhere to Aslan culture and force these values in the larger human culture (referred to as "Aslan in the Regency"). Until the Collapse, the only Aslan recognized by the Domain of Deneb government to legally reside within the Domain boundaries were of the assimilable Regency Aslan variety. However, the impending arrival of Virus is 1131 changed all of this.

Fait Accompli

If politics makes strange bedfellows, then Screaming Unavoidable Necessity mothers the invention of some mighty unusual looking siblings. Such is the relationship between the descendants of the Aslan *ihatei* invaders and the descendants of the rightful rulers of the former Domain of Deneb.



One unintended by-product of the Collapse is that it legitimized many of the Aslan acquisitions with the Domain of Deneb borders. Although in many cases the Domain government was engaged in military campaigns to dislodge Aslan enclaves or topple their governments, the urgency of presenting an impervious frontier to Virus made the conclusion of such campaigns a luxury. In order to ensure impervious borders, the new Regency had to formally accept and legitimize whatever governing structures were already in place, even if these were traditional cultural Aslan clan governments.

A Deal With the Devil

The most difficult of the internal political problems facing the Regency is that of traditional Aslan planetary government existing undigested within a larger Imperial culture Regency government. Not only does this create difficulties for the non-Aslan inhabitants of these planets, who feel oppressed by the inflexible social order placed on them, but the Aslan government itself has mixed loyalties. Although the Aslan have sworn fealty to the Regency for the land it has granted

An Abridged Aslan Abecedarium

Ahfa: Items kept as one's personal Shrine of Heroes.

Aisat: The Aslan dewclaw, literally "blade claw."

Aisaiaokheh: Duel of honor, often to the death.

Akhaoye: Essence or spirit of all things Aslan. "Because if it's not Aslan, *it's CRAP!!*"

Akyafteirleao: Contrary to the Aslan spirit. This refers to an active threat to the *akhaoye* rather than the contemptible, offhand disregard for it shown by barbarians.

Aokhaor: Honor, literally "spirit of strength." This is the term the Aslan use to encompass the entire Aslan life-style, one dedicated to the spiritually correct approach to life.

Aorlakht: "New Lords," or more accurately, "New Landholders." In other words Aslan, often *ihatei*, who previously did not hold land who now do so. This was the name used by the Aslan invaders of the Domain of Deneb.

Arlaeaha: Vargr.

Eakhau: Aslan day, 36 hours; 212.2 of these make an Aslan year, or *ftahea*.

Ekho: Aslan family.

Firukhte: Stylized use of insults to provoke another party into issuing a challenge.

Flyfiyair: The Imperium, literally "vassals of vassals of one." This term is still used for the Regency.

Flyfiyairya'uist: Trokh insult meaning an Imperial lackey which has soiled itself because it neither understands nor possesses personal honor.

Ftahea: Aslan year, 320 standard days.

Fteirle: The Aslan people.

Hisol'i: Solomani.

Ihatei: Second son. To the Aslan it goes without saying that this also means unlanded.

Istoiuael: Zhodani.

Khaofiy: "Submission to the Stronger." The ritual apology delivered by the loser in a duel of honor.

Khoafteirleao: Aslan concept of spiritual perfection which can only be achieved by the purging of all non-Aslan influences.

Rukhta: Deeds without honor.

Rukhtiywe: The act of denying one's Aslan nature.

Tahiwihteakhtau: Barbarians, literally "those who lack understanding of Aslan culture." This phrase is typically used for those who embrace Imperial culture, whether humans or Aslan who have adopted the human way.

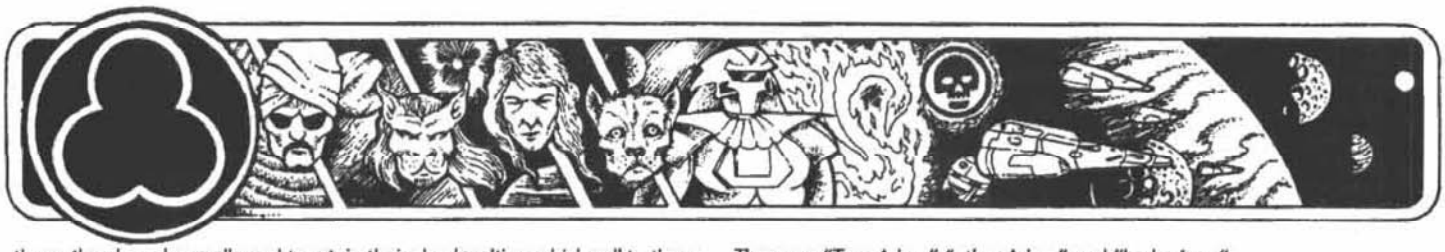
Tekhaaa: Aslan "hour," 137 minutes; 16 of these make an Aslan day, or *eakhau*.

Tlasoistsea: "Bounty of New Lands." Area ripe with new land for the taking by righteous, upright Aslan. Unfortunately many trans-rift Aslan viewed the Domain of Deneb as such an area during the Civil War.

Tlaukhu: "The 29," specifically the council of the 29 most powerful Aslan clans in the pre-Collapse period.

Trokh: The Aslan language.

Ukhtai: "Hero." The perfect Aslan role model, in perfect accord with Aslan concepts of *aokhaor* and *akhaoye*.



them, they have been allowed to retain their clan loyalties, which call to them from outside the borders of the Regency.

By 1202 the upshot of this is that Aslan clans in the Regency have a "foot in the door" which they are using to permit immigration of other clan members, thus further consolidating their power. While the Regency government cannot be happy with this development, there is very little it can do about it.

Trekhyair

The exclusively Aslan-manned portion of the "Patrol," or *Trekhyair* ("land protector") was established by then-Archduke Norris in 1120 to co-opt Aslan, including *ihatei*, into defending the Domain in exchange for land (**Survival Margin**, page 25). This brilliant stroke resulted in the "domestication" of a large number of uncontrolled *ihatei*, and added defenders to the Vargr frontiers to boot. Had it not been for the 1132 *faits accompli*, this would perhaps have been the solution to the Aslan problem, but events did not fall that way.

Nonetheless, the *Trekhyair* itself became a tremendous success. Although it might have initially appeared as a cynical attempt to co-opt the Aslan, the Denebians soon learned the same lesson as their Darrian neighbors (see page 31): the Aslan can be some mighty good friends to have. Within a few short years the Domain was actually recommissioning older warships for the use of the growing patrol, including *Azhanti High Lightning*-class cruisers (***Azhanti High Lightning***, OP, ***Arrival Vengeance***, SA).

The *Trekhyair* lives on in 1202, as vigorous Aslan participation in the Regency Quarantine Service. As a continuation of the *Trekhyair* incentives, Aslan RQS personnel can opt to receive land instead of normal monetary compensation. These land titles are typically on worlds in or near the Regency Frontier that have been abandoned by their former human inhabitants. Aslan RQS crews typically operate Aslan-built and -styled variants of the Quarantine Cutter design (see page 91). However, these ships are a lumpy blend of flowing Aslan naval architecture and blistered-on fairings of human-built equipment.

ASLAN IN THE REGENCY: THE ASLAN POINT OF VIEW

As could be expected, the Aslan view of Aslan inhabitants of the Regency is more complex, not to mention more doctrinaire. To the Aslan mind, there are three types of Aslan, in increasing order of compromise with barbaric values. These are "True Aslan," "other Aslan," and "barbarians."

True Aslan are any who retain their full Aslan culture and traditions. These would include the *Aorlakht* rulers of the Regency *fait accompli* worlds.

Other Aslan are those who have made some concessions to human culture that allow them to trade more effectively. Most would include the Darrian Aslan in this group, as well as the Aslan members of the *Trekhyair*, RQS, and other Regency armed forces. Although these Aslan are not as scorned as the barbarians, Aslan exude an unmistakable sniffiness when they speak of these other Aslan and the way they sold out for prosperity.

Barbarians are the true fallen Aslan who have fully adapted to human values. Lest there be any question about where the fallen Aslan stand on the cosmic pecking order, the Aslan hold non-Aslan who live by Aslan culture to be closer to them than racial Aslan who have rejected their rightful culture. Some such Aslan have formed their own states, such as the so-called Glorious Empire in Trojan Reach, which was conquered by true Aslan eager to teach them their errors.

Adventure Hook

Turncoats: The PCs are members of a human military peacekeeping force (PKF) sent to quiet guerrilla activity on an Aslan-ruled Regency world. The catch is that the guerrillas are humans, the original inhabitants of the world before the *ihatei* took over during the Final War. However, owing to the accommodation made with the Aslan rulers during the Collapse, the Aslan are the lawful rulers and the humans are legally in the wrong (although perhaps morally in the right). The ruling Aslan make it clear that they will annihilate the guerrilla strongholds if these activities continue, and they are within their legal rights to do so. The PKF is the last chance the guerrillas have to make peace before the Aslan destroy them. And although the Regency government's heart is with the human guerrillas, its hands are tied.

As representatives of the government which backs the Aslan rulers, the human peace-keepers are the enemies of the human guerrillas, and may be treated as such. The peace-keepers don't like what they have to do to their repressed human brethren, but they know that if they don't do it, the Aslan will, and with much more terrible results.

Complications: Aslan observers are sent along with the PKF. They may demand harsher measures, or may deliberately make the situation worse, to create an excuse for final Aslan intervention. These observers may be contemptuous of the human PKF, continually goading and insulting them in the Aslan *firukhte* tradition.

The Aslan government, impatient with the pace of the PKF operations, sends an Aslan strike force into the field to "make an example" of a human village. The PKF must observe the slaughter and still attempt to convince the humans to peacefully exist with their Aslan rulers.

The Aslan may be deliberately setting up the PKF to fail, to allow them to accuse the Regency government of betraying them and giving them an excuse to declare their independence.

This adventure is not a shoot 'em up. It is intended for groups that accept the challenge of complex and ambiguous moral and psychological dilemmas.

Creating Aslan Characters

Regency Aslan (by Aslan standards, either "Other Aslan" or "Barbarians"), because they follow human professional norms, may be generated using the character generation procedures presented in **TNE** with the following modifications.

Attribute	*Mod*	*Roll*
STR	+2	2D6 +1
AGL	–1	2D6 –2
CON	+2	2D6 +1
INT	—	2D6 –1
EDU	—	2D6 –1
CHR	—	2D6 –1
SOC	—	2D6 –1

Psionics: –2 per four-year term rather than –1. In addition, PSI continues to drop with age, even after testing: –1 the first term (four-year block) after testing, –2 the second term after testing, –3 the third term after testing, and so on.

Skills: Among cultural Aslan, the gender division of labor extends even to skill receipt. For example, a male would not receive skills of a technical, scientific or economic nature, and females would not receive close combat skills. However these distinctions are less important for assimilated Aslan.

There are also several new skills for the Aslan, below.

Dewclaw (STR): This skill replaces Unarmed Melee Combat for Aslan and covers the ability to fight "unarmed" with their natural weaponry.

Independence (INT): This skill is available only to male Aslan and governs their ability to deal with money and handle financial concepts, which are traditional female responsibilities. The presence of this skill means a male can see to his own needs in simple monetary transactions. Lack of this skill means the Aslan has no understanding of money whatsoever, and will need to be looked after by a wife or female companion who takes care of making his purchases.

Meditation (CON): This allows the Aslan to duplicate most of abilities of the psionic cascade skill Self, without having to possess psionic talents. Meditation is used just like Self, except it is controlled by the CON attribute and only has three cascades: Suspended Animation, Psionically Enhanced Strength and Psionically Enhanced Constitution.

Tolerance (CHR): This skill allows Aslan to interact with non-Aslan. It is thus similar to Liaison skill, except it particularly refers to the ability to ignore violations of Aslan propriety on the part of non-Aslan, allowing the possessor to better get along with these barbarians. Those Regency Aslan known as *Tahiwihteakhtau* (barbarians) to other Aslan have no use for this skill, as they have already adapted to human social norms.

Tradition (EDU): This skill confers deep and detailed knowledge of Aslan history and traditions, allowing an Aslan to "out-Aslan" other Aslan. Use of this skill is helpful in persuading other Aslan, as the possessor can use fine points of honor and tradition to support his points and undercut others'. It is also be used to allow really cranky Aslan to pick fights all the time, because there is very little that cannot piss off an Aslan who is really paying attention. Those Regency Aslan known as *Tahiwihteakhtau* (barbarians) to other Aslan have no use for this skill, as they have adapted to human social norms and have no need (nor the right) to quote Aslan propriety.





Tips for Humans in Vargr Society

1. Pay attention to your relative status in the framework of Vargr society, and be sure to know the charisma of the Vargr you encounter.

2. Keeping point 1 in mind, think about *privilege*. Relative levels of charisma confer various privileges in Vargr society. Demand to receive yours and see that you grant others the privileges to which they are entitled.

3. Be assertive. Making firm decisions and standing by them is a hallmark of charisma.

4. Use it or lose it. Charisma must be constantly fed and exercised. It is rapidly reduced if it is not demonstrated often, even for *seemingly* minor points. Vargr are always keeping score.

5. Be vigilant. Vargr are always pushing to see what they can get away with. If you do not reassert your authority in the face of such challenges you have *agreed* to let that Vargr gain power at your expense, and he will only push harder the next time. Loss of charisma is the death by 1000 pricks.

6. Praise those who submit to your authority. Subordinate Vargr need approval and affirmation; it cements their loyalty to their superiors and it gives them a secure and comfortable role in the universe. By making sure they know you value their contributions, you give them value, and because you are now a source of their value, they will *support* your authority, thereby further validating the approval you give them.

7. Like begets like. The best way to gain high charisma among Vargr is to act as if you already have it. This will become a self-fulfilling prophecy. Conversely, the best way to achieve low charisma is to not care about it enough to use it. Vargr do not grant the benefit of the doubt—to a Vargr the only explanation for failure to exercise charisma is that one already had none to begin with.

The Survivor's Guide to the Spinward States
Regency Foreign Service University and
the Regency Ministry for Public Information and Welfare
Government Printing Office, Regina, 1142

VARGR

Of all the Regency's neighbors, the Vargr are the most difficult to describe in any concise fashion. Some Vargr are Regency citizens. Some Vargr are pirates or criminals, preying on humans. Some Vargr are pirates or criminals, preying on other Vargr. Some Vargr are members of Vargr states or polities. Vargr do different things, but they all behave in the same way.

The irony is that all Vargr society is the same, yet it is also all different. The central theme of Vargr social interaction is flux. This is the result of the ceaseless Vargr jockeying for relative authority, status, and power, called by the Vargr *charisma*. The Vargr have never achieved a large unified state like those of the Zhodani, Vilani, Solomani, Aslan, K'kree or Hivers. Instead they have always existed as a bewildering kaleidoscope of small states, constantly fissioning, realigning, coalescing, splintering, then coalescing again only to splinter some more. The constant struggle for charisma where one's gain only comes at the expense of another's loss, and the constant willingness to abandon an old leader when someone better comes along, has prevented any kind of Vargr stability at the microcosmic level. However, the nature of all Vargr societies at the macrocosmic level remains exactly the same as it has always been. The only constant is change. In fact, Vargr profess to be uneasy at the stability of human society—surely something unnatural and suspicious is going on.

This lack of organization makes the Vargr both more dangerous as individuals and less dangerous as a group. Thus human empires have long been required to fend off Vargr corsairs, but have never been truly threatened by a Vargr invasion.

However, it is their very lack of organization that creates the greatest Vargr threat to the Regency, that of an entry vector for Virus. The experience of the Regency and its other neighbors has taught one indelible lesson—that Virus can only be successfully defeated by a unified, airtight front. The Vargr are constitutionally incapable of imagining such a thing, let alone carrying it out.

Physical Characteristics

The Vargr have something in common with the Zhodani, Darrians and other transplanted human races. They too owe their existence to the activities of the Ancients over 300,000 years ago. However, unlike the humans, the Vargr were created, genetically engineered from prehistoric Terran dogs, and given larger brains, hands with manipulative digits, and an upright posture.

Average Vargr males are 1.6 meters in height, while females are 1.5 meters. They are therefore lighter and less strong than humans, but are more agile. Like the dogs from which they were derived, Vargr demonstrate a wide variety of fur color, texture and pattern.

Regency Vargr

There have been Vargr citizens in the Domain of Deneb for centuries, and although they are capable of functioning within the broad parameters of that society, they still retain their distinctive social style. They prefer to live in communities with other Vargr, and the "Vargrtowns" within many large Regency cities are characterized by the same raucous, freewheeling anarchy as Vargr interstellar society.

There are three main populations of Vargr living in the Regency. These mostly differ in how long ago they forced their way in—most Vargr arrive the same way: uninvited. The first group is the established Vargr, those who have been living in the Imperium for several generations. These can be found most anywhere in the Regency, although they gravitate to other existing Vargr communities.

The second group is the Vargr who arrived on Imperial worlds during the Vargr raiding and incursions during the Civil War, from 1117 to 1130. These Vargr are found on the coreward and trailing worlds of the Regency on which they gained a foothold by force of arms. Their recognition by the *faits accompli* of 1132 gave them more staying power on these worlds than they could have achieved on their own, and they remain in power on these worlds.

The final group are the Vargr refugees, those who fled the onslaught of Virus after 1131. These Vargr at least did not come to conquer or steal, they came simply to survive. These found their way into Regency-organized Vargr refugee camps, unlike the first two groups.

A Regency human would say that Regency Vargr do not have much respect for authority, and that they obey the Regency's laws when it suits them or when they are forced to do so. This assessment is true, but a truer description is that humans and Vargr have quite different understandings of "respect for authority." While humans believe in self-control, in willingly submitting to laws so that others will do the same for the benefit of all, Vargr competition for charisma does not permit this. Vargr are constantly pushing the envelope, looking for openings where they can increase their own authority, constantly trying to see what they can get away with. The amount of respect a Vargr is willing to give to the law (or



society, or government) is *precisely* the amount of respect the Vargr's experience shows him that law demands, *no more and no less.* Responding to such human criticism, one Vargr replied, "You humans might as well say that we are morally bound to obey the law of gravity. It is there, it acts on me, I accept that. But I do not let it stop me from leaping or flying. If it ultimately wins, pulling me to the ground, so be it. But I will not give up my right to follow my own laws. If it is strong enough to make me obey, then it is strong enough to make me obey. But if it is not, why should I grant it authority it does not deserve? All laws are the same way."

Vargr Organized Crime: A growing force in the Regency is Vargr-controlled organized crime. There is some such activity on every world which has a significant Vargr population, and even on some which do not. This activity, on all the worlds on which it appears, is commonly known as "the Pack."

Lawless organizations are nothing new for the Vargr, but it appears that the Pack is something different, as its operations and procedures are the same from world to world, implying higher control, or at least coordination. Although the Pack's activities do draw on human possessions and moneys, its membership seems to be exclusively Vargr. And while human populations are largely immune from Pack reprisals, murder and violence within Vargr communities associated with failure to cooperate with the Pack are common.

The Vargr-specific nature of its violence has helped the spread of the Pack, as most humans see it as a purely Vargr problem, which has limited the response of human law enforcement agencies. The racist nature of this thinking, "it's okay so long as they only do it to their own kind," is clear, and not encouraging.

Vargr Splinters

Even before the Collapse, Vargr space was always know as the "Vargr Extents," meaning that this area was no true Vargr nation, only that there were a lot of Vargr there. These circumstances still hold true in 1202, which makes it very difficult for the Regency to maintain relations with the Vargr states (usually called the "Vargr Splinters") given the threat of Virus. However, given Vargr tendencies and history, it would not do to try to maintain a perfectly closed border against the Vargr. By allowing some legitimate Vargr trade the Regency is able to exercise more control over its nature than if it allowed none at all, forcing all Vargr trade to be, by definition, out of its control.

For this reason the Regency's frontier with the Vargr is the most fortified of all of its interfaces with the Spinward States, having more in common with the frontier on the deep Wilds than with the civilized interfaces with the Darrians or Zhodani. Whatever can be said of the thoroughness of inspection and impoundment procedures at other interfaces, these do not hold a candle to the Vargr interface inspections. In fact, no Vargr Splinter ships are allowed across the frontier into the Regency under any circumstances, as it is assumed that they are Virus plagues just waiting to happen.

Despite the strictness of this border, it is only a fortunate minority of Vargr that are extended even this dubious honor. The interface with the Vargr Splinters extends only along the coreward edge of three subsectors—Regina, Aramis (C and D/Spinward Marches), and a small slice of Pretoria (A/Deneb). These border on the Vargr groups that were sheltered in the "shadow" of the Domain of Deneb as Virus rounded the corner of the Great Rift and barreled through Corridor. These therefore had the opportunity to benefit from the Domain's warning and protect themselves. The Vargr to coreward of the remainder of Deneb were not so lucky. These areas are classified as deep Wilds, and these frontiers are sealed against contact.

No one in the Regency really believes that Virus could not be spread from the Wilds Vargr to the Vargr Splinters, then into the Regency. But that is why the Vargr interface is guarded as well as it is.

One Cannot Punch the Air: One dissenting view to the uniquely Vargr susceptibility to Virus argues that Vargr society is actually immunizing itself to Virus and will eventually emerge stronger than those societies that spent their finite energies on holding Virus at bay. This is a long-view ecological perspective of interstellar culture that persuasively demonstrates (via historical examples, psycho-historical principles and sophisticated computer modeling) that decentralization is precisely the sort of organization that will ultimately defeat Virus. This is the ancient Terran Oriental theory of warfare by simply absorbing the invader and passively destroying him over time, perhaps even assimilating the invader into the absorbing culture. At the end the invader disappears as a distinct entity and the invaded culture survives, but it has now converted the strengths of the invader into its own. Radical proponents of this view argue that the Regency should open its borders to Virus and to the forces of social Darwinism that would eventually craft the Regency into the sort of organization that could survive these new conditions.

However, this ecology of civilizations is persuasive only to ivory tower academics and others who imagine that they can hold themselves over and above real life as disinterested observers. First Regent Norris himself answered these theoreticians by agreeing that they were perhaps correct, but registered the following reservations:

"The same human culture that practiced what you propose was also the author of the curse. May you live in interesting times. And there is the trick. This life, this walking the razor's edge between survival and extinction, is a lovely spectator sport, but who is the spectator? Since this victory would take place over decades and trade the destruction of planets and the extinguishing of billions of lives for our rebirth in a new form, it makes us choose whether it is people or societies that are real. Are we mere cells in a body that can live on without us, or is each individual the irreducible currency of reality so that it is society which serves them? This life I live would be merely interesting if I did not have to take it so personally, but I find that I do take it personally, and these theories that you propose take on life or death significance."

Although Norris' refusal to subject his people to this sort of evolution is ethical, the possibility remains that new societies are forming in the Vargr Wilds—new societies that are the fusion of biologically-based point-identity and electronic meta-identity (see Library Data).

Creating Vargr Characters

Vargr may be generated using the character generation procedures presented in **TNE** with the following modifications.

Attribute	*Mod*	*Roll*
STR	–1	2D6 –2
AGL	+2	2D6 +1
CON	–1	2D6 –2
INT	—	2D6 –1
EDU	—	2D6 –1
CHR	Special	1D6
SOC	N/A	None

Psionics: Vargr psionics is handled as in **TNE**. However, the Vargr states have no psionic training centers to speak of, so testing and training is almost impossible to find outside of the Regency.

Charisma Increases: During character generation, CHR is increased by one each time the character exceeds the required Commission or Promotion roll by four or more points.

Church of the Chosen Ones

Fanatical Vargr sect which believes that the Vargr were deliberately created by the Ancients to be the supreme race in Charted Space and that they are destined to someday rule over all other races, perhaps after the Ancients' final return to invest them in their rightful glory.

The church therefore accepts the theories that the Vargr were created by genetic manipulation (and is thus in conflict with some Vargr sects which see this as slander), but finds this to be not degrading, but proof of the Vargr superiority. After all, the Ancients transplanted humans on a great many worlds but did not significantly modify them. And after having gained such expertise on humans, the Ancients found this Terran species to be inadequate. Proof is that they took the trouble to create the Vargr, an unnecessary effort if the already existing humans had measured up to the Ancients' standards. And because the Ancients would not have bothered to create something that was less than perfect, the Vargr are the only race that can claim racial perfection by deliberate design.

Given the Vargr nature, the church has naturally split into many factions. The militant wing believes their superiority requires the Vargr to conquer other cultures. The beneficent wing believes their superiority obligates them to assist lesser races to achieve what the Vargr have naturally. The penitent wing believes their current status proves they have sinned and betrayed their potential and must rediscover their true glory before the Ancients return to punish them for having squandered their gifts. Many other factions have no real doctrinal differences, but have merely split to follow different leaders.



Darrian Timeline

Date (Imperial)	*Event*
-300,000	Ancients transport Terran humans to Daryen.
-300,000	Ancient civilization destroyed.
-1520	Itzin Fleet departs Dingir.
-1511	Terran traders contact Darrians.
-1410	Daryen begins space exploration. Darrian Golden Age begins.
-1270	Darrian space exploration reaches out to 20 parsecs.
-1000	Experiments on Daryen's sun, Tarnis, begin.
-924	Darrians reach TL16. *Maghiz*: Tarnis destabilizes.
-905	Darrians decide to abandon space.
-860	All Darrian interstellar contact ceases. Night Time begins.
-399	Sword Worlds colonization begins.
-275	Mire returns to space.
-187	First Zhodani contact with Darrians.
60	Imperial colonization of Spinward Marches begins.
148	Imperial Scouts contact Daryen.
450	Darrian Special Arm created.
489	Star Trigger demonstrated.
585	Aslan arrive at Daryen.
589	First Frontier War begins. Darrians neutral.
593	Sword Worlds invade Entropic Worlds.
595	Darrian Confederation allies with Imperium.
604	First Frontier War ends.
788	Darrians retake Entropic Worlds.
1084	Sword Worlds retake Entropic Worlds.
1107	Fifth Frontier War begins.
1110	Darrians retake Entropic Worlds. Fifth Frontier War ends.
1121	Darrian Confederation annexes Nonym.
1132	Darrians assist Regency in putting down Sword Worlds land-grab.



DARRIANS

Like the Zhodani, the Darrians are a human race planted by the Ancients. Unlike the Zhodani, the Darrians are classed as a minor human race as they received jump drive only as the result of contact with Solomani traders who were assimilated by the Darrian race. The Darrians have long been aligned with the Imperials against their Zhodani and Sword Worlds rivals, and continue their friendly relationship with the Regency.

Although the Darrians are a specific race of humans, the term "Darrian" has a broader social meaning within the Darrian Confederation. Only 75% of the Darrian population are ethnic Darrians. Another 12% are of mixed Darrian-Solomani descent, and 8% are Aslan.

Darrian Physical Characteristics

Although remaining within the broad range of human morphology, the Darrians have a distinctive "elfin" appearance which is a combination of environmental adaptations and genetic drift.

Having spent many millennia adapting to a world with a surface gravity of 0.5G, Darrians are taller than the human norm, averaging two meters in height. They are also more slender than other human races and tend toward sharp facial features.

Darrian skin is a uniform golden color, due to the pigment protremelanin which protects the skin from ultraviolet rays without darkening and controls vitamin D production to needed levels regardless of the amount of sunlight. Darrian hair is white or grayish-silver.

Darrians are less strong but more agile than Imperial humans. Other minor differences include the fact that 40% of Darrians are left-handed or ambidextrous, probably the result of a larger and better developed corpus callosum than is present in Vilani, Solomani or Zhodani brains. Darrians have a wider pelvic structure than other human races, meaning fewer complications in childbirth and a wider walking track. Darrians also sweat less than other human races, an adaptation to the somewhat drier Daryen climate.

Darrian Society and Psychology

In comparison with other human cultures, Darrians tend to be quiet, dignified and stoic. They are also constitutionally peaceful; Darrian history records remarkably few wars.

Darrian philosophy, distilled in the Codes of Darrian, is based firmly in tolerance and the veneration of intelligence and rationality as the highest expression of humanity. Tolerance is evidenced by prohibitions against cruelty to animals as well as stiff penalties against slandering another person. This tolerance demands that each creature be allowed to live in accordance with its own nature, which leads to the Darrian emphasis on rationality and civility.

Humans have both an animal nature and a higher nature, but it is the responsibility of humans to rise above slavery to the instincts they share with animals and express the true, uniquely human virtues of rationality, intelligence, self-control and civilization. Although this Darrian philosophy is quite spiritual in nature, Darrian society has no truck with organized religion. The significance of the spiritual life is broadly recognized, but experiencing it is a personal and private matter, as befits the Darrian emphasis on tolerance. Darrian philosophy also contains a strong streak of fatalism, surely an artifact of their history.

Darrian society places great value on knowledge and discovery for its own sake, and does not glamorize violence or brute force as do many other human cultures. Learning is something of a passion in Darrian society; Darrian role models are typically teachers, scholars, scientists, or academics, not warriors or military personnel. Pacifism and extreme life-respecting traditions (i.e., even plant life may not be taken; only fruit is eaten; only deadfall wood may be used; and animal fur may only be obtained by shearing) are not the norm in Darrian society, but are rather more common than in the Vilani or Solomani traditions.

The Darrians also value art; their most distinctive art form is also unique to them: Darrian flame sculpture. Flame sculpture uses various energy fields to hold a burning flame in a static, three-dimensional form, or in more sophisticated examples, in an animated series of forms. Flame sculpture embodies the Darrian concept of humanity's dual nature. Just as wild animal nature is made acceptable by rationality and self-control, the wild, dangerous flame is made safe by the containment fields, but its fiery beauty remains as a reminder of the wildness held in check.

Darrian History

Darrian accounts of their prehistory are quite reminiscent of Terran Eden myths: The early Darrians lived in well-balanced, well-laid-out orchards in which all their needs were met. This idyllic beginning and the fact that Daryen shows no marks of the Ancients' final war fits with the Darrian peacefulness, but even the Darrians were eventually expelled from their Eden by the gradual failure of the orchard systems, forcing them to spread



out, explore and meet their own needs.

The basically benign character of the Daryen environment continued, and Darrian science developed as a desire to understand and work with a beneficent nature, rather than a desire to control a cruel and capricious one. The Darrians peacefully continued to grow and learn until –1511 when the Terrans of the Itzin Fleet introduced themselves to them.

Terrans: In –1520 the 35 transports and 10 armed escorts of the Itzin Fleet left Dingir with the goal of travelling the long way around the Great Rift to what later became known as the Spinward Marches. The Itzin corporation, originally from Turkey on Terra, sought to escape the steady economic decline that was the Long Night. The fleet arrived at then-uninhabited Sacnoth in –1513, surveyed the surrounding area, and decided to settle on Daryen with its hospitable environment and untouched minor human race that could benefit from their technology. Significantly, and to their great credit, the Itzin Terrans did not come, as they could have, as sky gods using their technology to rule, but on the ground, using their technology to trade with the Darrians.

By –1400 the Terrans had been completely absorbed into Darrian society, and the synergy of the thoughtful, inquisitive Darrians and the manic, driven Solomani caused explosive advancements in science and technology, and a rapid rise to TL16 in only 400 years.

Maghiz: Among the many topics of surpassing interest to the Darrians were stars, particularly Tarnis, the sun of their home system of Daryen. Extensive observations and probings of Tarnis began in –1000. In –924 the fateful step was taken of sending a probe, part of the *Adh* ("Alpha," or "A") Project, to explore the star's interior. Somehow this probe destabilized the star causing three days of cataclysmic stellar flares.

The result was known as the *Maghiz* (Chaos) or *te-Zuyes* (the Holocaust). The first effect of the flares was a huge electromagnetic pulse which arrived at Daryen at the speed of light. This pulse destroyed almost all electronic equipment, turning computers, communicators, power grids, and contra-grav lifters to slag. Aircraft fell out of control and crashed, vehicles would not work, data systems were useless. Without these tools, repairs and damage control were almost impossible.

But this was not all. Following the EMP was the searing wave front of expanding stellar gas, moving at 300,000 kph. When it arrived three weeks later it raised surface temperatures to 250°, burning entire forests, vaporizing seas, and killing 80% of the world's inhabitants. Half of the Darrian starship fleet was destroyed as well.

While the gas damage was confined to the Daryen system, the EMP continued to travel outward, eventually hitting each of the Darrian colonies in turn, doing further damage. Although there was advance warning of the pulse, the colonies were all dependent upon their mother world, which could no longer provide science, technology, or replacement starships to maintain trade.

In –905 it was decided that the remaining colonies could no longer maintain their interstellar contact and must instead focus their resources to meet their own separate needs. The few remaining starships were divided up among the colonies, three for each world, and carefully stored. By –860 all interstellar contact had ceased.

Re-Emergence

By –275 the Darrian colony world Mire had rebuilt itself to TL10 and began refurbishing its starships and building new ones. It soon reestablished contact with the other Darrian worlds, but discovered that things had changed. When the Darrians voluntarily relinquished space 600 years before, theirs was the only society to be found. But now space was crowded. The growing Sword Worlds were nearby, and the Darrians soon contacted the looming Zhodani Consulate.

Little Fish, Big Sea

The remainder of Darrian history is the story of a once vigorous and unchallenged people coming to terms with the limitations of their power and making accommodations with the powerful forces around them.

There have been three major results of these accommodations. The first is their development and much-publicized deployment of the Star Trigger as a deterrent weapon. This weapon is an application of the technology which accidentally triggered the *Maghiz*, but now the Darrians are capable of visiting this catastrophe on any star belonging to their adversaries. These weapons are deployed aboard special starships operated by the Darrian Special Arm since the 400s.

Second is their welcoming of Aslan *ihatei* into their society. Aslan *ihatei*, looking for new lands, arrived in the Spinward Marches just prior to the First Frontier War. With the coming of war, they offered their services to the grateful Darrians as mercenaries in exchange for land. The Aslan were a welcome and timely addition to the Darrian social mix; the following years required their talents and greatly strengthened the Darrian position in its very challenging surroundings. In return the Aslan gained prime land and excellent economic opportunities, both of which have held them in good stead to the present day.

The Aslan are considered to be well-integrated into the tolerant Darrian society. Unlike the polygyny typical of the Aslan Hierate, the Darrian Aslan mostly practice monogamous marriage, a practice restricted to the lower classes among cultural Aslan. Furthermore, the practice of speaking the Aslan language, *Trokh*, among themselves is gradually falling into disfavor, being replaced by the Darrian and Galanglic that they use in trade and in their day-to-day lives. Such is the slick slope leading to barbarism (see page 27).

Last is their history of alliance with the Imperium, and later the Regency. This began during the First Frontier War and serves as a counterbalance to the threat of the Sword Worlds, which are usually allied with the Zhodani.

The Darrians are currently engaged in extensive cooperation with the Regency, in the areas of advanced technology ship design, and in assisting to maintain the Quarantine. Darrian TL16 ship designs, such as the *Barekdoldin* ("Lightning-wind")-class patrol cruisers are license-produced in the Regency, and Darrian Confederation Navy forces perform exchange duty with the RQS on the Regency's outrim frontiers.

Creating Darrian Characters

Darrian characters may be generated using the character generation procedures presented in **TNE** with the following modifications.

These attribute modifiers are in addition to any other homeworld modifiers, with the exception that the STR and CON rolls already allow for homeworld gravity.

Attribute	*Mod*	*Roll*
STR	Special	1D6 +2
AGL	—	2D6 –1
CON	Special	1D6 +2
INT	—	2D6 –1
EDU	+1	2D6
CHR	—	2D6 –1
SOC	—	2D6 –1

Psionics: Identical to procedures in **TNE**.

Careers: Darrian term choices should concentrate on the Professor, Scientist, Scout, Trader and Navy careers.

Darrian vs. Daryen

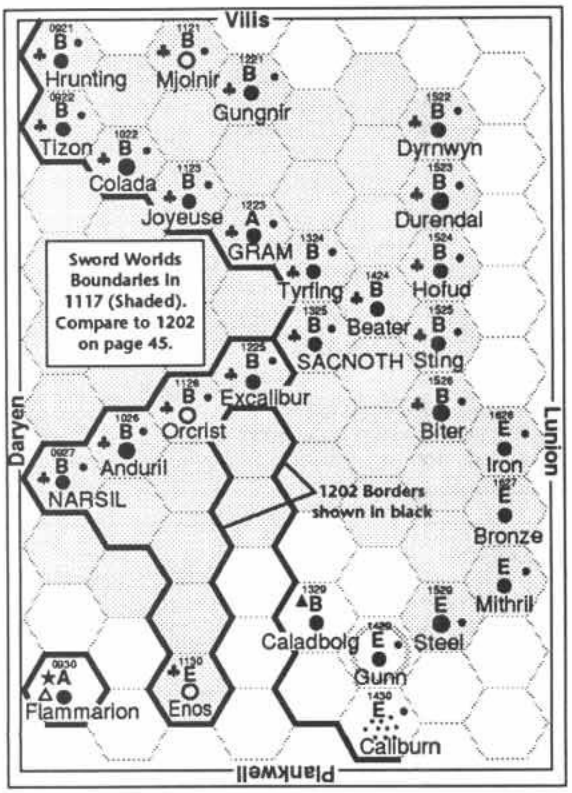
During the Imperial period, citizens of the Domain of Deneb referred to the Darrian race and their homeworld with the same word: Darrian. In fact, Darrian is an Imperial corruption of *Daryen*, the word for "home" in the Darrian language, *te-zlodh* or *te-zapet*. Compared to star maps from the Imperial era, maps used in the Regency label worlds in their home language whenever possible. Thus the world is now referred to as Daryen, while the term Darrian is retained for the race and political entity.

Adventure Hooks

1. Do the Darrians have a functioning star trigger? (*Referees see page 84.*) Could they, as they have implied, set up a vampire fleet equipped with such devices to wreak havoc on their neighbors as a doomsday weapon? The PCs could be assigned to uncover this information, which would constitute a multi-part adventure. First they would have to research the concept and history of the star trigger, learn about the DCN and Special Arm, and finally prove or disprove whether such a capability exists.

2. Many smaller units of the DCN do exchange duty with the RQS on the Regency frontiers. Thus there is a chance to meet or roleplay Darrian characters even on the outrim frontier, where the Darrians usually operate their own equipment, in the form of pre-positioned patrol cruisers (see page 92).





Sword Worlds Timeline

Date	*Event*
–399	First settlement of Gram.
–186	First interstellar government among Sword Worlds, the Sacnoth Dominate.
–164	First Sword World contact with Darrians.
–102	Sacnoth Dominate breaks up as a result of the War of the First Rebellion.
–80	Complete breakdown of interstellar government among the Sword Worlds.
60	Imperial colonization of the Spinward Marches begins at Mora.
73	First Sword Worlds contact with Imperial traders.
104	Triple Dominion of Colada, Anduril and Dyrwyn established.
217	Triple Dominion breaks up.
589	First Frontier War begins.
593	Sword Worlds invade and take the Darrian Entropic Worlds.
604	First Frontier War ends. Sacnoth Dominate re-established as the Second Dominate.
615	Second Frontier War begins.
620	Second Frontier War ends. Imperials temporarily occupy 10 Sword Worlds.
626	Imperial occupation ends.
698	Second Dominate overthrown by Gram Coalition.
788	Darrian War results in loss of Entropic Worlds to Darrian Confederation. Gram Coalition falls, is replaced by Trilateral Alliance of Narsil, Sacnoth and Durendal.
848	Trilateral Alliance breaks up.
852	Current Sword Worlds government formed, capital at Gram.
979	Third Frontier War begins.
986	Third Frontier War ends.
1082	Fourth Frontier War begins.
1084	Fourth Frontier War ends, Sword Worlds retake Entropic Worlds.
1098	Joyeuse Civil War begins.
1107	Fifth Frontier War begins.
1110	Darrians retake Entropic Worlds. Imperial forces take many coreward and trailing Sword Worlds. Fifth Frontier War ends.
1111	Border Worlds, consisting of Sword Worlds, taken by Imperium, established as Imperial client state.
1132	Sword Worlds attempt land-grab.
1133	Regency absorbs Border Worlds and Gram arm.

SWORD WORLDS

The Sword Worlds have never been much of a threat to the security of the Spinward Marches, Domain of Deneb or Regency. Their numbers are simply too small when compared to the coiled power contained in the 800-some worlds of this salient of the Imperium. This is especially true now, with the Sword Worlds reduced to five independent worlds, down from 27 at the peak of their power.

It was only when united with the Zhodani and Vargr in one of the Outworld Coalitions that the Sword Worlders were able to leverage themselves into being a player in area politics. But with improved Domain-Consulate relations during the Civil War and since, the Zhodani card was no longer the Sword Worlders' to play.

Sword World Irredentism

The main threat presented by the Sword Worlds to the Regency is that of internal unrest. With 19 former Sword Worlds incorporated into the Regency, there are numerous points for friction between the Sword World and Imperial cultures, and no shortage of Sword Worlders to demand their independence.

Since the beginning of the Abandonment in 1133 the Regency has pursued the policy of resettling loyal Imperials onto the former Sword Worlds and Border Worlds. While this has created a firm base of pro-Imperial sentiment, it has not eliminated the influence of Sword World separatists. It is unlikely that the former Sword Worlds will ever be entirely assimilated into the Imperial mainstream.

The Sword Worlds are not a society; they are a collection of squabbling boors. To call this assemblage a society would be like a Terran claiming that the set of all Parisian waiters constitutes a society.

At best, the Sword Worlders constitute a subculture which can only exist in contrast with a true culture, the same as all rednecks, hillbillies and crackers can exist only so long as they have access to a true society which takes care of the real work of civilization.

Governor Esteban Hanreddy
Subsector Governor, Sword Worlds

Those who do not have honor cannot be expected to understand those who do.
Margrave Elector Basenji Himmelsdottir
Sword Worlds Separatist Party, Narsil Column

Those who can express themselves only via self-righteous tautologies should not be surprised when no one else can understand them, or be bothered to try.
Esteban Hanreddy

Sword Worlds History and Society

The Sword Worlds were populated beginning in –399 by Terrans of Germanic and Nordic descent. By –200 most of the Sword Worlds (Gram, Joyeuse, Colada, Tizon, Hrunting, Tyrfing, Beater, Sacnoth, Excalibur, Hofud, Sting, Biter, Orcrist, Anduril, Durendal, Narsil and Dyrnwyn) were settled. The official language of the Sword Worlds is a variant of Terran Icelandic, with many Nordic, Germanic and Vilani additions.

Although the Sword Worlds are a confederation in the purest possible sense, leaving each member world complete autonomy in its internal affairs, their culture is rather homogeneous, being broadly militaristic and male-dominated. The highest Sword World values are honor, stoicism, obedience and respect for authority, and Sword Worlders use these standards to judge non-Sword Worlders. Sword Worlders therefore regard other cultures with disdain, and impute weakness and cowardice to the behavior of others unless it is strongly proved otherwise.

Females are much more subordinate in Sword World society than in Imperial culture, and are expected to adhere to this status by demonstrating passivity and obedience to their male superiors. Men are expected to be decisive, strong-willed, stern and silent. Above all, they expect to be treated with respect for these traits, which causes them to be easily provoked when dealing with non-Sword Worlders.

Although they have allied themselves numerous times with the Zhodani, Sword Worlders have a low opinion of them. Much of this stems from their mistrust of psionics, as its subtlety goes against the grain of the hirsute, testosterone-addled Sword Worlds culture.

The Sword Worlds government is called the Confederation Council, which limits itself to handling interworld trade, disputes and foreign policy. Each of the Sword Worlds maintains its own separate armed forces, but these are confederalized and placed under unified command in time of war.



THE ISLANDS

The entity known by the Regency as "The Islands" comprises the worlds of subsectors J (the New Islands subsector) and K (the Old Islands subsector) of Reft sector. Both subsectors are collectively an occupied territory of the Regency, which is responsible for security and peacekeeping there. See page 72.

History of the Islands

In 2050 the European Space Agency launched the most ambitious of the sublight interstellar colonization missions: three large colony ships hollowed out from asteroids and carrying 100,000 colonists each. These ships, *Voyageur*, *Marinus van der Lubbe*, and *C-Jammer*, carried culturally homogeneous crews of French, German and British extraction, respectively. They were launched core-spinward toward the Great Rift on a journey that would last 2500 years.

Each ship had an active crew of 1000 (which would eventually grow to 10,000) in addition to the 100,000 colonists in cold sleep. Each colonist was revived for a five-year work period during the mission, with 750 such sleepers being awake at any given time. This allowed subsequent generations of the active crew to meet first-hand colonists who had started the mission in 2050 and ensured that each crew's ties to their 21st century European cultures remained strong.

When the Terrans discovered jump drive 37 years later such expeditions became obsolete. However, the intervention of the Terran-Vilani interstellar wars prevented the interception or recall of these missions, which were eventually forgotten in the Long Night, long before they ever reached their destinations.

The ships arrived at their separate destination worlds (spread across an area of six parsecs) in Reft sector just a few years before the Third Imperium was to be founded hundreds of light years away. However, the active crews preferred their familiar ships to the bizarre worlds of open skies, and after dropping off their colonists set off to explore the other worlds in the area. Sublight exploration and colonization is slow work, but eventually *C-Jammer* placed a fourth colony at Serendip Belt while *Van der Lubbe* and *Voyageur* explored further afield. When their explorations were complete, *Van der Lubbe* and *Voyageur* returned to the original colonies to began carrying new colonists to other new worlds.

The older colonies eventually began building sublight ships of their own, and the second-generation sublight colonization movement ratcheted up to a slightly less glacial pace. Second- and third-generation colonization retained the cultural-ethnic segregation of the original ships. However, the crews of the ships, cruising through interstellar space for generations at a time, developed their own supra-national culture, and served all the colonies equally. The colonies continued to grow, and gradually split into new subcultures as the result of civil wars and the separation that eroded ties between isolated worlds whose only common ground was that of common ancestry several centuries earlier.

Meanwhile, unknown to the Islanders, the Third Frontier War raged a sector away, and a battle-damaged participant, the strike cruiser ISS *Eldorado*, misjumped into the Islands, arriving at Serendip Belt. With the help of the locals, they repaired their jump drive, fashioned auxiliary fuel tanks and jumped back to the Imperium.

After the end of the war, the IISS visited the Islands only to find that the Serendips had duplicated the jump drives they had helped repair and were in the process of conquering both subsectors with their new fleet of starships. The IISS mission commander suffered from some sort of messiah complex and, seeking to atone for this inadvertent sin, began distributing jump technology to the other major powers, thoughtfully ensuring that they could all make interstellar war on an even footing.

It took 90 years for the Islanders to adjust to this new balance of power, and like most cultures they found that expanded reach led inevitably to expanded greed. Military budgets, fleets and saber-rattling all prospered, and in 1106 all-out war broke out for the consolidation of the Islands.

Wars among the major Islands powers raged intermittently from 1106 until 1140. Behind their eight-parsec moat, the Islanders remained unconcerned by the Civil War, but each power was determined to be firmly in control by the time a re-united Imperium came to offer membership to the victorious rulers.

In 1140 Regency forces arbitrarily declared an end to these wars when they effectively annexed both subsectors. Such an act is normally a clear act of political cynicism or corruption, but Regency leadership and public opinion found such niceties to be naive hairsplitting under the circumstances of preserving civilization "behind the claw," especially in the aftermath of the Rape of Trin. Should vampire fleets gain a foothold in the Islands, they would present a clear threat to the survival of civilization to spinward of the Great Rift.

In this regard it is significant that between 1130 and 1140 no fewer than six of the Islands worlds died. While three of these have since been re-occupied as Regency Quarantine Bases, three (Sturgeon's Law, Wellington, and Berlichingen) remain barren. Thus far it has been impossible to determine whether these died as a result of the consolidation wars or at the hands of vampires which slipped into the Islands under cover of the wars.

Timeline of the Islands Subsectors

Terran	*Imperial*	*Event*
2050	–2452	ESA Long-Range Colony Mission leaves solar system.
2087	–2431	Jump drive invented on Earth.
2096	–2422	First Interstellar War begins between Terrans and Vilani First Imperium.
2742	–1776	Long Night begins.
4512	–6	*C-Jammer* arrives at New Home.
4516	–2	*Van der Lubbe* arrives at Neubayern.
4518	0	*Voyageur* arrives at Amondiage.
4518	0	Third Imperium Founded.
4608	90	*C-Jammer* discovers and settles Serendip Belt.
4788	270	First new spaceship, *Outward Bound*, launched from New Home.
4814	296	*Outward Bound* places first colony on Colchis.
4860	342	*Van der Lubbe* and *Voyageur* return to Neubayern following voyages of discovery, begin ferrying colonists to these new worlds.
4861	343	Amondiage completes first new spaceship, *Asterix*.
5232	714	*Infinité* forced down on Sturgeon's Law.
5501	983	ISS *Eldorado* misjumps to Serendip Belt.
5504	986	First Serendip starship, *C-Breaker*, enters service.
5534	1016	IISS spreads jump technology.
5624	1106	Wars of consolidation break out in Islands.
5634	1116	Strephon murdered. Final War begins.
5648	1130	Virus released. Collapse begins.
5658	1140	Regency annexes Islands, enforce end to consolidation wars.

Sources of Colonization or Bases

New Home	*Neubayern*	*Amondiage*
Colchis*	Topas*	St. Denis
Esperanza*	Herzenslust	Acadie
Sturgeon's Law	Berlichingen	Quichotte
	Schlesien Belt	Sansterre*
		Joyeuse*

Colchis	*Joyeuse*	*Besançon*	*Topas*	*Sansterre*	*Esperanza*
New Colchis	St. Hilaire	Elysée	Zuflucht	Achille	Wellington
	Besançon*	Gloire			

*Indicates world which itself became the source of further colonization

Major Powers and Possessions circa 1202

New Home	*Neubayern*	*Amondiage*	*Sansterre*
Colchis	Topas*	Acadie	St. Genevieve*
Elysée*	Elysée*	St. Genevieve*	
St. Genevieve*	St. Genevieve*		

Joyeuse	*New Colchis*	*Serendip Belt*	*Esperanza*
Quichotte	Herzenslust*	Gloire	St. Hilaire
Besançon*	Besançon*	Topas*	Nebelwelt
Herzenslust*		Elysée*	

*Disputed ("Powderkeg") world. RPKF ground troops man DMZs separating combatants.



Islander Aggression

The Islands are the only area in the Spinward States (outside of, perhaps, the Zhodani Consulate, but no one knows what is going on in there) where anything approaching open warfare is going on in 1202. To Regency citizens, the Islanders possess an incomprehensible and repugnant level of aggression and expansionism. After all, the Regency consists of hundreds of worlds which possess no desire to make war on each other, but instead find it inescapably reasonable that they should instead be knitted into a larger society that provides benefits to all its members. Besides, war in the face of virus howling at the gate is suicidally insane.

These tendencies are in fact an instructive example of how drastically different conditions can create drastically differing social assumptions.

Whereas the Regency and its neighbors have benefited from centuries of mutual trade and communication, the Islands became insular and even xenophobic over the course of centuries of effective isolation that is the reality of sublight commerce. Furthermore, the Islanders began as distinctly segregated English, French and German cultures cemented by 2000 years of shipboard travel with none of the mixing effects experienced by ethnic and national groups that expanded out into space with the more rapid travel times allowed by jump drive with all of the ethnic, cultural, and social blending that such communication implies.

The fact that these people had the ambition and drive to expand when the only avenue was painstaking sublight travel testifies to their determination to assert their wills over the universe, and this determination is easily expressed as aggression. Because the nature of sublight travel allowed no option for true interstellar warfare that could have vented these forces, and in the absence of external enemies to unite them, the Islanders were distinctly unready to coexist peacefully with each other when super-light travel was inflicted on them.

Now possessing the tools to practice their expansionist tendencies in real time, they found themselves trapped on a small playing field where all of the real estate was already taken, and there was no other direction to exercise their expansionism. The only choice left was to fight over what was already there.

RQS and RPKF forces in the Islands have developed a notably impatient attitude toward their warlike protectorate. Early Regency forces suffered frequent casualties as a result of being caught between warring Island states, or as part of humanitarian relief missions turned hot. After years of bitter experience, the attitude of Island-deployed RQS and RPKF personnel has hardened into one of, "when in doubt, do it to them before they do it to us."



Adventure Hook

RQS duty in the Islands is a combination of the traditional RQS job of Quarantine enforcement plus one other explicit task, that of the Regency Peacekeeping Force (RPKF). The very clear danger of conflict in the Islands is that it can create openings for, and conceal the intrusion of, Virus. Thus PKF duty not only requires the saintly resolution and forbearance traditional for such operations, but adds the disastrous consequence of Virus outbreak if one is too forbearing and insufficiently vigilant.

A typical PKF flotilla consists of a Darrian patrol cruiser (either Darrian- or Regency-manned), a pair of Quarantine cutters (either the standard Faith-class or Aslan-manned *Trekhyair* variants), one or two *Empress Marava*-class far traders for logistical support and troop carriage, and two or three jump-boats for courier and liaison service. These flotillas are limited to jump-2, which restricts them to riding the circuit in the Old Islands and the core-trailing portion of the New Islands. See the Starships section, pages 85-92, for details.

The duties of the flotilla are to "show the flag," protect free trade, see that buffer zones are being maintained and respected, inspect and maintain boundary and other navigational markers, transport relief troops to observation posts and demilitarized zones, prevent celestime incidents at powder-keg worlds, and militarily intervene when cease-fires are violated.

Powderkeg worlds are those which are disputed by one or more power (see sidebar, "Major Powers and Possessions, 1202"). Because the rivals still send shipping to support their forces there, opportunities for incidents and combat are many. These nominally civilian vessels are crewed by military personnel and harass each other by violating celestime rules of the road, provoking accidents and "playing chicken" in restrictive traffic patterns.

A tour of duty with such a flotilla begins at RQB Valdivia (at Gloire, 1123 Reft, see page 72) and lasts for six months, at which time the force returns to Valdivia for rotation back safeside. This holds true for reserve and active-duty RQS personnel, as PKF duty is deemed too stressful for long deployments.

More than one weary Regency peacekeeper has been heard to lament, "How can we keep a peace they don't want? When people want to end a war peacekeepers make sense, but they *like* killing each other. They don't want us to stop them. What the hell are we supposed to do?" For most Regency warriors the answer has become simple pragmatism—by maintaining order in the Islands they protect the Regency's borders. Only a minority still try to maintain an ethic of compassion and service to the Islanders, not all of whom are the uncivilized animals they are portrayed as.

FEDERATION OF ARDEN

The Federation of Arden (pages 37 and 41) has long been neutral ground between the Zhodani Consulate and the Domain of Deneb. Thus it was teeming with diplomats engaged in secret negotiations, unextraditable celebrity fugitives and exiles, fashionable expatriates, intelligence operatives exchanging information, prisoners, or seeking to penetrate the frontier, arms merchants, guerrillas, terrorists, freedom fighters, assassins, bounty hunters, out-of-work mercenaries, and all the other amoral sorts attracted by an environment of ambiguity, deceit, and shady opportunity.

With the warming of Consulate-Domain/Regency relations through most of the post-Civil War period, the importance of this underworld nexus declined, but it has taken steps to maintain its association with underground and "gray" organizations. The Federation of Arden has the distinction of being one of the few states to refuse to sign the Spinward States Accords. This not only underscores the Federation's status as an independent power, but achieves two other functions. First, it allows the Federation to not renounce the use of Virus as a weapon of last resort to maintain its independence. Second, it makes the Federation attractive to the kind of extralegal activities that have long fueled its economy. For example, the Federation is one of the main sites of money-laundering for the Vargr underworld. With the beginning of the Exodus and renewed uncertainty between the Zhodani and Regency, Arden is reasserting its role as the axle of intrigue in the Marches.

The Federation is a relative late-comer to interstellar sovereignty. Arden only took Zircon (1110) and Utoland (1209) as colonies just prior to the Fifth Frontier War, extending its grasp to four more worlds, Quare (0915), Zenopit (1010), Pequan (1210), and Tremous Dex (1311) by 1210. The Federation reached its current size in 1133, although it lost Tremous Dex to the new Regency.

The Federation of Arden's government is considered to be quite oppressive; it is controlled by the Arden Society, a small group of leaders selected for their contributions to the Society's advancement. Arden maintains a policy of passive neutrality, leaving its systems conditionally open to belligerents in time of war—belligerent vessels may refuel and pass through the systems, but may not engage in combat. They are kept segregated by the Federation's naval forces.

The Federation of Arden refuses to accept Zhodani refugees. These are either sent back into the Consulate or encouraged to proceed on into the Regency.

Data Section

NOTES FOR REGENCY UWP DATA

The following 37 pages contain complete UWP information for all 981 worlds in the Regency and its immediate surroundings, located in four sectors and 45 subsectors.

UWP Abbreviations and Codes

The standard UWP format as described and detailed in TNE pages 180-195 will be used. The following specific codes are used in this book.

Base Codes: A: Naval Base and Scout Base; B: Naval Base and Way Station, C: Corsair (Vargr) Base; D: Naval Depot; I: Interface World; M: Military Base; N: Naval Base; S: Scout Base; T: Terminus World (see page 20); W: (Xboat) Way Station; Z: Zhodani Naval/Military base

Trade Codes and Notes: Ag: Agricultural; An: Ancients' Site; As: Asteroid; Aw: Aslan ruled world within the Regency; Ba: Barren; Cf: Frontier Capital; Cm: Cemetary world (a world whose original population has died off completely, the current population is all recent settlers); Cp: subsector Capital or of other small interstellar state; Cx: Sector or higher level regional Capital; De: Desert; Ex: Exile camp; Fl: Fluid oceans; Hi: High population; Ic: Ice-capped; In: Industrial; Mr: Military rule; O:NNNN indicates that the world is owned by the world in the indicated (NNNN) hex; Po: Poor; Pr: Prison camp; Re: Reserve world; Ri: Rich; Rs: Research Station (with Greek letter designation); Rw:N: Refugee world, where "N" can be a letter or a number: "Z" indicates Zhodani refugees and "V" indicates Vargr refugees, a number indicates imperial humans from the Abandonment, see notes below; Va: Vacuum; Vw: Vargr-ruled world within the Regency; Wa: Water world.

A:N, C:N, D:N, or V:N indicates that the world was populated in part by Aslan, Chirpers, Droyne, or Vargr. The number "N" following the colon indicates how many tenths of the world's population consists of these races (0=1-9%, 9=90-99%). The remaining population is assumed to be predominantly human (i.e., Zhodani if on Zhodani worlds, imperial culture on Imperial worlds, some local mix on non-aligned worlds or client states).

TPPG indicates Travel Zone, Population Multiplier, Planetoid Belts, and Gas Giants. If Travel Zone digit is empty, it is listed as a Green Travel Zone; A and R indicate Amber and Red zones respectively. In addition, all worlds in the Regency Frontier (gray-shaded hexes) are considered to be Amber Zones, but are not separately listed as such. *All* worlds in the Wilds, outside of the Regency Safe and Frontier, are Red Zones for Regency citizens, as the Wilds are officially interdicted by the Regency government as well as the governments of *all other* Spinward States. Although Regency armed forces patrol these areas, they are off-limits to all other persons.

A B in this column indicates a Balkanized world located in the Wilds ("Wi" allegiance code), the government code in the UPP string describes the most common government type or the most powerful government on the world (varies from world to world, referee's discretion).

Allegiance Codes: As: Aslan Hierate, AF: Aslan Frontier world; Cs: Client state of the Regency; Cz: Client state of the Zhodani Consulate; Da: Darrian Confederation; DD: Domain of Deneb (Third Imperium); Dr: Droyne world; FA: Federation of Arden; Na: Non-aligned, no off-planet allegiance, but these worlds are minor members of the Spinward States, and have not collapsed (they are therefore not part of the Wilds; these worlds use the government types listed on page 188 of the TNE rulebook); Re: Regency, RF: Regency Frontier worlds; SF: Senlis Foederate; SW: Sword Worlds; Va: Vargr, nonaligned or unspecified allegiance; Vf: Dzarrgh Federate (Vargr state); Vu: United Followers of Augurgh (Vargr state); V6: Assemblage of 1116 (Vargr state); Wi: Wilds, no off-world allegiance, and perhaps no off-world contact; these worlds have collapsed and use the Wilds government type from page 191, TNE rulebook (in the case of government type 6: "Technologically Elevated Dictator," the world's listed tech level is that of the world as a whole; the tech level of the TED and his or her support structure is higher, up to the world's original tech level); Zh: Zhodani Consulate; "—" indicates no allegiance because there is no population.

Aslan Government Codes: The following government codes are used in the UWPs of Aslan-ruled worlds in place of the standard government types found on page 188 of TNE. G: Small station or facility: operated by an off-world clan or controlled by a company. This is the only instance in which an Aslan world is controlled by anything other than a clan. H: Split clan control: several on-world clans control different parts of the world, analagous to human balkanized worlds. J: Single on-world clan control: world is controlled by a single clan which only rules one world, however the world may also include other small clans which are controlled by the major clan. K: Single multi-world clan control: world is controlled by a clan which owns several worlds. L: Major clan control: world is controlled by one of the 29 major clans of the *Tlaukhu*. M: Vassal clan control: world is controlled by a vassal clan subservient to a large clan, however the world is actually *owned* by the larger clan. N: Major vassal clan control: as M above, but the controlling clan is subservient to one of the *Tlaukhu* clans. Again, it is the superior clan which *owns* the world, the vassal clan merely controls it in its stead.

Map Symbols

The 45 subsector maps use the standard symbology detailed on TNE page 183 and given on the Subsector Data Forms found in the **Traveller Players' Forms** supplement.

Regency Frontier: This area is found in the Deneb, Reft, and Trojan Reach Sectors, and is indicated by a gray-shaded hex. Worlds in these hexes use the "RF" allegiance code, above. All worlds in the Frontier are considered to be Amber Travel Zones, even if not otherwise listed.

Note that Wilds areas are not indicated on the map, they are simply the area on the far side of the Frontier from the Regency safe area. All worlds in the Wilds are considered to be Red (Interdicted) Travel Zones, although they are not otherwise listed as such.

Military Base: Military bases, found in the Sword Worlds (page 45) and some Aslan worlds, use the club (♣) symbol.

Zhodani Military/Naval Base: Although these bases are in all respects equivalent to the naval bases shown in Regency and other territory with the five-pointed star (★) symbol, for the sake of tradition these bases are shown by a closed diamond (♦) symbol.

Interface World: These quarantine border security worlds (see below) are indicated by a "cross-hairs" insignia (⌖). This symbol is also used for the Wildside and Safeside Termini worlds (see page 20) on pages 54, 58, and 62. Because of their placement along the Regency Frontier there is no danger of their confusion with normal interface worlds.

Calibration Point: These deep-space military refueling points are indicated with a circle-x symbol (⊗), accompanied by "CP" and their code-names. See Library Data, page 76, for description of calibration points.

New Terms and Facilities

Military Base: A smaller version of the standard naval base, which also includes facilities for non-naval military forces. Whereas a naval base is designed to support subsector-sized fleets or larger, military bases are sized for planetary navies.

Interface Worlds: These are the border worlds that provide contact between the Spinward States. All starships passing from one Spinward State to the next must make first planetfall in the new state at one of these worlds. It is illegal to pass into a Spinward State to a non-interface world, and this action carries heavy penalties, usually involving the confiscation of the starship. See page 20 for further discussion.

Note that interface worlds are only indicated for the major Spinward States (i.e., those which consist of more than one world). For the minor states (single worlds) none are listed, as each minor state functions as its own interface world.

Terminus Worlds: Similar to interface worlds, above, but will be used to control access to the Regency Safe following the opening of the Frontier. See page 20.

Calibration Point: See page 76.

Refugee Worlds: The Regency contains three kinds of refugee worlds: Zhodani refugee worlds, Vargr refugee worlds, and Regency refugee worlds.

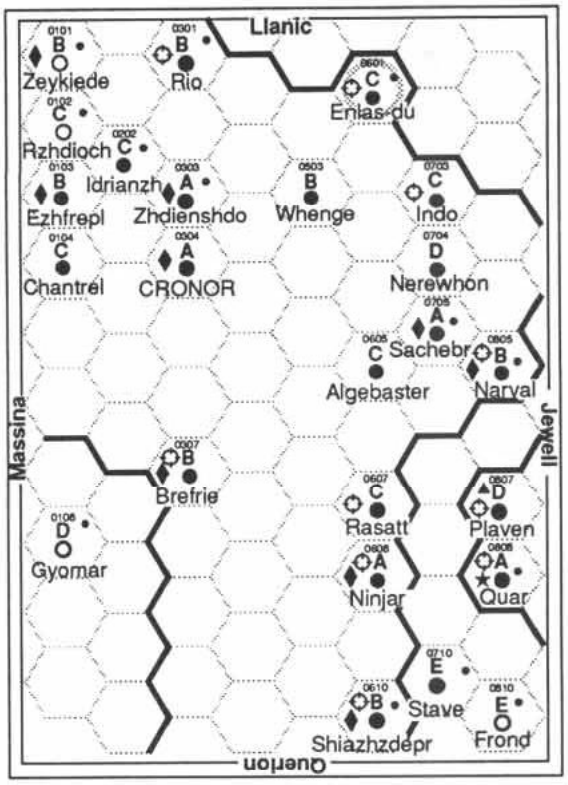
For Zhodani and Vargr refugee worlds, the size of their refugee population is not given, nor are the refugees included in the world's UWP population data. Since the Zhodani Exodus is still underway with no sign of abating, the size of these refugee populations are subject to rapid change, and the few remaining Vargr refugee worlds (as most Vargr refugees eventually moved to established Vargr communities on other worlds) will have their populations listed under the world remarks.

The number of Zhodani refugees continues to expand, so these refugees can be found on worlds which do not have the Rw:Z note. The Rw:Z note indicates worlds which have either been officially designated as sites where Zhodani refugees are transferred, or which have large continuous influxes of Zhodani refugees and have become *de facto* refugee worlds. Any world which has a naturally breathable atmosphere and is reasonably close to the Zhodani interface is likely to become a Zhodani refugee world, whether it wants to or not. While it would perhaps be simple to destroy all incoming Zhodani ships, standards of decency simply will not allow this.

Zhodani refugees may be found on most any Regency world; the difference between a refugee world and a world which simply contains some refugees is a matter of density. A world where large homogeneous groups of Zhodani live in temporary housing or overcrowded ghettos are refugee worlds. A world in which a relatively small number are spread throughout its population is not such a world. However, with the continuing influx, more refugee worlds are being created, and there is nothing to stop a referee from stipulating that a world without the Rw:Z code has now become such a world.

Regency refugee worlds are the by now semi-permanent homes of imperial citizens who fled to the Regency interior during the period of the Civil War or Abandonment. Most such refugees have long since found permanent homes (sometimes on the refugee worlds themselves, sometimes on other worlds offering new opportunites, and sometimes by deliberate resettlement on former Sword Worlds or Aslan *fait accompli* worlds, see pages 11 and 45) and integrated themselves into Regency society. Where the Regency refugee world note remains, these populations still live in separate communities peopled almost entirely by refugees and their descendants. By now these communities have become bewilderingly complex subcultures; regardless of the travel zone of the world itself, all refugee camps are considered to be Amber Travel Zones.

Note on Aslan and Vargr Populations: The Regency contains a great many Aslan and Vargr citizens, most of which are not indicated by A:N or V:N notes. Worlds with these notes are those which contain politically significant populations of these beings, usually living according to their own cultures and preferences, rather than imperial culture, see page 78.



Cronor Subsector, 1117 and 1202 dual listing (Subsector A of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Zeycude	0101	C330698-9		De Na Ni Po	613	Zh	K9 V
Zeykiede	0101	B330698-A	Z, I	De Na Ni Po	813	Zh	K9 V
Reno	0102	C1207B9-A		De Na Po	603	Zh	G8 V M1 D
Rzhdioch	0102	C1207B9-B		De Na Po	903	Zh	G8 V M1 D
Errere	0103	B263664-B	Z	Ni Ri C:0 O:0304	910	Zh	M1 V M4 D
Ezhfrepl	0103	B263764-B	Z	Ri C:0 O:0304	210	Zh	M1 V M4 D
Cantrel	0104	C366243-9		Lo Ni	520	Zh	F1 III
Chantrel	0104	C366577-A		Ni Ag	120	Zh	F1 III
Gyomar	0108	D8B2889-5		Fl	824	Na	A8 IV
	0108	D8B2889-5		Fl	924	Na	A8 IV
Thengo	0202	C868586-5		Ag Ni	801	Zh	G5 V M3 D
Idrianzh	0202	C868686-6		Ag Ni Ri	101	Zh	G5 V M3 D
Rio	0301	C686648-8		Ag Ni Ri	201	Na	M1 V M0 D
	0301	B686648-A	I	Ag Ni Ri	601	Cz	M1 V M0 D
Gesentown	0303	B21169B-C	Z	Ic Na Ni	801	Zh	M2 V M9 D
Zhdienshdo	0303	A21179B-D	Z	Ic Na	101	Zh	M2 V M9 D
Chronor	0304	A6369A5-D	Z	Hi Cp	810	Zh	F8 V
Cronor	0304	A636AA5-E	Z	Hi Cp	210	Zh	F8 V
Atsa	0307	B4337CA-A	Z	Na Po	810	Zh	F7 V M9 D
Brefrie	0307	B4337CA-B	Z, I	Na Po An	910	Zh	F7 V M9 D
Whenge	0503	D648500-8		Ag Ni	610	Na	F8 V
	0503	B648743-A		Ag	810	Na	F8 V
Enlas-Du	0601	E975776-6		Ag	323	Na	F1 V
	0601	C975876-6	I	V:3	A123	Cz	F1 V
Algebaster	0605	C665658-9		Ag Ni Ri	410	Na	M0 V M1 D
	0605	C665758-A		Ag Ri	110	Cz	M0 V M1 D
Rasatt	0607	E883401-7		Lo Ni	910	Na	F0 V
	0607	C883601-9	I	Ni	210	Zh	F0 V
Ninjar	0608	A211666-C	Z	Ic Na Ni O:0304	410	Zh	A4 V
	0608	A211766-D	Z, I	Ic Na O:0304	110	Zh	A4 V
Sheyou	0610	B756779-A	Z	Ag	111	Zh	F4 V M0 D
Shiazhzdepr	0610	B756779-B	Z, I	Ag	411	Zh	F4 V M0 D
Indo	0703	E334662-5		Ni O:0704	320	Na	F6 V
	0703	C334766-7	I	O:0704	320	Cz	F6 V
Nerewhon	0704	E738475-7		Lo Ni	820	Na	K5 V
	0704	D738475-9		Lo Ni	820	Cz	K5 V
Cipango	0705	A886865-C	Z	Ri O:0304	121	Zh	G2 V
Sachebr	0705	A886865-C	Z	Ri O:0304	321	Zh	G2 V
Stave	0710	E7667A8-2		Ag	801	Na	K9 V M2 D
	0710	E7667A8-2		Ag	701	Na	K9 V M2 D
Narval	0805	D525688-6	Z	Ni	A603	Na	G4 V M6 V
	0805	B525688-8	Z, I	Ni	903	Cz	G4 V M6 V
Plaven	0807	E845300-3		Lo Ni	910	Na	G8 V M7 D
	0807	D845500-8	S, I	Ni Ag Rw:Z	210	Re	G8 V M7 D
Quar	0808	B532720-8	N	Na Po	A401	DD	M2 V
	0808	A532820-C	N, I	Na Po	101	Re	M2 V
Frond	0810	E9C3300-9		Fl Lo Ni	103	Na	F8 V
	0810	E9C3200-8		Fl Lo Ni	603	Na	F8 V

SPINWARD MARCHES SECTOR

The Spinward Marches were settled by the young Third Imperium beginning in the year 60 (IC). The Zhodani name for the sector is *Tloql*, and by 500 Imperial settlements extended all the way to the spinward edge of the Chronor (A) subsector, and were beginning to encroach on Zhodani settlements in core-spinward *Tloql*/Spinward Marches. These frictions precipitated the First Frontier War of 589-604, longest of the frontier wars, which resulted in the loss of territory in the Chronor subsector to the Zhodani. (This is in spite of the fact that the war ended in an Imperial victory by Grand Admiral hault-Plankwell's destruction of the Zhodani-Vargr fleet in the Rhylanor subsector; this victory was sufficient only to end the 15-year conflict, but not to recover territory already lost in it.) The Second Frontier War of 615-620 resulted in the loss of more territory to the Zhodani Consulate in the Jewell (B) subsector, as well as the relinquishing of a number of Imperial worlds in the Querion (E) subsector, creating a buffer zone of non-aligned human worlds between the two powers.

This arrangement proved to be quite stable, and lasted for over 350 years, until 979 with the outbreak of the Third Frontier War. This war also resulted in a roll-back of Imperial borders, with further Zhodani gains in the Jewell and Querion subsectors, and the expansion of the non-aligned "demilitarized zone" into the Vilis (F) subsector.

The Fourth Frontier War a century later (1082-1084) was essentially an accident (and is also known as the "False War") which resulted in minor border adjustments affecting only four worlds.

The fifth and last frontier war from 1107 to 1110 was the first true Imperial victory, resulting in a small net gain of worlds. Zhodani-Imperial relations since then have been remarkably warmer than in the past, as related in other sections. (See also **The Spinward Marches Campaign**, and **Supplement 11, Library Data N-Z**, both OP.)

Spinward Marches Subsector A: Cronor (formerly Chronor)

The Cronor subsector, formerly known to Imperials by its Imperial transliteration, "Chronor," is now referred to by both Zhodani and Imperials by its Zhodani name Cronor.

This is a by-product of the closer relations between the Consulate and Domain/Regency in the period following the disintegration of the Imperium. This is also seen in the "name changes" on the UWP listings above. These are not actual name changes, but are merely the Regency's recognition of the proper Zhodani names for these worlds, and are another result of the post-Collapse warming of Zhodani-Regency relations.

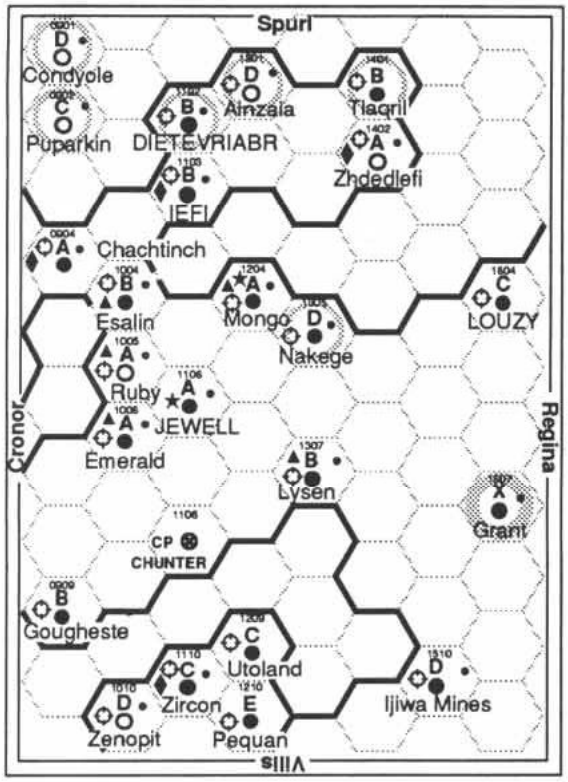
For the Zhodani, the Cronor subsector had been a frontier area far from the well-trafficked center of the Consulate, and consequently not particularly well-developed. With the warming of Imperial-Zhodani relations, Cronor gradually became a center for trade with the Regency. This growth is reflected in the increased starport quality and technology in the Zhodani worlds. The population increase is partially due to this same cause, but is equally the result of the Zhodani rimward migration that eventually erupted into the Exodus in 1201 (see pages 13 and 24).

Cronor does not have a Regency fleet assigned, as only two worlds in the subsector have Regency allegiance. The defense of Regency interests and territory in Cronor is the responsibility of the 212th Fleet based in Jewell, and the Cronor frontier falls within the 1st Quarantine District (see Jewell, next page, for more details).

Cronor Cleft: The major astrographic feature of the Cronor subsector is the Cronor Cleft, a divide that cuts core-rimward down the center of the subsector, interrupting communications between its spinward and trailing halves. This obstacle was only a problem for Zhodani military forces before the warming of relations between the Consulate and Regency, but with the increase in trade, communications, and travel (especially among those involved in the psionic sciences) it became a significant obstacle to commerce. The result was the flowering of Whenge (0503). This former minor world occupies a unique location, sitting as it does astride the cleft and has become a port of call for almost all commercial shipping moving between the Zhodani interior and the Regency frontier. (Like the the Regency, the Consulate presumably maintains calibration points, see "Library Data," page 76, to assist military traffic in surmounting this obstacle when staging into the border areas.)

Sea Bear: Large, dangerous, amphibious carnivore native to Thengo/Idrianzh (0202), but it has been distributed to a large number of worlds in the Cronor, Jewell (B), and Querion (E) subsectors. Also known as the "surfer's nightmare."

Sea bears are mammalian in appearance and layout, with four pairs of powerful, clawed limbs which can be used interchangeably for predation, locomotion, or holding itself firm against ocean currents. Adult sea bears average 1.5 meters in length and mass upward of 50 kg. They hunt alone, but



during mating season assemble into social groups of hundreds of individuals, much like Terran seals.

The sea bear hunts along beaches, shallow offshore waters, and its eight strong limbs make it powerful enough to hunt even in the surf zone. (See also JTAS 3, OP, and **Best of the Journal** 1, SA.)

Spinward Marches Subsector B: Jewell

Jewell subsector is home to the 212th Fleet which earned fame in the Fifth Frontier War by repulsing invading Vargr fleets from the Regina subsector. The 212th is currently headquartered at Jewell (1106).

Jewell's frontier is entirely contained within Quarantine District 1, which runs from Zeta 2 (0919) in the Vilis subsector (page 41) to Menorb (1803) in the Regina subsector (page 38).

Battle subsector: Imperial nickname for the Jewell subsector, because of status as a major battleground in all of the frontier wars.

Condyole (0901): Condyole and its immediately rimward neighbor Puparkin (0902) are unusual examples of minor Spinward States, in that they are not within the envelope of the Zhodani, Regency, and Aslan frontiers. These two worlds trade directly with the Vargr frontiers, and contain large Vargr trading communities.

The worlds are similar in that they both have inhospitable atmospheres and all settlements are either built below ground or in sealed surface modules. Because of the essentially uncontrolled Vargr presence on these worlds, both are considered rather lawless and dangerous environments. Both worlds are classified as Amber Zones by the Travellers' Aid Society (and its equivalents in other Spinward States) because of their proximity to the unstable Vargr Splinters and the presence of Vargr organized crime on these worlds (see page 29, *referees only see page 85*).

CP Chunter: The Regency Navy maintains several calibration points (see Library Data) within the Regency itself to facilitate fleet movements across interstellar gaps, such as the Abyss (see page 41). CP Chunter is one such intra-Regency mobility CP, and like all CPs, is for military use only. Its exact location and beacon code are classified.

Esalin (1004): Esalin was originally settled by Imperials in 835, but was taken by the Zhodani in 1082 during the Fourth Frontier War. Joint Imperial-Zhodani administration of the world was established during the armistice following the war, and Esalin was declared neutral in 1098. Esalin was reconquered by the Imperium in the Fifth Frontier War and the Zhodani portion of its government deposed, but the world retained a significant Zhodani population which was encouraged to remain on the world. Although now clearly Imperial territory, its previous status as a neutral meeting ground for Consulate-Imperial negotiations was too useful to abandon. Esalin was maintained in a demilitarized status and its Zhodani citizens were not treated as conquered subjects but, in an experiment that would eventually pay handsome dividends for the Regency, were allowed to retain their lifestyles within "Zhodani Cultural Enclaves."

Jewell Subsector, 1117 and 1202 dual listing (Subsector B of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Condyole	0901	E7A1522-8		Fl Ni	923	Na	F8 III
	0901	D7A1664-7		Fl Ni V:4	A223	Na	F8 III
Puparkin	0902	C7B3386-9		Fl Lo Ni	502	Na	K8 V M4 D
	0902	C7B3553-A		Fl Ni V:8	A302	Na	K8 V M4 D
Chwistyoch	0904	B766766-A	Z	Ag Ri	A424	Zh	M2 V
Chachtinch	0904	A766866-B	Z, I	Ri	224	Zh	M2 V
Gougeste	0909	C372510-A		Ni	A420	Na	K2 V
Gougheste	0909	B372510-A	I	Ni	420	Re	K2 V
Esalin	1004	C565673-8		Ag Ni Ri	A223	Cs	F3 V M5 D
	1004	B565866-A	S, I	Ri Rw:Z	423	Cs	F3 V M5 D
Ruby	1005	B400445-B	S	Lo Ni Va	201	DD	M1 V M3 D
	1005	A400445-C	S, I	Lo Ni Va	401	Re	M1 V M3 D
Emerald	1006	B766555-B	S	Ag Ni	534	DD	M1 V
	1006	A766555-C	S, I	Ag Ni Rw:Z	934	Re	M1 V
Zenopit	1010	D130546-7		De Ni Po	622	FA	M3 V
	1010	D130598-7	I	De Ni Po	722	FA	M3 V
Riverland	1102	C566A99-9		Hi	A214	Zh	M7 III
Dietevriabr	1102	B566A99-A	I	Hi V:2	A314	Zh	M7 III
Clan	1103	B672899-A	Z		A901	Zh	K8 V
Iefi	1103	B672999-A	Z, I	Hi In	201	Zh	K8 V
Jewell	1106	A777999-C	A	Hi In Cp	623	DD	G7 V
	1106	A777A99-F	A	Hi In Cp Rw:Z	123	Re	G7 V
Zircon	1110	C792668-8	J	Ni O:1011	624	FA	F0 V
	1110	C792668-8	J, I	Ni O:1011	824	FA	F0 V
Ao-dai	1201	E410644-6		Na Ni	312	Zh	K2 V M3 D
Ainzaia	1201	D410644-6	I	Na Ni V:1	A412	Zh	K2 V M3 D
Mongo	1204	A368685-A	A	Ag Ni Ri	603	DD	M6 III M0 D
	1204	A368686-B	A, I	Ag Ni Ri Rw:Z	803	Re	M6 III M0 D
Utoland	1209	C473464-7		Lo Ni O:1011	410	FA	M0 V
	1209	C473464-7	I	Lo Ni O:1011	610	FA	M0 V
Pequan	1210	E565689-4		Ag Ni	710	FA	K5 V
	1210	E565669-4	I	Ag Ni Ri	910	FA	K5 V
Nakege	1305	D591314-2		Lo Ni	A501	DD	M2 V M0 D
	1305	D591414-6	I	Lo Ni Rw:Z	A101	Re	M2 V M0 D
Lysen	1307	B592655-A	S	Ni	623	DD	M3 V
	1307	B592677-B	S, I	Ni Rw:Z	823	Re	M3 V
Foelen	1401	B638665-8		Ni O:1402	A910	Zh	K0 V
Tlaqril	1401	B638788-8	I	V:2	A310	Zh	K0 V
Farreach	1402	A200400-B	Z	Lo Ni Va	A415	Zh	M3 II M0 V
Zhdedlefi	1402	A200400-C	Z, I	Lo Ni Va	715	Zh	M3 II M0 V
871-438	1510	E722000-8		Lo Ni Po	801	Na	M9 V M8 D
Ijiwa Mines	1510	D722200-8	I	Lo Ni Po	301	Re	M9 V M8 D
Louzy	1604	D322A88-8		Hi In Na Po	110	DD	M2 V
	1604	C322A78-A	I	Hi In Na Po	210	Re	M2 V
Grant	1607	X664100-0		Lo Ni	R222	DD	K6 V
	1607	X664100-0		Lo Ni Rw:Z	R222	Re	K6 V

With the unanticipated warming of Zhodani-Domain relations during the pre-Collapse period, Esalin became an increasingly important conduit for communications between the neighboring powers (see, for example, **Survival Margin** page 41) until Norris formally moved these proceedings to Regina (next page).

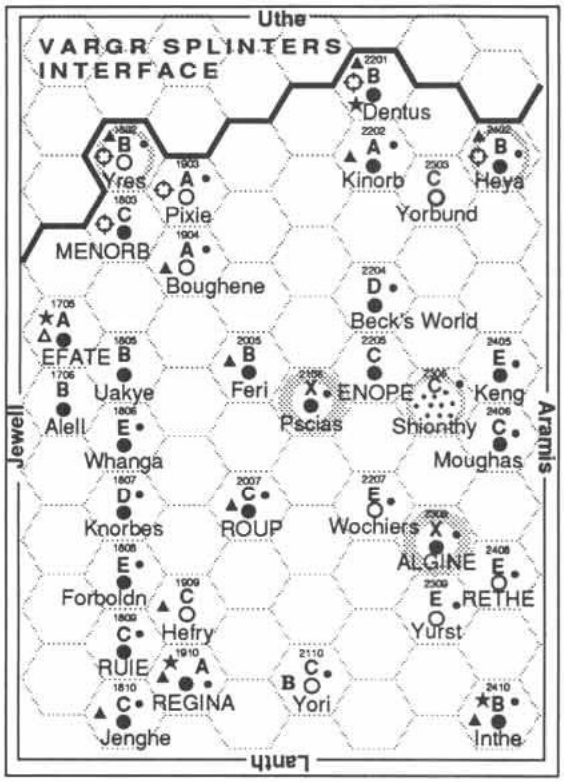
Jewell (1106): Already one of the key worlds of the subsector, Jewell became even more important in the post-Collapse period as one of the focal points of the Regency's industrial development strategy. Jewell was one of 26 worlds identified by the Regency as a developmental priority to increase the number of high-technology manufacturing centers, particularly in areas where these were scarce. One such area was the Regency's core-spinward region, as these five subsectors (Jewell, Regina, Aramis, Vilis, and Lanth) had not a single TL-15 world, much less a TL-15 industrial world. Jewell was the figurative and literal cornerstone of this project, and became the most core-spinward of the Regency's high technology worlds, providing needed high technology at the crucial junction of the Zhodani and Vargr frontiers.

Jewells, The: Popular name for the cluster of six Imperial-held worlds in the center of the subsector: Ruby (1005), Emerald (1006), Jewell (1106), Mongo (1204), Nakege (1305), and Lysen (1307). These strategic worlds have long been a thorn in the Zhodani side, constituting a fortified dagger pointed into Zhodani territory. They have therefore seen much fighting, as their capture has been a Zhodani strategic goal in most of the frontier wars.

Puparkin (0902): See remarks under Condyole, above.

Refugee Worlds: The Jewell subsector contains a number of Zhodani refugee worlds. These worlds are usually the first Regency stop on their journey; Regency authorities are attempting to ship these refugees further from the interface to purpose-built refugee facilities, to avoid overcrowding on these border worlds. Low-population worlds, such as Nakege (1305) are easily overwhelmed by refugee influxes that can outnumber their own population.

The Federation of Arden (page 34) will not accept Zhodani refugees. These are either sent back to the Consulate or are encouraged to continue on into the Regency.



Spinward Marches Subsector C: Regina

The Regina subsector is defended by the famous 213th Fleet which defended the Lunion subsector and conquered the trailing Sword Worlds in the Fifth Frontier War. The 213th headquarters are located at Efate (1705).

The Regina frontier falls within the 2nd Quarantine District. RQD 2 runs from Menorb (1803) to Enaaka (0203 Deneb) in the Pretoria subsector and has exclusive responsibility for the interface with the Vargr Splinters.

General Products, LIC: One of the former Imperial megacorporations (see "Ling Standard Products," page 46) which survives in the Regency, General maintains three shipyards in the Regina subsector, at Efate (1705), Pixie (1903), and Regina (1910). Regina obtained a bad reputation for starship quality in the antebellum period, and was actually forced to withdraw from the military starship market until the onset of the Civil War. General was one of the manufacturers of the uniformly ill-regarded *Kinunir*-class Colonial Cruisers (see **Brilliant Lances Technical Booklet**, page 38), hastily returned to production during the war.

Regina (1910): Capital of the Regina subsector and of Spinward Marches Sector, Regina is the moon of a gas giant, Assiniboia (Lusor 4/Lusor Epsilon).

During the Final War Norris established Regina as the site of talks to improve Domain's foreign relations, with special attention begin given to its relationship with its traditional enemies, the Zhodani. Regina was a convenient location for this initiative, and Regina grew to replace Esalin (1004) as the focal point of Consulate-Domain diplomacy. This was another manifestation of the crucial lifelong theme of Norris' career: the Domain's coming to terms with psionics and its Zhodani neighbors (detailed elsewhere in this book). Norris, as the military leader of the first true victory over the Zhodani, was probably the only Imperial leader who could have engineered a *rapprochement* with the Zhodani, and even had this been his only accomplishment, he would still be regarded as one of the most important statesmen in Imperial history. It is still remarked to this day, "Only Norris could go to Zhodane."

University of Regina: Although originally a planetary institution, the demands of the Final War and Collapse prompted "Regina" to expand its services and mandate to first the entire Spinward Marches Sector and later to the entire Domain/Regency. It is now regarded as one of the foremost institutions of learning in the Regency, although certainly some of this cachet is due to its association with the revered First Regent.

Although Regina is a broad-spectrum institution, it continues to concentrate on its traditional strengths in the social sciences: history, sociology, cultural anthropology, public policy, and political science. Since the First Regent's death, Regina has added a high-profile Norris Aella Aledon School of Leadership Philosophy.

By law Regina is the only university in the sector allowed to call itself the "U of R" (see University of Rhylanor, page 43). However, its students and faculty breezily scorn this distinction and refer to the university simply by the world's name: "Regina." Through some tortuous administrative path the university has traced a portion of its campus to an act approved by the young Duke of Regina in 1099, thereby allowing its alumni the sanctimonious claim that Regina is the university that the First Regent built, which they invariably fit into conversations as often as possible. This arrogance, which has only arisen since the Collapse, extends to many institutions based on Regina, and is characterized by the presumption that Regina is the true repository of the greatest traditions of the Regency, and "birthplace of two thirds of all Regents." This sentiment is not suffered lightly on other Regency worlds.

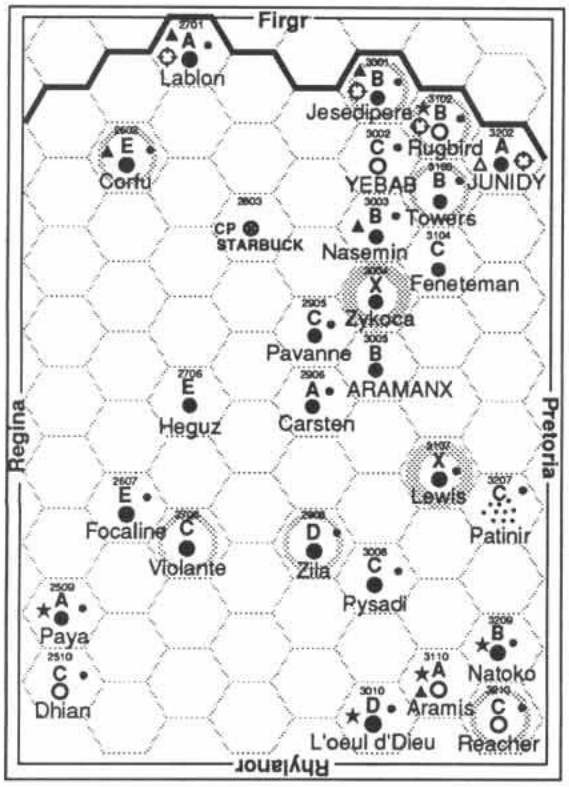
Regina Center for Research: Not a true university or learning institution, the RCR is rather a center for analysis which draws on the expertise of the region's colleges and universities to support its assigned projects. It was the RCR to which then-Archduke Norris turned in 1117 to create the Spinward Marches Archive Retrieval Team (SMART), which is the foundation on which all current Regency library databases are built (see the **MegaTraveller Imperial Encyclopedia**, SA).

Regency Foreign Service University: Located on Regina, the RFSU is the school where all career and senior diplomats of the Regency are trained. This school is the outgrowth of the foreign affairs initiatives begun by Norris in the pre-Collapse period (see "Regina," above).

Shionthy (2306): This belt is thought to be the remains of a world destroyed by the Ancients in their final war, as it contains significant quantities of antimatter. It is this danger that caused its previous interdiction and current Amber Zone status. Those brave or foolish enough to collect these particles can sell them for amazing prices, but face the hazards of handling, or even operating near, this dangerous material (see **Fire, Fusion, & Steel**, page 65).

Regina Subsector, 1117 and 1202 dual listing (Subsector C of Spinward Marches Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Efate	1705	A646930-D	B	Hi In	810	DD	K4 V
	1705	A646A30-F	B	Hi In An Rw:Z	110	Re	K4 V
Alell	1706	B46789C-A		Ri	410	DD	M7 V M7 D
	1706	B46789C-B		Ri Rw:Z	810	Re	M7 V M7 D
Yres	1802	BAC6773-7		Fl	335	DD	G5 V
	1802	BAC6773-8	S, I	Fl V:1	A635	Re	G5 V
Menorb	1803	C652998-7		Hi Po	310	DD	M5 II
	1803	C652998-8	I	Hi Po Rw:Z	310	Re	M5 II
Uakye	1805	B439598-D		Ni	320	DD	M9 V
	1805	B439598-D		Ni	620	Re	M9 V
Whanga	1806	E676126-7		Lo Ni	224	DD	A1 V M1 D
	1806	E676326-A		Lo Ni Rw:Z	724	Re	A1 V M1 D
Knorbes	1807	E888787-2		Ag Ri	834	DD	G3 V
	1807	D888887-4		Ri An Rw:Z	134	Re	G3 V
Forboldn	1808	E893614-4		Ni	312	DD	G0 V
	1808	E893614-5		Ni Rw:Z	612	Re	G0 V
Ruie	1809	C776977-7		Hi In	A701	Na	G5 V
	1809	C776977-8		Hi In	901	Re	G5 V
Jenghe	1810	C799663-9	S	Ni O:1910	323	DD	M0 V
	1810	C799663-A	S	Ni O:1910	523	Re	M0 V
Pixie	1903	A100103-D	N	Lo Ni Va	901	DD	M1 V M0 D
	1903	A100203-D	N, I	Lo Ni Va An	801	Re	M1 V M0 D
Boughene	1904	A8B3531-D	S	Fl Ni	601	DD	K7 V
	1904	A8B3531-D	S	Fl Ni	901	Re	K7 V
Hefry	1909	C200423-7	S	Lo Ni Va	320	DD	K6 II M6 D
	1909	C200423-8	S	Lo Ni Va	320	Re	K6 II M6 D
Regina	1910	A788899-C	A	Ri Cp	703	DD	F7 V M8 D M6 V
	1910	A788999-D	A	Hi Cp	103	Re	F7 V M8 D M6 V
Feri	2005	B384879-B	S	Ri	620	DD	G4 V M3 D
	2005	B384879-B	S	Ri Rw:Z	720	Re	G4 V M3 D
Roup	2007	C77A9A9-7	S	Hi In Wa	A323	DD	F9 V
	2007	C77A9A9-7	S	Hi In Wa	223	Re	F9 V
Pscias	2106	X355423-1		Lo Ni	R501	DD	K5 V
	2106	X355523-2		Ag Ni	R801	Re	K5 V
Yori	2110	C360757-A		De Ri RsB	713	DD	F1 V
	2110	C360857-D		De Ri RsB An	113	Re	F1 V
Dentus	2201	C979500-A	S	Ni	920	DD	M2 V
	2201	B979600-B	A, I	Ni Rw:Z	220	Re	M2 V
Kinorb	2202	A663659-8		Ni Ri	622	DD	G7 V
	2202	A663659-9	S	Ni Ri V:0 Rw:Z	822	Re	G7 V
Beck's World	2204	D88349D-4		Lo Ni	701	DD	M0 V M2 D
	2204	D88349D-5		Lo Ni An	901	Re	M0 V M2 D
Enope	2205	C411988-6		Hi Ic In Na	600	DD	K6 V M5 D
	2205	C411988-7		Hi Ic In Na	700	Re	K6 V M5 D
Wochiers	2207	EAC28CC-9		Fl	703	DD	F0 V
	2207	EAC28CC-A		Fl	803	Re	F0 V
Yorbund	2303	C7C6503-7		Fl Ni	220	DD	M3 V
	2303	C7C6503-8		Fl Ni	320	Re	M3 V
Shionthy	2306	X000742-8		As Na	R714	DD	M4 V
	2306	C000742-9		As Na An	A814	Re	M4 V
Algine	2308	X766977-4		Hi	R723	DD	G9 V
	2308	X766977-4		Hi	R923	Re	G9 V
Yurst	2309	E7B4643-5		Fl Ni	824	DD	K9 V
	2309	E7B4643-6		Fl Ni	724	Re	K9 V
Heya	2402	B687745-5		Ag Ri	734	DD	K6 III M8 D
	2402	B687845-7	S, I	Ri V:1 Rw:Z	A134	Re	K6 III M8 D
Keng	2405	E2718CA-3			812	DD	G5 III M9 D
	2405	E2718CA-5			712	Re	G5 III M9 D
Moughas	2406	CA5A588-B		Ni Wa	801	DD	K9 V M9 D
	2406	CA5A588-B		Ni Wa	901	Re	K9 V M9 D
Rethe	2408	E230AA8-8		De Hi Na Po	323	DD	G7 V
	2408	E230AA8-9		De Hi Na Po	323	Re	G7 V
Inthe	2410	B575776-9	A	Ag	423	DD	F8 V
	2410	B575776-A	A	Ag An	723	Re	F8 V



Shionthy has tremendous historical significance because of its role in the life of Norris, the First Regent. The Shionthy belt was the final resting place of the Colonial Cruiser *Kinunir* (TailNo. 9514), which was carrying an Imperial Warrant from Emperor Strephon for then-Duke Norris. *Kinunir* suffered a failure in her AI security system, killed her crew (forshadowing the Collapse) and wound up out of fuel as a derelict in the then-interdicted system. Norris was eventually able to trace the location of the warrant, enter the Shionthy system, find the ship, and recover the Warrant, allowing him to take over command of the Imperial forces in the Fifth Frontier War from Sector Admiral Santanocheev, and bring the war to a successful conclusion.

Kinunir remains in her resting place as an historic site and war grave. Tampering with war graves is a high justice crime. For further details, see the **MegaTraveller Imperial Encyclopedia** (SA), **Adventure 1: Kinunir** (OP), **Fifth Frontier War** (OP), and **The Spinward Marches Campaign** (OP).

Tree Kraken: See page 81.

Spinward Marches Subsector D: Aramis

Aramis is defended by the 214th Fleet, which also earned laurels in the Fifth Frontier War, by taking the Sword World invasion in the flank, destroying the Sacnoth Fleet, and opening the way to the occupation of the trailing Sword Worlds and the creation of the Border Worlds (see page 45).

The Aramis frontier is part of Regency Quarantine District 2, see Regina, previous page, for discussion. Calibration Point Starbuck (2803) was established to enhance strategic mobility of RQS and naval forces from the Regency interior to the sector frontier.

In the antebellum period the Aramis subsector was often referred to as "the breadbasket of the Vargr," because of the tremendous quantity of agricultural exports that the subsector traded with the Vargr Extents. Naturally in times of war this fact made the Aramis subsector a target for Vargr conquest, which is testified to by the large Vargr populations on the subsector's deeprim frontier following the Civil War invasions.

Junidy (3202): Homeworld of the sapient race known as the Llellewyoly, also known colloquially as "Dandelions." Llellewyoly have five multi-jointed limbs which function as "hands" and "feet," and also carry the being's sensory organs. The Llellewyoly have an excruciatingly complex social order. Each individual has multiple social ranks which pertain only under specific circumstances, and to make a hierarchical error is a grievous social gaffe. Nonetheless, Junidy is coded as a Green Travel Zone, as crimes committed by non-Llellewyolians are punished by expulsion from society.

Junidy is subject to severe thermal fluctuations in the course of its local day, and many Llellewyolian features are unique adaptations to these variations.

Although this is not strictly true, as the distinction between "plant" and "animal" is only applicable within a distinct ecosystem, Regency and Imperial wags have been known to joke that the subsector known for its agricultural exports has also produced one of the few "agricultural" forms of intelligent life.

It has also been observed by many non-human species that humans are the most racist and judgemental of all starfaring sapient lifeforms, a dubious distinction to be sure.

Pysadi (3008): Pysadi has long been ruled by a religious dictatorship, the "Mother Church." This faith worships the world Pysadi itself, believing Pysadi to be the mother of all things (much like the Terran Gaia movement of the -2500s). Pysadi is also the sole environment of the Anolas, a hermaphroditic prosimian analog (similar in performance and function to members of the Terran genus *Platypoecilus*). Anolas are "naturally" considered holy by the Mother Church, and their capture, study, or export is prohibited. (Killing one is a capital offense, in case you were wondering.)

Offworld, Pysadi is renowned for its fruit. Fresh (and preserved) fruit from Pysadi is esteemed (and accordingly priced) throughout the Regency. In fact, Pysadian fruit is one of the few agricultural commodities that is actually shipped in low berths to preserve its freshness. Noteable Pysadian fruit include skymelon and trake. Trake grown on Pysadi produces much better trake wine (called atrake) than that from trake grown elsewhere, but alcohol is forbidden by the Mother Church, making the production of Pysadian atrake a difficult proposition.

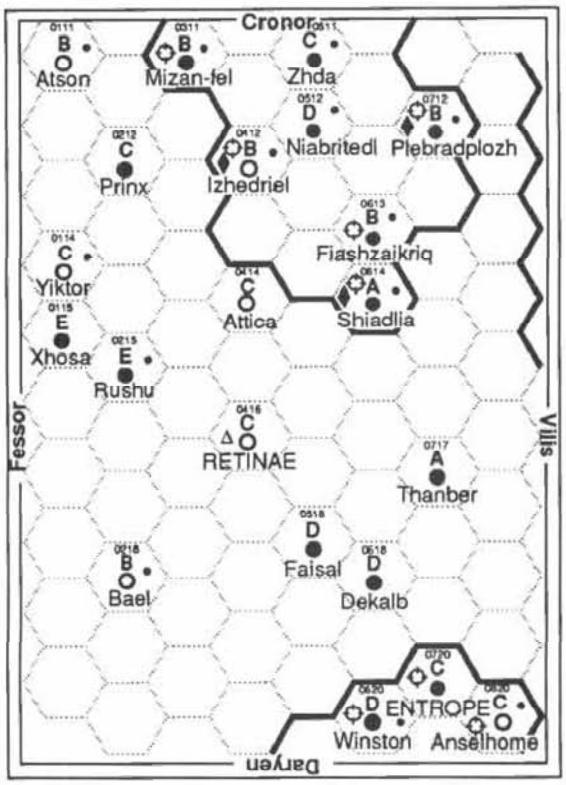
Tree Rat: See page 81.

Yebab (3002): Homeworld of the Ebokin (singular is irregular: Eibokin). The Ebokin are bilaterally symmetrical and possess four pairs of legs and two pairs of manipulative "arms" near the head, at the anterior end. Ebokin government is matriarchical, characterized by strict laws which are slow to change. Females average 1.5 meters in length and mass 130 kg, with males being smaller. Because of the nature of their society, most Ebokin never leave Yebab.

Zila (2908): Zila is the site of some of the most respected wineries in the Marches. Although they are not of the legendary quality of Terra's Tokaj Eszencia, once served at the Emperor's table (see **Azhanti High Lightning**, OP), they are quite good, and are made from grapes as well as trake (see under "Pysadi," above). Nonethless, their reputation was enhanced in the antebellum period by calculated marketing by the megacorporation Tukera, which hoped to buy out the Zilan vineyards (see **The Traveller Adventure**, SA). Fortunately for the Zilans, the Final War forced Tukera to consolidate its holdings outside of the Marches, a gamble which ultimately failed (**Hard Times**, OP, and **Survival Margin**). Four wineries dominate the Zilan market: Fireau et Fille, Signal, Delatest, and Tessalan & Bucephalus, a previously small firm which bought up the Tukera interests when they abandoned the Domain.

Aramis Subsector, 1117 and 1202 dual listing (Subsector D of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Paya	2509	A655241-9	N	Lo Ni	603	DD	F3 V
	2509	A655333-B	N	Lo Ni	303	Re	F3 V
Dhian	2510	C9A769D-4		Fl Ni	202	DD	K5 V
	2510	C9A759D-7		Fl Ni	602	Re	K5 V
Corfu	2602	X895674-8		Ag Ni	R222	DD	M0 V
	2602	E895552-5	S	Ag Ni V:3	A322	Re	M0 V
Focaline	2607	EA88544-A		Ag Ni	724	DD	F3 V
	2607	EA88544-8		Ag Ni V:0	924	Re	F3 V
Lablon	2701	B646589-A		Ag Ni	503	DD	M2 III M4 D
	2701	A646689-A	S, I	Ag Ni V:4	103	Re	M2 III M4 D
Heguz	2706	E66A224-C		Lo Ni Wa	510	DD	M2 V M7 D
	2706	E66A224-C		Lo Ni Wa	410	Re	M2 V M7 D
Violante	2708	C669452-A		Lo Ni	420	DD	M0 V
	2708	C6697A5-A		Vw	A520	Re	M0 V
Pavanne	2905	C669452-A		Lo Ni	425	DD	G2 V
	2905	C669442-A		Lo Ni V:2	625	Re	G2 V
Carsten	2906	C427402-B		Lo Ni	804	DD	M1 V
	2906	C427502-C		Ni	204	Re	M1 V
Zila	2908	E25672C-7		Ag	A701	DD	K6 V M3 D
	2908	D25672C-7		Ag	A801	Re	K6 V M3 D
Jesedipere	3001	C775300-7		Lo Ni	411	DD	F4 V
	3001	B7756A5-8	S, I	Ag Ni Vw	A311	Re	F4 V
Yebab	3002	C9A489A-7		Fl	712	DD	G9 V
	3002	C9A499B-8		Fl Hi V:1	112	Re	G9 V
Nasemin	3003	B98A422-B	S	Lo Ni Wa	612	DD	K2 V
	3003	B98A422-C	S	Lo Ni Wa V:1	812	Re	K2 V
Zykoca	3004	X994542-6		Ag Ni	R320	DD	K9 V
	3004	X994542-5		Ag Ni	R520	Re	K9 V
Aramanx	3005	B657974-6		Hi	210	DD	G0 V
	3005	B65799B-A		Hi V:1	310	Re	G0 V
Pysadi	3008	C4766D7-4		Ag Ni	201	DD	K9 V M1 D
	3008	C4765D7-6		Ag Ni	601	Re	K9 V M1 D
L'oeul d'Dieu	3010	B98A510-B	N	Ni Wa	502	DD	G1 V M9 D
	3010	B98A510-C	N	Ni Wa	802	Re	G1 V M9 D
Rugbird	3102	BAC5634-A		Fl Ni	A811	DD	M1 V
	3102	BAC5789-B	N, I	Fl Vw	A911	Re	M1 V
Towers	3103	B444448-A	S	Lo Ni	A735	DD	A8 III K6 D
	3103	B444548-B		Ag Ni V:1	A235	Re	A8 III K6 D
Feneteman	3104	C222200-C		Lo Ni Po	910	DD	G4 V M7 D
	3104	C222200-C		Lo Ni Po	810	Re	G4 V M7 D
Lewis	3107	X427402-D		Lo Ni	R701	DD	F8 V
	3107	X427344-8		Lo Ni	R801	Re	F8 V
Aramis	3110	A6B0556-B	A	De Ni Cp	710	DD	M2 V
	3110	A6B0653-C	A	De Ni Cp	210	Re	M2 V
Junidy	3202	B434ABD-9	W	Hi	310	DD	F7 V M9 D
	3202	A434AEE-D	W, I	Hi V:1	410	Re	F7 V M9 D
Patinir	3207	C000632-9		As Na Ni	223	DD	F3 V
	3207	C000632-A		As Na Ni An	323	Re	F3 V
Natoko	3209	B582211-8	N	Lo Ni	A801	DD	M2 V M6 D
	3209	B582468-A	N	Lo Ni	801	Re	M2 V M6 D
Reacher	3210	C9A8542-8		Fl Ni	A233	DD	G4 V
	3210	C9A8542-8		Fl Ni	A433	Re	G4 V



Querion Subsector, 1117 and 1202 dual listing (Subsector E of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Atson	0111	B310598-8		Ni	933	Na	K8 V
	0111	B310698-8		Ni	233	Cz	K8 V
Yiktor	0114	C6B6431-A		Fl Lo Ni	123	Na	G4 V M4 D
	0114	C6B6487-A		Fl Lo Ni	323	Na	G4 V M4 D
Xhosa	0115	EA95124-4		Lo Ni	910	Na	M0 III
	0115	EA95546-6		Ag Ni	710	Na	M0 III
Prinx	0212	C436635-6		Ni	720	Na	A9 V K8 V
	0212	C436635-7		Ni	920	Na	A9 V K8 V
Rushu	0215	E765664-4		Ag Ni Ri Vw	903	Va	A0 IV M6 D
	0215	E766784-4		Ag Ri Vw	203	Na	A0 IV M6 D
Bael	0218	E200100-8		Lo Ni Va	812	Na	K2 V
	0218	B200476-A		Lo Ni Va	612	Na	K2 V
Mizan-fel	0311	B46258A-8		Ni	323	Na	F3 V
	0311	B46258A-9	I	Ni	723	Zh	F3 V
Sansibar	0412	B200310-A	Z	Lo Ni Va D:4	701	Zh	M3 V M3 D
Izhedriel	0412	B200310-B	Z, I	Lo Ni Va D:5	901	Zh	M3 V M3 D
Attica	0414	C400546-8		Ni Va	810	Na	K1 V M6 D
	0414	C400646-9		Ni Va	210	Na	K1 V M6 D
Retinae	0416	E8C69AA-5		Fl Hi RsΔ	910	Cs	M1 V
	0416	C8C6A8A-8		Fl Hi RsΔ Rw: Z	110	Cs	M1 V
Terra Nova	0511	C786342-9		Lo Ni	812	Zh	M2 V
Zhda	0511	C786442-A		Lo Ni	112	Zh	M2 V
Asmodeus	0512	E596400-4		Lo Ni	205	Zh	K8 V
Niabritedl	0512	D586510-6		Lo Ni	605	Zh	K8 V
Faisal	0518	D445436-3		Lo Ni	810	Cs	K9 V M7 D
	0518	D445556-5		Ag Ni	310	Cs	K9 V M7 D
Lebeau	0613	B869554-C		Ni	901	Zh	G8 V M5 D
Fiashzaikriq	0613	B869654-D	I	Ni Ri	501	Zh	G8 V M5 D
Querion	0614	B254788-9	Z	Ag Cp	804	Zh	G6 V
Shiadlia	0614	A2548A8-9	Z, I	Cp	204	Zh	G6 V
Dekalb	0618	EA8A799-6		Ri Wa	320	Cs	M1 V
	0618	DA8A799-7		Ri Wa	820	Cs	M1 V
Winston	0620	E887573-6		Ag Ni	501	Sw	K5 V M9 D
	0620	D887573-6	I	Ag Ni	801	Da	K5 V M9 D
Rapp's World	0712	C592320-8	Z	Lo Ni	402	Zh	K5 V M8 V
Plebradplozh	0712	B592320-A	Z, I	Lo Ni	802	Zh	K5 V M8 V
Thanber	0717	B243653-C		Ni Po	210	Cs	M0 V M1 D
	0717	A243755-C		Po	110	Cs	M0 V M1 D
Entrope	0720	E336AAA-C		Hi	110	Sw	G6 V M1 D
	0720	C336AAA-D	I	Hi	210	Da	G6 V M1 D
Anselhome	0820	C110588-8		Ni	601	Sw	M1 V M0 D
	0820	C110547-A	I	Ni	901	Da	M1 V M0 D

Spinward Marches Subsector E: Querion

The Querion subsector is one of the few truly neutral subsectors of the Spinward Marches. In the antebellum period it contained exactly no Imperial-member worlds (although it did contain an Imperial Research Station on a non-Imperial world, see "Retinae," below), but it did contain a number of nonaligned worlds, Zhodani worlds, and worlds subject to competing claims of both the Darrian Confederation and Sword Worlds (see "Entropic Worlds," below).

Querion contains a number of "minor Spinward States," individual world-states which exist within the Quarantine protocols that are primarily administered and paid for by their larger neighbors. These worlds are inhabited primarily by the descendants of Imperial settlers. Many of these worlds were originally members of the Third Imperium, but were obliged to become independent as the Imperial boundaries were pushed back as a result of the first three frontier wars (see page 36). Because these states exist within the larger envelope of viral safety ensured by Regency, Zhodani, and Aslan quarantine forces, their responsibilities are minor. In fact, the major Spinward States consider themselves the guarantors of these "lazy" and privileged minor states, but these individual worlds are obligated, as signatories of the Spinward States Accords, to uphold the anti-viral protocols to the best of their abilities. Fortunately for the minor states of Querion, the major viral threats have been eliminated by other forces long before they make it to the individual worlds of this subsector.

Asmodeus (0512): Asmodeus was the site of a major nuclear war which ended in 1005, and is quite a tourist attraction for those who fancy such things, for academic, ethically instructive, or morbid reasons. Rebuilding is proceeding under Zhodani direction, using the proceeds earned by this planet-sized war monument and demonstration area.

Bael (0218): Bael was known to be the site of extensive lanthanum deposits in the period immediately following the Fifth Frontier War. This was expected to create intense competition for these assets, and caused no small amount of Zhodani-Imperial jockeying in the period 1110-1117. However, in the pre-Collapse period from 1119 on these rivalries cooled considerably and Bael became a very profitable nonaligned world, trading peacefully with all of its neighbors.

Entropic Worlds: The Entropic Worlds consist of the three worlds Winston (0620), Entrope (0720) and Anselhome (0820). These worlds are the object of centuries-old conflicting Darrian and Sword World claims. They were most recently retaken by the Darrians in the last stages of the Fifth Frontier War (see **The Spinward Marches Campaign**, OP). See timelines on pages 30 and 32 for further details.

The fourth world in this cluster, Torment (0721, see page 45) is no considered part of the Entropic Worlds, and has remained under Darriar control for centuries.

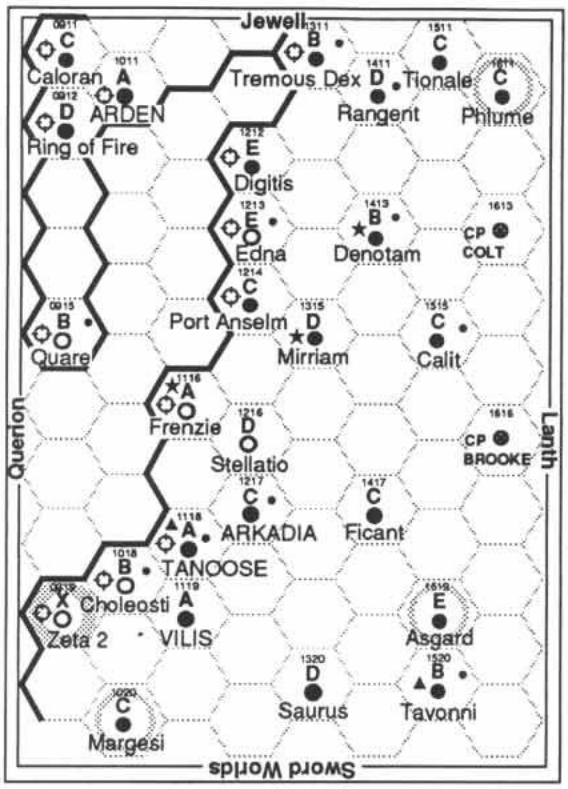
Four Corners: Four Corners, or the Four Corners Interface, refers to the interface where the Regency and Darrian Confederation borders meet and run contiguously along the corners of four subsectors: Querion, Vilis (F), Daryen (I), and Sword Worlds (J). Because of the strong relations between the Darrians and Regency, a large number of merchant vessels are jointly licensed by Darrian and Regency Quarantine authorities, allowing operations in both Spinward States without the need for lengthy relicensing at the interface. Such dual-licensed vessels are, of course, required to stop for inspection at the interface between the two states, but the inspection is abbreviated given the joint licensing arrangement (see page 20).

Retinae (0416): Site of Imperial Research Station Delta (Δ) established in 556. Although the Imperium relinquished the Retinae system in 986 as a result of the Third Frontier War, the station was maintained on this now nonaligned world. The Imperial Navy operated a courier route through Frenzie and Thanber, which is maintained by the Regency.

Before the Exodus (pages 13 and 24, *referees only page 85*), RSΔ also provided data to the Consulate, pursuant to Regency directives. This data flow has been *officially* suspended as a result of the many violations of the Spinward States protocols committed by Zhodani nationals since 1201.

Spinward Marches Subsector F: Vilis

One of the major astrographic features of this subsector is the Abyss, a region of low stellar density than extends into the Vilis, Lanth (G), and Lunion (K) subsectors. Although authorities differ on the actual boundaries of the Abyss, it is commonly considered to include seven worlds, although the roster of these worlds vary. All lists include Ghandi (1815), Ylaven (1916), Victoria (1817), Sonthert (1918), and D'Ganzio (1920). The remaining two worlds are chosen from Ficant (1417), Calit (1515), Lanth (1717), Arba (1721), Rabwhar (1822), and Quopist (2215), depending upon the authority.



Vilis Subsector, 1117 and 1202 dual listing (Subsector F of Spinward Marches Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Caloran	0911	C796746-5		Ag	510	Cs	G2 V M4 D
	0911	C796646-5	I	Ag Ni	710	FA	G2 V M4 D
899-076	0912	E201300-8		Ic Lo Ni Va	520	Na	F7 V
Ring of Fire	0912	D201300-9	I	Ic Lo Ni Va	820	FA	F7 V
Quare	0915	B200545-9		Ni Va	204	FA	M3 V
	0915	B200545-A	I	Ni Va Mr	404	FA	M3 V
Zeta 2	0919	X6B0000-0		Ba De Lo Ni	R020	Na	M4 V
	0919	X6B0000-0	I	Ba De Lo Ni	R020	Re	M4 V
Arden	1011	C5549CB-8		Hi	810	FA	G4 V M5 D
	1011	A554ACB-B	I	Hi Cp	110	FA	G4 V M5 D
Choleosti	1018	C200100-9		Lo Ni Va	101	DD	M9 V M4 D
	1018	B200322-A	I	Lo Ni Va Rw:Z	501	Re	M9 V M4 D
Margesi	1020	C575677-6		Ag Ni	A910	DD	K4 V M7 D
	1020	C575787-7		Ag Ni	A210	Re	K4 V M7 D
Frenzie	1116	A200436-A	N	Lo Ni Va Cp	110	DD	M2 III M3 D
	1116	A200436-E	N, I	Lo Ni Va Cp Rw:Z	210	Re	M2 III M3 D
Garda-Vilis	1118	B978868-A	S	O:1119	912	DD	M3 V
Tanoose	1118	A978987-B	S, I	Hi Rw:Z	512	Re	M3 V
Vilis	1119	A593943-A		Hi In	820	DD	G5 V M8 D
	1119	A593A43-B		Hi In Rw:Z	120	Re	G5 V M8 D
Digitis	1212	E53668A-5		Ni	920	Na	M6 III
	1212	E53678A-6	I		120	Re	M6 III
Edinina	1213	E400220-5		Lo Ni Va	A401	Cs	K6 V M0 D
Edna	1213	E400220-9	I	Lo Ni Va	601	Re	K6 V M0 D
728-907	1214	D955000-2		Lo Ni	610	DD	F1 V M4 D
Port Anselm	1214	C955300-8	I	Lo Ni Rw:Z	210	Re	F1 V M4 D
Stellatio	1216	D5A4420-4		Fl Lo Ni	210	DD	M9 III
	1216	D5A4420-7		Fl Lo Ni	710	Re	M9 III
Arkadia	1217	E446845-6			402	DD	G8 V
	1217	C4469BC-9		Hi In	102	Re	G8 V
Tremous Dex	1311	B511411-C		Ic Lo Ni	201	FA	K8 V M5 D
	1311	B511557-C	I	Ic Ni	401	Re	K8 V M5 D
Mirriam	1315	E472300-8	N	Lo Ni	110	DD	F5 V
	1315	D472464-8	N	Lo Ni	510	Re	F5 V
Saurus	1320	D888588-7		Ag Ni	820	DD	A8 V M1 V
	1320	D888688-7		Ag Ni Rw:Z	120	Re	A8 V M1 V
Rangent	1411	E67A612-7		Ni Wa	503	Na	K8 V
	1411	D67A612-8		Ni Wa	703	Re	K8 V
Denotam	1413	B739573-A	N	Ni	324	DD	M2 V
	1413	B739573-C	N	Ni	624	Re	M2 V
Ficant	1417	E567353-5		Lo Ni	910	DD	M0 V M1 D
	1417	C567455-7		Lo Ni	310	Re	M0 V M1 D
Tionale	1511	C674321-8		Lo Ni	A210	Cs	M2 V M5 D
	1511	C674321-9		Lo Ni	310	Re	M2 V M5 D
Calit	1515	C334867-7		C:1 O:1413	501	DD	K9 V M5 D
	1515	C334867-8		C:1 O:1413	701	Re	K9 V M5 D
Asgard	1519	X3437C7-2		Po	R520	DD	F5 II M1 D
	1519	E3437C7-4		Po	A720	Re	F5 II M1 D
Tavonni	1520	E567000-7		Lo Ni	434	DD	G6 II
	1520	B567642-D	S	Ag Ni Ri	434	Re	G6 II
Phlume	1611	C887624-8		Ag Ni	710	DD	G5 V M8 D
	1611	C887645-8		Ag Ni Ri	A910	Re	G5 V M8 D

The coreward portion of the subsector is essentially a demilitarized zone established after the Third Frontier War. This was created by the Imperium's withdrawal from a number of former member worlds, settled by Imperial subjects.

Vilis is defended by the valiant 193rd Fleet, another veteran of the Fifth Frontier War, maintaining its headquarters at Frenzie (1116). The 193rd spent the entire war in essentially static positions defending Efate (1705, page 38). Following the "surrender" of Louzy (1604, page 37) to the Zhodani (this system was actually entrusted to the care of its system defense flotillas, *referees only see page 82*), the 193rd did not give one centimeter of territory to the Outworld Coalition for the remainder of the war, and was actually able to liberate some worlds during the course of the campaign.

The worlds of the Vilis frontier are part of Regency Quarantine District 1, running coreward from Zeta 2 (0919). RQD 7 begins immediately to rimward of Zeta 2, and runs into the Sword Worlds (J) subsector (page 45).

Arden (1011): Arden is a former Imperial world, abandoned after the Third Frontier War and now independent and neutral. It is the capital of the Federation of Arden, a small independent power taking advantage of the power vacuum between the Zhodani and Imperial frontiers. In the period between the Third Frontier War and the Collapse it carved out a niche as a meeting place for Imperial and Zhodani covert operators and negotiators. However, following the warming of Imperial-Zhodani relations beginning in 1119, its importance waned with the increasing number of legitimate channels between the two governments. Nonetheless, by virtue of its intermediary status between the Regency and Zhodani Consulate, the Federation has exerted an attraction on the sort of elements that thrive in an extra-national environment (see page 34).

CP Brooke: Calibration Point Brooke is one of the network of calibration points placed in and around the Abyss to assist Regency military forces in making their way across this stellar desert. The ability to maintain longer average jumps and follow straight-line courses to trouble spots can save weeks in redeployments. See also the maps for the Lanth (page 42) and Lunion (page 46) subsectors for the location of other CPs in this network.

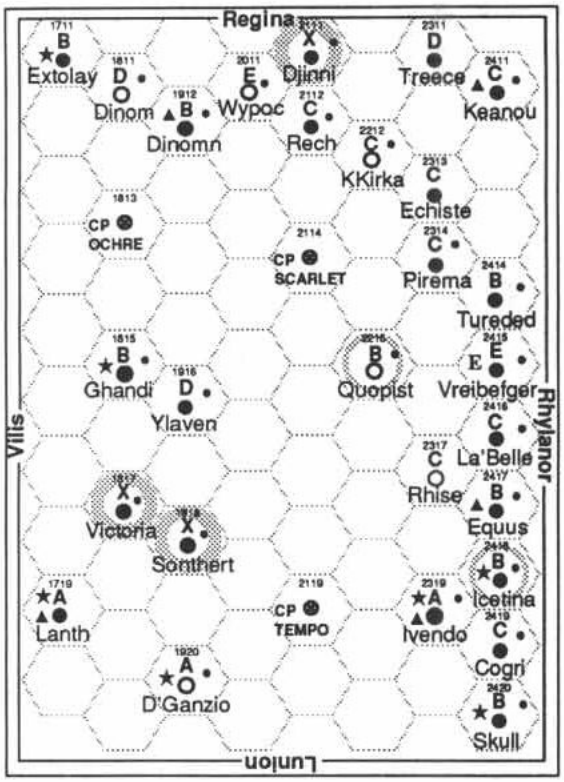
CP Colt: See "CP Brooke."

Tanoose (formerly Garda-Vilis) (1118): Formerly a subject world of Vilis (1119), Tanoose gained home rule in 1155 as a result of Norris' Representational Reforms. Originally settled in approximately –120 (IC), the failing settlement was taken over by Vilis, and in the years since then was deliberately maintained as an economically dependent world. By late in the antebellum period, the Vilis-imposed government was widely unpopular, and open rebellion broke out in 1103. Although this sentiment attracted Sword World and Zhodani opportunism (See **Adventure 7: Broadsword**, OP), the mainstream of Tanoose nationalism was not anti-Imperial, but only in favor of home rule. Active resistance to the cynical, externally imposed Vilisian military rule was muted by the common cause of Virus, but the onset the declaration in 1152 of the Representational Reforms created an outlet for dissatisfaction that could not be silenced, and resulted in the world's ultimate independence. See also "Vilis," below.

Vilis (1119): Although Vilis was one of the 26 targeted worlds of the Regency Industrial Development Program (see page 67), it is not a success story. Unlike other targeted worlds, which typically advanced three tech levels, Vilis advanced only one. Blame for this poor performance is placed by Vilisians on the Tanoose independence upheavals, in which the Vilis-owned industries of Tanoose were nationalized by the newly independent world, with Regency acquiescence.

Non-Vilisian observers agree that Vilis' troubles date to the Tanoosian independence, but blame the Vilisians themselves. Vilis appears to have been far too dependent on their subject world. They have not recovered from the loss, and have slid into a cultural decline. Tanoose is now considered to be the dominant Regency world of the subsector, taking the position of Vilis.

Vilis was originally settled in 240 by colonists from the Sword World Gungnir (1221, page 45).



Lanth Subsector, 1117 and 1202 dual listing (Subsector G of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Extolay	1711	B45589A-A	N		110	DD	M2 V M4 D
	1711	B45589A-A	N	Rw:Z	210	Re	M2 V M4 D
Lanth	1719	A879533-B	A	Ni Cp	710	DD	F5 IV M9 D
	1719	A879631-D	A	Ni Cp	410	Re	F5 IV M9 D
Dinom	1811	D100535-A		Ni Va	201	DD	A4 III
	1811	D110535-B		Ni	401	Re	A4 III
Ghandi	1815	B211455-A	N	Ic Lo Ni	303	DD	F8 V M3 D
	1815	A211560-C	N	Ic Ni	703	Re	F8 V M3 D
Victoria	1817	X697772-3		Ag	R112	DD	K6 V
	1817	X697772-3		Ag An	R312	Re	K6 V
Dinomn	1912	B674632-9	S	Ag Ni	204	DD	G8 V
	1912	B674632-9	S	Ag Ni	404	Re	G8 V
Ylaven	1916	X587552-4		Ag Ni	R922	DD	F9 V
	1916	D587646-6		Ag Ni Ri	222	Re	F9 V
Sonthert	1918	X6266AB-3		Ni	R314	DD	K6 V M0 D
	1918	X6265AB-3		Ni	R714	Re	K6 V M0 D
D'Ganzio	1920	B120410-D	N	De Lo Ni Po	312	DD	M3 V M0 D
	1920	A120610-E	N	De Na Ni Po	112	Re	M3 V M0 D
Wypoc	2011	E9C4547-8		Fl Ni	A922	DD	M3 V
	2011	E9C4687-9		Fl Ni	322	Re	M3 V
Djinni	2111	E459000-9		Lo Ni	R822	DD	K5 V
	2111	X459000-0		Ba	R022	Re	K5 V
Rech	2112	D9957AA-6		Ag	501	DD	M0 V
	2112	C9957AA-7		Ag	701	Re	M0 V
KKirka	2212	CAA5345-8		Fl Lo Ni	102	DD	M2 V
	2212	CAA5345-9		Fl Lo Ni	602	Re	M2 V
Quopist	2215	B150679-A		De Ni Po	A721	DD	M3 V
	2215	B150679-B		De Ni Po	A821	Re	M3 V
Treece	2311	D232866-8		Na Po O:2410	610	DD	M1 V
	2311	D2328A6-8		Na Po	810	Re	M1 V
Echiste	2313	C53A313-A		Lo Ni Wa	720	DD	G4 V
	2313	C53A434-C		Lo Ni Wa	520	Re	G4 V
Pirema	2314	D691142-5		Lo Ni	802	DD	M2 V
	2314	C691142-7		Lo Ni	902	Re	M2 V
Rhise	2317	C100576-A		Ni Va	A710	DD	K7 V
	2317	C100644-9		Ni Va	210	Re	K7 V
Ivendo	2319	B324659-A	A	Ni C:0	112	DD	A9 V
	2319	A324659-C	A	Ni C:0	412	Re	A9 V
Keanou	2411	C792348-7	S	Lo Ni	213	DD	M3 III M2 D
	2411	C792348-8	S	Lo Ni	613	Re	M3 III M2 D
Tureded	2414	C465540-9		Ag Ni	614	DD	M3 V
	2414	B465540-A		Ag Ni	814	Re	M3 V
Vreibefger	2415	E481542-3		Ni RsE	901	DD	K9 V
	2415	E481642-6		Ni Ri RsE	801	Re	K9 V
La'Belle	2416	C564112-4		Lo Ni	701	DD	F2 V M3 D
	2416	C564223-6		Lo Ni	201	Re	F2 V M3 D
Equus	2417	B55A858-B	S	Wa	202	DD	F6 V M5 D
	2417	B55A858-C	S	Wa	602	Re	F6 V M5 D
Icetina	2418	B5245A9-7	N	Ni	A301	DD	K9 V M8 D
	2418	B5245C8-9	N	Ni	A701	Re	K9 V M8 D
Cogri	2419	CA6A643-9		Ni Ri Wa	432	DD	M1 II
	2419	CA6A654-9		Ni Ri Wa	832	Re	M1 II
Skull	2420	C2237C7-9	N	Na Po	601	DD	M1 V M0 V
	2420	B2237C7-B	N	Na Po	801	Re	M1 V M0 V

Spinward Marches Subsector G: Lanth

Although the astrography of the Lanth subsector is dominated by the Abyss, a major impediment to interstellar travel (see Vilis subsector, page 41), its coreward and trailing borders constitute two main branches of the most important communications network of the sector: the Spinward Main, making it a transport nexus.

The Spinward Main is a remarkable grouping of 242 star systems in 16 subsectors (15 of the 16 Spinward Marches subsectors plus subsector I of Deneb) that are all mutually accessible by jump-1. Only the Trin's Shroud subsector (subsector P, page 51) of the Spinward Marches does not include a portion of the Spinward Main. The Spinward Main is not only a primary network of current trade, but it was also a major mechanism of the Imperial settlement of the sector. The settlement of Mora (3124), located at the trailing end of the Spinward Main in 60 (IC) opened this jump-1 highway to exploitation by inexpensive jump-1 free traders. In only 15 years worlds as far away as Regina (1910, page 38) had been settled, and Imperial development of the sector was off to a running start which would not be challenged for almost another five centuries.

Lanth is the home of the 18th Fleet, headquartered at D'Ganzio (1920). Lanth is also home to the Regency's spinward "swing fleet," the 88th, headquartered at Ivendo (2319). The two swing fleets, one each in Spinward Marches and Deneb, are highly mobile reserve fleets that can be rapidly moved to respond to emergencies and are also used to support the permanent subsector fleets in training and working-up operations.

The 88th had originally been stationed in the Atsah subsector (Deneb H), but was redeployed following the withdrawal from the Corridor frontier (Atsah subsector, Deneb/H, page 59).

Dinom (1811): This world orbits at the trailing trojan point of the system's only gas giant, with its axis laying along the ecliptic plane, and its rotation perpendicular to the ecliptic. Precession of Dinom's axis proceeds at 0.225° per year, meaning that every 800 years the world reverses the pole that is facing the sun. While one pole is facing the sun this "Bright Face" is baked into vacuum while the opposite "Cold Face" collects the frozen atmosphere in deep crevasses. In intermediate periods, when Dinom's axis is perpendicular to the sun, it experiences "normal" day-night thermal cycles, the frozen gases sublimate to create a breathable atmosphere, and plant-life sprouts from seeds germinated over centuries. Dinom is currently 70 years past its most recent "Bright/Cold Face" phase, and its axis is now aligned 21.6° away from the sun. This twilight day-night cycle near the equator is allowing the first traces of atmosphere to reappear, but this will not reach its full density for another 330 years. See also **Double Adventure 2: Across the Bright Face/Mission on Mithril, OP.**

Quopist (2215): 61% of this world's population consists of Jonkeereen, the geneered humans created by Imperial Ministry of Colonization for settlement on desert worlds (see page 61).

Tree Krakens: See page 81.

Victoria (1817): Victoria is a rather light, metal-poor world which has nonetheless managed to retain a fairly dense, tainted atmosphere. This taint cannot be handled by normal filter masks, and requires the use of full environment suits and oxygen tanks. Fortunately the taint is only present at altitudes less than 1000 meters above sea level, so settlements built above this altitude are not affected by the taint.

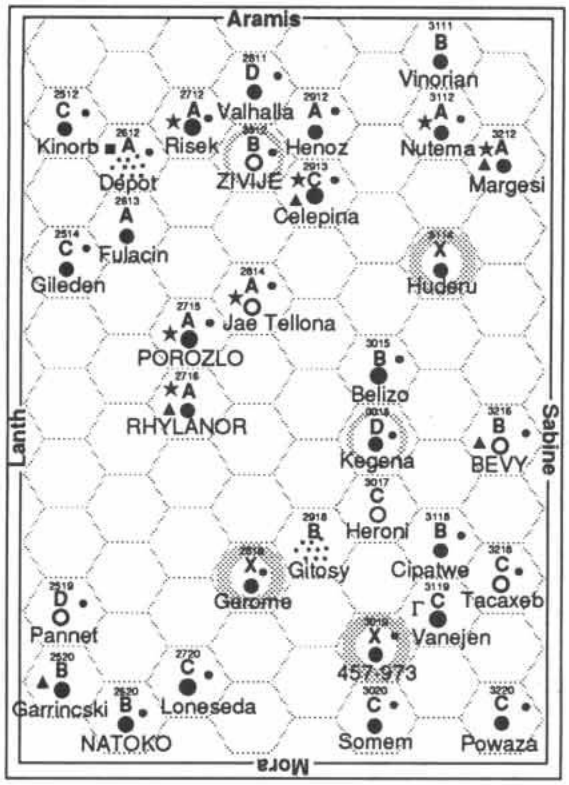
Victoria's human population therefore lives atop a large system of mesas, with these communities connected by locally constructed airships. (The builders obtain hydrogen from the indigenous balloon plant which grows bundles of large, hydrogen-filled sacs, and the ships are propelled by manual power, either aerial wing/oars or hand cranked aero-screws.) Victoria is believed to have been settled by sublight colony ships in about –1450, and was not recontacted by humans until late in the settlement of the Spinward Marches, given the world's inconvenient location in the midst of the Abyss. Following its examination by the IISS, it was interdicted to allow the local culture to find its own solutions to their development. It is believed that their slow technological advance is due to the severe lack of metals on the world.

Victoria shows signs of intensive asteroid bombardment dating to the Ancients' final war, and an Ancient site has been discovered on its single moon, Albert.

Victoria also shows signs of much seeded flora and fauna, also consistent with Ancient attention. It is the only world where the Kudebeck's Gazelle (also known as the Ivory Gazelle or "Kudie") exists in the wild, although it is known not to be native to the world. The six-legged Kudie is an important animal for Victorian society. It is hunted not only for its hide, fur, and meat, but most importantly for its light, durable, and easily-worked ivory, which is a primary structural material on this metal-poor world. (For more details, see JTAS 2, OP.)

Spinward Marches Subsector H: Rhylanor

Rhylanor, at the opposite end of the Spinward Marches Sector from the Zhodani border, has seen more than its fair share of crucial battles in the Frontier Wars. In the First Frontier War, Zivije (2812) and Jae Tellona (2814) were the sites of the climactic battles where Grand Admiral Plankwell destroyed the Zhodani expeditionary fleet. In the Third Frontier War, Porozlo (2715) was taken by the Zhodani and served as their base for the siege of Rhylanor (2716), which became the site of many battles before the siege was ultimately lifted by the end of 981. And in the Fifth Frontier War, the Zhodani 40th Fleet penetrated deep into the Spinward Marches to again invade Porozlo and Rhylanor. Here it eventually met and was defeated by the Corridor Fleet on 231-1109. The repulse of the Zhodani penetration force at Rhylanor effectively ended the Fifth Frontier War by denying the Outworld Coalition their last strategic objective.



Today the 23rd Fleet, "The Axemen," defends Rhylanor from its headquarters at Rhylanor itself. The 23rd is another veteran of the Fifth Frontier War, when it held the Imperial center in the Vilis subsector, and moved to cut off and destroy the Zhodani 40th Fleet after its repulse at Rhylanor.

Pannet (2519): Pannet's insidious atmosphere contains a wide variety of compounds used in heavy industrial processes. Although these compounds are typically caustic and hazardous to collect, the nearby high-technology industries of Rhylanor (2716), Lunion (2124, page 46), and Mora (3124, page 47) have created a high demand for them, and correspondingly high financial rewards for those who gather them.

Fulacin (2613): In the period before the Fifth Frontier War the Zhodani had established a secret base on this world. Unknown to the Zhodani, it was discovered and destroyed before the war, throwing a wrench into the Zhodani Abyss Campaign and the ultimately unsuccessful Siege of Rhylanor. (See **Adventure 3: Twilight's Peak**, OP, and **The Spinward Marches Campaign**, OP.)

Gitosy (2918): Unlike most asteroid belts which are laid out in the system's ecliptic plane, the Gitosy belt is spherical, i.e., the asteroids' orbits are inclined at all angles to the ecliptic plane. However, the belt is almost exclusively made up of ice asteroids, with few habitable rocky asteroids.

Depot (formerly Macene) (2612): During the antebellum period Macene was the home of the Spinward Branch of the Imperial Navy Fleet Tactics College (serving the Domain of Deneb area). The system's entire population was connected with either the Macene naval base or the Fleet College.

Since the Collapse the Navy's interest in the system has expanded. The Fleet College is now the Regency Naval War College, and the naval base has been expanded to be a full-size depot, serving Spinward Marches Sector.

Pelouse (formerly 457-973) (3019): This world has been interdicted by the IISS and RISS to protect a developing race, but contact is being undertaken by the RISS, as the acheivement of TL 5 is usually considered sufficient to open previously interdicted worlds to outside contact. However, the interdiction is still in effect against commercial contact, as the RISS contact process is not yet complete. The name is a lyrical translation of the race's name for their world, which means "lawn."

Rhylanor (2716): One of the key worlds of the Regency, it was the site of one of the pivotal battles of the Fifth Frontier War.

Rhylanor was the birthplace of Olav hault-Plankwell, Grand Admiral of the Spinward Marches and "victor" of the First Frontier War (see page 36), as well as the first of the Emperors of the Flag.

University of Rhylanor: Like the University of Regina (page 38), the University of Rhylanor is a planetary university which expanded to meet the needs of the now isolated and vulnerable Regency. Unlike the U of R, Rhylanor does not have a glamorous sector-wide reputation, and still primarily serves the 12 billion citizens of its own world. As befits the needs of the small, high-population, technologically sophisticated world, Rhylanor's academic strengths are the hard sciences: biology, chemistry, electronics, gravitics, mechanics, and physics.

A minor point is that the University of Rhylanor is prohibited by law from referring to itself as the "U of R." This picayune regulation is a relic of Imperial times when feudal requirements gave Regina, as sector capital and seat of the sector Duke, pride of place and exclusive patent of usage of the "U of R" phrase throughout the Spinward Marches Sector. This law is still on the books.

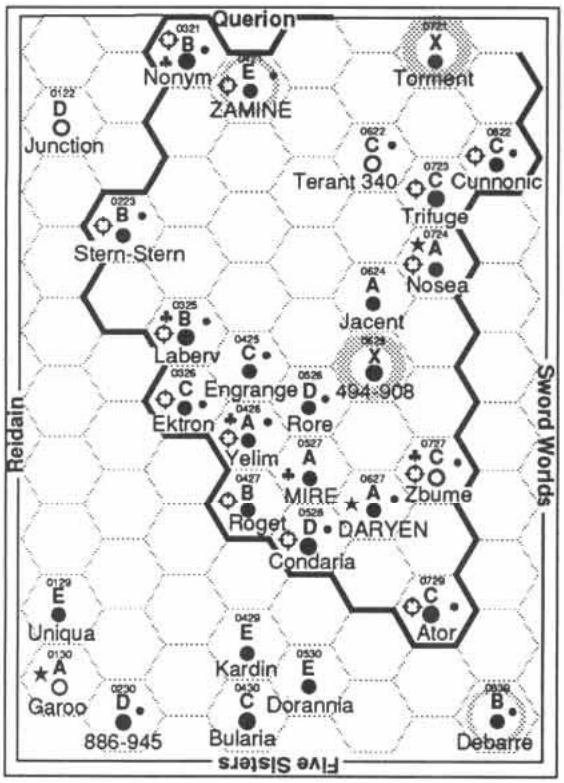
Rhylanor Institute of Technology: Once one of the leaders in robotic research in the Domain of Deneb, RIT is only now regaining its former stature, lost in the wave of anti-robotic sentiment which swept the Regency following the Rape of Trin. Although RIT retained strong programs in all of the natural and applied sciences, its new reputation as the "Robot Institute of Terror" caused a massive flight of students and faculty to other schools, notably the University of Rhylanor.

Over the years RIT has gradually built itself back up to near its former stature, by a combination of pragmatic focus on non-autonomous MIL (man-in-loop) automation technology and anti-virus countermeasures and contracts from the Regency government, in particular the High Regent for Technology Assessment. Ironically, many of these contracts involved work for the Regency Artificial Sentience Analysis Commission, and the RASAC revelations of 1201 (see page 80) have caused a new round of condemnation for the hapless RIT.

Vanejen (3119): Site of Spinward Marches Research Station Gamma (Γ). RSΓ continues its research into psionics (*referees only, see page 83*). See also **Adventure 2: Research Station Gamma**, SA.

Rhylanor Subsector, 1117 and 1202 dual listing (Subsector H of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Kinorb	2512	C449433-9		Lo Ni	502	DD	A0 V K9 D
	2512	C449433-B		Lo Ni	902	Re	A0 V K9 D
Gileden	2514	C483103-6		Lo Ni	203	DD	M1 V
	2514	C483454-9		Lo Ni	303	Re	M1 V
Pannet	2519	E9C5677-7		Fl Ni	224	DD	K5 V
	2519	D9C5577-7		Fl Ni	824	Re	K5 V
Garrincski	2520	B632520-7	S	Ni Po	410	DD	M0 V M7 D
	2520	B632520-A	S	Ni Po	710	Re	M0 V M7 D
Macene	2612	B000453-E	N	As Lo Ni	911	DD	G8 V M8 D
Depot	2612	A000553-F	D	As Ni	311	Re	G8 V M8 D
Fulacin	2613	A674210-D		Lo Ni	810	DD	G3 V
	2613	A674475-D		Lo Ni An	110	Re	G3 V
Natoko	2620	C8879AB-9		Hi	204	DD	F4 V
	2620	B8879AB-A		Hi An	404	Re	F4 V
Risek	2712	A325579-A	N	Ni	401	DD	M2 V M3 D
	2712	A325579-C	N	Ni	501	Re	M2 V M3 D
Porozlo	2715	A867A74-B		Hi	201	DD	M1 V M9 D
	2715	A867A74-E	N	Hi	301	Re	M1 V M9 D
Rhylanor	2716	A434934-F	A	Hi Cp	810	DD	M2 V
	2716	A434A34-F	A	Hi Cp	110	Re	M2 V
Loneseda	2720	C86A215-7		Lo Ni Wa	705	DD	K9 V
	2720	C86A415-9		Lo Ni Wa	305	Re	K9 V
Valhalla	2811	E365432-5		Lo Ni	622	DD	G4 IV
	2811	D365582-7		Lo Ni	422	Re	G4 IV
Zivije	2812	C6B199C-B		Fl Hi	A421	DD	G6 V
	2812	B6B199C-D		Fl Hi	A721	Re	G6 V
Jae Tellona	2814	A560565-8	N	De Ni	913	DD	F9 IV
	2814	A560665-B	N	De Ni Ri	213	Re	F9 IV
Gerome	2818	X573000-0		Ba	R701	DD	K2 V
	2818	X573000-0		Ba	R701	Re	K2 V
Henoz	2912	A245543-B		Ag Ni C:0	824	DD	F3 V
	2912	A245543-B		Ag Ni C:0	924	Re	F3 V
Celepina	2913	B434456-9	A	Lo Ni	201	DD	M2 V
	2913	B434456-B	A	Lo Ni	401	Re	M2 V
Gitosy	2918	B000676-9		As Na Ni	620	DD	G6 V M3 D
	2918	B000676-B		As Na Ni	820	Re	G6 V M3 D
Belizo	3015	B895646-5		Ag Ni	923	DD	G1 V
	3015	B895646-9		Ag Ni	823	Re	G1 V
Kegena	3016	E869569-3		Ni O:3216	A224	DD	F6 V
	3016	D869569-5		Ni O:3216	A424	Re	F6 V
Heroni	3017	E7A0614-3		De Ni	820	DD	G5 V
	3017	C7A0614-6		De Ni	920	Re	G5 V
457-973	3019	X372215-4		Lo Ni	R534	DD	G9 V
Pelouse	3019	X372776-5			R534	Re	G9 V
Somem	3020	C301340-B		Ic Lo Ni Va	201	DD	M2 V M7 V
	3020	C301342-B		Ic Lo Ni Va	301	Re	M2 V M7 V
Vinorian	3111	B879610-9		Ni	610	DD	M3 V M4 D
	3111	B879610-9		Ni	810	Re	M3 V M4 D
Nutema	3112	B864310-8	N	Lo Ni	822	DD	M3 V
	3112	A864543-A	N	Ag Ni	822	Re	M3 V
Huderu	3114	X575000-0		Ba Lo Ni	R920	DD	M0 III
	3114	X575000-0		Ba Lo Ni	R920	Re	M0 III
Cipatwe	3118	B35879A-6		Ag	623	DD	M1 V
	3118	B35879A-9		Ag	723	Re	M1 V
Vanejen	3119	C686854-5		Ri C:4 RsΓ	520	DD	K1 V M0 D
	3119	C686854-8		Ri C:2 RsΓ	720	Re	K1 V M0 D
Margesi	3212	A576257-C	A	Lo Ni	920	DD	F0 V
	3212	A576557-D	A	Ag Ni	420	Re	F0 V
Bevy	3216	D4209CC-A	S	De Hi In Na Po	224	DD	F4 V
	3216	B4209CC-C	S	De Hi In Na Po	324	Re	F4 V
Tacaxeb	3218	C230411-B		De Lo Ni Po	801	DD	M2 V M2 D
	3218	C230411-A		De Lo Ni Po	501	Re	M2 V M2 D
Powaza	3220	C787566-5		Ag Ni O:3218	332	DD	A5 V K4 D
	3220	C787566-7		Ag Ni O:3218	532	Re	A5 V K4 D



Spinward Marches Subsector I: Daryen (formerly Darrian)

This subsector comprises most of the Darrian Confederation (see pages 30-31), although three of its current member worlds, the so-called "Entropic Worlds," are located in the Querion subsector (E) to coreward (see page 40).

As is the case with the Zhodani worlds of the Cronor and Jewell subsectors, Regency charts now show the names of the Darrian worlds in their own *te-zlodh* language rather than as approximate Imperial transliterations.

The period since the Collapse has become known as "the Darrian Renaissance," evidenced by the growth in population, territory, and technology of the Confederation.

Darrian Group: The Darrian Group, as distinct from the Darrian Confederation, consists of the 12 worlds originally colonized from Daryen in its first era of space travel, before the *Maghiz* (see page 31). These 12 are Condaria (0528), Daryen (0627), Ektron (0326), Engrange (0425), Jacent (0624), Laberv (0325), Mire (0527), Roget (0427), Rore (0526), Yelim (0426), Zbume (0727), and 494-908 (0625). Note that these worlds are all mutually jump-1 accessible, and in fact comprise one of the spinward termini of the Spinward Main (see page 42).

Daryen (formerly Darrian) (0627): Darrian homeworld and still the center of Daryen technological development. The world is ruled by scientists, and has strict laws against the export of pre-*Maghiz* artifacts. Daryen is the Darrian word for "world" or "home."

Mire (0527): Political capital of the Darrian Confederation. Mire's civilization is contained completely underground. This is not because of an inhospitable environment; to the contrary, it is to allow the world's surface to be saved for agriculture and natural preserves.

Roget (0427): Roget contains the largest concentration of the Darrian's Aslan citizens, who settled this world in large numbers to establish a separate society where they could preserve their traditional Aslan culture. Roget is *te-zlodh* for "gift," a reference to granting the Aslan *ihatei* their own new "homeworld."

Rore (formerly Rorre) (0526): Rore was colonized by anti-technological, ethnic Darrians who wished to preserve the traditional Darrian culture from before the Terran contact. Rore thus was untouched by the *Maghiz* and to this day is a relaxing, pastoral world, very popular among tourists. Rore is *te-zlodh* for "fertile."

Torment (0721): Torment, although part of the astrographic cluster that includes the Entropic Worlds (see page 40), is not normally considered one of the Entropic Worlds. Torment has been under continuous Darrian control since before the Third Frontier War, even during periods when the other three Entropic Worlds were held by the Sword Worlds. This is because Torment is populated entirely by incorrigible criminals that cannot exist within the tolerant Darrian society. Torment is governed by the criminals themselves, who must mine raw materials to trade for imported food. Torment is Galanglic for "torture, pain, anguish, or agony."

Yelim (formerly Ilium) (0426): Yelim was terraformed by the Darrians of the pre-Maghiz period to make its climate more suitable for habitation, and the atmosphere's slight sulfuric taint is a remnant of these efforts. Yelim is *te-zlodh* for "pioneer."

Zamine (0421): Zamine is *te-zlodh* for "hopeful." Zamine has been beset by a series of most un-Darrian civil disruptions and wars in the post-Collapse period.

Zbume (formerly Spume) (0727): Zbume is an inhospitable mining world; all of its population live in a single domed city which protects them from the world's toxic, radioactive atmosphere, a result of natural volcanism. Zbume is *te-zlodh* for "golden," the color of the world's tainted atmosphere.

494-908 (0625): Although one of the Darrian Group of originally colonized worlds, 494-908 is not so much a Confederation member world as it is a possession. The barren 494-908 is used by the Darrian Confederation Navy (DCN) as a test range and area for military maneuvers, including live-ordnance orbital bombardment practice. The world is interdicted for safety measures, although DCN vessels do use the world's single sea for refueling.

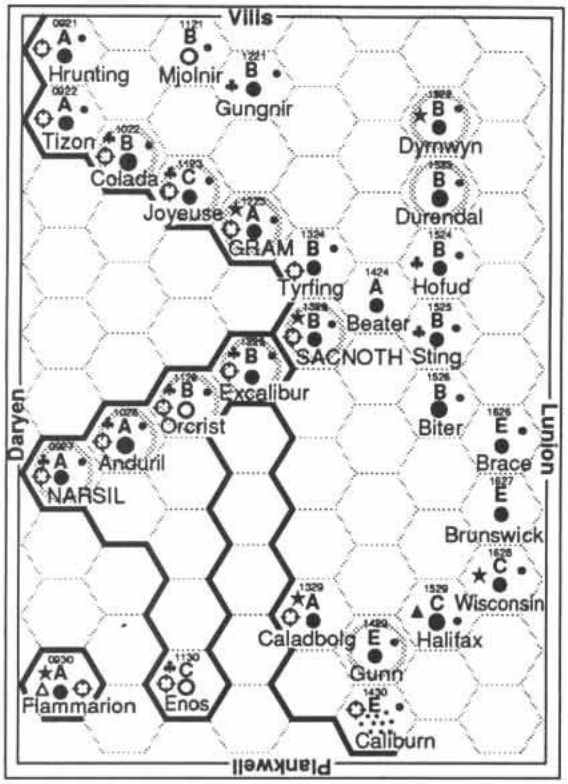
Daryen Subsector, 1117 and 1202 dual listing (Subsector I of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Junction	0122	D150441-4		De Lo Ni Po	210	Na	M3 V M2 D
	0122	D150441-3		De Lo Ni Po	110	Na	M3 V M2 D
Uniqua	0129	E625568-4		Ni O:0130	210	Na	K9 V M2 D
	0129	E625578-4		Ni	510	Na	K9 V M9 D
Garoo	0130	A2008CB-A		Na Va	210	Na	M1 V M5 D
	0130	A2008CB-B	N	Na Va	410	Cs	M1 V M5 D
Stern-Stern	0223	B321588-B		Ni Po	701	Da	M0 V M3 D
	0223	B321688-D	I	Ni Po Na	301	Da	M0 V M3 D
886-945	0230	D833000-3		Lo Ni Po	504	Na	F8 V
	0230	D833100-3		Lo Ni Po	704	Na	F8 V
Nonym	0321	C233898-A	M	Na Po	623	Na	G0 V
	0321	B23385A-C	M, I	Na Po	923	Da	G0 V
Laberv	0325	B354443-7	M	Lo Ni	834	Da	F0 V
	0325	B354525-B	M, I	Lo Ni Ag	234	Da	F0 V
Ektron	0326	C332652-9		Na Ni Po A:1	423	Da	M1 V
	0326	C332652-B	I	Na Ni Po A:2	623	Da	M1 V
Zamine	0421	E897977-A		Hi In A:0	223	Da	K9 V
	0421	E897977-C	I	Hi In A:0	A423	Da	K9 V
Engrange	0425	C554769-8		Ag O:0426 A:1	701	Da	M1 V M3 D
	0425	C554794-A		Ag A:1	801	Da	M1 V M3 D
Ilium	0426	B444831-9	M		401	Da	G3 V M8 D
Yelim	0426	A444831-B	M, I		801	Da	G3 V M8 D
Roget	0427	B566777-9		Ag Ri A:7	420	Da	F8 V M9 D
	0427	B566777-9	I	Ag Ri A:8	620	Da	K8 V M9 D
Kardin	0429	E453123-6		Lo Ni Po An	410	Na	F7 V
	0429	E453203-7		Lo Ni Po An	310	Na	F7 V
Bularia	0430	C774622-5		Ag Ni	310	Cs	K5 V M3 D
	0430	C774622-5		Ag Ni	610	Cs	K5 V M3 D
Rorre	0526	D765657-3		Ag Ni Ri	103	Da	F4 V M7 D
Rore	0526	D765658-3		Ag Ni Ri	203	Da	F4 V M7 D
Mire	0527	A665A95-B	M	Hi Cp	110	Da	K6 V
	0527	A665A95-E	M	Hi Cp	310	Da	K6 V
Condaria	0528	E54779B-5		Ag	901	Na	K3 V M0 D
	0528	D54789B-6	I		201	Da	K3 V M0 D
Dorannia	0530	E42158A-8		Ni Po	510	Na	K4 V
	0530	E42158A-7		Ni Po	310	Na	K4 V
Terant 340	0622	D1405A7-9		De Ni Po	523	Da	G0 V M5 D
	0622	C1405A7-B		De Ni Po	923	Da	G0 V M5 D
Jacent	0624	A333644-D		Na Ni Po	710	Da	M0 V
	0624	A333644-F		Na Ni Po	910	Da	M0 V
494-908	0625	X893000-0		Ba Lo Ni	R710	Da	M1 V
	0625	X893000-0		Ba Lo Ni	R710	Da	M1 V
Darrian	0627	A463955-G		Hi A:0	225	Da	G1 V M1 D
Daryen	0627	A463955-G	N	Hi A:0	325	Da	G1 V M1 D
Torment	0721	X233231-4		Lo Ni Po Ex	R820	Da	G1 V
	0721	X233231-4		Lo Ni Po Ex	R920	Da	G1 V
Trifuge	0723	C446556-9		Ag Ni	210	Da	M5 II
	0723	C446556-C	I	Ag Ni	510	Da	M5 II
Nosea	0724	B2326BB-C	M	Na Ni Po	620	Da	G0 IV
	0724	A2326BB-F	N, I	Na Ni Po	920	Da	G0 IV
Spume	0727	C140200-A	M	De Lo Ni Po	434	Da	M2 V
Zbume	0727	C140213-B	M, I	De Lo Ni Po	734	Da	M2 V
Ator	0729	D326258-6		Lo Ni An	821	Na	F7 V M7 D
	0729	C326358-9	I	Lo Ni An	521	Da	F7 V M7 D
Cunnonic	0822	E65767A-3		Ag Ni A:0	502	Da	M0 V
	0822	C657758-8	I	Ag A:0	202	Da	M0 V
Debarre	0830	B854123-9		Lo Ni	A822	Cs	M2 V
	0830	B854564-7		Ni Ag	A122	Cs	M2 V

Spinward Marches Subsector J: Sword Worlds

This subsector takes its name from the state which used to dominate the subsector, which comes from the fact that almost all of its member worlds are named for famous swords of Terran history, folklore, and literature (and in at least two cases, the same fanciful sword which had two names gives one such name to each of two worlds).

Sword Worlds society and culture (see page 32) is remarkably homogeneous, although each world maintained independent sovereignty, armed forces, governments, etc. This cohesive independence made the Sword Worlds a rather volatile collection of worlds, and continues to make them volatile occupied worlds. Many of these worlds have a history of occupation by Imperial forces, going back to the end of



Sword Worlds Subsector, 1117 and 1202 dual listing (Subsector J of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Hrunting	0921	B463747-9	M	Ri	313	SW	M2 V
	0921	A463756-A	I	Ri	413	Re	M2 V
Tizon	0922	B386887-A	M	Ri	323	SW	K2 IV M3 D
	0922	A386885-B	I	Ri	423	Re	K2 IV M3 D
Narsil	0927	B574A55-A	M	Hi In	224	SW	M0 II M6 D
	0927	A574A57-D	M, I	Hi In Cp	A424	SW	M0 II M6 D
Flammarion	0930	A623514-B	B	Ni Po	710	DD	F8 V
	0930	A623634-D	B, I	Ni Po Na	210	Re	F8 V
Colada	1022	B364685-B	M	Ag Ni Ri	A211	SW	K2 V M8 D
	1022	B36466A-B	M, I	Ag Ni Ri	A311	Re	K2 V M8 D
Anduril	1026	B985855-B	M	Ri	222	SW	F2 V
	1026	A985855-D	M, I	Ri	A522	SW	F2 V
Mjolnir	1121	B530544-A	M	De Ni Po	522	SW	A5 V G0 D
	1121	B530566-B		De Ni Po	822	Re	A5 V G0 D
Joyeuse	1123	B464778-A	M	Ag Ri	A201	SW	M3 V M9 D
	1123	C47476A-A	M, I	Ag Mr	A601	Re	M3 V M9 D
Orcrist	1126	B8A6733-A	M	Fl	401	SW	K7 V M7 D
	1126	B8A6733-C	M, I	Fl	A801	SW	K7 V M7 D
Enos	1130	E250598-4	M	De Ni Po	710	SW	M1 V
	1130	C2506AA-7	M, I	De Ni Po	110	SW	M1 V
Gungnir	1221	B444779-8	M	Ag	432	SW	G3 IV M4 V
	1221	B444788-9	M	Ag	732	Re	G3 IV M4 V
Gram	1223	A895957-B	M	Hi In Cp	603	SW	F2 V M2 D
	1223	A895957-C	N, I	Hi In	A803	Re	F2 V M2 D
Excalibur	1225	B324755-A	M		402	SW	K5 V
	1225	B324755-C	M, I		A702	SW	K5 V
Tyrfing	1324	B637735-A	M		701	BW	M2 V
	1324	B637835-A	I		101	Re	M2 V
Sacnoth	1325	B775956-C	M	Hi In	801	BW	F9 V M8 D
	1325	B775A69-D	N, I	Hi In Mr Cp	A201	Re	F9 V M8 D
Caladbolg	1329	B365776-A	S	Ag Ri	710	DD	F7 V M0 D M4 D
	1329	A365876-A	N, I	Ri	110	Re	F7 V M0 D M4 D
Beater	1424	B685686-A	M	Ag Ni Ri	610	BW	K4 V
	1424	A685686-D		Ag Ni Ri	910	Re	K4 V
Gunn	1429	E344110-8		Lo Ni	A602	DD	M3 V
	1429	E344000-8		Lo Ni	A602	Re	M3 V
Caliburn	1430	E000514-A		As Ni	924	DD	M2 V
	1430	E000614-C	I	As Ni Na	324	Re	M2 V
Dymwyn	1522	B958412-A	M	Lo Ni	201	BW	K4 V M8 D
	1522	B958418-B	N	Lo Ni	A801	Re	K4 V M8 D
Durendal	1523	B687334-B	M	Lo Ni	714	BW	M1 V
	1523	B687647-C		Ni Ri Ag	A714	Re	M1 V
Hofud	1524	B666553-A	M	Ag Ni	501	BW	K4 V M9 D
	1524	B666655-B	M	Ag Ni Ri	101	Re	K4 V M9 D
Sting	1525	B645896-A	M		302	BW	M0 V
	1525	B645887-B	M		402	Re	M0 V
Biter	1526	B354623-A	M	Ag Ni	301	BW	G7 V M1 D
	1526	B354626-C		Ag Ni	501	Re	G7 V M1 D
Steel	1529	E655000-7		Lo Ni	324	BW	M8 III
Halifax	1529	C655557-A	S	Ni Ag	124	Re	M8 III
Iron	1626	E529000-9		Lo Ni	714	BW	F0 V
Brace	1626	E529000-0		Ba	014	Re	F0 V
Bronze	1627	E201000-9		Ic Lo Ni Va	510	BW	M3 V
Brunswick	1627	E201000-0		Ic Va Ba	010	Re	M3 V
Mithril	1628	E568000-7		Lo Ni	301	BW	F4 D
Wisconsin	1628	C568645-A	N	Ni Ri Ag	301	Re	F4 D

the Second Frontier War, when Hrunting (0921), Tizon (0922), Colada (1022), Mjolnir (1121), Joyeuse (1123), Gungnir (1221), Dymwyn (1522), Durendal (1523), Hofud (1524), and Biter (1526) were occupied from 620-626. It was apparently thought by the Imperials that this would teach the Sword Worlds a lesson, without being so harsh as to create lasting enmity. So much for theory, as these years are still remembered as the "First Occupation," as distinct from the "Second Occupation" of the Border Worlds from 1110-1132, and the "Third Occupation" from 1132 to the present.

The Sword Worlds subsector is considered one of the most unstable regions of the Regency, a fact reflected by the great number of TAS-designated Amber Zone worlds. Since the late 1130s the Regency has practiced a policy of resettling refugees from the Abandonment of Deneb's trailing worlds (page 11) on the Regency-owned Sword Worlds to balance out local anti-imperial sentiment. However, most observers now admit that this program was a failure. Rather than being able to combine with the original Sword World inhabitants to create a new, moderate, culture, the newcomers were excluded from existing communities, and there now exist two mutually hostile sets of cultures on the Regency Sword Worlds. And because the Denebian refugees have now lived on these worlds for two generations (and have no homes to return to), they now reasonably regard the Sword Worlds as the only homes they have ever known. This situation seems sure to create lasting strife for generations to come.

On some worlds the Regency has retained former Sword Worlds military bases in order to keep local control, on others it has upgraded these bases to Regency naval bases, and on others still it exercises a policy of demilitarization under which it dismantles the old military bases.

As a part of the Regency, the Sword Worlds subsector is defended by the 151st Fleet (transferred from the Antra subsector, Deneb/C, following the establishment of the Quarantine borders), headquartered at the upgraded former Sword World base at Sacnoth (1325). The 151st Fleet was created during the final weeks of the Fifth Frontier War during the breakout from the Siege of Jewell (SM 1106, page 37).

The Sword Worlds subsector frontier is contained within Quarantine District 7, which starts at the Glisten-Pax Rulin border and runs core-spinward into the Vilis subsector.

Border Worlds: This was an Imperial client state created in 1111 from Sword Worlds occupied by Imperial forces in the Fifth Frontier War. By the end of hostilities the Imperial 213th and 214th Fleets had occupied Dymwyn, Durendal, Hofud, Beater, Sting, Biter, Iron, Bronze, Mithril and Steel, which prompted Tyrfing and Sacnoth to read the writing on the wall and bolt from the failing Confederation. These 12 worlds constituted the Border Worlds until the great Sword Worlds landgrab of 1132.

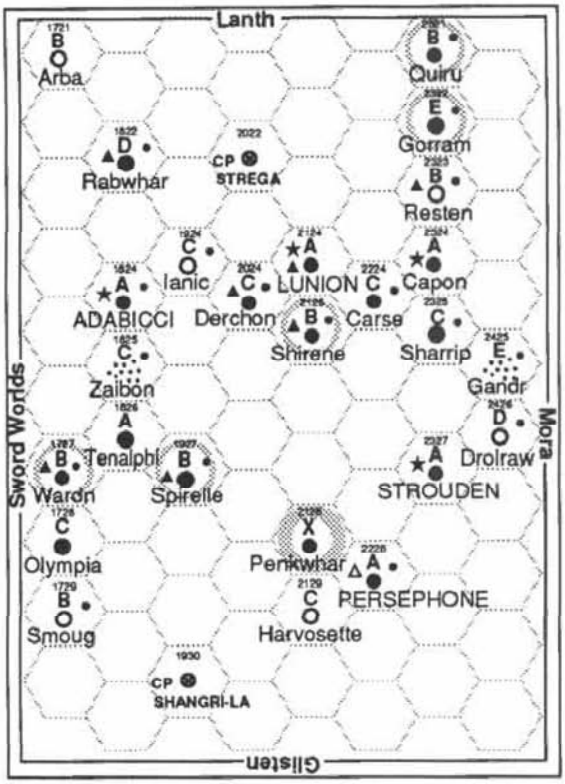
It is typical of Sword Worlds fractiousness that the Border Worlds capital actually moved from Sting to Beater during the period of "tight" Imperial control.

Enos (1130): Enos is an unusually dense world, and is thought to be a rogue world captured by its star, Kaleshi. The world's most unusual natural feature is the Fire Sea, a desert which lies atop a great many unusually large pockets of oil and natural gas. Frequent seismic activity and erosion have thinned and weakened the impermeable trapping rock, allowing the pressurized gas to leak out through the sand, sometimes inhuge jets. Static discharge or lightning storms can ignite the gas, causing explosions which often trigger further cataclysmic releases of burning gas.

The Fire Sea was the headquarters of a secret anti-Imperial organization backed by the Sword Worlds, composed of former Imperial psionics. This group was discovered and its base destroyed during the Civil War period (see *TD* 14-17).

Metal Worlds: These are the four worlds Steel/Halifax (1529), Iron/Brace (1626), Bronze/Brunswick (1627), and Mithril/Wisconsin (1628), so-called because of their former names. These four then-uninhabited worlds were held in common by the entire Sword Worlds Confederation as resource worlds. Since the absorption of many of the Sword Worlds, the Regency has renamed the metal worlds, showing its intention to retain them. To make its position more firm, it has settled the two habitable worlds—Steel, now Halifax, and Mithril, now Wisconsin— with a unique group of colonists: a joint Vargr-human religious community from Deneb (Deneb 1925) which has split off from the "Willies," as the Denebian faith is commonly known. See "Deneb," page 62.

Sword Worlds Confederation: The Sword Worlds Confederation of 1202 is only a shadow of its former extent and power, with only five worlds remaining (from its 1107 highwater-mark of 27) as independent members: Narsil (the capital), Anduril, Orcrist, Excalibur, and the outpost of Enos. Naturally it is Sword Worlds official policy to support the rights of "the freedom loving peoples imprisoned within the Imperial [sic] borders to repatriation and self-determination." Although the Quarantine provides ample opportunity to prevent military assistance from crossing the frontier, simple inflammatory moral support from the spinward side of the border seems to be all that is needed to encourage revolutionaries and freedom fighters on the "occupied Sword Worlds."



Spinward Marches Subsector K: Lunion

The Lunion subsector is known as the crossroads of the Spinward Marches, as the branches of the Spinward Main (see page 42) running coreward-rimward and spinward-trailing intersect here. Lunion also contains two of the Regency's 16 TL-15 industrial worlds, making it an important economic area.

In the period before the Fifth Frontier War the Lunion subsector also constituted the Imperial frontier with the Sword Worlds, but with the incorporation of the Border Worlds in 1133 Lunion became an interior subsector.

Lunion is defended by the 43rd Fleet headquartered at Lunion.

The Abyss which extends through the Lunion subsector (see also page 41) is a subject of some popular speculation, as it widely believed to have been the area of a number of "mysterious starship disappearances" over the years (see "Lost Treasure Ships of the Abyss Rift," **Challenge** 44, SA, and "Demon Dark," **Challenge** 58, SA).

Gandr (2425): Perhaps the least valuable asteroid/planetoid belt currently being worked in the sector. Superheavy elements were discovered here in 1060, but these quickly played out, and no more have been discovered.

Ianic (1924): 32% of this world's population consists of the geneered human race known as the Jonkeereen (see page 61).

Ling Standard Products: Ling Standard Products (LSP) is one of the former megacorporations of the Third Imperium (see **Supplement 8: Library Data (A-M)**, OP, **JTAS** 16, SA, **The Traveller Adventure**, SA, **MegaTraveller Referee's Companion**, SA, **Hard Times**, OP, *MTJ* 3 for fuller discussions of Imperial-era megacorporations than is practical here), and although its powers are not what they once was, it still looms as one of the dominant corporations of the smaller Regency, concentrating in the manufacture of vehicles, starships, and starship armament and subsystems.

The LSP shipyards at Strouden (2327) and Lunion (2124) are two of largest starship yards in the Marches, and LSP has maintained a reputation for high quality, unlike some of its competitors (see "General Products," page 38).

Lunion School of Economics: Located on Lunion (2124 Spinward Marches), this is the largest business and management college in the Regency, accrediting tens of thousands of high speed young whiz kids every semester to lead the corporations of the Spinward States. LSE grads typically have little patience with the fine points of public policy, history, international relations, or the arts, although they are highly trained in the practical mechanics of public relations and spin control.

Shirene (2125): This world is owned by the Al Morai merchant line, which uses its shipyard as as an overhaul and maintenance center for its fleet of cargo carriers, see "Al Morai," page 47.

Lunion Subsector, 1117 and 1202 dual listing (Subsector K of Spinward Marches Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Arba	1721	C200200-C		Lo Ni Va	610	DD	K2 V
	1721	B200260-C		Lo Ni Va	810	Re	K2 V
Wardn	1727	B756486-B	S	Ni	A502	DD	M2 V
	1727	B756586-C	S	Ni Ag	A102	Re	M2 V
Olympia	1728	C328342-7		Lo Ni	120	DD	M3 V
	1728	C328342-9		Lo Ni	320	Re	M3 V
Smoug	1729	C14078A-9		De Po	902	DD	M1 V M7 D
	1729	B14088A-B		De Po	202	Re	M1 V M7 D
Rabwhar	1822	D5448BA-6	S		313	DD	K5 V
	1822	D5448BA-6	S		413	Re	K5 V
Adabicci	1824	A57189B-B	N		801	DD	K8 V M8 D
	1824	A57199B-D	N	Hi In	201	Re	K8 V M8 D
Zaibon	1825	B000544-B		As Ni	512	DD	G5 III
	1825	B000544-A		As Ni	112	Re	G5 III
Tenalphi	1826	A774102-E		Lo Ni	610	DD	F7 V
	1826	A774102-F		Lo Ni An	410	Re	F7 V
Ianic	1924	E360697-5		De Ni Ri	924	DD	M6 II M9 D
	1924	C360797-8		De Ni Ri	624	Re	M6 II M9 D
Spirelle	1927	C766846-8	S	Ri D:1	715	DD	G7 V
	1927	B766976-C	S	Hi D:1	A315	Re	G7 V
Derchon	2024	C512799-8	S	Ic Na	901	DD	M0 V M7 D
	2024	C5128A9-9	S	Ic Na	101	Re	M0 V M7 D
Lunion	2124	A995984-D	A	Hi In Cp	810	DD	M3 V M7 D
	2124	A995A84-F	A	Hi In Cp	210	Re	M3 V M7 D
Shirene	2125	B984510-B	S	Ag Ni	A723	DD	G4 V M1 D M1 D
	2125	B984644-C	S	Ag Ni Ri	A423	Re	G4 V M1 D M1 D
Penkwhar	2128	X978310-1		Lo Ni	R320	DD	M0 V
	2128	X978310-3		Lo Ni	R420	Re	M0 V
Harvosette	2129	C330737-9		De Na Po	910	DD	M0 V M5 D
	2129	C330847-A		De Na Po	110	Re	M0 V M5 D
Carse	2224	C463325-9		Lo Ni	601	DD	M3 V M6 D
	2224	C463325-A		Lo Ni	801	Re	M3 V M6 D
Persephone	2228	B775833-A	W		922	DD	M2 V
	2228	A775933-C	W	Hi In	122	Re	M2 V
Quiru	2321	B365300-8		Lo Ni	323	DD	M3 V
	2321	B36536A-9		Lo Ni	A723	Re	M3 V
Gorram	2322	X554220-0		Lo Ni	R801	DD	K8 V M6 V
	2322	E554220-7		Lo Ni	A801	Re	K8 V M6 V
Resten	2323	B310100-B	S	Lo Ni	501	DD	M5 V M8 D
	2323	B310100-B	S	Lo Ni	601	Re	M5 V M8 D
Capon	2324	B747748-A	N	Ag	610	DD	F9 V
	2324	A747748-B	N	Ag	810	Re	F9 V
Sharrip	2325	C575101-A		Lo Ni	503	DD	K5 V
	2325	C575101-B		Lo Ni	403	Re	K5 V
Strouden	2327	A745988-D	N	Hi In	920	DD	G5 V M4 D
	2327	A745A88-F	N	Hi In	120	Re	G5 V M4 D
Gandr	2425	E000347-8		As Lo Ni	813	DD	M7 V
	2425	E000347-9		As Lo Ni	613	Re	M7 V
Drolraw	2426	EAB6311-5		Fl Lo Ni	904	DD	F1 V
	2426	DAB6413-8		Fl Lo Ni	204	Re	F1 V

Wardn (1727): One of the remarkable features of this world is the Patterned Desert, which features a complex patter of lines in the desert surface made by the "dalev-thur," an indigenous non-sapient lifeform, now extinct. This regrettable state was made necessary by the discovery in 1121 that the dalev-thur were the hosts of a plague that threatened the population of Wardn (see adventure in *MTJ* 1).

Wardn's Amber Zone status is due to its thin atmosphere and weak magnetic field. These provide insufficient protection from its sun; the populace is obliged to seek cover during solar flare cycles.

Zaibon (1825): Site of the largest copper deposits ever discovered in the Marches, these reserves are now played out, leaving the system in decline.

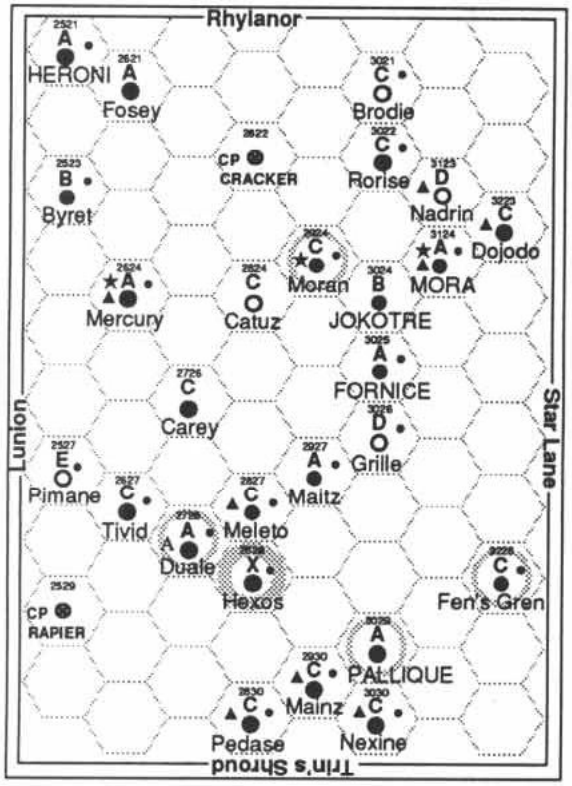
Spinward Marches Subsector L: Mora

The Mora subsector is considered to be the industrial hub of the Spinward Marches, containing a number of high technology economic powerhouses worlds, such as Fornice (3025), Pallique (3029), and Mora (3124) itself, one of only two TL-16 industrial worlds in the Regency.

Mora is patrolled by the 73rd Fleet, headquartered at Mora.

Al Morai: Major interstellar merchant line serving the Spinward Marches, with corporate headquarters on Mora. (See **Spinward Marches Campaign**, OP).

Al Morai maintains service to all Regency subsector capitals and the worlds along the routes which connect them, plus selected minor states (see pages 35 and 40) outside the Regency. Al Morai also provides service to the Darrian Confederation via the "Four Corners" interface at the junction of the Querion (E), Vilis (F), Daryen (I), and Sword Worlds (J) subsectors, see page 40. During the antebellum period Al Morai operated only in the Spinward Marches, but expanded its operations to include the



Mora Subsector, 1117 and 1202 dual listing (Subsector L of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Heroni	2521	B6449B9-8		Hi In	721	DD	F3 V
	2521	A6449B9-A		Hi In	921	Re	F3 V
Byret	2523	B485697-6		Ag Ni Ri	812	DD	G9 V
	2523	B485726-9		Ag Ni Ri	112	Re	G9 V
Pimane	2527	E500343-4		Lo Ni Va	803	DD	K0 V
	2527	E500343-6		Lo Ni Va	903	Re	K0 V
Fosey	2621	A633656-A		Na Ni Po	620	DD	M3 V
	2621	A633688-C		Na Ni Po	820	Re	M3 V
Mercury	2624	B658663-8	A	Ag Ni	304	DD	F7 V
	2624	A658663-A	A	Ag Ni	404	Re	F7 V
Tivid	2627	C534477-8		Lo Ni	401	DD	M3 V
	2627	C534477-A		Lo Ni	901	Re	M3 V
Carey	2726	C579221-9		Lo Ni	910	DD	M2 V M2 D
	2726	C579321-B		Lo Ni	210	Re	M2 V M2 D
Duale	2728	A54378F-B		Po RsA	401	DD	M2 V M0 D
	2728	A54378A-C		Po RsA	A701	Re	M2 V M0 D
Catuz	2824	C22048C-9		De Lo Ni Po	510	DD	G9 V M2 D
	2824	C22067C-B		De Na Ni Po	510	Re	G9 V M2 D
Meleto	2827	C675100-S	S	Lo Ni	724	DD	F9 V
	2827	C675100-9	S	Lo Ni	624	Re	F9 V
Hexos	2828	B534420-8	N	Lo Ni C:3	123	DD	K1 V M2 D
	2828	X534000-0		Ba	R023	Re	K1 V M2 D
Pedase	2830	C415346-7	S	Ic Lo Ni	101	DD	M2 V M7 D
	2830	C415346-8	S	Ic Lo Ni	301	Re	M2 V M7 D
Moran	2924	C367300-8	N	Lo Ni	A201	DD	M3 V M7 D
	2924	C367322-A	N	Lo Ni	A401	Re	M3 V M7 D
Maitz	2927	A201511-B		Ic Ni Va	122	DD	F1 V
	2927	A201511-D		Ic Ni Va	322	Re	F1 V
Mainz	2930	C553352-A	S	Lo Ni Po	803	DD	K2 V M7 D
	2930	C553452-B	S	Lo Ni Po	203	Re	K2 V M7 D
Brodie	3021	C410468-7		Lo Ni O:3020	114	DD	M1 III M7 D
	3021	C410468-9		Lo Ni O:3020	314	Re	M1 III M7 D
Rorise	3022	C994100-A		Lo Ni	502	DD	M7 V
	3022	C994100-A		Lo Ni	602	Re	M7 V
Jokotre	3024	B6548D9-7			810	DD	K6 V
	3024	B6549D9-9		Hi	110	Re	K6 V
Fornice	3025	A354A87-C		Hi	202	DD	M0 V
	3025	A354A87-E		Hi	502	Re	M0 V
Grille	3026	E410335-7		Lo Ni	701	DD	F0 V M5 D
	3026	D410435-8		Lo Ni	101	Re	F0 V M5 D
Pallique	3029	A511965-E		Hi Ic In Na	A320	DD	M1 V M0 D
	3029	A5119C7-F		Hi Ic In Na	A620	Re	M1 V M0 D
Nexine	3030	C97A443-8	S	Lo Ni Wa	801	DD	K8 V M6 D
	3030	C97A554-A	S	Ni Wa	201	Re	K8 V M6 D
Nadrin	3123	D120203-6	S	De Lo Ni Po	920	DD	K5 V M1 D
	3123	D120203-8	S	De Lo Ni Po	720	Re	K5 V M1 D
Mora	3124	AA99AC7-F	A	Hi In Cx	112	DD	M2 V
	3124	AA99AC7-G	A	Hi In Cx	312	Re	M2 V
Dojodo	3223	C512311-7	S	Ic Lo Ni C:0	710	DD	M0 V
	3223	C512311-8	S	Ic Lo Ni C:1	810	Re	M0 V
Fen's Gren	3228	C647346-9		Lo Ni	A423	DD	K7 V
	3228	C647346-B		Lo Ni	A723	Re	K7 V

entire Regency over the past 70 years.

Al Morai maintains a homogeneous fleet of 93 World-class vessels, a proprietary design that is manufactured only for Al Morai. Most of these 3000-ton, unstreamlined, jump-4 ships are named for the worlds served by Al Morai (e.g., *Regina, Jewell*, etc.), but four carry non-world names: *Imperial Glory, Imperial Reign, Regency Shield*, and *Regency Flame*. Although the ships are all constructed to TL-15 standards, most of the fleet is a little long in the tooth, but the Regency starship shortage (page 11) leaves no real alternative.

Al Morai was once renowned for maintaining its own force of military vessels for antipiracy and security patrols, the famed Route Protectors, but this force was dissolved with the establishment of the Quarantine (page 11), the ships themselves being pressed into service with the fledgling RQS. The Regency does not look kindly on private armies, and "trade wars" and other such aberrations of the Imperial era (see **The Traveller Adventure**, SA) are a thing of the past.

Al Morai maintains its own facilities along its scheduled routes, and maintains its own maintenance and overhaul yards at several worlds including its Mora headquarters and Shirene (SM 2125), which is entirely owned by Al Morai (see page 46).

Duale: The research station at Duale is engaged in secret research for the Navy. It was severely damaged in 1102 by an explosion of unknown origin but was rebuilt in 1108 by the Imperial Navy to continue its research.

Duale is suffering a succession struggle between the displaced nobility who formerly held power on the world and the new popularly-selected government which thus far has been unable to uproot or coopt the nobles' power base (see also pages 16-18).

Mora (3124): Mora is the site of the Regency capital, having been established as the Domain of Deneb capital in 1120 because of its location at the approximate center of the Domain. Mora has one major continent which is home to most of the world's 30 billion inhabitants. Mora has grown significantly since the antebellum period, as a result of its importance as capital, fleet headquarters, and one of the only two TL-16 industrial worlds in the Regency (see "Regency Industrial Development Program," page 67). The Regency government offices and the residence of the Regent are contained in the huge Giyachii arcology, built off the coast of the major Moran continent.

The system's belt is the site of some of the Regency's most advanced biotechnology research and manufacturing facilities. Its location among asteroids makes it easy to contain or destroy unanticipated mishaps as necessary.

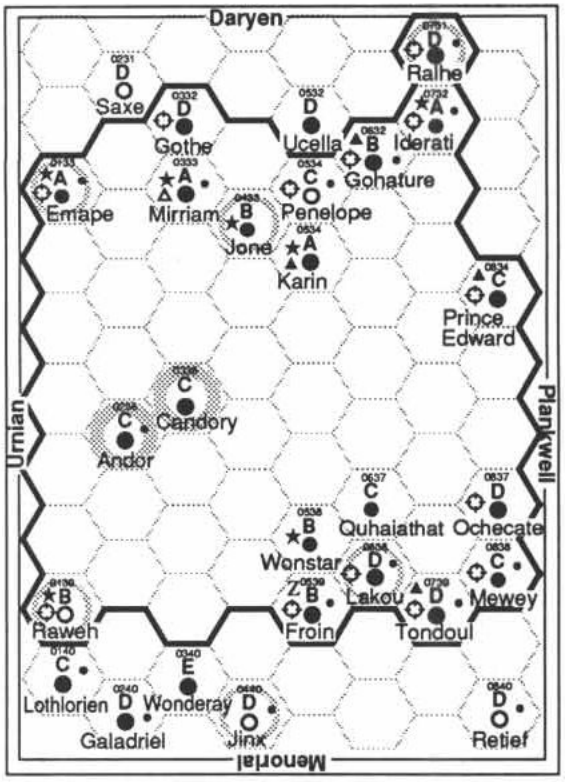
Mora is known as the "Gateway to the Marches" because of its location near the trailing end of the Spinward Main (see page 42) where it crosses from Deneb Sector into Spinward Marches. Mora was the first major Imperial settlement in the sector, created in 60 as a commercial enterprise by Ling Standard Products (which see, page 46). With its location, Mora became the economic dynamo of Spinward Marches development, building and maintaining starships for the expansion, and producing industrial goods used to outfit the new worlds.

Nadrin (3123): The entire permanent population of this world is Jonkeereen (see page 61). Nadrin is the site of trials to establish the limits of atmospheric conditions that can be tolerated by Jonkeereen without artificial assistance.

Nexine (3030): This waterworld is inhabited by geneered (see Library Data) humans who live underwater and conduct undersea foarming. These humans were created by the then-Imperial Ministry of Conservation, now integrated into the Regency MInistry of the Interior (MoI), see "Malory," page 54.

Pallique: For reasons which are unclear today, this battered world was settled as an industrial center to exploit the two extremely rich planetoid belts in the system, even though as a captured body in an eccentric orbit perpendicular the system's ecliptic plane, it passes through one of planetoid belts twice each local year, enduring severe meteor bombardment. All of Pallique's vast settlements are underground for protection from this bombardment, and the world is coded as an Amber Zone because of the hazards to navigation present near the world.

Because Pallique's population depend on these things to a greater degree than do other non-suicidal populations, Pallique is justly famous for the quality of the vacuum survival equipment manufactured there, including life support plants, containment buildings, vac suits, and emergency, survival, and rescue equipment.



Spinward Marches Subsector M: Five Sisters

Originally known to the Imperium as District 267 (see Plankwell/District 268, facing page), this subsector owes its name to the merchant captain Ignaz Ruffleran, who was the first Imperial to explore this area. He found a cluster of five habitable worlds which he laid claim for and named for his daughters: Mirriam (0333), Jone (0433), Ucella (0532), Penelope (0533), and Karin (0534). These five sisters and their sister worlds gave the subsector its name.

The subsector had not been heavily settled through the pre-Collapse era. Serious colonization only began in 740, but was cut short with the start of the Psionic Suppressions in 800, and the frontier wars made it clear that major Imperial development would not be practical in this area. In the antebellum period the Five Sisters were by necessity administered by the defensive umbrella of the Imperial Navy. Since the Collapse and foundation of the Spinward States the Five Sisters have become less of a military outpost, but retain a very strong RQS presence. However, in the new friendly climate between the Zhodani and Domain/Regency, development and migration long-postponed began in earnest in the 1130s, when many flocked to the unexploited worlds of the subsector, concious of the fact that they were on the far side of the Regency from the threat of virus. This expansion continues, with Regency emigrants of a moderately naturist/ecological movement avidly developing such naturally habitable "garden" worlds as Lothlorien (0140), Galadriel (0240), and Prince Edward (0834).

During periods of Imperial-Zhodani hostility the subsector's only connection to the Imperium proper was via the fortified world Flammarion (0930) in the Sword Worlds subsector, see page 45. Although Flammarion remains as its official connector for the XWeb, the prevailing good relations among the Spinward States have permitted extensive contact, especially through the imperial culture worlds of the Plankwell (N) subsector.

Penelope (0533): In the post-Collapse period, Penelope's population has been augmented by Jonkeereen (see page 61). They currently constitute about 12% of the world's population.

Spinward Marches Subsector N: Plankwell (District 268)

The Plankwell subsector was formerly the unnamed Imperial District 268. The Imperium maintained a policy of formally identifying unincorporated subsectors along its border as potential sites for expansion. This identification resulted in their designation as districts; District 268 was therefore the 268th sequentially designated district since the foundation of this policy. District 268 was opened for Imperial development in 941 by decree of the empress Margaret II.

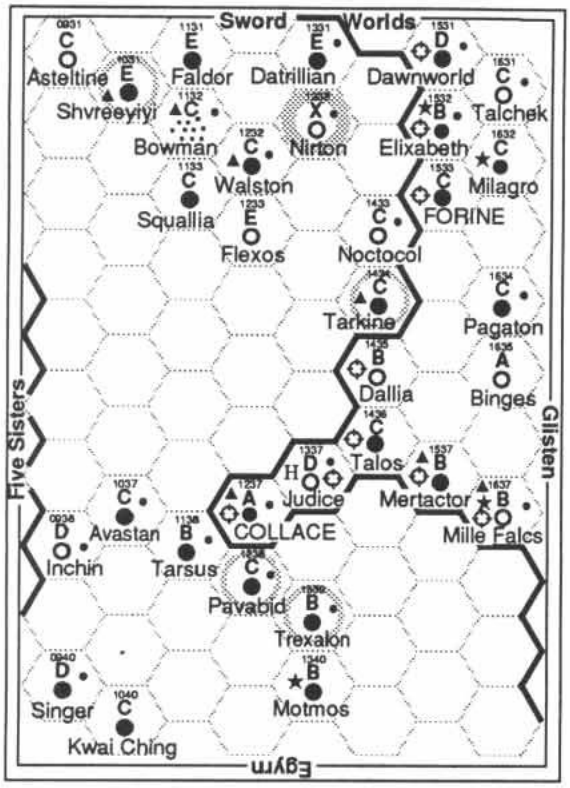
Five Sisters Subsector, 1117 and 1202 dual listing (Subsector M of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Emape	0133	B564500-B	N	Ag Ni	A503	DD	M0 V
	0133	A564622-B	N, I	Ag Ni	A203	Re	M0 V
Raweh	0139	B130300-B	N	De Lo Ni Po	A920	DD	G3 V M1 D
	0139	B130412-D	N, I	De Lo Ni Po	A320	Re	G3 V M1 D
876-574	0140	E687200-0		Lo Ni	702	Na	K7 V
Lothlorien	0140	C687643-8		Ni Ag Ri	502	Cs	K7 V
Saxe	0231	EAA5543-7		Fl Ni	910	Na	A2 V
	0231	DAA5643-8		Fl Ni	110	Na	A2 V
Andor	0236	C695735-9		Ag	R603	DD	F3 V
	0236	C6958X5-D		Dw An	R103	Re	F3 V
769-422	0240	E754401-8		Lo Ni	924	Na	G2 V
Galadriel	0240	D754545-8		Ni Ag	424	Cs	G2 V
Gothe	0332	E22159B-6		Ni Po	310	DD	F5 IV
	0332	D22159B-8	I	Ni Po	510	Re	F5 IV
Mirriam	0333	B9998A6-A	B		A514	DD	G6 V
	0333	A9999A6-C	B	Hi	114	Re	G6 V
Candory	0336	C593634-8		Ni	R920	DD	F6 V M3 D
	0336	C5937X4-E		Ni An Dw	R420	Re	F6 V M3 D
Wonderay	0340	E88A46A-4		Lo Ni Wa	210	Na	M3 V M1 D
	0340	E88A56A-5		Lo Ni Wa	510	Na	M3 V M1 D
Jone	0433	B792785-9	N		A810	DD	G8 V M5 D
	0433	B792885-B	N		A110	Re	G8 V M5 D
Jinx	0440	D100133-7		Lo Ni Va	A202	Na	G3 IV M6 D
	0440	D100133-9		Lo Ni Va	A102	Na	G3 IV M6 D
Ucella	0532	D574654-7		Ag Ni C:0	A410	Cs	F2 V M6 D
	0532	D574554-8		Ag Ni C:2	810	Cs	F2 V M6 D
Penelope	0533	C460642-4		De Ni Ri	323	DD	F6 V M7 V
	0533	C460642-8	I	De Ni Ri	423	Re	F6 V M7 V
Karin	0534	A767768-C	A	Ag Ri	A410	DD	G7 V
	0534	A767789-E	A	Ag Ri	810	Re	G7 V
Wonstar	0538	B455741-7	N	Ag	A910	DD	M0 V M1 D
	0538	B455741-9	N	Ag	910	Re	M0 V M1 D
Froin	0539	C535225-9		Lo Ni RsZ	601	DD	M7 V M2 D
	0539	B535543-A	I	Lo Ni RsZ	701	Re	M7 V M2 D
Gohature	0632	C754766-7	S	Ag O:0732	523	DD	F8 V
	0632	B754766-7	S, I	Ag O:0732	723	Re	F8 V
Quhaiathat	0637	C31479B-9		Ic	210	DD	K8 V
	0637	C31479B-B		Ic	410	Re	K8 V
Lakou	0638	E779454-7		Lo Ni	A601	DD	M2 V
	0638	D779454-8	I	Lo Ni	A801	Re	M2 V
Ralhe	0731	E224564-8		Ni O:0732	801	Na	M2 V M3 D
	0731	D224575-9	I	Ni	A701	Re	M2 V M3 D
Iderati	0732	A887798-C	N	Ag Ri Cp	201	DD	G9 V
	0732	A887798-C	N, I	Ag Ri Cp	401	Re	G9 V
Tondoul	0739	E5136A7-4		Ic Na Ni	701	Na	K8 V M1 D
	0739	D5136A7-6	I	Ic Na Ni	901	Re	K8 V M1 D
875-496	0834	E888421-7	S	Lo Ni	A510	Cs	M3 V M7 D
Prince Edward	0834	C888653-8	S, I	Ni Ag Ri	110	Re	M3 V M7 D
Ochecate	0837	E747569-7		Ag Ni	210	Na	G8 V M8 D
	0837	D747569-9	I	Ag Ni	410	Re	G8 V M8 D
Mewey	0838	D786799-5		Ag Ri	701	Na	K3 V M3 D
	0838	C786799-7	I	Ag Ri	901	Re	K3 V M3 D
975-452	0840	E100316-9		Lo Ni Va	821	Na	M0 V
Retief	0840	D100453-A		Lo Ni Va	121	Cs	M0 V

Under this policy, the worlds of a district were not Imperial members but received Imperial protection. Imperial affairs were administered from Glisten (2036) in subsector O, but a token capital was maintained at Mertactor. This office is maintained at Mertactor in order to simplify relations between the Regency proper and the many individual client states in the subsector. Because of the relative safety of the worlds of this subsector, located as they are in a pocket well-protected by the main bulk and frontiers of larger Spinward States (the Zhodani and Regency frontiers to coreward and the Regency and Aslan frontiers to trailing), the protection of these worlds by incorporation into the Regency was not a high priority to the young government, as it was focused on securing its own coreward and trailing borders.

Nonetheless, as a sign of its commitment to the worlds of the subsector, the Regency government renamed District 268 as the Plankwell subsector (for Grand Admiral Olav hault-Plankwell, victor of the First Frontier War and first of the "Barracks Emperors," see **Supplement 11, Library Data (N-Z)**, OP, and the **MegaTraveller Imperial Encyclopedia**, SA) and assigned the 184th Fleet to its defense, newly transferred from the Regency's trailing frontier (Vast Havens subsector, Deneb/P) and headquartered at Mille Falcs (1637).

Even in the antebellum environment of Imperial-Zhodani hostility, District 268 was a much better developed area than might be expected for a nonaligned buffer zone. Much of the reason for this was the presence of a major branch of the Spinward Main (page 42) touching all but two systems of the subsector. In fact, all jump-1 contact with the major world of Glisten (2036, page 50) had to pass through the district, with the result that a vigorous economy had developed over the centuries to support this trade.



Major trade worlds along the jump-1 route included (and still do) Collace (1237), an industrial world specializing in low-cost, high technology trade goods, Forine (1533), an industrial world specializing in exportable electronic components, and Tarkine (1434), and agricultural world that produces a wide variety of exotic spices and plant extracts.

Bowman (1132): The phenomenal size of the Bowman Belt, one of the most extensive ever discovered, cannot really be divined from the UWP listed above. Although the system does contain just one contiguous belt (listed as an asteroid rather than a planetoid belt, as it is the system's inhabited main "world"), another way of encoding the system would be to list it with *four additional* planetoid belts, as the Bowman belt occupies five orbits: 0, 1, 2, 3, and the irregular 3.5 (**TNE** page 195). Orbit 0 contains mostly nickel-iron asteroids, orbits 2, 3, and 3.5 contain primarily carbonaceous and ice asteroids (the latter useful for starship refueling), and orbit 1 is a mix of nickel-iron and carbonaceous.

The only planet in the system is the single gas giant, Bowman Prime, which is accompanied by three large and nine small moons, and a ring system. Epsilon, one of the large moons, contains the remains of a pre-*Maghiz* Darrian outpost (see page 31). One of the small moons, Alpha, is the site the Regency scout base, the community of Garrison, and the system's starport, Garrison Starport.

Ling Standard Products (see page 46) maintains a base in the gas giant's trailing trojan asteroids, established in 853, from which it controls its in-system prospecting and mining operations. (See also adventure module **Beltstrike**, SA.)

Pavabid (1238): This world is ruled by an unorthodox offshoot of the Church of the Stellar Divinity, which believes that each star is a god to be worshipped by the inhabitants of its system. The so-called "Pavabidian Heresy" goes farther, and claims that these star-gods are each enemies of the other, and that a star-god may place part of its divine essence is a person, making this person a "Son of the Star." The ruling Thearchs of Pavabid have naturally all claimed this distinction.

The inhabitants of the world are maintained at TL 6 in an ignorant state, they are not allowed to emigrate, and they may not meet visitors form other "enemy" stars. The Thearch rules from his flying palace, which the populace believes is held in the air by "the hand of god" (actually contra-grav generators; the palace was built at the Glisten shipyards in 874). See **Double Adventure 6: Divine Intervention/Night of Conquest**, SA.

Shvreeyiyi (formerly 567-908) (1031): Homeworld of the intelligent race known as the "Shriekers," the world's name is an approximation of the Shriekers' name for their own world, although since much of their language is beyond the range of human hearing, this approximation is not recognizable to the Shriekers themselves. (For details on the Shriekers, see page 81.)

Plankwell Subsector, 1117 and 1202 dual listing (Subsector N of Spinward Marches Sector)

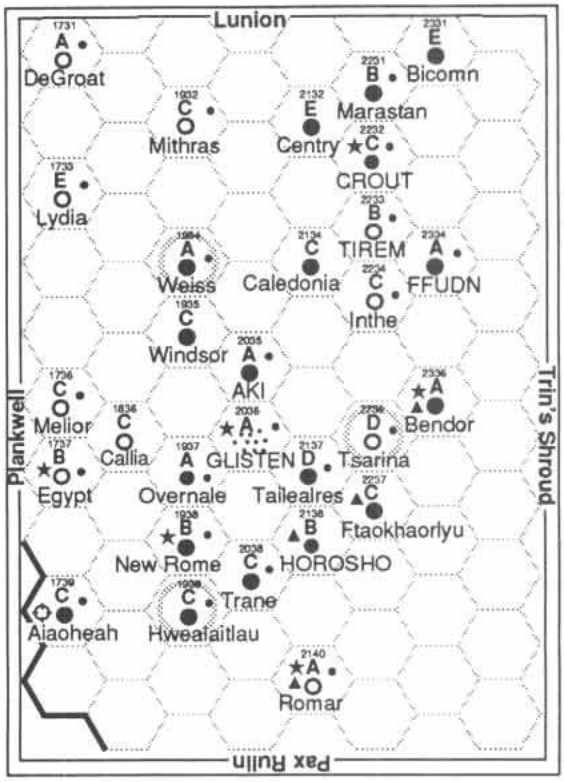
Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Asteltine	0931	B7A7402-A		Fl Lo Ni	210	Na	K7 V M3 D
	0931	C7A7402-9		Fl Lo Ni	110	Cs	K7 V M3 D
Inchin	0938	D12035C-A		De Lo Ni Po	823	Na	F0 III
	0938	D12035C-A		De Lo Ni Po	923	Cs	F0 III
Singer	0940	D553774-6		Po	901	Na	M2 V M2 D
	0940	D553774-7		Po	801	Cs	M2 V M2 D
567-908	1031	E532000-8		Lo Ni Po	310	Na	M9 V M1 D
Shvreeyiyi	1031	D5325E2-2	S	Ni Po	A610	Cs	M9 V M1 D
Avastan	1037	C433520-A		Ni Po	724	Na	M3 V
	1037	C433543-B		Ni Po	924	Cs	M3 V
Kwai Ching	1040	C503758-A		Ic Na Va	320	Na	K3 V
	1040	C503758-B		Ic Na Va	620	Cs	K3 V
Faldor	1131	E5936A7-2		Ni	520	Na	M7 III
	1131	E5936A7-2		Ni	720	Na	M7 III
Bowman	1132	D000300-9	S	As Lo Ni	801	Cs	M0 V
	1132	C000421-B	S	As Lo Ni	201	Cs	M0 V
Squallia	1133	C438679-9		Ni	320	Na	F0 V
	1133	C438679-9		Ni	720	Na	F0 V
Tarsus	1138	B584620-A		Ag Ni	202	Cs	K9 V
	1138	B584620-B		Ag Ni	402	Cs	K9 V
Walston	1232	C544338-8	S	Lo Ni V:9	302	Cs	M2 V
	1232	C544338-A	S	Lo Ni V:8	602	Cs	M2 V
Flexos	1233	E5A1422-6		Fl Lo Ni	610	Na	M1 V M2 D
	1233	E5A1422-7		Fl Lo Ni	810	Na	M1 V M2 D
Collace	1237	B628943-D	S	Hi In	101	Cs	F1 V M6 D
	1237	A628943-E	S, I	Hi In	201	Re	F1 V M6 D
Pavabid	1238	C6678D8-6			A701	Cs	K7 V
	1238	C6678D8-6			A901	Cs	K7 V
Datrillian	1331	E227633-8		Ni	801	Na	M1 V
	1331	E227633-9		Ni	901	Na	M1 V
Nirton	1332	X600000-0		Ba Lo Ni Va	R011	Na	K8 V
	1332	X600000-0		Ba Lo Ni Va	R011	Na	K8 V
Judice	1337	E9B2000-8		Fl Lo Ni RsH	321	Cs	M3 III
	1337	D9B2210-7	I	Fl Lo Ni RsH	421	Re	M3 III
Trexalon	1339	B361851-C		Ri	923	Na	M0 D
	1339	B361851-B		Ri	A823	Cs	M0 D
Motmos	1340	B68468B-5	N	Ag Ni Ri	710	Cs	M2 V M2 D
	1340	B68478B-9	N	Ag Ri	110	Cs	M2 V M2 D
Noctocol	1433	E7A5747-6		Fl	602	Na	F5 V M2 D
	1433	C7A5847-8		Fl	202	Cs	F5 V M2 D
Tarkine	1434	C466662-7	S	Ag Ni Ri O:1435	A310	Cs	M0 V M2 D
	1434	C466662-9	S	Ag Ni Ri O:1435	A810	Cs	M0 V M2 D
Dallia	1435	B8B5883-9		Fl	610	Cs	F2 V
	1435	B8B5883-B	I	Fl	810	Re	F2 V
Talos	1436	E333532-9		Ni Po	820	Na	F9 V M1 D
	1436	C333643-A	I	Ni Po Na	120	Re	F9 V M1 D
Dawnworld	1531	E885000-0		Ba Lo Ni	025	Na	F8 V M5 D
	1531	D885160-A	I	Lo Ni	625	Re	F8 V M5 D
Elixabeth	1532	B426467-8	N	Lo Ni	201	Cs	M1 V M5 D
	1532	B426467-C	N, I	Lo Ni	401	Re	M1 V M5 D
Forine	1533	D312988-A		Hi Ic In Na	610	Na	G9 V
	1533	C312988-B	I	Hi Ic In Na	810	Re	G9 V
Mertactor	1537	B262732-B	S	Cp	610	DD	G1 V
	1537	B262832-B	S, I	Cp A:1	110	Re	G1 V
Talchek	1631	C7B1462-5		Fl Lo Ni O:1532	A601	Cs	K8 V M5 V
	1631	C7B1462-6		Fl Lo Ni O:1532	701	Re	K8 V M5 V
Milagro	1632	E21178A-7		Ic Na	920	Cs	M2 V
	1632	C21188A-9		Ic Na	120	Re	M2 V
Pagaton	1634	C769873-4		Ri	913	Na	M0 V
	1634	C769973-6		Hi	913	Re	M0 V
Binges	1635	A800231-A		Lo Ni Va	720	Na	F0 V
	1635	A800231-B		Lo Ni Va D:4	920	Re	F0 V
Mille Falcs	1637	B9A2469-C	A	Fl Lo Ni	301	DD	M2 V
	1637	A9A248A-E	A, I	Fl Lo Ni A:0	501	Re	M2 V

Although it lies outside of the Regency boundaries, the RISS operates an outpost in the system to maintain contact with this interesting race and protect them from abusive contact like the denuli gem trade.

Talchek (1631): This world contains ruins of a Darrian gas refinery dating to about –1000.

Tarsus (1138): Agricultural world, origianally settled from Fornice from 450-460. World contains two settlements descended from Sword Worlders: one is the low-tech survivors of an oil refinery dating from –104, and the other is the descendants of a Tizonian army regiment, accused of war crimes on Vilis (1119) during the Second Frontier War, and who fled their Imperial-occupied homeworld to escape Imperial war-crimes prosecution after the war.

The Tarsus system is also the site of a pharmaceutical plants owned by the former megacorporation SuSAG, which are used in the manufacture of psi drugs (**TNE** page 258) using *tarsuline*, an extract of a plant fungus that has thus far only been grown on Tarsus. (See also adventure module **Tarsus**, SA.)



Spinward Marches Subsector O: Glisten

Glisten had been considered a backwater subsector until the opening of District 268 (see page 49), when the Glisten subsector became the jumping-off point for the subsector's development and the focal point for its subsequent support. In the years since, Glisten has emerged in its own right as one of the marches' major manufacturing centers, containing three industrial worlds ranging from TL-12 to 15 (Aki, Ffudn, and Glisten).

Glisten is defended by the 100th Fleet, headquartered at Glisten itself, and its small frontier is included in Quarantine District 7, which begins at the Glisten-Pax Rulin border (Trojan Reach/C, page 66) and runs core-spinward into the rimward end of the Vilis subsector (F, page 41). The 100th Fleet was established in 1108 during the Fifth Frontier War and pushed invading Sword Worlds forces from the Lanth subsector within a year.

The Glisten and Trin's Shroud (facing page) subsectors were particularly hard-hit by the *ihatei* invasions and contain a number of *fait accompli* worlds (see pages 10, 26, and 78).

Aki (2035): The world's Aslan population dates to an *ihatei* invasion in 1117 (recounted in *TD* 14). Aki was anotherte of bloody and brutal Aslan-human fighting during the Civil War-era. After over a year of unwelcome Aslan rule, in mid-1119, during one of Aki's 87-hour nights, humans of the local Kritin faction, led by Tyrar "Trooper" McTavish took over the Aslan government compound and slaughtered the world's leaders. The downtrodden humans held the compound for five days before it was retaken by the Aslan. In a wave a bloody reprisals, the Aslan slaughtered many humans (including McTavish and his followers) for their "dishonorable" behavior. However, the takeover was not in vain, as its shock delayed further Aslan advances from this world, buying time for human worlds all through the Domain's threatened areas. When news of the short revolt became public, McTavish and all the people of Aki became heroes among the *ihatei*-threatened Domain. (See **Survival Margin** page 22.)

Bendor (2336): The Bendor shipyards are a major producer of Aslan-designed spacecraft such as the *Trekhyair*-type quarantine cutters (see pages 27 and 91).

Callia (1836): 25% of this world's population is Jonkeereen (see page 61).

Egypt (1737): Egypt used to the home of the Domain's Imperial Ministry of Colonization training base, but this facility fell into disuse for obvious reasons following the Collapse. Indeed, the Regency no longer maintains a Ministry of Colonization, this Ministry having been merged with the Ministry of Conservation in 1135 as the Regency's Ministry of the Interior.

The MoI base at Egypt is involved in determining the best means to utilize the worlds of the Regency, and is involved in studies on the suitability of Jonkeereen (page 61) to various marginal worlds, as well as training participants of settlement programs targetted for the Regency's underused worlds. (For important details on world survey and acclimatization to new environments, see **World Tamers Handbook** pages 11-17, 20-24, and 36.)

With the impending opening of the Regency frontier (see pages 13 and 20-21), MoI's Egypt base is undergoing a renaissance of attention, and it is likely that the colonization mission will be removed from the MoI and once more established as a separate concern.

Glisten (2036): Not a world, but rather a large number of settlements in one of two belts orbiting the star Gliss (named for the systems 10th settlement, "Gliss Ten," eventually shortened to the current name). Glisten is one of the major high-tech industrial centers of the marches, and consists of a number of separate asteroid cities, most of which specialize in a particular industry or social role. The Glisten Belt, although not as extensive in area as some belt systems, has the most aggregate mass of the belts in the Spinward Marches. Glisten was the site of extensive ihatei intrusion, but unlike many such systems, the Aslan presence was completely rooted out.

Glisten Subsector, 1117 and 1202 dual listing (Subsector O of Spinward Marches Sector)

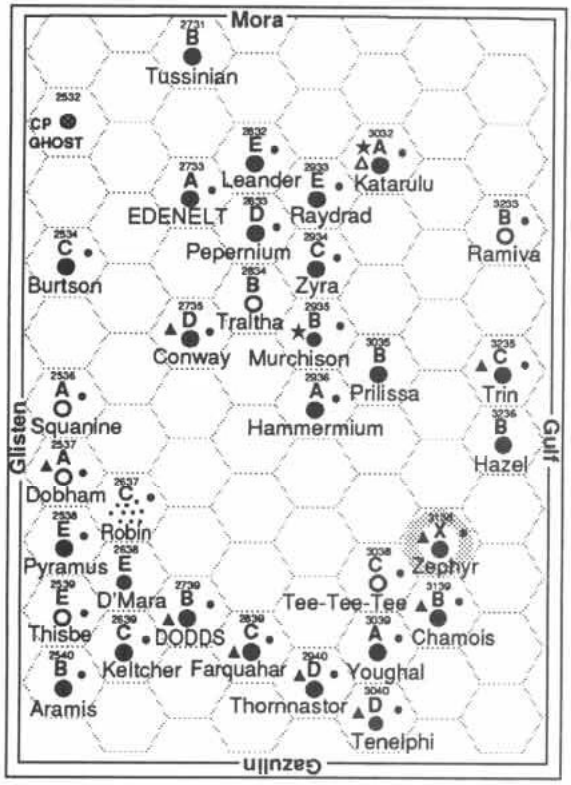
Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Grote	1731	A400404-B		Lo Ni Va	124	DD	F8 V
DeGroat	1731	A400415-E		Lo Ni Va	724	Re	F8 V
Lydia	1733	E110430-6		Lo Ni	902	DD	M4 III M0 V
	1733	E110430-7		Lo Ni	602	Re	M4 III M0 V
Melior	1736	D140466-7		De Lo Ni Po	A724	DD	G3 V
	1736	C140477-8		De Lo Ni Po	924	Re	G3 V
Egypt	1737	BAC6567-7	N	Fl Ni	521	DD	F8 V
	1737	BAC6667-A	N	Fl Ni	421	Re	F8 V
Aster	1739	C86A410-9		Lo Ni Wa	401	DD	K9 V
Aiaoheah	1739	C86A6N9-9	I	Ni Wa Ri Aw	401	Re	K9 V
Callia	1836	E150852-6		De Po	810	DD	M3 V
	1836	C150952-7		De Po Hi	210	Re	M3 V
Mithras	1932	C8B5546-6		Fl Ni Pr	302	DD	M7 V
	1932	C8B5546-6		Fl Ni Pr	402	Re	M7 V
Weiss	1934	A626464-B		Lo Ni O:2036	A703	DD	M0 III M2 D
	1934	A626564-C		Ni A:4 O:2036	A203	Re	M0 III M2 D
Windsor	1935	C783511-9		Ni	210	DD	K9 V M0 D
	1935	C783634-A		Ni Ri A:1	210	Re	K9 V M0 D
Overnale	1937	B45467A-9		Ag Ni	423	DD	G3 V
	1937	A45467A-C		Ag Ni A:2	623	Re	G3 V
New Rome	1938	B837866-B	N	O:2036	704	DD	F8 V M0 D
	1938	B837866-B	N	O:2036	804	Re	F8 V M0 D
Craw	1939	C573674-6		Ni	923	Re	G7 V
Hwealaitlau	1939	C5737M5-3		Ni Aw	A223	DD	G7 V
Aki	2035	B443987-9		Hi In Po	A214	DD	G6 V M2 D
	2035	A4439AC-C		Hi In Po A:0	414	Re	G6 V M2 D
Glisten	2036	A000986-F	A	As Hi In Na Cp	821	DD	K9 V
	2036	A000A86-F	A	As Hi In Na Cp	521	Re	K9 V
Trane	2038	C639422-B		Lo Ni	704	DD	F4 V M3 D
	2038	C639422-C		Lo Ni An	904	Re	F4 V M3 D
Centry	2132	E222447-6		Lo Ni Po	220	DD	K3 V
	2132	E222447-8		Lo Ni Po	420	Re	K3 V
Caledonia	2134	C541636-5		Ni Po	910	DD	M4 III M0 D
	2134	C541536-8		Ni Po	810	Re	M4 III M0 D
Sorel	2137	E48569A-2		Ag Ni Ri	921	DD	G3 V M3 D
Tailealres	2137	D4857LB-5		Ag Ni Ri Aw	821	Re	G3 V M3 D
Horosho	2138	C3378A6-A	S		920	DD	F4 V
	2138	B3379A6-B	S	Hi	120	Re	F4 V
Romar	2140	B450456-B	A	De Lo Ni Po	112	DD	M2 V M3 D
	2140	A450576-D	A	De Ni Po A:7	212	Re	M2 V M3 D
Marastan	2231	D868772-5		Ag Ri	924	DD	K7 V
	2231	B868794-9		Ag Ri Re K:0	924	Re	K7 V
Crout	2232	E4359CA-7		Hi	314	DD	M7 II M9 V
	2232	C4359CA-8		Hi	414	Re	M7 II M9 V
Tirem	2233	C7B5975-B		Fl Hi	621	DD	K5 V
	2233	B7B5A85-C		Fl Hi	221	Re	K5 V
Inthe	2234	C100598-B		Ni Va	924	DD	K3 V
	2234	C100698-C		Ni Va	224	Re	K3 V
Tsarina	2236	D120636-5		De Na Ni Po	A301	DD	M2 V M2 D
	2236	D120636-7		De Na Ni Po	A601	Re	M2 V M2 D
Wurzburg	2237	C795300-A	S	Lo Ni	A510	DD	F8 V
Ftaokhaorlyu	2237	C7953K4-A	S	Lo Ni Aw	A810	Re	F8 V
Bicomn	2331	E563576-2		Ni	210	DD	M0 V
	2331	E563576-5		Ni A:2	310	Re	M0 V
Ffudn	2334	A41489D-C		Ic	904	DD	F3 V M3 V
	2334	A41499D-D		Hi Ic In	104	Re	F3 V M3 V
Bendor	2336	A756656-C	A	Ag Ni	820	DD	A5 V
	2336	A756756-E	A	Ag A:1	220	Re	A5 V

Glisten City (a group of five asteroids linked into a tetrahedron) is the system's business and governmental center, the Pluvis group is the site center of starship manufacture and home of the famous Bilstein shipyards, Therak and Erom conduct most of the belt's mining and mineral refining, while heavy industryis concentrated in the Mistar and Namdet groups and Erom. Light industry is concentrated on Alea and the Warem and Thacen groups, and agricultural production (Glisten is agriculturally self-sustaining) is conducted in Alea, Ensu, and the Thacen and Vedfor groups. Among the more specialized asteroid cities are the diplomatic and trade center at Gro'un, the tourism center at Chun, and the "artist's colony" of Ensu. (See also *TD* 15).

Glisten Institute of Planetological Studies: Located on Was-hin, an asteroid orbiting near Glisten City (see "Glisten," above), "GLIPS" is one of the leading educational institutions in the Regency. Established in 630, it trains its students in the broad discipline of planetology (including the skills Biology, Chemistry, Farming, Geology, and Meteorology) conducts studies on terraforming and the introduction of new or geneered lifeforms into new environments, and maintains close ties with the RISS (see page 81), for which it is a major contracted research arm, and site for advanced training. Its student body is close to one million, with almost 50,000 faculty and researchers. The GLIPS facility includes over one hundred sample ecologies for study, each housed in its own separate asteroid.

Marastan (2231): Marastan was an Imperial reserve world, and is maintained as such by the Regency. Different reserve worlds served different purposes (see, for example, Aosta, Deneb 0332, page 64), and Marastan preserved and displayed examples of flora and fauna collected by Imperial Interstellar Scout Service (IISS) in its pre-Collapse explorations. Because of the irreplaceable value of this collection, research on this world is allowed only to accredited academics.

Marastan has also become the home of an enclave of K'kree, the descendants of a trade and diplomatic mission stranded in the Domain by the Civil War. They live on the world's open



plains and adhere to the environmental restrictions of the world. This sizeable population is the cause of a small but significant economy in the subsector catering to the unique needs of these militant herbivores.

Mellor (1736): 55% of the world's population is Jonkeereen (page 61).

Mining School of Glisten: Located in the Glisten Belt (2036), this institution trains its students in all aspects of asteroid mining: prospecting, mining techniques, and the management of large-scale mining operations. It was established and continues to be maintained by large endowments from the large mining corporations of the Glisten Belt.

Mithras (1932): Mithras was an Imperial exile prison, considered to be a shining example of criminal rehabilitation, unlike prison worlds like Torment (SM 0721, page 44) and Exile (Deneb 1928, page 62), where the prisoners are free to create whatever hellish worlds they like, so long as they are safely out of mainstream society.

Convicts sent to Mithras begin life anew in the Mithran wilderness, but the opportunities for self-discipline and self-improvement, and periodic review of their sentences (Mithras is not a life sentence world) allows these convicts to turn themselves around. Indeed, rehabilitated Mithrans were a major source of IISS and Ministry of Colonization recruits during the Imperial era.

Romar (2140): Source of the "dust spice" popular among the Aslan, a major cause of Aslan trans-rift colonization after 380 (see timeline, page 25).

Spinward Marches Subsector P: Trin's Shroud

This subsector, formerly named Trin's Veil in reference to the highly reflective debris cloud (ancient remains of a shattered moon) around that world, was renamed to remember the billions killed in the Rape of Trin (see page 80).

Trin's Shroud is home to the 207th Fleet, headquartered at Katarulu (3032).

Katarulu (3032): Formerly home to the training center for IISS Xboat pilots, this center has been expanded to the headquarters of the Regency Flight School, serving the RISS and RQS, see below.

Prilissa (3035): Prilissa is the world of origin of the kian, a widely-used riding beast and beast of burden. In the years since its discovery early in the settlement of the Spinward Marches it was distributed throughout the Imperium. Although never so common as the Terran horse and its relatives, kian are a familiar sight on human-habitable worlds throughout former Imperial territory, and were used on Capital as ceremonial mounts for the Household Cavalry Regiment of the Imperial Guard.

Kian are bipedal, furred, long-necked, herbivorous grazers. They are quite hardy, with excellent eyesight and hearing, and are easily able to carry a fully-equipped human at high speeds. Their thick fur and subcutaneous fat makes them highly immune to parasites, and quite amenable to cold environments. Their colors include brown, gold, yellow and black. In appearance, they look like mammalian versions of Terran flightless birds such as the ostrich, emu, or moa, with features reminiscent of giraffes and antelope, and a luxuriant brushlike tail. (See also **JTAS 9**, OP, **Best of the Journal 3**, OP, *TD 9*, and **Striker II**.)

Regency Flight School: Located on Katarulu (3032), this school was originally the IISS Xboat pilot training school for the Spinward Marches. With the expansion of the Domain Xboat network following the Collapse the school was expanded dramatically to handle the influx of new Xboat pilots as well as to train and recertify flight crews for with fledgling RQS.

The RFS is now the owning command for all government pilot training in the Regency, establishing doctrine and training standards used by all Regency flight training facilities, just as the Jumpspace Institute (see page 62) oversees and regulates the technical and engineering side of the starflight industry.

Robin (2637): Robin was originally a corporate-managed mining enterprise, owned by Mora Metals, LIC. However, miners dissatisfied with working conditions successfully rebelled against the corporation, taking over the system's equipment and facilities. Robin was the site of brutal Aslan *ihatei* attacks during the Civil War (see page 22, Survival Margin). Continued hard feelings account for the Amber Zone.

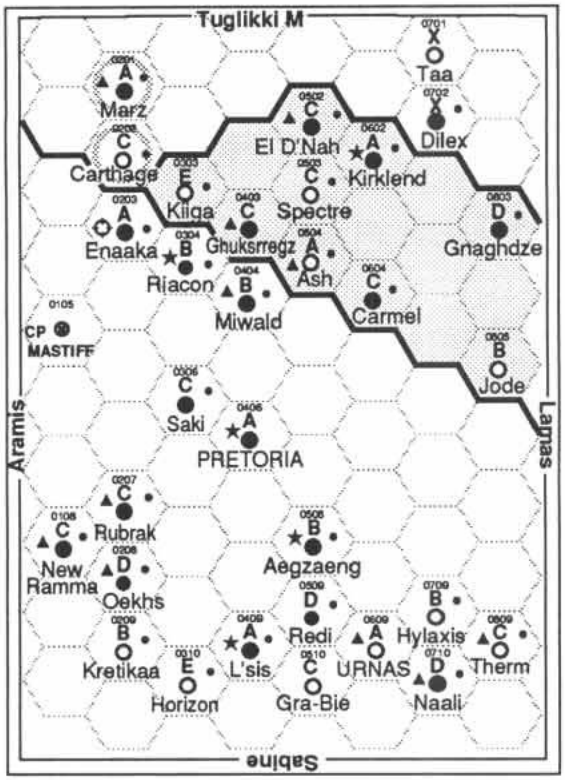
Thisbe (2539): This marginal world has for a number of years been the object of a terraforming program, initially under the auspices of the Imperial Ministry of Conservation.

Thisbe is currently preparing to host the 1204 Imperial Poetry Convocation. The honor of hosting this quadrennial event is due to the fact that Thisbe is one of the few worlds whose name honors a poetic work, in this case a piece by the Terran poet Philip Larkin (–3796- –3733, IC).

Trin (3235): The story of the Rape of Trin is told more fully on page 80. Note that Trin still retains its naval base. This is because Trin was the site of a naval inactive ship facility, where hundreds of decommissioned spacecraft were stored against possible future need. The Trin NavInacShipFac, as it was known, was located in far orbit around Trin, and included the system's naval base. This base itself was severely damaged by *Kishkil*, but the extent of the reserve fleet and subsidiary facilities was so vast that damage to the installation as a whole was relatively minor. It was cheaper to rebuild or replace the destroyed portions of the base that it would have been to reactivate and move the entire reserve fleet to a new location. However, many of the naval activities located on Trin, such as the headquarters of the subsector fleet (the 207th) had to be moved off world due to the annihilation of the dirtside facilities.

Trin's Shroud Subsector, 1117 and 1202 dual listing (Subsector P of Spinward Marches Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Burtson	2534	C462667-8		Ni Ri O:2536	402	DD	G4 V
	2534	C462667-9		Ni Ri O:2536	602	Re	G4 V
Squanine	2536	A300550-B		Ni Va	303	DD	F4 V M7 D
	2536	A300550-E		Ni Va	603	Re	F4 V M7 D
Dobham	2537	A450457-A	S	De Lo Ni Po	523	DD	G0 V
	2537	A450552-D	S	De Lo Ni Po A:2	323	Re	G0 V
Pyramus	2538	E566335-2		Lo Ni	214	DD	K6 V
Roihye	2538	E566SL9-4		Lo Ni Aw	814	Re	K6 V
Thisbe	2539	E4305AD-5		De Ni Po	322	DD	F8 II
	2539	E430599-7		De Ni Po	622	Re	F8 II
Aramis	2540	B659772-6			924	DD	K5 V
	2540	B659883-9		A:0	224	Re	K5 V
Robin	2637	C00059C-C		As Ni	212	DD	M2 V
	2637	C00059C-C		As Ni A:1	A112	Re	M2 V
D'Mara	2638	E75A798-5		Wa	910	DD	F4 IV
	2638	E75A898-8		Wa	210	Re	F4 IV
Keltcher	2639	C525567-9		Ni O:2637	602	DD	K6 V
	2639	C525588-A		Ni	802	Re	K6 V
Tussinian	2731	B678324-7		Lo Ni	520	DD	K0 V
	2731	B678333-9		Lo Ni	620	Re	K0 V
Edenelt	2733	A4638BD-B			934	DD	G7 V
	2733	A4639BD-D		Hi	134	Re	G7 V
Conway	2735	D894586-7	S	Ag Ni	311	DD	F0 V M0 D
	2735	D894586-8	S	Ag Ni	611	Re	F0 V M0 D
Dodds	2739	C4439DF-7	S	Hi In Po	423	DD	G7 V
	2739	B4439DF-A	S	Hi In Po	823	Re	G7 V
Leander	2832	E695244-5		Lo Ni	801	DD	K5 V M1 D
	2832	E695233-5		Lo Ni	901	Re	K5 V M1 D
Pepernium	2833	D567530-3		Ag Ni	503	DD	M1 V
	2833	D567530-5		Ag Ni	703	Re	M1 V
Traltha	2834	B790630-6		De Ni	410	DD	F5 V
	2834	B790630-9		De Ni An	610	Re	F5 V
Farquahar	2839	C625563-7	S	Ni O:2739	201	DD	M3 V
	2839	C625563-8	S	Ni O:2739	301	Re	M3 V
Raydrad	2933	E99467A-6		Ag Ni	303	DD	M7 III M9 D
	2933	E99457A-6		Ag Ni	603	Re	M7 III M9 D
Zyra	2934	B555448-7		Lo Ni	301	DD	K8 V
	2934	C555448-9		Lo Ni	701	Re	K8 V
Murchison	2935	B544433-6	N	Lo Ni	305	DD	M5 III M9 V
	2935	B544433-9	N	Lo Ni	805	Re	M5 III M9 V
Hammermium	2936	A5525AB-B		Ni Po	535	DD	M3 III
	2936	A5525AB-C		Ni Po	935	Re	M3 III
Thornnastor	2940	D534443-8	S	Lo Ni C:1	804	DD	M1 III
	2940	D534443-9	S	Lo Ni C:2	804	Re	M1 III
Katarulu	3032	B252665-B	B	Ni Po	201	DD	M0 V M9 D
	3032	A252686-D	B	Ni Po Cp	801	Re	M0 V M9 D
Prilissa	3035	B985588-6		Ag Ni	510	DD	K9 V
	3035	B985588-8		Ag Ni	610	Re	K9 V
Tee-Tee-Tee	3038	C110530-9		Ni	902	DD	M2 V
	3038	C110630-A		Ni	102	Re	M2 V
Youghal	3039	AA95365-B		Lo Ni O:3235	201	DD	M3 V
	3039	AA95475-C		Lo Ni A:2	301	Re	M3 V
Tenelphi	3040	D76A579-9	S	Ni Wa	901	DD	F4 V M0 V
	3040	D76A679-A	S	Ni Wa Ri	401	Re	F4 V M0 V
Zephyr	3138	X89556A-3		Ag Ni O:3039	R404	DD	K5 V
	3138	X895546-4		Ag Ni	R604	Re	K5 V
Chamois	3139	B544642-5	S	Ag Ni	723	DD	F9 IV
	3139	B544642-9	S	Ag Ni	823	Re	F9 IV
Ramiva	3233	B1107A7-8		Na	913	DD	M3 V
	3233	B1108A7-B		Na	113	Re	M3 V
Trin	3235	A894A96-F	A	Hi In Cp	101	DD	M0 V
	3235	C894861-6	N	Mr	501	Re	M0 V
Hazel	3236	C645747-5		Ag	A110	DD	A1 V M6 D
	3236	B645747-9		Ag	210	Re	A1 V M6 D



DENEB

Deneb was not seriously settled by either of the first two human empires (the Vilani First Imperium or Ziru Sirka and the Solomani-run Second Imperium/Rule of Man/Ramshackle Empire, which was really nothing more than the First Empire taken over from Vilani control—for further details see the **MegaTraveller Imperial Encyclopedia**, SA); this had to wait until the early years of the vigorous Third Imperium when explorers of the new Imperial Interstellar Scout Service pushed beyond the known frontiers of Corridor Sector and found many readily exploitable worlds.

The Zhodani name for Deneb Sector is *Nieklsdia*.

Deneb Subsector A: Pretoria

The Pretoria subsector is patrolled by the 194th Fleet, which maintains its headquarters at Pretoria (0406). Pretoria's frontier is part of two quarantine districts, RQD 2 which enters Pretoria from spinward and extends to Enaaka (0203). This represents the trailing terminus of the Vargr interface that runs along the coreward edge of the Spinward Marches. RQD 3 begins immediately to trailing of Enaaka, and is the core-spinward beginning of the Regency Frontier that runs trailing and rimward all the way around the Regency to the Trojan Reach. RQD 3 encompasses the frontier shaded in gray in the map above, as well as the worlds on the edge of the safe immediately to its rear.

Enaaka (0203): This hot, humid world is perpetually overcast and has an ecosystem completely dominated by fungus, whose varieties number hundreds of times more than most other worlds. For example, rather than the photosynthetic plantlike forms common on most worlds, Enaaka's surface is covered by tall, treelike mushrooms and spongy fungal carpets for ground cover. While photosynthetic plants do exist, they are low on the ecological pyramid, such as marine algae, etc.

The wide variety of exotic fungi provides the basis of Enaaka's economy, being exported for pharmacological and exotic food markets, but they also provide a constant danger to its human inhabitants. Anyone directly breathing the Enaakan atmosphere is liable to catch a fungal infection in the lungs, and exposed skin is susceptible to a bewildering variety of topical infections (see **World Tamers Handbook**, pages 24-25 for discussion of diseases in TNE and examples of diseases upon which others can be based).

There are no native terrestrial lifeforms more advanced than insects, and almost all such lifeforms exist in a symbiotic relationship with the dominant fungal ecology, which of course means that their bites will often cause fungal infections within the circulatory system. (See *MTJ* 1 for further details.)

L'sis (0409): Although largely untouched by Vargr incursions during the Civil War, L'sis later became a site of significant Vargr refugee camps.

Rachele Society: Genocidal secret society founded by Zid Rachele (963-1103?) on Pretoria (0406) in 992. The Rachele Society was a Vilani supremacist group (in itself an odd notion) dedicated to the creation of a Vilani "Fourth Imperium" and the extermination of the non-Vilani human races. It was responsible for the Rachelean Revolts of 1010-1011 in which the Society briefly took control of portions of Pretoria and Saki (0306, see below). The revolt was unsuccessful, and Rachele was sentenced to the prison world Exile (Deneb 1928, page 62). He escaped in 1015, and was presumed dead until 1103 when the Society, under his leadership, attempted to steal 22 large warships from the Imperial Navy Depot at Dynam (Lishun 1219). This attempt, in cooperation with Vargr corsairs, was found out and defeated, and Rachele's ship destroyed. (See also the **MegaTraveller Imperial Encyclopedia**, SA, and *TD* 7.)

Redi (0509): As part of the Regency accommodations of 1132, the Vargr occupiers of Redi were given control of the world. This was a particularly good prize for the Vargr because of the Ancient site on the world. Government sources state that nothing in the site could be used as a weapon against the Regency. Nevertheless, the Vargr have closed the site to the public.

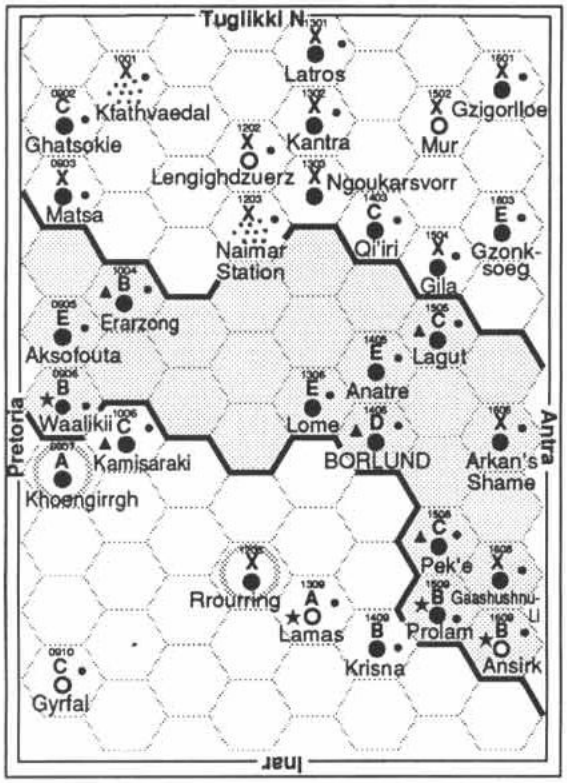
Saki (0306): Saki was the site of an Imperial scout base until the Rachelean Revolts of 1010-1011, during which the base was destroyed by a nuclear explosion as part of a failed blackmail attempt by the Rachele Society (which see, above). 26,000 people were killed, including 1900 Rachelean commandos. The base was never rebuilt.

Deneb Subsector B: Lamas

The Lamas subsector is defended by the 315th Fleet, headquartered at Lamas (1309). The 315th fought in the Fifth Frontier War as the 1st Fleet, defending the intersection of the Jewell (B), Regina (C), Vilis (F), and Lanth (G) subsectors. With the

Pretoria Subsector, 1117 and 1202 dual listing (Subsector A of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
New Ramma	0108	D465540-6	S	Ag Ni	703	DD	K6 V M6 V G6 V
	0108	C465740-9	S	Ag Ri	803	Re	K6 V M6 V G6 V
Marz	0201	A584985-A	S	Hi	101	DD	G4 V M7 D
	0201	A5848A9-B	S	V:2	A801	Na	G4 V M7 D
Carthage	0202	B2107B9-C		Na C:0	724	DD	M2 V
	0202	C2107B9-B		Na V:6	A224	Na	M2 V
Enaaka	0203	B777786-6		Ag	922	DD	F5 V
	0203	A777886-C	I	An V:1	122	Re	F5 V
Rubrak	0207	C554511-7	S	Ag Ni	701	DD	K3 V M8 D
	0207	C554524-9	S	Ag Ni V:5	901	Re	K3 V M8 D
Teh	0208	D263136-5	S	Lo Ni	802	DD	M2 V
Oekhs	0208	D263473-7	S	Lo Ni Vw	202	Re	M2 V
Kretikaa	0209	B20056B-C		Ni Va O:0409	623	DD	K2 IV
	0209	B20068B-D		Ni Va Na	823	Re	K2 IV
Kiiga	0303	D530624-8		De Na Ni Po	A201	DD	M0 V M2 D
	0303	E530526-8		De Ni Po	601	RF	M0 V M2 D
Riacon	0304	B666441-8	N	Lo Ni	301	DD	F6 V M8 V
	0304	B666441-C	N	Lo Ni Rw:2	701	Re	F6 V M8 V
Saki	0306	D276641-8		Ag Ni	701	DD	K8 V
	0306	C276746-9		Ag Rw:V	401	Re	K8 V
Horizon	0310	E110725-8		Na	324	DD	F2 IV K3 D
	0310	D110737-9		Na	624	Re	F2 IV K3 D
Gessert	0403	C254315-A		Lo Ni	320	DD	A2 V K2 D
Ghuksrregz	0403	C254435-A	S	Lo Ni Vw	120	RF	A2 V K2 D
Miwald	0404	C53349B-A	S	Lo Ni Po	602	DD	M0 V M5 V
	0404	B53359B-C	S	Ni Po	302	Re	M0 V M5 V
Pretoria	0406	B656967-C	N	Hi Cp Mr	720	DD	G5 IV
	0406	A656A87-E	N	Hi Cp Rw:0	220	Re	G5 IV
L'sis	0409	A764896-8	N	Ri	101	DD	K6 V
	0409	A764873-9	N	Ri V:3 Rw:V	201	Re	K6 V
El D'Nah	0502	C549456-B		Lo Ni	502	DD	M6 V
	0502	C549457-B	S	Lo Ni	202	RF	M6 V
Spectre	0503	B100654-A		Na Ni Va	A802	DD	M8 V
	0503	C100656-8		Na Ni Va	402	RF	M8 V
Ash	0504	A540887-8	S	De Po	201	DD	M9 V M1 D
	0504	A540889-8	S	Po De V:0	101	RF	M9 V M1 D
Caladib	0508	B697222-9	N	Lo Ni	301	DD	M2 V
Aegzaeng	0508	B697433-A	N	Lo Ni Vw	601	Re	M2 V
Redi	0509	E575565-4		Ag Ni An C:4 O:0409	712	DD	F3 V M3 D
	0509	D575534-5		Ag Ni An V:6 C:4	912	Re	F3 V M3 D
Gra-Bie	0510	C23027B-9		De Lo Ni Po	120	DD	G7 V
	0510	C23027C-B		De Lo Ni Po	320	Re	G7 V
Kirklend	0602	A668443-A	N	Lo Ni	423	DD	F4 V
	0602	A668547-A	N	Ni Ag V:4	223	RF	F4 V
Carmel	0604	B346441-9		Lo Ni	302	DD	F0 V M0 V
	0604	C346441-7		Lo Ni	102	RF	F0 V M0 V
Umas	0609	D120974-C	S	De Hi In Na Po	A210	DD	K7 V
	0609	A120974-F	S	De Hi In Na Po	810	Re	K7 V
Taa	0701	A650643-9		De Ni Po	330	Na	G7 V
	0701	X650677-3		De Ni Po V:2	B230	Wi	G7 V
Dilex	0702	D626888-7			902	Va	M1 V
	0702	X626000-0		Ba	002	—	M1 V
Hylaxis	0709	B7B2354-A		Fl Lo Ni	522	DD	K7 V
	0709	B7B2355-C		Fl Lo Ni	622	Re	K7 V
Naali	0710	D61657A-8	S	Ic Ni	324	DD	M4 V
	0710	D61647A-A	S	Ic Lo Ni	424	Re	M4 V
Retion	0803	C558445-4		Lo Ni	601	Va	K7 V M4 D
Gnaghdze	0803	D55846A-2		Lo Ni Vw	301	RF	K7 V M4 D
Jode	0805	A9A6683-B		Fl Ni V:1	410	DD	F3 IV
	0805	B9A6683-9		Fl Ni V:2	210	RF	F3 IV
Therm	0809	D9B0489-5	S	De Lo Ni	313	DD	M9 V
	0809	C9B0489-7	S	De Lo Ni	513	Re	M9 V



realignment of the Imperial fleets in the early 1110s, the 1st Fleet's designation was reassigned to the fleet assigned to the Core subsector (Core/G), and the former 1st Fleet became the 315th. Since the end of the Fifth Frontier War, the 1st/315th was rotated into Deneb in order to allow pride of place to go to those fleets that retained their historic wartime designations.

The Regency Frontier in the Lamas subsector is part of Regency Quarantine District 3, with its capital at Antra (1808, page 54).

Ansirk (1609): Ansirk's very small population supports little more than the starport and the naval operations in the system. The world of Ansirk orbits one of the system's two gas giants, and contains a huge store of refined fuel, skimmed from the nearby gas giant. The Ansirk system is used by the Navy for large-scale fleet maneuvers in conjunction with the Regency Naval War College (at Depot/Macene, SM 2612, page 43). Although its location in the Wilds already makes it an Amber Zone, it is specifically listed as an Amber Zone because the Navy often conducts live-fire exercises in the system, now possible because of its position outside of the Regency safe. Reserve squadrons frequently deploy to the Ansirk system for refresher training, and the 55th Fleet (see page 56) often conducts maneuvers here.

Arkan's Shame (formerly Yef) (1606): This world was originally named Yef. It is located in the Regency Frontier and was largely depopulated by the Abandonment by the time Fleet Admiral Arthur Arkan arrived on the world. Arkan was the commander of the task force that formed the last line of defense against the *Kishkii* vampire fleet as it drove on toward Trin (see "Rape of Trin," page 80). The valiant efforts of Task Force Alpha destroyed all ships in the fleet except *Kishkii*, incurring tremendous losses of ships and personnel. Arkan blamed himself for the escape of *Kishkii* and the subsequent loss of life on Trin. He resigned his commission and drifted to Yef, and later declined to catch the last ship out. Travellers who stop by the world report that he is still living there, but has been driven quite mad by his guilt and the "ghosts" of Trin.

Gaashushnu Lil Mur (1608): Name means "Valley of the Living Dead Ones;" the world underwent a global nuclear war in 815, and the 1117 population were the descendants of those survivors who refused evacuation. This heart-breakingly mutated society eventually died out in the post-Collapse period.

Ghatsokie (0902): Homeworld of the Crenduthaar, a hexapodal sapient race. The Crenduthaar have a fearsome appearance completely out of keeping with their natures; they are large for sapients, 2.5 meters in length and massing 500 kg, and have a reptilian, draconic appearance, studded with scales, sharp teeth, and razor-sharp slashing limbs. However, the Crenduthaar have become vegetarians, as the beasts they used to prey on are long since extinct.

Of their three pairs of limbs, the rearmost is for locomotion, the frontmost is for manipulation and contains the "slashers," and the middle pair can be used as legs or manipulative arms, as the Crenduthaar are comfortable in a bipedal stance. However, their typical social stance is quadrupedal with their slashers safely folded, making them highly reminiscent of the Terran praying mantis.

Adding to their fearsome appearance and size is their tendency to yell in loud, deep, booming voices. This is because their hearing is adapted to dense atmospheres, and in thinner atmospheres they cannot hear very well, and must compensate by speaking louder.

Lamas Subsector, 1117 and 1202 dual listing (Subsector B of Deneb Sector)

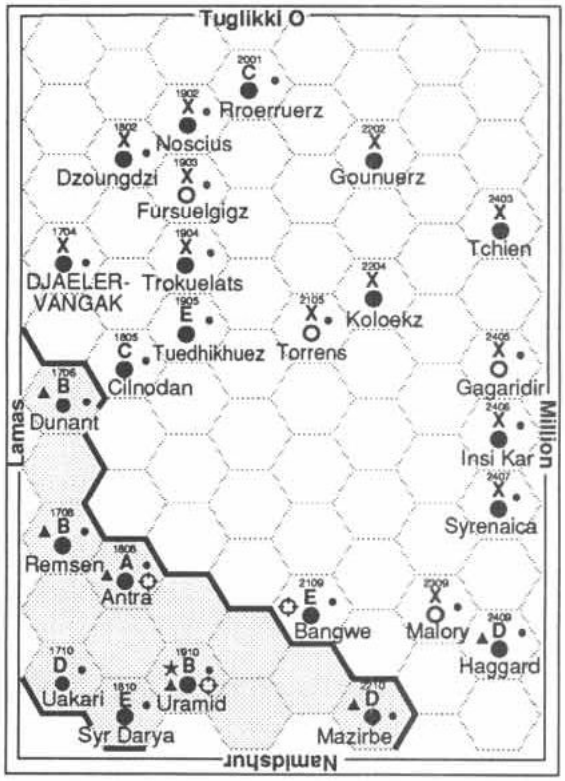
Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Ghatsokie	0902	BA8669D-8		Ag Ni Ri	304	Va	M7 V
	0902	CA8687A-7		Vw	404	Wi	M7 V
Matsa	0903	A234453-F		Lo Ni	102	Cs	F3 IV M5 V
	0903	X234000-0		Ba	002	—	F3 IV M5 V
Aksofouta	0905	D55677A-4		Ag	612	Va	F6 V
	0905	E556779-4		Ag Vw	212	RF	F6 V
Waalikii	0906	B525586-B	N	Ni	834	DD	M8 V
	0906	B525566-B	N	Ni O:1006	134	RF	M8 V
Malkei	0907	B659866-8		O:1309	610	DD	M1 III
Khoengirrgh	0907	A659873-B		Vw Rw:1	A810	Re	M1 III
Gyrfal	0910	C8B6545-7		Fl Ni	103	DD	M8 V
	0910	C8B6545-8		Fl Ni	803	Re	M8 V
Kfathvaedal	1001	B000661-C		As Na Ni O:0902	224	Va	M5 V
	1001	X000000-0		Ba As	024	—	M5 V
Sisi	1004	B8D0610-8		De Ni	624	Va	M4 V
Erarzong	1004	B8D0613-9	S	De Ni Vw	324	RF	M4 V
Kamisaraki	1006	C354467-A	S	Lo Ni O:0906	703	DD	G1 V M3 D
	1006	C354588-C	S	Ag Ni	103	Re	G1 V M3 D
Lengighdzuerz	1202	A300520-B		Ni Va Vw	923	Va	G6 V
	1202	X300000-0		Ba Va	023	—	G6 V
Naimar Station	1203	B000347-A	N	As Lo Ni	912	Cs	M5 V F6 D
	1203	X000000-0		Ba As	012	—	M5 V F6 D
Haniiwa	1208	XA9A643-4		Ni Wa	R210	DD	F4 II
Rrourring	1208	XA9A772-6		Wa Vw	A310	Re	F4 II
Latros	1301	B688227-B		Lo Ni	501	Na	K3 V M0 D
	1301	X688258-2		Lo Ni	101	Wi	K3 V M0 D
Kantra	1302	C301698-9		Ic Na Ni Va	622	Na	M7 V
	1302	X301000-0		Ba Va Ic	022	—	M7 V
Qi'iri	1303	E454323-7	C	Lo Ni	410	Va	M0 V
Ngouksarsvorr	1303	X454333-4		Lo Ni Vw	110	Wi	M0 V
Lome	1306	E32487B-9			101	DD	M0 V M7 D M7 D
	1306	E32477B-8			501	RF	M0 V M7 D M7 D
Lamas	1309	B7AA585-C	N	Fl Ni Wa Cp	701	DD	M5 V
	1309	A7AA685-E	N	Fl Ni Wa Cp	501	Re	M5 V
Qi'ire	1403	A657377-A		Lo Ni	402	Na	K8 V
	1403	C657301-8		Lo Ni	202	Wi	K8 V
Anatre	1405	D5788A7-6			401	DD	M0 V
	1405	E5788A7-6		V:2	201	RF	M0 V
Borlund	1406	E454AAA-9		Hi	701	DD	K8 V M9 V
	1406	D454AAA-9	S	Hi	201	RF	K8 V M9 V
Krisna	1409	C84A651-A		Ni Wa	812	DD	F8 V
	1409	B84A757-C		Wa V:1	312	Re	F8 V
Mur	1502	C100733-A		Na Va	120	V6	M1 V M8 D
	1502	X100000-0		Ba Va	020	—	M1 V M8 D
Gila	1504	E663674-6		Ni Ri	201	Na	K5 V K5 D
	1504	X663698-5		Ni	301	Wi	K5 V K5 D
Lagut	1505	C312555-B		Ic Ni	932	DD	M9 V
	1505	C312256-A	S	Ic Lo Ni	332	RF	M9 V
Pek'e	1508	C441325-7	S	Lo Ni Po	412	DD	F3 V
	1508	C441254-7	S	Lo Ni Po	212	RF	F3 V
Prolam	1509	B769436-A	N	Lo Ni	223	DD	A7 V
	1509	B769436-A	N	Lo Ni	123	RF	A7 V
Gzigorlloe	1601	A311677-A		Na Ni Ic	A801	V6	M1 V
	1601	X311000-0		Ba Ic	001	—	M1 V
Gzonksoeg	1603	D567200-7	C	Lo Ni	401	Va	K9 V
	1603	E567200-5		Lo Ni Vw	201	Wi	K9 V
Yef	1606	E243342-4		Lo Ni Po	202	DD	M2 V
Arkan's Shame	1606	X243000-3		Lo Ni Po	102	RF	M2 V
Gaashushnu Lil Mur	1608	X744255-4		Lo Ni	R404	DD	F4 V
	1608	X744000-0		Ba	004	—	F4 V
Ansirk	1609	B100100-F	N	Lo Ni Va	522	DD	F2 V
	1609	A100357-F	N	Lo Ni Va	A722	RF	F2 V

Despite their looks, the Crenduthaar are friendly, nonviolent, and extremely talkative. They take great joy in travel and learning, and delight in talking with others about all the wonders they have experienced. They are quite intelligent, and never tire of philosophy and other intellectual-spiritual pursuits. However, they find no real need for technology, and are completely happy with their own static TL 0 culture. They know how to use tools, but left to their own devices, find no attraction in technological advancement. (See also *MTJ* 3.)

The Crenduthaar name for the world is Thaar, or "wide place." The name Ghatsokie is the Vargr name for the world. The antebellum Vargr population, followers of a Vargr religion known as "The Followers of Auugh," were augmented by Vargr raiders, corsairs, and opportunists during the Civil War, and the world is now dominated by a non-spiritual Vargr government.

Of Ghatsokie's 400 million population, 30 million are the Vargr rulers (who enslave and "domesticate" the Crenduthaar), and the remainder are Crenduthaar. The world's tech level refers only to the Vargr, Crenduthaar society is TL 0.

Waalikii (0906): When the Regency established its borders, the people of Waalikii found themselves in the Frontier. Subsequently, over 85% of the population moved to Waalikii's colony world of Kamisaraki (1006). In 1135 the government was moved to Kamisaraki because the vast majority of its subjects now live on that world. The government of Kamisaraki claims ownership of Waalikii, although it is seldom visited.



Antra Subsector, 1117 and 1202 dual listing (Subsector C of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Graek	1704	D7879C7-4		Hi V:9	A101	Cs	M4 V
Djaelervangak	1704	X7879AA-4		Hi Vw	301	Wi	M4 V
Dunant	1706	B311320-E	S	Lo Ni Ic	A523	DD	M2 V M4 V
	1706	B311252-E	S	Lo Ni Ic	923	RF	M2 V M4 V
Remsen	1708	B788676-9	S	Ag Ni Ri C:7	524	DD	F9 V M7 D
	1708	B788676-9	S	Ag Ni C:5 V:2	324	RF	F9 V M7 D
Uakari	1710	C5348AA-6			912	DD	K6 V
	1710	D5348AA-5			412	RF	K6 V
Dzoungdzi	1802	A457353-E		Lo Ni	624	V6	K7 V
	1802	X457300-5		Lo Ni Vw	224	Wi	K7 V
Cilnodan	1805	B342221-9		Lo Ni Po	632	DD	M9 V F8 D
	1805	C342257-6		Lo Ni Po	232	Wi	M9 V F8 D
Antra	1808	A53789C-E		Cp	501	DD	M0 V K5 D
	1808	A53789C-E	S, T	Cf V:1	301	RF	M0 V K5 D
Syr Darya	1810	E55769C-5		Ag Ni	922	DD	G3 V M4 V
	1810	E55769C-5		Ag Ni V:3	422	RF	G3 V M4 V
Noscius	1902	C222201-7		Lo Ni Po	A511	V6	M3 V M8 V
	1902	X222000-0		Ba Po	011	—	M3 V M8 V
Fursuelgigz	1903	B200787-8		Na Va Vw	901	V6	M1 V
	1903	X200000-0		Ba Va	001	—	M1 V
Marnig	1904	E241101-5		Lo Ni Po	301	V6	K7 III M8 V
Trokuelats	1904	X241100-4		Lo Ni Po Vw	101	Wi	K7 III M8 V
Ostov	1905	C768532-6		Ag Ni	422	DD	F7 V G7 D
Tuedhikhuez	1905	E768534-5		Ag Ni V:9	B222	Wi	F7 V G7 D
Uramid	1910	B345568-A	A	Ag Ni O:1808	621	DD	M2 V
	1910	B345568-A	A, T	Ag Ni O:1808	321	RF	M2 V
Filangger	2001	A76A654-C		Ni Ri Wa	823	V6	A0 IV G6 V
Rroerruerz	2001	C76A7AA-9		Wa Vw	B123	Wi	A0 IV G6 V
Torrens	2105	C100238-D		Lo Ni Va	104	DD	M4 V
	2105	X100000-0		Ba Va	004	—	M4 V
Bangwe	2109	D78A302-A		Lo Ni Wa	112	DD	K5 V
	2109	E78A246-6	T	Lo Ni Wa	412	Wi	K5 V
Gounuerz	2202	B235330-A	C	Lo Ni	510	Va	M9 V
	2202	X235000-0		Ba	010	—	M9 V
Dofil	2204	E59368B-5	C	Ni	710	Va	F3 V M1 V
Koloekz	2204	X59366C-3		Ni Vw	B810	Wi	F3 V M1 V
Mazirbe	2210	D5537A6-4		Po	124	DD	K7 III F0 D
	2210	D553689-4	S	Po V:5	424	RF	K7 III F0 D
Malory	2309	C320774-6	S	De Na Po	223	DD	M8 V K8 D
	2309	X320000-0		Ba	023	—	M8 V K8 D
Tchien	2403	B696266-A	N	Lo Ni Mr	610	Cs	M1 V
	2403	X696268-6		Lo Ni	210	Wi	M1 V
Gagaridir	2405	B220310-A	N	De Lo Ni Po	201	DD	K2 V M1 V
	2405	X220000-0		Ba De Po	001	—	K2 V M1 V
Insi Kar	2406	B211454-B		Lo Ni Ic	624	DD	M4 V
	2406	X211000-0		Ba Ic	024	—	M4 V
Syrenaica	2407	C669464-9		Lo Ni O:2406	503	DD	A4 V M6 V
	2407	X669403-4		Lo Ni	203	Wi	A4 V M6 V
Haggard	2409	C777224-6	S	Lo Ni	613	DD	F1 V M9 D
	2409	D777224-5	S	Lo Ni	313	Wi	F1 V M9 D

Deneb Subsector C: Antra

The Antra subsector is severely reduced from its antebellum extent; the subsector contains no worlds in the Regency safe area, and well over half of the subsector's worlds lie outside of the Frontier as well, in the Wilds.

Antra subsector is defended by the 61st Fleet, which was pulled back from its previous station in the Million subsector (Deneb/D). The 151st Fleet, which had formerly defended Antra, was sent spinward to cover the new Regency territories in the Sword Worlds subsector (Spinward Marches/J, page 45). The 61st is headquartered at Uramid (1910), within the Frontier itself. Uramid possesses the only naval base in the subsector.

The Antra frontier is part of Regency Quarantine District 3, which runs from the beginning of the frontier in Pretoria subsector (Deneb/A, page 52) to the border between the Antra and Namidshur (G) subsectors in the three-world line of Orenberg, Diiski (2011 and 2111, page 58), and Mazirbe (2210, this page). Note that these three worlds, being the boundary between RQD 3 and 4 are considered to be in *both* quarantine districts. This overlap is to prevent gaps from occurring on the seams between districts where the forces of each side assume that certain threats are within the neighboring district's area of responsibility.

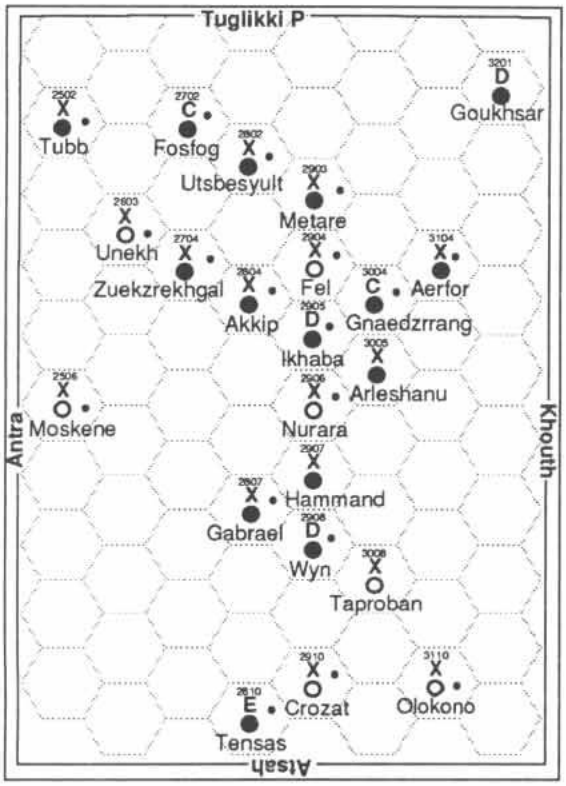
Antra (1808): Antra is the frontier capital of Regency Frontier worlds in Quarantine District 3 (i.e., the Frontier areas in Deneb subsectors A, B, and C, plus two worlds, Orenberg and Diiski, see above, in subsector G).

Malory (2309): Malory had been a Jonkeereen world (see page 61), but with the collapse of even its relatively low technology (TL 6), the Jonkeereen's adaptations to an arid environment did not preserve them in an airless environment. Those that were not evacuated as the world's infrastructure deteriorated simply died, the same as any non-geneered human would have.

A test program is currently underway on Nadrin (SM 3123, page 47) to evaluate the usefulness of the Jonkeereen adaptations to environments with trace atmospheres, which are possessed by the majority of worlds classed as "desert" by their trade classification. It is now privately believed among members of the Regency government that the Imperial Ministry of Colonization's Jonkeereen project, 500 years in the making, was an expensive failure, born of the swaggering self confidence of many geneering advocates. However, the expense is not in financial terms, but rather in the human cost: by creating a new race of humans which are psychologically and culturally isolated from the remainder of humanity, but which do not have a significantly different environmental niche, all that has been accomplished is to create a new occasion for racial strife and

Adventure Hooks

When fleshing out the details of worlds, pay attention to the changes listed between 1117 and 1202. These tiny little variations in digits are all that a miserable little UWP can do to reflect the changes of 85 years of history. Think of what Earth was like in 1910, and try to count all of the changes, revolutions, wars, and social upheavals that have taken place since then. Each of the 981 worlds in RSB has had this much more history added to it by the New Era. Some of these changes will be long over, but their effects will live on into 1202 in the form of social inequalities, resentments, or unfinished business like, say, the period between 1918 and 1939.



Million Subsector, 1117 and 1202 dual listing (Subsector D of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Tubb	2502	C89A799-9		Wa	701	Na	F7 V M0 D
	2502	X89A7A8-7		Wa V:1	801	Wi	F7 V M0 D
Moskene	2506	E200101-B		Lo Ni Va	603	DD	F5 V G7 V
	2506	X200000-0		Ba Va	003	—	F5 V G7 V
Unekh	2603	C20088B-7		Na Va	502	Vu	M1 V
	2603	X200000-0		Ba Va	002	—	M1 V
Fosfog	2702	A57559C-8		Ag Ni	114	Vu	G5 IV M3 V
	2702	C57547C-5		Lo Ni Vw	414	Wi	G5 IV M3 V
Talon	2704	C343976-B	C	Hi In Po	224	Vu	K4 V
Zuekzrekhgal	2704	X343566-0		Ni Po Vw	B424	Wi	K4 V
495-524	2802	D785300-4		Lo Ni An D:6	422	Vu	F3 V M6 D
Utsbesyult	2802	X7855X4-4		Ag Ni An Dw V:0	222	Wi	F3 V M6 D
Akkip	2804	C4426B7-9		Ni Po	522	Vu	F8 V
	2804	X44256A-2		Ni Po Vw	B322	Wi	F8 V
Gabrael	2807	A473646-E		V:3 Ni	424	DD	K4 V
	2807	X473658-5		Ni V:3	124	Wi	K4 V
Tensas	2810	C556550-6		Ag Ni	504	DD	K8 III
	2810	E556532-2		Ag Ni V:6	204	Wi	K8 III
Metare	2903	A32465A-E		Ni	801	Vu	M2 V M3 D
	2903	X324000-0		Ba	001	—	M2 V M3 D
Fel	2904	A7A7898-A		Fl	622	Vu	M3 V
	2904	X7A7000-0		Ba Fl	022	—	M3 V
Ikhaba	2905	C675512-8		Ag Ni	A933	DD	M5 III
	2905	D675573-7		Ag Ni	433	Wi	M5 III
Nurara	2906	C5A5422-B	S	Fl Lo Ni	604	DD	M0 V
	2906	X5A5000-0		Ba Fl	004	—	M0 V
Hammand	2907	E736132-4		Lo Ni	A120	DD	M9 V M4 D
	2907	X736000-0		Ba	020	—	M9 V M4 D
Wyn	2908	C546444-5		Lo Ni	701	DD	K2 V
	2908	D54648A-4		Lo Ni V:8	301	Wi	K2 V
Crozat	2910	C410424-7		Lo Ni	404	DD	M4 V M6 V
	2910	X410000-0		Ba	004	—	M4 V M6 V
Oluk Dzas	3004	B363521-7		Ni	814	Vu	K8 V
Gnaedzrrang	3004	C363556-3		Ni Vw	B314	Wi	K8 V
Arleshanu	3005	A262333-E	N	Lo Ni Cp	420	DD	F4 IV
	3005	X262224-3		Lo Ni	520	Wi	F4 IV
Taproban	3008	B8A8787-C	N	Fl	A720	DD	M2 V
	3008	X8A8000-0		Ba Fl	020	—	M2 V
Aerfor	3104	A584520-D		Ag Ni RsD	534	Vf	K7 V
	3104	X584564-8		Ag Ni Vw	234	Wi	K7 V
Olokono	3110	E6A5211-5		Fl Lo Ni	801	Vf	M0 V
	3110	X6A5000-0		Ba Fl	001	—	M0 V
Goukhsar	3201	C563224-5		Lo Ni	310	Vf	A6 V
	3201	D563243-4		Lo Ni Vw	110	Wi	A6 V

unhappiness. Relations between "normal" humans and Jonkeereen on worlds where both exist in numbers are strained at best, and because unmodified humans have found ways to exist in deserts for millenia, the need for this new source of human misery is hardly justified.

Note that both organizations merged to create the Regency's Ministry of the Interior (MoI), the former Imperial Ministries of Conservation and Colonization, were engaged in geneering projects, of which the Jonkeereen project was perhaps the most needless. However, the MoI is not engaged in geneering programs. Instead, it concentrates on using existing human, technological, and planetary assets in the most effective and beneficial possible manner. To this end, they are engaged in projects such as that on Nadrin.

Deneb Subsector D: Million

The Million subsector is completely outside of the Regency, not even the Regency Frontier extends into this subsector. However, it is patrolled by squadrons of the 61st and 125th Fleets, based respectively in the neighboring Antra and Namidshur subsectors (Deneb/C, facing page, and Deneb/G, page 58).

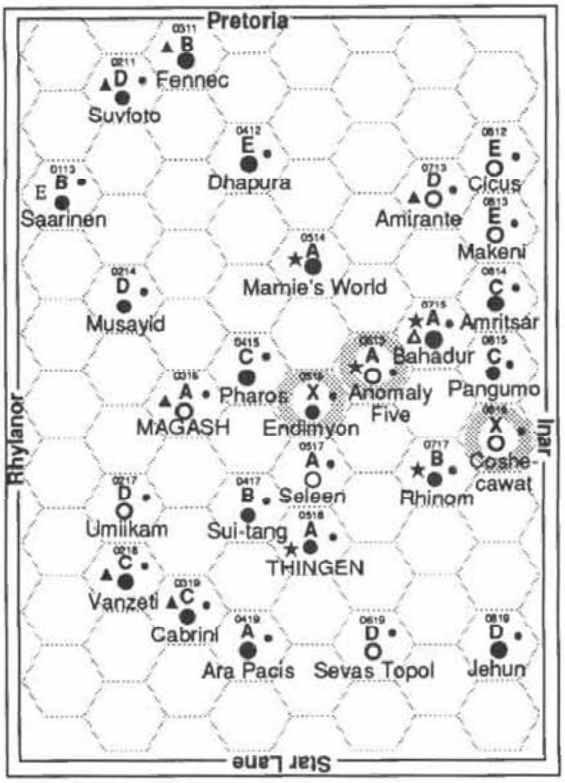
Utsbesyult (formerly 495-524) (2802): As the Collapse caused disorganization among the Vargr rulers of this world, the Droyne population staged an uprising and gained control of the world. Some isolated bands of Vargr remain on the world, which the Droyne have renamed Utsbesyult, but they are not considered citizens.

The Imperial Calender

The imperial calendar is a simple chronological numbering of days in a 365-day year from 001 to 365. It contains no months, although days are divided into the traditional seven-day weeks. In order to allow an integer-number of weeks, one day a year is set outside of the week structure (52x7=364, leaving one day left over). This day is called Holiday, and is the first day of the year, 001.

Imperial convention assigns simple names to each day of the week: Wonday, Tuday, Thirday, Fourday, Fiday, Sixday, and Senday. The standard abbreviations for these days (1dy, 2dy, 3dy, 4dy, 5dy, 6dy, 7dy) show their derivation. Holiday (Hdy) is a unique day, occuring only once a year, and does not fall in any week.

Because the imperial calender consists of an integral number of weeks, there is no slippage between date and day of the week. In other words, day 008 of any given year will always fall on Senday. Incidentally, this means that there is no imperial concept comparable to "*Friday* the 13th," as 013 falls on Fiday every year.



Sabine Subsector, 1117 and 1202 dual listing (Subsector E of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Saarinen	0113	B566212-8		Lo Ni RsE	513	DD	K6 V M5 D
	0113	B566444-A		Lo Ni RsE	313	Re	K6 V M5 D
Suvfoto	0211	D95488A-7	S		304	DD	K6 V
	0211	D95488A-6	S	V:2	404	Re	K6 V
Musayid	0214	E5448AE-5			514	DD	K5 V
	0214	D5448AE-6			714	Re	K5 V
Umiikam	0217	DAA6300-5		Fl Lo Ni	401	DD	G1 V M7 D
	0217	DAA6300-7		Fl Lo Ni	701	Re	G1 V M7 D
Vanzeti	0218	C52A531-C	S	Ni Wa	401	DD	M3 V M7 V
	0218	C52A531-C	S	Ni Wa	601	Re	M3 V M7 V
Fennec	0311	C556833-8	S		520	DD	G7 V
	0311	B556836-A	S	V:0	820	Re	G7 V
Magash	0316	A400976-F	S	Hi In Na Va Cp	824	DD	K7 III F8 V
	0316	A400A56-F	S	Hi In Na Va Cp	124	Re	K7 III F8 V
Cabrini	0319	C365510-6	S	Ag Ni	123	DD	K9 V
	0319	C365510-7	S	Ag Ni	323	Re	K9 V
Dhapura	0412	E579758-7			512	DD	F4 V
	0412	E579758-8		V:1 An	612	Re	F4 V
Pharos	0415	B593477-8		Lo Ni	612	DD	M2 V
	0415	C593477-9		Lo Ni	712	Re	M2 V
Sui'tang	0417	B552864-A		Po O:0316	415	DD	G4 V M3 D
	0417	B552854-C		Po	515	Re	G4 V M3 D
Ara Pacis	0419	A337678-B		Ni	601	DD	M3 V
	0419	A337778-D			101	Re	M3 V
Marnie's World	0514	AA9A324-B	N	Lo Ni Wa	510	DD	F3 V
	0514	AA9A324-E	N	Lo Ni Wa	610	Re	F3 V
Endimyon	0516	X555434-1		Lo Ni	R523	DD	F3 III M5 D
	0516	X555434-5		Lo Ni	R723	Re	F3 III M5 D
Seleen	0517	A310467-E		Lo Ni O:0316	704	DD	M6 V
	0517	A310467-F		Lo Ni O:0316	204	Re	M6 V
Thingen	0518	B467998-D	N	Hi	305	DD	G9 V
	0518	A467998-E	N	Hi	505	Re	G9 V
Anomaly Five	0615	X100000-5		Lo Ni Va	R623	DD	M9 V
	0615	X100000-6		Lo Ni Va	R423	Re	M9 V
Sevas Topol	0619	D9C3256-7		Fl Lo Ni	923	DD	M2 V
	0619	D9C3156-8		Fl Lo Ni	323	Re	M2 V
Amirante	0713	D210899-4	S	Na	602	DD	K5 V
	0713	D210999-5	S	Na Hi	102	Re	K5 V
Bahadur	0715	A326230-E	B	Lo Ni	102	DD	M5 V
	0715	A326230-E	B	Lo Ni	102	Re	M5 V
Rhinom	0717	B7768AB-8	N		601	DD	F9 V
	0717	B7768AB-A	N		801	Re	F9 V
Cicus	0812	E310330-5		Lo Ni	621	DD	G0 V K0 V M4 V
	0812	E310330-8		Lo Ni	521	Re	G0 V K0 V M4 V
Makeni	0813	E100542-8		Ni Va	302	DD	M1 V
	0813	E100542-9		Ni Va	302	Re	M1 V
Amritsar	0814	C897535-8		Ag Ni An	413	DD	F3 V
	0814	C897535-A		Ag Ni An	613	Re	F3 V
Pangumo	0815	C35259B-B		Ni Po	301	DD	K0 V M8 V
	0815	C352498-A		Lo Ni Po V:7	901	Re	K0 V M8 V
Coshecawat	0816	X100641-1		Na Ni Va	R313	DD	M6 V F6 D
	0816	X100641-5		Na Ni Va	R513	Re	M6 V F6 D
Jehun	0819	E66766A-7		Ag Ni Ri O:0717	901	DD	K2 V M4 V
	0819	D667756-8		Ri	201	Re	K2 V M4 V

Deneb Subsector E: Sabine

Deneb contains no astrographic features comparable to the great Spinward Main in the neighboring Spinward Marches (see page 42). The largest main in Deneb is Sabinar Main, named by combining the names of the two subsectors that it connects. The Sabinar Main connects 40 worlds by a contiguous jump-1 route, and all but one of these worlds fall into either the Sabine or Inar subsectors (the one exception is the trailing-most world of the main, Polizzi [1719], in the Namidshur subsector, page 58).

Defended by the 195th Fleet headquartered at Bahadur (0715), Sabine is also home to the Regency's trailing swing fleet, the 55th Fleet, based at Marnie's World (0514). (See the Lanth subsector, page 42, for details of the spinward swing fleet.)

Anomaly Five (0615): This world was first explored by the IISS in the early 400s, when it was discovered that the world contained enormous mass concentrations far beneath its surface. Despite almost 800 years of study, scientists still cannot explain these concentrations, but speculation involves some artifacts of the Ancients as well as deposits of superheavy elements (which see, below). The system was interdicted in 690, and remains so to this day. The world is naturally the subject of ongoing study.

Superheavy Elements: These are extremely rare elements with atomic numbers ranging from 114 to 122. Although elements heavier than uranium (atomic number 92) are typically highly unstable, rapidly decaying to lighter elements, quantum theory predicts an "island" of stability between atomic numbers 114 and 122, with half-lives in the millions of years. Like all heavier elements, these would be produced in the hearts of stars, and only distributed in supernovae. Nonetheless, small samples of such elements have been analyzed, and it is clear that their unique qualities would make them extremely valuable, and would be likely to enable numerous technological breakthroughs not possible with commonly available materials, just as the rare earth metal lanthanum is indispensable for the manufacture of jump drives.

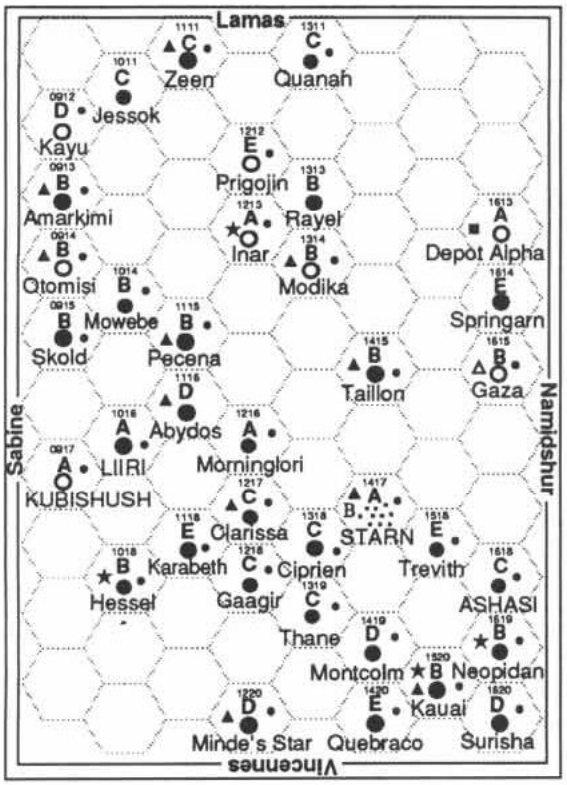
Superheavy elements are also known as eka-metals or island metals.

Deneb Subsector F: Inar

The Inar subsector is home to the 257th Fleet, which maintains its headquarters at Inar (1213).

Depot Alpha (1613): Formerly Deneb's only naval depot, the Depot system became Depot Alpha with the establishment of Depot Beta in the Pashus system (1432, page 65). The actual name of the world itself is Sika'im, but following Imperial convention the system as a whole is named Depot, for the crucial facility located there.

Kauai (1520): As Kauai's population increased its leadership began long-range programs to make the world more attractive to interstellar trade and immigration. This was necessary in particular to make them more competitive with Bumushe (1522) in the neighboring Vincennes subsector (page 61). These programs included the transition to a more inclusive government and less restrictive code of



laws. As a result Kauai is now classed as a Rich world.

Kubishush (0917): Homeworld of the Gl'lu, Kubishush has ammonia oceans and a very dense atmosphere, composed primarily of nitrogen at 6.1 atmospheres of pressure (6.1 kg/cm²).

The Gl'lu are a barrel-shaped hermaphroditic race with seven limbs (three legs and four arms), three stalk-mounted eyes, and which respire the ammonia vapor in their thick nitrogen "air."

The world is subject to frequent geological upheavals, which complicates the Gl'lu's attempts to maintain a stable society. Fortunately they are excellent technicians, as is witnessed by their tech level. Despite their technology, they are not distributed in great numbers off of their homeworld because of their adaptations to their very unusual environment.

The Vargr inhabitants are remnants of particularly far-ranging raiders during the Civil War. The Regency is little concerned about evicting them from Kubishush, as leaving them stuck on such an inhospitable world seems to be the best revenge, and serves as a living example that crime, indeed, does not pay.

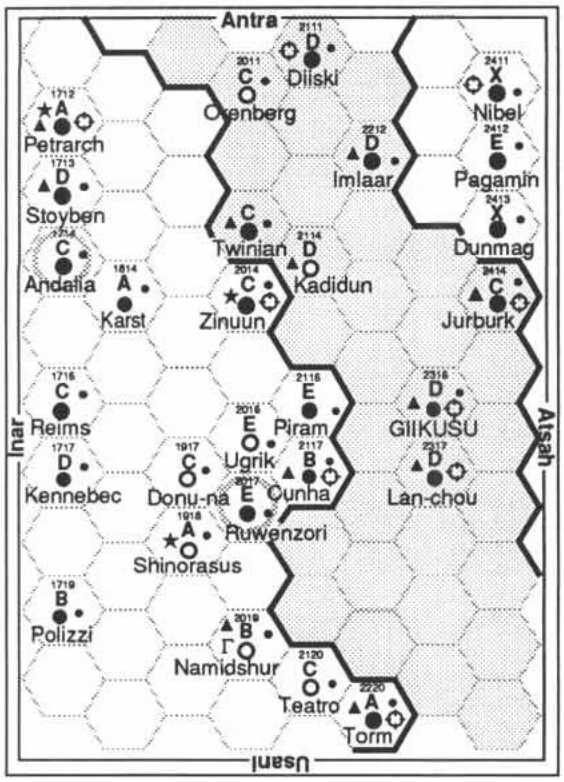
Minde's Star (1220): This system is actually named for its star, rather than the main world. Minde's star is an extremely variable red flare star which has been observed to vary in brightness by a factor of 60 in as little as 30 seconds, making it unique within Charted Space. The system therefore is given over entirely to the study of this fascinating phenomenon, hence the system's name.

Morninglori (1216): Morninglori had been the site of a secret Psionics Institute. The institute, located in the home of a Dr. Edmond Kalavatos, was destroyed during the Psionics Suppressions (see the **MegaTraveller Imperial Encyclopedia**, SA) and all of its members were killed. An heir to the Kalavatos estate turned up in the early Civil War period, leading many locals at the time to speculate that important items remained undestroyed in the old institute (see *TD* 19).

Rayel (1313): Rayel has six moons, more than any non-gas giant world in the Imperium. These moons create complex tidal patterns in Rayel's oceans as well as in its desert sands.

Inar Subsector, 1117 and 1202 dual listing (Subsector F of Deneb Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Kayu	0912	E9B75A8-8		Fl Ni	412	DD	M2 V
	0912	D9B75A8-9		Fl Ni	612	Re	M2 V
Amarkimi	0913	B446410-A	S	Lo Ni	902	DD	K8 V
	0913	B446543-C	S	Ag Ni	102	Re	K8 V
Otomisi	0914	B5A5577-C	S	Fl Ni	403	DD	G6 V M9 V
	0914	B5A5577-D	S	Fl Ni	503	Re	G6 V M9 V
Skold	0915	B764323-A		Lo Ni C:2	124	DD	K0 V
	0915	B764323-B		Lo Ni C:2	324	Re	K0 V
Kubishush	0917	B8B69AA-D		Fl Hi	901	DD	M3 V M8 V
	0917	A8B6AAA-E		Fl Hi V:0	101	Re	M3 V M8 V
Jessok	1011	C623510-B		Ni Po	920	DD	G8 V G0 V
	1011	C623683-C		Ni Po	120	Re	G8 V G0 V
Mowebe	1014	C748551-B		Ag Ni	601	DD	K9 V M2 V
	1014	B748551-B		Ag Ni V:6	801	Re	K9 V M2 V
Liiri	1016	B542998-D		Hi In Po	401	DD	M4 V K8 D
	1016	A542998-F		Hi In Po	901	Re	M4 V K8 D
Hessel	1018	B658100-D	N	Lo Ni	801	DD	K4 V M2 D
	1018	B658100-C	N	Lo Ni	901	Re	K4 V M2 D
Zeen	1111	D6536X3-6	S	Ni Po Dw	301	DD	K6 V
	1111	C6536X3-8	S	Ni Po Dw	601	Re	K6 V
Pecena	1115	B347014-A	A	Lo Ni	722	DD	M4 III
	1115	B347114-A	S	Lo Ni	122	Re	M4 III
Abydos	1116	D335666-8	S	Ni O:1016	410	DD	M5 V
	1116	D335666-8	S	Ni O:1016	410	Re	M5 V
Karabeth	1118	E663468-7		Lo Ni O:1016	102	DD	K9 III M3 V
	1118	E663468-7		Lo Ni O:1016	902	Re	K9 III M3 V
Prigojin	1212	E100440-8		Lo Ni Va	903	DD	K4 V
	1212	E100440-A		Lo Ni Va V:6	303	Re	K4 V
Inar	1213	A310736-E	N	Na Cp	903	DD	M7 V
	1213	A310836-E	N	Na Cp	303	Re	M7 V
Morninglori	1216	B544585-7		Ag Ni	113	DD	M2 V
	1216	A544585-B		Ag Ni	413	Re	M2 V
Clarissa	1217	C536422-A	S	Lo Ni	514	DD	M4 V
	1217	C536422-B	S	Lo Ni	714	Re	M4 V
Gaagir	1218	C86A358-A	S	Lo Ni Wa	601	DD	K6 V K9 V
	1218	C86A358-B		Lo Ni Wa	901	Re	K6 V K9 V
Minde's Star	1220	D235452-B	S	Lo Ni	303	DD	M7 V
	1220	D235352-D	S	Lo Ni	703	Re	M7 V
Quanah	1311	C467474-6		Lo Ni	123	DD	K4 V
	1311	B467685-8		Ni Ag Ri V:1 Rw:1	123	Re	K4 V
Rayel	1313	B693632-8		Ni	410	DD	G3 V
	1313	B693632-A		Ni V:3	710	Re	G3 V
Modika	1314	B450413-8	S	De Lo Ni Po	503	DD	F5 V M5 D
	1314	B450413-A	S	De Lo Ni Po	303	Re	F5 V M5 D
Ciprien	1318	C553310-7		Lo Ni Po	821	DD	F5 V
	1318	C553310-9		Lo Ni Po	921	Re	F5 V
Thane	1319	D585430-8	S	Lo Ni	421	DD	M2 V
	1319	C585730-9		Ag	121	Re	M2 V
Taillon	1415	C78A668-9	S	Ni Ri Wa O:1213	701	DD	K6 V M9 D
	1415	B78A668-A	S	Ni Ri Wa O:1213	201	Re	K6 V M9 D
Starn	1417	B000996-F	S	As Hi In Na RsB	722	DD	M0 V
	1417	A000996-F	S	As Hi In Na RsB	822	Re	M0 V
Montcolm	1419	D675212-8		Lo Ni	122	DD	K4 V
	1419	D675212-7		Lo Ni	122	Re	K4 V
Quebraco	1420	E78A568-4		Ni Wa O:1419	824	DD	M1 III F3 V
	1420	E78A658-7		Ni Wa Ri	224	Re	M1 III F3 V
Trevith	1518	E673347-4		Lo Ni	422	DD	G0 V M0 D
	1518	E673247-5		Lo Ni	422	Re	G0 V M0 D
Kauai	1520	BA89537-B	A	Ni	924	DD	F8 V K3 D
	1520	BA89645-B	A	Ni Ri	624	Re	F8 V K3 D
Depot	1613	A100644-G	D	Na Ni Va	220	DD	F9 II
Depot Alpha	1613	A100644-G	D	Na Ni Va	120	Re	F9 II
Springarn	1614	E564320-5		Lo Ni D:6	510	DD	G9 V M6 D
	1614	E564320-6		Lo Ni D:6	910	Re	G9 V M6 D
Gaza	1615	B430656-B	W	Na Ni Po De	723	DD	K5 V M1 V
	1615	B430656-C	W	De Na Ni Po	923	Re	K5 V M1 V
Ashasi	1618	E9D5AA8-C		Fl Hi	621	DD	M3 V
	1618	C9D5AA8-C		Fl Hi	521	Re	M3 V
Neopidan	1619	BA9A547-8	N	Ni Wa	724	DD	K3 V
	1619	BA9A647-C	N	Ni Wa	224	Re	K3 V
Surisha	1620	D682232-3		Lo Ni	201	DD	K1 V M9 D
	1620	D682232-3		Lo Ni	401	Re	K1 V M9 D



Deneb Subsector G: Namidshur (formerly Dunmag)

With the abandonment of the subsector capital at Dunmag, a new capital was established at Namidshur (2019). The subsector was renamed for its new capital, a tradition which is often observed, though not always.

The Namidshur subsector is defended by the 125th Fleet, which maintains its headquarters at Shinorasus (1918). The 125th fought in the Fifth Frontier War, being the longest continuously engaged Imperial unit. It was cut off early on by Zhodani advances, and spent the war under siege in the Jewell system (SM 1106, page 37) until its breakout in 1110.

The Namidshur frontier is part of the 3rd and 4th Regency Quarantine Districts. RQD 3 runs rimward from the Antra subsector (Deneb/C, page 54) into Namidshur and terminates at Orenberg (2011) and Diiski (2111). These worlds are also part of RQD 4, as the districts overlap to prevent perceived gaps in areas of responsibility (AoRs). RQD 4 runs from these worlds rimward into the Usani subsector (Deneb/K, page 62). RQD 3 is defended by the 61st Fleet and RQD 4 is defended by the 183rd Fleet.

Diiski (2111): Although it is located in the Regency Frontier, the small population of Diiski elected not to take part in the Abandonment (see page 11). Reasoning that a hospitable world would support them even if technology failed, they made their technology as safe as possible and continued living on their world.

Giikusu (2316): Giikusu, a frontier world, lost a lot of population during the Abandonment (page 11), although it remains a high-population world.

Kadidun (2114): Kadidun gained population and organization from refugees fleeing Giikusu during the Abandonment (see page 11).

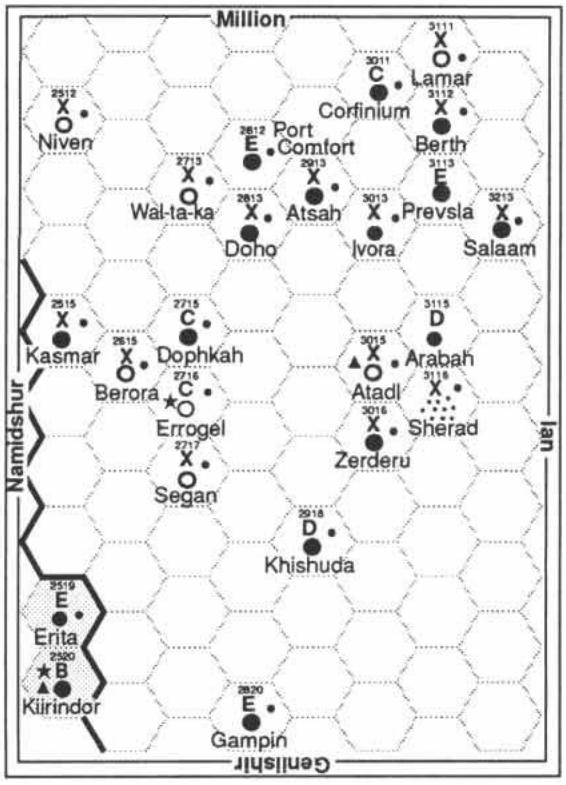
Namidshur (2019): New subsector capital after former capital, Dunmag (2413) wound up in the Regency Frontier. Namidshur also was the recipient of other circumstance-dictated largesse in the form of Deneb Sector's Research Station Gamma (G) which was relocated from Maelstrom (2522, page 63) after it too would up in the less secure frontier.

This world's law level does not reflect the need for repressive measures to keep a restive population in line, as is often the case. The world simply requires a great deal of care to keep its population alive on a small and very inhospitable world. Those who live there affirm the structured nature of its society and usually embrace the pacifistic ethic that goes with the world's general prohibition of weapons.

Shinorasus (1918): This world was colonized by a small group of families from Namidshur who were fed up with the world's structure and law level, seeking, as do many colonists, a place where they could simply be left alone to do whatever they please. However, unlike many colonists, these were not members of a repressed lower class with nothing but the clothes on their backs, but were wealthy, skilled professionals who built Shinorasus as a libertarian paradise. In a dramatic statement typical of the world's residents, the world's capital, St. Volle, has no permanent inhabitants. It is intermittently manned by members of the populace on a rotating schedule. Those who "have the duty" oversee the world's automated archives and function as the world's Secretary of State to all ships which call during that period. However, the full title is Lord High Governor, Shinorasan Plenipotentiary, and Grand Pooh-bah, and most Shinorasans on duty demand their visitors to use the full title at every opportunity.

Namidshur Subsector, 1117 and 1202 dual listing (Subsector G of Deneb Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Petrarch	1712	B554853-8	A		210	DD	K6 V
	1712	A554853-B	A, T		510	Re	K6 V
Stoyben	1713	D21356A-8	S	Ni Ic O:1712	211	DD	M3 V
	1713	D21356A-9	S	Ic Ni O:1712	911	Re	M3 V
Andalia	1714	C87A447-6		Lo Ni Wa	A903	DD	G7 V M8 D
	1714	C87A547-9		Ni Wa	A303	Re	G7 V M8 D
Reims	1716	C624779-6			601	DD	M9 V M0 V
	1716	C624779-9		V:2	701	Re	M9 V M0 V
Kennebec	1717	E978552-6		Ag Ni	523	DD	F7 V
	1717	D978655-9		Ag Ni An	623	Re	F7 V
Polizzi	1719	B402532-E		Ni Va Ic	823	DD	M9 V
	1719	B402532-D		Ic Ni Va	623	Re	M9 V
Karst	1814	B87679B-6		Ag C:2	133	DD	F8 III
	1814	A87689B-A		C:1 Rw:2	233	Re	F8 III
Donu-na	1917	C460850-B		De Ri	525	DD	F2 V M8 D
	1917	C460876-A		De Ri V:3	725	Re	F2 V M8 D
Shinorasus	1918	A410200-E		Lo Ni	203	DD	F8 V M9 D
	1918	A410300-F	N	Lo Ni	103	Re	F8 V M9 D
Orenberg	2011	B130678-E		De Na Ni Po	201	DD	M5 V G4 D
	2011	C13057A-C		De Ni Po	601	RF	M5 V G4 D
Twinian	2013	C40447B-7	S	Ic Lo Ni Va	702	DD	M5 V
	2013	C40447B-7	S	Ic Lo Ni Va	402	RF	M5 V
Zinuun	2014	E2367BA-5			911	DD	M8 V
	2014	C2368BA-8	T	V:0	211	Re	M8 V
Ugrik	2016	E300000-7		Lo Ni Va	321	DD	F7 V
	2016	E300000-8		Lo Ni Va	321	Re	F7 V
Ruwenzori	2017	E749024-7		Lo Ni	303	DD	M3 V
	2017	E749410-8		Lo Ni V:4	A503	Re	M3 V
Namidshur	2019	B2106A9-D	S	Na Ni	215	DD	G9 V
	2019	B2106A9-F	S	Na Ni Cp Rs[Γ]	415	Re	G9 V
Diiski	2111	C66A200-8		Lo Ni Wa	812	DD	K7 V
	2111	D66A320-7	T	Lo Ni Wa	212	RF	K7 V
Kadidun	2114	D5A2003-9	S	Fl Lo Ni	220	DD	K1 IV K0 V
	2114	D5A2214-9	S	Fl Lo Ni V:2	320	RF	K1 IV K0 V
Piram	2116	E311777-4		Ic Na	611	DD	G2 V
	2116	E311777-6		Ic Na	811	Re	G2 V
Cunha	2117	C62677C-7			324	DD	M7 V
	2117	B62677C-A	S, T		224	Re	M7 V
Teatro	2120	C8A78CA-7		Fl	903	DD	F8 V M7 V
	2120	C8A77CA-9		Fl V:2	903	Re	F8 V M7 V
Imlaar	2212	D677551-6	S	Ag Ni	423	DD	M5 II K5 V
	2212	D677551-6	S	Ag Ni	323	RF	M5 II K5 V
Torm	2220	C456445-9	S	Lo Ni	134	DD	K5 V
	2220	A456445-C	S, T	Lo Ni V:1	934	Re	K5 V
Giikusu	2316	E647ABC-8		Hi In	105	DD	M2 V
	2316	D6479AB-A	S, T	Hi In Cf	805	RF	M2 V
Lan-chou	2317	D855788-7	S	Ag	120	DD	K8 V M5 V
	2317	D855688-7	S, T	Ag Ni	620	RF	K8 V M5 V
Nibel	2411	E688303-4		Lo Ni	701	DD	K5 V M1 D
	2411	X688331-2	T	Lo Ni V:1	B301	Wi	K5 V M1 D
Pagamin	2412	C371114-8		Lo Ni	S02	DD	K7 V
	2412	E371110-5		Lo Ni Vw	202	Wi	K7 V
Dunmag	2413	A427138-C	N	Lo Ni Cp	201	DD	M3 V M1 D M1 D
	2413	X427000-0		Ba	001	—	M3 V M1 D M1 D
Jurburk	2414	B454033-B	N	Lo Ni	802	DD	G9 V K9 V M6 V
	2414	C454253-A	S, T	Lo Ni	302	RF	G9 V K9 V M6 V



Atsah Subsector, 1117 and 1202 dual listing (Subsector H of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Niven	2512	E9C3237-6		Fl Lo Ni	A534	DD	F3 II M3 V
	2512	X9C3000-0		Ba Fl	034	—	F3 II M3 V
Kasmar	2515	E631754-9		Na Po	101	DD	M3 V M5 D
	2515	X631000-0		Ba Po	001	—	M3 V M5 D
Erita	2519	E99A575-8		Ni Wa	113	DD	G8 V K9 V
	2519	E99A45A-7		Lo Ni Wa	513	RF	G8 V K9 V
Kiirindor	2520	B446666-B	A	Ag Ni O:2519	310	DD	A0 V K9 D
	2520	B446686-B	A	Ag Ni V:3	110	RF	A0 V K9 D
Berora	2615	B100672-D		Na Ni Va	822	Na	M8 V G7 V
	2615	X100000-0		Ba Va	022	—	M8 V G7 V
Wal-ta-ka	2713	C360431-A		De Lo Ni	601	Na	M5 V
	2713	X360433-5		De Lo Ni	201	Wi	M5 V
Dophkah	2715	B647777-8	N	Ag	324	Cs	K9 V
	2715	C647746-5		Ag V:3	B324	Wi	K9 V
Errogel	2716	B150554-A	N	De Ni Po	724	Cs	G9 V
	2716	C150544-8	N	De Ni Po	324	Wi	G9 V
Segan	2717	B3509A8-C	N	De Hi Po	504	Cs	F4 V K4 V
	2717	X35056F-1		De Ni Po	B204	Wi	F4 V K4 V
Og Bere'	2812	B464002-8		Lo Ni	223	Na	G7 V
Port Comfort	2812	E464313-6		Cm Lo Ni V:4	B523	Wi	G7 V
Doho	2813	A696444-C		Lo Ni	621	Na	F8 V K6 D
	2813	X69646A-5		Lo Ni V:3	B221	Wi	F8 V K6 D
Gampin	2820	D668644-7	S	Ag Ni Ri	533	DD	G2 IV M7 V
	2820	E668644-7		Ag Ni V:2	733	Wi	G2 IV M7 V
Atsah	2913	A656750-D	W	Ag	723	Cs	K4 V
	2913	X656759-6		Ag V:1	B523	Wi	K4 V
Khishuda	2918	C856040-5		Lo Ni	201	Na	G8 V M8 D
	2918	D856001-4		Lo Ni	101	Wi	G8 V M8 D
Corfinium	3011	B443634-8		Ni Po	522	DD	M1 V
	3011	C443669-7		Ni Po V:3	722	Wi	M1 V
Ivora	3013	E999533-5		Ni	401	Na	K5 V
	3013	X999568-4		Ni V:4	B201	Wi	K5 V
Atadl	3015	B2109C7-F		Hi Na In	201	Cs	M1 V M1 V
	3015	X210000-0		Ba	001	—	M1 V M1 V
Zerderu	3016	B441685-B		Ni Po	401	Na	M1 V M1 V
	3016	X441513-6		Ni Po V:2	201	Wi	M1 V M1 V
Lamar	3111	C410410-7	S	Lo Ni	223	Vf	M1 V
	3111	X410000-0		Ba	023	—	M1 V
Berth	3112	B547345-B	A	Lo Ni	901	Vf	K5 V M5 V
	3112	X547378-6		Lo Ni Vw	401	Wi	K5 V M5 V
Prevsla	3113	D243300-8		Lo Ni Po	410	Vf	K5 V M4 V
	3113	E243365-7		Lo Ni Po Vw	210	Wi	K5 V M4 V
Arabah	3115	C877233-5	S	Lo Ni	820	Vf	F8 V
	3115	D877242-2		Lo Ni Vw	B320	Wi	F8 V
Sherad	3116	A000447-F	N	As Lo Ni	913	Vf	M6 V
	3116	X000000-0		Ba As	013	—	M6 V
Salaam	3213	D576300-4	S	Lo Ni	222	Vf	M4 III K5 D
	3213	X576226-3		Lo Ni Vw	B522	Wi	M4 III K5 D

The high Shinorasan tech level allows them to liberate all of the oxygen that they need from the world's crust, which they pipe into their sealed environments. The world is known for its very high quality and extremely high-priced shipyard, as all components are specially crafted by the small population. Those who contract for ships at the prestigious St. Volle yards are widely thought to have more money than sense.

Unfortunately for the colorful and cantankerous Shinorasans, their uninterrupted paradise became another casualty of the Collapse: Shinorasus' location and (albeit small) high-technology infrastructure made it the site of a new naval base to defend the Regency Frontier. Although the Shinorasans protested the intrusion, the Regency exercised its right of eminent domain and built the base anyway, although they do what they can to stay out of the locals' way, and especially do not avail themselves of the over-priced starship maintenance services, using the naval yards instead.

Deneb Subsector H: Atsah

The Atsah subsector lies almost entirely outside of the Regency's area of protection—only two of the subsector's worlds, Erita (2519) and Kiirindor (2520) remain even in the Regency Frontier. The remainder of the subsector is Wilds.

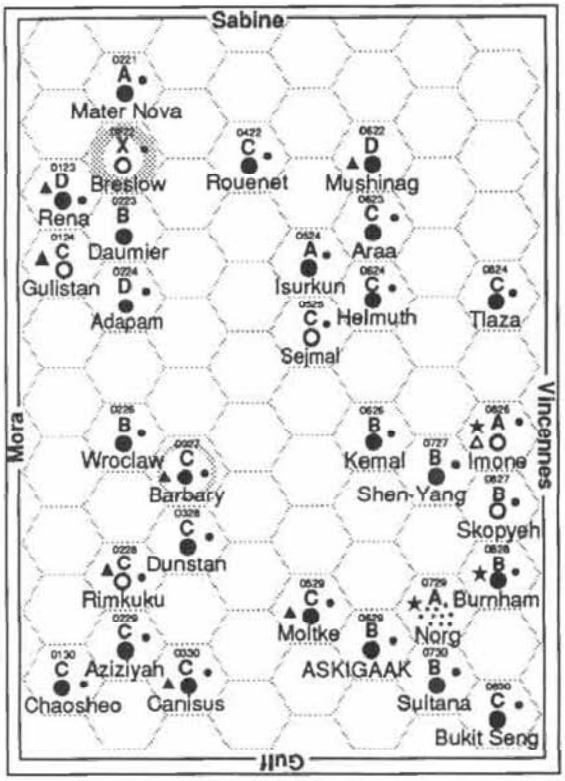
These two worlds are incorporated into Quarantine District 4, whose capital is at Usani (2225, page 62) in the Usani subsector (Deneb/K). As part of RQD 4, these worlds are defended by the 183rd Fleet, also headquartered at Usani (2225, page 62).

Kiirindor (2520): This world was colonized from Erita (2519) and obtained its independence in 1125. The atmospheric taint is carbon dioxide, which makes the world pleasantly warm, although the thin atmosphere is difficult to breathe. Kiirindor is known as the "Glass House World," because virtually its entire population lives in glass-roofed homes all of which are literally arboreta or greenhouses in order to convert as much carbon dioxide as possible into oxygen. Most homes are therefore self-sufficient in foodstuffs, and produce enough surplus that each home is a small truck farm.

With the world's vulnerability ("people in glass houses..."), it was hard-hit by the Abandonment (see page 11), losing about two-thirds of its population by 1136. (Ironically, a very large number of Kiirindorians found their ultimate homes in the Sword Worlds resettlement program, see page 45, which in retrospect could be said to be like jumping out of the frying pan and into the fire.) Those who remained on Kiirindor either trusted in the protection of the Regency Navy and Quarantine Service, added robust compartmentalization to their homes, or, in most cases, both.

Segan (2717): The underground cities of this world were fitted with with completely independent, closed ecologies, and it was this fact which saved many inhabitants when Virus hit the already decimated, embattled trailing edge of Deneb. Most of the world sought safety within the Regency safe. Those few remaining are surface-living desert dwellers, including Jonkeereen (page 61), which comprise some 40% of the population.

Port Comfort (ex-Og Bere') (2812): The world of Og Bere' was depopulated during the Collapse. Later Free Traders came across this rather pleasant world and eventually made it a safe base of operations. These traders also cautiously welcomed Vargr corsairs as kindred spirits. Each ship's crew has its own "tribe" of maintenance personnel and dependants on this world.



Deneb Subsector I: Star Lane

The Star Lane subsector is defended by the 196th Fleet, *headquartered at Imone (0826).*

Askigaak (0629): Askigaak is the most highly populous world in the Regency, with over *100 billion* persons. Such worlds were exceedingly rare anywhere in Charted Space, even before the Collapse. Askigaak, as a small world with a thin atmosphere can only support such a population with massive technological support.

Chaosheo (0130): Home to the sapient race known as the Shi'awei. The Shi'awei are unusual in that they have evolved for life in the deepest ocean, in a light-independent ecology. Rather than using stellar energy to fuel photosynthesis, as in typical plant-based ecologies, the Shi'awei's ecosystem is based on chemosynthesis: the metabolism and derivation of energy from the chemicals (especially hydrogen sulfide) in the very hot, mineral-rich water that is expelled from the geothermal vents in their seafloor habitat. This ready availability of minerals and high temperatures has allowed the Shi'awei to achieve skills in metal-working (an unusual opportunity for an aquatic species), and have advanced to the aquatic equivalent of TL 1. In physical form, they have bulky, bullet-shaped bodies equipped with four evenly-spaced arms.

Imperial law was specific that low-technology indigenous cultures were to be protected from interstellar contact, and Chaosheo was interdicted by the IISS for that reason. This changed in the year 1073 when a starship (the liner *Ishgarlu*) misjumped and crashed into the Chaosheon ocean, allowing the curious Shi'awei to explore the ship and meet its living survivors. Since this contact, the world's travel zone was upgraded to amber, allowing limited and carefully-observed trade.

Deneb Subsector J: Vincennes

The Vincennes subsector is protected by the 258th Fleet, with its headquarters in the HRD system (1623).

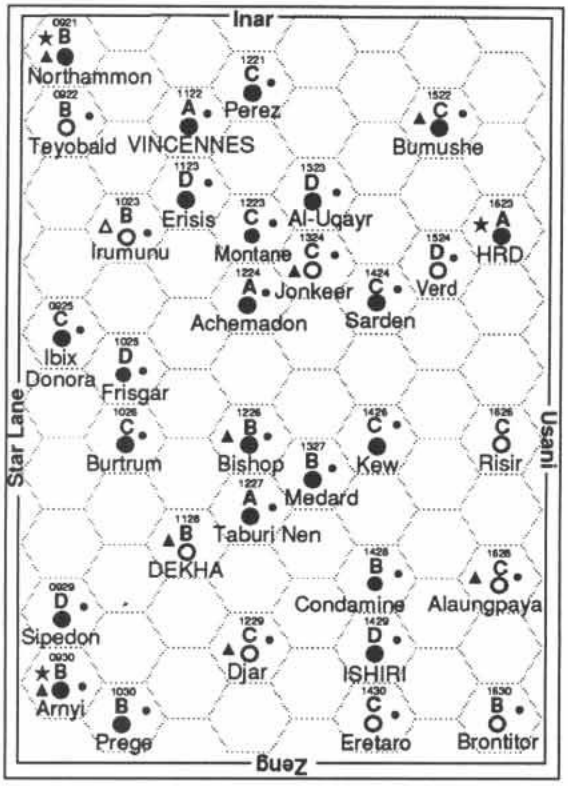
HRD (1623): Originally established as an Imperial Navy research center, HRD is now a think tank, whose only export is information and analysis. Unlike research stations, however, it is not a unified government-owned operation. HRD consists of a large number of commercial analytical groups, all competing for government contracts.

Operations in HRD have long been the subject of public speculation, but these remain secret, if only for proprietary reasons. It is known that HRD is host to large numbers of Droyne consultants, so psionic research seems to be a prominent subject of its inquiry. (*Referees only, see page 83.*)

Jonkeer (1324): The inhabitants of this world, the Jonkeereen (singular: Jonkeerin) are geneered humans, created by Imperial Ministry of Colonization for life in desert environments. Jonkeereen are tall, thin, and dark-skinned, with protective membranes shielding their eyes and ears. More important than these cosmetic differences are sophisticated changes to their metabolism that allow them to survive in the temperature extremes of the dry desert environment. These metabolic and biochemical changes have created unintended side-effects in the Jonkeereen psychology; they are notably conservative, and, while highly cooperative with other Jonkeereen, are insular and distant in their interactions with non-Jonkeereen humans. Relations between the Jonkeereen of Jonkeer and the Imperial authorities have been so bad that the Jonkeer population has staged two rebellions against Imperial power, specifically the Ministry of Colonization, in 1083 and again in 1101. Both were put down, and relations have become better since the

Star Lane Subsector, 1117 and 1202 dual listing (Subsector I of Deneb Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Rena	0123	D596211-7	S	Lo Ni	403	DD	K4 V
	0123	D596211-7	S	Lo Ni	503	Re	K4 V
Gulistan	0124	CAB2358-7	S	Fl Lo Ni	820	DD	K6 II
	0124	CAB2458-9	S	Fl Lo Ni	120	Re	K6 II
Chaosheo	0130	E87A788-1		Wa	A625	DD	K8 V
	0130	C87A888-7		Wa	A225	Re	K8 V
Mater Nova	0221	B575744-9		Ag	314	DD	K8 V M0 D
	0221	A575744-C		Ag	514	Re	K8 V M0 D
Breslow	0222	X440510-1		De Ni Po	R902	DD	K8 V M1 D
	0222	X440510-2		De Ni Po	R702	Re	K8 V M1 D
Daumier	0223	B88A452-E		Lo Ni Wa	510	DD	K7 V M9 V
	0223	B88A452-E		Lo Ni Wa	710	Re	K7 V M9 V
Adapam	0224	E796442-8		Lo Ni	822	DD	K8 V
	0224	D796642-A		Ag Ni	322	Re	K8 V
Wroclaw	0226	C4667BF-7		Ag	823	DD	K2 V M8 V
	0226	B4667BF-9		Ag	223	Re	K2 V M8 V
Rimkuku	0228	D9A8872-7	S	Fl	324	DD	G1 V M3 V
	0228	C9A8874-9	S	Fl	524	Re	G1 V M3 V
Aziziyah	0229	C86A475-B		Lo Ni Wa	624	DD	M0 V
	0229	C86A455-C		Lo Ni Wa	824	Re	M0 V
Barbary	0327	C5717CF-4	S		813	DD	F5 V K3 D
	0327	C5718CF-5	S		A213	Re	F5 V K3 D
Dunstan	0328	C649220-8		Lo Ni	523	DD	G4 V
	0328	C649120-9		Lo Ni	823	Re	G4 V
Canisus	0330	C4317BA-8	S	Na Po	901	DD	M9 V G6 D K6 D
	0330	C4318B8-A	S	Na Po	101	Re	M9 V G6 D K6 D
Rouenet	0422	C362201-B		Lo Ni	705	DD	K0 V
	0422	C362401-C		Lo Ni	505	Re	K0 V
Isurkun	0524	A441334-A		Lo Ni Po	721	DD	G4 IV
	0524	A441337-D		Lo Ni Po	921	Re	G4 IV
Sejmal	0525	C210643-A		Na Ni C:0	534	DD	K4 V
	0525	C210643-B		Na Ni C:2	134	Re	K4 V
Moltke	0529	C646110-8	S	Lo Ni	204	DD	M6 V K9 D
	0529	C646210-9	S	Lo Ni	304	Re	M6 V K9 D
Mushinag	0622	D575556-8	S	Ag Ni	520	DD	F6 V
	0622	D575656-9	S	Ag Ni	420	Re	F6 V
Araa	0623	C566254-A	S	Lo Ni	522	DD	F7 V M4 D
	0623	C566254-B		Lo Ni	622	Re	F7 V M4 D
Helmuth	0624	C846203-8	S	Lo Ni	922	DD	M9 III
	0624	C846203-A		Lo Ni	822	Re	M9 III
Kemal	0626	B566786-7		Ag Ri	323	DD	F3 V
	0626	B566786-9		Ag Ri	523	Re	F3 V
Askigaak	0629	E549AA8-C		Hi In	901	DD	M1 V
	0629	B549BA8-E		Hi In	101	Re	M1 V
Shen-Yang	0727	C665520-5		Ag Ni	502	DD	F7 V K1 V
	0727	B665620-9		Ag Ni An	402	Re	F7 V K1 V
Norg	0729	A000114-D	N	As Lo Ni	710	DD	M7 V
	0729	A000325-F	N	As Lo Ni	610	Re	M7 V
Sultana	0730	B649414-9		Lo Ni	521	DD	M5 III
	0730	B649414-B		Lo Ni	921	Re	M5 III
Tlaza	0824	C303100-A		Ic Lo Ni Va	913	DD	M6 V
	0824	C303000-B		Ic Lo Ni Va	113	Re	M6 V
Imone	0826	A9C1555-F	B	Fl Ni Cp	613	DD	M0 V
	0826	A9C1555-F	B	Fl Ni Cp	813	Re	M0 V
Skopyeh	0827	B500534-C		Ni Va	902	DD	F9 V M9 D
	0827	B500534-D		Ni Va	802	Re	F9 V M9 D
Burnham	0828	B664379-8	N	Lo Ni	501	DD	K3 V
	0828	B664579-8	N	Lo Ni Ag	701	Re	K3 V
Bukit Seng	0830	C442334-8		Lo Ni Po	404	DD	M4 III
	0830	C442334-A		Lo Ni Po	504	Re	M4 III



Vincennes Subsector, 1117 and 1202 dual listing (Subsector J of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Northammon	0921	B764667-A	A	Ag Ni Ri O:0917	620	DD	G5 V
	0921	B764767-A	A	Ag Ri O:0917	220	Re	G5 V
Teyobald	0922	B8B3545-D		Fl Ni	822	DD	M4 V F0 D
	0922	B8B3645-E		Fl Ni	122	Re	M4 V F0 D
Ibix Donora	0925	C332245-9		Lo Ni Po	901	DD	K1 V M3 V
	0925	C332345-B		Lo Ni Po	201	Re	K1 V M3 V
Sipedon	0929	E3536AB-8		Ni Po	902	DD	K0 V M4 D
	0929	D3537AB-A		Po	202	Re	K0 V M4 D
Arnyi	0930	B683697-8	A	Ni Ri	723	DD	G2 V
	0930	B683757-B	A	Ri	723	Re	G2 V
Irumunu	1023	B7B3620-C	W	Fl Ni	101	DD	M6 V M6 V
	1023	B7B3620-E	W	Fl Ni	201	Re	M6 V M6 V
Frisgar	1025	E424752-9			401	DD	M1 V K7 V K7 V
	1025	D424752-B			601	Re	M1 V K7 V K7 V
Burtrum	1026	C5387A9-8			501	DD	M3 V M0 V
	1026	C5387A9-A			801	Re	M3 V M0 V
Prege	1030	B79A678-9		Ni Wa	702	DD	M2 V
	1030	B79A678-B		Ni Wa	902	Re	M2 V
Vincennes	1122	A899AA6-G		Hi In Cp	113	DD	K7 V M7 V G1 V
	1122	A899AA6-G		Hi In Cp	213	Re	K7 V M7 V G1 V
Erisis	1123	D679443-7		Lo Ni	913	DD	F1 V
	1123	D679543-8		Ni	113	Re	F1 V
Dekha	1128	C100A9A-F	S	Hi In Na Va	210	DD	M6 V F3 V
	1128	A100A9A-F	S	Hi In Na Va	510	Re	M6 V F3 V
Perez	1221	C536224-6		Lo Ni	801	DD	M6 V K8 D
	1221	C536224-8		Lo Ni	A201	Re	M6 V K8 D
Montane	1223	C683104-7		Lo Ni	122	DD	G8 V
	1223	C683204-8		Lo Ni	222	Re	G8 V
Achemadon	1224	A3477BB-A		Ag	701	DD	M3 V M7 V
	1224	A3477BB-C		Ag	901	Re	M3 V M7 V
Bishop	1226	B201553-F	S	Ic Ni Va	524	DD	M6 II
	1226	B201553-F	S	Ic Ni Va	724	Re	M6 II
Taburi Nen	1227	A44658A-B		Ag Ni	121	DD	K7 V
	1227	A44658A-E		Ag Ni	221	Re	K7 V
Djar	1229	C3008CE-7	S	Na Va	102	DD	F0 V M4 D
	1229	C3007CE-A	S	Na Va	702	Re	F0 V M4 D
Al-Uqayr	1323	E567259-5		Lo Ni	513	DD	F2 V
	1323	D567459-7		Lo Ni	713	Re	F2 V
Jonkeer	1324	C4908C9-9	S	De	401	DD	M1 V
	1324	C4908CC-9	S	De	501	Re	M1 V
Medard	1327	B321425-C		Lo Ni Po	701	DD	K9 V G0 D M0 D
	1327	B321425-D		Lo Ni Po	801	Re	K9 V G0 D M0 D
Sarden	1424	E552652-7		Ni Po	501	DD	M1 V
	1424	C552652-A		Ni Po	901	Re	M1 V
Kew	1426	C512103-B		Ic Lo Ni	313	DD	M3 V
	1426	C512103-B		Ic Lo Ni	213	Re	M3 V
Condamine	1428	C665578-7		Ag Ni	921	DD	F9 V M0 V
	1428	B665678-9		Ag Ni	521	Re	F9 V M0 V
Ishiri	1429	E36598A-7		Hi	521	DD	F7 V M0 V K0 V
	1429	D365A8A-B		Hi	821	Re	F7 V M0 V K0 V
Eretaro	1430	C9C4100-B		Fl Lo Ni	901	DD	M3 V K9 D
	1430	C9C4200-C		Fl Lo Ni	501	Re	M3 V K9 D
Bumushe	1522	C68A657-6	S	Ni Ri Wa C:6	324	DD	F9 V
	1522	C68A657-9	S	Ni Ri Wa C:7	524	Re	F9 V
Verd	1524	E150433-6		De Lo Ni Po	102	DD	M2 V M7 V
	1524	D150433-9		De Lo Ni Po	302	Re	M2 V M7 V
HRD	1623	A401654-F	N	Ic Na Ni Va	810	DD	M5 III
	1623	A401775-F	N	Ic Na Ni Va	220	Re	M5 III
Risir	1626	C230225-9		De Lo Ni Po	310	DD	K1 V M6 D
	1626	C230225-B		De Lo Ni Po	210	Re	K1 V M6 D
Alaungpaya	1628	C140794-8	S	De Po	601	DD	M6 V
	1628	C140794-A	S	De Po	901	Re	M6 V
Brontitor	1630	B9C4210-8		Fl Lo Ni	904	DD	K0 IV
	1630	B9C4310-A		Fl Lo Ni	204	Re	K0 IV

Domain was isolated under Norris' leadership.

Jonkeereen are best adapted to worlds with breathable atmospheres (codes 4-9). Many worlds named "desert" by their trade classification have problems far worse than the lack of water—only radical geneering allows unassisted respiration in very thin atmospheres, and on a world where death results from the lack of a respirator, being adapted to lack of moisture is at best a marginal advantage (as can be seen by the example of Malory, 2309 Deneb, page 54). In fact, the Jonkeereen traits are not only suited to worlds with hydrographic codes of 0; their artificial adaptations would also be useful on hot, low-tech waterworlds where fresh water is scarce.

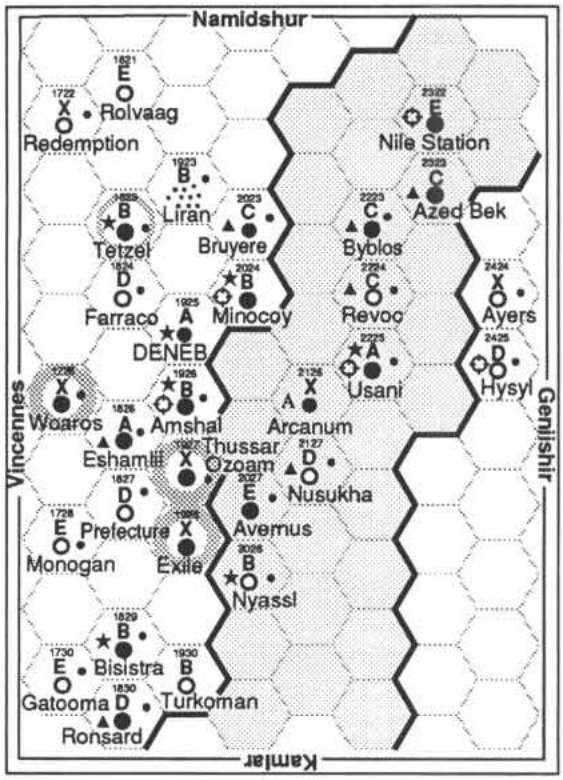
The Jonkeereen are spread through much of the Regency, and comprise a significant proportion of the population of 10 other worlds. For other Jonkeereen populations, see Quopist (2215 SM, page 42), Ianic (1924 SM, page 46), Nadrin (3123 SM, page 47), Penelope (0533 SM, page 48), Melior and Callia (1736 and 1836 SM, page 50), Taa (0701 Deneb, page 52), Segan (2717, page 59), Verd (1524, this page), and Atab (1433 Deneb, page 65).

Jonkeereen may also be found in small numbers in the desert environments of many (even non-"desert") worlds, but only as recent post-Collapse arrivals, not as established communities. For a related topic, see "Malory," page 54 (see also *MTJ* 3).

Perez (1221): Homeworld of a sapient race, now protected because it has been abused in the past by Vincennes' rulers, who were extracting hallucinogenic compounds from these beings via cruel, unethical, and deadly processes.

Vincennes (1122): Although TL-16 technology is more widespread than in the Imperial era, TL-16 Vincennes is still unsurpassed in the Regency in technology, and is one of only two TL-16 industrial worlds in the Regency. This is primarily the result of the Regency's explicit policy to raise the average technology of all its worlds as a group, with TL-15 being the tech level "cap," rather than allowing its high-tech worlds to race on ahead. However, experts agree that Vincennes is an imminent TL-17 society, "just add water," with a significant amount of TL-17 technology existing in prototype form.

Vincennes is also unusual because of its star system's layout. Although its true primary (in that Vincennes receives its life-sustaining energy from this star) is the K7 V Undraczech, Vincennes orbits around the M7 V Ember, which itself orbits Undraczech. (The G1 V, Guazhirniim, and Undraczech orbit each other at a great distance; Guazhirniim is itself the primary of the Paven subsystem which includes the agricultural world Paven, producer of most of Vincennes' food.) This stellar geometry gives Vincennes four seasons (although since it has no significant axial tilt, these are not seasons in the classic sense): winter, when it is on the far side of Ember from Undraczech, summer when it is between the two, with spring and fall and fall being the approaching and receding intermediate positions. Mean surface temperatures range from –20 in the winter to 66C in the summer, and this wide thermal range creates tremendously violent storms, meaning that Vincennes' surface is not habitable. The world's extensive population live either in vast undersea metroplexes near the world's sole continent or in 71 gravitic cities which float close to the surface in the mild spring but climb to high altitude during the violent seasons.



Deneb Subsector K: Usani

Although Usani is no longer the subsector capital, the subsector's name was not changed to reflect its new capital of Deneb in order to avoid confusion with the name of the sector itself, and also to continue to honor Usani which continues to serve as a frontier capital. Usani is defended by the 154th Fleet, headquartered at Deneb (1925). Usani's frontier is contained in Quarantine District 4, and the RQD 4 capital, Usani (2225), is also located in this subsector.

Deneb (1925): Long one of the most important worlds of the Domain/Regency, this core world has become a frontier world, sitting at the boundary of the Regency safe, backing up RQD 4. The world's naval facilities and shipyards have therefore become even more important than they had been before.

Technicians form the ruling class of Deneb, and in a highly complex arrangement, serve a theological structure that is rather isolated from Denebian society, being described by its (actually very few) detractors as "too black-and-white." Although the faith, known by the phrase, "To Will One Thing," is philosophically complex, the the ruling technicians serve as buffers and mediators between society's needs and the sometimes abstract strictures of the faith. The highest level of these technicians are actually annointed religious leaders, and given the fact that any of these could have begun their public life as simple garage mechanics, the faith is able to keep something of a common touch. Adherents of the faith are known as the "Pure of Heart."

Deneb has become a major site of post-Collapse Vargr refugee camps. This was entirely the doing of the leadership of the To Will One Thing faith, who saw that few worlds of the Regency will willing to allow Vargr camps on their soil, fearing the danger of Vargr lawlessness, as well as demonstrating typical anti-Vargr racist beliefs. Thus Deneb, quite distant from the Vargr frontier where the Vargr were arriving, has become a major center of post-Collapse Vargr society. These Vargr are not remnants of the Civil War-era raiders, but are rank-and-file Vargr who fled Virus with their entire families. These Vargr refugees have become enthusiastic adherents of To Will One Thing, although as is their wont, they have spawned numerous sub-denominations, including the liberal and anarchic Adherents of the Halifax Protocols and the ultra-conservative Wisconsin Synod. Of all Regency worlds with Vargr populations, Deneb is the least affected by "The Pack" (see page 29); the Vargr Pure of Heart actively oppose its methods.

The Jumpspace Institute: Located at Deneb (1925), the Institute was originally established by the Duke of Deneb for the research of future jump technology. The JI has since become an official governmental agency (first of the Domain of Deneb and now of the Regency) with the mandate of oversight and regulation of advanced starship technology, starship construction and major component manufacture, as well as the training of starship engineers and naval architects via a structure of education standards and accreditation. The JI maintains local offices at all subsector capitals.

Exile (1928): Despite the best efforts of the Regency government, there are always certain members of society who just *don't get it*, "it" being the corporate acceptance of limits on behavior to allow people to live together in peaceful and productive relationships. These persons are called criminals.

Exile is the dumping ground for the worst criminals of Deneb, where they are left with only the clothes on their backs to make their way in the harsh environment with the harsh survivors of previous criminal deposits. Although the principle behind Exile is similar to that of Mithras (SM 1932, page 50), its Spinward Marches counterpart, the results are diametrically opposed. It is widely believed that conditions on Exile only further hardern criminals into their patterns. Advocates of penal reform frequently point to the different results of Mithras and Exile to advocate programs of reform rather than punishment.

Usani Subsector, 1117 and 1202 dual listing (Subsector K of Deneb Sector)

Name	*Hex*	*UPP*	*Base*	*Trade*	*TPPG*	*Alg*	*Stellar*
Redemption	1722	X140634-1		De Ni Po	A633	DD	G0 V
	1722	X140677-2		De Ni Po	733	Re	G0 V
Woaros	1726	X747678-1		Ag Ni	R214	DD	K4 V
	1726	X747678-3		Ag Ni	R314	Re	K4 V
Monogan	1728	E10056A-8		Ni Va O:1829	902	DD	M2 V M0 D
	1728	D10066A-A		Ni Va O:1829	102	Re	M2 V M0 D
Gatooma	1730	E100566-7		Ni Va O:1829	424	DD	M8 II
	1730	D100468-7		Lo Ni Va O:1829	724	Re	M8 II
Rolvaag	1821	E380345-7		De Lo Ni	804	DD	F6 V K1 D
	1821	D380445-9		De Lo Ni	504	Re	F6 V K1 D
Tetzel	1823	B643232-B	N	Lo Ni Po An	A301	DD	F3 V M6 D
	1823	B643432-B	N	Lo Ni Po An	A301	Re	F3 V M6 D
Farraco	1824	E200478-A		Lo Ni Va	112	DD	M7 V
	1824	D200478-B		Lo Ni Va	212	Re	M7 V
Eshamlii	1826	A334343-B	S	Lo Ni	323	DD	F2 IV
	1826	A334343-D	S	Lo Ni	623	Re	F2 IV
Prefecture	1827	E1307B6-9		Na Po De	724	DD	M1 V
	1827	D1307B6-A		De Na Po	624	Re	M1 V
Bisistra	1829	B357579-D	N	Ag Ni	802	DD	G0 V
	1829	B357679-E	N	Ag Ni Rw:0	702	Re	G0 V
Ronsard	1830	DA89654-8	S	Ni Ri	225	DD	G5 V M5 D
	1830	CA89858-A	S	Ri Rw:1	225	Re	G5 V M5 D
Liran	1923	B0008B8-A		As Na	811	DD	M5 V G5 D M5 D
	1923	A0009B8-C		As Na Hi In	211	Re	M5 V G5 D M5 D
Deneb	1925	B537ADD-C	N	Hi Cx	610	DD	A2 Ia
	1925	A537ADD-E	N	Hi Cx Cp V:0 Rw: V	810	Re	A2 Ia
Amshal	1926	B687365-9	N	Lo Ni O:2225	622	DD	M0 V
	1926	B687685-C	N, T	Lo Ni Rw:5	522	Re	M0 V
Thussar Ozoam	1927	X245101-6		Lo Ni	R615	DD	G3 III M1 V
	1927	X245101-7		Lo Ni	R615	Re	G3 III M1 V
Exile	1928	X799212-4		Lo Ni Pr	R810	DD	M3 V
	1928	X799312-5		Lo Ni Pr	R310	Re	M3 V
Turkoman	1930	B9C67CB-7		Fl	220	DD	A4 V
	1930	B9C67CB-A		Fl	120	Re	A4 V
Bruyere	2023	C524367-B	S	Lo Ni C:9 O:2225	422	DD	F0 V
	2023	C524367-A	S	Lo Ni C:9 O:1829	822	Re	F0 V
Minocoy	2024	B422505-D	N	Ni Po	620	DD	G4 V K5 V
	2024	B422505-F	N, T	Ni Po	920	Re	G4 V K5 V
Avernus	2027	E8865A6-4		Ag Ni	602	DD	K3 V M9 V
	2027	E8865A6-3		Ag Ni	302	RF	K3 V M9 V
Nyassl	2028	B300653-D	N	Na Ni Va	324	DD	M2 V M0 V
	2028	B300453-D	N	Lo Ni Va	124	RF	M2 V M0 V
Arcanum	2126	X334868-3		RsA O:2225	R810	DD	M6 V
	2126	X334868-3		RsA O:2225	R410	RF	M6 V
Nusukha	2127	E310100-7		Lo Ni	215	DD	M7 V M7 V
	2127	D310256-7	S	Lo Ni	615	RF	M7 V M7 V
Byblos	2223	C6738BD-7	S		601	DD	M1 V
	2223	C6738BD-7	S	V:4	301	RF	M1 V
Revoc	2224	C9AA577-A	S	Fl Ni Wa	502	DD	M7 V M2 D
	2224	C9AA252-A	S	Fl Lo Ni Wa	202	RF	M7 V M2 D
Usani	2225	A452699-C	N	Ni Po Cp	202	DD	M0 V
	2225	A452699-C	N, T	Ni Po Cf	102	RF	M0 V
Sage	2322	D463310-A		Lo Ni	120	DD	AS III M1 V
Nile Station	2322	E463210-9	T	Lo Ni	320	RF	AS III M1 V
Azed Bek	2323	C766300-B	S	Lo Ni	610	DD	K5 V
	2323	C76625A-B	S	Lo Ni	910	RF	K5 V
Ayers	2424	C230668-A	S	De Na Ni Po	323	DD	M8 V
	2424	X230000-0		Ba De Po	023	—	M8 V
Hysyl	2425	C2407A9-7	S	De Po	702	DD	M8 V
	2425	D24049B-6	T	De Lo Ni Po	302	Wi	M8 V

Liran (1923): This asteroid belt had been a crucial source of raw materials for the industry on Deneb, but was selected as one of the 26 target worlds of the Regency Industrial Development Program, and is now an industrial "world" in its own right. Fortunately the Liran Belt is extensive enough that it can meet the system's own needs while continuing to meet the voracious needs of nearby Deneb.

Redemption (1722): Redemption was settled by a "back to nature" religious sect. Its former Amber Zone rating was due to their sometimes sneaky attempts to persuade visitors to scrap their starships and adopt their pastoral lifestyle. The Redeemers profess to be delighted by Virus and the resultant Collapse, for it proved their beliefs. For this reason, Redemption is commonly known as "We Told You So." Traders shun the world, reasoning that a low standard of living is the best punishment.

Revoc (2224): The world of Revoc was visited by a vampire ship in late 1146. Although its systems were immune to virus infection, the world came under fire by the vampire's weapons. Several pressure domes were breached and thousands were killed before Scout ships in the system destroyed the vampire. This caused a panic among the population, and most of them fled for the greater security of the safe area. Virtually all that remains of the population on Revoc are RISS personnel who man the base there.

Usani (2225): Usani was formerly the subsector capital of the Usani subsector. However, when Usani ended up in the Regency Frontier, the subsector capital was moved to Deneb. Usani now serves as the frontier capital of Regency Quarantine District 4, including 24 frontier worlds in the Deneb subsectors Namidshur, Atsah, Usani, Genii'shir, Zeng, Kamlar, and one world in Antra (G, H, K, L, N, O, and C respectively).

Geniishir Subsector, 1117 and 1202 dual listing (Subsector L of Deneb Sector)

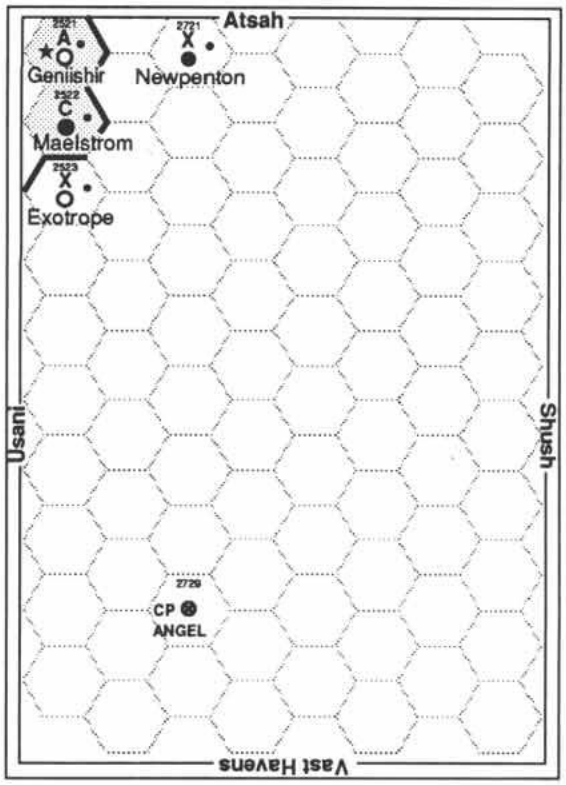
Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Geniishir	2521	A110123-D	N	Lo Ni Cp	302	DD	M8 V
	2521	A110356-D	N	Lo Ni	102	RF	M8 V
Maelstrom	2522	B79A855-D		Wa C:5 RsΓ	702	DD	G3 V M0 V M3 V
	2522	C79A855-A		Wa C:4	202	RF	G3 V M0 V M3 V
Exotrope	2523	D300674-4	S	Na Ni Va	401	DD	M6 V M6 V
	2523	X300000-0		Ba Va	001	—	M6 V M6 V
Newpenton	2721	C495321-A		Lo Ni	703	DD	M2 V
	2721	X495301-8		Lo Ni V:8	303	Wi	M2 V

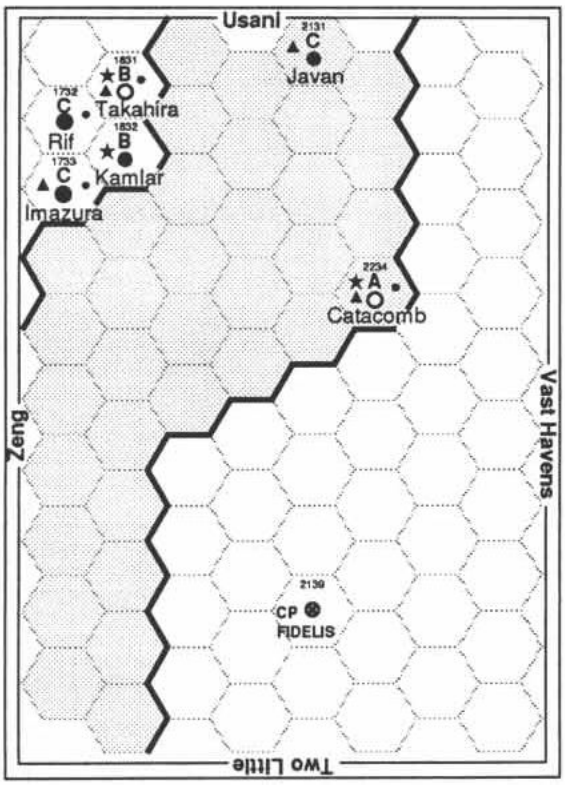
Kamlar Subsector, 1117 and 1202 dual listing (Subsector O of Deneb Sector)

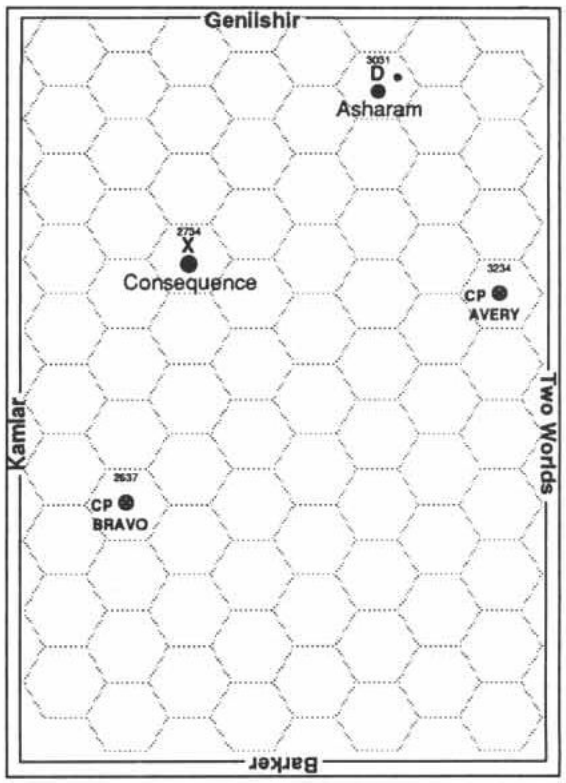
Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Rif	1732	C687200-6		Lo Ni	702	DD	G4 IV F4 V
	1732	C687312-8		Lo Ni	502	Re	G4 IV F4 V
Imazura	1733	C555555-9	S	Ag Ni	203	DD	G8 V
	1733	C555755-A	S	Ag	503	Re	G8 V
Takahira	1831	B9C5223-8	A	Fl Lo Ni	722	DD	M7 V
	1831	B9C5323-A	A	Fl Lo Ni	222	Re	M7 V
Kamlar	1832	B387462-C	N	Lo Ni O:1633	810	DD	M2 V
	1832	B387446-C	N	Lo Ni	910	Re	M2 V
Javan	2131	C77A135-A	S	Lo Ni Wa	510	DD	M0 III
	2131	C77A253-A	S	Lo Ni Wa	310	RF	M0 III
Catacomb	2234	A8A7551-B		Fl Ni	201	Cs	K1 V K4 D
	2234	A8A7657-E	A	Fl Ni	101	RF	K1 V K4 D

Vast Havens Subsector, 1117 and 1202 dual listing (Subsector P of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Lorin Antune	2734	D525877-3			410	Na	M2 V M2 V
Consequence	2734	X525000-0		Ba	010	—	M2 V M2 V
Asharam	3031	C76279A-3		Ri	622	Cs	G9 V M4 D
	3031	D762730-3		V:3	B622	Wi	G9 V M4 D







Nile Station (ex-Sage) (2322): Former scout Sir Thomas Nile of Regina journeyed to Deneb during the Civil War to help defend the Domain. When the Collapse ended that conflict he worked for the RQS until he had fully paid for his ship. Most of Thomas' patrols were made in the Regency Frontier, and he got to know it quite well. On one patrol he was asked to transport the last remaining residents of Sage to the Regency's safe area. Later, he returned to that world and staked a claim, and was joined by his family. After his service ended, Thomas made regular runs between the renamed Nile Station and Torm, transporting passengers and cargo between the Frontier and safe area. Today his son, Terry, continues the run. The population of Nile Station has grown substantially over the last 40 years.

Deneb Subsector L: Geniishir

The Geniishir subsector contains only two worlds under the Regency's protection, Geniishir and Maelstrom, both in the Frontier, part of RQD 4, under the protection of the 183rd Fleet and administered by the District capital at Usani (2225, page 62).

Geniishir (2521): Geniishir is an example of the inflexible and unimaginative nature of the old Imperial administration. To the Imperium a subsector was a subsector was a subsector, no matter how many worlds it had. Thus the Geniishir subsector, proud possessor of four worlds and 700 million persons, required its own capital. Geniishir is now a member of Regency Quarantine District 4, containing worlds of six subsectors (Deneb/C, G, H, K, L, and O).

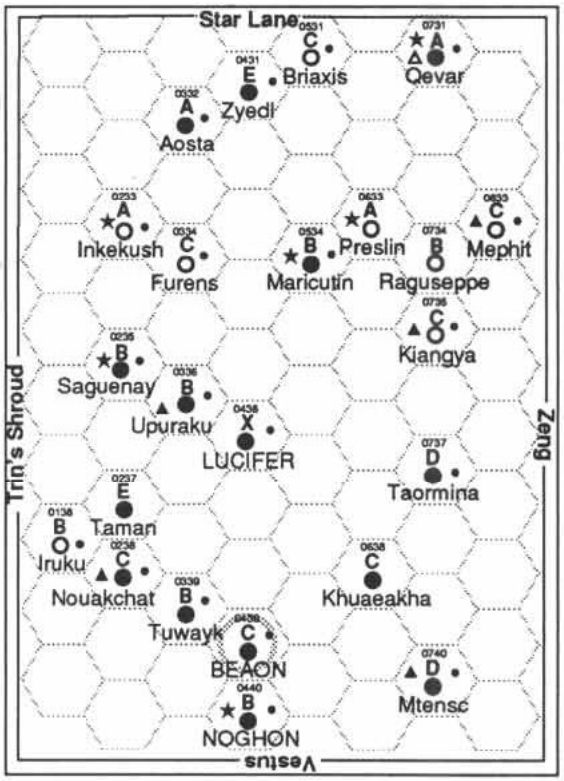
Deneb Subsector O: Kamlar

The Kamlar subsector contains only six worlds, four in the Regency safe and two in its Frontier. The line from Catacomb (2234) to Kamlar (1832) represents the frontier boundary between Quarantine Districts 4 and 5. This line, including Catacomb, belongs to both districts. Javan (2131) falls into the 4th District. RQD 4 is defended by the 183rd Fleet headquartered at Usani (2225, page 62), and RQD 5 is defended by the 74th, headquartered at Yvette (Reft 1103, page 70) with forward bases at Jecife (1640, page 65).

Catacomb (2234): Because of its strategic positioning dominating many trans-rift avenues of approach, Catacomb became the site of a major naval base while retaining its scout base. Catacomb is the departure point of a great many deep space sweeps.

Deneb Subsector P: Vast Heavens

The Vast Havens subsector contains as many calibration points as it does worlds. As with all calibration points, the CPs in this subsector are for military use only. Their precise locations and beacon frequencies are not available to the public. This entire subsector falls outside of the Regency's protection, although it is periodically patrolled by the 183rd and 74th Fleets from their home ground in RQDs 4 and 5.



Deneb Subsector M: Gulf

The Gulf subsector is the home of the 193rd Fleet, with its headquarters at Qevar (0731). The 193rd achieved fame in the Fifth Frontier War by its stubborn defense of the coreward Regina subsector (Spinward Marches/C, page 38). The only ground it gave in the entire war was Louzy (SM 1604, page 37), although it left formidable system defense forces in the system which dogged Zhodani supply lines and ultimately doomed the Zhodani's Siege of Efate. The 193rd moved trailward during the fleet realignment that took place shortly after the conclusion of the war.

Aosta (0332): Aosta is an Imperial Reserve World (see also Marastan, 2231, page 50), but it is unique among all of the reserve worlds of the Imperium in that it was, and still is, the only such world devoted predominantly to marine life. It was established by Empress Nicholle in 474.

All researchers (for researchers are the primary visitors to reserve worlds) live in orbit, as permanent structures are prohibited on the world itself. However, sophisticated research submarines operate in all of the world's oceans, and all are required to observe strict anti-pollution guidelines.

Lucifer (formerly Endup) (0436): Among Imperial subjects of conscience and good will, it was worlds like Endup that challenged the naive faith in the Imperium as an organization that had humanity's best interests at heart. The Imperium had long ago recognized its limited power to directly secure the happiness of its citizens on each of thousands of worlds, and enunciated its doctrine that Imperial power encompassed the space between worlds, but did not extend to their surfaces: there local power held sway, and the Imperium would not intervene unless forced to, like a surly bear awoken from its slumber, eager to teach it subjects to not bother it again.

Therefore the Imperium could be thought of as an aloof environment that incidentally created the conditions within which humans could create a good life, but which was uninterested in actually helping that creation take place, just as wind and rain do not care whether they water crops in moderation or wash them away in storms.

What began as a clear-sighted recognition of the limitations of power gradually hardened into a structural cynicism in which the Imperium winked at government by thugs and murderers, so long as these thugs and murderers did not allow their local problems to spill off their worlds into public view, forcing the Imperium, like an embarrassed patriarch, to sweep the unsightly family problems beneath the rug.

Endup was heavily exploited for minerals, originally using forced Imperial convict labor, but by 1117 had stabilized into a despotic society which no longer needed an external source of human bodies to exploit. Endup was ruled by a religious autocrat, the "Ward of Vision," who posed as an omniscient, omnipotent god. This was simplified by his keeping his subjects limited to TL 3, prohibiting their contact with off-worlders, and keeping them sick. Endup's atmospheric taint is limited to lower elevations where the commoners are forced to live. Here the taint limits lifespans to 45 years. Only the Ward and his power structure were allowed to live on the high ground, and commoners were prevented from entering the higher elevations on pain of death (which, after all, is all they got if they stayed off the higher elevations).

Gulf Subsector, 1117 and 1202 dual listing (Subsector M of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Iruku	0138	B21048A-9		Lo Ni	501	DD	F1 V M2 V
	0138	B21048A-B		Lo Ni	301	Re	F1 V M2 V
Inkekush	0233	A140548-E	N	De Ni Po	631	DD	F9 V M2 V
	0233	A140548-F	N	De Ni Po	831	Re	F9 V M2 V
Saguenay	0235	B438256-F	N	Lo Ni	324	DD	M0 V
	0235	B438256-F	N	Lo Ni	624	Re	M0 V
Taman	0237	E874300-4		Lo Ni	810	DD	M3 V M7 V
	0237	E874200-5		Lo Ni A:5	610	Re	M3 V M7 V
Nouakchat	0238	C532114-6	S	Lo Ni Po	103	DD	M9 V
	0238	C532114-8	S	Lo Ni Po	203	Re	M9 V
Aosta	0332	A669236-C		Lo Ni Re	412	DD	M1 V
	0332	A669366-F		Lo Ni Re	712	Re	M1 V
Furens	0334	C8AA698-A		Fl Ni Wa	603	DD	M2 V M9 D
	0334	C8AA698-B		Fl Ni Wa	703	Re	M2 V M9 D
Upuraku	0336	B484554-9	S	Ag Ni	301	DD	G2 V
	0336	B484654-C	S	Ag Ni Ri A:2	501	Re	G2 V
Tuwayk	0339	B672843-A			501	DD	K8 V
	0339	A672942-D			201	Re	K8 V
Zyedl	0431	E551443-5		Lo Ni Po	501	DD	K3 IV
	0431	E551443-7		Lo Ni Po	801	Re	K3 IV
Endup	0436	D6939EG-9		Hi In	104	DD	G6 V M5 D
Lucifer	0436	B693986-8		Hi In	104	Re	G6 V M5 D
Beaon	0439	D88AA99-C		Hi Wa	A923	DD	F1 V
	0439	C88AA99-E		Hi Wa	A323	Re	F1 V
Noghon	0440	D79798B-9		Hi In	521	DD	F5 V M6 D
	0440	B79798B-C	N	Hi In	621	Re	F5 V M6 D
Briaxis	0531	C120445-D		De Lo Ni Po	901	DD	M1 V M9 V
	0531	C120445-E		De Lo Ni Po	901	Re	M1 V M9 V
Maricutin	0534	B764000-A	N	Lo Ni	213	DD	F9 V K5 V
	0534	B764001-A	N	Lo Ni A:4	413	Re	F9 V K5 V
Preslin	0633	B130679-E	N	De Na Ni Po	310	DD	M2 II
	0633	A130679-F	N	De Na Ni Po	610	Re	M2 II
Brufort	0638	C669642-6		Ni Ri	420	DD	F5 III M5 V
Khuaeakha	0638	C6696H4-7		Ni Ri Aw	820	Re	F5 III M5 V
Qevar	0731	A2326AE-F	B	Na Ni Po Cp	403	DD	M6 V
	0731	A2326AE-F	B	Na Ni Po Cp	703	Re	M6 V
Raguseppe	0734	B410555-B		Ni	710	DD	M0 V K5 D
	0734	B410555-D		Ni	910	Re	M0 V K5 D
Kiangya	0735	C7C0200-C	S	De Lo Ni	714	DD	M3 V
	0735	C7C0200-C	S	De Lo Ni	614	Re	M3 V
Taormina	0737	D3216AE-7		Na Ni Po	834	DD	G8 V
	0737	D3216AE-A		Na Ni Po	934	Re	G8 V
Mtensc	0740	D351454-A		Lo Ni Po	123	DD	M0 V
	0740	D351454-C	S	Lo Ni Po	323	Re	M0 V
Mephit	0833	C9B8436-7	S	Fl Lo Ni	302	DD	G6 V K4 V
	0833	C9B8436-9	S	Fl Lo Ni	502	Re	G6 V K4 V

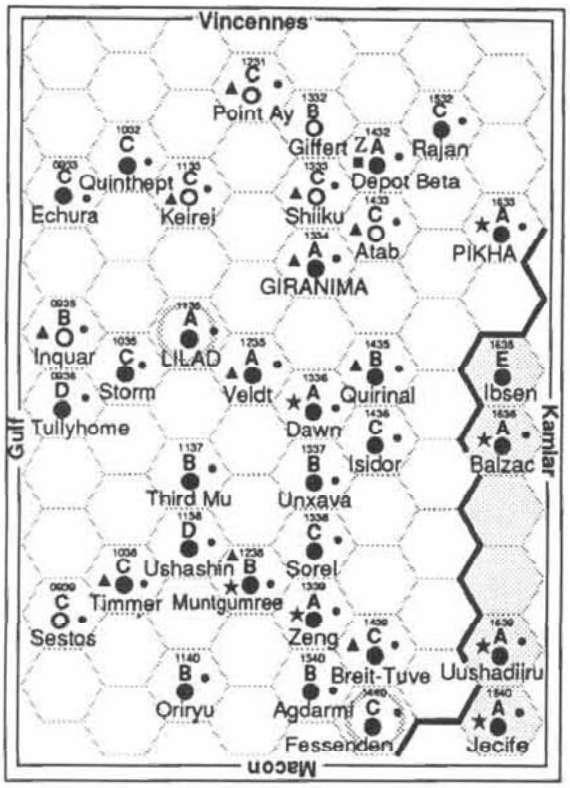
What the Imperium saw in the Ward of Vision that it suffered him to continue sentencing his people, Imperial subjects all, to early death is hard to say 85 years later. Perhaps he made the trains run on time.

Endup was thus typical of the many corrupt, cynical societies winked at by the Imperium but abolished by the Norrian or Aledon Reforms (see Library Data), especially the Representational Reforms (see page 12). The transformation of Endup was a bitter struggle, and was eventually accomplished by teams of Regency Election Observers (see Library Data) that were infiltrated into the lower classes. Here they undertook the unlikely mission of organizing an uprising against the Ward of Vision and his theocracy. Part of this movement, which took over a decade, was the creation of a "liberation theology" which encouraged the populace, within the tenets of their existing faith, to question the form their world had taken.

The uprising was a bloody affair, given the technological imbalance between the Ward's weaponry and that of the commoners, and Lucifer's population has only recently returned to its pre-uprising levels. Although the healthful highland areas are limited in extent, none of the population are excluded from them, and extensive tunneling has begun to allow purified atmospheres to be available to the low-level dwellers.

The name Lucifer means "light bearer," an ancient Terran name for the morning star, and has clear mythological connections to evil, specifically the fall of good beginnings into evil results. However, the ethical creation myths are clear that Lucifer was the most beautiful of the angels before his fall, and that only after his fall did he become identified as Satan. Thus Lucifer is an allegory for the partnership of vigilance and goodness.

The lower technology level in 1202 compared to 1117 does not represent a drop in tech level, but rather the tech level available to the entire population. Following the successful uprising, the Regency government, as heir to the Imperial government, elected to pay its debt to the people of Endup by adding the world to the Regency Industrial Development Program, making it the 27th and last world admitted to the program (see page 67). Despite its relatively low tech level, Lucifer is one of the leading worlds in the rim-trailing quarter of the Regency, possessed of a vigorous population with a clear sense of their purpose and what they believe in. Lucifer's government sponsors a great number of projects on poor environment worlds in the Regency or its frontiers with the goal



of raising the local standards of living. This is Lucifer's way of "paying forward" to the next generation the debt that they owe to the Regency.

Taman (0237): Taman's secondary is in a close orbit around the primary star. The combination of the two gives this system a narrow habitable zone. Taman occupies this zone, and has a chilly environment.

Khuaeakha (ex-Brufort) (0638): Although most of the Aslan incursions occurred in Trojan Reach and Spinward Marches, some reached into Deneb. This resulted in appreciable Aslan population on some worlds, and the world of Brufort was given over to Aslan control and subsequently renamed Khuaeakha.

Deneb Subsector N: Zeng

The Zeng subsector is defended by the 260th Fleet, headquartered at Dawn (1336). The portion of the Regency Frontier in the Zeng subsector is part of Quarantine District 5, although most of this section of the frontier falls in the Kamlar subsector, the next subsector to trailing (page 63).

Dawn (1336): This waterworld supports two completely independent cultures: one in orbit and one that live on the ocean's surface in free-floating *Makranii* ("ship cities"). The orbital population is over 250,000, and the sea-dwellers number almost 400,000.

Dawn's listed tech level corresponds to the orbital culture; the Makranites have a tech level of 9. Dawn's naval base is located in the orbital community, but ships based there make extensive use of the oceans below for refueling.

No land whatsoever breaks the surface of Dawn's world ocean, so the Makranii contain all of the industrial facilities to exploit the ocean's riches: kelp farms and fish ranches, hydrothermal power generation plants, submarine docks for vehicles that collect mineral nodules from the seafloor, and vast collectors for the recovery of dissolved minerals.

The world gets its name from its atmospheric taint: the atmosphere's neon and argon taint create sunrises and sunsets that are breath-taking to visitors, but which the locals have long since accepted as routine.

Depot Beta (formerly Pashus) (1432): After the vampire fleet invaded the Regency and devastated Trin, the Admiralty determined that Deneb need a second depot, and elected to build it in the Pashus system. The original Deneb depot was renamed Depot Alpha, and the newly constructed one was named Depot Beta.

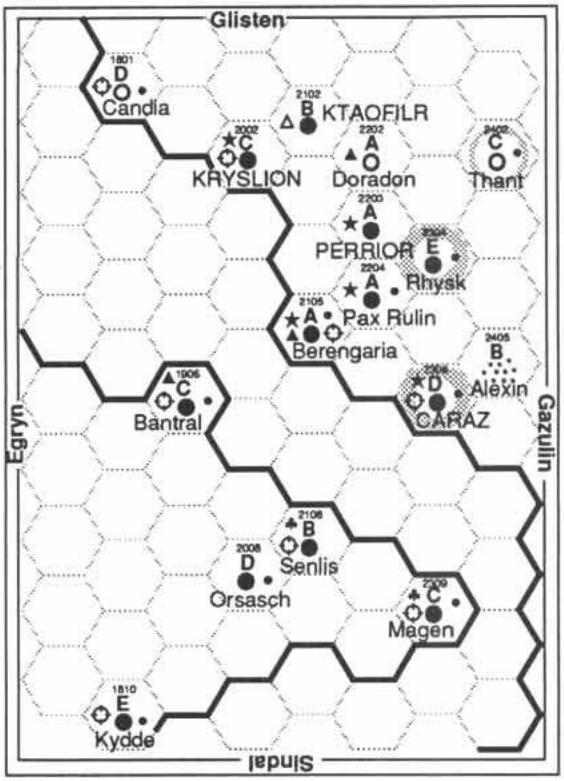
Note that the world stself still retains the name Pashus, it is only the system's name which has been changed.

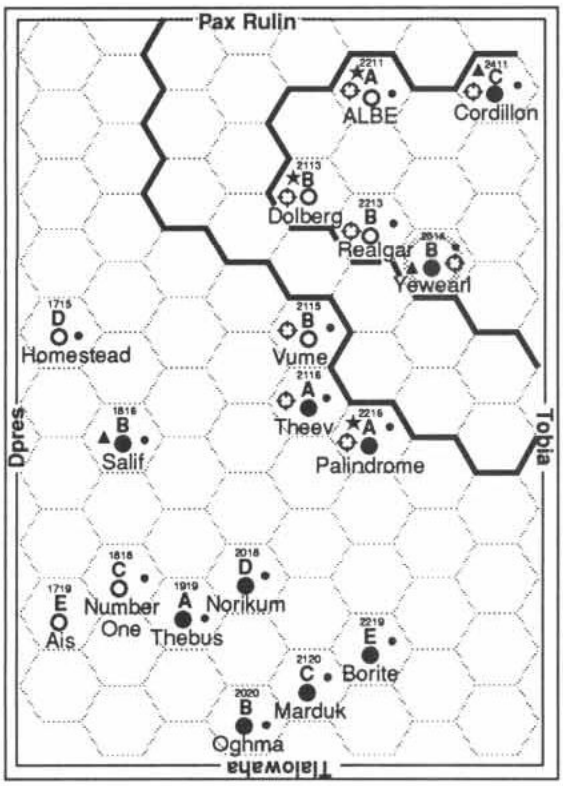
Pashus is the site of Research Station Zeta (RSZ), which continues the work of Ashak Moroyanga (818-881). Moroyanga was a controversial leader in the field of temporal physics. He began his career at the Jumpspace Institute (see page 62) where his studies convinced him that the basic principles of time were themselves other expressions of the same phenomena that were utilized by jump technology. Moroyanga earned both popular celebrity and professional contempt with these views, and eventually died under mysterious circumstances. Nonetheless, the Imperium took his work seriously enough to create Deneb's RSZ to pursue Moroyanga's inquiries.

Conspiracy theorists (of which there is sadly never any shortage in civilized society) maintain that Depot Beta was constructed solely as a cover for the dramatic temporal breakthroughs that are being made at RSZ. By creating a huge naval presence in the system, the Regency government can more easily control public observation of the time travel programs being undertaken by the Regency government.

Zeng Subsector, 1117 and 1202 dual listing (Subsector N of Deneb Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Echura	0933	C6837A8-8			603	DD	K1 V
	0933	C683789-9		Ri	403	Re	K1 V
Inquar	0935	B8B5754-B	S	Fl	723	DD	M6 III
	0935	B8B5754-C	S	Fl	223	Re	M6 III
Tullyhome	0936	D66977A-5		Ri	401	DD	F2 V M1 V
	0936	D66977A-7		Ri	901	Re	F2 V M1 V
Sestos	0939	D5A6878-7		Fl	803	DD	K6 V M6 V
	0939	C5A6878-9		Fl	903	Re	K6 V M6 V
Quinthept	1032	C521575-B		Ni Po	521	DD	F0 V
	1032	C521575-D		Ni Po	821	Re	F0 V
Storm	1035	CAD6223-B		Fl Lo Ni	614	DD	M0 V
	1035	CAD6223-7		Fl Lo Ni	314	Re	M0 V
Timmer	1038	C362652-8	S	Ni Ri	214	DD	K3 V M6 V
	1038	C362652-A	S	Ni Ri	814	Re	K3 V M6 V
Keirei	1133	C110330-C	S	Lo Ni	734	DD	M7 V
	1133	C110330-D	S	Lo Ni	934	Re	M7 V
Lilad	1135	C447AAE-E		Hi In	824	DD	M6 V
	1135	A447A7B-F		Hi In	A924	Re	M6 V
Third Mu	1137	BA7A210-C		Lo Ni Wa	225	DD	K3 V
	1137	BA7A210-D		Lo Ni Wa	525	Re	K3 V
Ushashin	1138	EA9A210-7		Lo Ni Wa	734	DD	M2 V
	1138	DA9A210-9		Lo Ni Wa	934	Re	M2 V
Oriryu	1140	B536534-9		Ni	901	DD	M3 V M4 V
	1140	B536434-9		Lo Ni	901	Re	M3 V M4 V
Point Ay	1231	C460524-B	S	De Ni	902	DD	M1 V
	1231	C460624-C	S	De Ni	302	Re	M1 V
Veldt	1235	C467754-8	S	Ag Ri	514	DD	F6 V
	1235	A467754-9	S	Ag Ri An	714	Re	F6 V
Muntgumree	1238	B253666-8	A	Ni Po O:1339	303	DD	K1 V
	1238	B253666-A	A	Ni Po	403	Re	K1 V
Giffert	1332	B7A9557-E		Fl Ni	220	DD	F5 V K1 D
	1332	B7A9557-F		Fl Ni	620	Re	F5 V K1 D
Shiiku	1333	D6507BF-6	S	De Po	522	DD	M0 V
	1333	C6507BD-6	S	De Po	222	Re	M0 V
Giranima	1334	D7979C8-9	S	Hi In	313	DD	K9 V M1 V
	1334	A7979C8-C	S	Hi In	513	Re	K9 V M1 V
Dawn	1336	AA9A531-C	N	Ni Wa	403	DD	K9 V
	1336	AA9A533-E	N	Ni Wa	603	Re	K9 V
Unxava	1337	B677627-7		Ag Ni	723	DD	G3 IV
	1337	B677757-9		Ag Ni	123	Re	G3 IV
Sorel	1338	B539113-C	N	Lo Ni	601	DD	K6 V K8 D
	1338	C539113-D		Lo Ni	601	Re	K6 V K8 D
Zeng	1339	A226446-C	N	Lo Ni Cp	411	DD	M3 V
	1339	A226446-E	N	Lo Ni Cp	911	Re	M3 V
Agdarmi	1340	B266799-A		Ag Ri	724	DD	M8 III
	1340	B266899-B		Ri	524	Re	M8 III
Pashus	1432	A232455-G	S	Lo Ni Po RsZ	812	DD	A9 V
Depot Beta	1432	A232566-G	D	Lo Ni Po RsZ	312	Re	A9 V
Atab	1433	C140899-A	S	De Po	303	DD	G7 V M7 V
	1433	C140999-B	S	De Hi In Po	103	Re	G7 V M7 V
Quirinal	1435	C651754-9		Po	101	DD	K9 V M9 V G2 D
	1435	B651754-B	S	Po	201	Re	K9 V M9 V G2 D
Isidor	1436	C371565-8		Ni O:1435	623	DD	M0 II
	1436	C371565-9		Ni O:1435	723	Re	M0 II
Breit-Tuve	1439	C325574-B		Ni	811	DD	M1 V
	1439	C325574-D	S	Ni	911	Re	M1 V
Fessenden	1440	C4357CC-6			401	DD	M1 V
	1440	C43579A-8			A601	Re	M1 V
Rajan	1532	C87A112-B		Lo Ni Wa	821	DD	F2 V F3 D
	1532	C87A212-B		Lo Ni Wa	621	Re	F2 V F3 D
Pikha	1633	B738A86-C		Hi	612	DD	K7 V
	1633	A738A86-E	N	Hi	712	Re	K7 V
Ibsen	1635	D4346AC-6		Ni	110	DD	M8 III A2 D
	1635	E434558-5		Ni	510	RF	M8 III A2 D
Balzac	1636	A452879-D	N	Po	513	DD	G1 IV K5 D
	1636	A452879-D	N	Po	313	RF	G1 IV K5 D
Uushadiiru	1639	A351445-A	N	Lo Ni Po	521	DD	G0 V
	1639	A351445-B	N	Lo Ni Po	221	RF	G0 V
Jecife	1640	A439667-F	N	Ni O:1636	123	DD	F6 II
	1640	A439567-F	N	Ni O:1636	523	RF	F6 II





Pax Rulin Subsector, 1117 and 1202 dual listing (Subsector C of Trojan Reach Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Candia	1801	D4006A9-4		Na Ni Va	703	Na	M7 V M2 D
	1801	D4007A9-7	I	Na Va	103	Re	M7 V M2 D
Kydde	1810	B644779-5	S	Ag	804	Cs	F2 V
	1810	E6448M4-5			704	As	F2 V
Bantral	1906	C886589-9	S	Ag Ni D:0	503	Cs	F5 V
	1906	C886589-A	S, I	Ag Ni D:1	603	As	F5 V
Kryslion	2002	D483AA9-9		Hi	520	DD	F6 V
	2002	C483AA9-D	N, I	Hi	720	Re	F6 V
Orsasch	2008	C241364-7	M	Lo Ni Po O:2108	223	SF	F1 V
	2008	D241364-8		Lo Ni Po O:2108	323	As	F1 V
Cyan	2102	C469989-B	W	Hi	510	DD	F6 V M7 D
Ktaofilr	2102	A4699N9-E	W	Hi Aw	210	Re	F6 V M7 D
Berengaria	2105	B566644-7	A	Ag Ni Ri	304	DD	F7 V
	2105	A566644-A	A, I	Ag Ni Ri A:1	904	Re	F7 V
Senlis	2108	B671633-A	M	Ni	510	SF	F6 V
	2108	B671633-A	M, I	Ni A:0	710	As	F6 V
Doradon	2202	A400369-B	S	Lo Ni Va O:2102	100	DD	F3 V
	2202	A400358-F	S	Lo Ni Va	300	Re	F3 V
Perrior	2203	A633966-B	N	Hi Na Po O:2102	330	DD	G2 V
	2203	A633986-E	N	Hi Na Po An A:2	430	Re	G2 V
Pax Rulin	2204	A402231-E	N	Ic Lo Ni Va	413	DD	M8 III
	2204	A402431-F	N	Ic Lo Ni Va	313	Re	M8 III
Rhysk	2304	E413730-3		Ic Na	R613	DD	M1 V M4 V
	2304	E413776-7		Ic Na A:0	R713	Re	M1 V M4 V
Caraz	2306	E111959-A	N	Hi Ic In Na	A222	DD	F7 V M5 D
	2306	D111959-C	N, I	Hi Ic In Na	R722	Re	F7 V M5 D
Magen	2309	C543550-9	M	Ni Po	902	SF	F9 V
	2309	C543653-A	M, I	Ni Po A:4	102	As	F9 V
Islent	2402	BAC0789-6		De	A103	DD	A4 V
Thant	2402	CAC0589-9		De	A703	Re	A4 V
Alexin	2405	B000420-C		As Lo Ni	230	DD	F5 V
	2405	B000420-E		As Lo Ni A:1	430	Re	F5 V

Sindal Subsector, 1117 and 1202 dual listing (Subsector G of Trojan Reach Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Homestead	1715	D560250-6		De Lo Ni	524	Na	F9 V
	1715	D5605K4-6		De Ni	624	As	F9 V
Ace	1719	E7A08B9-5		De	700	Na	M0 V M7 D M5 D
Ais	1719	E7A08J5-8		De A:4	600	As	M0 V M7 D M5 D
Salif	1816	A6236A6-A		Na Ni Po	301	Na	F9 III M0 D
	1816	B6236M6-A		Na Ni Po A:3	401	As	F9 III M0 D
Number One	1818	C9C6778-7		Fl	602	Na	M8 V
	1818	C9C68K5-9		Fl	402	As	M8 V
Thebus	1919	B534320-6		Lo Ni	823	Na	M8 V
	1919	A5345J7-D		Ni	523	As	M8 V
Noricum	2018	D8867BB-1		Ag	804	Na	G2 V M9 D M6 D
Norikum	2018	D8868J6-1		Ri A:2	104	As	G2 V M9 D M6 D
Oghma	2020	B214754-9		Ic	404	Na	F5 V M4 D M5 D
	2020	B2147LA-9		Ic A:3	504	As	F5 V M4 D M5 D
Dolberg	2113	BAC889D-B		Fl	300	Na	F7 V
	2113	BAC8850-E	N, I	Fl	600	Re	F7 V
Vume	2115	B100477-C		Lo Ni Va An	123	Na	K7 II
	2115	B1004M9-E	I	Lo Ni Va An A:8	223	As	K7 II
Theev	2116	A434500-F		Ni	A934	Na	G0 V
	2116	A4346M3-F	I	Ni	434	As	G0 V
Marduk	2120	C377436-3		Lo Ni	503	Na	F7 V
	2120	C3778MA-A			203	As	F7 V
Albe	2211	A540A98-E		De Hi In Po	213	DD	F4 V M2 D
	2211	A540A52-F	N, I	De Hi In Po A:0	413	Re	F4 V M2 D
Realgar	2213	B750444-A		De Lo Ni Po	303	DD	G4 V M7 D
	2213	B750435-B	I	De Lo Ni Po A:2	303	Re	G4 V M7 D
Palindrome	2216	B433334-B		Lo Ni Po	502	Na	F9 V M1 D
	2216	B4335N6-D	N, I	Ni Po	602	As	F9 V M1 D
Borite	2219	E655796-4		Ag	703	Na	G4 V M8 D
	2219	E6557M6-5		Ag A:4	903	As	G4 V M8 D
Chalchiutlicu	2314	B76A787-7		Ri Wa	423	Na	G9 V M3 D
Yewearl	2314	B76A7M8-B	S, I	Ri Wa Aw	A823	Re	G9 V M3 D
Cordillon	2411	C431210-C		Lo Ni Po	922	DD	K1 V
	2411	C431338-B	S, I	Lo Ni Po	222	Re	K1 V

TROJAN REACH

Trojan Reach was the area of the greatest Imperial territory losses to the Aslan *ihatei*. The antebellum Imperial border enclosed the core-trailing quarter of Sindal (G) subsector, and three-quarters of the Tobia (H) subsector. All territory in both these subsectors was lost by the late 1110s, but this dire situation was eventually stabilized by the new Sector Duchess, Sharik Arcadia of Gazulin (who succeeded Duke Alexander Quinn in 1118 upon his suicide with the Aslan invasion of Tobia) who enacted policies to encourage the encroaching clans to fight with each other, which they were only too willing to do.

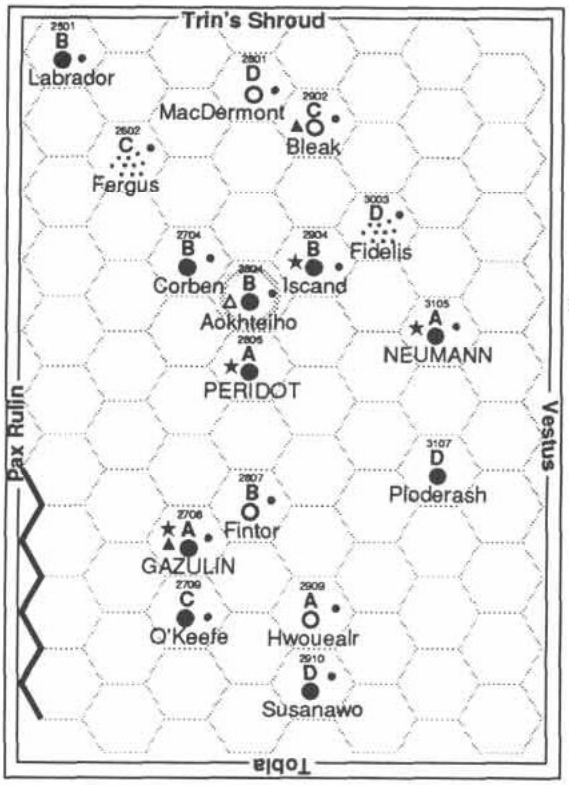
The Zhodani name for Trojan Reach is *Idrflanta*, the Aslan name is *Hlaoirloahauri*.

Archeological evidence shows that the sector was settled by Vilani expatriates from about –2300. These were not formal colonies, but were the settlements of Vilani fleeing Vargr raiding in the abandoned Vilani colonies of Corridor Sector. The last of these settlements is believed to have died out by –1400.

Trojan Reach Subsector C: Pax Rulin

The Pax Rulin subsector is defended by the 201st Fleet, headquartered at Perrior (2203). Its frontier is part of RQD 6, which has sole responsibility for the Aslan interface. It runs from Fist (2918) in the Tobia subsector (page 68) to Candia (1801) at the coreward border of the subsector.

Bantral (1906): Bantral was the 1122 site of talks between the then-Domain and the Aslan Ikhtealyo clan. The Ikhtealyo, which had a long history of trade with the Imperium,



Gazulin Subsector, 1117 and 1202 dual listing (Subsector D of Trojan Reach Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Labora	2501	B533544-7		Ni Po	103	DD	M1 V M1 D
Labrador	2501	B533584-A		Ni Po	203	Re	M1 V M1 D
Belt 9	2602	B000213-E		As Lo Ni	523	DD	M1 V M5 D
Fergus	2602	C000355-C		As Lo Ni	423	Re	M1 V M5 D
Corben	2704	B545455-8	N	Lo Ni	814	DD	F5 V M9 D M7 D
	2704	B545410-9		Lo Ni	114	Re	F5 V M9 D M7 D
Gazulin	2708	AA86987-B	A	Hi An	213	DD	F3 V
	2708	AA86A96-C	A	Hi An A:2	713	Re	F3 V
O'Keefe	2709	D879625-7	S	Ni	604	DD	F4 V
	2709	C879740-9		Ni A:0	204	Re	F4 V
MacDermont	2801	D200768-8		Na Va O:2904	A204	DD	F1 V
	2801	D200786-9		Na Va A:0	A104	Re	F1 V
Junction	2804	B763773-6		Ri	905	DD	G9 V M8 D
Aokhteiho	2804	B7637H4-7	W	Ri Aw	A705	Re	G9 V M8 D
Peridot	2805	B989894-A	N	Ri	700	DD	F3 V M8 D
	2805	A989894-C	N	Hi A:1	200	Re	F3 V M8 D
Fintor	2807	B440344-7		De Lo Ni Po	703	DD	F9 V
	2807	B440353-9		De Lo Ni Po A:0	903	Re	F9 V
Bleak	2902	C9C6225-9	S	Fl Lo Ni An	304	DD	M2 V
	2902	C9C6242-B	S	Fl Lo Ni An	804	Re	M2 V
Iscand	2904	B795553-B	N	Ag Ni C:4	101	DD	K6 V
	2904	B795553-D	N	Ag Ni C:4	301	Re	K6 V
Mirage	2909	A560676-A		De Ni Ri	603	DD	F0 V
Hwouealr	2909	A5606K7-B		De Ni Ri Aw	803	Re	F0 V
Susanawo	2910	D68A430-5		Lo Ni Wa	111	DD	F0 V
	2910	D68A430-6		Lo Ni Wa	211	Re	F0 V
627-301	3003	E000120-A		As Lo Ni RsB	R911	DD	F3 V
Fidelis	3003	D000241-B		As Lo Ni	811	Re	F3 V
Neumann	3105	B876AA9-D	N	Hi In	123	DD	G3 V
	3105	A876AA9-F	N	Hi In	323	Re	G3 V
Ploderash	3107	D303696-8		Ic Na Ni Va	520	DD	F1 V M9 D
	3107	D303651-A		Ic Na Ni Va	720	Re	F1 V M9 D

desired an amicable solution that would allow trade and not require open warfare. However, such sentiments were complicated by other factions on both sides. Many human worlds (described elsewhere) were inclined to go to war with the Aslan intruders, and other Aslan clans preferred war as well. One such clan was the militant Eakhtiyho, and its motivations were two-fold. First, war would allow it to simply take what it wanted; Imperial weakness made it likely that this would prove true. Second, by pursuing war, the Eakhtiyho could undercut the power of the the Ikhtealyo, Tlaukhu rivals (see page 25) who sought peace with the Imperium. A solution that allowed the Eakhtiyho to gain strength at the expense of the Imperium and the Ikhtealyo was irresistible to them. Thus Eakhtiyho policy was to provide military assistance to all *ihatei* forces (regardless of clan affiliation) who pursued military conquest of new lands in the Imperium. This would add fuel to the fire and give greater strength to the Eakhtiyho. Attempts at negotiation were therefore foredoomed to failure so long as the Eakhtiyho figured in the equation, and their policy was to forcibly insert themselves into the equation at every opportunity. (See also **Survival Margin**, page 19, **Rebellion Sourcebook**, *SA, TD MTJ* 3)

Trojan Reach Subsector G: Sindal

The Sindal subsector is defended by the 203rd Fleet, headquartered at Albe (2211). The Sindal frontier is also part of RQD 6, see Pax Rulin, above.

General Development Company (GeDCo): This company was active in Trojan Reach and Reft and dates to the early 600s when Empress Arbellatra resettled many nobles in the Imperium's border regions. As these regions were undeveloped, many of these nobles pooled their wealth for the establishment of an organization dedicated to trade and the increase of tech levels. The result was GeDCo, which achieved success through trade and the production of high-tech export goods.

When the Regency government established its Industrial Development Program it borrowed heavily from the expertise and structure of GeDCo. Many GeDCo executives became Regency officials, and portions of the GeDCo infrastructure were taken over whole by the Regency government and became local offices of the Industrial Development administration.

Trojan Reach Subsector D: Gazulin

The Gazulin subsector is defended by the 202nd Fleet, based at Neumann (3105). Neumann is one of the key worlds of the Regency thinrim. Because of the paucity of TL-15 industrial worlds in the Regency's rimward interior, Neumann fills an important gap, and was selected for the industrial development program (see box, below) for just that reason.

Fidelis (formerly 627-301) (3003): The Imperial research station in this system was evacuated in the pre-Collapse period when it became impossible to defend. The present population of the system comprise an asteroid mining colony made up of families intending to make a life in the system, not corporate employees who come an go based upon their contracts. These settlers gave the system its new name as a commitment that their world would not be abandoned like its predecessor but would remain a valuable and valued member of the Regency.

Regency Industrial Development Program: This was one of the Regency's most important internal development initiatives of the post-Collapse period. Its goal was the increase of high-technology industrial capability in the Regency, particularly in areas which were lacking such centers. One major thrust of the program was to identify industrial worlds which could be rapidly advanced to TL-15, and target them for intensive industrial investment. The Regency government accomplished this by providing interest-free government loans for infrastructure improvement, and by providing grants to the high-tech industrial worlds that would produce the expertise and equipment that would make this possible.

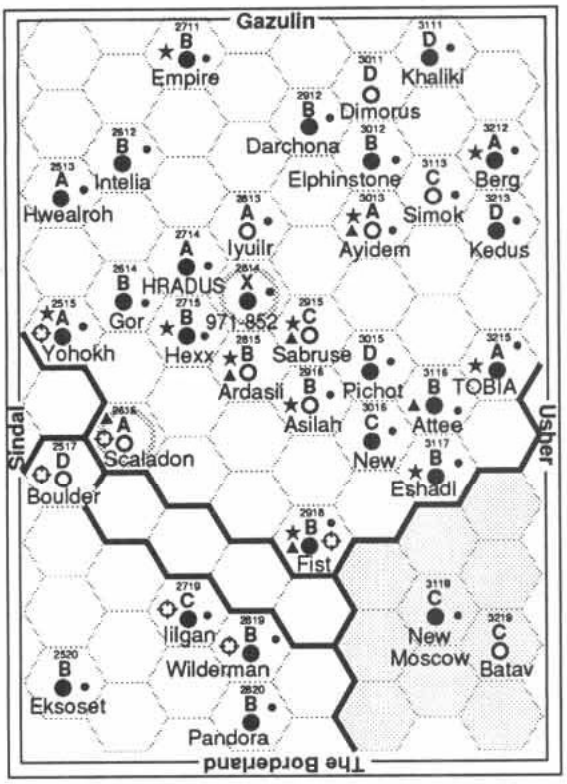
The second major thrust was the advancement of industrial or non-industrial early stellar (TLs 9-A) worlds to average stellar (TLs B-D) industrial worlds. This was also accompanied by starport improvement programs, and additional local investment was also provided in the form of the construction of new bases on these worlds.

A total of 26 worlds were chosen from the program, in 21 subsectors. (A 27th world was added later, see "Lucifer," page 64.) As can be imagined, this program was the target of many attempts to exert political favoritism and promote local pork-barrelling, but Norris himself exerted his personal influence by making it a Regency priority, and created an independent office, the Industrial Development Office, to administer the program which was answerable directly to the First Regent.

One stipulation of this program was that technological development beyond TL-15 was severely limited, to avoid diluting the effort that would be focused on bringing up as many sub-TL-15 worlds as possible to this level. Only one TL-15 industrial world would be allowed to advance its industrial base to TL-16, and after intensive lobbying by Glisten (2036 SM), Rhylanor (2716 SM), Trin (3235 SM), Magash (0316 Deneb), Starn (1417 Deneb), and Tobia (3215 TR), Mora was selected for the honor, making it only the second TL-16 industrial world in the Regency, which it remains in 1202. Although this decision did not go down well in all quarters, after the decision a decade earlier to move the Domain capital to Mora, it at least proved fortunate that Trin was not chosen, given the eventual fate of that world.

Vincennes was denied its request to advance to TL-17, and its industry was primarily used to produce selected high-payoff technology that could be used as "force multipliers" in an otherwise TL-15 society.

The 26 worrlds originally selected for this program were Jewell (SM 1106, page 37), Efate (SM 1705, page 38), Junidy (SM 3202, page 39),, Vilis (SM 1119, page 41), Porozlo (SM 2715, page 43), Adabicci, Lunion, and Strouden (SM 1824, 2124, and 2327, page 46), Mirriam (SM 0333, page 48), Aki (SM 2035, page 50), Dodds (SM 2739, page 51), Urnas (Deneb 0609, page 52), Liiri (Deneb 1016, page 57), Askigaak (Deneb 0629, page 60), Ishiri (Deneb 1429, page 61), Liran (Deneb 1923, page 62), Tuwayk and Noghon (0339 and 0440, page 64), Lilad, Giranima, and Pikha (1135, 1334, and 1633, page 65), Caraz (TR 2306, page 66), Albe (TR 2211, page 66), Neumann (TR 3105, page 67), Hradus (TR 2714, page 68), and Colony Five (Reft 0707, page 69).



Trojan Reach Subsector H: Tobia

By 1120, the entire Tobia subsector, along with the Sindal subsector to spinward, had fallen to *ihatei* invasion, although most of these worlds retained human majority (though now subject) populations.

The arrival of Regency forces in 1131 was greeted with delirious joy by the human inhabitants after over a decade of Aslan occupation. The Regency no longer particularly feared full-scale war with the Aslan Hierate, and this freed it to act with a stoic confidence that it had not exhibited before, and this new confidence struck fear into the Aslan, prompting them to accept these bold acts and enter into honest negotiations. The Regency knew that Virus was by far the greatest threat, and in any event, an Aslan-Regency war would not be the last word—Virus would destroy whatever victors were left behind. Besides, the Regency was essentially only restoring its antebellum boundaries, reasserting control over worlds which had traditionally been Imperial worlds until the late 1110s.

Many Aslan populations abandoned their former-Imperial conquests during this period, and on many words the remainder were subject to varying degrees of "justice" at the hands of their former subjects, which often involved simple deportation.

The Tobia subsector is defended by the 204th Fleet, headquartered at Ayidem (3013). Its frontier is part of Quarantine District 5A, spawned from RQD 5 in 1140 with the annexation of the Islands (see pages 12 and 33). It was clear that patrolling this new territory would overstretch the forces assigned to RQD 5, so RQD 5A was split off from it to patrol subsectors J and K (page 72) and the stretch of frontier backing this area, beginning to core-trailing at Tonnurad (Reft 0416, page 69) and running rim-spinward to the rimward end of the Regency Frontier in the Tobia subsector.

Due to the lack of adequate basing facilities in the Regency Frontier itself, the 128th Fleet is headquartered at Tobia (3215), and not in the frontier itself as is the case in RQDs 3 and 4.

Imisaa (2916): In contrast to the experience of other Aslan-visited worlds, Imisaa benefitted from non-violent and helpful Aslan investment. With the local economic downturn during the Civil War, the Imisaan economy was saved by Aslan investment, as Aslan traders were well-known on this world. In return for this investment the Aslan were granted unused land to settle in the Imisaan outback. Given the character of Imisaan land (it is coded a Desert world), the human inhabitants felt fortunate indeed that someone would pay them for this useless real estate. The world's population is now 89% Aslan.

Fist (2918): Another location of bitter Aslan-human fighting. The world's government, fearful of Aslan power, concluded deals for Aslan settlement. When the disgusted populace overthrew this government and demanded that the Aslan depart, the Aslan refused; they had gotten their land fair and square. Naturally, war resulted.

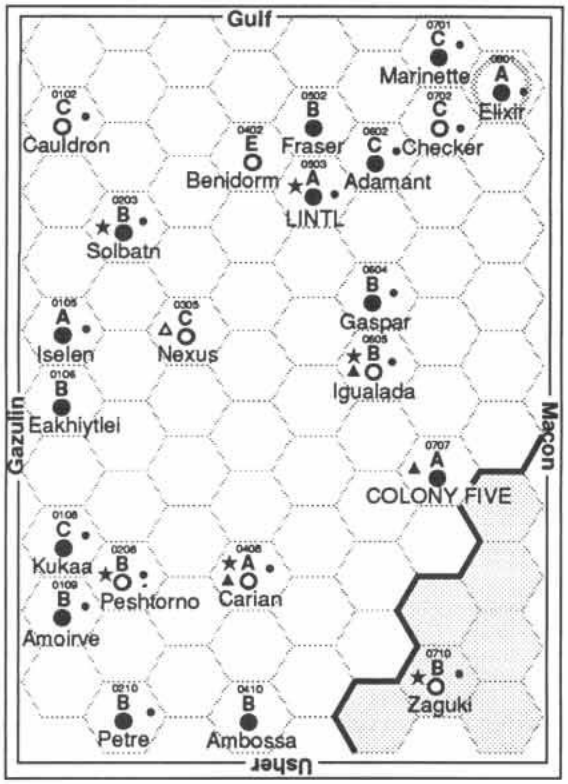
Intelia (2612): Like Imisaa (above), Aslan came to Intelia as investors, buying out the agricultural world's failing meat-packing industry. Naturally the new Aslan owners offered jobs to poor members of their clans, but the humans of this world (which was suffering disastrous unemployment because of the Imperial withdrawal from the subsector) opposed what appeared to be an Aslan economic takeover and rebelled. Wars are easier to start than they are to end.

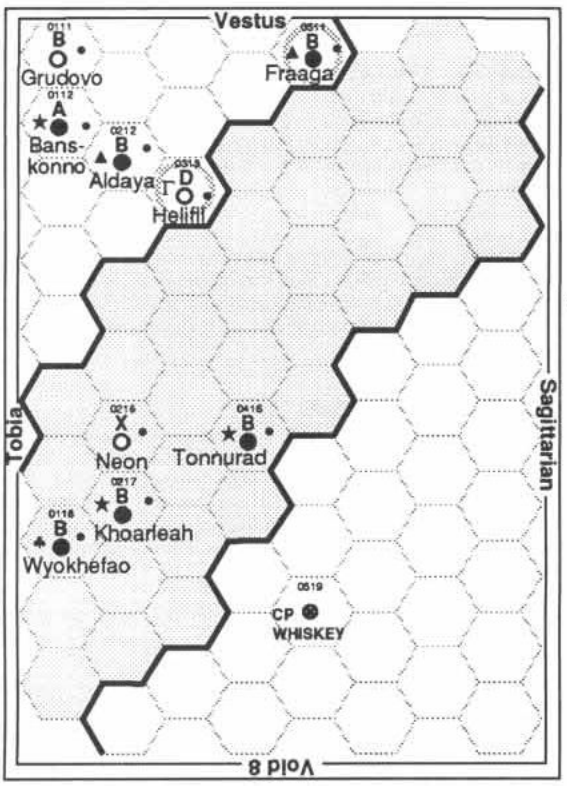
Tobia (3215): Tobia is one of the crucial worlds of the Regency, anchoring the rimward extreme of its defenses. Tobia is not only a subsector capital, it is one of only 16 TL-15 industrial worlds in the Regency, and is the rimward-most of these. In the antebellum period Tobia had also been the Sector capital, but the Regency has dispensed with this fatuous legalism, as it only holds one-quarter of the sector.

Tobia is also the headquarters of the 128th Fleet, whose area of responsibility (AoR) is actually to trailing in Quarantine District 5A. However, because of the lack of suitable facilities in the fleet's AOR, its administrative headquarters (and center for scheduled maintenance availabilities and overhaul) is placed farther to the rear than is the case with the three other frontier fleets.

Tobia Subsector, 1117 and 1202 dual listing (Subsector H of Trojan Reach Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Pryme	2513	B48668B-9		Ag Ni Ri	305	DD	F0 V
Hwealroh	2513	A4866KB-E		Ag Ni Ri Aw	405	Re	F0 V
Nekrino	2515	A788400-C	N	Lo Ni	914	DD	K4 V
Yohokh	2515	A7885J7-C	N	Lo Ni Aw	214	Re	K4 V
Boulder	2517	D100758-9		Na Va	330	Na	K2 V M4 D
	2517	D1007H7-A		Na Va A:3	430	As	K2 V M4 D
Exocet	2520	A574126-8		Lo Ni	203	Na	F6 V
Eksoset	2520	B5742G7-B		Lo Ni	703	As	F6 V
Intelia	2612	C474653-6		Ag Ni	704	DD	F4 V
	2612	B474653-8		Ag Ni A:0	904	Re	F4 V
Gor	2614	C868677-3		Ag Ni Ri	403	DD	G5 V
	2614	B868677-A		Ag Ni Ri A:0	803	Re	G5 V
Scaladon	2616	AAD98DK-A		Fl	A600	DD	F6 V
	2616	AAD98DK-A	S	Fl A:2	A400	Re	F6 V
Empire	2711	B679334-C	N	Lo Ni	503	DD	G2 V M4 D
	2711	B679434-C	N	Lo Ni	403	Re	G2 V M4 D
Hradus	2714	B54699B-7		Hi In	223	DD	F1 V M6 D
	2714	A5469B9-D		Hi In A:1	223	Re	F1 V M6 D
Hexx	2715	B78A577-D	N	Ni Wa	314	DD	F6 V
	2715	B78A577-E	N	Ni Wa A:2	614	Re	F6 V
Iilgan	2719	C467787-8		Ag Ri	812	Na	G7 V
	2719	C4678N2-8		Ri	712	As	G7 V
Saurus	2813	A350543-B		De Ni Po	512	DD	F0 V
Iyuilr	2813	A3505N7-E		De Ni Po Aw	712	Re	F0 V
971-852	2814	X78A000-0		Ba Wa	A004	DD	F6 V M3 D
Dreadnought	2814	X78A443-8		Ba Wa	804	Re	F6 V M3 D
Ardasii	2815	B650684-9	N	De Ni Po	110	DD	F7 V
	2815	B650684-B	A	De Ni Po A:2	210	Re	F7 V
Wilderman	2819	B201674-C		Ic Na Ni Va	402	Na	F7 V
	2819	B2016M7-D		Ic Na Ni Va A:6	802	As	F7 V
Pandora	2820	B878313-B		Lo Ni	401	Na	F0 V
	2820	B8783G3-B		Lo Ni	501	As	F0 V
Darchona	2912	B49A742-A		Wa	533	DD	F9 V
	2912	B49A743-D		Wa A:1	633	Re	F9 V
Sabruse	2915	EAC8343-8		Fl Lo Ni RsA	220	DD	F3 V M5 D
	2915	CAC8343-A	A	Fl Lo Ni	320	Re	F3 V M5 D
Imisaa	2916	B520867-6	N	De Na Po O:2815	113	DD	F8 V M5 D
Asilah	2916	B5208L8-A	N	De Na Po Aw	813	Re	F8 V M5 D
Fist	2918	B789430-C		Lo Ni	313	Na	F1 V
	2918	B789696-D	A	Ni Ri A:1	313	Re	F1 V
Dimorus	3011	D300755-4		Na Va	600	DD	G0 V M7 D
	3011	D300761-7		Na Va O:3212	400	Re	G0 V M7 D
Our Planet	3012	B687100-A		Lo Ni	314	DD	F1 V
Elphinstone	3012	B687220-B		Lo Ni	414	Re	F1 V
Ayidem	3013	A7407X4-D	N	De Po D:9	A804	DD	M2 V
	3013	A7407X4-E	A	De Po Dw	904	Re	M2 V
Pichot	3015	E546330-3		Lo Ni	123	DD	F1 V M8 D
	3015	D546330-5		Lo Ni	223	Re	F1 V M8 D
New	3016	D66668A-5		Ag Ni Ri	503	DD	F9 V
	3016	C66678A-8		Ag Ri A:1	203	Re	F9 V
Khaliki	3111	D111568-9		Ic Ni Pr O:3212	215	DD	F5 V
	3111	D111568-9		Ic Ni O:3212 A:0	315	Re	F5 V
Simok	3113	DAA08CC-5		De	701	DD	F0 V
	3113	CAA08A5-8		De A:0	601	Re	F0 V
Attee	3116	C7529AE-4		Hi Po	404	DD	F9 V
	3116	B7528AE-5	S	Po A:2	404	Re	F9 V
Eshadi	3117	B431358-E		Lo Ni Po	311	DD	M7 V
	3117	B431358-F	N	Lo Ni Po A:1	311	Re	M7 V
New Moscow	3119	B76779A-7		Ag Ri	513	DD	F8 V
	3119	C7677J8-5		Ag Ri	313	RF	F8 V
Berg	3212	A675542-B	N	Ag Ni	805	DD	F5 V
	3212	A675575-D	N	Ag Ni A:2	905	Re	F5 V
Kedus	3213	D867400-3		Lo Ni	913	DD	F8 V
	3213	D867534-6		Lo Ni A:0	213	Re	F8 V
Tobia	3215	A444A55-F	N	Hi In	203	DD	F7 V
	3215	A444A58-F	N	Hi In A:1	303	Re	F7 V
Batav	3219	B5A8764-A		Fl An O:3215	110	Na	M6 II
	3219	C5A86J6-8		Fl Ni An A:3	810	RF	M6 II





Vestus Subsector, 1117 and 1202 dual listing (Subsector A of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Cauldron	0102	D9B8222-4		Fl Lo Ni	403	DD	M0 V
	0102	C9B8245-9		Fl Lo Ni	503	Re	M0 V
Iselen	0105	A243678-9		Ni Po	403	DD	G0 V
	0105	A243678-A		Ni Po A:4	703	Re	G0 V
Reudden	0106	B3536BG-7		Ni Po	400	DD	G4 V
Eakhiytlei	0106	B3536MA-8		Ni Po Aw	700	Re	G4 V
Kukaa	0108	C544100-B		Lo Ni	503	DD	G1 V
	0108	C544300-A		Lo Ni	403	Re	G1 V
Amoirve	0109	B565476-C	N	Lo Ni	704	DD	G8 V
	0109	B565413-B		Lo Ni A:1	904	Re	G8 V
Solbatn	0203	B87A443-A		Lo Ni Wa	603	DD	K3 V
	0203	B87A452-C	N	Lo Ni Wa	703	Re	K3 V
Peshtorno	0208	B7B3841-8	N	Fl	622	DD	G1 V
	0208	B7B3861-A	N	Fl	922	Re	G1 V
Petre	0210	B696478-A		Lo Ni	210	DD	F4 V
	0210	B696478-B		Lo Ni	110	Re	F4 V
Dimple	0305	D200201-8	S	Lo Ni Va	500	DD	G1 V M1 D
Nexus	0305	C200311-A	W	Lo Ni Va	600	Re	G1 V M1 D
Benidorm	0402	E446400-A		Lo Ni	120	DD	G2 V
	0402	E446400-9		Lo Ni A:3	120	Re	G2 V
Carian	0408	B300459-B	N	Lo Ni Va	924	DD	M0 V M7 D
	0408	A300524-D	A	Lo Ni Va	424	Re	M0 V M7 D
Ambossa	0410	B684459-9		Lo Ni	700	DD	G2 V
	0410	B684459-9		Lo Ni A:2	800	Re	G2 V
Corp Town	0502	B474211-B		Lo Ni	100	DD	F6 V M1 D
Fraser	0502	B474425-C		Lo Ni A:0	300	Re	F6 V M1 D
Lintl	0503	B739AEE-F		Hi Cp	404	DD	K2 V
	0503	A739AEE-F	N	Hi Cp	604	Re	K2 V
Whisp	0602	C251110-6		Lo Ni Po	204	DD	F7 V M0 D
Adamant	0602	C251100-9		Lo Ni Po	204	Re	F7 V M0 D
Gaspar	0604	B336337-D		Lo Ni	801	DD	M5 V
	0604	B336410-D		Lo Ni	101	Re	M5 V
Igualada	0605	B140567-9	N	De Ni Po O:0604	701	DD	G2 V
	0605	B140577-A	A	De Ni Po	601	Re	G2 V
Mukiud	0701	B333210-E		Lo Ni Po	823	DD	M6 V
Marinette	0701	C333210-D		Lo Ni Po	523	Re	M6 V
Checker	0702	C300225-9		Lo Ni Va	615	DD	M4 V M7 D
	0702	C300224-A		Lo Ni Va	715	Re	M4 V M7 D
Colony Five	0707	B4759A5-E		Hi In	420	DD	G9 IV M1 D
	0707	A4759A5-F	S	Hi In A:2	520	Re	G9 IV M1 D
Zaguki	0710	B2602G2-9		De Lo Ni	804	As	F2 V M6 D
	0710	B260454-9	N	De Lo Ni A:7	A904	RF	F2 V M6 D
Elixir	0801	B768321-9		Lo Ni	A423	DD	F4 V
	0801	A768587-C		Ni Ag	A623	Re	F4 V

Usher Subsector, 1117 and 1202 dual listing (Subsector E of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Grudovo	0111	B260453-E		De Lo Ni	914	DD	K0 IV M9 D
	0111	B260553-F		De Ni	314	Re	K0 IV M9 D
Banskonno	0112	A4824M4-C		Lo Ni D:6	204	As	G0 V
	0112	A482574-E	N	Ni D:4 A:3	204	Re	G0 V
Bastion	0118	B7373N2-B	N	Lo Ni	701	As	A9 V K4 D
Wyokhefao	0118	B7374N8-B	M	Lo Ni Aw	101	RF	A9 V K4 D
Aldaya	0212	B8856J9-6	M	Ag Ni Ri	423	As	K4 V
	0212	B885620-8	S	Ag Ni A:2	723	Re	K4 V
Neon	0216	D9B22HA-8		Fl Lo Ni	923	As	M4 V M8 D
	0216	X9B2000-0		Ba Fl	023	—	M4 V M8 D
Cerebin	0217	B3236M2-C		Na Ni Po	534	As	G1 III
Khoarleah	0217	B3236M3-C	N	Na Ni Po Aw	334	RF	G1 III
Helifil	0313	D1107N4-8		Na Rs[	403	As	K1 V
	0313	D110744-9		Na Rs[A:6	A203	Re	K1 V
Tonnurad	0416	B463695-7		Ni Ri	803	Na	G3 V M5 D M5 D
	0416	B463787-7	N	A:3	203	RF	G3 V M5 D M5 D
Fraaga	0511	B691420-D		Lo Ni	702	DD	K2 V M9 D M1 D
	0511	B691320-B	S	Lo Ni	A302	Re	K2 V M9 D M1 D

Dreadnought (formerly 971-852) (2814): This world's crust was cracked during the Ancients' final war, destroying most indigenous life. When first contacted by the IISS the world still had a small human population eking out an existence by such means as cannibalism. By 852 this population had become extinct. The world is still a hazardous environment as its crust remains weak. The world has been re-settled under the auspices of the Ministry of the Interior with its new grandiose and courageous name: "Fear God and Dread Nought." This unwieldy name is officially shortened to "Dreadnought" for normal usage.

REFT

Reft Sector, as its name suggests, is dominated by the Great Rift (see Library Data). Its few worlds are split into three areas: the Regency/spinward side of the rift, the Imperial core/trailing side of the rift, now Wilds, and scattered mid-rift worlds in between.

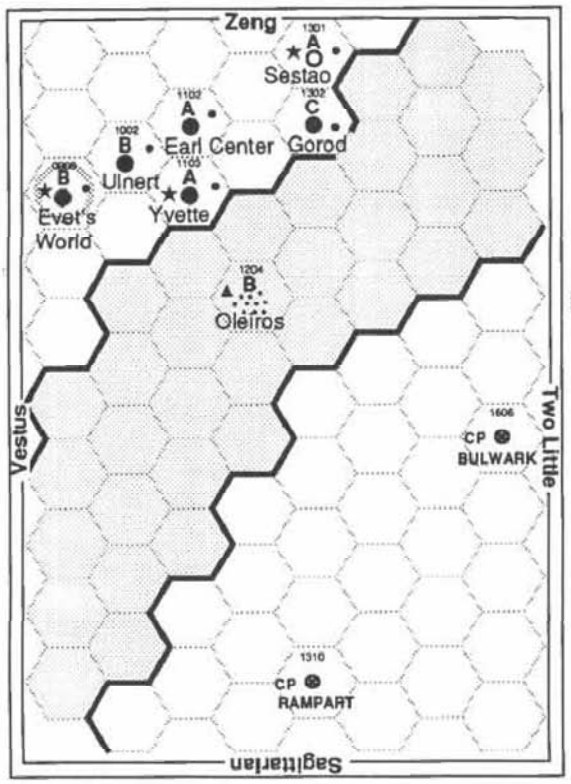
The Zhodani name for Reft Sector is *Bransakral.*

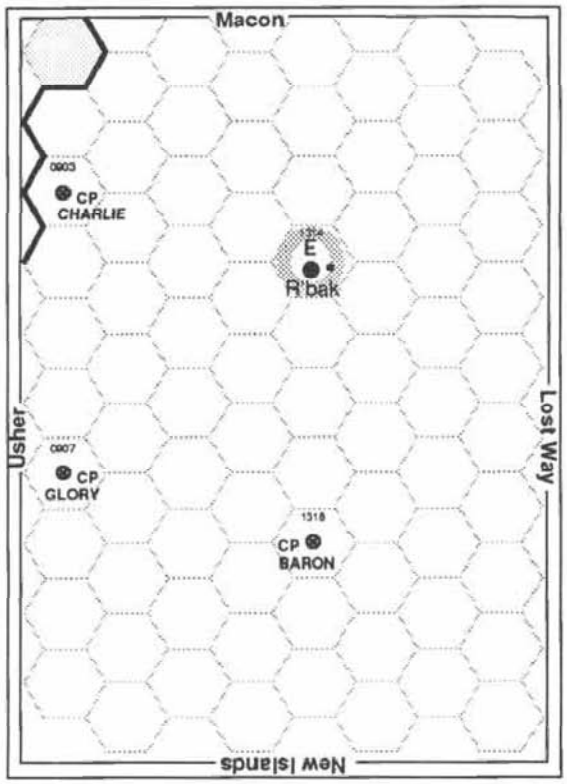
Reft Subsector A: Vestus

The Vestus subsector is defended by the 19th Fleet, headquartered at Carian (0408). The Vestus frontier is part of RQD 5, defended by the 74th Fleet.

Several of the worlds of this subsector were not continuously occupied during the Civil War, but were abandoned in the face of the Aslan incursions and reoccupied following the establishment of the Regency. Most of these can be recognized by the new names given them by their new inhabitants.

Many of the starports and bases in this subsector exist solely to support fleet movements and lines of communication (such as the XWeb) from the Regency





interior to the rim-trailing frontier.

Lintl (0503): Lintl served as the provincial capital of Reft Sector for the Domain of Deneb, and continues in this role for the Regency, adding the small collection of worlds in Usher (E) and Macon (B) subsectors to its purview.

Reft Subsector E: Usher

The Usher subsector does not maintain its own capital; it is administered from Lintl (0503) in the Vestus subsector to coreward. Usher is defended by the 74th and 128th Fleets, whose primary AoRs are RQDs 5 and 5A, but which share the patrolling of the Usher subsector.

Aldaya (0212): Aldaya is another former Imperial world that fell to the Aslan (Hreakhari clan) but was reincorporated (matter-of-factly annexed is a good description) during the establishment of the Quarantine (see page 8).

Macon Subsector, 1117 and 1202 dual listing (Subsector B of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Evet's World	0903	B201656-D	N	Ic Na Ni Va	A503	DD	M6 V
	0903	B201556-E	N	Ic Ni Va	A103	Re	M6 V
Ulnert	1002	B53769D-7		Ni	803	DD	K4 V M8 D
	1002	B53779D-9		Ni	103	Re	K4 V M8 D
Earl Center	1102	A998011-9		Lo Ni	604	DD	K9 V
	1102	A998111-B		Lo Ni	304	Re	K9 V
Yvette	1103	A79A633-D		Ni Wa	133	DD	G2 V
	1103	A79A735-E	N	Wa	133	Re	G2 V
Oleiros	1204	B000457-D		As Lo Ni	300	Na	M1 V
	1204	B000357-D	S	As Lo Ni	800	RF	M1 V
Sestao	1301	A120675-C	N	De Na Ni Po	611	DD	M0 V
	1301	A120658-E	N	De Na Ni Po	911	Re	M0 V
Gorod	1302	D6689CC-9		Hi	111	DD	K4 V M1 D
	1302	C66888A-A		Ri	711	Re	K4 V M1 D

Sagittarian Subsector, 1117 and 1202 dual listing (Subsector F of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
R'bak	1314	B387777-3		Ag Ri	R721	Na	G3 V
	1314	E387873-2		Ag	R221	Na	G3 V

Wyokhefao (formerly Bastion) (0118): Bastion/Wyokhefao was the origin point of much of the Aslan encroachment in this area, including that of Tonnurad, below. Originally an Imperial world with a naval base, Bastion was abandoned in the early Civil War period, and it and its base were taken over by the advancing Aslan Hreakhari clan who used the world as a springboard for further penetration of the Domain.

Tonnurad (0416): Tonnurad was the site of some of the heaviest *ihatei*-Domain fighting of the Civil War era. The Domain actually lost control of the world to the Aslan encroachers, and only regained it by the unilateral extension of the Regency frontier during the early days of the creation of the Quarantine (page 8).

Reft Subsector B: Macon

Because of its size the Macon susbsector does not have a subsector capital of its own; it is governed from Lintl (0503) in the Vestus subsector to spinward. However, Macon is home to a Regency fleet, the 74th, headquartered at Yvette (1103). The 74th is "dual-hatted" with the protection of the Macon subsector as well as the extensive Quarantine District 5, its primary area of responsibility (AoR).

Calibration Points Rampart and Bulwark are part of the CP network that allows passage along the wildside of the Regency Frontier. This allows Regency Navy and RQS forces to intercept intruders before they actually enter the defended areas of the Frontier or Regency Safe. The CP network allows the Regency's patrol envelope to be pushed farther out into the Wilds to make the borders that much safer, by allowing the threat to be destroyed while still in the Wilds, or at least to allow advanced warning while picket forces slow the threat down.

Reft Subsector F: Sagittarian

The Sagittarian subsector contains only one world, well outside of the Regency frontier into the Wilds. Its Calibration Points are used by the Regency Navy and Quarantine Service for deep space sweeps of the rift.

CP Baron also allows approach to the Islands from coreward. It is deliberately placed far from the Islands so that high-jump Regency ships can jump from Baron into the Islands but lower-tech Islander ships cannot jump from the Islands out into the Regency CP network.

CPs Charlie and Glory are primarily connector CPs, providing access either parallel to the frontier or to and from the Regency interior to more distant CPs like Baron. They are not open to public or commercial traffic, and their precise locations and beacon codes are not available to the public.

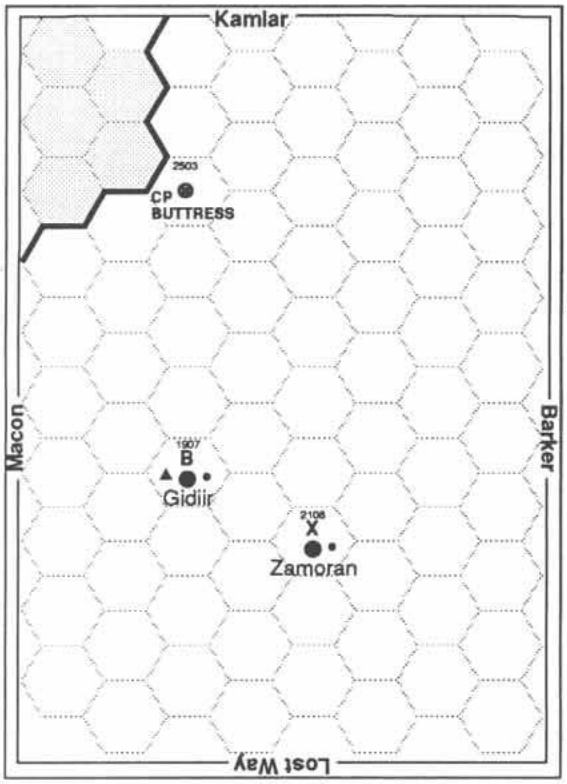
R'bak (1314): Meteor swarms make navigation in this system very hazardous, but the Imperial-era interdiction order is not related to this. The world itself, but not the system, was placed under interdiction to protect the world's culture, humans that had fallen back to barbarism. However, many believed that the interdiction was a cover for military research, as the world's surface contained unusual lifeforms and extensive psionic activity.

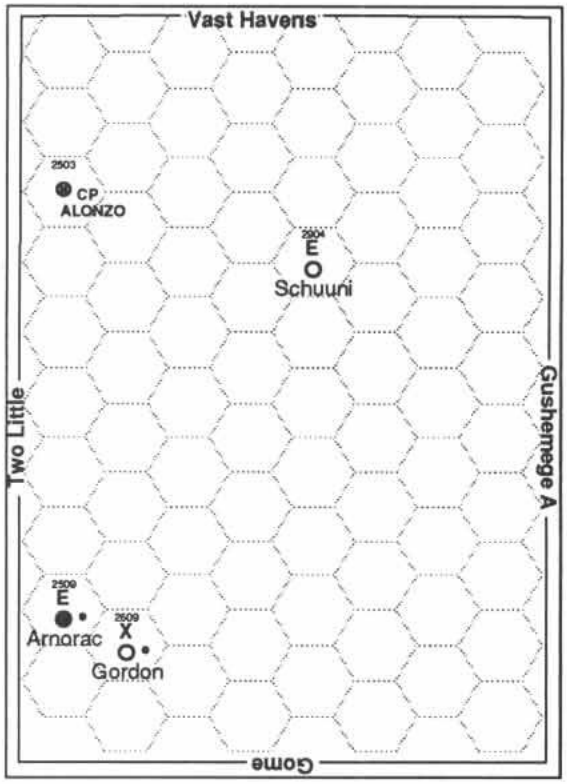
The system's starport was an orbital facility off of the interdicted world surface.

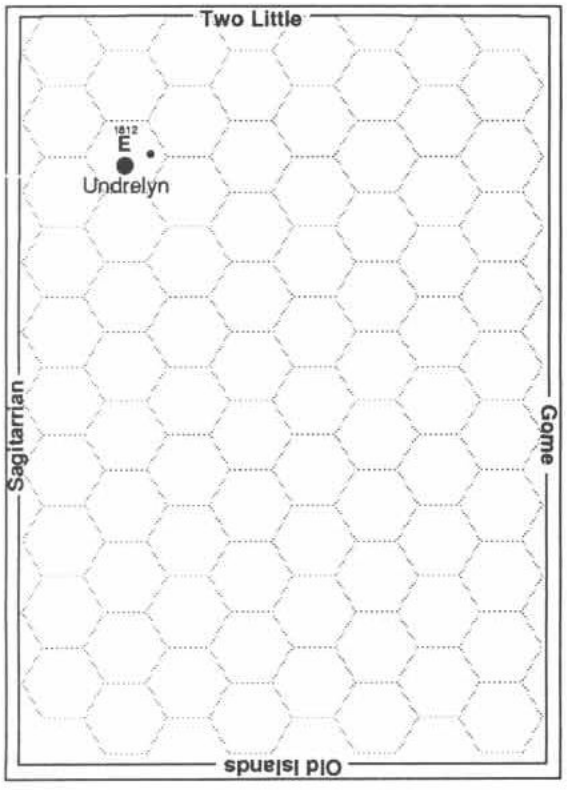
Reft Subsector C: Two Little

The worlds of all three subsectors on this page fall outside of Regency-protected space. However, they are patrolled by deep sweeps of the 74th Fleet, based in RQD 5 to their rear. As with all calibration points, the CPs in these subsectors are for military use only, their precise locations and beacon codes are classified.

Zamoran (2108): This world was struck by a vampire ship in 1143. In the recovery which followed, the world's Droyne took the lead, and today are the rulers of the world.







Two Little Subsector, 1117 and 1202 dual listing (Subsector C of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Lemente	1907	B897563-B		Ag Ni O:1204	824	Na	K4 V
Gidiir	1907	B89769B-B	S	Ag Ni	124	Na	K4 V
Zamoran	2108	B674675-A	M	Ag Ni D:9	904	Dr	F5 V
	2108	X6747X5-8		Ag Dw	104	Na	F5 V

Barker Subsector, 1117 and 1202 dual listing (Subsector D of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Arnorac	2509	B381468-A	N	Lo Ni O:2609	302	Cs	K8 V
	2509	E381444-8		Lo Ni	102	Na	K8 V
Gordon	2609	B310776-A		Na	203	Na	M4 V M3 D
	2609	X310654-8		Na Ni	703	Na	M4 V M3 D
Schuuni	2904	BAAA599-D		Fl Ni Wa	100	Na	G0 V
	2904	EAAA431-8		Fl Lo Ni Wa	400	Na	G0 V

Lost Way Subsector, 1117 and 1202 dual listing (Subsector G of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Undrelyn	1812	B551433-6		Lo Ni Po C:2	A514	Na	F4 V M7 D
	1812	E551468-5	M	Lo Ni Po C:2	214	Cs	F4 V M7 D

Reft Subsector D: Barker

Arnorac (2509): Although this world has a critical mid-rift position and is still visited by Regency Navy sweeps, the Regency was unable to actively defend it in the post-Collapse period, and its naval base fell into disrepair. However, its strongly pro-Regency inhabitants continue to maintain what starship facilities they can, and make sure that all Regency personnel have a very pleasant planetfall.

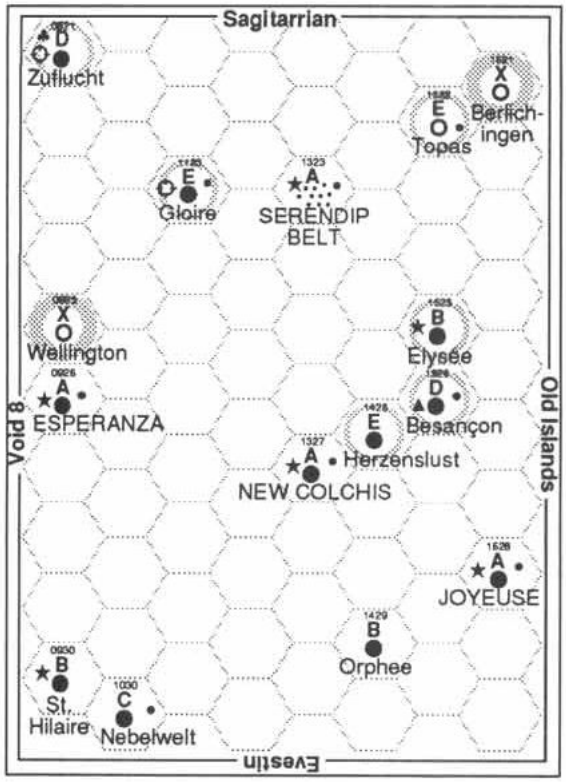
CP Alonzo (2503): This deep CP supports deep space sweeps and also provides access to coreward to the Denebian transrift route via CP Avery in the Vast Havens subsector (Deneb/P, see page 63).

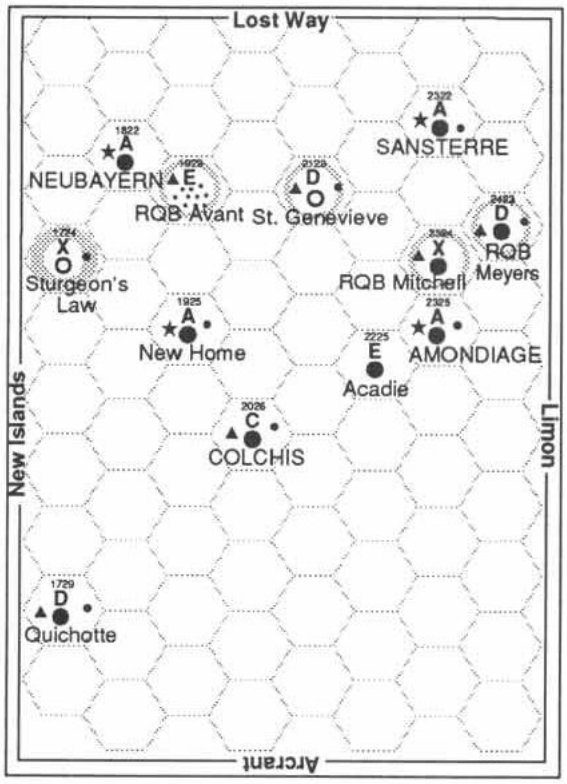
Gordon (2609): Gordon is struggling with very old life support systems. Replacement parts are few and far between, making repairs difficult. Several habitation domes have failed over the past decades. This life support crisis has caused the world to unify its government beneath a ruling class of technicians who make all of the worlds decisions based on their technical feasability and value to the world as a whole.

Schuuni (2904): When ships stopped visiting this system, approximately half of the population decided to abandon the world before the life support failed. Two bulk transports were taken over, and overloaded with fuel and passengers. They then headed coreward, intending to undertake deep space refueling. It is not known what became of these ships.

Reft Subsector G: Lost Way

This subsector's only world is regularly visited by the Regency Navy and RQS, as it is a crucial mid-rift crossroads of the various deep space sweep route packages. The minor base maintained here is for resupply, rest and recreation, etc., on long-duration deep space deployments. Located deep in the Wilds, Undrelyn is currently a world in decline, and its only government and organization is provided by the Regency military forces there.





New Islands Subsector, 1117 and 1202 dual listing (Subsector J of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Zuflucht	0921	C445720-8	M	Ag	800	Na	F6 V
	0921	D445655-7	M	Ag Ni	A400	Re	F6 V
Wellington	0925	C8B0263-A		De Lo Ni O:0926	800	Es	M6 II
	0925	X8B0000-0		Ba De	R000	—	M6 II
Esperanza	0926	A674ABC-B	N	Hi In	303	Es	F9 V M2 D
	0926	A674ABC-A	N	Hi In	403	Re	F9 V M2 D
St. Hilaire	0930	B579763-A	N	O:0926	500	Es	K2 V
	0930	B579763-9	N	O:0926	400	Re	K2 V
Nebelwelt	1030	C879425-5		Lo Ni	612	Na	F2 D
	1030	C879567-5		Ni O:0926	312	Re	F2 D
Gloire	1123	C764567-9		Ag Ni O:1323	924	SB	M0 III M0 D
	1123	E764769-8		Ag O:1323	A324	Re	M0 III M0 D
Serendip Belt	1323	A000959-C	N	As Hi In Na	502	SB	G1 V M4 D
	1323	A000959-B	N	As Hi In Na	402	Re	G1 V M4 D
New Colchis	1327	A8959AA-C	N	Hi In	103	NC	F8 V
	1327	A8959AD-B	N	Hi In	203	Re	F8 V
Herzenslust	1426	E995765-6		Ag O:1327	920	NC	F0 V M6 D
	1426	E995765-5		Ag O:1327	A720	Re	F0 V M6 D
Orphee	1429	X885600-0		Ag Ni	R100	Na	M9 III
	1429	X885647-0		Ag Ni	200	Re	M9 III
Topas	1522	D120899-5		De Na Po	904	Na	K8 V
	1522	E120869-5		De Na Po	A404	Re	K8 V
Elysée	1525	B502532-9	N	Ic Ni Va	200	Na	M1 V
	1525	B502455-7	N	Ic Lo Ni Va	A600	Re	M1 V
Besançon	1526	C201341-9	M	Ic Lo Ni Va	502	Na	M2 V
	1526	D201457-8	S	Ic Lo Ni Va	A902	Re	M2 V
Berlichingen	1621	D600437-7		Lo Ni Va	700	Na	F5 V
	1621	X600000-0		Ba Va	R000	—	F5 V
Joyeuse	1628	A7899B9-C	N	Hi	404	Jo	K2 V M3 D
	1628	A7899B9-B	N	Hi	304	Re	K2 V M3 D

Old Islands Subsector, 1117 and 1202 dual listing (Subsector K of Reft Sector)

Name	Hex	UPP	Base	Trade	TPPG	Alg	Stellar
Sturgeon's Law	1724	DAC1451-6		Fl Lo Ni	815	Na	M1 V
	1724	XAC1000-0		Ba Fl	R015	—	M1 V
Quichotte	1729	C576667-6	M	Ag Ni O:1628	413	Jo	F6 V
	1729	D576667-5	S	Ag Ni O:1628	613	Re	F6 V
Neubayern	1822	A7889C9-C	N	Hi	610	Nb	M3 V
	1822	A7889C8-B	N	Hi	510	Re	M3 V
Schlesien Belt	1923	C000367-B	M	As Lo Ni O:2026	110	Na	K4 V
RQB Avant	1923	D000366-A	S	Cm As Lo Ni	A410	Re	K4 V
New Home	1925	A565857-D	N	Ri	704	NH	G0 V
	1925	A565859-B	N		804	Re	G0 V
Colchis	2026	B676898-9	N		911	Na	F7 V M5 D
	2026	C676969-8	S	Hi In O:1925	111	Re	F7 V M5 D
St. Genevieve	2123	C460100-A	M	De Lo Ni	404	Na	K4 V
	2123	D460366-8	S	De Lo Ni	A104	Re	K4 V
Acadie	2225	C868563-9		Ag Ni O:2325	400	Am	K6 V M9 D
	2225	E868563-8		Ag Ni O:2325	800	Re	K6 V M9 D
Sansterre	2322	A87A943-C	N	Hi In Wa	222	Sa	M0 V M9 D
	2322	A87A943-B	N	Hi In Wa	322	Re	M0 V M9 D
Achille	2324	E101335-9		Ic Lo Ni Va	100	Na	M0 V M4 D
RQB Mitchell	2324	X101100-A	S	Cm Ic Lo Ni Va	A900	Re	M0 V M4 D
Amondiage	2325	A5629A9-C	N	Hi	102	Am	F1 V
	2325	A562976-B	N	Hi	202	Re	F1 V
St. Denis	2423	C735764-7	M	O:2322	803	Sa	K1 V M7 D
RQB Meyers	2423	D735368-A	S	Cm Lo Ni	A703	Re	K1 V M7 D

Reft Subsector J: New Islands

Note: The two subsector maps on this page are the only ones in this book that are not shown in their proper spatial relationship with each other, for reasons of space. The Old Islands map should be located to the right of the New Islands map, as is shown by the neighboring subsector indicators around the map edges.

Both Islands subsectors are considered to be in the Regency Frontier, as part of Quarantine District 5A. RQD 5A was created specifically for the administration of these subsectors, and includesthem as well as the frontier "proper" in front of the Tobia (TR/H, page 68) and Usher (Reft/E, page 69) subsectors, core-trailing to the line from Tonnurad to Helifil (0416 and 0313, both page 69). District 5A is patrolled by the 128th Fleet, based at Tobia (TR 3215, page 68).

The two interface worlds in this subsector are located at the chokepoints out of the Islands subsectors towards the Regency, and are intended to protect the Regency from the Islands, and not vice versa. These worlds are coded amber because RQS forces in the Islands are not known for their patience or willingness to take risks in unusual circumstances (see page 34).

Because both Islands subsectors are considered to be in the Regency Frontier, all of their worlds are already classed as Amber Zones. However, certain worlds are specifically classed either as Amber or Red Zones to call attention to specific dangers to be found there.

Topas (1522), Elysée (1525), Besançon (1526), and Herzenlust are all coded Amber because they are "powderkeg worlds," disputed worlds where military forces of the rival powers are still present. See sidebar on page 33 for details.

Berlichingen (1621) and Wellington (0925) are interdicted Red Zones. Both are dead worlds with no refueling sources and are therefore easy to keep isolated while the RQS examines the systems for the presence of Virus.

Reft Subsector K: Old Islands

St. Genevieve is an Amber Zone powderkeg world (see page 33). RQBs Avant, Mitchell, and Meyers are coded Amber because RQS peacekeeping forces are "not taking any crap" in the Islands, and because as dead worlds they are being examined for Virus. Likewise, Sturgeon's Law is being interdicted until it can be certified free of Virus. All of the Islands' dead worlds are Virus suspects until they can be proved otherwise.

Regency World Name Index

This index includes every world in the Spinward Marches and Deneb sectors, but only sectors C, D, G and H of Trojan Reach, and sectors A through K of Reft sector. Where the name of a world has changed from 1117 to 1202, both names are listed in the index, with the appropriate year listed in parenthesis after the hex number. When there is no year listed after the hex number, this means the world's name was the same in 1117 and 1202. The number in **bold** is the page number in the **RSB** on which the world's UWP data appears.

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Library Data

LIBRARY DATA

The following information should be made available to PCs who have access to any reasonable database, either printed or electronic.

Aledon, Avery: Artificial biological son of Emperor Strephon Aella Alkhalikoi and (posthumously) Empress Iolanthe. Conceived *in vitro* in 1118 at Usdiki (1015 Gushemege), and raised to age 8 by his father. Evacuated to the Domain of Deneb aboard ISS *Arrival Vengeance* in 1126 and adopted by Archduke Norris Aledon.

Upon his majority in 1139, he publicly assumed his rightful name as Avery Alkhalikoi. It was widely believed that he would succeed Norris as First Regent, either singly or jointly with Seldrian Aledon (which see). His marriage to Seldrian in 1144 was intended to unite the Aledon and Alkhalikoi lines for reasons of state, but was never successful on a personal basis. It is believed that the single product of this union, Caranda Aledon Alkhalikoi, was the result of *in vitro* conception.

Avery served as High Regent for Technological Assessment from 1137 to 1149, when he was killed in a mishap at a technological demonstration. See also page 13.

Aledon, Norris Aella: First Regent of the Regency, born in 1063 and died in 1157. Became Duke of Regina in 1098, appointed as Archduke of the Domain of Deneb in 1116, proclaimed First Regent in 1132. True Father (which see) of Seldrian Aledon, his successor as Regent. See page 9.

Aledon, Seldrian: True daughter of First Regent Norris Aledon and second Regent of the Regency, born 1097, died 1190.

Seldrian was a free clone (which see), owing to the fact that her true father was not a first son, and was therefore not cloned as an infant. Furthermore, Norris took pains to ensure that his clone would not be a duplicate of himself, to the extent of stipulating that his clone be female. Although Norris was determined that his clone would be an independent person, their relationship enabled her to act as Norris' eyes and ears in a number of capacities.

Seldrian was Norris' heir throughout his life, and served as his representative on the *Arrival Vengeance* mission of 1123-1126 (see **Arrival Vengeance**, SA). It was on this mission that Avery Aledon (which see) was brought to the Domain of Deneb from Strephon's stronghold at Usdiki.

Following the proclamation of the Regency in 1132, Seldrian served her true father in many capacities, as Second Regent (later redesignated High Regent) in charge of a large number of topics important to Norris.

Seldrian, who had taken responsibility for Avery Aledon during the *Arrival Vengeance* mission, continued to show an interest in the boy, overseeing his education and sponsoring his entry into many social and educational organizations. By the late 1130s it was clear that Norris would not produce a natural heir, and pressure mounted for Seldrian to marry and preserve the Aledon line. Because of the obvious affection and long history between Avery and Seldrian, public sentiment mounted that the two should be married. Following the 1139 revelation that Avery was the son of the last emperor of the Third Imperium, and clear heir to any future imperial throne, these sentiments were only magnified by the vision of uniting the Aledon and Alkhalikoi lines. Although observers believed that neither Seldrian nor Avery concurred with this reasoning, the Tower (which see) strangely made no attempt to discourage thoughts of such a union.

Following her marriage to Avery Alkhalikoi in 1144, she adopted the name Seldrian Aledon-Alkhalikoi. This marriage was soon and widely seen as a marriage of political convenience, and it appears that the genuine friendship between Seldrian and Avery was destroyed by this new relationship. They ceased maintaining a joint household in 1146, with Seldrian remaining on Mora and Avery moving between his many offices as High Regent for Technological Assessment. Seldrian bore a son in 1147, who was confirmed as being the biological child of Avery and Seldrian. The child was named Caranda Aledon Alkhalikoi, and eventually became Regent following his mother's death.

Following the death of Avery in 1149, Seldrian again worked closely with Norris, preparing herself to succeed him, which she did in 1157 upon his death. Seldrian continued her true father's policies, and raised Caranda to do the same. By the time she died in 1190 the Regency was clearly safe from the threat of virus, and was beginning to look outward to the Wilds that it would once again claim in the name of the Imperium.

Aledon Reforms: The body of social, cultural, political, and spiritual reforms championed by First Regent Norris Aledon and the second Regent, his true daughter Seldrian Aledon-Alkhalikoi. See also Norrian.

Alkhalikoi, Avery: See Aledon, Avery.

Alkhalikoi, Caranda Aledon: Son of Avery Alkhalikoi and Seldrian Aledon. Assumed the title of Regent (the third since the founding of the Regency in 1132) in 1090 following the death of his mother.

Named for the first Duke of Regina, who was appointed to that position by the first of the Alkhalikoi line, Empress Arbellatra in 629, on the day following her coronation. There is a very clear historical symbolism at work here, which is not limited solely to the significance of Baron Caranda of Regina as the first of the illustrious Aledon dukes. There is also the fact that Arbellatra, first of the Alkhalikoi line, recognized Caranda just as Strephon, last of the line to sit on the throne, recognized Norris five centuries later, showing the families' long relationship of service and loyalty one to the other.

However, the key symbolism is the fact that the name Caranda recalls the crucial support provided by the earlier Caranda to Arbellatra which allowed her to take control of and reunify an Imperium that had been rocked by civil war (although clearly not so destructive as the 1117-1130 war). Arbellatra, victor of the Second Frontier War, was only able to depart for Core and her ultimate victory at the Battle of Zhimaway in 622 because of Caranda's loyalty in protecting her achievements in the Marches during her absence. Norris clearly saw his role as Archduke to be the preservation of Strephon's Imperium in the Marches, just as his ancestor had done. With the uniting of the Aledon and Alkhalikoi lines, the Aledon line will again be instrumental in placing an Alkhalikoi on the throne of a restored Imperium. This was the very symbolism that Norris began in 1132 by styling himself as Regent in charge of an interdynastic Regency. And to bring the symbolism full circle, Norris and Caranda Aledon Alkhalikoi are following in Arbellatra's footsteps, because the title that she served under between 622 and her coronation in 629 was none other than Regent.

Alkhalikoi, Seldrian: See Aledon, Seldrian.

Ancients, The: A race which flourished in Charted Space during the period –400,000 to –300,000, Imperial Dating. The Ancients possessed a staggeringly high level of technology, incalculable by current standards, but which included the ability to construct sophisticated artificial environments such as rosette and ring worlds.

The Ancients appear to have destroyed themselves in a climactic war lasting for approximately 2000 years and ending in –300,000. Many worlds were utterly destroyed by this war, resulting in the unusually high proportion of asteroid belts in some areas of the Imperium.

The primary significance of the Ancients to modern society is the existence of a number of starfaring races, namely the Zhodani, Vilani, and Vargr, as well as the wide distribution of separately developed populations of *homo sapiens*, "seeded" onto a number of worlds during their prehistory. These seeded homo sapiens populations (primarily the so-called "minor" human races plus the two major races, the Zhodani and Vilani) were placed on over forty worlds where they developed from prehistory without realizing that these worlds were not the worlds on which they originally evolved. Forty-six minor human races are known within Charted Space, but because many transplanted *homo sapiens* populations may have become extinct in their pre-history, or were planted outside of Charted Space, the total number of these seeded populations may never be known.

Antebellum: "Before the war." The period of Imperial history before 1117. This is different from "pre-Collapse," which means before 1130, and often specifically refers to the period of internal conflict between 1116 and 1130.

C3D: Pronounced "See-three-dee," standard military acronym for command, control, communications, and data, the four requirements for successful military operations.

Calibration Point: The term given by the Regency Navy and Quarantine Service to the deep space refueling points used to cross areas of space where there are no star systems to provide gas giant, ocean, or asteroid refueling points. Calibration points are located in deep interstellar space, light years from the nearest significant astronomical body. At the simplest level, they consist of a natural source of hydrogen, typically a comet nucleus or other ice body, but rogue planets are rarely found and used for these purposes. These natural calibration points are discovered and exploited, not constructed.

The most sophisticated calibration points are manned space stations, with huge tanks of refined liquid hydrogen fuel ready for transfer into starship fuel tanks, repair facilities, hospitals, and rest and recreation facilities. These can be built entirely from scratch, from modular components or sometimes from empty fuel tanks, but it is best if they can be constructed on an existing body such as the natural calibration points above.

The key feature of all calibration points is that they are carefully plotted for those who use them, as interstellar space is a very large haystack in which to find a needle like a calibration point. Ships which jump into interstellar space without precise information on the location of such calibration points are doomed to eventually run out of fuel and drift forever in the cold and dark.

Calibration points are usually secret, as their use confers operational and strategic advantages that must be denied to rivals. Most calibration points carry locator beacons which remain silent until they are activated by pre-arranged coded challenge signals, to prevent them from being used by unauthorized vessels.

In the period since the collapse, the calibration points have been sites of some of the bloodiest space battles in history, as large Vampire Fleets have attempted to force their way across the Great Rift and through the Quarantine into the Spinward States to prey on the societies there. This was possible because the pre-Collapse Imperial Navy maintained a large number of secret calibration points throughout the Great Rift, and their locations became known to Vampire fleets which took over former Imperial facilities and ships, complete with their databases. These calibration points either had to be defended by large Regency naval forces or destroyed to prevent vampire fleets from using them.

It is known that some highly sophisticated vampire fleets have attempted to establish their own calibration points to cross the Great Rift, but none have as yet been entirely successful.

Cardinal Directions: In interstellar space, the terrestrial directions of north, south, east, and west with reference to the world's axis of rotation are clearly unhelpful. For this reason, the civilizations of Charted Space have adopted an analogous convention, based on the structure and rotation of the Milky Way galaxy. The four directions are coreward, rimward, spinward, and trailing.

Coreward: One of the four cardinal astrographic directions, toward the center of the galaxy, and therefore the opposite of rimward. Standard maps generally place this direction at the top, making it analogous to north on planetary maps.

Rimward: One of the four cardinal astrographic directions, toward the edge of the galaxy, and therefore the opposite of coreward. Standard maps generally place this direction at the bottom, making it analogous to south on planetary maps.

Spinward: One of the four cardinal astrographic directions, in the direction of the rotation ("spin") of the galaxy, and therefore the opposite of trailing. Standard maps generally place this direction at the left, making it analogous to west on planetary maps.

Trailing: One of the four cardinal astrographic directions, opposite the direction of the rotation ("spin") of the galaxy, and therefore the opposite of spinward. Standard maps generally place this direction at the right, making it analogous to east on planetary maps. Trailing is often rendered as Trail*ward* in contexts where this is more clear.

These directions can be combined in the same manner that northeast and southwest are used on planetary surfaces. Usually core and rim are placed first in compound directions, e.g., core-spinward, rim-trailing.

See also *Local Directions*.

Celestime: of or relating to navigation or commerce in space.

Charted Space: The name used for the volume of space known to imperial society. Charted Space does not merely include the territory of the former Third Imperium. It also includes all territory known by imperial civilization to be under the control of the Zhodani, Solomani, Vargr, Aslan, K'kree, and Hivers.

Before the Civil War, the size of the major interstellar powers in terms of sectors controlled was computed as follows: Third Imperium: 27; Aslan Hierate: 18; Hive Federation: 17; Two Thousand Worlds: 14; Vargr Extents: 14; Zhodani Consulate: 13; Solomani Confederation: 11.

Civil War: Commonly accepted term in the Regency for the War of the Shattered Imperium, 1117-1130. This replaces the inaccurate name "the Rebellion," which was only properly used by Lucan and Dulinor, who imagined that others were rebelling against their rightful leadership. The Civil War was hardly a rebellion, as it involved many factions each fighting for their own perceived advantage against multiple opponents, and not against a single power.

This usage of Civil War causes potential confusion with the Imperial "Civil War" of 604-622 (which, incidentally, was both begun and ended by a Grand Admiral of the Spinward Marches, Olav hault-Plankwell and Arbellatra Alkhalikoi, respectively). This was a civil war in name only, as the popular (e.g., "civil") participation which is the prerequisite of a civil war was noteable only by its absence. In reality it was merely a series of 18 *coups d'etat* or juntas, supported only by raw military power and largely ignored by the Imperial bureaucracy and populace, who muddled on, serving whomever happened to be sitting on the throne that day. When referred to at all, the war of 604-622 is referred to as the First Civil War, the Wars for the Iridium Throne, the Emperors' War, the Wars of the Fleets, or the Wars of the Throne. The reason for the profusion of names is that they all make dandy book titles for academicians seeking tenure.

C-Lag: The C-lag, or "lightspeed lag" refers to a phenomenon and a variety of implied naval tactics that result from the speed at which light, and hence passive sensor signals, propagate. The specific scenario to which c-lag refers is that of two warring starships or fleets, one of which has been operating in a star system (the *native* force), and another which has just jumped into the system (the *intruder* force). The c-lag phenomenon gives an operational advantage to the intruder force by allowing it to see the native forces before they can see it, in the following fashion.

A star system has been occupied for 24 hours by a native ship. The native ship is surrounded by a signature sphere consisting of all of the electromagnetic radiation which has been emitted by or bounced off of the ship for as long as it has been present in normal space. This sphere is now 24 hours old with a diameter of 24 light-hours or 26 billion kilometers, and the sphere continues to grow at the speed of light.

An intruder jumps into the system at a point 1.08 billion kilometers, or two light-hours from the native ship. Because it is within the native signature sphere, it immediately "sees" the native ship. More accurately, it is *capable* of seeing the ship assuming its sensors are good enough, and even then it would only "see" where the native ship had been two hours earlier. (1 billion kilometers is less than the distance from a star to orbit number 7, see **TNE** page 195, or 36,000 **TNE** space combat range bands or **Brilliant Lances/Battle Rider** hexes.) However, the intruder's signature sphere is only moments old, and will take about 2 hours to reach the native ship. That means that even if the native ship had sensors pointed at the exact location of the intruder, it could not detect it for two hours, because it will take that long for the signature to reach its sensors.

The intruder therefore has a potential 2 hour headstart which it can use to maneuver toward military targets, refueling points, or run away from a superior enemy force. This is a significant edge, and the advantage will vary depending upon the size of this lightspeed lag.

Because starships are such small targets, the example above is an extreme case, and works better in the case of a large signature such as an immobile planetary facility. Ranges of a billion kilometers are too great for starship-mounted sensors to obtain target locks on other starships, but the presence of radio traffic, active EMS emissions, and infrared signatures are sufficient to tip-off an intruder to approximate force compositions and likely activities of native forces.

Claw, the: Nickname for the Great Rift, so called because of its clawlike shape, originating as a broad area far to spinward of the Imperial borders, running through former imperial space in the Trojan Reach, Reft, Gushemege, Deneb, and Corridor Sectors, and arcing core-trailward to a narrow point in the Vland Sector. The former Domain of Deneb and its neighbors, now known as the Spinward States, were saved from Virus largely by the astrographic obstacle of the Great Rift.

Consolidation Wars: Wars fought in the Old and New Islands subsectors from 1106 until their enforced end in 1140 by RQS forces.

Core Axis: The axis along which the Zhodani core expeditions travelled, 30 parsecs in diameter and stretching from the Zhodani Consulate some 5000 parsecs toward the galactic core.

Core Expeditions: A series of eight expeditions launched by the Zhodani toward the Galactic Core, some 8000 parsecs away. The first of these was mounted in –4000 Imperial (1211.1 Zhodani calendar), the seventh in 750 (3311.1), and the eighth and most recent in 1149 (3487.2). The seventh expedition is known to have lasted 50 years for the round trip, and pushed to within 3000 parsecs of the core, a distance of 5000 parsecs from the Consulate. The eighth expedition is believed to have been a failure, and was abandoned partway through.

Deep space: Interstellar space, i.e., an area of space, usually a parsec across, which contains no stellar systems and typically no astronomical bodies of any significant size. However, these areas are only very poorly understood by contemporary science, because of the very real difficulties of getting around in them. With no refueling resources, deep space areas are the "no man's land" of interstellar travel.

The primary means for "exploring" deep space is by passive observation from a parsec or more away using very long baseline observation (VLBO). However, the sort of cold bodies likely to inhabit deep space are very difficult to detect, and given the fact that it takes 3.26 years for data to travel one parsec from a would-be observed object to a VLB sensor, these sensors have absolutely no value as militarily applicable tactical sensors. However, VLB observations are crucial for the establishment of deep space calibration points (which see).

Deep system: The outer zone of a star system, typically synonymous with the area surrounding a system's gas giants. The deep system is frequented mostly by military traffic which do not intend to call at the system's primary world, and are merely using the gas giants for refuelling.

The deep system is one of the primary areas of responsibility for system defense squadrons, which allows them to attack and destroy intruding forces either while they are refueling or before they can refuel and are vulnerable because they have insufficient fuel for extended maneuvers or to disengage by jumping away.

Dilgaadin, Branj: Also known as "Father of the Psions." Long-serving seneschal of Norris Aledon, Duke of Regina, Archduke of Deneb, and First Regent of the Regency, born 1065 and died 1146.

Dilgaadin was a telepath, and served Norris by serving as a figurative second brain and pair of hands. It was well known in the Spinward Marches that Norris' seneschal carried the full power of the Duke himself, so Dilgaadin was able to dramatically expand Norris' effectiveness by telepathically monitoring the Duke's thoughts and carrying out the Duke's wishes in his name. Dilgaadin also transcribed his telepathic exchanges with the Duke/Archduke/Regent, and these documents constitute the most valuable of the First Regent's personal papers.

Dilgaadin naturally functioned as a close advisor and confidante of Norris, and was eventually appointed as High Regent for Psionic Reforms in 1133. With this mandate Dilgaadin orchestrated Norris' repeal of the psionic suppressions and brought Regency psionics into the open, and organized the new schools that would encourage psionic development. The shaved head style affected by almost all Regency psionics is a tribute to Dilgaadin, who was himself naturally bald.

Branj Dilgaadin is believed to have been the driving force behind the unsuccessful marriage of state between Avery Alkhalikoi and Seldrian Aledon (which see). Some observers believe that in the last decade of his life Dilgaadin exerted an over-protective and insular influence on the weary First Regent.

After having spent most of his life as Norris' closest advisor, he was perhaps jealous of the influence of others who would have shunted Dilgaadin aside.

Dream Time: Popular term used in the Regency for the period following the Collapse and concluding with the formal opening of the Regency Frontier in 1202. The term is intended to invite thoughtful and grateful comparison to the Long Night of –1526 to 0 (dogmatically, local dates for Dawn vary) Imperial calendar. The phrase was coined by popular political writer Ignatz P. Yaonis in his remark, "Now come the times when we alone are left to dream the Imperial dream until it re-awakens to carry on again." It also connotes that the regressed, isolated worlds of the Wilds are individually sleeping and waiting, like Snow White, for the kiss of a devoted and courageous hero to bring them back to the land of the living.

Emotional Connection: One of the major psychological underpinnings of Zhodani society. Unlike emotional sovereignty (which see), emotional connection is an explicit assumption among the Zhodani.

Emotional connection is a by-product of the integration of psionics into Zhodani society. Psionics allows the Zhodani to know that all humans share many of the same relevant vulnerabilities, fears, hopes, and desires. The knowledge that all people share these characteristics removes the need for people to conceal these characteristics for fear of ridicule or the perception of strangeness. This basic knowledge that all people are substantially alike leads to a sense of social and emotional connectedness in which members of a society can assist each other in achieving the goals that all people share, and undercuts the impetus for dishonesty. The most important sensation of emotional connection is a sense of true community.

Emotional Sovereignty: One of the major, though not articulated, psychological underpinnings of imperial society and culture, and a by-product of the prohibition of psionic powers in imperial culture.

Without psionics, the contents of an individual's mind are secret. Thus emotional states, beliefs, hopes, dreams, and fears that are common to all humans are believed to be unique to the individual simply because no one has the opportunity to experience their universality among sapient beings. Because the individual imagines these states to be unique, and potential sources of weakness, they are usually kept secret from others, and the individual must chart his own course, relying solely on his internal strength, unable to depend on the persons around him who would ridicule or prey on him if they knew his inmost thoughts.

It is this inability to share common core experiences that leads to deceit in imperial society. The fact that imperial humans keep up a false front before their real feelings creates the necessary conditions that allow deceit to arise in other areas of their lives. The most important sensation of emotional sovereignty is a sense of loneliness.

This is the opposite of emotional connection, which see.

Exodus: Name for the flood of Zhodani refugees entering the Regency beginning in 1201. Such dramatic developments from the normally stable and slow-moving Consulate surely indicate disastrous events within the Consulate, but the nature of these events is not known to the Regency.

***Fait Accompli* Worlds:** Domain of Deneb worlds under the nominal control of Vargr or Aslan invaders when the Quarantine and Regency were being finalized in 1131 and 1132.

Although the Domain was committed to support its citizens who were fighting off the alien invaders, the arrival of Virus allowed no time for human armed forces to eject the interlopers before Virus would arrive. In order to defend its worlds, the new government was forced to recognize the Vargr or Aslan rulers in order to gain their cooperation in creating a Virus-tight frontier.

These worlds, which are still inhabited by their sometimes downtrodden, rightful human owners, are one of the greatest sources of conflict within the Regency today.

First Regent: The unique title for Norris Aella Aledon, who served as the first Regent of the Regency from 1132 until his death in 1157. This is the result of the early structure of Regency government, which had secondary and tertiary Regents in charge of specific areas analogous to the old Imperial Ministers. In strict dynastic usage (from which the imagery of the Regency was derived), there can really only be one Regent, who serves in the stead of the sovereign. Thus "First Regent" is as nonsensical as "First Emperor." So with the redesignation of the Second and Third Regents as High Regents, Norris' title of First Regent came to denote his status as chronologically the first leader of the Regency.

Subsequent Regents have not been formally known by their chronological number (i.e., Seldrian was not "the Second Regent"), but simply as the Regent.

Football: The rimward-most portion of the Regency, considered to be Aslan territory in the pre-Collapse period, although it had been Imperial territory before the *ihatei* invastions. It was reaquired by the Regency during the period of the establishment of the Quarantine in the face of local Aslan disorganization and unwillingness to create a united frontier against oncoming Virus.

The Football proper consists of Regency worlds in the Gazulin, Sindal, and Tobia subsectors of Trojan Reach and the Usher subsector of Reft. The Aslan Hierate also administers a number of border worlds that are inhabited mostly by imperial-culture humans. It is popular opinion that these serve as hostages against the treatment of Aslan within the Regency.

Free clone: A clone who is allowed to develop as a normal "natural" personality, rather than being shaped to replicate the personality of its objective parent. The opposite of a free clone is called a simulacrum (which see).

Frontier Wars: A series of five wars predominantly between the Zhodani and Imperium fought in the Spinward Marches from the period 589-1110. Various Vargr states and the Sword Worlds were usually allied with the Zhodani in these wars as the Outworld Coalition.

Geneering: Contraction for GENetic enginEERING. This applied science includes the field of cloning as well as the modification of "natural" creatures by the introduction of genetic material by retroviruses.

Governance: All truly great governments (in that they serve something of lasting value, beyond the simple perpetuation of their own power) stand for something beyond their simple existence. In a sense, this is the greatest indictment of the final form of the Third Imperium, which was content to remain a passive greenhouse, rather than acting as a gardener or farmer.

The Regency faces similar judgement. While Norris portrayed and shaped the Regency government according to values of integrity, service, and honesty, the vast majority of its citizens agree that any government must retain the right to maintain certain secrets, and act in the public interest even without public awareness. While Norris' aspirations were clear and admirable, the Regency is the lineal descendant of the Third Imperium, which made extensive use of secrecy and benign neglect. How much could the Regency redirect these traditions within itself? More importantly, what of the cognitive dissonance within Norris himself (and his descendants/successors)? He passionately believed in courage, honesty, and accountability, but was quite able to use secrecy to his own benefit, most notably in his self-appointment as Archduke (page 9), and his illegal accomodation with psionics (until 1133, when he made his crimes legal, see page 12). So far as the public is aware, all such examples were scrupulously managed for the public benefit, but there remain two issues: 1) what else did Norris do that we are not aware of, and 2) the Platonic formula that dictates that capability is equivalent to an occasion for misuse (evil).

Is the Regency firmly founded on honor according to universal values, or has it made so many compromises with secrecy, expedience, and self-righteousness that it is ripe for abuse and subversion? In practice, most governments teeter agonizingly back and forth on this precipice, between their real desires to stand for something timeless and their leaders' susceptibility to flattery and the seduction and celebrity of power.

Ensuring that governments remain on the proper side of this precipice is the duty of the governed, whether they live in a democracy or a dictatorship (although the weapons in these two examples are quite different, as are the risks in taking them up: cowards can comfortably live much longer in a democracy than they can in a repressive dictatorship). In other words, people get the government they deserve, or at the very least, demand.

In practice, one must remember that Norris was a man, subject to the same errors and sins of commission and omission of any other. But to the extent that he was also the architect of the human future, his actions come under the scrutiny of a higher court.

Great Rift: See "Claw, the."

Imperial: Used capitalized, it refers to a citizen of the Third Imperium. Many Regency citizens still think of themselves in this light, and think of the Regency as nothing less than a smaller Third Imperium.

Used lower-case, refers to any member of the social culture that was standardized within the Third Imperium as opposed to members of the Zhodani, Sword Worlds, Darrian, Aslan, Solomani, Vilani, or Vargr cultures. The citizens of the Regency are heirs to this culture, which includes the classic imperial attitudes toward such things as psionics, nobility, planetary government, anagathics, etc. Regency citizens are therefore often referred to as imperials because their Regency is simply a renamed continuation of this imperial society and culture.

One of the facets of this cultural orientation is a *laissez-faire* attitude to local planetary affairs. In its positive sense this is a commitment to the principles of home rule and local self-determination, and a tolerance for the broad variety of cultures that can peacefully coexist within such a non-intrusive political umbrella.

Its dark side is manifested in a willingness to look away from injustice and corruption on the planetary level so long as these inconveniences do not extend to the interstellar level. This was a byproduct of the feudal structure of the Imperium, and was expressed in such things as the Imperial Rules of War and the concept that while individual worlds were responsible for themselves, the Imperium owned the space between these worlds.

This tendency was most strongly exhibited during the time of the Third Imperium in which cruel military dictatorships or corrupt pseudo-religious dictatorships were winked at by the interstellar authorities because they were "more efficient" than their more inclusive or humane predecessors or alternatives. This cynical focus on keeping the Imperial trains running on time at the cost of those citizens who might ride them is one of the imperial excesses condemned by the Regency. The Regency's policy of replacing feudal representation with popularly elected planetary representatives is a major aspect of this new thinking.

One of the Aledon or "Norrian" ethical reforms is the creation of an explicitly active concept of tolerance as opposed to the passive tolerance of the Third Imperium which often amounted to nothing so much as an institutionalized laziness. In describing this concept, Norris explained,

"Tolerance is easy, and hollow, when you believe in nothing. So long as you

don't care, anything is fine with you. Nihilists are the most open-minded people you'll ever meet, except that they are not open to the one thing that makes life worth living, and that is meaning. Meaning brings beauty and provides hope, which the nihilists have a desperate need for.

"But meaning is difficult. It requires thought and pain and perseverance. It requires sorting through ambiguous and seemingly contradictory elements all woven together in complex, frustrating knots. But that is the price of meaning and beauty. It requires courage.

"Tolerance must be an active concept, a conscious embracing of that which is not familiar to you, a willingness to believe that there is a truth greater than the contradictions that are all you can see now, and that by embracing life and those around you living that same life, you will find that truth. Tolerance is the faith that there is a purpose to what we do here; it is not simply an emptiness where no beliefs lie."

Imperial Core: The meaning of this term varied with usage. To inhabitants of the Marches, "behind the claw," it referred to the entire contiguous Imperium to trailing of the Great Rift, from Vland Sector on.

To residents of this region, it specifically referred to the coremost sectors: Core, Dagudashaag, Zarushagar, and Massilia. These were the longest-settled and most advanced and sophisticated of the Imperial sectors, with continuous history dating back to the First (Vilani) Imperium.

By definition this term referred only to this core imperial area, but it came to connote the arrogance and self-satisfied sophistication of these regions, where exquisitely detailed family trees showing the right sort of Sylean, Vilani, and Solomai bloodlines were the currency of social importance. In this rarified society, the presence of a questionable ancestor many centuries in the past was often sufficient reason to deny entry to social, political, or business organizations.

Because of the importance of this social core (as opposed to the astrographic, or galactic core) the term "coreward" was often used to mean toward the Imperial Core, rather than in its proper meaning (see Cardinal Directions). In this meaning, coreward in the Marches meant "trailing," in Vland and Lishun meant "rimward," on the K'kree border meant "spinward," and only in the region of the Solomani Rim, Daibei, Diaspora, and Old Expanses meant "coreward" in its proper meaning.

Intruder: Standard term used in military starship tactical, operational, and strategic theory. The intruder force is the force which most recently jumped into the star system under examination. Compare with *native*.

The classic presumptive characteristics of the intruder force include: 1) Post-precipitation disorientation, 2) no active C3D organization, 3) empty fuel tanks with consequent limitations on tactical (maneuver drive) and operational/strategic (jump drive) mobility, 4) offensive and/or proactive in nature, 5) beneficiary of c-lag phenomenon.

Local Directions: Colloquial terms used by Regency citizens in place of the standard cardinal directions (which see). Rather than being related to a more "universal" framework such as the Milky Way galaxy, this terminology is based on conditions local to and descriptive of the Regency point of view. All of these terms serve both as directions and as names for the astrographic areas referred to.

Outrim: Toward the Regency's trailing frontier with the Wilds, so-called because it is outward toward the uncivilized Wilds. Outrim is also the name for the astrographic region comprising the Great Rift, trailing Deneb, and the Corridor Sector.

Incore: Toward the center of the Regency, so-called because it is inward, facing toward the core of surviving civilized areas. Depending upon the position of the speaker within the Regency, this direction can be spinward, coreward, trailing, or rimward.

Deeprim: Toward the Regency's coreward frontier with the Vargr, so-called because on the far side of the razed Vargr fragments lies uncharted space.

Shortrim: Toward the Regency's spinward frontier with the Zhodani Consulate, so-called because of the closeness of the highly developed areas of the Regency and Zhodani Consulate along this border.

Thinrim: Toward the Regency's rimward frontier with the Aslan Hierate, so-called because of the thin stellar population of this area as well as the perceived thinness of this border with the Aslan states.

Meta-identity: Literally "above identity," refers to electronic or Viral consciousness which is able to move itself from one body to the next while retaining the same identity. This is the opposite of the embedded- or "point-identity" which has thus far been universally present in biologically-based sapients.

Minor Human Race: A human society planted by the Ancients during the period before –300,000 and which developed separately from other human-inhabited worlds until it was eventually contacted by a star-faring society. Thus the Sword Worlders and inhabitants of the Islands subsectors are not a minor human race because they were not planted by the Ancients, although they did evolve their own societies while separated from the mainstream of human society. Likewise geneered races likek the Jonkeereen are not minor human races.

During the imperial period, minor human races were distinguished from major human races by the fact that minor human races had not discovered jump drive on their own, while major races had. The only so-called "major" human races are the Vilani, Zhodani, and Solomani.

Native: Standard term used in military starship tactical, operational, and strategic theory. The native force is the force which was already operating in the star system under examination when the enemy force jumped into the system (this recently-arrived enemy is labelled the *intruder*, which see). The native force is typically cast in the role of the defender, and is the victim of the c-lag phenomenon (which see). Status as native or intruder force has nothing to do with which side actually "owns" the system, but simply distinguishes which fleet is the most recent arrival.

The classic presumptive characteristics of the native force include the following: 1) "up and running" C3D organizations, 2) effective deployment around key worlds, bases, and refueling points, 3) fully fueled and provisioned, 4) defensive and/or reactive in nature, 5) victim of the c-lag phenomenon.

Natural: Opposite of artificial (no, really, keep reading). Refers to a creature created (i.e., conceived and born) by simple, instinctive, biological means, as opposed to a creature created by cloning, geneering, etc.

Refers also to a pre-existing physical object rather than one artificially constructed.

Noble Appurtenances: Collective term that refers to all of the duties, rights, responsibilities, privileges, properties, possessions, and powers that accrue to a noble by virtue of the patent of nobility. These are considered distinct from that individual's personal possessions, rights, etc., although this dividing line can sometimes be difficult to establish in the area of possessions and property.

Norrian: Adjective used for any concepts, developments, and socio-ethical beliefs particularly associated with First Regent Norris. Classic Norrian values include duty, service, inclusiveness, and governmental openness.

Outrim: A colloquial term used by Regency citizens to refer to the Regency's frontier with the Wilds, especially the frontier that runs along and through the Great Rift. See Local Directions.

Outworld Coalition: The name for the several groups of powers that fought against the Imperium in the five Frontier Wars. The coalition always included the Zhodani plus several *ad hoc* Vargr states (often created by the Zhodani for the sole purpose of serving as allies in these coalitions) and often the Sword Worlds.

Note the pre-Collapse meaning of "out," i.e., away from the Imperial core and toward the Zhodani in contrast to its current meaning: toward the Wilds of the former Imperium and away from other civilized areas, such as the Zhodani Consulate.

Penetration: Entry into jumpspace (j-space) from normal space (n-space). Also referred to as departure, j-transition or j-translation. Usually accompanied by brief biological unease, but this is not militarily significant as objects in jumpspace are unable to interact with other objects in jumpspace. (Exception, large gravity sources project "shallow" perturbing influences into jumpspace under some circumstances.)

Penetration is accompanied by gravitic "indentation" and "ripples" which can be detected by sensors with a hard fire control lock on a departing ship. Proper analysis of the penetration angle, jump envelope configuration, and entry vector can allow a prediction of the likely direction and distance of the jump. Prevention of such penetration lock-ons is one of the main missions of rear-guard screening forces in space combat. Area jammers and nuclear "white-out" patterns are typically used to obscure enemy view of friendly penetration for just this reason.

Point Identity: The concept of self possessed by all known biologically-based sapients, also known as embedded identity. Unlike *meta-identity* (which see) which comprehends itself as existing above, and independent of whatever bodies it may occupy, biological point identity consists of a self which cannot be meaningfully discussed without the living body which gives it all of its means for data collection and self-expression. Although most sapients have a concept of the "spirit" or "soul" which is an example of meta-identity, in all cases this soul simply disappears following the destruction of its body. This is in marked contrast to a vampiric intellect which can move from one electronic processing system, or "body," to another while retaining the same continuous identity.

Precipitation: Entry into normal space (n-space) from jumpspace (j-space). Also referred to as emergence, n-transition, and n-translation. Precipitation is accompanied by gravitic "bulging" and "ripples" which can be detected by passive sensors in normal space starting several minutes before impending precipitation. However, this phenomenon is sufficiently short-ranged that sensor operators must have a prior idea of the precip point in order to focus on it and detect it.

For those participating in the penetration, it is usually accompanied by brief but militarily significant biological unease, such as nausea or disorientation, which can confer a temporary advantage to native forces if they are overwatching the precip point.

Project Longbow: LONG Baseline Observation Window, the name for a system created in the 800s for observation of the galactic core and the Zhodani axis of exploration toward the core. Longbow was the largest known application of aperture synthesis (see **Fire, Fusion, & Steel** page 50) ever constructed, and was a deep Imperial secret throughout its existence. Longbow was created to observe the Zhodani core expeditions, and, after many decades of data accumulation and calibration was actually able to measure Zhodani shipping activity along the core axis. Because sensor signatures propagate at the speed of light, the observations were not in real time. Rather, the deeper into the core the sensor "looked," the older the signatures. Beyond a range of 1500 parsecs, whose EMS radiation had been travelling for about 4900 years, the Zhodani had not yet arrived in the time-space observation window, or TSOW (1100 – 4900 = –3800, and the first Zhodani Core Expedition only began in –4000). Thus the first Zhodani

expedition was being observed at a range of around 1500 parsecs while the seventh expedition (which departed in 750) was being observed at a range of only 110 parsecs in the year 1100. Observations of more recent events could only be made by moving the observing sensors nearer the target. (Conversely, observations of older events could be made by moving to an observation point much farther away from the event. Naturally this capability was only possible with jump drives that could move observers faster than light itself.)

The Longbow collector plane was located in the Depot/Lishun (1219 Lishun) system as part of the sprawling Imperial Navy facility there, aiding in its concealment. The collector plane was a disk of billions of linked receiver elements 46 billion kilometers in diameter, the size of the orbit 12 orbital disk (**TNE** page 195). This collector yielded a resolution at 1500 parsecs of 10 meters in long-wavelength infrared, and of half a meter in visible light.

Strephon was at Depot/Lishun observing Longbow activities when Dulinor assassinated one of his ceremonial doubles at Capital on 132/1116.

A more ambitious project, Longbow II, based on the lessons learned from the first Longbow, was begun under Strephon's direction in 1103. This project would use the entire width of the Imperium as its long baseline. With its sensor termini located in the Spinward Marches and Antares Sectors, in resolution but not sensitivity, Longbow replicated a passive sensor dish with a diameter of 160 parsecs (30 trillion kilometers), sensitive in all electromagnetic bands, from gamma and x-rays down through visible light and infrared all the way to long-wavelength radio. Longbow would be able to achieve a theoretical resolution of 0.05 *centimeters* at a range of 8000 parsecs, the distance to the galactic core. However, unlike the original Longbow whose disk-shaped receiver provided two-dimension resolution (width and height), Longbow II's long baseline lay only in the width dimension, along the galactic plane. This meant that this spectacular theoretical resolution was only in width, not height. Longbow II data was to have been collected at all of the listening points along the "bowline" and carried by jump-6 Imperiallines couriers to its "focal point" at Depot/Lishun where the data would have been synchronized (by such methods as pulsar emissions within the common field of view of all of the sensors), compiled, filtered, and enhanced by lengthy and demanding computer runs.

However, the calibration of such a complicated system was expected to require decades if not centuries before meaningful observations on the galactic core could be extracted, but the Civil War intervened, destroying the project. All Longbow II data is presumed to have been lost.

Project Jumpstart: An initiative approved by Emperor Strephon in 1103 to create a backstop in the event of a major breakdown of Imperial society. Jumpstart placed a number of high-technology caches throughout the Imperium, usually collocated with existing Imperial facilities: IISS and IN bases, offices of various Imperial ministries, and Imperium-subsidized schools, colleges, libraries, museums, and public works projects.

The Jumpstart cache is almost always a self-contained, autonomously-powered, hermetically-sealed, and sensor-shielded chamber buried deep beneath the ground. These caches are not, contrary to popular imagination and holovid entertainment, huge subterranean arsenals of high-tech weaponry. Instead, they provide information on crucial scientific and technological breakthroughs so that these can be recreated if they are lost as the result of a society-wide catastrophe. Much of this information is the broad base of mathematical, physical, biological, and engineering concepts on which these breakthroughs are built. This information also usually includes blueprints or prototypes of crucial equipment associated with these breakthroughs, such as superconductor technology and jump drives, or samples and cultures which must be synthesized to permit certain medical breakthroughs.

In order to reduce the chance of unauthorized use, many Jumpstart caches contain equipment or instructions which can only be used in conjunction with material or information contained at other Jumpstart caches.

Rape of Trin: In 1139 Trin (3235 Spinward Marches) was attacked by a vampire ship, the former Ziru Sirkaan battleship *Kishkii*, which destroyed most of the world's orbital facilities and bombarded the world's surface for several hours before finally crashing itself onto the world's surface. *Kishkii* was the sole survivor of a huge vampire fleet, estimated at between 60 and 80 vessels, which had deliberately advanced across four subsectors with what appeared to be the sole purpose of destroying Trin.

The rape of Trin killed 3 billion inhabitants outright, but tens of millions more died in the following months and years from radiological injuries. With the destruction of its orbital shipyards and port facilities, industrial facilities, and solar power collector/transmitters, the world's economic heart was ripped out, and Trin could no longer support itself, let alone repair the tremendous destruction done to the surface infrastructure. Although Trin received emergency technical and disaster relief from neighboring worlds and the Regency government, most of the five billion displaced persons had no choice but to emigrate to surrounding worlds. In 1202 Trin has still not recovered its former population or tech levels.

Kishkii's vampire fleet entered the Regency frontier in the Nusukha system (2127 Deneb), probably coming from Hysyl (2425 Deneb) in the Wilds. From Nusukha the fleet jumped to Prefecture (1827 Deneb), Gatooma (1730 Deneb), then Ishiri (1429 Deneb).

At each stop in the journey the fleet was faced by system defense forces which attempted to whittle the fleet down, slow it down, and buy time for couriers to leave the system and carry warning to surrounding worlds. However, it became clear that the fleet's target was none of the systems through which had passed thus far. This path led only through systems with poor quality (usually Class E) starports and gas giants. This allowed the vampire fleet to conduct gas giant refueling without being molested by large system defense forces.

From Ishsir *Kishkii* and her attendants jumped to Djar (1229 Deneb), Sipedon (0929 Deneb), and Askigaak (0629 Deneb). It was evident by now that the *Kishkii* fleet possessed an intact database on worlds in this region. From Askigaak the force jumped to Zyedl (0431 Deneb), and then to the Furens system (0334 Deneb). Here the vampire fleet met a task force commanded by Fleet Admiral Arthur Arkan. Arkan deployed the majority of his task force at the system's three gas giants. As expected, the bulk of the vampire fleet emerged from jump at the largest of the three. However, *Kishkii* was not among them. She entered the system at Furens, a water world, with a smaller force of ships. Although Arkan's task force adjusted quickly to this development, it was not enough to stop *Kishkii*, which had cleverly misdirected the human force. While *Kishkii*'s escort fanned out to form a high guard, *Kishkii*'s fuel shuttles siphoned fuel from the oceans below. Once refueled, *Kishkii* jumped from the system alone, leaving her remaining escorts to serve as a screen, in which duty all were destroyed.

Kishkii's next and final destination was Trin. She emerged in the system at Trin's 100-diameter gradient, and did not attempt to refuel. Instead she fired volley after volley of missiles and spinal mount fire at the world and its orbital facilities while completely ignoring the defending Regency ships that were battering her. The defenders were able to destroy hundreds of the missiles, but those that slipped through caused widespread destruction. No accurate count of the number of detonations has ever been made. As a last act of defiance, *Kishkii* dove into the world, adding to the damage already done.

Mop-up operations after the attack took months as each system along the vampire fleet's route and several parsecs to each side had to be carefully searched. Also, any ship sighting of a suspicious nature had to be investigated. Naturally there were a large number of sightings for years after the incident, but careful investigation proved them to be groundless.

In commemoration of this tragedy, the Trin's Veil subsector was renamed Trin's Shroud in 1140.

RASAC (Regency Artificial Sentience Analysis Commission): RASAC is the arm of the Regency government specially organized to study the phenomenon of virus and develop countermeasures for it. All virus-infected machinery, including vampire ships, are remanded to RASAC custody for study, followed by sterilization and repair or disposal.

Headquartered on Rhylanor (2716 Spinward Marches), RASAC has field offices on most Regency worlds, and has representatives on the staffs of all Regency Navy and RQS units.

In late 1201 a number of documents, reputedly stolen from secret internal RASAC files, were widely distributed to the Regency news media. These documents, if authentic, showed that RASAC was involved in more than research on virus countermeasures, but was actually involved in breeding domesticated strains of virus for its own use. The documents also implied that RASAC leadership was sympathetic to the notion that some strains of virus were living creatures with the same rights to exist as other sapient beings, and foresaw a future in which organic and electronic sapients would coexist in the same society.

The public response to these revelations (see **TNE** page 77) was naturally one of outrage. Special commissions appointed by the Regency Senate and Moot to investigate these charges are still under way.

Regency Election Observers: One of the hurdles of instituting representational reforms on a formerly feudal polity is the difficulty of ensuring fair elections on worlds which have no such traditions. Regency Election Observers are posted to observe elections on worlds which are new to democratic procedures or which are in danger of having their democratic processes subverted by some other force.

In only 60 years the REOs have established a tradition of dedication, honor, and courage. Hundreds of REOs have been killed while attempting to enforce legal and democratic standards, especially on the Vargr and Aslan-ruled *fait accompli* worlds (which see). See also "Lucifer," page 64.

Regent: The single executive leader of the Regency, essentially equivalent to the old position of Archduke of the Domain of Deneb. This position is held for life, and is obtained by formal designation by the previous holder of the office.

The title High Regent applies to a number of Regency officials appointed by the Regent and confirmed by the Regency Senate. The subject matter areas presided over by High Regents correspond to those of the old Imperial ministries.

RISS: Regency Interstellar Scout Service. Renaming of the Imperial Interstellar Scout Service, although the RISS has contracted quite a bit from its antebellum scope. Most of this is due to the sealed nature of the Regency borders. With no outward exploration, much of the service's mandate has disappeared, and with it one of the former IISS mission offices, the Exploration Office, has disappeared as well, officially disestablished in 1135.

The RISS retains two mission offices which continue its Imperial-era responsibilities: the Survey Office (formerly the Imperial Grand Survey, IGS) and the Communications Office. (The RISS also retains its four support offices: the Administration Office, Detached Duty Office, Technical Services Office, and Operations Office.) The Survey Office is responsible for resurveying and updating

the navigational charts of the Regency, and for mapping world surfaces when necessary. Since 1135 this office has also been made responsible for the Regency's navigation aids, including the commercial penetration corridors.

The Communications Office is responsible for operating and maintaining spaceside components of the XWeb (see page 21).

Much former IISS equipment and many of their facilities have been taken over by the Regency Quarantine Service (RQS).

RQS: Regency Quarantine Service. Stood up in 1131 using primarily IISS equipment, bases, and personnel. See page 19.

Safeside: Inside of the Regency Frontier, in the safe area.

Shriekers: The Shriekers are an omnivorous pseudo-mammalian race with four pairs of limbs and three pairs of eyes, native to the world Shvreeyiyi/567-908 (SM 1031, page 49). Each pair of eyes is specialized for a different area of sight: distant sight, near sight (less than one meter), and infrared sight. One pair of limbs are used as hands, ("manipulators"), and the other three pairs are used for locomotion. However, these limbs are short and the Shriekers can only move relatively slowly. The Shriekers have therefore developed a prosthetic device known as "walking legs." These legs are essentially jointed stilts harnessed to the six walking limbs that raise the Shriekers above the ground to allow more rapid travel. Because use of these stilts requires a surgical modification to the limb joints, these Shriekers are permanently crippled if their walking legs are taken from them. However, Shriekers skilled with these legs are able to perform any and all activities without removing them.

Shriekers reproduce sexually via sacs of eggs which are protected and fertilized outside of the body, one at a time. These unfertilized eggs are known to imperials unaware of their actual nature as "denuli gems" and can fetch as much as Cr10,000 each. However, Shriekers will not permit such use of their unborn offspring. See also **Adventure 10: Safari Ship** (SA).

Simulacrum: a clone fashioned to duplicate the original from which it was created. Such clones are raised in environments similar to those of the originals they are to simulate, to enable them to be as much like those originals as possible.

In the Third Imperium it was a tradition dating back to Paulo I (684-767, r. 736-767) that heirs apparent to the Iridium Throne would be cloned in infancy to provide stand-in "ceremonial emperors" to deal with the fact that the Emperor cannot be everywhere at once, although he is expected to be. This tradition later spread to high nobles, especially dukes and above.

The status of simulacra as individual human beings is problematic. Some emperors created programs to allow their simulacra to be rehabilitated and enter society as "real persons," while others simply ordered them to be destroyed like common animals upon their deaths. Imperial ethical theory is thus seen to have been deficient in the area of advanced genetics and bioengineering.

Squatters: This pejorative term is used by imperials to refer to the Aslan *ihatei* who flowed into the during the Final War. However, given friction between imperial and Aslan culture, the term is often extended to all Aslan, including assimilated Regency Aslan as well as Hierate Aslan.

Spinward States: Post-Collapse term used to refer to the governments centered around the Spinward Marches Sector which survived the Collapse and onset of Virus. Strictly speaking, the Spinward States include only the signatories of the 1132 Spinward States Accords that formalized the Quarantine. However, the term has become used for any of the surviving societies in the area, even those, like some Vargr States and the Federation of Arden, who were not signatories. These include the Regency, Zhodani Consulate, Darrian Confederation, Sword Worlds, Aslan fragments (those to spinward of the Great Rift), Vargr fragments (those sufficiently in the shadow of the Regency that they were able to escape the destruction wrought on the fragmented majority of Vargr society), and minor groupings, such as the Federation of Arden, Old and New Islands, Florian League, etc.

All of these states are "behind the Claw" in the imperial vernacular.

Terminal Noble: A noble who, due to the Representational Reforms, knows that he or she will be the last member of his or her line (see "Local Status of Nobility," page 17).

Third Imperium: Human-dominated interstellar society which existed between the years 0 and 1130 (Imperial calendar). This society was the largest interstellar society in Charted Space until 1117, when it began to disintegrate in a Civil War. The last act of this war was the release in 1130 of virus (which see), an artificially intelligent electronic combat system, which brought down all that remained of the Imperium in an event called the Collapse. The only survivor of the Third Imperium was the Domain of Deneb, since renamed the Regency.

Toons: Obscure imperial slang for Aslan, because they have only four digits on each hand.

Tower, the: The Great Tower of the Giyachii arcology which forms the most visible and recognizable part of the personal residence and offices of the Regent. As such, it has become the shorthand expression for the office and entourage of the Regent, in the same way as "the Palace" was used to refer to the office of the emperor.

Tree Kraken: Also known as land squid, the tree kraken is a 6 kg pouncer originally from Forboldn (SM 1808, page 38), but which has become distributed to many worlds in the Regina (C) and neighboring subsectors of Spinward Marches. The tree-kraken resembles the Terran octopus, but has only six arms, and is adapted to a terrestrial lifestyle, with a stiffer internal structure. Tree krakens live in trees and jump on their victims from above, using their excellent long-range binocular vision. Two to seven toothed suckers at the end of each arm scrape bits of flesh from the prey and place it in the ventral mouth, located between the arms.

Worlds with known tree kraken populations include Forboldn, Menorb (1803/Regina), Kinorb (2202/Regina), Jesedipere (3001/Aramis), Aramanx (3005/Aramis), Extolay (1711/Lanth), and Dinomn (1912/Lanth). It is rumored that the tree kraken's liver contains compounds useful in the manufacture of anagathics. (See also **JTAS** 1, OP, and **Best of the Journal** 1, SA.)

Tree Lion: Dangerous carnivore/pouncer native to Jesedipere (SM 3001, page 39), and now distributed to forested subtropical regions on many worlds of the Regina (Spinward Marches/C), Aramis (Spinward Marches/D), Lanth (Spinward Marches/G), and Rhylanor (Spinward Marches H) subsectors.

Tree lions resemble large 10-legged spiders (hence their other names: drop spiders and shovel spiders) massing 1 kg and covered with stiff bristles. Tree Lions live in trees and, using their shovel-shaped anterior limbs (hence, you know what I'm going to say), excavate pits around the base of their tree homes which they line with a smelly, sticky web which is attached to the lion's lair by "telegraph lines" which transmit the vibrations of prey struggling in the pit. The tree lion rapidly descends on another web line and delivers a paralyzing bite to its prey. They only rarely present a mortal danger to adult humans (although they can make short work of toddlers), except those who are allergic to the venom. Most humans only suffer paralysis of the bitten limb for 1D6x10 minutes; clearly the worst thing about tree lions is the shock of having a nasty, sharp, prickly two-pound spider suddenly sitting on your shoulder. (See also **JTAS** 18, OP.)

The profusion of creatures named "Tree something" in the Spinward Marches was the source of much jocularity in the Imperial Core (which see) during the antebellum period, when the populations "behind the claw" (which also see) were commonly regarded as frontier rubes by Imperial sophisticates. These jokes usually portrayed the people of the Marches as sodbusters who always had their noses in the dirt and were easily surprised by anything above them. It was joked that "Marchers" called air rafts and airplanes "tree cars," and called birds, "tree...thingies." However, we all know who got the last laugh.

Tree Rat: Also known as the Focaline Tree Rat because of its world of origin (2607), the tree rat is an arboreal omnivore similar in appearance to the Terran rat, although it is more intelligent, approximately equivalent to small Terran monkeys, with comparably complex social structures. Adult tree rats mass 3-4 kg and are 70-80 cm long, with two-thirds of this length being the rat's prehensile tail.

Although they can be pests, raiding orchards for the fruits that form the majority of their diet, they also perform a beneficial role by preying on more serious pests, such as insects, mice, and true rats. They have an excellent sense of smell, and are intelligent enough to be readily trained to detect fires, human emotional states, and suspicious substances. They are also clean and easily housebroken. They have become widely distributed through human space, and are common pets or mascots aboard starships because of their intelligence and friendliness, useful skills, clever and amusing antics, and their ability to keep starships free of vermin.

They are very adaptable, able to rapidly shed or grow thicker coats in response to temperature changes. Tree rat fur is reddish-brown, but can vary to extremes of chocolate or maroon. Part of the tree rat's charm is its natural curiosity and mischievousness, which asserts itself in the collecting of small, shiny or colorful objects (tools, keys, money, jewelry) which it will hide in its nest. They quickly learn to play with their owners by obviously stealing a valuable item and then leading their owners on a chase to get it back. (See also **JTAS** 10, OP, or **Best of the Journal** 3, OP.)

True Father/True Mother: The original person from whom a clone or clones are made. Also referred to, less romantically, as "donor," "source," "original," "pattern," or "objective parent." Clones of an original "natural" person are euphemistically called "true sons" or "true daughters" of the original.

Vampire Fleet: A group of ships controlled by virus. Such fleets often constitute a group mind, in which the fleet is the whole organism and each ship performs a specific function for that organism, analogous to an organ within an organic body. Such fleets are extremely dangerous. Not only can they infect other systems like most any virus-controlled system can, but given their control of an entire fleet of ships, their means for inserted their code into target systems is dramatically increased. Furthermore, because they possess the mobility and firepower of a fleet of starships, they can easily destroy what they cannot infect. Many of the dead worlds in the Wilds were killed by vampire fleets which bombarded life support systems, power grids, and containment domes until life became impossible.

Vampire Ship: A starship controlled by virus. Such a starship is actually a thinking, albeit artificial, being in its own right. The virus infestation can be said to have brought the inanimate ship to life. Where once the ship was a thing, it is now a creature.

Virus: The artificial intelligence weapon created and unleashed in the last days of the Final War, and which brought about the Collapse. Virus in its many mutated forms can infect almost any electronic data system, and once established within such a system, functions as a self-aware brain, controlling any and all systems and equipment to which the electronic system was connected.

Wildside: Outside of the Regency Frontier, in the Wilds.

Referees Only

REFEREES' SECTION

This section is for the use of referees only, as it details areas of potential mystery and interest to the players which can be resolved and detailed over the course of adventuring. These items are particularly those which are not common knowledge to the population at large.

Players will find that it is easier and more rewarding to roleplay characters who do not know a secret fact if they themselves as players do not know these details. After all, it is only in this way that PCs can experience the thrill of discovery as a campaign unfolds. For this reason, players will enhance their future roleplaying experiences by refraining from reading any further into this section.

So if you wreck your campaign by reading too much, don't come crying to me.

THE ANCIENTS

Yes, the Ancients are the Droyne, kind of, and there's also this guy called Grandfather...(**Secret of the Ancients**, OP, etc.) but such things are not known by the general public, nor even for certain by Smart Scientists. For purposes of campaign development and play, the Ancients can safely be assumed to be out of the picture.

THE REGENCY

Perhaps the one major identity crisis being faced by the Regency is the tension between imperial traditions of governmental secrecy and autonomy and the newer Regency and Norrian values of openness. While openness has been dramatically successful in cases like the Psionic Reforms, there has been a basic reluctance by the Regency government to be completely honest with its citizens about some of the dangers they have faced since the Collapse. Prudence dictates that opportunities for public panic must be limited. However, insufficient openness can create unrest by convincing the public that things are being concealed from them.

Although Norris certainly championed governmental openness, he also demonstrated great ambivalence on this score. Some of his most effective acts, such as appointing himself Domain Archduke in 1116, relied on his having a certain amount of secret maneuvering room. Acutely aware of this, he would have deliberately preserved such prerogatives. Tendencies toward hidden-hand ruling styles would only have been reinforced by the influence of Avery, trained in the autocratic imperial style of his ancestors.

Secret Regency Calibration Points

The Regency maintains or interdicts calibration points other than those shown in the Data Section (pages 35-72). These include CPs intended for the normal strategic mobility purposes, but also include special-purpose CPs, such as those allocated to Project Blackheart, see below. Rather than listing any here, let it suffice to say that referees should feel free to add secret CPs at points where their campaigns require them. People who look at maps of the Great Rift with a creative, analytical eye will be able to work out where they think useful CPs would lie, and there is a good chance that Imperial and Regency Navy officers have had exactly the same thoughts.

Note also that an interstellar hex can hold more than one calibration point, all of which would be, for all practical purposes, unobservable one from the other.

Firebreaks

Significant planning was done for the possibility of a massive virus breakthrough and the measures that would be required to contain it. These plans involved the phased fallback of the Regency Frontier in order to maintain a defensible perimeter. Depending upon where the Quarantine had been breached, certain areas of the Regency would have to be abandoned as undefendable. Rather than attempted to evacuate these worlds in a disorganized fashion, which would only increase the risk of further infection, these worlds were to be immediately excluded from the safe perimeter and their evacuees would have to pass through the full-up Quarantine just as refugees today do. This policy would thus trade the "cold-hearted" abandonment of many innocents for the increased chance of survival of the whole of the remaining civilization. However, in the hard calculus of virus and the Collapse, these coldly pragmatic principles seem the only rational approach.

For obvious reasons these plans and the list of worlds they would abandon as "expendable" are political hot potatos/toes. With the limited opening of the outrim frontier, these plans are being dusted off once more.

Project Blackheart

In late 1110 the emerging lessons of the just-completed Fifth Frontier War were used to lay the foundation for a new Imperial military capability to be used in future frontier wars. The most important of these lessons was the validation of the "reserve" strategy rather than the "crust" strategy to defend the Marches. Rather than having to maintain impervious forward defenses at all points along the border, the reserve strategy allowed for initial enemy penetration which would then be defeated in depth and eventually reversed through the use of reserve forces held in central locations.

The Zhodani siege of Efate was broken by just such an approach. The world of Louzy (1604) was the chokepoint for of all Zhodani shipping to Efate, and rather than sacrificing themselves in a "hold at all costs" stand, the Louzy system defense force "went to ground" where it remained a threat, able to gather intelligence on Zhodani operations and conduct attacks on their supply lines. After several months of this constant disruption of the siege, the Zhodani campaign into the Regina subsector was effectively abandoned (**The Spinward Marches Campaign**, OP).

An ambitious program to enhance future such operations in the enemy rear was instituted and named Operation Blackheart (*TD* 11). Blackheart consisted of the construction of a number of calibration point bases within the Imperial boundaries which would provide secure bases for the conduct of deep interdiction in the Zhodani rear areas. Each of these bases was home to a squadron of newly constructed *Nemesis*-class Intruder Cruisers, placed in mothballs awaiting hostilities.

Tailor-made for their intended mission, the *Nemesis* cruisers are equipped with jump-5 drives, fuel tankage for jump-6, black globe generators, powerful spinal mounts, but no secondary or tertiary armament. Their jump drives confer high operational/strategic mobility from their bases, and the fuel capacity allows jump-3 stand-off raids without refueling. The tactical profile of the *Nemesis* squadron is to jump into an enemy-occupied system, raise the black globes, and coast (hopefully) undetected to close firing range while charging the jump drives for jump. Once in firing range the cruisers drop their globes and open up a high-intensity volley with their powerful spinal mounts, doing maximum damage in minimum time, and then immediately jumping away before the enemy can adjust to the attack. Thus the provision of armament other than the spinal mounts would simply detract from the mission. And as these raids will primarily be against logistical facilities, forward depots, fleet trains, and other high-value soft targets, the *Nemesis* cruisers are not expected to have to stand up to heavy enemy fire in any event.

Blackheart CPs are especially concentrated in the Abyss of the Vilis (F) and Lanth (G) subsectors.

Because of the good relations between the Zhodani and Regency between 1110 and 1201 there has been no chance for the *Nemesis* cruisers to be used in their intended role. The weak point in the Blackheart program was the necessity of anticipating hostilities sufficiently far in advance for the *Nemesis* crews to be assembled, trained up, and have time to reactivate the ships. However, RASAC (see Library Data) was conducting preliminary studies on the feasibility of adapting the Blackheart force to "Man out of the Loop Autonomous Operations." RASAC was ordered to terminate these studies by direct communication from the First Regent.

Project Longbow

The Library Data entry is correct, although incomplete. After its creation, the Longbow project became an umbrella organization for a variety of long-range observation and intelligence gathering systems focused on the Zhodani and galactic core, which included natural and augmented psionics as well as the Longbow II project already discussed. These included smaller versions of the Longbow VLB array, but placed much closer to the core, many sectors to coreward of the Vargr extents. These observations were carried across the light years to the Imperium by relays of couriers, similar to the old Xboat network.

Many of these observations were connected to ongoing psionic research, particularly attempts to isolate the physical phenomena (as opposed to supranormal phenomena, see Psionics, below) associated with psionic activity. So in addition to collecting and processing EMS data in the normal fashion, this EMS data was examined for evidence of psionic activity by wiring human psions into the loop.

Although there was little unambiguous evidence of psionic signals being received this way, the research was continued as a great number of useful data was being generated. (This included the creation of baseline data on how typical EMS signals are perceived by psionic perception which had many useful applications in signals processing technology, the establishment of data protocols that would allow the electronic storage of telepathic or teleperceptive visions for later observation by other psions, and, entirely by accident, the discovery of the amounts of electronic information that could be pushed through a human brain without burning portions of it out.)

Longbow observations in the last years before the disintegration of the Imperium showed what appeared to be space combat along the core axis, headed toward the Zhodani Consulate. Regency intelligence agencies believe that this was connected to the observation of unusual Zhodani naval activity in 1119 (see **Survival Margin**, pages 22-23). These events presumably prompted the hasty core expedition of 1149 which ended in failure, and is in turn connected to the current upheavals behind the Exodus.

However, the final dramatic Longbow observation was actually connected to the Imperium's disintegration, as it was the reason for Strephon's absence from Capital on

the day Dulinor assassinated one of his doubles (**Survival Margin**, pages 7-9). It was one of the few unambiguous examples of the reception of psionic signals across interstellar distances, and was dramatic enough and connected to enough other events that it required the emperor's personal attention.

The signal was carried by a normal EMS wavefront emanating from the core, although of great strength and coherence. It was perceived by psions as a human female, dressed in black, standing before a city skyline. Also in the background was a scene of a desert with two astronomical bodies hanging above the horizon.

This vision was projected into Strephon's mind by psion Jonathan Crocker, the psionic relay on duty at the Longbow focal point during Strephon's visit. Both Crocker and Strephon agreed that the vision was not a "still picture," but a motion picture of a pregnant moment, waiting for an event or a message to be delivered, in Crocker's words, "one of those moments when the birds suddenly stop singing for no reason." Whether this was their joint perception of a real phenomenon or simply Strephon responding to Crocker's impression embedded in the projection is not known.

The woman was holding a staff which may have been technological in function, and had a bearing of great, even regal, dignity which was enhanced by the perceived timelessness of the image. Strephon immediately began thinking of the woman as an empress.

As an EMS phenomenon it was advancing toward the galactic rim at the speed of light, and projection of its propagation indicated that its arrival was associated with several Longbow stations having inexplicably gone silent. This implied a danger of some kind and required Strephon's attention. Future projection of the wave established that it would reach the Imperial border in 1205 at Meridian 78 along the Prime Radial (**Survival Margin**, page 7), using the standard Imperial coordinate system (page 19, **MegaTraveller Imperial Encyclopedia**, SA). This designates the point 78 parsecs to coreward of Reference (0140 Core) on the line running directly from Reference to the galactic core. This corresponds to the then coreward border of the Third Imperum in subsector A of Lishun Sector.

The gravity of this information, combined with uncertainty of the security of the important Longbow headquarters prevented Strephon from accurately referring to this journey (**Survival Margin** page 13, *TD* 15), but many of the key Longbow personnel were eventually able to make to Usdiki where they helped Strephon's government in exile formulate responses to this crisis. This included the eventual creation of Avery (see "Avery Aledon/Alkhalikoi," below). Raw data from the Longbow II program was removed from Depot/Lishun for transport to Usdiki, but was lost *en route*. Its fate remains unknown.

These details have been kept from the public for the simple reason that, until more information is available, there is no point in having the public believing the Millenium is arriving in 1205, making everything that they do pointless.

Psionics

The Imperial armed forces had a number of highly secret psionic programs in hand for many years, in the Marches as well as elsewhere in the Imperium. However, the Domain of Deneb possessed the highest density of these programs, including operations at Wypoc (2011 Spinward Marches), Regina (1910 Spinward Marches), Vanejen (3119 Spinward Marches), and HRD (1623 Deneb), among others. These programs were quickly expanded (secretly from 1116 on, and publicly from 1133 on) to create the broader capabilities available to the Regency today.

Artificial Psionics: Advances in the understanding of the electrochemical processes in the human brain allowed the Imperium to experiment with what became known as "artificial psionics," although it is more accurately referred to as broadcast electrochemical-electrical synaptic replication, or BECESR (pronounced "beezer").

The goal behind BECESR is the creation of a psionic-type capability which would still function in a degraded psionic environment (see psionic countermeasures below). Thus while natural psionics would be incapable of functioning, artificial psions would be capable of replicating some of their useful functions.

BECESR technology is still in the experimental and field test stage, with certain elite (and naturally secret) groups of military personnel evaluating the equipment. Subjects fitted with BECESR technology are known informally as "wireheads," although this technology is almost never externally visible.

Natural Psionics and Supranormal Theory: Because BECESR technology functions within normal physical limitations, such as the speed of light limiting the broadcast of electrical transmission, this technology is considered to be inherently limited when compared to true "supranormal" phenomena.

Psionic researchers believe that certain psionic manifestations are truly instantaneous (i.e., the receipt of telepathic information has nothing to do with the speed at which light travels the distance between data and observer) because they represent the intrusion of a higher reality into the physical world. This theory posits that this higher reality exists everywhere simultaneously and is "adjacent" to all points in the physical world. Thus if telepath A reads person B's mind he is not actually perceiving energy emanating from B. Rather he is directly accessing the higher reality, specifically that part of the higher reality which is manifested in the physical world as person B's "spirit." This would mean that such readings would be instantaneous rather than being limited by the speed of light. This theory has not yet been adequately tested in the Imperium or Regency, as psionics is a young, imprecise, and often quite subjective science. Furthermore, the ranges at which telepathy and teleperception can reliably be achieved are not great enough to to demonstrate a measurable light-speed delay.

This concept links the science of psionics to the science of jump space, and many researchers in this area group both disciplines within the larger category of phenomena called the "supranormal."

Psionic Countermeasures Research: Psionic Countermeasures, or PCM, has long been a major area of research by the Imperial armed forces. The psionic shield helmet (TNE page 344) is the best-known example of these efforts, and has been in common public use within the Spinward Marches for many years.

Most PCM thought uses the analogy of ECM and ECCM in the electronic spectrum. PCM would attempt to "jam" psionic activity by interfering with either the quality of information at the target (as the shield helmet does) or the ability of psions to exercise their talents.

However, in reality (or "suprareality" as the researchers like to point out), the principles of line-of-sight between psion and the object of influence are not clear, and may not pass entirely through the physical world as it is commonly experienced (see supranormal theory above), and therefore may not be targetable. Nonetheless, the impinging of psionic influences into the world of "normal" physics argues that these normal principles can be turned back against psionic processes.

Military psionic researchers in the Regency have been split into two main groups, those working on psionic countermeasures and those working for psionic superiority. The countermeasures school reasons that the Regency can not overcome the Zhodani headstart in psionic applications, and finite resources are best spent to "cut the psionic leg" from under Zhodani standard operational procedures, thereby throwing them into chaos which Regency forces can take advantage of.

The superiority school does not deny the Zhodani lead, but believes that psionics are sufficiently powerful that their effective use, even in the face of an enemy capability, is more effective than denying both sides the use of the "psionic spectrum." These researchers maintain that creative research can discover immature applications that the Regency can rapidly exploit into narrow but specific "bandwidths of spectrum superiority."

The two groups, which bitterly compete for finite funding, have been united recently under the concept of "escalation dominance" which attempts to synergize the strengths of both approaches. In escalation dominance Regency forces would be able to set the conditions under which psionics were used, and retain the initiative at each level. Under conditions in which enemy psionic activity represents only a minor threat to friendly operations, PCM efforts would be minimal, allowing friendly psionic activities to be undertaken without interference.

At intermediate levels, PCM would be increased, but with gaps in coverage—"windows" where friendly psionic capabilities could be exercised. Thus friendly superiority in certain psionic capabilities ("bandwidths") would be combined with PCM against areas in which the enemy held the upper hand.

At the highest level Regency forces would be able to simply take the entire psionic arena out of play, thus blowing all psionics, friendly and enemy alike, "off the air."

Regency Psionics: Naturally there are psionics in the Regency who are criminals and who disregard their vows, but their numbers are actually very small, because Regency psions maintain a strict policy of internal monitoring via telepathic and teleperceptive skills. In other words, they do not grant the rights of privacy to each other that they grant to the non-psionic public at large. As with the monitoring, punishment is usually administered internally within the psionic community.

Minor and first-time infractions are dealt with by education, correction, and moral suasion, but serious crimes can be punished by psionic assault or drugs. Capital offenses are turned over to the Regency Ministry of Psionics, which maintains psionic courts and correctional facilities for just such purposes.

All publicly-known psionic schools are ethical (i.e., they practice internal monitoring and correction of their members). However, there are underground psionic schools which exist to encourage antisocial psionic development. Most of these have front operations of some sort, but these are never psionic schools and none are actively connected to a legitimate school.

Project Jumpstart

The Library Data is correct, but does not contain in-depth knowledge of the function of these caches that is not available to the general public.

Except in rare cases of accidents where individuals are trapped or sneak into the sealed

chambers, Jumpstart caches are unmanned and fully automated. Because they are unmanned, many Jumpstart caches are passive resources, requiring individuals to know of their existence and location in order to use them. Some Jumpstart caches are accompanied by subtle clues planted in their surroundings to assist inhabitants of a shattered society to find them. The fact that these caches are often sited beneath museums, libraries, universities, etc., is an example of this, because the location is one associated in the local mentality with information and knowledge. However, on some worlds the clues are quite sophisticated, being associated with local mythologies and folkways that would be expected to survive a civilization-destroying catastrophe.

Some Jumpstart caches have sophisticated sensor systems that determine whether local society has collapsed. The simplest of these is an electronic dead man's switch, an indicator that the Imperial facility above has ceased functioning. Others have passive EMS sensors emplaced on the surface which could determine, for example, the sudden absence of any broadcast transmissions on a high-tech world. The continued absence of these transmissions might activate clues to the location of the cache for self-selecting individuals. For example, surface dispensers could release written instructions that would only be comprehensible to literate, Anglic-speaking populations. These notes could lead explorers to mechanical, electronic, or holographic terminals that would screen individuals for pre-selected characteristics and grant them entry to the facility.

These could be as simple as electronic "toys" which would select for intelligent and technologically sophisticated individuals (see the novel **To Dream of Chaos** for an example of this, although it does not specifically involve a Jumpstart cache), or as complex as simulated reality persons or situations which would require explorers to demonstrate certain levels of knowledge or education, or certain cultural assumptions. (For example, Jumpstart archives would be programmed to not admit simple Vargr corsairs, for example.)

All Jumpstart caches include an entrance hall where a moving slideway carries the visitors past impressive holographic displays of the glorious accomplishments of the Third Imperium, accompanied by a recorded message from Emperor Strephon on the value of the Imperium and the importance of its preservation (see **Survival Margin**, page 3 for text).

Avery Aledon/Alkhalikoi

Although assumed by many to be a clone of the last emperor, Strephon Alkhalikoi, Avery was in fact the biological son of Strephon and the dead Empress Iolanthe. Avery was conceived *in vitro*, using frozen ova that had been removed from Iolanthe in her youth. However, Avery was geneered (see Library Data, "Geneering") for psionic capabilities of the type Strephon witnessed on his visit to the Longbow focal point in 1116 (thereby missing his "assassination" by Dulinor, see **Survival Margin** page 7). The name Avery means "spirit ruler."

The Regent Consort was not killed in 1149 as announced. Instead, he departed on a mission to the galactic core, in command of a force of natural psionics, artificial psionics, and ships controlled by a specially bred strain of domesticated Virus. His mission, for which his father Strephon geneered, trained, psychologically conditioned, and raised him, was to follow up on the Longbow data and determine its relationship to the Zhodani core expeditions and its threat to the Imperium. At the time of his departure the "Empress Wavefront" was 17 parsecs to coreward of the Regency Frontier, in the Vargr splinters.

Rape of Trin

The battleship *Kishkii* was originally built at the Trin shipyards as ISS *Golden Redemption* in 1080. She was assigned to one of the Corridor reserve fleets which retreated into Vland following the loss of Corridor to the Vargr invasions. There she was added to the growing forces defending Vland. With the restoration of the Vilani Empire (Ziru Sirkaa), *Golden Redemption* was renamed *Kishkii*. Because she destroyed herself in her dive onto Trin, her original identity as *Golden Redemption* is unknown to Regency authorities.

Regency Quarantine Service

Deceit and corruption are antithetical to the Regency's principles and the fact that compartmentalized secrecy increases the risk of Virus infestation. However, people are people. (So why should it be, that we should—oh, never mind.)

By 1202 there is a small but well-established ring of corruption within the RQS ranks. The ring is essentially a Wilds import business catering to the wealthy, often members of the terminal or disenfranchised nobility.

None of the members of the import ring intend any harm to the Regency, nor any *real* violation of the Quarantine. All would claim that they are utterly loyal to the safety of the Regency and its people, and there is truth in that. Many of them have selflessly risked their lives in the performance of their duty many times, and most of them would unhesitatingly give up their lives to defend against a vampire invasion.

All they are doing is allowing a small number of harmless items into the Regency that would otherwise be uselessly piled up in impoundment areas, waiting for their turn with inspectors who carry inspection backlogs measured in years. And after all, if they make some extra money on the side, that's only fair compensation for all of their years of sacrifice on the Quarantine line, risking their lives to stop virus, right?

There is truth in that as well. That is the beauty of any form of corruption. It starts out innocuously: small irregularities that are not against the true spirit of the rules, just against little technicalities that don't apply in this case. A victimless crime. And boundaries erode until the point, completely unanticipated by the individual, that they have been unwittingly crossed. (For an excellent study of this phenomenon see the 1981 film "Prince of the City.")

It began when wealthy refugees begged RQS personnel for the opportunity to revisit their old homes to recover important items. Although RQS personnel initially refused these requests, knowing that any exceptions would breed more exceptions and an eventual breach of the Quarantine, eventually some gave in. After all, what would it hurt if the items weren't electronic systems that could harbor virus?

In the Wilds adjacent to the Regency, as everywhere in the collapsed Imperium, there lives a small but determined population of stateless Free Traders who dodge innumerable dangers in the pursuit of their age-old profession. These brave individuals were willing and able to undertake these missions, and why shouldn't they be allowed to make a living? They've got it tougher than any Regency citizen, and so long as the Regency's security isn't breached, what would it hurt this once?

These arrangements grew to allow the sale of priceless, unique pieces of imperial art or items of historical interest, recovered from an abandoned museum, government office, or noble's estate somewhere in the Wilds. As the black market in these items quietly grew, its patrons began making wish lists of items they would like to see recovered.

Inevitably, someone threatened to blow the whistle on the operation. The first life that was taken to ensure silence was probably an accident, but then even that accident had to be concealed. RQS duty is dangerous, involving operations on the Frontier where its members are subject to the many normal mishaps of interstellar travel, not to mention the chance of encountering Virus, Vargr corsairs, etc., so operational losses are an unfortunate, though not unexpected fact of life.

RQS Secret Files: It is a well-kept secret that there were a great many close calls in the period 1132 to 1170 that could have rivalled or even surpassed the carnage of the Rape of Trin. Although a certain amount of publicity on the danger of vampire penetration was deemed by Regency leaders to be useful in ensuring public compliance with anti-viral measures, it was feared that too much fear would only undermine the stability of Regency society. For example, if it were to become commonly known that major worlds such as Deneb, Aramis, Rhylanor, and Regina had been seriously threatened by vampire incursions, a massive exodus from the Regency rims could have resulted. Such an exodus could have crippled economically crucial worlds such as Deneb and dealt a serious blow to the Regency's ability to continue to defend itself.

Was the risk of massive slaughter for these unwarned populations worth the chance to keep crucial Regency shipyards and factories running? This was the judgement of High Regent Avery Aledon and his adoptive father First Regent Norris.

Deneb alone was threatened by a "Class 1" threat on no fewer than six occasions in 40 years. Many such threats were destroyed at the last minute in deep system engagements in their target systems. In one particularly dramatic case, a vampire ship had worked its way across the Regency by masquerading as a merchant vessel, and had arrived in orbit around Rhylanor, its target. However, when it attempted to open fire, its otherwise competent circuitry discovered that its missile magazines were empty. The ship was dealt with rapidly by Rhylanor system defense, but the incident was not made public.

Other examples include the fact that many of the reports of suspicious ships following the passage of the *Kishkii* vampire fleet (see Library Data, "Rape of Trin") were in fact accurate reports of vampires. In the event, these "slave" ships turned out to be harmless without the presence of *Kishkii* to control them, and they were taken over by RASAC for study. Consistent with the policy of keeping controversial RASAC initiatives secret, the significance of these suspicious sightings were covered up by RQS authorities, with the knowledge and approval of higher levels, including High Regent Avery and the First Regent.

THE DARRIANS

The Star Trigger

Through much of their recent history, the fabled Darrian star trigger was only a bluff. The Maghiz event of -924 was the result of Darrian activities, but the Darrians were unable to reproduce this event. By keeping this fact a secret, the Darrians were able to use the purported star trigger as a powerful deterrent weapon.

However, in the late 1110s, the Special Branch was able finally to isolate the true chain

of events that caused the catastrophic flaring of Tarnis (see Alien Module 8, Darrians, SA), and by the late 1120s were able to produce a functional Star Trigger weapon.

The actual Star Trigger consists of three parts: two meson communicators and a probe which penetrates deep into the star. It is equipped with a cooling system that vents vaporized tungsten into the star as it descends. This creates a column of tungsten within the star that extends behind the probe. When the two meson beams are deployed so that their beams intersect at the proper angle within the tungsten column, intense solar flares result in about 10 hours. (The bluff Star Trigger consisted only of the probe, but without the tungsten emission and the interference of the meson beams, was unable to accomplish anything except scare people.)

Thus the star trigger requires three platforms: one each for the meson communicators and the probe itself. The meson communicators must be deployed so that they intersect at a very obtuse angle, requiring that they be many thousands of kilometers apart, on nearly opposite sides of the sun and far enough away to be able to directly communicate with each other outside of the stellar interference. The system can be deployed from one starship which carries one meson communicator and deploys the other communicator and the probe aboard drones. More often, however, two ships would be used, each with a meson communicator and one or both launching probes.

In theory, a star which already possesses high metallic concentrations could be triggered by the meson communicators alone, but research in this area has been understandably difficult to carry out.

Darrian Tech Level 16 Navy

Sad as this might sound, it turns out that the much-respected Darrian TL-16 fleet is something of a fraud as well. Although the Imperium derived substantial advantage from their single tech level advantage over the Zhodani, this was because the TL-14 to 15 gap offered many significant advantages, not least of which was the three-fold increase in power:mass density in nuclear power production.

The TL-14 to 15 gap is also accompanied by increases in efficiency in many electronic systems, plus the appearance of a crucial brand-new technology, the force field, better known as the "black globe generator."

However, the TL-15 to 16 gap's improvements are mostly of the incremental variety, and these incremental improvements are not as dramatic as the TL-14 to 15 nuclear power efficiencies. Because of the Regency's new mastery of TL-16 starship systems, gained over the past 70 years, the nature of this additional bluff is now common knowledge to any Regency citizen who cares to think about the subject.

Likewise, any TNE player can deduce from examining Fire, Fusion, & Steel, that these improvements are primarily incremental in nature as follows.

No Change: Armor, Jump drive, Control systems, laser, maser, and radio communicators, solar collector panels, Contra-grav, Beam pointers, Master fire directors, Laser gravitic focusing.

Increased Efficiency: Power production, Avionics, Computers, Meson communicators, Active EMS and jammers, Ladar, Densitometers, Neutrino sensors, Neural activity sensors, Passive EMS, Area jammers, Nuclear dampers, Meson screens, Sandcasters, Force fields, Fuel purification, Fuel cells, Nuclear power plants, Batteries, Homopolar generators, Explosive power generation, Solar sails, Particle accelerators, Meson guns, Laser focal array volume.

Combat Advantages vs. TL-15: Advantage for jamming TL-15 radio, *no advantage* for TL-16 weapons firing against TL-15 sandcasters.

New Capability: Repulsors and Manipulators.

Darrian Patrol Cruisers: One little known fact (because it is carefully concealed by both Regency and Darrian sources) is that all of the TL-16 "Darrian" Patrol Cruisers are in fact manufactured in the Regency. The design of these vessels and their subsystems are based on Darrian examples, but these were used as templates to guide the Regency's developing TL-16 industrial base to avoid developmental blind alleys before finally hitting on workable configurations.

There *are* TL-16 yards on Daryen, but these are engaged in pushing forward the frontiers of advanced starship design (again, using relic Darrian examples), allowing the vast Regency yards to concentrate on quantity.

Darrian Secret Base

This, at least, is not a bluff. The Darrians have for centuries maintain a secret base, used by its high-technology mobile deterrent fleets and Special Branch star trigger detachments. The base is a large (200 kilometer diameter) ice ball which provides starship refuelling. Over the years a vast infrastructure including repair, logistical, medical, and rest and recreation facilities have been built into and around the body. It is therefore in all respects comparable to the most sophisticated of the Regency Calibration Points.

The base is at all times guarded by a defensive squadron of SDBs to prevent its use by unauthorized agents. It is located in grid 0423, 2 parsecs to rimward of Zamine.

THE ZHODANI

The interior of the Zhodani Consulate, one or two sectors to coreward of the Regency, is wracked by open warfare and breakdown of social cohesion as Zhodani fight Zhodani for reasons that are as yet not understood. Zhodani society has been the most stable human civilization ever created, and Imperial sour grapes to the contrary, was never known to harbor any deep-seated, simmering dissatisfactions or internal contradictions.

Regency authorities believe that the Zhodani breakdown is related to the "Empress Wave" which has been passing through the Consulate for the past few decades, centered as it is an average of 40 parsecs farther to coreward than the Regency. The same way that Longbow outposts were observed to go off the air after having been reached by the Empress Wave, the Zhodani appear to be the victims of whatever phenomena follows the arrival of the wave. Because it appears to have a clear psionic component, it is reasoned that Zhodani society, with its social structure based on psionic powers, is uniquely vulnerable to the effects of the wave.

Based on data received with Avery, Longbow did not have information on the nature of the psionic signals on the other side of the Empress Wavefront, which by itself appears to be innocuous. It is likely that it is a phenomenon behind the wavefront observed by Longbow that is the actual cause of the Zhodani problems.

Without further data on the relation between the wavefront and the Zhodani breakdown it is impossible to project how the Regency will be affected beginning in 1205 when the wave breaks on its borders. This was the purpose of Avery's mission which departed in 1149, which would also examine the wave's affect on the Vargr to see how this compared with the Zhodani experience.

Evidence of the Zhodani breakdown was seen as early as 1119 in the form of starship movements which implied warfare within the Consulate. At this point the wavefront was approximately halfway across the Consulate, on a radius 26 parsecs to coreward of the Regency's coreward borders. However, it is not actually known if the strife is caused by a delayed effect at some point after the wave's leading edge has passed over or whether the Zhodani could have directly infected themselves with some related phenomenon through their traffic coming down the core axis (see Library Data).

The "intimations of doom" described by Zhodani refugees are a response to received psionic impressions of the unravelling of their bedrock-solid society as well as to the wavefront itself.

By the Way: The phenomena alluded to above are not related to past draft ideas about the "Primordials," "Sparklers," or "Baddies from the Core," although there are certain similarities, at least of origin. So you need not bone up on the old rumors.

THE ASLAN

Regency intelligence services have observed evidence of several virus outbreaks in Aslan territory in the Riftspan Reaches. These are connected to Aslan efforts to reunite the spinward Hierate with its main body across the Great Rift, or at least to allow trailing Aslan to emigrate to the still-intact societies to spinward.

During the Collapse a great many Aslan began migrating across the Rift to safety, so that all of the circa 1130 Tlaukhu clans are today represented in the transrift territories, in at least small numbers. Due to the strength of Aslan familial ties, these small clan groups cannot resist the desire to reach out to their surviving brethren in the Wilds to bring them to safety as well. This sentiment, although laudable, increases opportunities for Virus infection. For this reason RQS inspections of Aslan immigrating to the Regency fait accompli worlds are increasing in thoroughness.

Aslan leaders both in and outside of the Regency interpret this development as anti-Aslan prejudice, intended to limit Aslan immigration into the Regency. The Regency is reluctant to explicitly present its reasons, for fear that this would be taken as either an attempt to interfere with Aslan internal affairs or as criticism of Aslan culture. Either way, the likely response is easily imagined.

THE VARGR

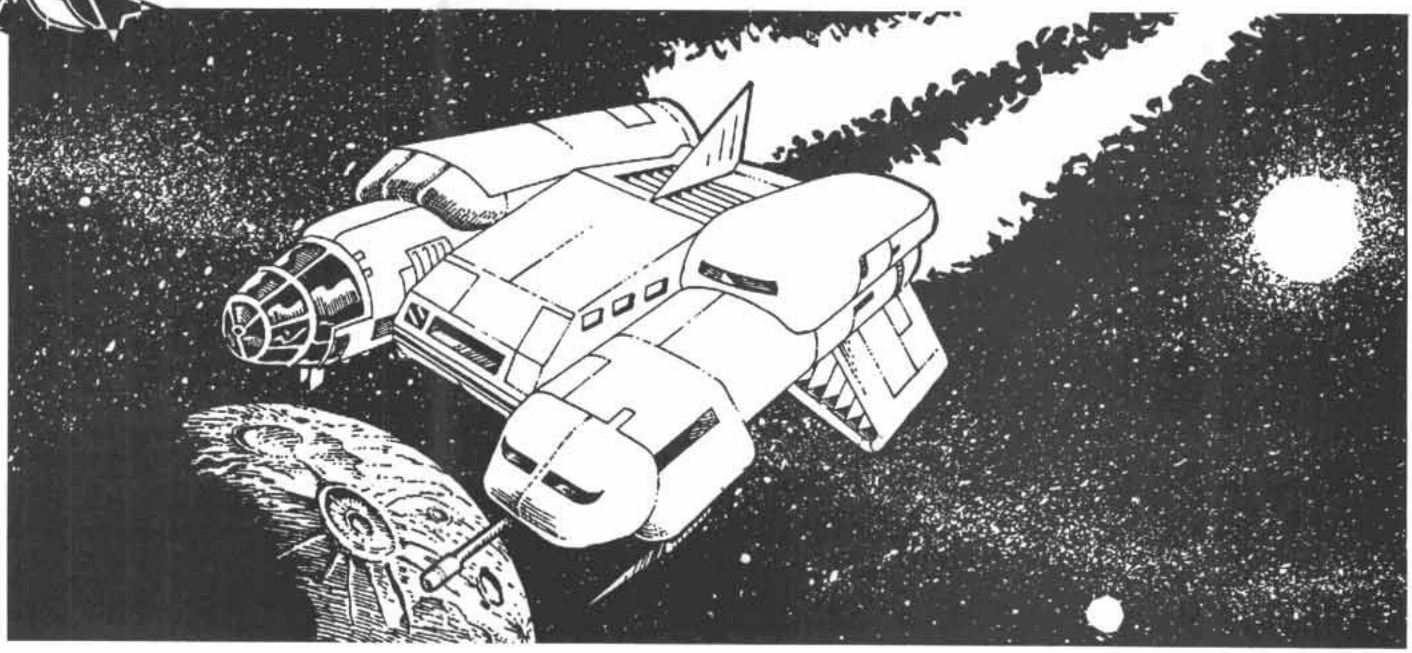
The Vargr Pack is not an example of organized crime in the Mafia style so much as it is a nationalist movement, operating covertly within the territory of another nation.

The Pack exists to funnel support out to Vargr groups in the Wilds, to support their efforts at rebuilding. While trade with the Vargr splinters along the spinward portion of the Vargr frontier is allowed, trade with the Wilds is illegal, as is any attempt to organize contact with the Wilds. Since the organization's core purpose is illegal, its methods and operations have been forced outside of the law as well.

Although the majority of Vargr in the Regency are not directly involved with the Pack, the nature of Vargr society and racial pride are such that most Vargr are eventually pulled into it one way or another, at least to the extent of paying Pack extortion or protection money, or providing their businesses as covers for Pack operations.

The Pack's leader is unknown, but this must be a quite charismatic Vargr to exert so much control over such distances, and anonymously at that.

Empress Marava-Class Far Trader



General Data

Displacement: 200 tons
Length: 42.5 meters
Price: MCr62.06 (72.84 armed)
Configuration: Wedge SL
Mass (Loaded/Empty): 1556.45/670.45 unarmed
1682.47/796.47 armed (see notes)
Hull Armor: 10
Volume: 2800m³
Target Size: S
Tech Level: 15

Engineering Data

Power Plant: 165 MW Fusion Power Plant (165 MW/hit), 1 year duration (11.585 MW excess, 1.475 MW excess when armed)
Jump Performance: 2 (420m³ fuel for Jump-2, 210m³ for J-1)
G-Rating: 1G (100 MW/G), Contra-Grav lifters (20 MW)
G-Turns: 48 (64.8 with Jump-1 fuel reserve, 81.6 using all jump fuel), 12.5 m³ each
Fuel Tankage: 1020m³ (72.86 tons) plus 16.5m³ (1.18 tons) reserved for power plant
Maint: 61 (67 armed)

Electronics

Computer: 3×TL-15 Model St (0.55 MW ea.)
Commo: 300,000 km radio (10 hexes, 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 30,000km (1 hex, 0.02 MW), Active EMS 3000 km (0 hexes; use long range for task difficulty in same hex; 5 MW)
Controls: Flight deck with 5×Workstation (only 3 used when unarmed) plus 1 other workstation.

Armament

2 turret hardpoint sockets fitted (Locs: 8,9; Arcs: 1,2,3). When weapons package is fitted, characteristics are as follows:
Offensive: 2×TL-15 150-Mj Laser Turrets (Locs: 8, 9; Arcs: 1, 2, 3; 4.2 MW; 1 crew ea.)
Fire Control Systems: 1×TL-15 Dual-purpose beam/missile MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW; 1 crew)

Accommodations

Life Support: Extended (0.56 MW), Grav Compensators (6G; 14 MW)
Crew (Unarmed): 5 (2×Maneuver, 1×Electronics, 1×Engineering, 1×Steward)
Crew (Armed): 7-9 (2×Maneuver, 1×Electronics, 1×Engineer, 0-2×Gunners, 1×MFD Gunner, 1×Command, 1×Steward)
Crew Accommodations: 1×Large Stateroom (0.001 MW), 4×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 10×Small Stateroom (0.0005 MW ea.)
Cargo: 805.2 m³ (57.51 tons), 3 large cargo hatches
Small Craft and Launch Facilities: Air raft with internal hangar (Minimal), 1 launch port
Air Locks: 2

Notes

Off of the Spinward Main (page 42) where jump-1 free traders hold an economic advantage, the far trader in its many variants is the most common privately-owned merchant vessel in the Regency.

The far trader has space reserved for a weapons package as detailed above. The two turret gunners can be dispensed with and the turrets fired directly from the MFD, making a crew of only 7, but the unmanned turrets cannot be fired under local control should the need arise. Its sensor suite is optimized for low cost, not combat. Owners who bother to add the weapons package are well-advised to upgrade the ship's sensors as well.

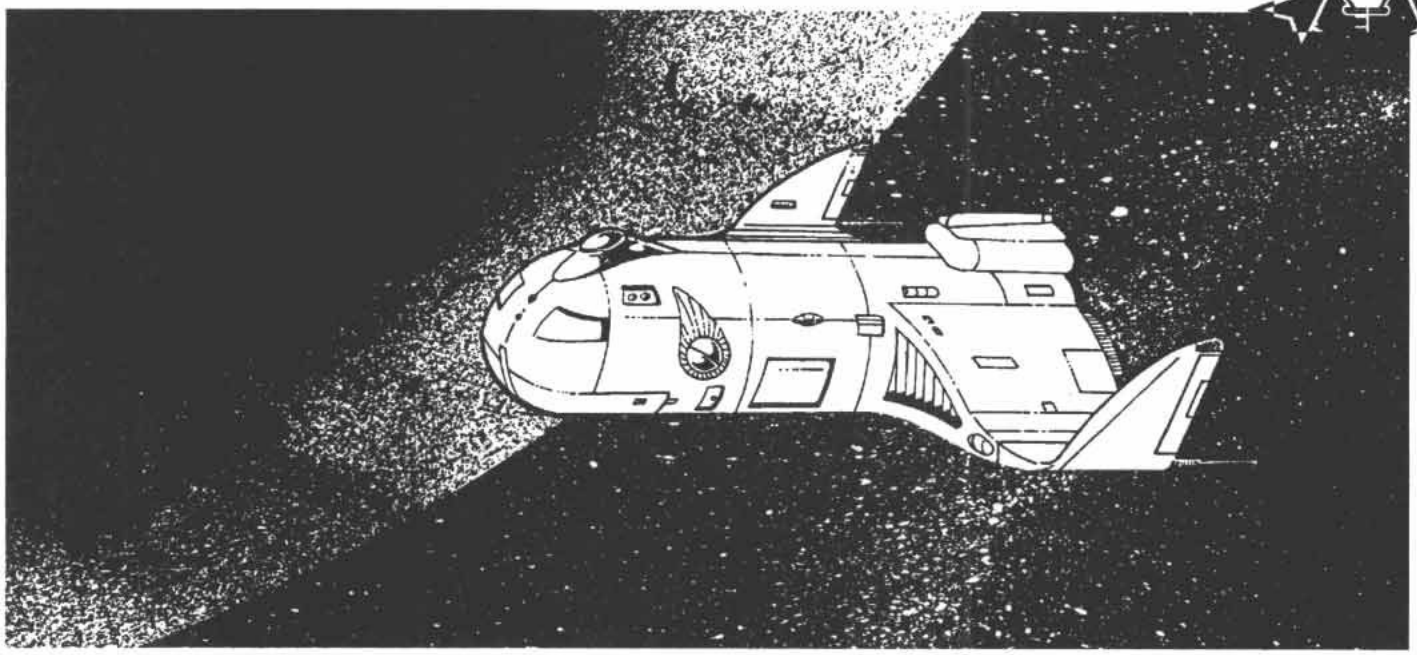
Unlike the sleek and attractive TL-12 *Jayhawk* variant, the TL-15 *Empress Marava* variant of the far trader is the victim of some passing artistic conceit, current when the class was first designed, but lost to all contemporary understanding. With its prominent glazed nose, the Maravas are more reminiscent of TL-5 propeller-driven atmospheric craft than starships. In fact, their appallingly baroque appearance has led to their nickname, in naval circles, of "Puking Dogs." Their defenders point out that, although they may be ugly, they are at least "ugly with an attitude," namely defiantly unapologetic.

Fuel purification machinery (1.275 MW), 24 hours to refine 1020m³ (9.9 hours to refine 420m³). Fuel scoops allow 560m³ of fuel to be skimmed per hour.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*System*	
1	1-6: LCH, 7: AL	1: Elec, 2-20: Hold	JD-3H	LS-1H
2, 4	1-8: Ant	1-5: Elec, 6-20: Qtrs	PP-1H	ELS-1H
3, 5	1-8: Ant	Qtrs	MD-(2h)	AG-1H
6-7		Hold	FPP-2H	Hangar-1H
8-9	1-6: LCH	1-6: TS, 17-20: Hold	CG-1H	MFD-(2h)
10		1-3: Qtrs, 4-19: Hold, 20: Eng	FPP-1H	
11-15		Hold	LSR-1H	
16-19		1-3: Eng, 4-20: Hold	SSR-(2h)	
20		Eng	All Others (1h)	

TL-15 Subsidized Merchant ("Fat Trader")



General Data

Displacement: 390/400 tons **Hull Armor:** 10
Length: 43.6 meters **Volume:** 5460/5600 m³
Price: MCr87.58 (98.35 armed) **Target Size:** S
Configuration: Cylinder AF **Tech Level:** 15
Mass (Loaded/Empty): 3202.42/1175.72 unarmed
3328.43/1301.73 armed (see notes)

Engineering Data

Power Plant: 301.2 MW Fusion Power Plant (301.2 MW/hit), 1 year duration (10.17 MW excess, 0.06 MW excess when armed)
Jump Performance: 1 (560 m³ fuel)
G-Rating: 1G (200 MW/G), Contra-Grav lifters (40 MW)
G-Turns: 60 (82.4 using jump fuel), 25 m³ of fuel each
Fuel Tankage: 2060 m³ (147.14 tons) plus 30.12 m³ (2.15 tons) reserved for power plant
Maint: 125 (130 armed)

Electronics

Computer: 3×TL-15 Mod St Computer (0.55 MW ea.)
Commo: 300,000km radio (10 hexes; 10MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 90,000km (3 hexes; 0.06 MW), Active EMS 60,000km (2 hexes; 7 MW)
Controls: Flight deck with 5×Workstation (only 4 used when unarmed) plus 2 other workstations.

Armament

2 turret hardpoint sockets fitted (Locs: 4,5; Arcs: 1,2,3). With weapons package fitted, characteristics are as follows:
Offensive: 2×TL-15 150-Mj Laser Turrets (Locs: 4, 5; Arcs: 1, 2, 3; 4.2 MW; 1 crew ea.)
Fire Control Systems: 1×TL-15 Dual-purpose beam/missile MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW; 1 crew)

	Short	*Medium*	*Long*	*Extreme*
TL-15 150-Mj Laser Turret	10:1/10-31	20:1/10-31	40:1/10-31	80:1/10-31

Accommodations

Life Support: Extended (1.092 MW), Gravitic Compensators (6G; 27.3 MW)
Crew (Unarmed): 9 (2×Maneuver, 1×Electronics, 2×Engineering, 1×Steward, 2× Small Craft Flight Crew, 1×Command).
Crew (Armed): 10-12 (2×Maneuver, 1×Electronics, 2×Engineering, 1×MFD Gunner, 0-2×Turret Gunners, 1×Steward, 2× Small Craft Flight Crew, 1×Command).
Crew Accommodations: 1×Small Stateroom (command; 0.0005 MW), 4×Large Stateroom (double-occupancy; 0.001 MW ea.)
Passenger Accommodations: 13×Small Stateroom (0.0005 MW ea.), 13×Low Berth (0.001 MW ea.)
Cargo: 1798.5 m³ (128.46 tons), six large cargo hatches
Small Craft and Launch Facilities: 10-ton Launch in AF External Grapple
Air Locks: 4

Notes

Because of its jump performance the subsidized merchant is encountered mostly along the Regency's "mains" (clusters of star systems linked by contiguous jump-1 routes), although with the use of auxiliary tanks it can cover two or more parsecs in consecutive jumps. However, this method is economically unviable, and is generally only used to move a ship from one main to another, usually resulting from a new owner or reassignment to a new market.

The "fat trader" has an efficient "drive-through" deckplan. With its rear cargo ramp and bow clamshell doors open its cargo deck is one continuous space.

The weapons package described above does not include a sensors upgrade. Crews who anticipate combat will want longer-ranged sensors to support the weapons. The two turret gunners can be dispensed with if the crew is content to fire the turrets solely from the MFD.

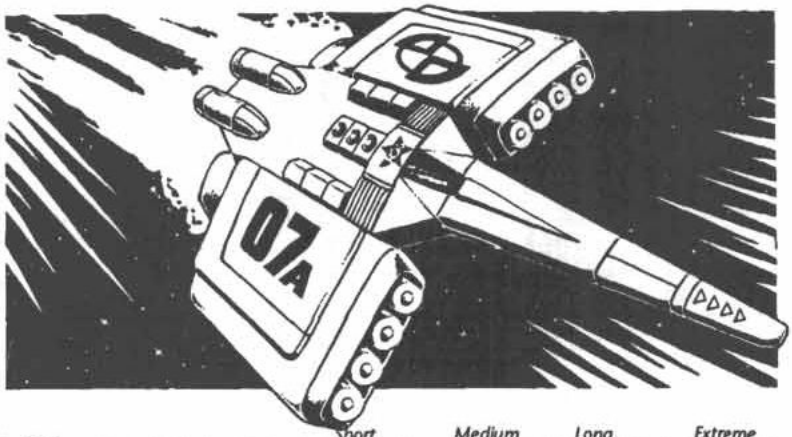
The ship itself displaces 390 tons; with its launch fitted to the grapple it displaces 400 tons. Jump, maneuver, and contra-grav drives are all configured to support the 400-ton figure.

Fuel purification machinery (2.8 MW), 22 hours to refine 2060m³ (6 hours to refine 560m³). Fuel scoops allow the skimming of 1092m³ of unrefined fuel per hour.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	1-8: Ant	1-2: Elec, 3-11: Hold, 12-20: Qtrs	JD-4H	AG-1H
2-3	1-6: Ant	1-2: Elec, 3-20: Qtrs	PP-1H	LBth-(1h)
4-5	1-4: LCH	1-3: TS, 4-20: Hold	MD-(4h)	LT-1H
6-7		1-11: Qtrs, 12-20: Hold	CG-1H	MFD-(2h)
8-9	1-4: LCH	Hold	FPP-3H	All Other-(1h)
10	1-13: Launch	Hold	Grapple-1H	
11-15		Hold	LSR-1H	
16-17	1-12: Launch	Hold	SSR-(2h)	
18-19		1-15 Eng, 16-20: Hold	LS-1H	
20	1-8: LCH	Hold	ELS-1H	

RQS Modular Inspection Launch and Jump-Boat



General Data

Displacement: 70 tons
Length: 28 meters
Hull Armor: 60
Volume: 980 m³
Price: MCr61.27
Target Size: VS
Configuration: Wedge/Box SL
Tech Level: 15
Mass (Loaded/Empty): 929.43/783.07

Engineering Data

Power Plant: 267.84 MW Fusion Power Plant (see notes; 267.84MW/hit), 1 year duration (0.0675 MW excess power)
Jump Performance: None
G-Rating: 6 (35 MW/G), Contra-Grav lifters (7 MW)
G-Turns: 76.9, 4.375 m³ of fuel each
Fuel Tankage: 336.272m³ (24 tons) plus 27m³ for power plant
Maint: 25

Electronics

Computer: 2×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 300,000km radio (10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (0.98 MW)
Controls: Flight deck with 3×workstations plus one other workstation

Armament

Offensive: 1×TL-15 144Mj Laser Lance (Loc: 1; Arcs: 1; 4 MW; Crew on Flight Deck), 1×TL-15 210Mj Laser Turret (Loc: 10; Arcs: 1-3; 5.83 MW; No crew), 2×Missile Pods (Loc: 13/15/17/19, 12/14/16/18; 8 ready Msls ea.; 0 MW, crewed from MFD), total of 16 ready missiles
Fire Control Systems: 1×TL-15 Msl/Beam MFD (6 Diff Mod; Msl 10 hexes; 10 hexes; 1.71 MW; 1 crew)

	Short	*Medium*	*Long*	*Extreme*
TL-15 144-Mj Laser Lance	10:1/10-30	20:1/10-30	40:1/5-15	80:1/2-8
TL-15 210-Mj Laser Turret	10:1/12-36	20:1/12-36	40:1/12-36	80:1/12-36

Accommodations

Life Support: Extended (0.168 MW), Gravitic Compensators (6G; 4.9 MW)
Crew: 4 (1×Commander/Pilot, 1×Engineer, 1×Gunner, 1×Electronics)
Crew/Passenger Accommodations: 3×Small Staterooms (0.0005 MW ea.)
Cargo: 10.826 m³ (0.78 tons), one small cargo hatch
Air Locks: 3

Notes

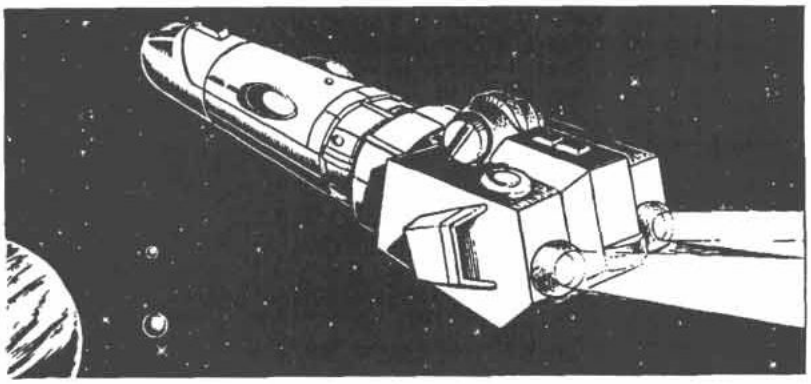
The inspection launch is an RQS-subsidized design like the quarantine cutter (see page 19), but is built for in-system operations only. In between RQS duty its owners use it for high-speed in system and courier service, often operating between a world and bases on its moons or in asteroid belts. It is a modular design, with a 50-ton main hull and two 10-ton pods, to port and starboard.

The missile pods, 210-Mj laser turret, and MFD pallet are RQS property, and are only fitted when on official duty. The price above includes these items, so the actual price to the civilian owner with two cargo pods is only MCr51.20. Each pod carries 112m³ (8 tons) of cargo, and with the MFD and turret socket space used for cargo, carriage is increased to 285.8m³ (20.4 tons).

Fuel scoop (2800m³/hr, or full fuel tankage in 7.2 minutes) is fitted, but no purification machinery is required for reaction mass.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1		1-11: LLance, 12-20: Elec	LS-2H	CG-(3h)
2-5	1-15: Ant	1-7: Elec, 8-20: Qtrs	ELS-1H	AG-(4h)
6-9		Hold	PP-1H	SSR-(2h)
10	1-5: EMMR, 6-8: AL	1-17: LT, 18-20: Qtrs	MD-1H	MFD-(2h)
11	1-10: LCH	1-4: Hold, 5-20: Eng	Msl Pod-1H	EMM-(2h)
12-13, 16-17		1-11: Msl Pod, 12-20: Hold	LLance-1H	
14-15, 18-19		1-12: Msl Pod, 13-20: Hold	LT-1H	
20		Eng	All Others-(1h)	



General Data

Displacement: 55 tons
Length: 38.35 meters
Hull Armor: 60
Volume: 770 m³
Price: MCr47.11
Target Size: VS
Configuration: Needle/Box SL
Tech Level: 15
Mass (Loaded/Empty): 557.24/406.25

Engineering Data

Power Plant: 120 MW Fusion Power Plant (120 MW/hit), 1 year duration (3.8685 MW power surplus)
Jump Performance: 3 (154m³ fuel for Jump-3, 102.7m³ for J-2, 51.3m³ for J-1)
G-Rating: 3 (27.5 MW/G), Contra-Grav lifters (5.5 MW)
G-Turns: 84 with Jump-3 fuel reserve (99 with J-2 reserve, 114 with J-1 reserve), 3.4375 m³ of fuel each
Fuel Tankage: 442.75m³ (31.6 tons) plus 12m³ for power plant
Maint: 19

Electronics

Computer: 4×TL-15 Mod St Computers (0.55 MW ea.)
Commo: 1000 AU maser (∞; 0.6 MW), 1000 AU laser (∞; 0.3 MW), 300,000km radio (10 hexes; 10 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 150,000km (5 hexes; 10 MW)
Controls: Flight deck with 2×Workstations

Accommodations

Life Support: Extended (0.154 MW), Gravitic Compensators (6G; 3.85 MW)
Crew: 2 (1×Pilot/commander, 1×Electronics/Engineer)
Crew Accommodations: 1×Small Stateroom (0.0005 MW)
Passenger Accommodations: (See notes)
Cargo: 120m³ (8.6 tons), one small cargo hatch
Air Locks: 2

Notes

The "Jboat" is a modified TL-15 ship's boat used to supplement Xboats for short-haul runs on the XWeb. The Jboat makes maximum use of standard ship's boat systems, including identical power plants, main hulls, etc. (See page 11.)

The small crew is allowed by the use of pregenerated jump programs and the fact that the craft will receive starport maintenance at the end of each jump. The fuel purifier is intended for emergency use, or if pressed into service as a fleet courier, as XWeb operations do not call for frontier refuelling (fuel scoop skims 154m³ per hour).

The fourth computer is a dedicated data storage/retrieval unit. Its capacity is entirely given over to XWeb electronic message storage and cannot be used for any "normal" computer tasks. (For details on the XWeb, see page 21.)

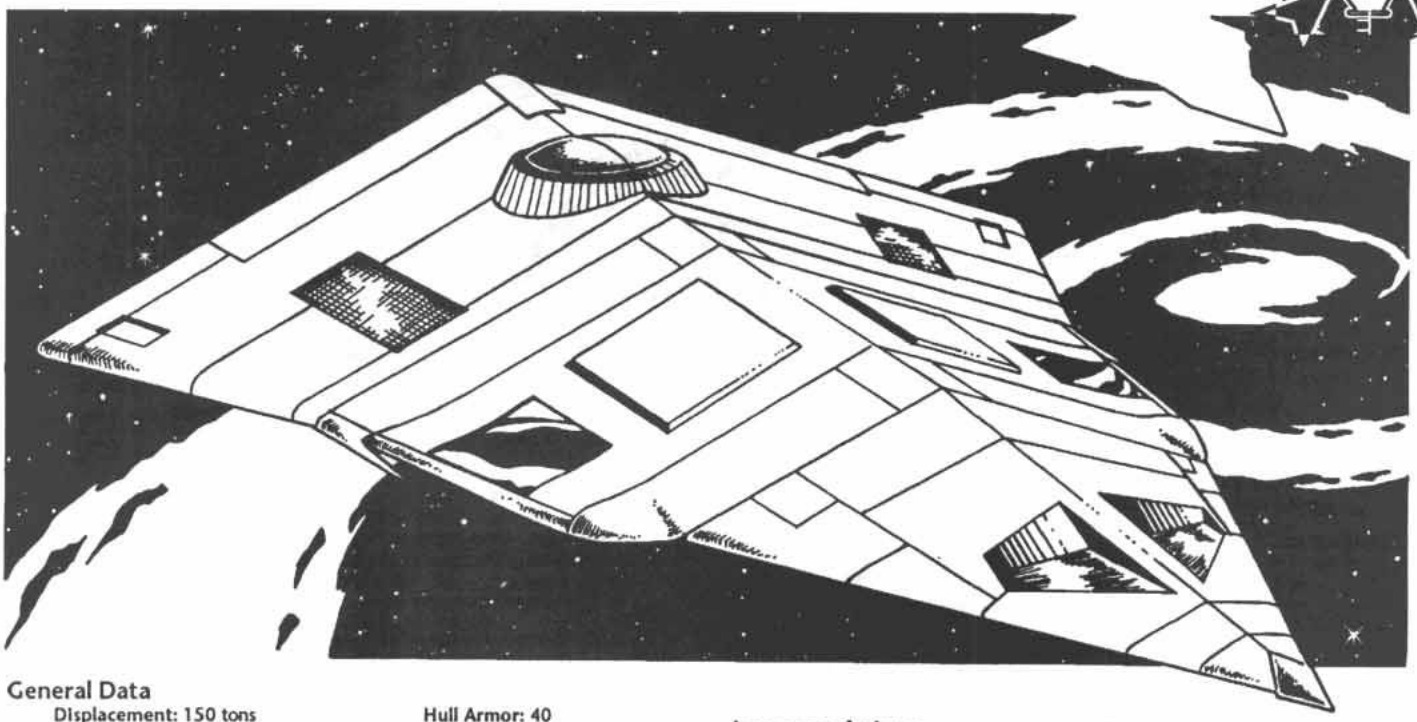
The variant shown here is the pure data/cargo variant. Small staterooms can be fitted at the expense of 28m³ of cargo each. Pure courier variants are fitted with four additional small staterooms (total of five) and have no cargo space.

For self-defense in high-risk areas, the Jboat can be fitted with a laser lance (see details with Inspection Launch above) at the expense of 28.2m³ of cargo, and MCr0.5522. The power overage allows its use with only a small (0.1315 MW) power shortfall.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	1-18: Ant	Elec	LS-1H	CG-(2h)
2-5	1-12: Ant	1: Elec, 2-9: Qtrs, 10-20: Hold	ELS-1H	FPP-(4h)
6-8, 10-15		Hold	AG-(3h)	SSR-(2h)
7	1-7: SCH, 8-9: AL	Hold	JD-1H	All Others-(1h)
16-19		1-7: Eng, 8-20: Hold	PP-1H	

Faith-Class Tier-4 RQS Quarantine Cutter



General Data

Displacement: 150 tons
Length: 38.75 meters
Price: MCr155.40 (144.17 unarmed)
Configuration: Wedge SL
Mass (Loaded/Empty): 1491.02/1017.65
Hull Armor: 40
Volume: 2100m³
Target Size: S
Tech Level: 15+

Engineering Data

Power Plant: 318 MW Fusion Power Plant (318 MW/hit), 1 year duration (0.588 MW power surplus)
Jump Performance: 3 (420m³ of fuel for Jump-3, 280m³ for J-2, 140m³ for J-1)
G-Rating: 3G (75 MW/G), Contra-Grav lifters (15 MW)
G-Turns: 60 with Jump-3 fuel reserve (75 with J-2 reserve, 90 with J-1 reserve, 104.8 using all jump fuel), 9.375 m³ fuel each
Fuel Tankage: 982.5m³ (70.2 tons) plus 31.8m³ reserved for power plant
Maint: 43

Electronics

Computer: 3×TL-15 Model Fb (1.1 MW ea.)
Commo: 1000AU radio (∞; 20 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics **Sensors:** Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Passive EMS folding array 210,000km (7 hexes; 0.25 MW), Active EMS 480,000km (16 hexes; 25 MW)
ECM/ECCM: EM masking (2.1 MW)
Controls: Flight deck with 6×normal workstation plus two other workstations

Armament

2 turret hardpoint sockets fitted (Loc: 16/17, 18/19; Arcs: All).
Offensive: 2×TL-15 210-Mj Laser Turrets (Loc: 16/17, 18/19; Arcs: All; 5.83 MW ea., No crew)
Fire Control Systems: 1×TL-15 300,000km Dual-purpose Msl/Beam MFD (6 Diff Mods; Msl 10 hexes; 10 hexes; 1.71 MW; 1 crew)

	Short	*Medium*	*Long*	*Extreme*
TL-15 210-Mj Laser Turret	10:1/12-36	20:1/12-36	40:1/12-36	80:1/12-36

Accommodations

Life Support: Extended (0.42 MW), Gravitic Compensators (6G; 10.5 MW)
Crew: 8 (2×Maneuver, 2×Electronics, 2×Engineering, 1×Gunnery, 1×Command)
Crew Accommodations: 4×Large Stateroom (0.001 MW ea.)
Passenger Accommodations: Whatever space is not used by crew
Cargo: 196m³ (14 tons) armed, up to 307m³ (21.9 tons) unarmed, 1 large cargo hatch
Small Craft and Launch Facilities: Minimal hangar with launch port for 3×MOLRASP sensor drones; minimal hangar with launch port for air raft
Air Locks: 1

Notes

The Faith class is the standard RQS quarantine cutter. It was first created by adding a 50-ton "plug" to scout/courier hulls, but new-construction models are built from the keel up as cutters, with thicker hull plating and heavier internal structure. Faith-class cutters are designed for 3G performance; visually similar scout-based cutters which retain the scout's 2G performance are not members of this class. Faith-class cutters are well-equipped and expensive, but do offer the RQS subsidy for private owners.

Current versions (called "tiers") of the Faith class are equipped to take unmanned 210-Mj turrets in their sockets in place of the usual 150-Mj local-control turrets. Because they have no on-board gunner, they cannot be fired locally but are both fired as a battery by the MFD. Faith-class cutters also carry the 3-ton Maneuvering Off-board Long Range Active Sensor Platform, or MOLRASP, that is also used by the Regency's *Lauritson*-class picket ships (see table below for MOLRASP details and Challenge 76, page 36). These expensive drones are owned by the RQS and are issued to quarantine cutters only while on RQS active duty. The RQS likewise issues MFDs to those ships which do not have them, for the duration of active duty. When used for commercial trade the 18m³ hangar holds cargo, along with one or both turret sockets and the MFD space. Crews also hot-bunk to free up staterooms for paying passengers.

Early models of the class were not fitted with EMM suites and were not equipped for the 210-Mj remote turrets. These vessels are known as Tier-1 vessels. Tier-2 vessels added the EMM suite, and Tier-3 vessels were built to accept the 210-Mj unmanned turrets. Tier-3 is still the standard RQS cutter, with the Tier-4s, which add the 210,000km passive folding array, only available in limited numbers (note that the price of a Tier-3 is noticeably lower, at MCr120.40). Tier-1 vessels retrofitted with 210,000km passive arrays are known as Tier-1A, and carry 64 vice 60 G-turns without using jump fuel and four vice three MOLRASPs (cost is MCr144.26). Although the 150,000km fixed array seems redundant on cutters with the big array, its deletion saves very little cost, and is valuable not only as a backup to the folding array, but also for use while skimming fuel and in atmospheres, where its conformal configuration allows its use when the folding array is collapsed and stowed away.

Class names include *Augustine, Luther, Wesley, Calvin, Zwingli, Loyola, Aquinas, Torquemada, Franciscan, Dominican, Gregorian, Jesuit, Melancthon, Tillich, Bultmann, Barth, Kierkegaard, Nestorius, Flacius, Pelaglus, Nicea, Athanasius, Constantine, Albigenses, Waldenses, Arius, Gnostic, Manichaean, Donatus, Origen,* and *Tertullian.*

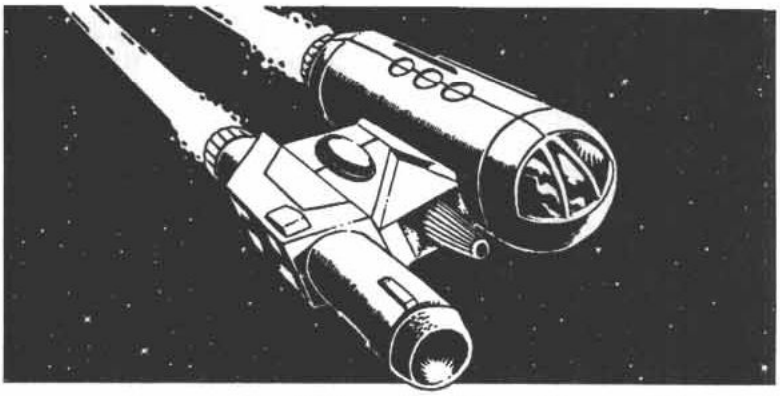
Fuel scoops skim 840m³ of fuel per hour. Fuel purification machinery (1.05 MW) requires 12 hours to refine 420m³ (35m³ each hour).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	1-15: Ant	1-4: Elec, 5-14: Qtrs, 15-20: Hold	JD-2H	LS-2H
2-3	1-10: Ant	1-4: Elec, 5-14: Qtrs, 15-20: Hold	PP-1H	ELS-1H
4-5		1-4: Elec, 5-14: Qtrs, 15-20: Hold	MD-1H	AG-1H
6-7	1-10: Ant, 11-17: LP, 18-19: EMMR	Hold	MFD-(2h)	FPP-1H
			AEMS-(2h)	CG-1H
8-9, 14-15		Hold	EMM-1H	LSR-1H
10	1-3: EMMR	1-4: Qtrs, 5-20: Hold	EMMR-(2h)	
11	1-7: LCH	Hold	Hangar 1-1H	
12-13	1-10: Ant	Hold	Hangar 2-1H	
16-19		1-4: LT, 5-11: Eng, 12-20: Hold	210 PEMS Ant-1H	
20	1: AL	Eng	All Others-(1h)	

TL	*Description*	*Vol*	*Mass*	*MCr*	*G-turns*	*Duration*	*Comm*	*Sensor*	*Sigs*
14	MOLRASP Act/Pass	3	66.4	28	94/3	∞	∞M	16A, SP(F), 8Lad	+3/+2/+3/+2/+1
14	Missile-Drone	0.5	8.845	4.01	48/1	∞	10L	SP(F)	+2/+2/+2/+2/+1

Cuspid-Type Gunboat & Fang-Type System Defense Boat



General Data

Displacement: 20 tons
Length: 14 meters
Price: MCr50.81
Configuration: Cylinder SL
Mass (Loaded/Empty): 330.46/325.44
Hull Armor: 10/60
Volume: 280 m³
Target Size: VS
Tech Level: 15

Engineering Data

Power Plant: 153.6 MW Fusion Power Plant (76.8 MW/hit), 1 month duration (0.2655 MW excess power)
Jump Performance: None
G-Rating: 1 (16.523 MW/G), Contra-Grav lifters (2 MW)
G-Turns: 14, 2.065375 m³ of fuel each
Fuel Tankage: 28.862m³ (2.06 tons) plus 0.755m³ for power plant
Maint: 9

Electronics

Computer: 2×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 30,000km radio (1 hex; 1 MW), 300,000km radio (2 hexes; 10 MW), 2×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics Sensors: Passive EMS fixed array 90,000km (3 hexes; 0.06 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (0.28 MW)
Controls: Flight deck with 3×workstations

Armament

Offensive: 1×TL-15 14m 196-Mj Particle Accelerator (Loc: 2/4/6/8/12/14/16/18; Arcs: 1; 109 MW [Powered to –3 Diff Mods]; 1 Crew), 74-Mj rapid-fire fusion gun (Loc: 10/11; Arcs: 1; 0 MW; crew on flight deck, also see notes)
Fire Control Systems: 1×TL-15 150,000km Single-purpose Beam MFD (6 Diff Mods; 5 hexes; 1.03 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-15 14m Part Accel (–3)	5:70	10:41	20:21	40:10
TL-14 74-Mj RFFG	1.3km:1-258	2.6km:1-258	5.2km:2-258	10.4km:10-258

Accommodations

Life Support: Basic (0.028 MW), Gravitic Compensators (6G; 1.4 MW)
Crew: 4 (1×Commander/Pilot, 1×MFD Gunner, 1×PA Gunner, 1×Electronics)
Crew Accommodations: 1×Small stateroom (0.0005 MW)
Cargo: None Air Locks: 2

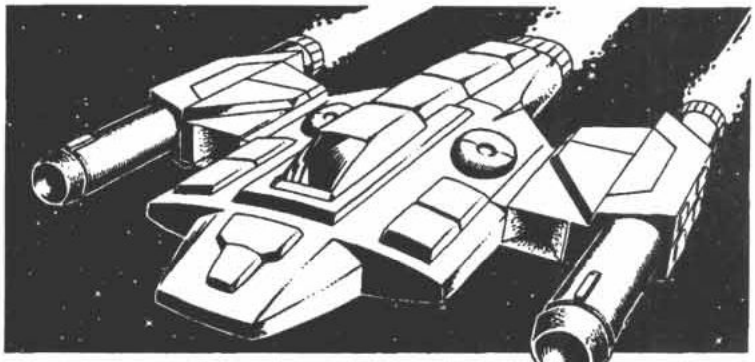
DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1, 3, 5	Ant	Elec	LS-1H	SSR-(2h)
2, 4, 6, 8, 12, 14		PA	ELS-1H	FG-(2h)
7, 9	1-14: Ant	1-16: Elec, 17-20: Qtrs	PP-1H	
10	1-4: AL	1: Elec, 2-5: FG, 6-20: Hold	PA-1H	
11	1-3: EMMR	1: Eng, 2-5: FG, 6-20: Hold		
13, 15		Qtrs		
16, 18		1-11: PA, 12-18: Eng, 19-20: Hold		
17, 19		1-9: Qtrs, 10-16: Eng, 17-20: Hold		
20		Eng		

Notes

The Cuspid gunboat is a particle accelerator pod mounted on a minimally-modified variant of the ubiquitous 10-ton utility craft, variously known as the launch, lifeboat, or skiff (TNE page 378, **Brilliant Lances Technical Booklet**, page 46). This use of existing production lines allowed the rapid production of system defense craft to meet the Regency's spacecraft shortage (page 11). The single PA pod (powered to –3 Diff Mods) is identical to those mounted on the Fang below, and is armored and stressed to withstand 6Gs. However, the Cuspid is limited to 1G by the main hull's structure and the high density of the assembled craft. The main hull's maneuver drives will allow it to carry a pod massing up to 494.5 tons (the PA pod masses 225 loaded) at 1G. The Cuspid is fitted with a "can-opener," a salvaged fusion gun taken from surplus TL-14 Trepida I grav tank turrets being refurbished as TL-15 Norris tanks (see **Challenge** 77 pages 76-79 and **Striker II** pages 97-99). Its range makes it useless in space combat, but it is a fearsome close-range weapon, able to slice open the belly of most any resisting starship. Given the Cuspid's short legs, it is mostly used for orbital security and law-enforcement (which allows it to get within "can-opener" range), based at orbital stations.

Cuspids have fuel scoops (28.862m³ in 15 minutes), but no purification machinery.



General Data

Displacement: 50 tons
Length: 23 meters
Price: MCr73.65
Configuration: Box/Cylinder SL
Mass (Loaded/Empty): 743.62/729.59
Hull Armor: 60
Volume: 700 m³
Target Size: VS
Tech Level: 15

Engineering Data

Power Plant: 372 MW Fusion Power Plant (186 MW/hit), 1 year duration (1.6965 MW power surplus)
Jump Performance: None
G-Rating: 6 (25 MW/G), Contra-Grav lifters (5 MW)
G-Turns: 64, 3.125m³ of fuel each
Fuel Tankage: 200.4305m³ (14.3 tons) plus 25.65m³ for power plant
Maint: 13

Electronics

Computer: 2×TL-15 Mod Fb Computers (1.1 MW ea.)
Commo: 2×30,000km radio (1 hex; 1 MW ea.), 300,000km radio (10 hexes; 10 MW), 3×1000 AU maser (∞; 0.6 MW ea.)
Avionics: TL-10+ Avionics Sensors: Passive EMS fixed array 120,000km (4 hexes; 0.1 MW), Active EMS 300,000km (10 hexes; 15 MW)
ECM/ECCM: EM Masking (0.42 MW)
Controls: Flight deck with 3×normal workstation plus one other workstation

Armament

	Short	*Medium*	*Long*	*Extreme*
TL-15 14m Part Accel (–3)	5:70	10:41	20:21	40:10

Offensive: 2×TL-15 14m 196-Mj Particle Accelerator (Locs: 6/8/12/14, 7/9/13/15; Arcs: 1; 109 MW [Powered to –3 Diff Mods] ea.; 1 Crew ea.)
Fire Control Systems: 1×TL-15 300,000km Dual-Purpose Beam/Msl MFD (6 Diff Mods; Msl 10 hexes; 10 hexes, 1.71 MW; 1 Crew)

Accommodations

Life Support: Extended (0.14 MW), Gravitic Compensators (6G; 3.5 MW)
Crew: 6 (1×Commander/Pilot, 1×Electronics, 1×Engineering, 1×MFD Gunner, 2×PA Gunners)
Crew Accommodations: 2×Small staterooms (0.0005 MW ea.)
Cargo: None Air Locks: 3

Notes

The Fang-type is the true SDB development of the initial Cuspid concept seen above, although it is only the size of a heavy fighter. Its long-endurance and habitability allow it to perform most traditional SDB missions, and its high-G performance allows it to handle with the best of the fighters in Charted Space.

Small-to-moderate-sized particle accelerators like those fitted to the Cuspid and Fang (they are only large in comparison to these small vessels) are known in naval circles as "varmint guns." They are able to rapidly inflict killing damage on small starships, and their EMP side-effects make short work of non-Fb computers. Contrary to popular entertainment programs, fighters are able to take on full-size warships only under the most unusual of circumstances. Fang SDBs are able to quickly strip away the "nuisance vessels" in a vampire force, allowing the large fleet units to quickly dispose of the major units.

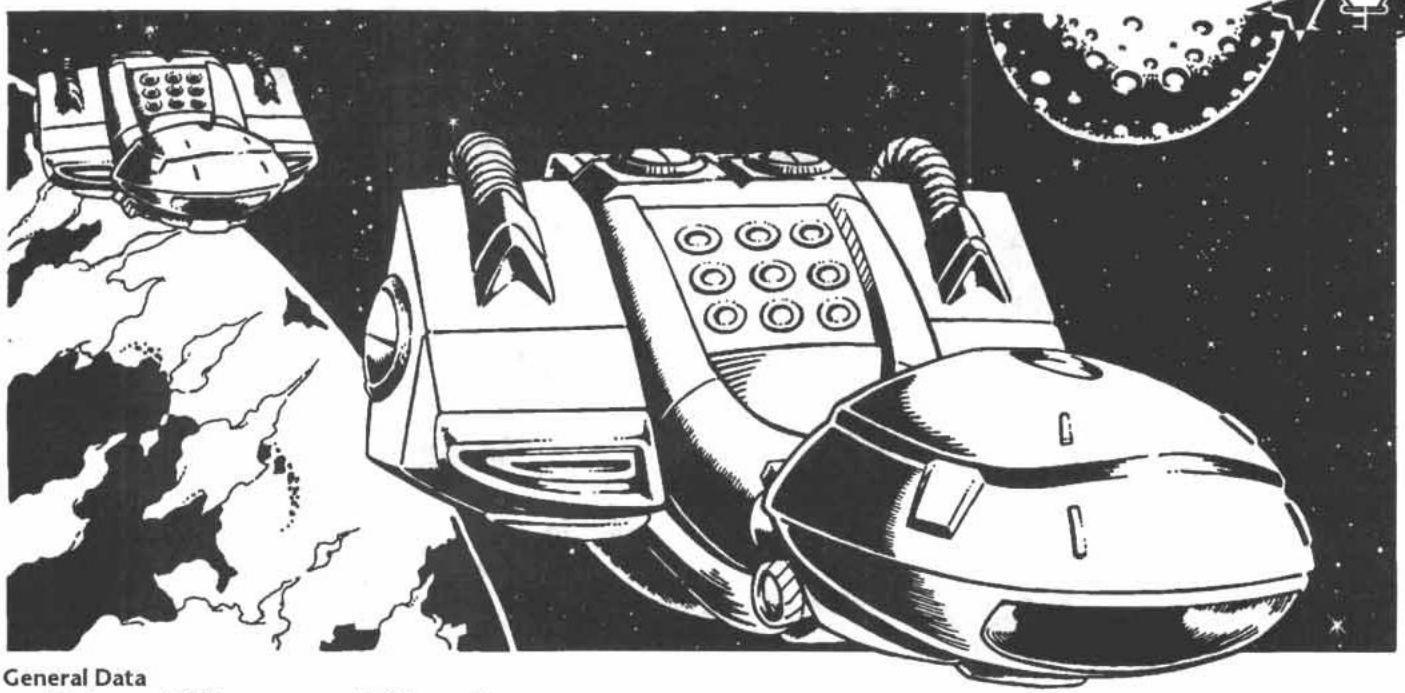
The Fangs' dual purpose (missile/beam) MFDs allow them to trade their PA pods for the missile pods seen on the inspection launch. Performance with these pods falls to 4Gs with 64 G-turns (3.125m³ each), and crew complement falls to four.

Fuel scoops allow te skimming of 280m³/hr, or 43 minutes for full fuel load.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*	
1	Ant	Elec	LS-2H	ELS-1H
2-5	1-17: Ant	1-7: Elec, 8-20: Qtrs	SSR-(2h)	
6-9, 12-15		1-14: PA, 15-20: Hold	PP-2H	
10	1-5: EMMR, 6-9: AL	1-4: Qtrs, 5-20: Hold	PA-1H	
11		Hold	MD-(3h)	
16-19		1-8: Eng, 9-20: Hold	CG-(2h)	
20		Eng	All Others-(1h)	

Trekhyair-Type RQS Quarantine Cutter



General Data

Displacement: 300 tons
Length: 50 meters
Price: MCr196.70
Configuration: Wedge SL
Mass (Loaded/Empty): 2862.14/2433.78
Hull Armor: 40
Volume: 4200m³
Target Size: S
Tech Level: 14

Engineering Data

Power Plant: 584.7MW Fusion Power Plant (97.45 MW/hit), 1 year duration (0.031 MW power surplus)
Jump Performance: 3 (840 m³ fuel for Jump-3, 280m³ for Jump-1)
G-Rating: 3G (150 MW/G), Contra-Grav lifters (30 MW)
G-Turns: 64.44 (109.2 using jump fuel), 18.75 m³ fuel each
Fuel Tankage: 2048m³ (146.29 tons), plus 58.47m³ (4.18 tons) reserved for power plant
Maint: 99

Electronics

Computer: 3×TL-14 Model Fb (1 MW ea.)
Commo: 1000AU radio (∞; 20 MW), 1000AU maser (∞; 0.6 MW)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.15 MW), Active EMS 480,000km (16 hexes; 25 MW)
ECM/ECCM: EM Masking package (4.2MW)
Controls: Bridge with 7×bridge workstations, plus 4 other workstations

Armament

2 barbette and 2 turret sockets fitted plus a dedicated 9-tube missile/drone launching cluster
Offensive: 2×TL-14 300-Mj Laser Barbettes (Loc: 16/18, 17/19; Arcs: All; 8.3MW ea.; 1 crew ea.), 2×TL-14 Laser Turrets (16/17, 18/19; Arcs: All; 4.2MW ea.; 1 crew ea), 9×Missile/drone launch tubes (Loc: 10; 1 ready Msl/drone ea.; 1 crew)
Fire Control Systems: 1×TL-14 Missile/Beam MFD (5 Diff Mods; Msl 10 hexes; 10 hexes; 1.77MW ea.; 1 Crew ea.), 1× Missile/Drone control station (No Diff Mods; Msl 10 hexes; 0.15 MW; 1 Crew)

	Short	*Medium*	*Long*	*Extreme*
TL-14 150-Mj Laser Turret	2:1/10-31	4:1/10-31	8:1/10-31	16:1/10-31
TL-14 300-Mj Laser Barbette	10:1/4+43	20:1/4+43	40:1/8-26	80:1/4-13

Accommodations

Life Support: Extended (0.84 MW), Gravitic Compensators (5G; 21MW)
Crew: 15 (2×Maneuver, 2×Electronics[incl. missile/drone operator], 4×Engineering, 5×Gunnery, 2×Command)
Crew Accommodations: Up to 15×Small Stateroom (0.0005 MW ea.)
Passenger Accommodations: 1×Small Stateroom (0.0005 MW ea.), plus any additional staterooms freed up from crew's multiple occupancy
Cargo: 196 m³ (14 tons), 2 large cargo hatches
Air Locks: 3

Notes

These distinctive RQS quarantine cutters are used almost exclusively by the RQS's Aslan personnel, still known as the *Trekhyair*, or "Land Protectors" (see page 27). They are built by Aslan shipyards on Aslan-ruled or -inhabited worlds of the Regency. Although they were built in response to the same requirements that resulted in the 150-ton Faith-class cutters (page 89), the Aslan stretched their 200-ton *Ktiyhui*-class courier (see *Solomani and Aslan*) by the same percentage and wound up with 300 tons. Their size and heavy armament makes these vessels highly sought after even by humans, but the differences in Aslan- and human-configured equipment means that human crews will operate the Aslan vessels at a uniform +1 Diff Mod for all tasks (see also **Aliens of the Rim, Volume 1: Hivers and Ithklur, page 86**).

Unlike the smooth, aesthetic curves of pure Aslan designs, the *Trekhyair* cutters have the appearance of "lash-ups," which in fact they are, using standard human technology overlaid on Aslan design techniques to which they are not visually or even technically matched. Late-production *Trekhyair* cutters are easily distinguished from earlier models by the unsightly exterior ducting that runs over the top of the engineering housings. This ducting was required by the retrofitted human-standard EMM suite which would not fit within the Aslan-standard interior ducting channels.

Anti-Aslan circles are loudly opposed to the *Trekhyair* cutter, noting its very heavy armament for its size, comparable to that of the 400-ton *Gazelle*-class close escorts (TNE page 370 or **Brilliant Lances Technical Manual**, page 23). The thought of such seemingly offensive vessels in the hands of theoretically disloyal inhabitants of the Regency is of great concern to these people, especially the fact that the RQS is bankrolling an instant rebellious navy within its own borders, tantamount to allowing the Hierate to forward base invasion fleets within the Regency.

The *Trekhyair* cutters are quite well-armed, and actually have more firepower than the larger *Gazelles* with their dorsal "missile farm" in addition to two laser barbettes and two laser turrets. However, they share a shortcoming with the *Gazelles* to which they are so often compared: they are limited by having only one master fire director.

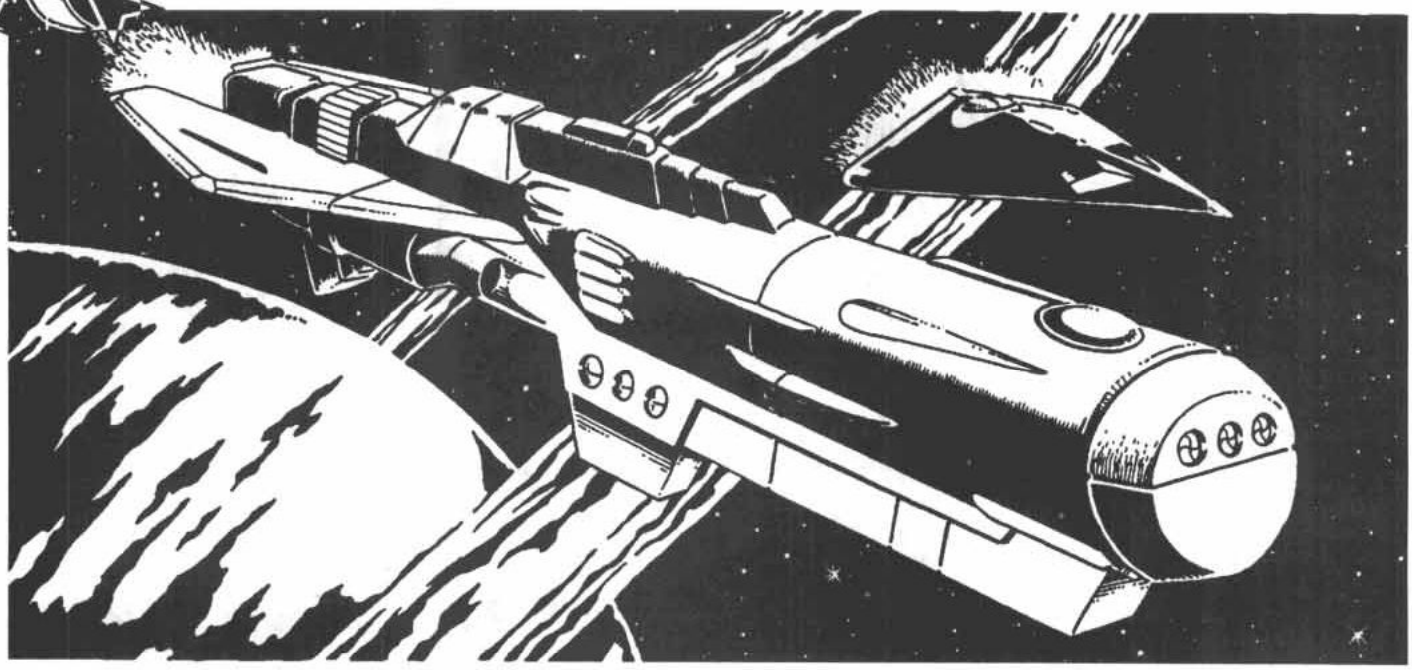
The missile/drone tubes may fire any standard 7m³ space-combat missile, or any drone of the same or smaller size. The standard TL-14 7m³ passive sensor drone is shown on the drone table on page 89 (as the "missile-drone"). The nine-tube missile farm is treated as a single missile bay for purposes of hits and damage, see the table at left.

Fuel scoops allow the cutter to skim 840m³ of fuel per hour. Fuel purification machinery (2.1 MW), 12 hours to refine 840m³ (or 420m³ each 6 hours).

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*	*Systems*		
1	1-16: Ant	1-9: Elec, 10-20: Qtrs	JD-4H	LS-3H	AEMS-(2h)
2-3	1-13: Ant	1-10: Elec, 11-20: Qtrs	PP-6H	ELS-2H	EMM-1H
4-5:	1-12: Ant, 13: AL	1-11: Qtrs, 12-20: Hold	MD-1H	AG-1H	EMMR-(4h)
6-9, 11-15		Hold	CG-1H	SSR-(2h)	Hangar-1H
10		1-12: Miss Bay, 13-20: Hold	FPP-2H	MFD-(3h)	
16-17	1-2: EMMR	1-4: LB, 5-8: LT, 9-20: Eng	LB-2H	LT-1H	
18-19	1-2: EMMR	1-4: LB, 5-20: Eng	Miss Bay-2H		
20	1: EMMR	1: Eng, 19-20: Hold	All Others-(1h)		

Barekdoldin-Class Darrian Patrol Cruiser (DPC)



General Data

Displacement: 500 tons
Length: 48 meters
Price: MCr400.47
Configuration: Cylinder SL
Mass (Loaded/Empty): 4467.07/3792.99
Hull Armor: 60
Volume: 7000 m³
Target Size: S
Tech Level: 16

Engineering Data

Power Plant: 1920.8 MW Fusion Power Plant (640.3 MW/hit), 1 year duration (0.173 MW surplus)
Jump Performance: 4 (1750 m³ for Jump-4, 1312.5m³ for J-3, 875m³ for J-2, 437.5m³ for J-1
G-Rating: 6G (250 MW/G), Contra-Grav lifters (50 MW)
G-Turns: 54 with Jump-4 fuel reserve (68 with Jump-3 reserve, 82 with J-2 reserve, 96 with J-1 reserve), 31.25 m³ of fuel each
Fuel Tankage: 3437.5m³ (245.54 tons) plus 192.08m³ (13.72 tons) reserved for power plant
Maint: 116

Electronics

Computer: 3×TL-16 Mod Fb Computers (1.2 MW ea.)
Commo: 1000AU radio (∞; 20 MW), 2×300,000km radio (only one powered; 10 hexes; 10 MW), 1000 AU maser (∞; 0.6 MW), 2×300,000km maser (10 hexes, 0.3MW ea.)
Avionics: TL-10+ Avionics
Sensors: Passive EMS fixed array 150,000km (5 hexes; 0.1 MW), Passive EMS folding array 240,000km (8 hexes; 0.25 MW), Active EMS 480,000km (16 hexes; 13 MW)
ECM/ECCM: EM Masking (7 MW)
Controls: Bridge with 10×Bridge Workstation, plus 9 other workstations

Armament

Offensive: 1×16.6m Particle Accelerator (Loc: Parallel/10; Arcs: 1; 71.1 MW [powered to –2 Diff Mod]; 1 Crew), 6×TL-16 207-Mj Laser Turret (Loc: 11, 11, 11, 11, 11, 11; Arcs: 2,3,4; 28.75 MW [powered to –1 Diff Mod]; No crew ea., fired by MFD), 1×Missile Bay (Loc: 1; 27 ready Msls; 0.45 MW; 1 crew), 1×1200-tonne Man-ipulator (Loc: 11; Arcs: 2, 3, 4; 24 MW; 1 crew)
Fire Control Systems: 4×TL-16 Dual-purpose Msl/Beam MFDs (6 Diff Mod; Msl 10 hexes [laser and maser]; 10 hexes; 1.51 MW, 1 crew ea.)

	Short	*Medium*	*Long*	*Extreme*
16.6m 256 Mj PA (–2/–5)	10:80	20:42	40:21	80:10
207-Mj Laser Turret (–1)	10:$^{1}/_{12}$-36	20:$^{1}/_{12}$-36	40:$^{1}/_{12}$-36	80:$^{1}/_{11}$-35
1200-tonne Manipulator	1:40 tonnes	2:20 tonnes	4: 10 tonnes	8:5 tonnes

Accommodations

Life Support: Extended (1.4 MW), Gravitic Compensators (7 G; 35 MW)
Crew: 22 (2×Maneuver, 1×Electronics, 9×Engineer, 7×Gunnery, 3×Command) plus 13 or more troops
Crew Accommodations: 6×Small Stateroom (single occupancy; 0.0005 MW ea.), 8×SmallStateroom (double-occupancy; 0.0005 MW ea.)
Cargo: 92.45 m³ (6.6 tons), one large cargo hatch
Small Craft and Launch Facilities: 10-ton unpowered pod controlled by manipulator in internal hangar (Minimal), one launch port
Air Locks: 5

Notes

Barekdoldin means "Lightning Wind" in the Darrian native language, *te-zlodh* (idiomatically, "Storm Wind," i.e., "the wind that brings the storm"). These ships are derived from old Darrian designs, but incorporate experimental fittings developed in conjunction with Regency engineers which are fitted for trials. A number of license-built *Barekdoldins* serve in the Regency Navy and RQS, where they are known as DPCs, for Darrian Patrol Cruiser. The design is highly thought of; it is considered to be well over twice as capable as the standard 400-ton TL-15 patrol cruiser (TNE page 372 or Brilliant Lances Technical Manual page 25) while it is only twice the price.

One example of this is the battery-boosted particle accelerator. Constant power from the ship's power plant is sufficient to power it at the –2 Diff Mod rate (ROF 200, see Fire, Fusion, & Steel page 115). However, it is connected to batteries which allow it to fire at the –5 Diff Mod rate (ROF 800) for three hours (six space combat turns). Alternatively, this battery may be used to provide 2G acceleration for three hours (12 G-turns).

The laser turrets are unmanned. They are fired as two three-gun batteries by two of the MFDs.

TL-16 Darrian missiles are equivalent to the standard TL-15 space missiles but may be controlled by either laser or maser communicators. They are launched from a 25-ton three-tube missile bay at the bow of the ship. Each tube is served by an autoloader. Total magazine capacity is 24 missiles, any of which can be fed to any of the three tubes.

The DPC carries a small tractor/repulsor manipulator which can exert 1200 tonnes of thrust on targets within 1000km, well within one space combat range band/hex. The weapons table above shows the number of tonnes of acceleration applied by the manipulator at the listed space combat ranges. Each 10 tonnes of manipulator thrust exert 1G of acceleration per displacement ton of the target. Thus at a range of 1 hex the manipulator could exert 1G on a 4-ton target, 4Gs on a 1-ton target, or 8Gs on a half-ton target (note that standard space combat missiles displace one-half ton).

The unpowered manipulator pod masses 151.98 tonnes empty, and can be loaded with 124.65m³/tonnes of cargo or up to 35 personnel in adequate seats. Within 1000 km of the ship it can be accelerated by the manipulator up to 12Gs in any direction. The pod's structure is stressed to handle 12G maneuvers, but its inertial compensators only negate 7Gs.

Troops may be housed in bunks in the cargo area (up to 13) or by multiple occupancy of the staterooms (22 more).

Fuel purification machinery (4.375 MW), 6 hours to refine 875m³, 12 hours to refine 1750m³ (145.8m³ per hour). Fuel scoops skim 1750m³ per hour.

DAMAGE TABLES

Area (1D20)	*Surface Hits*	*Internal Explosion*
1		Miss Bay
2-5	1-15: Ant	1-7: Elec, 8-17: Qtrs, 18-20 Hold
6-9, 12-14		Hold
10	1: AL, 2: EMMR	1-18: PA, 19-20: Hold
11	1-3: Ant, 4: AL	1-2: LT1, 3-4: LT2, 5-6: LT3, 7-8: LT4, 9-10: LT5, 11-12: LT6, 13: Manipulator, 14-20: Hold
16-17	1-5: EMMR	Hold
18-19	1-2: EMMR	Eng

Systems	
JD-7H	FPP-3H
PP-3H	SSR-(2h)
CG-1H	LT-1H
LS-5H	MBay-4H
ELS-3H	PA-6H
AG-2H	MFD-(2h)
MD-2H	Manip-(1h)
EMM-1H	
EMMR-(7h)	

The Regency Returns

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Regent General Mitchell De Groat,
Commander-in-Chief, Regency Planetary Forces,
Change of Command Ceremony, 1202

To Major General Lon E. Maggart, custodian of the future of mounted operations in this and all possible futures that are worth a damn: Forge the Thunderbolt!

Soli Deo Gloria.

About the Cover: The symbol on the cover is that of the Regency Planetary Forces, consisting of the Regency Army and Marine Corps. The Regency Army insignia removes the thunderbolt, places a shield behind the sun-and-unicorn device, and changes the sunburst from gold to black. The Regency Marine Corps insignia foregoes the shield and color change and replaces the thunderbolt with a downward-pointing cutlass, symbolizing its planetary assault role. The colors of the cover approximate the colors of the Regency Army (crimson and black) and the Marine Corps (maroon and gold).

Design and Development: David Charles Nilsen
Proofreading and Typesetting: Michelle Sturgeon
Cover: Julie Callahan
Interior Art: Kirk Wescom
Art Direction: David Nilsen and Julie Callahan

Credits Are: Going to be relatively dignified in this book. Well, maybe dignified isn't the right word. The others were dignified too, in a manic sort of way. Give me a break.

But Just In Case You Are Looking For Something Pithy: "The Armored Division must be a balanced fighting team of combat arms and service units, all of equal importance and equal prestige."

—Major General Adna R. Chaffee

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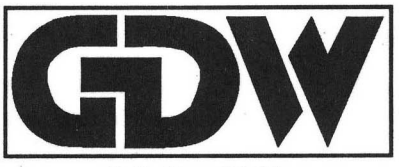

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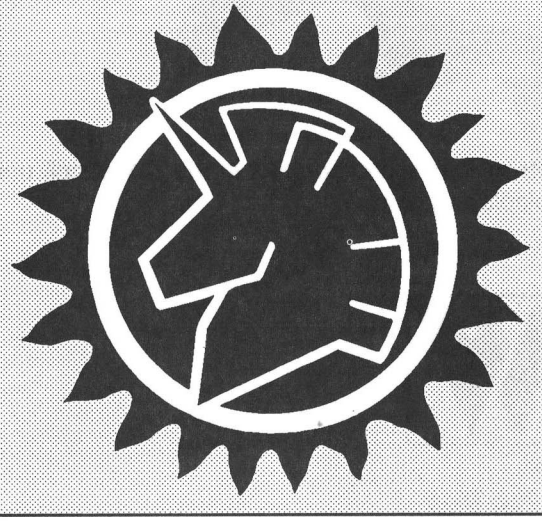


Introduction

With the publication of the **Regency Combat Vehicle Guide** (hereafter **RCVG**), GDW has in print more fully detailed vehicle designs for the current edition of **Traveller** than at any point in its history (I think—I trust that I will be corrected if I have miscalculated), and this number will continue to grow in the months to come, at least until we pass the magic figure "101." For obvious reasons, the 89 vehicles rated in **Striker II**'s Appendices B-E (along with all of the missiles and infantry equipment in Appendices F and G) had to first be fully designed to the roleplaying level of detail using the **Fire, Fusion & Steel (FF&S)** design sequences. Only then were these designs converted to the **Striker II** format, with the attendant loss of fine-grained detail.

Of these, 20 had previously been published as fully detailed **TNE** vehicles with all of the details necessary for a roleplaying campaign. Since the publication of **Striker II**, a handful of its vehicles (the TL9 Abomination and the Trepida/Intrepid series) have been detailed in **Challenge** magazine, leaving **64 Striker II** vehicles still to be published to the level of detail that would allow **TNE** referees to run them in their roleplaying campaigns. With the publication of **RCVG**, this number falls to 43, and will continue to fall with upcoming releases.

COMPATIBILITY WITH STRIKER II

This book is the first of a series of spin-offs from **Striker II**, which are not actually used *with* **Striker II**. While **RCVG** covers the same subject matter as **Striker II**, it expands on this material in ways which are used with the **TNE** roleplaying rules but do not add new material to the **Striker II** miniatures rules. These vehicles already exist in **Striker II** with sufficient detail to allow them to be fully used with that system, so there is no need to add to their presentation there. But what if a PC group obtained one of these amazing vehicles? How much cargo space do they have? How many people can they hold? How fast can they go?

RCVG is intended to help bring **TNE** up to date with **Striker II**, by presenting **Striker II**'s Imperial/Regency vehicles to the level of detail used in the **TNE** roleplaying rules. This book will not present new military organizations, because that sort of large-scale information is appropriate to **Striker**, while one-on-one or two-on-two vehicle engagements are appropriate to roleplaying rules. So **Striker II** does support **RCVG** by showing the frequency, numbers and organizations in which these vehicles may be found.

When you think about it, this represents something of new wrinkle for the **Traveller** lineage of game systems. Whereas the original **Striker** (1981—do you feel old yet?—back then people were still wondering if Ronald Reagan would live through a term in the White House, and when you mentioned Jimmy Carter, everyone thought of sweaters and "malaise," and no one thought of building houses) *was* the vehicle design system for the original **Traveller**, **Striker II** represents an *alternative* means of resolving large-scale ground combat, in the same fashion that **TNE**'s **Battle Rider** corresponds to **TNE**'s **Brilliant Lances**. Thus the same vehicle has two faces in the new **TNE** system: one for **TNE** proper (i.e., the roleplaying rules), and one for **Striker II**.

Perhaps the one way that **RCVG** actually does support a **Striker II** miniatures campaign is that it presents prices for these vehicles. These were not presented in **Striker II**, the same way that the price of an M4A3E2 (76) Jumbo was not presented in **Command Decision 2nd Edition**. Like **CD2**, **Striker II** was intended to allow the resolution of historical (i.e., "historical")

scenarios with the use of historical/"historical" TO&Es. But many **Striker II** players like to organize their own unique or mercenary units, and price figures are important for this. Now this is possible.

DESIGNER'S NOTES

As I hope all old-time **Traveller** fans have noticed by now, the selection of vehicles and TO&Es in **Striker II** were painstakingly based on material presented in original **Traveller**, especially **Striker** and various issues of the **Journal of the Travellers' Aid Society**. Some material was also drawn from the **MegaTraveller** period from such sources as the **Rebellion Sourcebook** and Digest Group's *Travellers' Digest* magazine.

For TO&Es, the conversion was straight-forward: **Traveller** and **MegaTraveller** TO&Es were presented in "real world" terms and were easily converted into the **Striker II** standards of fireteam and single-vehicle stands. This yielded the Huscarles, Imperial Marine Task Force, Imperial Guard, MArCav and Zhodani units.

Updating vehicle designs was more complicated, as weapons performance, armor and mobility were not convertible directly to **TNE** or **Striker II** standards. So what I had to do was divine the qualitative concept of a vehicle and create a vehicle for **TNE** which fulfilled the same concept while retaining as many of the original's quantitative features as possible. Although measurements of armor thickness or weapon penetration did not translate from the logarithmic **Striker/MegaTraveller** system into the linear **TNE** system, items such as number of crew or passengers were more easily accommodated. I treated armor and weapons on a relative basis, i.e., this guy has more than this guy, but not as much as that other guy, but specific weapons *types*—lasers, fusion guns, VRF gauss guns—were retained, even though their functional **TNE** performance might not perfectly replicate their **Striker/MegaTraveller** parameters. For example, if old **Striker** said a missile massed 95 kg and had a 0.5 kiloton warhead, I retained those data points as *defined features*, but allowed their *derived features* like range, speed and price to fall pretty much where **FF&S** dictated. But I did do a lot of tweaking when I could finesse the derived features closer to their models.

The high-energy weapons upgrade (see "Putting the Heat Back into Plasma," from **Challenge 76** or **Striker II**—take your pick) threw something of a wrench into this, as the tremendous increase in plasma/fusion lethality knocked some pre-existing designs out of balance, requiring some repairs to get them back into line with their concepts.

The most notable example of this is the radiation of the single Intrepid/Trepida tank in the **Reformation Coalition Equipment Guide** (**RCEG**) into the three Imperial versions seen in **Challenge 77** and this book. Since the upgrade had thrown the design's offensive/defensive balance out of whack, I "rescued" it by postulating a series of upgrades that explained how the imbalance came to be.

In other cases, I just left the wounded vehicles to their own devices. In the case of the hapless Pyrrhus support sled (**RCEG** page 126, a.k.a. **TNE**'s "grav tank," page 364) the vehicle was already an odd duck, so further weirdness just wasn't that big a deal.

REFORMATION COALITION CAMPAIGNS

All of you who love the Star Vikings, please do not fear that this book represents a turning away from the Reformation Coalition campaign. It does not. GDW loves the Star Vikings, too. We will not skimp on RC coverage and development, and as many of you already realize, this book is for RC campaigns too. Only one of the vehicles in this book (the Norris battle tank, pages 12-13) was not a standard Imperial vehicle in the pre-Collapse period. That means that all the other umpteen vehicles and variants in this book can be found in the Wilds, to be salvaged by RC recovery teams or already in use by TEDs, or, you guessed it, the Empire of Solee. (Oops—maybe this book is bad news for the RC after all. Sorry, I wasn't thinking.)

WHAT NEXT?

Future vehicle guides will cover the Zhodani and other Spinward States, lower-tech vehicles that can be used for Spinward States planetary armies or the Wilds, and the Reformation Coalition. While many of these will be military vehicles, civilian, exploration and paramilitary vehicles will be covered as well.

After that, I don't know. The Millennium?

Burma!

FORMAT

The 32 vehicles on the following pages are identical to the vehicles of the same names presented in **Striker II**, but are presented in the **TNE** format as presented in the basic **TNE** rulebook and expanded in the **Reformation Coalition Equipment Guide**. This latter format provides specific roleplaying-level information such as speed in kph, speed-specific Diff Mods vs. fire, more detailed fuel breakdowns, etc. These simplify the referee's job when converting vehicle performance into real-world or game-specific terms.

One additional line of data has been added compared to **RCEG**, and that is "Reloading Data." This provides the parameters of weapons magazines and gives the time required to replace turret-mounted magazines, whether from storage elsewhere in the vehicle or from supply vehicles. Replacement time does not refer to multiple magazines already carried within the turret (as in the case of multiple VRF gauss gun cassettes); these replace each other automatically as ammunition is expended. Replacement time refers to removing empty cassettes from the turret and replacing them with fresh ones.

Each vehicle also comes with historical and technical information, discussion of design variations and background on their military operational usage. However, details on the larger Regency or Imperial units of which these vehicles are a part will not be found here. **Striker II** is necessary for such large-scale data.

NOMENCLATURE

In the Regency of 1202, it is common to still refer to equipment as being an "Imperial" design. This is especially the case in the Regency's armed forces, which take pride in their unbroken descent from Imperial organizations. Although the Regency is no longer the Imperium *per se*, such vehicles as the Imperial Marine Grav APC are still called *Imperial* rather than Regency, as they are the same vehicles that were designed and used by the Imperial armed forces. Although used by the Regency, their names recall their original creators, and the organization that the Regency is committed to preserve. Therefore the terms *Imperial* and *Regency* are often used interchangeably in the following pages.

Regency Planetary Forces

The Regency's armed forces are divided into two broad categories: space forces and planetary forces. *Space forces* include the Regency Navy, Scouts and Quarantine Service. *Planetary forces* include the Regency Army and Marine Corps, and all planetary forces: armies, navies, air forces and aerospace defense forces.

The distinction derives from their differing main focus of operations. Planetary forces control planets: their ground, oceans, atmosphere and close orbit. Space forces control space: the area between planets.

Planetary forces comprise a tremendous variety of traditional military mission areas: ground forces (armies), nautical forces ("wet" navies), atmospheric forces (air forces), naval assault troops (marines) and orbital control forces (astronauts). But in spite of the wide variety of planetary force niches, and the different skills necessary to operate a howitzer, a submarine, a helicopter, or a satellite, from the point of view of the Imperial-cum-Regency Navy, "it's all dirtside." (Note, however, that at high tech levels, the speed and mode of contra-grav travel make the distinction between ground and air vehicles increasingly meaningless, and air, after all, has meaning only as it relates to the ground beneath it and the planetary regime within which it exists.)

The Regency government only maintains two planetary forces, the Regency Army and Marine Corps, and these only at the high end of the tech range: tech level 14 and 15 (although it is the Regency's goal to standardize all of its planetary forces at TL15, this has not yet proven possible). There is no reason for the Regency government itself to maintain forces at tech levels lower than this. First, it is the Regency's job to defend its territory using the most capable forces possible. Equipping them with anything less than the absolute best technology available would be wasteful.

Second, it is the role of world governments to maintain their own planetary armed forces at tech levels appropriate to local world conditions.

TYPES OF ARMED FORCES

There are two major types of distinctions when describing armed forces: function and ownership.

Functional distinctions are two, and are described in the main text: space forces and planetary forces.

Ownership distinctions are also two: Regency and world armed forces. *Regency* armed forces are those raised, outfitted, paid, maintained and controlled by the Regency government itself. *World* armed forces are those raised, outfitted, paid, maintained and controlled by an individual world.

There is naturally a great deal of overlap between the two ownership classifications. Since the Regency consists of a number of member worlds, its forces represent and act in the name of the worlds that make up the Regency. By the same token, world forces, controlled by loyal member worlds of the Regency, also (ideally) act in the name of the Regency as a whole. For this reason it is common for people to lump all armed forces in the Regency's territory, Regency-owned and world-owned alike, together under one term, "Regency armed forces." This term would be particularly appropriate if the Regency were attacked as a whole by an outside force (i.e., Virus, the Zhodani Consulate, etc.). However, it obscures the important distinctions of the missions an armed force is equipped to perform (Regency planetary forces are able to function in all kinds of planetary environments, while world planetary forces are usually only required to function in the world's own local environment) as well as the technology with which it is outfitted (Regency forces are equipped at TL 14 or 15, while world forces are usually equipped at the local tech level). Furthermore, only Regency forces can be found operating at all points in the Regency, while world armed forces will only be deployed for purposes that are of interest or advantage to the owning government.

Note the semantic distinction: *Planetary* refers to planets as a physical or natural entity. *World* refers to planets as a political and social entity. Thus Regina has a *planetary* atmosphere and a *planetary* gravity, but a *world* government and a *world* technology level. Regina has world armed forces (i.e., they are paid for and controlled by the Regina world government) but these world armed forces can consist of space forces (which primarily defend Regina's star system but can be deployed to other systems) and planetary forces (i.e., those which defend the Regina "planetary" environment, even though Regina is technically a moon).

Thus, there can be Regency space forces (forces owned and controlled by the Regency government whose mission is the control of the interplanetary, or space, environment), Regency planetary forces (forces owned and controlled by the Regency government whose military mission is the control of the planetary environment), world space forces (forces owned and controlled by the government of a single world whose mission is the control of the space environment at least in the world's own system, and perhaps farther away), and world planetary forces (forces owned by the government of a single world whose mission is the control of the planetary environment, usually the world's own, but perhaps other planets' environments as well).

REGENCY COMBAT VEHICLES

Regency armed forces have generally retained and perpetuated Imperial military doctrine except where it conflicts with new post-Collapse realities, such as Virus, smaller astrographic, manpower and industrial bases, etc. This includes the retention of four basic classes of battlefield vehicles: tanks, APCs, specialist vehicles and support vehicles.

Because the Regency does not maintain armed forces below the TL14 level, all Regency planetary forces are by definition "grav" or "lift" forces. While many of the Regency's units retain these distinctions in their designations (for historical reasons), classes of vehicles do not, as all Regency tanks are grav tanks, and all APCs are grav APCs (exception, see page 16).

Tanks: While Imperial forces maintained a distinction between classes of tanks—heavy, medium (called "grav," not "medium grav"), and light—the Regency maintains one class of tank, the medium tank, now called the battle tank. Like the former Imperial medium tanks, these are simply called "grav tanks." The Regency's much smaller industrial base and much higher threat:self ratio has not permitted it to retain the luxury of multiple types of first-line tanks nor the quantity of assault shipping to carry such specialized equipment. Battle tanks are in the 10-14 displacement ton range, and are typified by the Norris grav tank on pages 12-13. This new reality is largely due to the excellent performance of the 10-ton Trepida family of medium tanks in the Civil War. These vehicles proved the mainstay of high-stellar level combat (see page 8) during the Civil War, while the more massive, voluminous and expensive heavy tanks (see page 6) were simply high-value targets. They were never available in sufficient numbers to make a difference on their own, and their rareness made their commanders reluctant to commit them when they could have made a difference. Post-Collapse Regency analysts determined that a similar number of 10-ton tanks would have made a more significant contribution to the battles in which the heavy tanks were available. Heavy tanks remain in service in the Regency only in world planetary forces. Light tanks are now rated as reconnaissance/scout vehicles and are classed under specialist vehicles below. See pages 6-13.

APCs: This terminology was deliberately chosen instead of variations on the "infantry fighting vehicle" theme to emphasize an essential point of Imperial doctrine: the true nature of infantry is that they are capable of fighting dismounted, and not as glorified AFV gunners. Infantry does not perform its mission of tenaciously holding ground in detail, or of rooting out opposing infantry, when it is in a vehicle. From this point of view, the term "infantry fighting vehicle" is essentially an oxymoron, because infantry in a vehicle are not infantry at all.

Imperial/Regency APCs are infantry *carriers*. While they fulfill the IFV performance concepts—such as the speed to keep up with tank forces, the armor to stand on the battlefield, and an armament which allows the vehicle to suppress threats to its carried infantry—their only reason for existing is to carry infantry to where they are able to do their job.

Because fire support vehicles are variants of APCs and are usually used in infantry organizations, these vehicles are usually grouped with APCs rather than specialist vehicles. See pages 14-25.

Specialist Vehicles: Specialist vehicles include all other combat vehicles, including scout and reconnaissance vehicles, artillery vehicles, combat engineer vehicles, air/point defense vehicles, etc. Many of the vehicles of this class are variants of tank or APC chassis. See pages 26-41.

Support Vehicles: Support vehicles encompass the vehicles that operate on or near the battlefield but which are not intended to engage directly in combat. These vehicles include liaison vehicles, ammunition supply vehicles and fuelers, maintenance and recovery vehicles, ambulances, etc. See pages 42-45.

Other Vehicle Types: Although no vehicles of this class appear in this book, this includes the vast majority of military-owned vehicles that support the military's institutional infrastructure: unarmored long-haul supply vehicles and tankers, unarmored utility sleds, staff cars and troop-carrying buses.

There are other vehicle types that are no longer used or never found favor in Imperial/Regency service. One such vehicle is the "combat vehicle," intended to replace the tank and APC categories. The last attempt to build such a vehicle was the TL15 Lancer combat vehicle, in the final years of the antebellum period. Armed with a heavy laser and fusion gun (a TL15 version of the rapid-pulse Y gun), the Lancer was armed and armored like a tank (two tanks, really), but also carried a very large infantry section of 24 troops.

Bridging the gap (or obliterating the distinction, depending upon your point of view), between tank and APC, the combat vehicle was another misguided attempt to create an AFV that would be all things to all people. By crossing an over-armed main battle tank with an APC, the result is a vehicle needlessly powerful in the APC role, and needlessly valuable in the battle tank role. In other words, it is too expensive in roles for which cheaper purpose-designed vehicles will do just as well, and its very expense would make its users reluctant to use it where the loss of a single combat vehicle would equal the loss in capability of two tanks and two APCs.

Although the dual-role combat vehicle concept is sure to arise again, it is currently banished from Regency military thought and doctrine.

TYPE-STANDARDIZED IMPERIAL/ REGENCY HIGH-ENERGY WEAPONS

Because of the variety of tech levels and manufacturers that provided materiel to the military forces of the Third Imperium, it was crucial for the military services to establish equipment standards to ensure that ammunition produced in one sector would fit the weapons of the troops deployed there, and that grav tanks manufactured on different worlds would be able to use the same stocks of spare parts. The total scope of this administrative program was immense, as it covered everything from boots to small arms to armored fighting vehicles to starships, but in practice it was broken down into specific areas, rather than designating all weapons in a single unified series. One such area was AFV main armament, which was further broken down into functional areas: kinetic energy direct-fire projectiles, indirect fire systems, missiles, rockets, high-energy (plasma and fusion) weapons, etc.

The dominant AFV armament at the high end of Imperial technology (TL14-15) was the high energy weapon, specifically the fusion gun, generally in rapid-fire configurations. (For further information on the design of rapid-fire high energy weapons, see the **Reformation Coalition Equipment Guide**, page 156.) Imperial standard fusion guns were classified by the following system.

Fusion V Gun: Any single-chambered fusion gun with a pulse energy of 3 megajoules.

Fusion W Gun: Any single-chambered fusion gun with a pulse energy of 18.5 megajoules.

Fusion X Gun: Any single-chambered fusion gun with a pulse energy of 74 megajoules.

Fusion Y Gun: Any single-chambered fusion gun with a pulse energy of 125 megajoules.

Fusion Z Gun: Any single-chambered fusion gun with a pulse energy of 175 megajoules.

RAPID PULSE FUSION WEAPONS

These weapons were designated in the RPN-XX series, where N denoted the standardized pulse energy level shown above, and XX was the tech level of manufacture. Thus the TL14 rapid pulse fusion "Y" gun was designated RPY-14. In some cases, rapid pulse fusion guns of more than one rate of fire would be manufactured at the same tech level and within the same pulse energy band. In this case, the weapons received the additional designation "high" or "low" to indicate whether they were the high-ROF or low-ROF variant of the weapon. In a few cases, three ROFs were standardized, and the middle ROF weapon received the notation "medium."

Rapid Pulse Fusion V Gun: Any rapid pulse multi-chambered fusion gun with a pulse energy of 3 megajoules.

The most common example of this weapon was the RPV-14 mounted on the Astrin grav APC.

Rapid Pulse Fusion W Gun: Any rapid pulse multi-chambered fusion gun with a pulse energy of 18.5 megajoules.

This weapon was manufactured in large numbers at TL15 as the RPW-15 Low (RPW-15L) mounted on the Imperial Marine Grav APC and the RPW-15 High (RPW-15H) mounted on Imperial Point Defense and ND Control APCs.

Rapid Pulse Fusion X Gun: Any rapid pulse multi-chambered fusion gun with a pulse energy of 74 megajoules.

This weapon was manufactured in large numbers at TL14 as the RPX-14 mounted on early marks of the Trepida grav tank. At TL15 it was manufactured as the smaller RPX-15 and fitted to the Imperial Marine Support APC.

The 15-chamber TL14 weapon was often referred to as the RPX-14 High (RPX-14H) to further distinguish it from the lower ROF six-chamber TL15 weapon, which was also called the RPX-15 Low (RPX-15L).

Rapid Pulse Fusion Y Gun: Any rapid pulse multi-chambered fusion gun with a pulse energy of 125 megajoules.

This weapon was manufactured in large numbers at TL14 as the RPY-14 and mounted on the Trepida Mark II grav tanks. A lighter version of the weapon has also been built at TL15 with a lower rate of fire as the RPY-15. To further distinguish it from the higher-ROF TL14 version, the 10-chamber TL15 version is also known as the RPY-15 Low (RPY-15L) and the 20-chamber TL14 version is the RPY-14 High (RPY-14H).

Rapid Pulse Fusion Z Gun: Any rapid pulse multi-chambered fusion gun with a pulse energy of 175 megajoules. This weapon was manufactured in the Third Imperium as the RPZ-15 and mounted on the 20-ton heavy grav tanks. In the Regency, this weapon is fitted to the smaller Norris grav tank, an upgraded TL15 version of the TL14 Trepida.

Miscellaneous: A TL15 40-chamber 200-Mj rapid pulse fusion gun was tested and manufactured by the Third Imperium, but was never type-standardized. This undoubtedly saved Imperial bureaucrats from having to figure out what letter came after "Z."

WEAPON CHARACTERISTICS

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
TL14 3 Mj 3-Chamber Rapid Pulse Fusion Gun (RPV-14)							
14	3 Mj RP Fusion Gun RPV-14	5	52	1-1-2-10	52-52-26-5	3-5	260m
TL15 18.5 Mj 12-Chamber Rapid Pulse Fusion Gun (RPW-15 Low)							
15	18.5-Mj RP Fusion Gun RPW-15L	3	129	1-1-2-10	129-129-65-13	17-15	650m
TL15 18.5 Mj 19-Chamber Rapid Pulse Fusion Gun (RPW-15 High)							
15	18.5-Mj RP Fusion Gun RPW-15H	5	129	1-1-2-10	129-129-65-13	17-15	650m
TL15 74-Mj 6-Chamber Rapid Pulse Fusion Gun (RPX-15 Low)							
15	74-Mj RP Fusion Gun RPX-15L	SA2	258	1-1-2-10	258-258-129-26	67-25	1290m
TL14 74-Mj 15-Chamber Rapid Pulse Fusion Gun (RPX-14 High)							
14	74-Mj RP Fusion Gun RPX-14H	SA5	258	1-1-2-10	258-258-129-26	67-25	1290m
TL14 125-Mj 20-Chamber Rapid Pulse Fusion Gun (RPY-14 High)							
14	125-Mj RP Fusion Gun RPY-14H	SA4	335	1-1-2-10	335-335-168-34	112-35	1680m
TL15 125-Mj 10-Chamber Rapid Fire Fusion Gun (RPY-15 Low)							
15	125-Mj RP Fusion Gun RPY-15L	SA2	335	1-1-2-10	335-335-168-34	112-35	1680m
TL15 175-Mj 35-Chamber Rapid Pulse Fusion Gun (RPZ-15)							
15	175-Mj RP Fusion Gun RPZ-15	SA5	397	1-1-2-10	397-397-198-40	158-35	1980m

TL: Technology level; *ROF*: Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val*: Damage Value; *Pen Rtg*: Penetration Rating at short-medium-long-extreme ranges; *C-B*: Concussion value and Burst radius in meters; *Short Range*: Short Range in meters.

Heavy Grav Tank

TL15 HEAVY GRAV TANK

This tank is a classic example of "too much of a good thing." Although it served for many years as the standard TL15 tank for Imperial Marine, Army and Guard units, at 20 displacement tons it was simply too large for the capabilities it provided and was not that much more capable than the TL14 Trepida tanks which are only half its size. While this is not so much of a problem on the planetary battlefield, it is a major issue when it comes time to ship tank-equipped units from one world to another. Because the heavy grav tank requires twice the interstellar transport or assault lift of 10-ton designs, its use in these units created infrastructure costs far out of proportion to its actual battlefield capabilities. In addition, its crew size, also twice that of the Trepida series, doubled the personnel costs of the vehicle over the course of its operational life-cycle.

In addition, its command variant was a failure. The absence of a main armament on a vehicle which was clearly intended to operate with and masquerade as its fellow tanks on the battlefield was a critical shortcoming. Although it provided space for headquarters personnel, this function could have as easily been provided for with APCs at the headquarters, and this option would not have placed crucial headquarters personnel at risk in an effectively unarmed vehicle that was obliged to remain in the thick of the battle.

The heavy grav tank no longer serves in Regency Marine units, where it has been replaced by the Norris battle tank (see page 12). Heavy tanks removed from Marine service have been passed onto Regency Army units whose operational assignments do not require interplanetary redeployment.

Likewise, Regency Army "fire brigade," rapid-deployment and peacekeeping units have traded their heavy tanks for Norris tanks. Heavy grav tank production is complete, although manufacture of spares and maintenance parts continues; surplus vehicles from previous users are sufficient to meet the needs of all current heavy grav tank users. All new TL15 grav tank production is of 10-ton designs such as the Norris.

Heavy Grav Tank

Tech Level: 15

Price: MCr20.982401

Size: 280 cubic meters=20 displacement tons (VS)

Mass: 401.57 tonnes empty, 434.7 loaded

Power: TL15 12.42 MW fusion power plant supplying 2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 148 tonnes of thrust (0.0076 MW excess power)

Maint: 72

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system

Commo: TL15 3000km radio, TL15 300km meson communicator

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 4×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 60 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators (80 m3), and one air lock

Cargo: 312 kg of crew equipment (1.2515 m³)

Crew: 4 (Driver, Main Gunner, Secondary Gunner, Commander)

Passengers: None; includes two half-bunks for crew

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), each of two EMS rangefinders may function as 3km short range laser/EMS designator

Armament: TL15 rapid-pulse 175-Mj fusion gun in main turret, VRF gauss gun in remote turret

Stabilization: Advanced (fire at any speed) for both weapons

Ammo: 200 rounds of 175-Mj 24.6×73.6cm PFC cartridges (Cr1400 each, MCr0.28 for full load of 200) and 120,000 rounds of 4mm gauss ammunition (Cr1200 for full load of 120,000 rounds dart)

Reloading Data: Fusion gun magazine is 14 m³, 28.28 tonnes loaded, 0.28 tonnes empty, MCr0.2814 loaded, MCr0.0014 empty, reloading requires 283 five-second combat turns and a crane or contra-grav lifters. VRF gauss gun ammunition is carried in 4 cassettes, 0.017m³ each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).

Speed: 785 kph maximum, 589 kph cruising, 190 kph safe NOE

Travel Move: 2356/1140

Combat Move: 109 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

Maximum Acceleration: 0.34 G

Fuel Capacity: 55,500 liters reaction mass plus 103.5 liters for fusion reactor

Fuel Consumption/Endurance: 1850 liters/hour (endurance of 30 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Turret	**TF:** 336	**HF:** 336
Susp: Grav	**TS:** 168	**HS:** 168
	TR: 168	**HR:** 168
	Deck: 252	**Belly:** 252

WEAPON CHARACTERISTICS

TL15 175-Mj 35-Chamber Rapid Pulse Fusion Gun (RPZ-15)

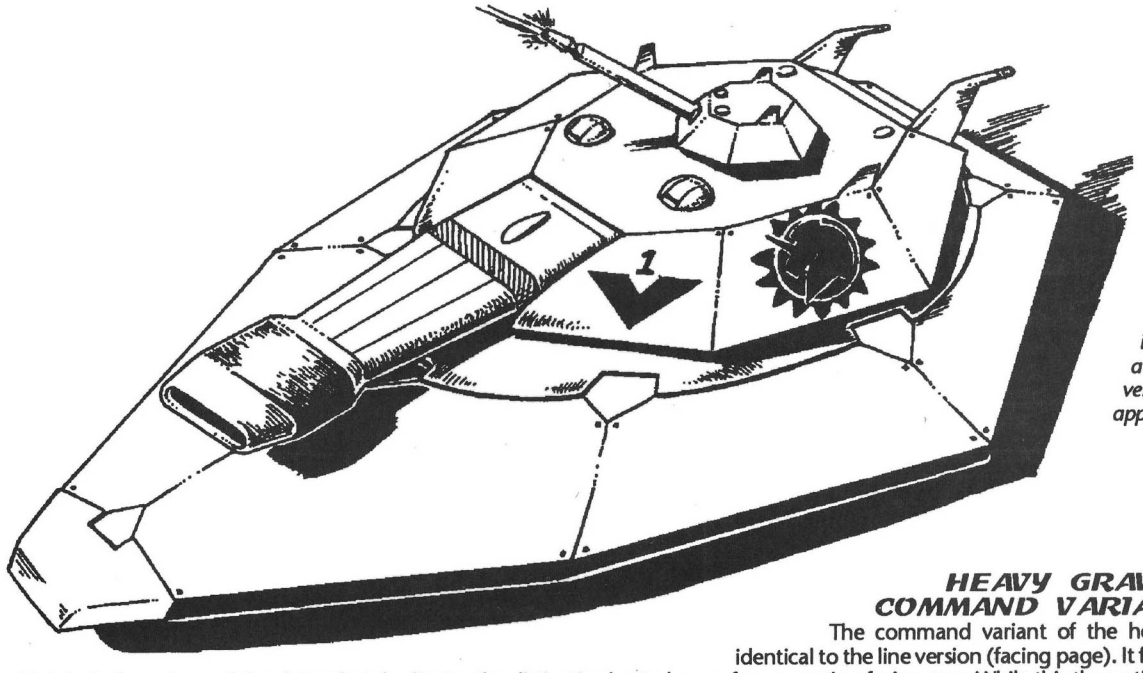
TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPZ-15 RP Fusion Gun	SA5	397	1-1-2-10	397-397-198-40	158-35	1980m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

Secondary Weapon, VRF Gauss Gun

TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Magazine*	*Short Range*
10	4×20mm/60 Dart	50	6	1-1-3-5	6-6-2-1	120,000C	300

TL: Technology Level; *Round:* type of round fired; *ROF:* Rate of Fire in shots per fire *action; Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *Pen Val:* Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine:* Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range:* Short Range in meters.



Heavy grav tank firing the VRF gauss gun in its secdondary turret. Note that the dummy fusion gun carried by the command variant makes it virtually impossible to tell if this is a line or a command version simply by its appearance.

HEAVY GRAV TANK, COMMAND VARIANT

The command variant of the heavy grav tank is visually identical to the line version (facing page). It features a dummy RPZ gun which includes a thermal simulator that duplicates the distinctive heat plume of an operating fusion gun. While this theoretically makes the command tank more visible than it otherwise would be, it performs the more important function of preventing the enemy from easily picking out the command tank from its line companions (however, experienced troops can identify command vehicles by their behavior on the battlefield, which cannot be disguised).

Under standard Imperial doctrine, platoon-level tactical jamming is provided by the platoon's command vehicle. The command tank is accordingly fitted with a 30km EMS jammer to fulfill this role.

Imperial and now Regency doctrine calls for the establishment of a "constellation" of orbital surveillance and communications relay satellites around all worlds on which major military operations are being conducted. The long-range maser communicator allows the command tank to tie into the orbital communications and surveillance constellation and thereby communicate with ships in orbit and units on the ground anywhere under the constellation's coverage. The standard pair of TL15 computers for command vehicles allows its personnel to efficiently track, access, coordinate and route all intelligence, communications, and all command and control instructions to and from subordinate and superior units.

Characteristics of the command variant are shown below only where they differ from the line variant on the facing page.

Heavy Grav Tank, Command Variant

Price: MCr19.553243

Mass: 388.13 tonnes empty, 393.94 loaded

Power: TL15 18.72 MW fusion power plant supplying 2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 148 tonnes of thrust (0.0574 MW excess power)

Maint: 66

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computers

Commo: TL15 3000km radio, TL15 300km meson communicator, 30,000km maser

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 6×WSV goggles

ECM: 30km EMS Jammer, Electromagnetic masking package, 4 decoy dispensers each with space for 60 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)

Cargo: 477 kg of crew equipment (1.788 m^3)

Crew: 3 (Driver, Gunner, Electronics Tech, Commander)

Passengers: Normal workstations for two command personnel, plus adequate seats for up to three additional passengers and two half-bunks for crew

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: VRF gauss gun in remote turret, dummy RPZ gun visually identical to basic noncommand version

Stabilization: Advanced (fire at any speed)

Ammo: 120,000 rounds of 4mm gauss ammunition (Cr1200 for full load of 120,000 rounds dart)

Reloading Data: VRF gauss gun ammunition is carried in 4 cassettes, 0.017m^3 each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).

Speed: 976 kph maximum, 732 kph cruising, 190 kph safe NOE

Travel Move: 2928/1140

Combat Move: 136 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Maximum Acceleration: 0.376 G

Fuel Capacity: 55,500 liters reaction mass plus 156 liters for fusion reactor

Fuel Consumption/Endurance: 1850 liters/hour (endurance of 30 hours), plus reactor fuel is sufficient for one month constant power

Weapon Characteristics

VRF Gauss Gun only, see weapons characteristics box (facing page) for line version

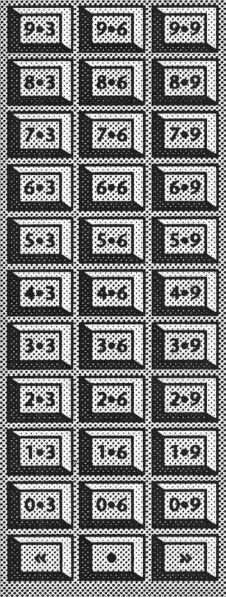
Decoys

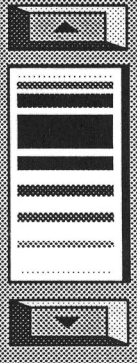
Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for heavy grav tanks cost Cr20,000 each regardless of type, or MCr4.8 for a full load of 240.

Trepida I Grav Tank







Security Clearance

Yes No

300-1202

Date

TL14 TREPIDA GRAV TANK

This tank was the pre-eminent symbol of irresistible armored firepower in the antebellum period, and was the standard grav tank of the high-stellar technology Imperial armed forces of the Last Imperium. The Imperial Army maintained units in three technology bands: Early Stellar (TL9-10), Average Stellar (11-13), and High Stellar (14-15). Because of the many significant technological break points (e.g., high-efficiency contra-grav at TL12, bonded superdense armor and fusion weapons at TL14, etc.) within these bands, technology of certain levels would tend to dominate the equipment of a certain band. In the High Stellar band, the greater number of TL14 worlds militated for TL14 vehicles rather than the Imperial TL15 absolute upper limit, and it was this consideration that made the TL14 Trepidas the standard high stellar tank. In addition to units of the three bands above, the Imperium maintained small numbers of "top tier" units equipped exclusively at TL15. Top tier units included Imperial Marine Regiments, Imperial Guard Regiments, and other elite spearhead forces. Sector governments typically maintained at least one top tier unit; in the Spinward Marches this unit was the Duke of Regina's Own Huscarles (see pages 46-47 and also **Striker II**).

The Trepida fully deserved its fearsome reputation; it is a dangerous weapon indeed, able to penetrate the equivalent of 2.5 meters of steel (in early models, more in later models) at a range of over 2.5 kilometers, but armored to withstand that same firepower across its frontal arc. Although the tank is expensive, it is more than a match for most starships, provided they get within its firing range.

It is interesting to note that almost the entire price of the tank is attributable to its powerful fusion gun, valued at 11.3 million credits of the tank's total price of MCr15.6 in the case of the Trepida II. As the Imperium's standard "high end" main battle tank, the Trepida was produced in a variety of models over the years, which are detailed below.

The TL14 Trepida is no longer the standard high stellar tank in the Regency, owing to the Regency's high priority program to maximize Regency technology up to the TL15 ceiling. Although many Trepidas can still be found in service in the armies of TL14 worlds, most Trepidas have been rebuilt as TL15 Norris battle tanks (see pages 12-13).

Trepida I Grav Tank

Tech Level: 14

Price: MCr9.885669

Size: 140 cubic meters=10 displacement tons (VS)

Mass: 210.97 tonnes empty, 237.21 loaded

Power: TL14 7.98 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0298 MW excess power)

Maint: 40

Controls: Holographic linked, TL10+ flight avionics, TL14 terrain following avionics, 3×TL14 Model FIt flight computers, TL10+ IGS navigation system

Commo: TL14 3000km radio, 2×TL14 3km masers

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 2×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators, and one air lock

Cargo: 155 kg of crew equipment (0.62 m^3)

Crew: 2 (Driver, Commander/Gunner)

Passengers: None

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: Turret-mounted TL14 rapid-pulse 74-Mj fusion gun, coaxial VRF gauss gun

Stabilization: Advanced (fire at any speed) for both weapons

Ammo: 410 rounds of 74-Mj 18.5×55cm PFC cartridges (Cr592 each, MCr0.243 for full load of 410) and 60,000 rounds of 4mm gauss ammunition (Cr600 for full load of 60,000 rounds dart)

Reloading Data: Fusion gun magazine is 12.15m^3, 24.543 tonnes loaded, 0.243 tonnes empty, MCr0.244215 loaded, MCr0.001215 empty, reloading requires 246 five-second combat turns and a crane or contra-grav lifters. VRF gauss gun ammunition is carried in 2 cassettes, 0.017m^3 each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).

Speed: 713 kph maximum, 535 kph cruising, 178 kph safe NOE

Travel Move: 2140/1068

Combat Move: 99 (high mode absolute speed)/25 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

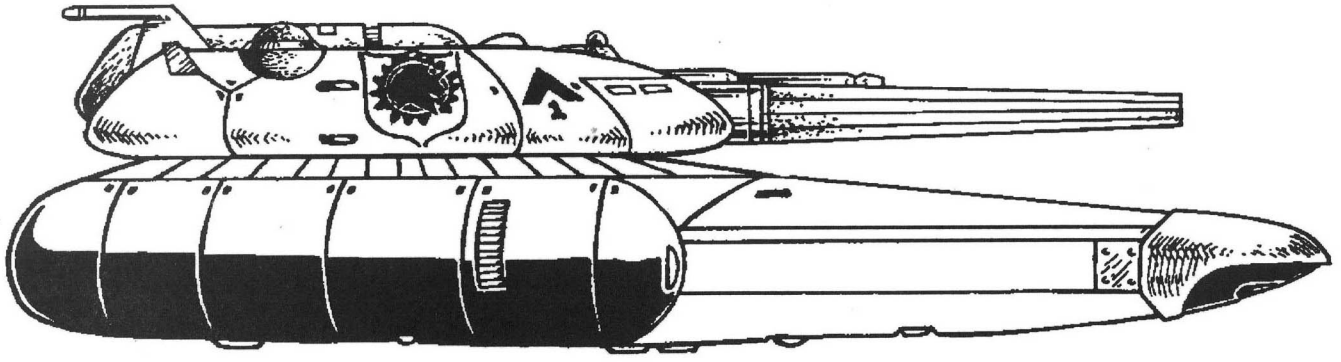
Maximum Acceleration: 0.365 G

Fuel Capacity: 19,922.6 liters reaction mass plus 66.5 liters for fusion reactor

Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 18.4 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129



*Regency Army Trepida I grav tank. Note the distinctive fluted barrel of the RPX-14H rapid-pulse fusion gun. Compare it to illustrations of the Cuspid-type gunboats (**Regency Sourcebook**, page 90). The barrel of the coaxial VRF gauss gun is barely visible above and beyond the fusion gun.*

TREPIDA I

This is the first production version of the tank, and arguably the best balanced design. For example, note that unlike the up-gunned Mk II Trepidas, its frontal armor is matched to its weapon's performance, a typical design consideration of Imperial AFV manufacturers. Although its gun is less powerful than that in the later Trepida IIs, the 74-Megajoule rapid-pulse fusion X gun has a higher rate of fire than the later 125-Mj weapon, and is supplied with more ammunition, allowing the tank to stand longer in combat, almost seven minutes at its maximum cyclic rate of fire. Furthermore, the coaxial VRF gauss gun allows the tank to economically engage a wider variety of targets than can the Trepida II, armed only with its huge fusion gun. Perhaps more importantly, it can engage these targets with restraint (a word not often used in reference to bolts of fusing hydrogen plasma), an important consideration for peacekeeping, police action, and internal security missions.

Because of its lower offensive performance as compared to the Trepida IIs (next page), the Mk I is the variant most often chosen for rebuilding to the Norris battle tank design, which involves the scrapping of the turret. However, the turrets components are reused in other programs. The most interesting example of this component recycling is the Cuspid-type gunboat. The Trepida's RPX-14 fusion gun is salvaged, refurbished, and installed as a close-quarters weapon on this space-based fighter (see **Regency Sourcebook** page 90).

Like the Norris battle tank (page 12), the command version of the Trepida I retains its main armament and is supplemented by an APC in the headquarters section.

WEAPON CHARACTERISTICS

74-Mj 15-Chamber Rapid Pulse Fusion Gun (RPX-14H)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
14	RPX-14H RP Fusion Gun	SA5	258	1-1-2-10	258-258-129-26	67-25	1290m

TL: Technology level; *ROF*: Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B*: Concussion value and Burst radius in meters; *Short Range*: Short Range in meters.

Secondary Weapon: VRF Gauss Gun

TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Magazine*	*Short Range*
10	4x20mm/60 Dart	50	6	1-1-3-5	6-6-2-1	60,000C	300

TL: Technology Level; *Round*: type of round fired; *ROF*: Rate of Fire in shots per fire *action; Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *Pen Val*: Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine*: Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range*: Short Range in meters.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL14 systems, or by two levels vs. TL13– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Trepida grav tanks cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

Trepida II Grav Tank

TREPIDA IIA

The Trepida IIA is an attempt to fit the maximum possible firepower into the Trepida tank, making it more useful in antitank and direct support roles. The 125-Mj gun was the largest gun that could practically be fitted to the tank without sacrificing too much in rate of fire or ammunition capacity.

Even so, the tank has lost some ROF compared to the earlier model, and has had its ammunition supply reduced to only 3.5 minutes at the maximum cyclic rate. More importantly, it has given up its secondary armament, so the tank has no weapon with which to engage low-value targets other than its expensive and often over-powerful fusion cartridges. The Trepida II is thus very poorly equipped for peace-keeping operations where carefully controlled lethality and limited collateral damage is critical.

The low ammunition capacity of the early Trepida IIs caused the creation of the Trepida IIB type, which traded fuel endurance for additional ammunition. Early model IIs then became known as IIAs, but remained in production on a number of worlds.

Trepida IIA Grav Tank

Tech Level: 14

Price: MCr15.441221

Size: 140 cubic meters=10 displacement tons (VS)

Mass: 216.12 tonnes empty, 235.11 loaded

Power: TL14 6.63 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0298 MW excess power)

Maint: 39

Controls: Holographic linked, TL10+ flight avionics, TL14 terrain following avionics, 3×TL14 Model FIt flight computers, TL10+ IGS navigation system

Commo: TL14 3000km radio, 2×TL14 3km masers

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 2×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators, and one air lock

Cargo: 238 kg of crew equipment (0.955 m³)

Crew: 2 (Driver, Commander/Gunner)

Passengers: None

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: Turret-mounted TL14 rapid-pulse 125-Mj fusion gun

Stabilization: Advanced (fire at any speed)

Ammo: 170 rounds of 125-Mj 22×66cm PFC cartridges (Cr1000 each, MCr0.17 for full load of 170)

Reloading Data: Fusion gun magazine is 8.5 m³, 17.17 tonnes loaded, 0.17 tonnes empty, MCr0.17085 loaded, MCr0.00085 empty, reloading requires 172 five-second combat turns and a crane or contra-grav lifters.

Speed: 712 kph maximum, 534 kph cruising, 178 kph safe NOE

Travel Move: 2136/1068

Combat Move: 99 (high mode absolute speed)/25 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

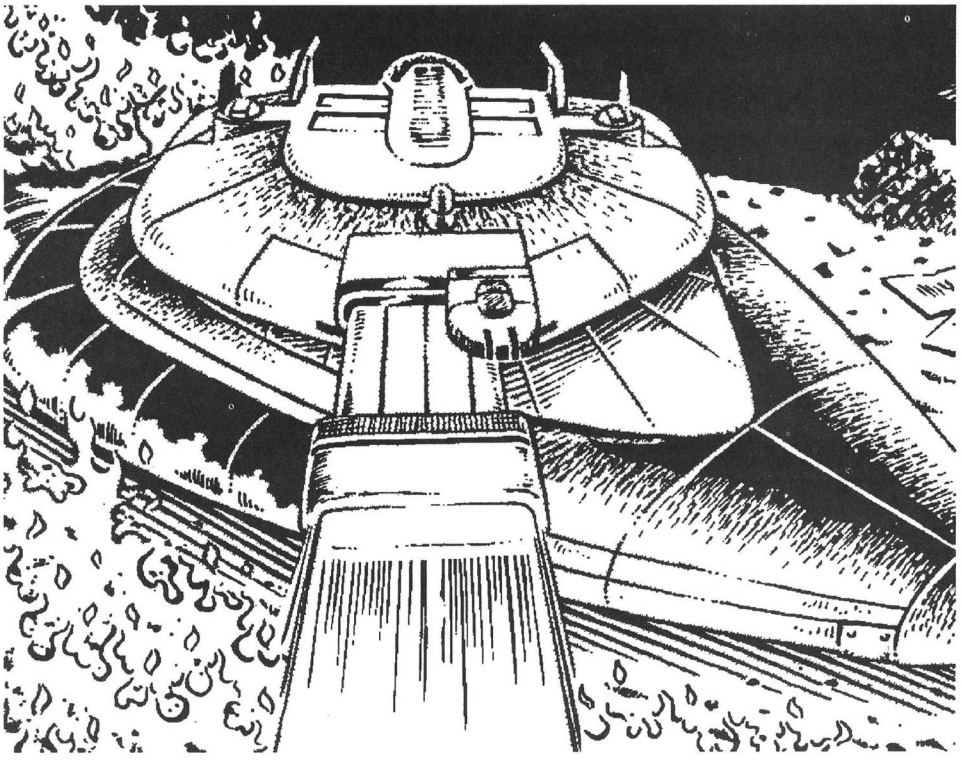
Maximum Acceleration: 0.368 G

Fuel Capacity: 19,922.6 liters reaction mass plus 55.25 liters for fusion reactor

Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 18.4 hours), plus reactor fuel is sufficient for one month constant power

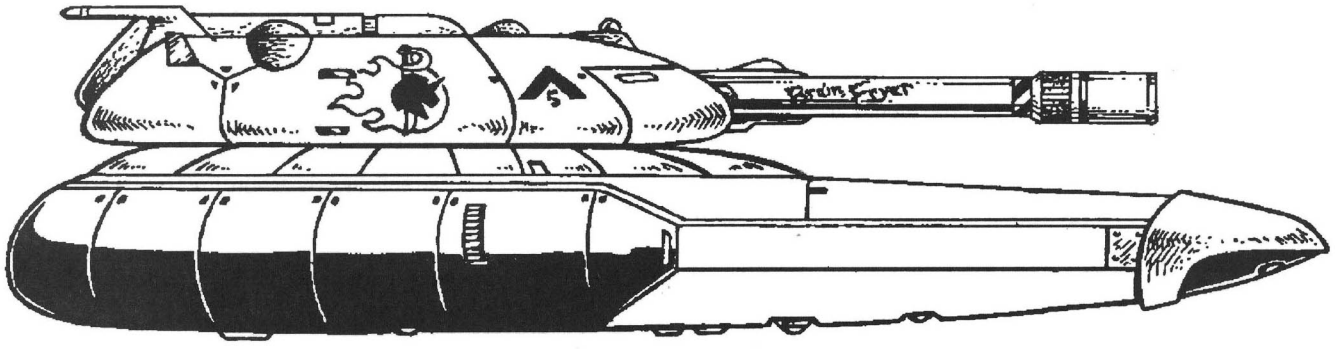
Combat Statistics

Config: Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129



Trepida II fires its 125-Megajoule fusion gun during a night engagement

Security Clearance
Yes No
300-1202
Date



Trepida IIB bearing the distinctive Fireball markings of the 444th Tank Regiment, currently serving with the 61st Fleet as the Regency Quarantine District 3 Mobile Force (see page 47). The presence of the cutlass in the design probably indicates that the vehicle is crewed by a Marine crew serving on an exchange tour with the Army.

TREPIDA IIB

The Trepida IIB is a revision of the up-gunned model II design, gaining greater ammunition capacity (over four minutes at the maximum cyclic rate) at the expense of four hours of fuel endurance. This is thought by most users to be a better balanced design than the IIA, as there is no need to have the additional fuel range on a vehicle which will run out of ammunition more rapidly, especially a tank which is ill-suited for peace-keeping patrol duty. The Trepida IIB was therefore produced in much greater numbers than the IIA.

The Trepida IIB is believed to have been the most numerous model of the Trepida family to see service in the Civil War, in which case it likely inflicted and sustained more casualties than any other single vehicle type.

Trepida IIB Grav Tank

Tech Level: 14

Price: MCr15.592871

Size: 140 cubic meters=10 displacement tons (VS)

Mass: 216.45 tonnes empty, 238.09 loaded

Power: TL14 6.63 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0298 MW excess power)

Maint: 40

Controls: Holographic linked, TL10+ flight avionics, TL14 terrain following avionics, 3×TL14 Model Flt flight computers, TL10+ IGS navigation system

Commo: TL14 3000km radio, 2×TL14 3km masers

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 2×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators, and one air lock

Cargo: 95 kg of crew equipment (0.381 m³)

Crew: 2 (Driver, Commander/Gunner)

Passengers: None

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: Turret-mounted TL14 rapid-pulse 125-Mj fusion gun

Stabilization: Advanced (fire at any speed)

Ammo: 200 rounds of 125-Mj 22×66cm PFC cartridges (Cr1000 each, MCr0.2 for full load of 200)

Reloading Data: Fusion gun magazine is 10 m³, 20.2 tonnes loaded, 0.2 tonnes empty, MCr0.201 loaded, MCr0.001 empty, reloading requires 202 five-second combat turns and a crane or contra-grav lifters.

Speed: 673 kph maximum, 505 kph cruising, 168 kph safe NOE

Travel Move: 2020/1008

Combat Move: 94 (high mode absolute speed)/23 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +2 at safe NOE speed, +3 at 2×safe NOE speed, and +4 at 3×safe NOE speed

Maximum Acceleration: 0.364 G

Fuel Capacity: 16,890.9 liters reaction mass plus 55.25 liters for fusion reactor

Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 15.6 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL14 systems, or by two levels vs. TL13– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Trepida grav tanks cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

WEAPON CHARACTERISTICS

125-Mj 20-Chamber Rapid Pulse Fusion Gun (RPY-14)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
14	RPY-14 RP Fusion Gun	SA4	335	1-1-2-10	335-335-168-34	112-35	1680m

TL: Technology level; *ROF*: Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B*: Concussion value and Burst radius in meters; *Short Range*: Short Range in meters.

Norris Grav Tank

TL15 NORRIS BATTLE TANK

Originally known as the Trepida Mk III while still in development, it was renamed for the late First Regent upon his death in 1157. Because of the known shortcomings of the TL15 heavy grav tank design (see page 6 for discussion), it was determined that a tank in the Trepida size range but with heavy tank's performance would be the design goal for the TL15 future battle tank (FBT-15). Although it was possible to fit the RPZ-15 gun into the Trepida chassis, it did not prove feasible to improve the armor protection without increasing the overall size of the vehicle. Because maintaining the 10-ton size for ease of interstellar deployability was a primary design requirement, this shortcoming was acceptable. However, it was the existence of large numbers of Trepidas that could be quickly converted to the FBT configuration that clinched the argument. Since this would allow many more tanks to be quickly placed in service than in the case of an entirely new design, the Trepida III was approved for production in late 1156.

The hulls of the TL14 Trepida and TL15 Norris are virtually identical, sharing hull structure, control, contra-grav, and ECM systems. Thus conversion from Trepida to Norris standards was accomplished primarily by the substitution of a more powerful (though smaller) TL15 power plant and the installation of a new turret containing the TL15 armament, fire control, communications, and sensor systems.

Another major feature of the Norris design is the provision of a secondary armament: the coaxial VRF gauss gun. This allows the tank to engage targets under circumstances that do not warrant highly destructive fusion gun fire. This makes the Norris much more suitable for peacekeeping operations than are the Mk II Trepidas.

Norris battle tanks are the standard tank used by the Regency Marine Corps and most top-tier Regency Army units. Only army units which are organized for planetary defense of high-tech worlds still utilize the 20-ton heavy grav tank (see pages 6-7).

Perhaps the only shortcoming of the Norris design compared to its Trepida forebears is its relatively small ammunition capacity, only 1.75 minutes at the maximum cyclic rate. However, it also shares a weakness with its TL14 ancestors: relatively weak armor. In some respects the Norris is actually less well-armored than the standard TL15 APCs.

Tech Level: 15
Price: MCr18.569693
Size: 140 cubic meters=10 displacement tons (VS)
Mass: 217.25 tonnes empty, 233.96 loaded
Power: TL15 10.2 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.2048 MW excess power)
Maint: 39
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 3000km radio, TL15 300km meson communicator
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (40 m³), and one air lock
Cargo: 176 kg of crew equipment (0.705 m³)
Crew: 2 (Driver/gunner, commander)
Passengers: None
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator
Armament: Turret-mounted TL15 rapid-pulse 175-Mj fusion gun, coaxial VRF gauss gun
Stabilization: Advanced (fire at any speed) for both weapons

Ammo: 105 rounds of 175-Mj 24.6×73.6cm PFC cartridges (Cr1400 each, MCr0.147 for full load of 105) and 60,000 rounds of 4mm gauss ammunition (Cr600 for full load of 60,000 rounds dart)
Reloading Data: Fusion gun magazine is 7.35m³, 14.847 tonnes loaded, 0.147 tonnes empty, MCr0.147735 loaded, MCr0.000735 empty, reloading requires 149 five-second combat turns and a crane or contra-grav lifters. VRF gauss gun ammunition is carried in 2 cassettes, 0.017m³ each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).
Speed: 784 kph maximum, 588 kph cruising, 190 NOE
Travel Move: 2352/1140
Combat Move: 109 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.37 G
Fuel Capacity: 19,489.5 liters reaction mass plus 85 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 18 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129

WEAPON CHARACTERISTICS

175-Mj 35-Chamber Rapid Pulse Fusion Gun (RPZ-15)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPZ-15 RP Fusion Gun	SA5	397	1-1-2-10	397-397-198-40	158-35	1980m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

Secondary Weapon: VRF Gauss Gun: VRF Gauss Gun

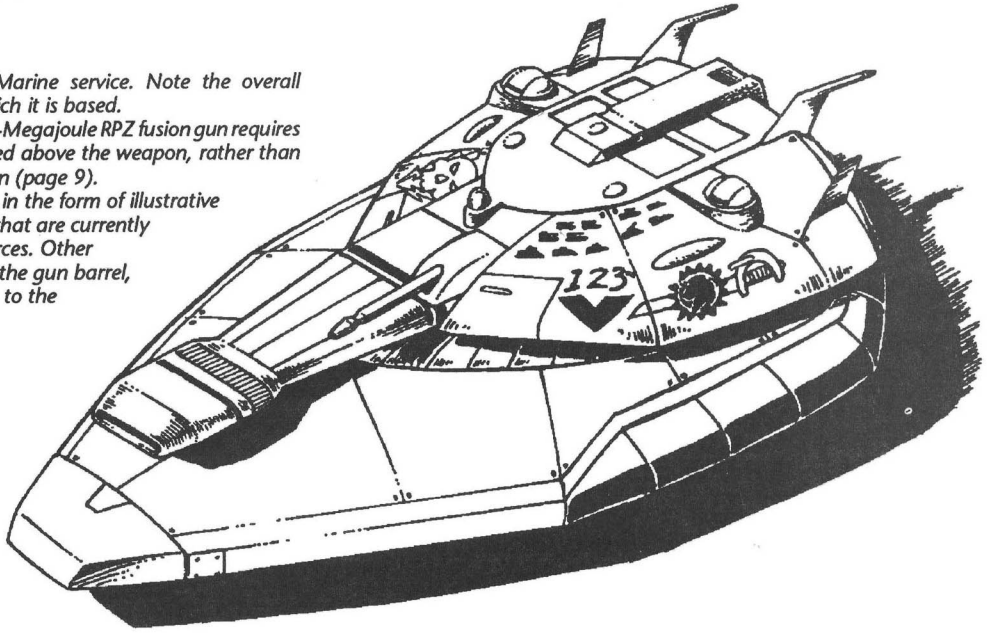
TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*Magazine*	*Short Range*
10	4×20mm/60 Dart	50	6	1-1-3-5	6-6-2-1	60,000C	300

TL: Technology Level; *Round:* type of round fired; *ROF:* Rate of Fire in shots per fire *action; Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *Pen Val:* Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine:* Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range:* Short Range in meters.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
2•3 2•6 2•9
1•3 1•6 1•9
0•3 0•6 0•9
« • »
Security Clearance
Yes No
300-1202
Date

Power

ON/OFF



Norris battle tank in Regency Marine service. Note the overall similarity to the Trepida tank on which it is based.

Note that the bulk of the huge 175-Megajoule RPZ fusion gun requires the coaxial VRF gauss gun to be fitted above the weapon, rather than alongside it as in the Trepida I design (page 9).

This vehicle displays kill markings in the form of illustrative silhouettes, one of several methods that are currently popular in the Regency planetary forces. Other methods include "kill rings" around the gun barrel, and national insignia corresponding to the allegiance of the destroyed system.

COMMAND VARIANT

The Norris command tank was carefully designed to be fully compatible with its subordinate tanks from a logistical and operational point of view. Both have identical battlefield endurance, and the command tank has equal or greater speed. Both use the same weapons fit, ammunition, decoys, electronics and avionics suites, fuel tanks, and thrusters, which greatly simplifies logistics support, maintenance, and stocking of spare parts.

The main differences between the two is the addition of a single TL15 computer and hull workstation for the commander, plus a 30,000km maser uplink to tie the platoon into the surveillance and communications constellation (SCC, see page 7). This is achieved at the cost of 47 rounds of main armament ammunition, and a new life-support scheme. Unlike the basic variant, which includes an air lock and 40 m³ habitable area, the command version has no air lock and limits its life support equipment to a small 15 m³ capsule occupied by the three crew in the hull.

The command version carries 55% of the ammunition available to the standard versions, so is able to effectively stand in battle when required to do so, and retains the same number of decoys as the standard tank. The command variant can be visually recognized by its slimmer turret, but unlike the command variant of the heavy grav tank (page 7), there was no attempt nor any real need to disguise the identity of this tank, as it is not a defenseless command vehicle masquerading as a tank, but a fully equipped combat vehicle well-able to defend itself.

Because the Norris command tank does not carry the other personnel of the platoon headquarters section (unlike the heavy command tank), the headquarters of a Norris-equipped platoon also includes an Imperial Marine Command/Computer APC (page18) or Imperial Fire Support/Command APC (page 24). This gives the Norris headquarters a separate "command" and "headquarters" vehicles: one from which the commander leads from the front and the other where the headquarters section coordinates information and logistics flow. The headquarters vehicle also makes up for the relative lack of computing capacity of the command tank, which only carries one computer instead of the two required of a full-fledged command/headquarters vehicle.

The Norris command tank is identical to the standard Norris but with the following changes. Simply replace the line in the Norris entry on the facing page with the information below.

Price: MCr26.430074

Mass: 218.28 tonnes empty, 228.34 loaded

Power: TL15 15.6 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0357 MW excess power)

Maint: 38

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, 1×TL15 St computer

Commo: TL15 3000km radio, TL15 300km meson communicator, TL15 30,000km maser

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 3×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom), 30km EMS jammer

Life Support: Heat, light, extended life support, artificial gravity/G-compensators (20 m³), *no* air lock

Cargo: 38.7 kg of crew equipment (0.155 m³)

Crew: 3 (Driver, gunner/vehicle commander, unit commander)

Ammo: 58 rounds of 175-Mj 24.6×73.6cm PFC cartridges (Cr1400 each, MCr0.0812 for full load of 58) and 60,000 rounds of 4mm gauss ammunition (Cr600 for full load of 60,000 rounds dart)

Reloading Data: Fusion gun magazine is 4.06m³, 8.2012 tonnes loaded, 0.0812 tonnes empty, MCr0.081606 loaded, MCr0.000406 empty, reloading requires 83 five-second combat turns and a crane or contra-grav lifters. VRF gauss gun ammunition is carried in 2 cassettes, 0.017m³ each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).

Speed: 869 kph maximum, 652 kph cruising, 190 NOE

Travel Move: 2608/1140

Combat Move: 121 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Maximum Acceleration: 0.38 G

Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 18 hours), plus reactor fuel is sufficient for 2.6 weeks constant power

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Norris grav tanks cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

Astrin Grav APC

TL14 ASTRIN GRAV APC

The Astrin grav APC is the standard Imperial TL14 APC, and as such was widely used and lost in the Civil War along with its sister AFV, the Trepida grav tank.

The Astrin APC is closely based on the chassis of the Trepida grav tank, and in fact has identical armor protection, power, locomotive, and electronic systems, allowing the two vehicles to operate together quite effectively. Although the Norris battle tank (see page 12) is the TL15 version of the Trepida, no TL15 APC version was ever built or contemplated, given the profusion of TL15 APCs already fielded and being produced.

The Astrin is intended for the carriage of 10 troops wearing heavy battle dress. The cramped seating required that a large troop door be installed to allow the troops to debark rapidly (five per five-second combat turn).

The Astrin has a substantial cargo capacity (equivalent to seating for an additional three troops), allowing the embarked squad to carry heavy weapons, support equipment, etc. along with them.

Tech Level: 14
Price: MCr3.7052325
Size: 140 cubic meters=10 displacement tons (VS)
Mass: 200.09 tonnes empty, 206.1 loaded
Power: TL14 5.37 MW fusion power plant supplying 1 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 58.65 tonnes of thrust (0.0123 MW excess power)
Maint: 34
Controls: Holographic linked, TL10+ flight avionics, TL14 terrain following avionics, 3×TL14 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL14 3000km radio, 2×TL14 3km masers
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3km active EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see facing page, bottom)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 70 cubic meters), and one air lock
Cargo: 2015 kg of crew equipment (8.06 m³)
Crew: 2 (Driver, commander/gunner)
Passengers: 10 in cramped seats with large cargo hatch, allowing 5 battle dress-equipped troops to debark/embark per five-second combat turn.
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator
Armament: TL14 rapid-pulse 3-Mj fusion gun in remote turret
Stabilization: Advanced (fire at any speed)
Ammo: 500 rounds of 3-Mj 6.3×19.25cm PFC cartridges (Cr24 each, MCr0.012 for full load of 500)
Reloading Data: Fusion gun magazine is 0.6m³, 1.212 tonnes loaded, 0.012 tonnes empty, MCr0.01206 loaded, MCr0.00006 empty, reloading requires 13 five-second combat turns and a crane or contra-grav lifters.
Speed: 867 kph maximum, 650 kph cruising, 180 kph NOE
Travel Move: 2600/1080
Combat Move: 121 (high mode absolute speed)/25 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.285 G
Fuel Capacity: 20,527.5 liters reaction mass plus 44.75 liters for fusion reactor
Fuel Consumption/Endurance: 733.125 liters/hour (endurance of 28 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 258	**HF:** 258
Susp: Grav	**TS:** 129	**HS:** 129
	TR: 129	**HR:** 129
	Deck: 129	**Belly:** 129

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL14 systems, or by two levels vs. TL13– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for Astrin grav APCs cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

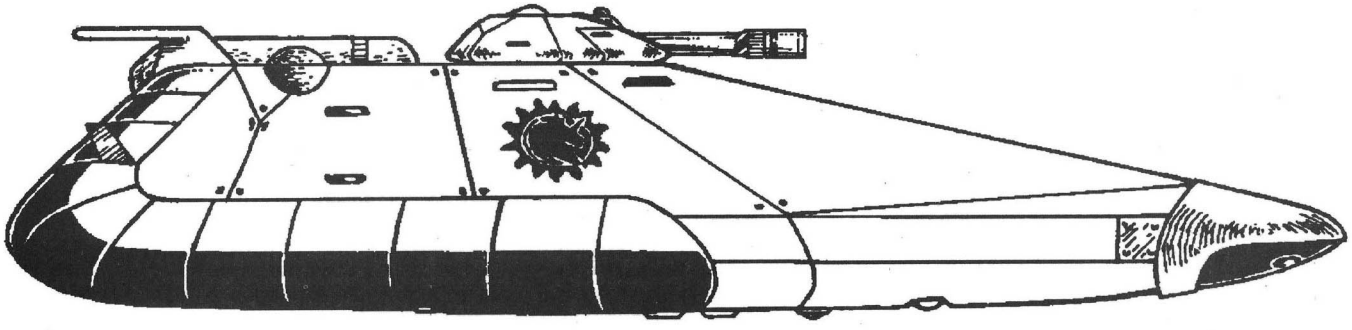
WEAPON CHARACTERISTICS

TL14 3 Mj 3-Chamber Rapid Pulse Fusion Gun (RPV-14)

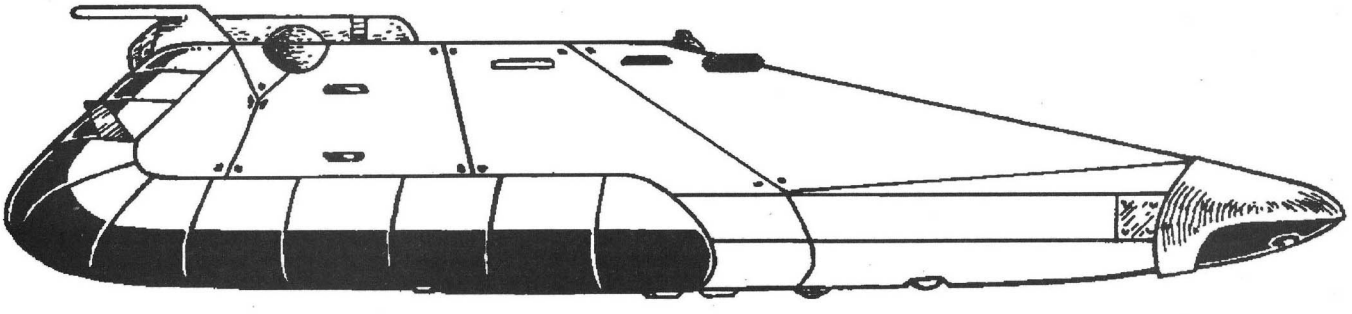
TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
14	RPV-14 RP Fusion Gun	5	52	1-1-2-10	52-52-26-5	3-5	260m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

Security Clearance
Yes No
300-1202
Date



Current production Regency Astrin APC, showing the standard turret-mounted RPV fusion gun. This side view makes the Astrin's common ancestry with the Trepida grav tanks very clear. Compare to pages 9 and 11.



Early production Imperial Astrin APC, without turret. In comparison with the current-production vehicle, note how the sensor equipment at the forward end of the hull deck has been displaced to the turret.

ASTRIN GRAV APC, EARLY PRODUCTION VERSION

The Astrin Grav APC was developed as a companion to the Trepida series tanks (see pages 8-11), and its production lagged several years behind that of the tanks. While the Trepida was type-standardized in 1109, the Astrin did not achieve large-scale deliveries until 1112, only four years prior to the assassination of Emperor Strephon. Thus the Astrin only began service entry in the last few years of the antebellum period, but these initial vehicles differed from current Regency-standard Astrins in their lack of a turret.

There was substantial pressure to field this companion vehicle in the Trepida-equipped organizations, and the design was rushed into production before a final decision was reached as to the nature of its armament, or even if such armament was required. Some pointed out that since the vehicle would operate in consort with Trepida tanks it would be wasteful and duplicative to give it a weapon of its own. Furthermore, the lack of a turret would increase the vehicle's speed and reduce its signature and target size.

In any event, the vehicle entered production and fought the Civil War without a turret, although its combat performance proved to Regency military leaders that such a turret was in fact quite necessary. For this reason, all Astrins produced in the Domain of Deneb and Regency following the onset of the Civil War have been equipped with a turret-mounted fusion gun as seen on the facing page.

Turretless early production Astrins are identical in most features to current production versions, except as detailed below.

Price: MCr2.5704725
Size: 130.666 cubic meters=9.333 displacement tons (Mc)
Mass: 199.72 tonnes empty, 204.54 loaded
Fire Control: None
Armament: None
Stabilization: None
Ammo: None
Speed: 953 kph maximum, 715 kph cruising, 180 kph NOE
Travel Move: 2860/1080
Combat Move: 132 (high mode absolute speed)/25 (NOE safe speed) in 10-meter grid squares
Signature: +2 Diff Mods vs. HRT and Radar, +1 vs. other methods
Diff Mods vs. Fire: 0 Diff Mod stationary, +6 at maximum speed (high mode combat move), +6 at cruising speed (high mode travel move), +4 at safe NOE speed, +5 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.287 G

Combat Statistics

Config: No Turret
Susp: Grav
HF: 258
HS: 129
HR: 129
Deck: 129
Belly: 129

Imperial Marine Grav APC

IMPERIAL MARINE GRAV APC

This vehicle has never been assigned an official name. It is simply known as the "Imperial Marine Grav APC," although it is unofficially referred to as "The Big Stick." It is no accident that the vehicle has no low-lethality secondary weapons. It literally has no ability to respond to provocation while limiting damage, for that is not its job.

The fact that it is entirely armed with nuclear Tac missiles and a fusion gun was well-advertised throughout the Imperium, and the message was clear: when the Marines arrive, the party is over, and no half-measures will be taken. And now, after the Collapse, the point remains: Regency Marines are not peacekeepers. Rather, they are peace*makers*, even if only the peace of the dead.

As an exception to the standard elimination of the title "grav" for Regency equipment, the Imperial Marine APC retains the descriptor "grav" as part of its antebellum mystique. It is curious that Imperial forces retain this mystique, for no forces of any of the various factions of the Shattered Imperium were ever able to gain a decisive advantage in the Civil War. Some historians claim that this is because the factions were each of approximately equal size, and it was the high quality of the former Imperial forces under the control of each that prevented any from gaining the advantage. Others claim that this inability of any faction to gain the upper hand is a fortunate (though admittedly chance) event that allows all former Imperial citizens to claim proud allegiance to the "real" Imperium, not just the faction that controlled their local space. Although this might simply be a flimsy nicety, it is from such psychological fig leaves that lasting peace can be fashioned.

Nonetheless, there are some armies which unaccountably retain the *cachet* of invincibility even in the presence of inconvenient refuting evidence, and the Imperial forces are one such army.

As another terminological exception, the "Imperial Marine Grav APC" carries no tech level designator, unlike most other Imperial-designed vehicles. This is because Imperial Marine equipment was automatically known to be TL15, so no designator was required.

Unlike the TL15 Imperial APC, the Marine grav APC carries all its weapons in its turret. As with most things this carries advantages and disadvantages. The carriage of its missile armament in a streamlined turret means that the Marine APC has less aerodynamic drag, and can therefore achieve a higher speed. Its missiles are also protected from non-penetrating fire.

On the down side, the Marine vehicle must reload its turret missile magazine after six shots while the army variant can fire all 30 of its missiles without any delay for reloading. Likewise, the Marine APC is limited in the firing of special rounds by the five missiles carried in the magazine. The army APC can fire any or all of its 30 rounds (assuming they have not been damaged by small arms fire or fragments) at any time, and in any order, as all 30 are ready to fire at any time.

Also unlike its army counterpart, the Marine APC carries a full-sized TL15 computer. This is used for command, control, and coordination of the APC's carried squad, and for proper integration with the remainder of the APC's unit. This computer was specified by the Imperial Marines because of the demands of the Marines' mission. Imperial (and Regency) Marines are usually deployed in small numbers, which requires them to operate over large areas with a resulting very low unit density. It is not unusual for a Marine regiment to be given responsibility for an entire planet, which means that entire countries can be the responsibility of a mere platoon or squad. The carried computer is tremendously valuable in keeping track of the data required by such distributed operations, and its provision is the main reason for the APC's very high unit cost (compare to the Trepida I grav tank, page 8, and the TL15 Imperial APC, page 22).

Another by-product of the on-board computer is the small squad size, only eight troops. The vehicle commander is also the squad commander, and is often obliged to disembark with the squad, although his or her usual post is at the console of the squad's command computer aboard the APC.

The Imperial Marine Grav APC is one of many TL15 combat vehicles which is built on the Imperial TL15 Standard APC Hull; see pages 22-23 for details.

WEAPON CHARACTERISTICS

TL15 18.5 Mj 12-Chamber Rapid Pulse Fusion Gun (RPW-15 Low)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPW-15L RP Fusion Gun	3	129	1-1-2-10	129-129-65-13	17-15	650m

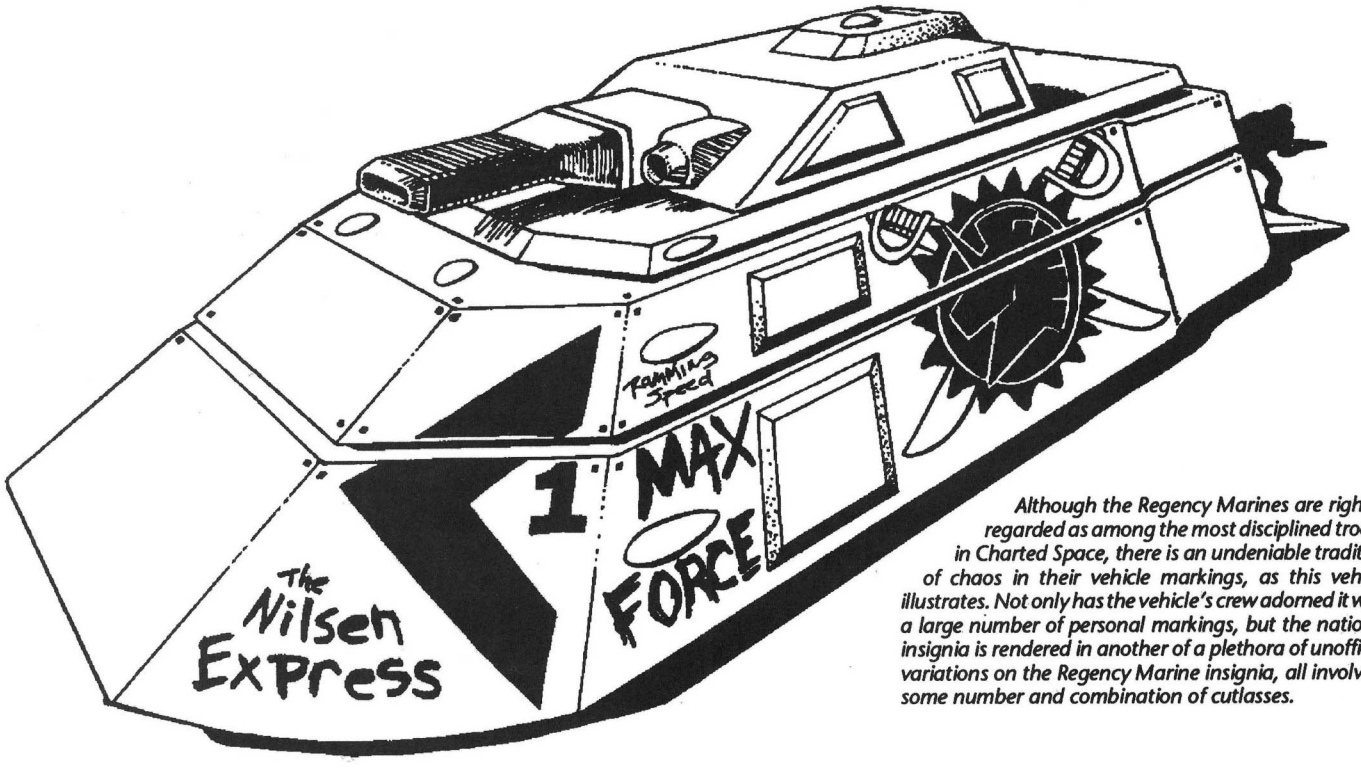
TL: Technology level; *ROF*: Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B*: Concussion value and Burst radius in meters; *Short Range*: Short Range in meters.

TL15 Nuclear Tac Missiles

TL	*Guidance*	*Yield*	*Mass*	*Price*	*Short Range*	*Max Range*	*M/turn*	*Agility*
15	TeleG/TD/Hmg	0.1	95	3810.4	20km	70km	1668	4
15	TeleG/TD/Hmg	0.5	95	7806.4	20 km	65km	1668	4
15	TeleG/TD/Hmg	1	95	12,803.2	20km	62km	1668	4
15	TeleG/Tgt Skr	0.1	95	12,310.4	40km	70km	1668	4/6
15	TeleG/Tgt Skr	0.5	95	16,306.4	40km	65km	1668	4/6
15	TeleG/Tgt Skr	1	95	21,303.2	40km	62km	1668	4/6
15	Tgt Skr/TD/Hmg	0.1	95	14,844.8	40/20km	133km	16,680	8/10
15	Tgt Skr/TD/Hmg	0.5	95	18,836.8	40/20km	124km	16,680	8/10
15	Tgt Skr/TD/Hmg	1	95	23,830.4	40/20km	118km	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TeleG indicates teleguidance, TD is AEMS/Laser target designated, Hmg is advanced IR homing, and Tgt Skr is imaging radar target seeker; *Yield* is warhead yield in kilotons; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Short Range* is short range of missile in homing mode, where figures separated by a slash are in target seeker/homing mode; *Max Range* is maximum range of missile in teleguided or target designated mode; *M/turn* is the number of meters the missile travels in a five-second combat turn; *Agility* is the missile's agility, where missiles with a target seeker guidance mode have their target seeker agility to the right of the slash. All missiles have a volume of 95 liters, diameter of 30cm, and length of 1.34m.

Regency Combat Vehicle Guide



Although the Regency Marines are rightly regarded as among the most disciplined troops in Charted Space, there is an undeniable tradition of chaos in their vehicle markings, as this vehicle illustrates. Not only has the vehicle's crew adorned it with a large number of personal markings, but the national insignia is rendered in another of a plethora of unofficial variations on the Regency Marine insignia, all involving some number and combination of cutlasses.

Tech Level: 15

Price: MCr12.001883

Size: 168 cubic meters=12 displacement tons (VS)

Mass: 218.72 tonnes empty, 233.73 loaded

Power: TL15 9.9 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0616 MW excess power)

Maint: 39

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, 1×TL15 Model St computer

Commo: TL15 30km radio, TL15 300km meson communicator

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 3×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock

Cargo: 2060 kg of crew equipment (8.24 m^3)

Crew: 3 (Driver, Commander, Gunner)

Passengers: 8 in adequate seats with large cargo hatch, allowing all 8 battle dress-equipped troops to debark/embark in one five-second combat turn.

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator

Armament: TL15 rapid-pulse 18.5-Mj fusion gun and magazine launcher with 1+5 nuclear Tac missiles, both mounted in remote turret

Stabilization: Advanced (fire at any speed)

Ammo: 500 rounds of 18.5-Mj 11.6×35cm PFC cartridges (Cr148 each, Cr74,000 for full load of 500), 1+5 nuclear missiles in magazine launcher plus up to 26 more in cargo/damper box (usually only 26 total in both locations because of radiation hazard)

Reloading Data: Fusion gun magazine is 3.7m^3, 7.474 tonnes loaded, 0.074 tonnes empty, MCr0.07437 loaded, MCr0.00037 empty, reloading requires 75 five-second combat turns and a crane or contra-grav lifters. Missiles are 95kg each, replacement requires 19 actions each (see **TNE** page 273).

Speed: 1092 kph maximum, 819 kph cruising, 190 kph NOE

Travel Move: 3276/1140

Combat Move: 152 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

Maximum Acceleration: 0.371 G

Fuel Capacity: 16,782.625 liters reaction mass plus 82.5 liters for fusion reactor

Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 15.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial Marine Grav APC costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

Imperial Marine Command/Computer APC

IMPERIAL MARINE COMMAND/COMPUTER GRAV APC

This is the standard command vehicle for line Marine companies, and is also used as a key headquarters vehicle at levels above company in Marine units. The organization tables in **Striker II** list this vehicle in three different ways: "Imperial Marine Command APC," "staff uplink Imperial Marine Command APC," and "staff radio Imperial Marine Command APC."

Imperial Marine Command APC and staff uplink Imperial Marine Command APC are the same identical vehicle. The only difference between the two is their assigned role; either vehicle could fill in for the other with a simple change in the specific crewmembers assigned (i.e., unit commanders and staff in the command vehicle, and communications specialists and staff in the staff uplink vehicle)

The staff radio Imperial Marine Command APC is a slight modification of the first vehicle and merely adds radios. It has the same uplink capability as the standard vehicle, and can fill in for the staff uplink vehicle if required to do so.

The communications suites of these and other Imperial Marine APCs show the reliance placed on meson communications at TL15. The only radio (except for the dedicated staff radio variant) is a small 30km model which is only a backup to the meson communicators. Compare this suite to the TL14 grav tank suites on pages 8-11, as meson communicators are not technically feasible until TL15.

In Imperial and Regency military doctrine, the ECM mission is handled at the company and battalion headquarters level. Thus all Imperial command vehicles intended for these levels are fitted with 30km EMS jammers. These are deception jammers and not broad-band "noise" jammers, and hence do not expose the command vehicles to a greater risk of detection or targeting. In order for such jamming to be successful, the vehicles to be protected must be sited relatively near to the command/jamming vehicle, which can often be a problem in Marine operations (see page 16). However, the jammer's range is generally sufficient to protect headquarters elements and such combat support elements as point defense and nuclear damper vehicles.

As is the case with the Marines' platoon-level command vehicle, the command/computer/staff APCs are fully combat ready, with offensive systems duplicating those of the line APCs, only omitting the internal stowage for additional missile rounds.

Imperial Marine Command/Computer and Staff Uplink Grav APC

Tech Level: 15

Price: MCr20.445411

Size: 168 cubic meters=12 displacement tons (VS)

Mass: 224.32 tonnes empty, 235.09 loaded

Power: TL15 15.6 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.01182 MW excess power)

Maint: 39

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computer

Commo: TL15 30km radio, 2×TL15 300km meson communicator, 2×TL15 30,000km maser (only one powered)

Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 3×WSV goggles

ECM: 30km EMS Jammer, Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock

Cargo: 489 kg of crew equipment (1.957 m^3)

Crew: 3 (Driver, Commander, Gunner)

Passengers: 2 unit leaders in normal workstations, plus adequate seats for 4 additional passengers, large cargo hatch

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator

Armament: TL15 rapid-pulse 18.5-Mj fusion gun and magazine launcher with 1+5 nuclear Tac missiles, both mounted in remote turret

Stabilization: Advanced (fire at any speed)

Ammo: 500 rounds of 18.5-Mj 11.6×35cm PFC cartridges (Cr148 each, Cr74,000 for full load of 500), 1+5 nuclear missiles in magazine launcher (*no* additional in hull)

Reloading Data: Fusion gun magazine is 3.7m^3, 7.474 tonnes loaded, 0.074 tonnes empty, MCr0.07437 loaded, MCr0.00037 empty, reloading requires 75 five-second combat turns and a crane or contra-grav lifters. Missiles are 95kg each, replacement requires 19 actions each (see **TNE** page 273).

Speed: 1092 kph maximum, 819 kph cruising, 190 kph NOE

Travel Move: 3276/1140

Combat Move: 152 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

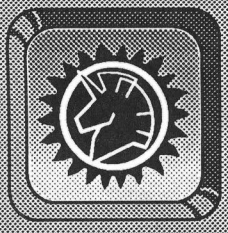
Maximum Acceleration: 0.368 G

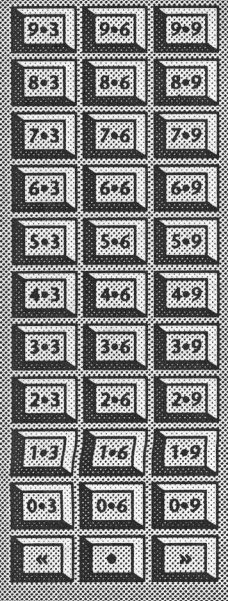
Fuel Capacity: 16,782.625 liters reaction mass plus 130 liters for fusion reactor

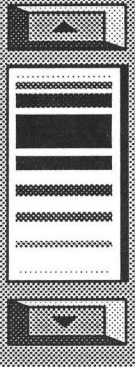
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 15.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140





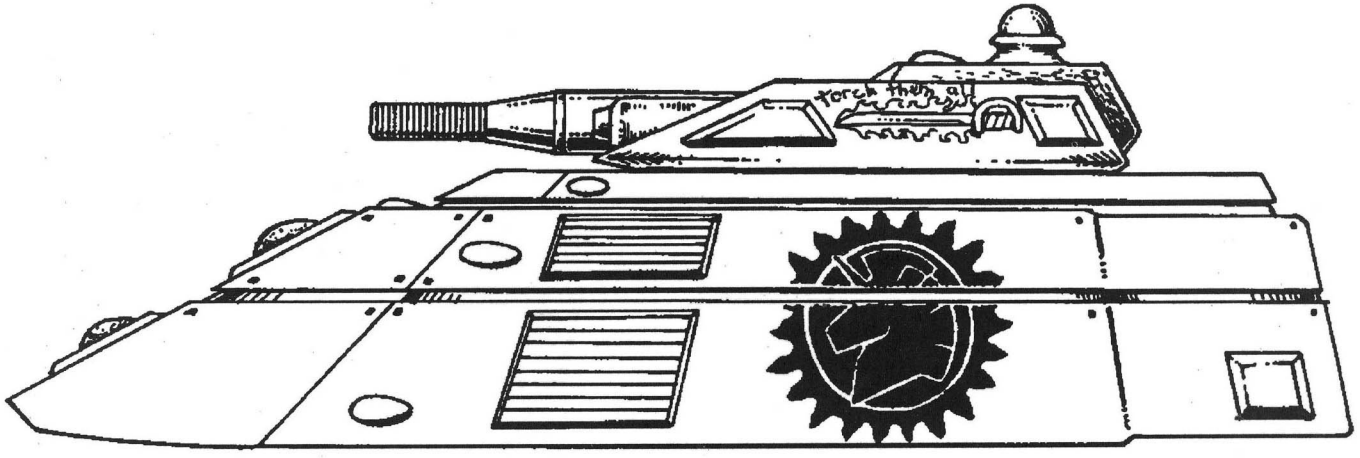


Security Clearance

Yes No

300-1202

Date



This Marine Command APC shows that even command vehicles are not exempt from bloody-minded personal markings. The "radome" on the turret is actually the protective housing for the 30,000km orbital maser link, a characteristic item of the communications suite of all Regency company level+ command and staff vehicles.

IMPERIAL MARINE COMMAND/COMPUTER AND STAFF RADIO GRAV APC

As discussed above, this variant is identical to the Command/Computer and Staff Uplink Grav APC except for the following items:

Price: MCr20.573411
Mass: 225.00 tonnes empty, 235.69 loaded
Power: TL15 17.64 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.05182 MW excess power)
Commo: TL15 30km radio, 2×TL15 300km meson communicator, 2×TL15 30,000km maser (only one powered), 2×TL15 30,000km radios
Cargo: 399 kg of crew equipment (1.598 m³)
Fuel Capacity: 16,782.625 liters reaction mass plus 147 liters for fusion reactor

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial Marine Command APC costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

WEAPON CHARACTERISTICS

TL15 18.5 MJ 12-Chamber Rapid Pulse Fusion Gun (RPW-15 Low)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPW-15L RP Fusion Gun	3	129	1-1-2-10	129-129-65-13	17-15	650m

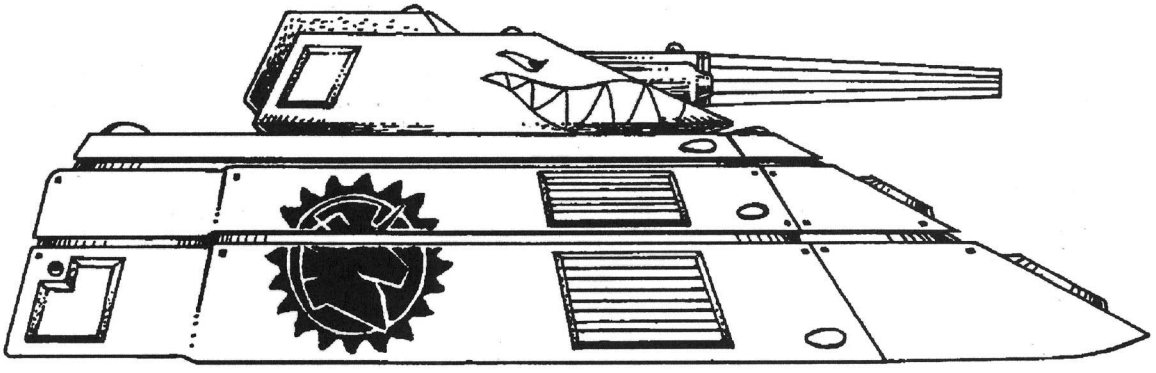
TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

TL15 Nuclear Tac Missiles

TL	*Guidance*	*Yield*	*Mass*	*Price*	*Short Range*	*Max Range*	*M/turn*	*Agility*
15	TeleG/TD/Hmg	0.1	95	3810.4	20km	70km	1668	4
15	TeleG/TD/Hmg	0.5	95	7806.4	20 km	65km	1668	4
15	TeleG/TD/Hmg	1	95	12,803.2	20km	62km	1668	4
15	TeleG/Tgt Skr	0.1	95	12,310.4	40km	70km	1668	4/6
15	TeleG/Tgt Skr	0.5	95	16,306.4	40km	65km	1668	4/6
15	TeleG/Tgt Skr	1	95	21,303.2	40km	62km	1668	4/6
15	Tgt Skr/TD/Hmg	0.1	95	14,844.8	40/20km	133km	16,680	8/10
15	Tgt Skr/TD/Hmg	0.5	95	18,836.8	40/20km	124km	16,680	8/10
15	Tgt Skr/TD/Hmg	1	95	23,830.4	40/20km	118km	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TeleG indicates teleguidance, TD is AEMS/Laser target designated, Hmg is advanced IR homing, and Tgt Skr is imaging radar target seeker; *Yield* is warhead yield in kilotons; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Short Range* is short range of missile in homing mode, where figures separated by a slash are in target seeker/homing mode; *Max Range* is maximum range of missile in teleguided or target designated mode; *M/turn* is the number of meters the missile travels in a five-second combat turn; *Agility* is the missile's agility, where missiles with a target seeker guidance mode have their target seeker agility to the right of the slash. All missiles have a volume of 95 liters, diameter of 30cm, and length of 1.34m.

Imperial Marine Fire Support APC and Assault Gun



Regency Marine Fire Support APC, with typically aggressive unofficial markings. The fire support vehicle is easily distinguished from the assault gun (facing page) by the distinctive fluted barrel of the RPX fusion gun (compare with the illustration of the Trepida I tank on page 9). The assault gun is equipped with smooth, oval-cross-sectioned RPY gun as seen on the Trepida II tanks (pages 10-11). The fire support vehicle also retains the stubby barrel of the 95-kg tac missile launcher, which is deleted from the assault gun design.

IMPERIAL MARINE FIRE SUPPORT APC

In keeping with Imperial doctrine, platoon command vehicles double as the platoon fire support element, replicating the role of weapons platoons in low-tech leg infantry platoons (see also page 24). Thus the vehicle is a fully capable combat unit, with sensors and firepower equal to or better than those in the squad APCs, but with command features layered on top of those.

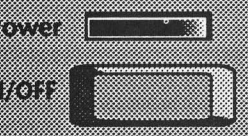
However, platoon command vehicles do not fulfill the orbital uplink or ECM roles, and are therefore lacking these systems which are present on company-level+ command vehicles.

Its command functions aside, this vehicle typically serves as a surrogate close-support tank, as the Imperial forces have never fielded a grav tank with the speed to keep up with the Imperial Marine Grav APC. This the Fire Support APC can do, and with its rapid-pulse fusion X gun, it provides tank-class firepower (although admittedly at the low end of this class). The logical extension of the capabilities inherent in this vehicle led ultimately to the Imperial Marine Assault Gun (facing page).

Tech Level: 15
Price: MCr19.066647
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 223.49 tonnes empty, 240.02 loaded
Power: TL15 10.5 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.0614 MW excess power)
Maint: 40
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computer
Commo: TL15 30km radio, 2×TL15 300km meson communicator
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 5×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 122 kg of crew equipment (0.491 m³)
Crew: 3 (Driver, Commander, Gunner)
Passengers: 2 unit leaders in normal workstations, plus adequate seats for 2 additional passengers, large cargo hatch
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator
Armament: TL15 rapid-pulse 74-Mj fusion gun, magazine launcher with 1+5 nuclear Tac missiles
Stabilization: Advanced (fire at any speed)
Ammo: 190 rounds of 74-Mj 18.5×55cm PFC cartridges (Cr592 each, Cr112,480 for full load of 190), 1+5 nuclear missiles in magazine launcher plus up to 26 more in cargo/damper box (usually only 26 total in both locations)
Reloading Data: Fusion gun magazine is 5.624m³, 11.36048 tonnes loaded, 0.11248 tonnes empty, MCr0.1130424 loaded, MCr0.0005624 empty, reloading requires 114 five-second combat turns and a crane or contra-grav lifters. Missiles are 95kg each, replacement requires 19 actions each (see **TNE** page 273).
Speed: 1028 kph maximum, 771 kph cruising, 190 kph NOE
Travel Move: 3084/1140
Combat Move: 143 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.361 G
Fuel Capacity: 16,782.625 liters reaction mass plus 87.5 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 15.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140



WEAPON CHARACTERISTICS

74-Mj 6-Chamber Rapid Pulse Fusion Gun (RPX-15L)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPX-15L RP Fusion Gun	SA2	258	1-1-2-10	258-258-129-26	67-25	1290m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

TL15 Nuclear Tac Missiles

TL	*Guidance*	*Yield*	*Mass*	*Price*	*Short Range*	*Max Range*	*M/turn*	*Agility*
15	TeleG/TD/Hmg	0.1	95	3810.4	20km	70km	1668	4
15	TeleG/TD/Hmg	0.5	95	7806.4	20 km	65km	1668	4
15	TeleG/TD/Hmg	1	95	12,803.2	20km	62km	1668	4
15	TeleG/Tgt Skr	0.1	95	12,310.4	40km	70km	1668	4/6
15	TeleG/Tgt Skr	0.5	95	16,306.4	40km	65km	1668	4/6
15	TeleG/Tgt Skr	1	95	21,303.2	40km	62km	1668	4/6
15	Tgt Skr/TD/Hmg	0.1	95	14,844.8	40/20km	133km	16,680	8/10
15	Tgt Skr/TD/Hmg	0.5	95	18,836.8	40/20km	124km	16,680	8/10
15	Tgt Skr/TD/Hmg	1	95	23,830.4	40/20km	118km	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TeleG indicates teleguidance, TD is AEMS/Laser target designated, Hmg is advanced IR homing, and Tgt Skr is imaging radar target seeker; *Yield* is warhead yield in kilotons (see **Fire, Fusion, & Steel** page 143); *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Short Range* is short range of missile in homing mode, where figures separated by a slash are in target seeker/homing mode; *Max Range* is maximum range of missile in teleguided or target designated mode; *M/turn* is the number of meters the missile travels in a five-second combat turn; *Agility* is the missile's agility, where missiles with a target seeker guidance mode have their target seeker agility to the right of the slash. All missiles have a volume of 95 liters, diameter of 30cm, and length of 1.34m.

IMPERIAL MARINE ASSAULT GUN

This is the logical extension of the Imperial Marine Fire Support APC, placing a larger tank-class gun in a vehicle with global mobility in the class of the Marine APC. It is likely that vehicles similar to this one, perhaps mounting RPY-14Hs identical to those in Trepida IIs, were created by various factions in the Civil War. Because of the higher priority given to the manufacture of TL15 battle tanks, production of the IM Assault Gun has been limited, and only a handful of regiments have received it. Furthermore, current TO&Es do not reflect the addition of the assault guns, so there is no official prescribed pattern for their assignment. Some units have replaced fire support APCs with assault guns on a one-for-one basis; others have added an assault gun to each platoon headquarters, or two or three to the company headquarters. More dramatically, the 5th MArCav regiment is conducting an experiment where all of the grav tanks in their armored cavalry squadrons are replaced on a one-for-one basis with assault guns, turning the tank sections into assault gun sections (see **Striker II** page 142). This gives the armored cavalry troops greater global mobility, but they are now less heavily armed. Because of the confusion over the assault gun's role, there are also many different schemes for using the vehicle's cargo and passenger capacity. When assigned to headquarters, they usually carry headquarters personnel, although they are sometimes used to augment the ammunition and fuel carriage of the units they are assigned to support. The fact that it retains a significant power overage has made it possible for many units to rig them as additional command vehicles, with a second computer, and commander's workstations replacing the passenger and cargo space. Characteristics of the assault gun where they differ from the fire support APC are shown below. Items not listed are identical to the figures on the facing page.

WEAPON CHARACTERISTICS

TL15 125-Mj 10-Chamber Rapid Pulse Fusion Gun (RPY-15L)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	125-Mj RP Fusion Gun	SA2	335	1-1-2-10	335-335-168-34	112-35	1680m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

Price: MCr14.543491

Mass: 222.75 tonnes empty, 248.21 loaded

Power: TL15 10.5 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.63262 MW excess power)

Maint: 41

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, 1×TL15 Model St computer

Cargo: 3.25 tonnes (13 m^3)

Passengers: Adequate seats for 4 passengers, large cargo hatch

Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: TL15 rapid-pulse 125-Mj fusion gun in remote turret

Ammo: 100 rounds of 125-Mj 22×66cm PFC cartridges (Cr1000 each, MCr0.1 for full load of 100), plus one additional fully-loaded magazine in hull (MCr 0.1005 fully loaded)

Reloading Data: Fusion gun magazine is 5m^3, 10.1 tonnes loaded, 0.1 tonnes empty, MCr0.1005 loaded, MCr0.0005 empty, reloading requires 101 five-second combat turns and a crane or contra-grav lifters.

Speed: 1004 kph maximum, 753 kph cruising, 190 kph NOE

Travel Move: 3012/1140

Combat Move: 140 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Maximum Acceleration: 0.349 G

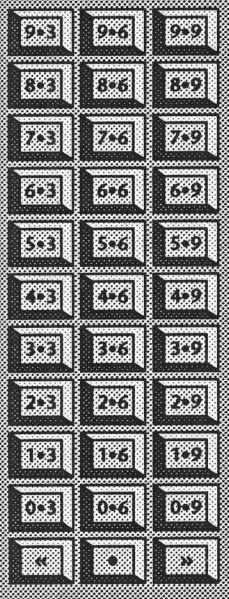
Decoys

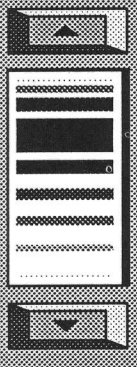
Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial Marine Fire Support APC or Assault Gun cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

TL15 Imperial APC







Security Clearance

Yes No

300-1202

Date

TL15 IMPERIAL APC

This was the standard grav APC for TL15 Imperial Army units, and remains, with the Astrin, as the standard APC for all Regency Army units. It is a successful design: well-armored, reasonably fast, flexibly armed, capacious, and best of all, inexpensive.

While it does not have the blistering speed of the Marine Grav APC (page 16), this is not a problem in the Imperial APC's role. The speed of the Marine vehicle is a by-product of the Marine requirement for distributed operations, and the need to be able to rapidly move from one point on the globe to any other. The army generally operates in larger numbers, with a greater unit density, and does not have such demanding mobility requirements. Thus, the main question when assessing the mobility of the Imperial APC is, "Can it keep up with the grav tanks?" and the answer is yes.

One of the main reasons for this vehicle's low price when compared to the Marine APC (page 16) is the lack of a full-size computer. This is possible because army operations usually do not call for the low unit densities typical of Marine operations, and the task of tracking unit locations and routing intelligence and instructions can be pushed up from the squad to the platoon level, where the Imperial Command APC (page 24) handles them with its computers.

The Imperial APC is armed entirely with missiles, a fact which makes some crew members unhappy. Although TL15 missiles are quite reliable, and even VRF gauss guns jam on occasion, there is something comforting about a noisy, lead- or plasma-spitting weapon that a missile launcher can just not replace.

The heavy missile magazine launcher is identical to that fitted on the Marine Grav APC family, but the army APC does not carry as many reloads in the hull, instead making space for a much larger infantry section, almost twice the size of that carried on the Marine vehicle. This makes the army version a much more flexible vehicle for army operations, allowing it to fulfill roles for which the Marines might require a specialized variant.

The siting of all of the APC's light Tac missiles on external launch rails is somewhat unusual, and makes the vehicles visually distinctive. While placing all the missiles on their own rails means they are immune to the sort of lucky hit that destroys a launch tube, leaving a magazine full of useless missiles, this position exposes them to small arms hits and fragments (the missiles' skin has an armor value of 3, any penetration makes it nonfunctional). In addition, there is never the problem of having the wrong mix of missiles loaded up in the magazine; any or all of the 30 missiles can be fired at any time, and in any order.

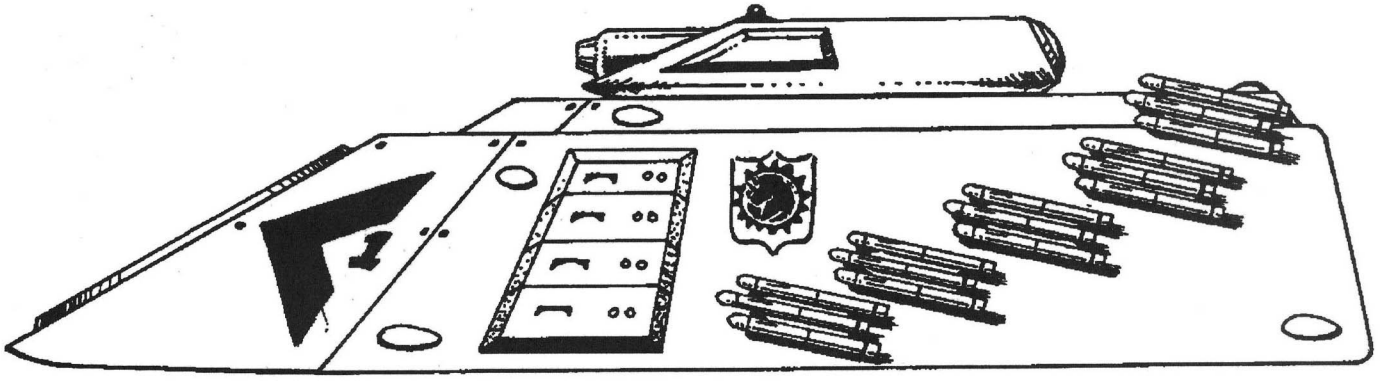
The Imperial APC is one of many TL15 combat vehicles which is built on the Imperial TL15 standard APC hull. Although there are many differences between the Imperial APC and the Imperial Marine Grav APC (page 16), both are based on the same standard hull, as are all the vehicles appearing on pages 16-33 and 36-39 of this book. Even the ubiquitous grav sled hull is related to the standard APC hull. Although its hull armor is much thinner, its overall dimensions and support systems are largely the same.

The use of a single hull for all TL15 APCs, command vehicles, and combat support vehicles vastly simplified the problems of logistics, maintenance, repair, and spares support over the vast reaches of the Imperium. Not only are hull fittings and incidentals, such as landing gear, identical on all users of this hull, they all also use identical contra-grav modules, avionics fits, holographic-linked control circuits, and 86.62-tonne HEPlaR thrust chambers. The life support system, for the hull's useful volume of 134.4 m³, is also identical on all but a handful of the vehicles that use this hull (see page 26).

Tech Level: 15
Price: MCr4.060751
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 216.11 tonnes empty, 224.22 loaded
Power: TL15 9.3 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.01187 MW excess power)
Maint: 37
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, TL15 300km meson communicator
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 2752 kg of crew equipment (11.011 m³)
Crew: 2 (Driver, Commander/gunner)
Passengers: 14 in cramped seats with large cargo hatch, allowing 5 battle dress-equipped troops to debark/embark per five-second combat turn.
Fire Control: Control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator
Armament: Magazine launcher with 1+5 nuclear Tac missiles, 30 launch rails for fire and forget missiles
Stabilization: Advanced (fire at any speed)
Ammo: 1+5 nuclear missiles in magazine launcher plus up to 6 more in cargo/damper box (usually only 6 total in both locations), 30 fire and forget missiles on launch rails, plus additional can be carried as cargo
Reloading Data: Missiles are 95kg (magazine-launched) and 30kg (rail-launched) each, replacement requires 19 actions each and 6 actions each, respectively (see **TNE** page 273).
Speed: 752 kph maximum, 564 kph cruising, 188 kph NOE
Travel Move: 2256/1128
Combat Move: 105 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.386 G
Fuel Capacity: 21,113.625 liters reaction mass plus 77.5 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140



The Imperial APC, also known as the Army APC, is one of the more distinctive vehicles of the Imperial/Regency services. With its exposed missile armament it has an aerodynamically "dirty" look that is not shared by Marine vehicles. Markings on Army vehicles, as this APC demonstrates, are also much more sober and subdued that on their Marine counterparts.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial grav APC costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

WEAPON CHARACTERISTICS

TL15 Nuclear Tac Missiles

TL	*Guidance*	*Yield*	*Mass*	*Price*	*Short Range*	*Max Range*	*M/turn*	*Agility*
15	TeleG/TD/Hmg	0.1	95	3810.4	20km	70km	1668	4
15	TeleG/TD/Hmg	0.5	95	7806.4	20 km	65km	1668	4
15	TeleG/TD/Hmg	1	95	12,803.2	20km	62km	1668	4
15	TeleG/Tgt Skr	0.1	95	12,310.4	40km	70km	1668	4/6
15	TeleG/Tgt Skr	0.5	95	16,306.4	40km	65km	1668	4/6
15	TeleG/Tgt Skr	1	95	21,303.2	40km	62km	1668	4/6
15	Tgt Skr/TD/Hmg	0.1	95	14,844.8	40/20km	133km	16,680	8/10
15	Tgt Skr/TD/Hmg	0.5	95	18,836.8	40/20km	124km	16,680	8/10
15	Tgt Skr/TD/Hmg	1	95	23,830.4	40/20km	118km	16,680	8/10

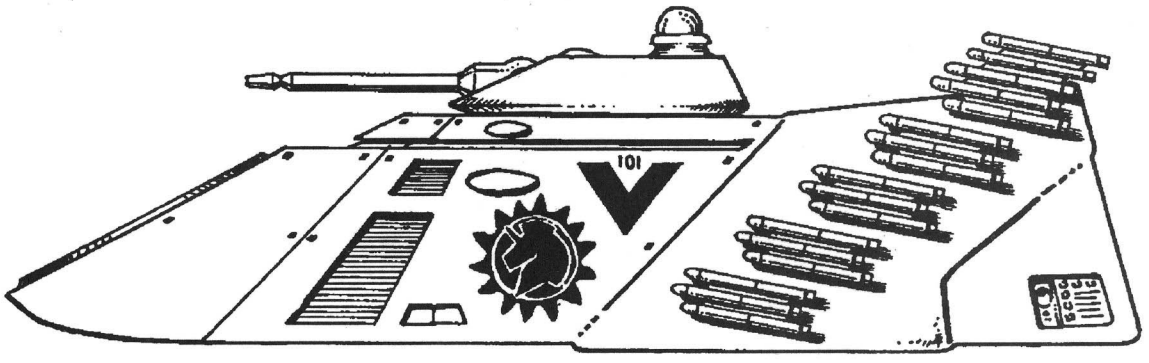
TL is tech level of missile; *Guidance* is guidance packages in missile, where TeleG indicates teleguidance, TD is AEMS/Laser target designated, Hmg is advanced IR homing, and Tgt Skr is imaging radar target seeker; *Yield* is warhead yield in kilotons; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Short Range* is short range of missile in homing mode, where figures separated by a slash are in target seeker/homing mode; *Max Range* is maximum range of missile in teleguided or target designated mode; *M/turn* is the number of meters the missile travels in a five-second combat turn; *Agility* is the missile's agility, where missiles with a target seeker guidance mode have their target seeker agility to the right of the slash. All missiles have a volume of 95 liters, diameter of 30cm, and length of 1.34m.

TL15 Fire and Forget Missiles

TL	*Guidance*	*Whd*	*Mass*	*Price*	*Sh Rng*	*Mx Rng*	*C-B*	*Dngr Spc*	*Pen*	*M/Turn*	*AGL*
15	Tgt Skr/TD	HE	30	4136.8	20	54	16-45	—	5C	16,680	8/10
15	Tgt Skr/TD	Flech	30	4328.8	20	54	—	150×600	1-Nil	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TD is AEMS/Laser target designated and Tgt Skr is IR target seeker; *Whd* is warhead type; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Sh Rng* is short range of missile in target seeker mode; *Mx Rng* is maximum range of missile in target designated mode; *C-B* is concussion and burst for HE warheads; *Dngr Spc* is danger space for flechette warheads; *Pen* is Penetration Value for HE warheads and Penetration Rating for flechette warheads in primary-secondary danger space (damage value is 2D6/1D6 respectively); *M/turn* is the number of meters the missile travels in a five-second combat turn; *AGL* is the missile's agility, with the target designation mode agility to the left of the slash and the target seeker guidance mode agility to the right of the slash. All missiles have a volume of 30 liters, diameter of 20cm, and length of 95cm.

Imperial Fire Support APC



As is typical for Regency Army vehicles, this fire support APC is distinguished by only authorized tactical markings and the Regency national insignia, with no personal crew markings. Contrast this with the flamboyantly-marked Marine command APC on page 19. The protective dome for the turret-mounted orbital maser link belies the vehicle's role as a command vehicle.

IMPERIAL FIRE SUPPORT APC

Following the Imperial doctrine of placing a devoted fire-support/command vehicle at the platoon headquarters, this vehicle is the army's counterpart to the Imperial Marine Fire Support APC (page 20). However, the choice of armament gives a clear insight to the service's operating procedures and mission roles.

The Marines are used as expeditionary forces and in environments of all-out war. The first point means that the Marines expect to fight outnumbered and have to hold out on their own for long periods of time, without being able to call on heavy armored support. This requires them to build expensive AFVs which can meet a wide variety of dissimilar threats. The second point is that the Marines do not anticipate fighting in ambiguous, low-intensity conflicts or in peacekeeping roles. When the Marines are committed they fight to win, quickly and violently. Their weapons are not intended to be non-escalatory, in fact, quite the opposite.

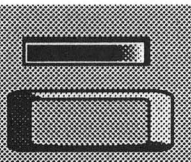
These two points taken together yield the Marine RPX-15 Armed Fire Support APC. First, its heavy gun allows it to serve as a surrogate tank, as tank support will likely not be available when needed. Second, it has no need for a weapon that allows it to respond carefully with minimal lethality to a low-grade threat. Just level the damn block, say the Marines.

Tech Level: 15
Price: MCr19.312404
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 222.48 tonnes empty, 231.87 loaded
Power: TL15 16.92 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.03182 MW excess power)
Maint: 38
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computers
Commo: TL15 30km radio, TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 5×WSV goggles
ECM: 30km EMS Jammer, Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 1302 kg of crew equipment (5.209 m^3) plus 150 fire and forget missiles carried as cargo
Crew: 3 (Driver, Commander, Gunner)
Passengers: 2 command personnel at normal workstations plus cramped seats for two additional passengers, large cargo hatch.
Fire Control: EMS rangefinder and TL14 point defense ballistic computer for VRF Gauss Gun (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator
Armament: VRF Gauss Gun, 34 launch rails for fire and forget missiles
Stabilization: Advanced (fire at any speed)
Ammo: 300,000 rounds VRF gauss gun (Cr3000 for full load of 300,000 rounds needle), 34 fire and forget missiles on launch rails, plus 150 additional carried as cargo
Reloading Data: VRF gauss gun ammunition is carried in 10 cassettes, 0.017m^3 each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273). Missiles are 30kg each, replacement requires 6 actions each.
Speed: 758 kph maximum, 569 kph cruising, 190 kph NOE
Travel Move: 2276/1140
Combat Move: 105 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.374 G
Fuel Capacity: 21,113.625 liters reaction mass plus 141 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140

Security Clearance
Yes No
300-1202
Date



The Imperial/Regency Army, on the other hand, expects that it will often be expected to deal with situations short of all-out war: brushfire wires, counter-insurgency, peacekeeping, and security roles. These require weapons that can be used with some discrimination. Second, the army, when committed to combat, is committed decisively and in quantity, which generates two circumstances and one requirement. The first circumstance is that the army will be able to set the conditions of engagement to an extent that the Marines are not capable of. By dictating the tempo and choosing the time and place of their decisive engagements, they can control the risk to which their forces will be subjected, which does not require the sort of super-AFVs the Marines favor. The second circumstance is that since the army operates in numbers, supporting forces will be readily available to units which get in over their heads. The one requirement is that committing forces in large numbers require that they be affordable.

These three points yield the army's take on the fire support vehicle's armament: an inexpensive high-rate-of-fire suppression weapon useful in low-intensity engagements, mounted on a relatively inexpensive vehicle designed to function in close company with other complementary weapon systems.

During the Imperial era the Fire Support APC was originally used as a command vehicle at the platoon, company, and battalion level, but the vehicle was too expensive for use at the platoon level and insufficiently capable at the battalion level. This prompted the creation of two sub-variants of the Fire Support APC, the Austere FS APC for use at the platoon headquarters level, and the Imperial Command/Computer/Staff APC for use at the company, battalion, and battalion staff level. Both of these variants, in current use by post-Collapse Regency forces, are detailed after the main entry for the original Fire Support APC.

WEAPON CHARACTERISTICS

VRF Gauss Gun

TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Magazine*	*Short Range*
10	4×20mm/60 Dart	50	6	1-3-5	300,000C	300

TL: Technology Level; *Round*: type of round fired; *ROF*: Rate of Fire in shots per fire *action*; *Dam Val*: Damage Value; *Pen Rtg*: Penetration Rating at short-medium-long-extreme ranges; *Pen Val*: Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine*: Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range*: Short Range in meters.

TL15 Fire and Forget Missiles

TL	*Guidance*	*Whd*	*Mass*	*Price*	*Sh Rng*	*Mx Rng*	*C-B*	*Dngr Spc*	*Pen*	*M/Turn*	*AGL*
15	Tgt Skr/TD	HE	30	4136.8	20	54	16-45	—	5C	16,680	8/10
15	Tgt Skr/TD	Flech	30	4328.8	20	54	—	150×600	1-Nil	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TD is AEMS/Laser target designated and Tgt Skr is IR target seeker; *Whd* is warhead type; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Sh Rng* is short range of missile in target seeker mode; *Mx Rng* is maximum range of missile in target designated mode; *C-B* is concussion and burst for HE warheads; *Dngr Spc* is danger space for flechette warheads; *Pen* is Penetration Value for HE warheads and Penetration Rating for flechette warheads in primary-secondary danger space (damage value is 2D6/1D6 respectively); *M/turn* is the number of meters the missile travels in a five-second combat turn; *AGL* is the missile's agility, with the target designation mode agility to the left of the slash and the target seeker guidance mode agility to the right of the slash. All missiles have a volume of 30 liters, diameter of 20cm, and length of 95cm.

AUSTERE FIRE SUPPORT APC

This vehicle is optimized for use at the platoon level by reducing its cost through the removal of one full-size computer and the EMS jammer which is not required in platoon command vehicles by Imperial military doctrine. However, the vehicle retains the larger power plant required by these two pieces of equipment, allowing the vehicle to be rapidly modified to the earlier standards if required.

The following characteristics are changed compared to the Fire Support Vehicle above; all other details are identical.

Price: MCr11.312604
Mass: 220.12 tonnes empty, 230.34 loaded
Power: TL15 16.92 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (5.58182 MW excess power)
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, 1×TL15 Model St computer
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Cargo: 1927 kg of crew equipment (7.709 m³) plus 150 fire and forget missiles carried as cargo
Passengers: 2 command personnel at normal workstations plus cramped seats for four additional passengers, large cargo hatch.

IMPERIAL COMMANDCOMPUTERSTAFF APC

This vehicle retains the full armament of the fire support vehicle, but has additional communications added to allow it to perform in any of the following roles: company-level+ command APC, computer APC, staff uplink APC, and staff radio APC. Its power plant has been increased in output to allow for the additional power draw from the three new communicators.

The following characteristics are changed compared to the Fire Support Vehicle above; all other details are identical.

Price: MCr19.480404
Mass: 223.23 tonnes empty, 232.52 loaded
Power: TL15 19.08 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.04182 MW excess power)
Commo: TL15 30km radio, TL15 300km meson communicator, 2×TL15 30,000km masers, 2×TL15 30,000km radios
Cargo: 1205 kg of crew equipment (4.819 m³) plus 150 fire and forget missiles carried as cargo
Fuel Capacity: 21,113.625 liters reaction mass plus 159 liters for fusion reactor

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial Fire Support APC and its two sub-variants cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

Imperial Marine Fire Direction Center (FDC) APC

IMPERIAL MARINE FDC APC

Fire direction centers (see also **Fire, Fusion & Steel** page 88) coordinate the fire of several indirect fire systems (tube artillery, rocket artillery, and meson guns) at a single target, convert correction requests from forward observers into precise elevation, traverse, propellant, and trajectory commands, and calculate the effects of a wide variety of factors on artillery accuracy (such as atmospherics, different elevations between the firing weapon and the target, and so on). While fire direction centers are not required to conduct indirect fire, they increase the effectiveness of that fire dramatically.

For fire conducted through a fire direction center, the task roll to hit the target is a Difficult (instead of Formidable) task.

Fire direction centers substitute the appropriate weapon skill/asset of the main operator (usually the most skilled gunner in the FDC) for the weapons skills of the gunners of all the weapons controlled by the FDC (called the "battery"). All weapons in the battery must have a communications link to the FDC.

TL15 FDCs have an effective indirect fire range of 80 kilometers, meaning that the advantages described in the two paragraphs above apply within this range. Indirect fire using the FDC beyond this range is allowed, but the task roll to hit is Formidable instead of Difficult. TL15 FDCs mass 10 tonnes, displace 14 m^3, cost MCr3, and require a crew of four (of these, three require dedicated workstations, one may double as the vehicle commander from a vehicle crewstation). The FDC in this vehicle is supplemented by the standard command vehicle suite of two full-size TL15 computers, allowing them to be fully integrated and coordinated with military operations throughout the operational area.

Note that this 80-kilometer range is from the FDC to the target, and has nothing whatever to do with where the firing artillery is in relation to the target or the FDC. Thus, as long as the firing artillery is in range of the target and in communications with the FDC, the indirect fire task can be conducted as described above, even if the firing artillery is thousands of kilometers from the target, as in the case of a battlefield meson gun, or orbital artillery fire (see **TNE** page 281). This allows meson guns (page 40), MRL artillery vehicles (page 36), and the like to be sited far away from potential combat while retaining the ability for precision fire.

The Imperial Marine Fire Direction Center (FDC) vehicle is designed to be externally similar to the standard grav APC to enhance its battlefield survivability. For this reason it retains a fully equipped grav APC turret, although it does not carry any additional missile reloads within the hull. This gives the vehicle a robust self-defense capability, and allows it do "service" small nuisance targets on its own without having to waste a fire mission. Retention of the missile fire control systems also means that the FDC vehicle has a 300km range laser designator, although the FDC role does not usually call for it to designate its own targets from the front.

Like the command variant of the Norris battle tank (pages 12-13), the Marine FDC vehicle has dispensed with its hull's standard airlock and life support arrangement, in favor of a small 35 m^3 life support module for its six crew. This makes it one of the few vehicles using the standard TL15 APC hull (see page 22) that does not use the standard life support system.

The range at which the TL15 fire direction center can apply its coordinating function, 80 kilometers, is rather limited compared to the range available to TL15 artillery systems (650 km in the case of TL15 MRL rockets, page 36, and 3600 km in the case of the Meson Artillery Vehicle, page 40). However, the fire direction center is the "on the scene" coordinator for such fire, and as described above, allows the actual firing artillery to remain far away from the battlefield.

Note also that remote drone missiles (pages 38-39), although classed as "artillery" do not use fire direction centers, as their mode of operation is entirely different from classical indirect fire.

WEAPON CHARACTERISTICS

TL15 18.5 Mj 12-Chamber Rapid Pulse Fusion Gun (RPW-15 Low)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
15	RPW-15L RP Fusion Gun	3	129	1-1-2-10	129-129-65-13	17-15	650m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.

TL15 Nuclear Tac Missiles

TL	*Guidance*	*Yield*	*Mass*	*Price*	*Short Range*	*Max Range*	*M/turn*	*Agility*
15	TeleG/TD/Hmg	0.1	95	3810.4	20km	70km	1668	4
15	TeleG/TD/Hmg	0.5	95	7806.4	20 km	65km	1668	4
15	TeleG/TD/Hmg	1	95	12,803.2	20km	62km	1668	4
15	TeleG/Tgt Skr	0.1	95	12,310.4	40km	70km	1668	4/6
15	TeleG/Tgt Skr	0.5	95	16,306.4	40km	65km	1668	4/6
15	TeleG/Tgt Skr	1	95	21,303.2	40km	62km	1668	4/6
15	Tgt Skr/TD/Hmg	0.1	95	14,844.8	40/20km	133km	16,680	8/10
15	Tgt Skr/TD/Hmg	0.5	95	18,836.8	40/20km	124km	16,680	8/10
15	Tgt Skr/TD/Hmg	1	95	23,830.4	40/20km	118km	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TeleG indicates teleguidance, TD is AEMS/Laser target designated, Hmg is advanced IR homing, and Tgt Skr is imaging radar target seeker; *Yield* is warhead yield in kilotons; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Short Range* is short range of missile in homing mode, where figures separated by a slash are in target seeker/homing mode; *Max Range* is maximum range of missile in teleguided or target designated mode; *M/turn* is the number of meters the missile travels in a five-second combat turn; *Agility* is the missile's agility, where missiles with a target seeker guidance mode have their target seeker agility to the right of the slash. All missiles have a volume of 95 liters, diameter of 30cm, and length of 1.34m.

9•3 9•6 9•9
8•3 8•6 8•9
7•3 7•6 7•9
6•3 6•6 6•9
5•3 5•6 5•9
4•3 4•6 4•9
3•3 3•6 3•9
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Yes No
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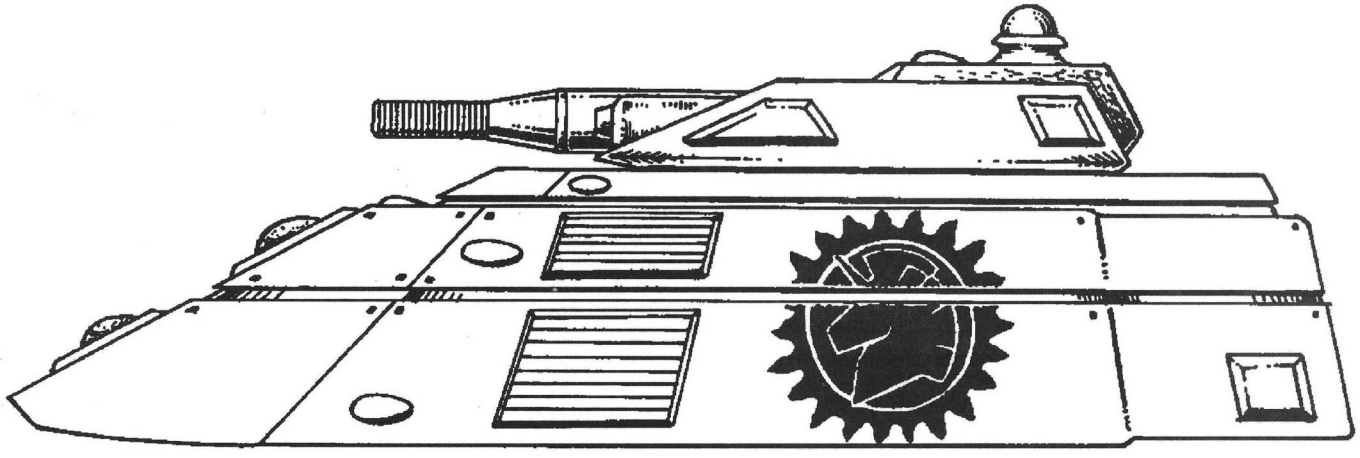
Date



With the exception of the dome-protected maser uplink atop the turret, the Marine FDC vehicle is externally virtually identical to the standard Marine APC (see view on page 17) as it is fitted with a fully operational turret. This was done to prevent enemy forces from rapidly targetting artillery direction vehicles, and to also give them the ability to auto-suppress nuisance targets with direct fire and thereby save artillery fire missions for more important targets.

Tech Level: 15
Price: MCr20.872611
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 227.79 tonnes empty, 238.01 loaded
Power: TL15 10.08 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.597 MW excess power)
Maint: 40
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computer
Commo: TL15 30km radio, TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 3×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 35 cubic meters)
Cargo: 160 kg of crew equipment (0.639 m^3)
Crew: 6 (Driver, Gunner, Commander/FDC Officer, 3 FDC Technicians)
Passengers: None.
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), control units for advanced IR homing, imaging radar target seeking, teleguided, and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator, TL15 Fire Direction Center with indirect fire coordinating range of 80 km.

Armament: TL15 rapid-pulse 18.5-Mj fusion gun and magazine launcher with 1+5 nuclear Tac missiles, both mounted in remote turret
Stabilization: Advanced (fire at any speed)
Ammo: 500 rounds of 18.5-Mj 11.6×35cm PFC cartridges (Cr148 each, Cr74,000 for full load of 500), 1+5 nuclear missiles in magazine launcher
Reloading Data: Fusion gun magazine is 3.7m^3, 7.474 tonnes loaded, 0.074 tonnes empty, MCr0.07437 loaded, MCr0.00037 empty, reloading requires 75 five-second combat turns and a crane or contra-grav lifters. Missiles are 95kg each, replacement requires 19 actions each (see TNE page 273).
Speed: 1092 kph maximum, 819 kph cruising, 190 kph NOE
Travel Move: 3276/1140
Combat Move: 152 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.364 G
Fuel Capacity: 17,865.375 liters reaction mass plus 84 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 15.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial Marine FDC Carrier costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

TL15 Imperial FDC APC

TL15 IMPERIAL FDC APC

Fire direction centers (see also **Fire, Fusion, & Steel** page 88) coordinate the fire of several indirect fire systems (tube artillery, rocket artillery, and meson guns) at a single target, convert correction requests from forward observers into precise elevation, traverse, propellant, and trajectory commands, and calculate the effects of a wide variety of factors on artillery accuracy (such as atmospherics, different elevations between the firing weapon and the target, and so on). While fire direction centers are not required to conduct indirect fire, they increase the effectiveness of that fire dramatically.

For fire conducted through a fire direction center, the task roll to hit the target is a Difficult (instead of Formidable) task.

Fire direction centers substitute the appropriate weapon skill/asset of the main operator (usually the most skilled gunner in the FDC) for the weapons skills of the gunners of all the weapons controlled by the FDC (called the "battery"). All weapons in the battery must have a communications link to the FDC.

TL15 FDCs have an effective indirect fire range of 80 kilometers, meaning that the advantages described in the two paragraphs above apply within this range. Indirect fire using the FDC beyond this range is allowed, but the task roll to hit is Formidable instead of Difficult. TL15 FDCs mass 10 tonnes, displace 14 m³, cost MCr3, and require a crew of four (of these, three require dedicated workstations, one may double as the vehicle commander from a vehicle crewstation). The FDC in this vehicle is supplemented by the standard command vehicle suite of two full-size TL15 computers, allowing them to be fully integrated and coordinated with military operations throughout the operational area.

Note that this 80-kilometer range is from the FDC to the target, and has nothing whatever to do with where the firing artillery is in relation to the target or the FDC. Thus, as long as the firing artillery is in range of the target and in communications with the FDC, the indirect fire task can be conducted as described above, even if the firing artillery is thousands of kilometers from the target, as in the case of a battlefield meson gun, or orbital artillery fire (see **TNE** page 281). This allows meson guns (page 40), MRL artillery vehicles (page 36), and the like to be sited far away from potential combat while retaining the ability for precision fire.

The Imperial Fire Direction Center (FDC) vehicle is based on the Imperial Fire Support and Command APC (page 24), but with the external missile racks deleted. The loss of drag gives the Imperial FDC vehicle a blistering turn of speed, and makes it by far the fastest member of the army family of grav APCs (pages 22-25 and this page). Its light armament is intended for self-defense only, as the army feels comfortable that it will have sufficient support forces available that its FDC vehicle will not need to attack targets itself in order to save scarce indirect fire missions. The removal of the missiles underscore this point, but more importantly, make it possible for the vehicle to rapidly move around the battlefield, bringing the effects of massive bombardment to any points required. While the Marines are concerned that bombardment assets will be scarce in the Marine combat environment, the army expects them to be relatively plentiful; it is rather the FDC vehicles that will be the limiting factor. Therefore high FDC vehicle speed, moving the "footprint" of applicable firepower around the battlefield in the shortest amount of time possible, is the critical feature of its FDC carrier.

However, for the simple sake of redundant capability, the vehicle does retain the missile fire control capability of the fire support vehicle. This allows it to control missiles fired by other vehicles, and also gives it a 300km range laser designator, although the FDC role does not usually call for it to designate its own targets from the front.

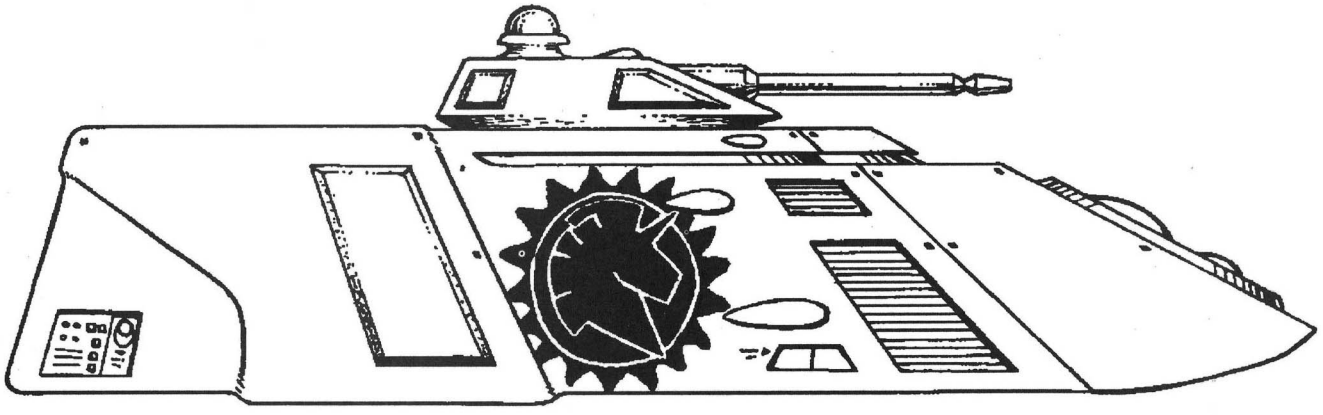
Note also that remote drone missiles (see pages 38-39), although classed as "artillery" do not use fire direction centers, as their mode of operation is entirely different from classical indirect fire.

Tech Level: 15
Price: MCr20.087204
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 229.16 tonnes empty, 231.78 loaded
Power: TL15 11.94 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.05182 MW excess power)
Maint: 39
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, 2×TL15 Model St computers
Commo: TL15 30km radio, TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 30km active EMS sensor, 5×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 150 kg of crew equipment (0.6 m³)
Crew: 6 (Driver, Gunner, Commander/FDC Operator, 3 FDC Technicians)
Passengers: None
Fire Control: EMS rangefinder and TL14 point defense ballistic computer for VRF Gauss Gun (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator, TL15 Fire Direction Center with indirect fire coordinating range of 80 km.
Armament: VRF Gauss Gun in remote turret
Stabilization: Advanced (fire at any speed)
Ammo: 300,000 rounds VRF gauss gun (Cr3000 for full load of 300,000 rounds needle)
Reloading Data: VRF gauss gun ammunition is carried in 10 cassettes, 0.017m³ each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273).
Speed: 1166 kph maximum, 875 kph cruising, 190 kph NOE
Travel Move: 3500/1140
Combat Move: 162 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.374 G
Fuel Capacity: 21,113.625 liters reaction mass plus 99.5 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140

Security Clearance
Yes No
300-1202
Date



Fire Direction Center vehicle belonging to an unidentified Regency Army unit. The national insignia is unusually large, probably indicating that the vehicle is a member of a peacekeeping force, which routinely use over-sized insignia to minimize the chance of mistaken identity in these tense operations. Note that although the Regency insignia appears to be applied "backwards," it is official policy that when affixed to vehicles, the unicorn in the insignia should be facing "forward," in the direction of the vehicle's travel. Thus port-side insignia appear "correct" while starboard-side insignia seem to be reversed.

The orbital maser uplink atop the turret is a standard part of the fire direction communications suite. These vehicles are able to collate data from orbital satellite networks or warships, coordinate fire from meson guns on the other side of a planet, and even direct the fire of orbital bombardment.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Imperial FDC Carrier costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

WEAPON CHARACTERISTICS

VRF Gauss Gun

TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Magazine*	*Short Range*
10	4×20mm/60 Dart	50	6	1-3-5	300,000C	300

TL: Technology Level; *Round*: type of round fired; *ROF*: Rate of Fire in shots per fire *action; Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *Pen Val*: Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine*: Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range*: Short Range in meters.

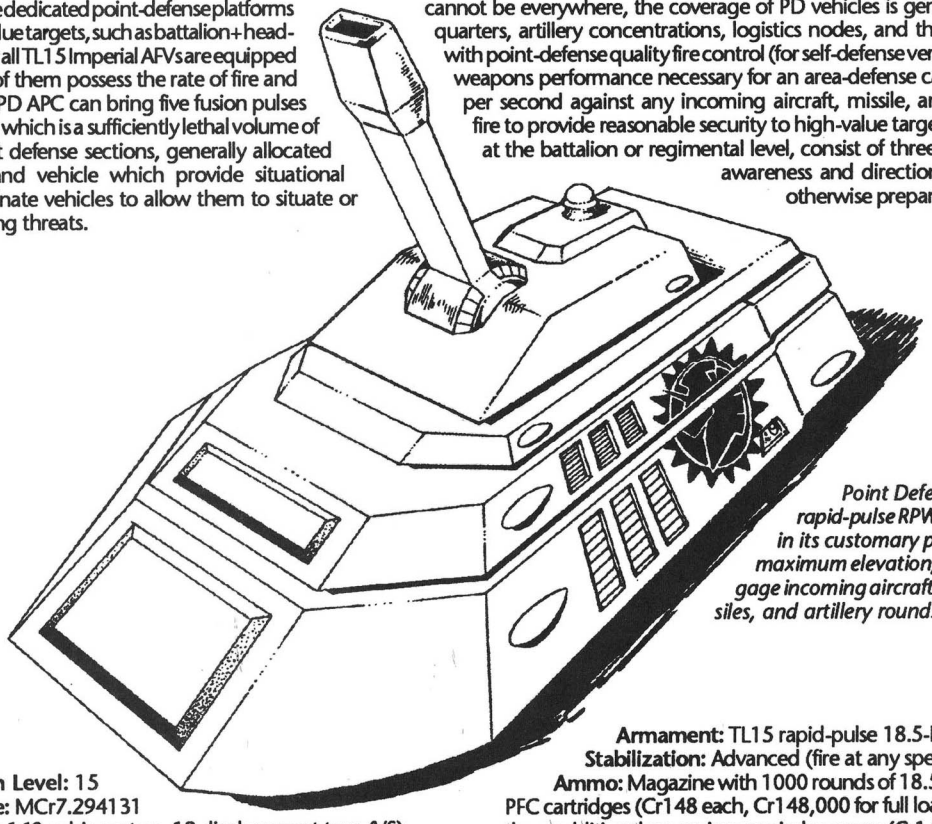
Imperial TL15 Point Defense and Nuclear Damper Control APCs

TL15 IMPERIAL POINT DEFENSE (PD) APC

At TL15, the point-defense mission combines the roles of antiaircraft, antiartillery, and antimissile fire into a single platform. However, because dedicated point-defense platforms cannot be everywhere, the coverage of PD vehicles is generally limited to high-value targets, such as battalion+ head-quarters, artillery concentrations, logistics nodes, and the like. Although virtually all TL15 Imperial AFVs are equipped with point-defense quality fire control (for self-defense versus Tac missiles), not all of them possess the rate of fire and weapons performance necessary for an area-defense capability.

The PD APC can bring five fusion pulses per second against any incoming aircraft, missile, artillery round, or vehicle, which is a sufficiently lethal volume of fire to provide reasonable security to high-value targets even at TL15.

Point defense sections, generally allocated at the battalion or regimental level, consist of three PD APCs and a command vehicle which provide situational awareness and directional cues to their subordinate vehicles to allow them to situate or otherwise prepare themselves for incoming threats.



Point Defense APC with its rapid-pulse RPW-15H fusion gun in its customary position: at near-maximum elevation, prepared to engage incoming aircraft, top-attack missiles, and artillery rounds.

Tech Level: 15
Price: MCr7.294131
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 219.46 tonnes empty, 282.35 loaded
Power: TL15 10.98 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.01262 MW excess power)
Maint: 47
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, 2×TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 300km active EMS sensor, 3×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 1033 kg of crew equipment (4.134 m³)
Crew: 3 (Driver, Commander, Gunner)
Passengers: 2 in adequate seats with large cargo hatch
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator

Armament: TL15 rapid-pulse 18.5-Mj fusion gun
Stabilization: Advanced (fire at any speed)
Ammo: Magazine with 1000 rounds of 18.5-Mj 11.6×35cm PFC cartridges (Cr148 each, Cr148,000 for full load of 1000), plus three additional magazines carried as cargo (Cr148,740 each fully loaded, Cr446,220 for all three)
Reloading Data: Fusion gun magazine is 7.4m³, 14.948 tonnes loaded, 0.148 tonnes empty, MCr0.14874 loaded, MCr0.00074 empty, reloading requires 150 five-second combat turns with no additional loading gear required, as gear is integral to vehicle.
Speed: 873 kph maximum, 654 kph cruising, 190 kph NOE
Travel Move: 2616/1140
Combat Move: 121 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.307 G
Fuel Capacity: 21,113.625 liters reaction mass plus 91.5 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret	**TF:** 252	**HF:** 252
Susp: Grav	**TS:** 140	**HS:** 140
	TR: 126	**HR:** 126
	Deck: 126	**Belly:** 140

Decoys

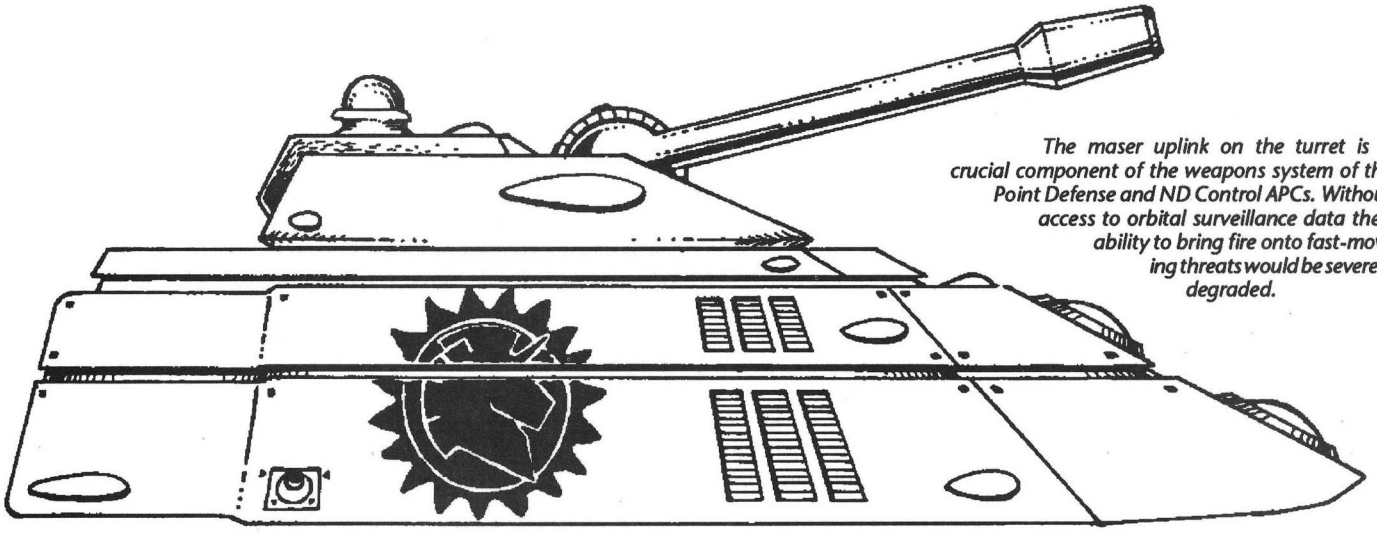
See facing page for description.
Decoys for the Imperial Point Defense APC costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

WEAPON CHARACTERISTICS

TL15 18.5 Mj 19-Chamber Rapid Pulse Fusion Gun (RPW-15H)

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Short Range*
T5	18.5-Mj RP Fusion W Gun	5	129	1-1-2-10	129-129-65-13	17-15	650m

TL: Technology level; *ROF:* Rate of Fire in shots per fire *action*, except in the case of weapons listed as "SAN," where N is the total number of shots that the weapon can fire per five-second combat turn; *Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *C-B:* Concussion value and Burst radius in meters; *Short Range:* Short Range in meters.



The maser uplink on the turret is a crucial component of the weapons system of the Point Defense and ND Control APCs. Without access to orbital surveillance data their ability to bring fire onto fast-moving threats would be severely degraded.

TL15 IMPERIAL NUCLEAR DAMPER (ND) CONTROL APC

The ND Control APC is the vehicle that directs and allocates the fire of Imperial Nuclear Damper Carriers (NDCs) against identified and suspected nuclear warheads to prevent their detonation (see NDCs, next page). TL15 NDCs have a 3000km over-the-horizon (OTH) range that requires the assistance of fire control centers that allows them to direct fire against nuclear warheads that are not yet in their line of sight. ND Control APCs provide this service, as they are tied into the planetary command-and-control network. This network conveys the identification of likely or confirmed nuclear warhead or nuclear warhead-carrying vehicles, as well as the determination of their cargo as fission or fusion weapons (see next page, or **Fire, Fusion & Steel** page 57; the correct determination of fission vs. fusion and the correct application of nuclear damper effects is handled via the standard task resolution system).

In design, the ND Control APC is a cross between a command APC and the Point Defense APC (previous page). The command functions allow the control vehicle to access the global observation and intelligence data to track and: 1) determine the location and imminent threat of nuclear warheads, 2) determine the firing and trajectory of nuclear warheads, and 3) hand off targeting data for these warheads to nuclear damper vehicles which can neutralize these warheads.

The purpose of ND control vehicle's armament is two-fold: to provide nonnuclear air defense to the NDCs under its control as well as to provide additional firepower against incoming projectiles in the case of saturation attacks too intense for the nuclear dampers to handle.

Each nuclear damper section (see **Striker II**) consists of three ND Control APCs and four Nuclear Damper Carriers. This allows two active ND controllers each controlling two NDCs plus one reserve ND controller which is either resting its crew between alert periods or is monitoring the global situation preparatory to taking over control of a two-NDC fire element. Each NDC element can maintain a rate of fire of two shots per five-second combat turn.

Tech Level: 15
Price: MCr13.820031
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 221.96 tonnes empty, 269.01 loaded
Power: TL15 12.54 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.02262 MW excess power)
Maint: 45
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system, TL15 Model St computer
Commo: TL15 30km radio, 2×TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3000km active EMS sensor, 3×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 140 kg of crew equipment (0.56 m^3)
Crew: 5 (Driver, Commander, Gunner, Coordinator, Relief Coordinator)
Passengers: None
Fire Control: EMS rangefinder and TL14 point defense ballistic computer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions), EMS rangefinder may function as 3km short range laser/EMS designator
Armament: TL15 rapid-pulse 18.5-Mj RPW-15H fusion gun
Stabilization: Advanced (fire at any speed)
Ammo: Magazine with 1000 rounds of 18.5-Mj 11.6×35cm PFC cartridges (Cr148 each, Cr148,000 for full load of 1000), plus two additional magazines carried as cargo (Cr148,740 each fully loaded, Cr297,480 for both)
Reloading Data: Fusion gun magazine is 7.4m^3, 14.948 tonnes loaded, 0.148 tonnes empty, MCr0.14874 loaded, MCr0.00074 empty, reloading requires 150 five-second combat turns with no additional loading gear required, as gear is integral to vehicle.
Speed: 916 kph maximum, 687 kph cruising, 190 kph NOE
Travel Move: 2748/1140
Combat Move: 127 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.322 G
Fuel Capacity: 21,113.625 liters reaction mass plus 104.5 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Sm Turret
Susp: Grav

TF: 252	**HF:** 252
TS: 140	**HS:** 140
TR: 126	**HR:** 126
Deck: 126	**Belly:** 140

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the Point Defense and ND Control APCs cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

TL15 Imperial Nuclear Damper Carrier

TL15 IMPERIAL NUCLEAR DAMPER CARRIER (NDC)

Nuclear dampers disable nuclear warheads by preventing their warheads from undergoing nuclear reactions. In the case of fission warheads, they do this by transforming their fissile material into nonfissile elements, and in the case of thermonuclear warheads, they do this by preventing the hydrogen nuclei from being able to fuse. This sort of alchemy is made possible by the manipulation of the strong and electroweak forces. Weakening the strong force, which holds subatomic particles together in atomic nuclei, prevents hydrogen nuclei from fusing in thermonuclear reactions. On the other hand, manipulating the electroweak force, which controls the decay of subatomic particles, allows the nuclear damper to cause Uranium or Plutonium to rapidly decay into nonfissile isotopes, preventing the nuclear warhead from functioning. (Note, however, that improperly identifying a fission warhead as a fusion warhead and firing a nuclear damper at it to weaken the strong force will actually cause the detonation of a fission warhead, rather than prevent it.) For further discussion of nuclear damper technology, see **Fire, Fusion & Steel** pages 56-57.

Although it is believed that at higher tech levels so-called "nuclear damper" technology (although "nuclear enhancer" technology would be just as accurate, depending upon its specific application) will permit true alchemy, at current levels it is only able to provide economical results in military applications (where the result of a nuclear explosion has truly profound implications), and with materials that are either inherently unstable (in the case of fissile elements) or are in critical transitional states (in the case of fusion ignition).

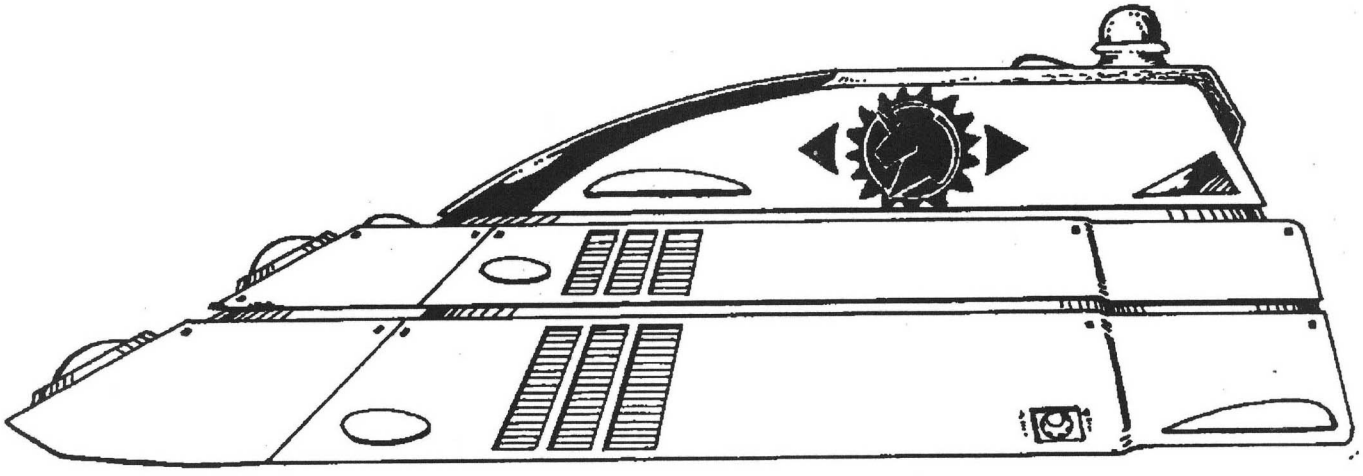
Like meson guns, the positive or negative "nodes" generated by nuclear dampers are not affected by intervening terrain and can be generated at points over the horizon. This means that unless nuclear damper fire is to be restricted to direct "above the horizon" fire, their fire must be controlled by command centers that can pass over-the-horizon targeting points to the firing nuclear dampers. These command centers are the Nuclear Damper Control APCs detailed on page 31.

Like most TL15 battlefield support systems, the NDC is based on the TL15 grav APC hull. This has led to its commonly being called the "Nuclear Damper Grav APC," although this term is a misnomer, as it is a damper carrier, not a personnel carrier.

Tech Level: 15
Price: MCr21.992491
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 235.11 tonnes empty, 238.75 loaded
Power: TL15 22.8 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.03292 MW excess power)
Maint: 40
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system, TL15 Model St computer
Commo: TL15 30km radio, 2×TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3000km passive EMS sensor, 3000km active EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 576 kg of crew equipment (2.306 m³)
Crew: 4 (Driver, Commander, Damper Operator, Replacement Damper Operator)
Passengers: None, but accommodations include two half-bunks for crew
Fire Control: TL15 3000km beam pointer (ignore 5 Diff Mods, and multiply Diff Mods of ballistic target by 0.5, dropping fractions)
Armament: TL15 3000km nuclear damper (SA1)
Stabilization: Advanced (fire at any speed)
Ammo: None (damper is powered directly from power plant)
Reloading Data: N/A
Speed: 1200 kph maximum, 900 kph cruising, 190 kph NOE
Travel Move: 3600/1140
Combat Move: 169 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +2 Diff Mods vs. HRT and Radar, +1 Diff Mods vs. Passive and Active EMS, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.363 G
Fuel Capacity: 34,648 liters reaction mass plus 190 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 32 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: No Turret **HF:** 252
Susp: Grav **HS:** 140
HR: 126
Deck: 126 **Belly:** 140



Imperial Nuclear Damper Carrier (NDC). These vehicles are allocated at the battalion level, and are generally deployed to protect high-value targets, such as command/control/communications nodes, resupply points, and civilian populations, although they can operate with small tactical units, moving their umbrella of protection with the lead formations.

Fire from nuclear dampers vs. a specified target (either detected by the NDC itself or passed off from an NDC control vehicle) is resolved as normal direct fire (**TNE** page 275), except that a nuclear damper has only a single range band. Targets within this range may be attacked, and targets outside this range may be not. Targets within this range are all attacked with a basic difficulty level of Difficult. This task also applies Diff Mods for target speed (**TNE** page 294). Note that the vehicle is equipped with ballistic fire control, allowing it to disregard five such Diff Mods after multiplying the Diff Mods for ballistic targets by 0.5.

Nuclear dampers apply one additional Diff Mod, detailed as follows. Since the effect of the nuclear damping described above is not instantaneous, but requires the application of the proper positive and negative nodes to the material, the success of the damper is based on the "dwell time" of its field upon the target. The ability to keep this field focused on the target depends again upon the target's closing speed, with Diff Mods based on the net closing velocity of the nuclear warhead. Divide the net closing velocity in kilometers per hour of the targeted warhead by 60,000, and round to the nearest whole number. The result is the target's CV (closing velocity, using units of the **TNE** and **Brilliant Lances** space combat system) which is divided by the indicated value to yield a positive difficulty modifier. This Diff Mod is then applied to the basic fire task difficulty level based on range. Note that the CV units are so large (with 29,999 kph rounding down to 0) that this hardly ever creates a problem in the planetary combat arena; it is only the frictionless vacuum of space that allows nuclear warheads to get up to such high speeds.

The nuclear damper carried by this vehicle has a rate of fire of only one shot per turn, which means that each ND carrier can only conduct one fire task per five-second combat turn.

The reality of terrain-following nuclear munitions (or warhead-carrying aircraft) and their high speed means that nuclear dampers are dependent on hand-offs from systems that can provide over-the-horizon (OTH) targeting. Such systems are carried by ND Control APCs, which are detailed on page 31. In general, two ND carriers are given targeting information by a single ND Control APC. Battery organization is discussed on page 31.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

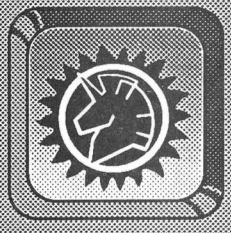
Decoys for the Imperial NDC costs Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

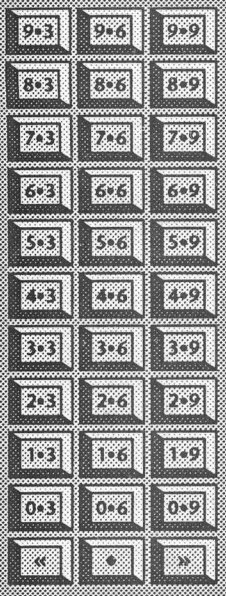
WEAPON CHARACTERISTICS

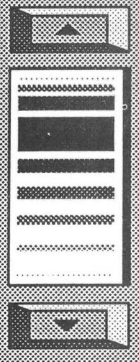
TL	*Weapon*	*ROF*	*Range*	*Diff Mod*
15	Nuclear Damper	SA1	3000km	CV+5

Diff Mod: Divide the net closing velocity in kilometers per hour of the targeted warhead by 60,000, and round to the nearest whole number. The result is the target's CV (closing velocity, using units of the **TNE** and **Brilliant Lances** space combat system) which is divided by the indicated value to yield a positive difficulty modifier. This Diff Mod is then applied to the basic fire task level, which is always Difficult.

TL15 Imperial Cavalry Vehicle/ Armed Air Raft







Security Clearance

Yes No

300-1202

Date

TL15 ARMED AIR RAFT

The Armed Air Raft is the standard scout vehicle of the Imperial/Regency planetary forces, army and Marines alike, and is used in regimental and battalion scout sections, Marine Armored Cavalry (MArCav) platoons, and a variety of other light armed roles. It has the advantages of being reasonably fast, inexpensive, and carrying the offensive punch of the TL15 Imperial Fire Support APC (page 22). Because of its scout role it is officially known as the TL15 Imperial Cavalry Vehicle.

Its combination of VRF gauss gun and light Tac missiles gives it an effective and powerful armament for a vehicle of its relatively small size, although the carriage of the missiles in a single-tube magazine launcher makes them slightly less flexible than on the Fire Support APC with its 34 missile rails, any or all of which can be fire at any one time. In addition, its 300km laser designator makes it an effective artillery designator (see the MRL Artillery Vehicle, page 36). "Hunter-Marker" teams of FDC vehicles (pages 26-29) and armed air rafts are often assembled in artillery-heavy forces to bring the force of massive indirect fire onto the battlefield, in the form of target designated MRL fire via armed air rafts or standard MRL/meson fire via the FDC vehicles.

The armed air raft is designed for use as a recce/scout vehicle, and carries two observers who can be dismounted for ground reconnaissance/target designation/special operations missions. A full scout section of five armed air rafts can place an infantry element of two full fire teams plus a two-man command element onto the ground, and support them with gauss gun and Tac missile fire. This combination makes not only a successful intelligence-gathering scout force, but also a useful rear-guard or economy of force detachment.

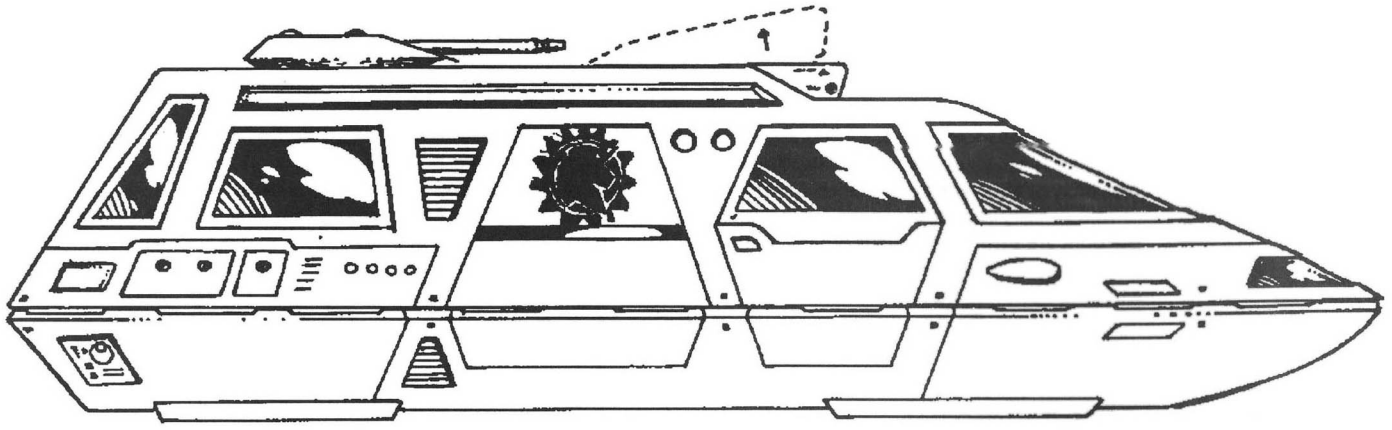
Although meson communicators are not standard equipment on the armed air raft in order to reduce costs, power is reserved in the design for 300km units, which adds MCr0.25 to the vehicle cost and reduce cargo capacity by 0.5 m^3.

The Regency Army maintains a number of light action civil security battalions that are equipped primarily with armed air rafts and grav belt-equipped infantry wrapped around a standard headquarters component which includes a battery of eight MRL artillery vehicles. These units have a relatively low impact in terms of public provocation, but are very effective in terms of area surveillance, and the MRL battery provides a devastating punch which allows the unit to hold its position while awaiting reinforcement.

Tech Level: 15
Price: MCr1.420423
Size: 42 cubic meters=3 displacement tons (Mc)
Mass: 6.33 tonnes empty, 8.03 tonnes loaded
Power: 2.52 MW fusion power plant, with HEPlaR thruster generating 8 tonnes of thrust (0.0733 MW excess power)
Maint: 1
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 2× Model 15-FLT computers, TL10+ IGS positioning navigation
Commo: 300km radio, 2×30km maser
Sensors: 30km passive EMS, 5×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antipassive sensor decoys (see below)
Life Support: Pressurized, light, heat, basic life support
Cargo: 260 kg of crew equipment (1.04 m^3)
Crew: 5 (Driver, Missile Gunner, Gauss Gunner, 2 Observer/Dismounted Scouts)
Passengers: None (2 Observer/Dismounted Scouts in adequate seats)
Fire Control: EMS rangefinder and TL14 direct fire ballistic computer (ignore 5 Diff Mods), control units for imaging radar target seeking and laser designated missiles, 300km laser designator, EMS rangefinder may function as 3km short range laser/EMS designator
Armament: Turret-mounted VRF gauss gun, hull-mounted magazine launcher with 0+12 30kg fire-and-forget Tac missiles
Stabilization: Advanced (fire at any speed)
Ammo: 5 cassettes for VRF gauss gun (Cr1600 for full load of 150,000 rounds needle) 12 Tac missiles in magazine launcher (price varies, see table below)
Reloading Data: VRF gauss gun ammunition is carried in 5 cassettes, 0.017m^3 each, 0.017 tonnes loaded, 0.002 tonnes empty, Cr320 loaded, Cr20 empty, replacement requires four actions (see **TNE** page 273). Missiles are 30kg each, replacement requires 6 actions each.
Speed: 746 kph maximum, 560 kph cruising, 187 kph NOE (safe speed)
Travel Move: 2240/1122
Combat Move: 104/26
Signature: +2 Diff Mods vs. HRT and Radar, +1 vs. other methods
Diff Mods vs. Fire: No Diff Mod stationary, +6 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +8 at safe NOE speed, +10 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.267 G
Fuel Capacity: 4800 liters liquid hydrogen (LHyd)
Fuel Consumption: 100 liters/hour (endurance of 48 hours), plus power plant fuel is sufficient for one month.

Combat Statistics

Config: Sm Turret	**TF:** 8	**HF:** 8
Susp: Grav	**TS:** 4	**HS:** 4
	TR: 4	**HR:** 4
	Deck: 4	**Belly:** 4



Imperial Cavalry Vehicle. Note dotted line showing missile launcher in the raised (firing) position. The VRF gauss gun turret cannot fire directly ahead when the missile launcher is firing, although it has full 360-degree traverse when the missile launcher is retracted. The two scouts dismount either through the doors on each side or through a crew ramp in the hull rear.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the armed air raft cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

WEAPON CHARACTERISTICS

TL15 30kg Fire and Forget Missiles

TL	*Guidance*	*Whd*	*Mass*	*Price*	*Sh Rng*	*Mx Rng*	*C-B*	*Dngr Spc*	*Pen*	*M/Turn*	*AGL*
15	Tgt Skr/TD	HE	30	4136.8	20	54	16-45	—	5C	16,680	8/10
15	Tgt Skr/TD	Flech	30	4328.8	20	54	—	150×600	1-Nil	16,680	8/10

TL is tech level of missile; *Guidance* is guidance packages in missile, where TD is AEMS/Laser target designated and Tgt Skr is IR target seeker; *Whd* is warhead type; *Mass* is mass of missile in kilograms; *Price* is price of missile in credits; *Sh Rng* is short range of missile in target seeker mode; *Mx Rng* is maximum range of missile in target designated mode; *C-B* is concussion and burst for HE warheads; *Dngr Spc* is danger space for flechette warheads; *Pen* is Penetration Value for HE warheads and Penetration Rating for flechette warheads in primary-secondary danger space (damage value is 2D6/1D6 respectively); *M/turn* is the number of meters the missile travels in a five-second combat turn; *AGL* is the missile's agility, with the target designation mode agility to the left of the slash and the target seeker guidance mode agility to the right of the slash. All missiles have a volume of 30 liters, diameter of 20cm, and length of 95cm.

VRF Gauss Gun

TL	*Round*	*ROF*	*Dam Val*	*Pen Rtg*	*Magazine*	*Short Range*
10	4×20mm/60 Dart	50	6	1-3-5	300,000C	300

TL: Technology Level; *Round*: type of round fired; *ROF*: Rate of Fire in shots per fire *action; Dam Val:* Damage Value; *Pen Rtg:* Penetration Rating at short-medium-long-extreme ranges; *Pen Val*: Penetration Value, i.e., Damage Value already adjusted by Penetration Rating at short-medium-long-extreme ranges for use against unarmored targets; *Magazine*: Magazine capacity in shots, where C indicates the cassette magazine type; *Short Range*: Short Range in meters.

TL15 Imperial Artillery Vehicle (Multiple Rocket), MRLAV

TL15 IMPERIAL MULTIPLE ROCKET LAUNCHER (MRL) ARTILLERY VEHICLE, MRLAV

The MRL Artillery Vehicle is the standard Imperial area-saturation weapon. By ripple-firing its full load of 20 rockets a single MRLAV is able to lay fire on an area as large as 2060 meters across as far as 650 kilometers away. With its integral autoloader the MRLAV can reload in only five minutes. Thus under ideal circumstances a single MRLAV could cover almost 40 square kilometers with fire in a single hour. In a high-threat environment this figure would be reduced by the need to displace to a new firing position after each salvo, but given the vehicle's ability to rapidly open fire this value would be no more than cut in half.

The EMS guidance of these rockets allows them to be designated by any laser, radar, or active EMS system, which allows a very high first-round hit probability. The rockets may also be fired using normal indirect fire procedures, but given the capability of EMS target designation this method is wasteful and is only used in unusual circumstances.

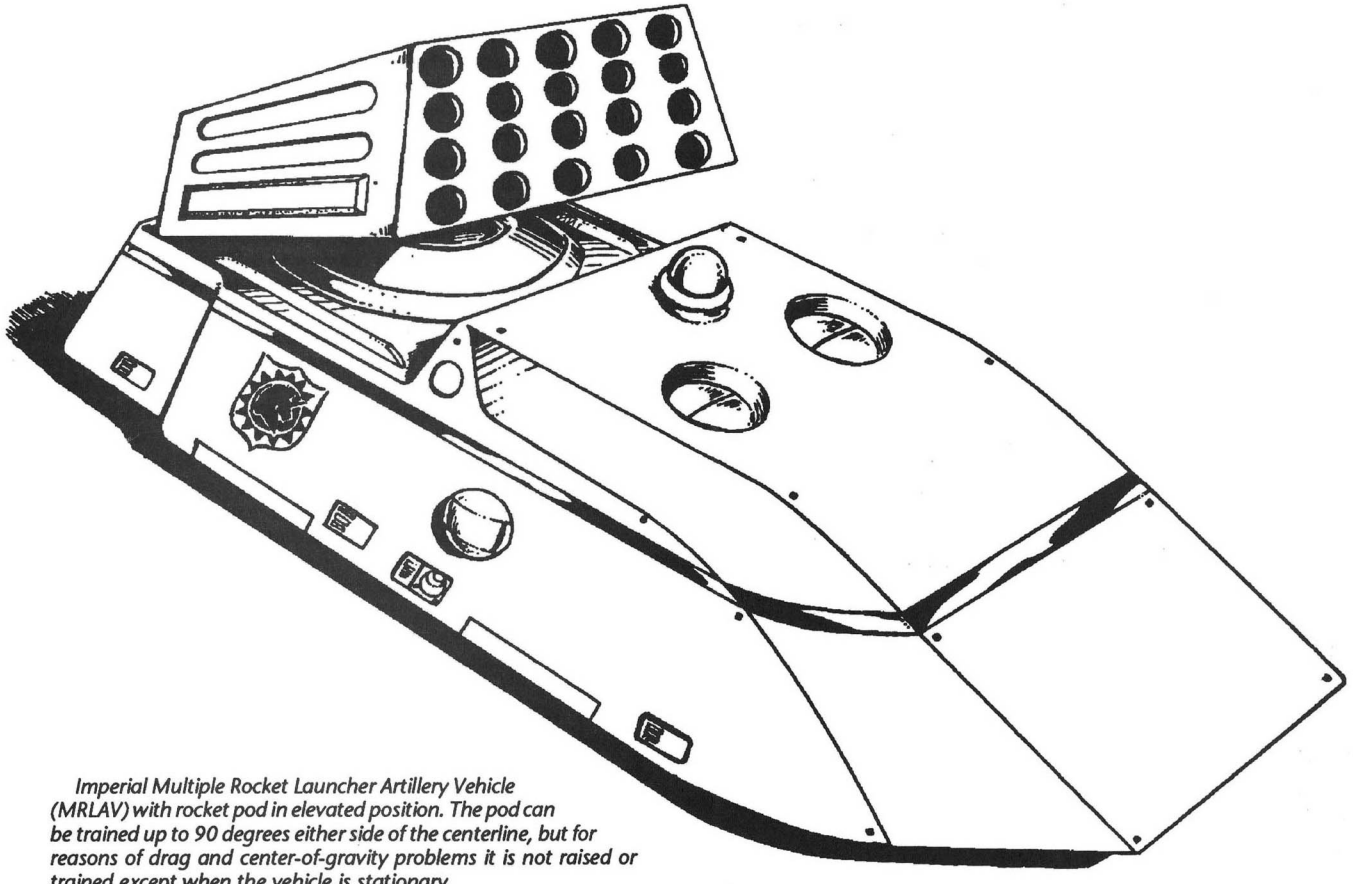
MRL Artillery Vehicles are employed in four-vehicle units, either as separate MRL platoons or as MRL sections. Separate MRL platoons are small artillery units organic to nonartillery battalions and include an FDC vehicle as the platoon headquarters. MRL sections are assigned one or two at a time to a regimental or divisional artillery battery along with an RDM section. The MRL and RDM sections have no FDCs of their own. The battery is commanded from a single FDC battery command vehicle.

In both cases, there is usually one grav sled (see page 42) assigned per MRL vehicle as an ammunition carrier.

Tech Level: 15
Price: MCr9.013841
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 257.17 tonnes empty, 269.24 loaded
Power: TL15 7.2 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.29092 MW excess power)
Maint: 45
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 49 kg of crew equipment (0.197 m³)
Crew: 3 (Driver, Commander, Gunner)
Passengers: None
Fire Control: TL15 Indirect Fire Control
Armament: 20-round multiple rocket launcher for 30cm, 500 kg EMS-designated artillery rockets
Stabilization: Advanced (allows set-up time to be reduced to 6 turns, or 30 seconds)
Ammo: 20×30cm rockets carried in launch tubes
Reloading Data: Autoloader reduces reload time to 5 minutes (60 combat turns)
Speed: 1070 kph maximum, 802 kph cruising, 190 kph NOE
Travel Move: 3208/1140
Combat Move: 149 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +2 Diff Mods vs. HRT and Radar, +1 Diff Mods vs. Passive and Active EMS, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.322 G
Fuel Capacity: 21,113.625 liters reaction mass plus 60 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Standard
Susp: Grav
HF: 252
HS: 140
HR: 126
Deck: 126
Belly: 140



Imperial Multiple Rocket Launcher Artillery Vehicle (MRLAV) with rocket pod in elevated position. The pod can be trained up to 90 degrees either side of the centerline, but for reasons of drag and center-of-gravity problems it is not raised or trained except when the vehicle is stationary.

Autoloader rails are installed at the rear of the rocket pod, allowing the pod to be reloaded from ammunition vehicles (such as the Imperial grav sled, see page 42) in as little as five minutes.

This view affords a good view of the radome-protected orbital maser uplink, located between and behind the crew hatches, and just in front of the break in the hull for the rocket pod recess. The maser allows full access to the FDC net (see pages 26-29), so crucial to accurate indirect fire.

The shield around the Regency insignia shows that this is an Army vehicle. In any event, the vast majority of MRLAVs in service belong to the Army anyway, as the Marines prefer the Meson Artillery Vehicle (MAV), see pages 40-41.

WEAPON CHARACTERISTICS

TL15 30cm Artillery Rockets

Warhead	*Guidance*	*Conc-Brst*	*Direct Hit On*	*Pen*	*IF Rng*	*Cbt Move*	*Price*
HE	EMS Desig	225-155	—	38C	650km	30,310/+9	3696
Submun	EMS Desig	NA-225	1, 1-5	10C	650km	30,310/+9	13,696
Hmg Submun	EMS Desig	NA-115	1-3, 1-7	10C	650km	30,310/+9	21,696
HEAP	EMS Desig	149-125	—	353C	650km	30,310/+9	4696

All rockets have a diameter of 30cm and a length of 7 meters. *Conc-Brst* is Concussion and primary burst radius in meters (**TNE** 283-285); *Direct Hit On* shows the chance of a submunition direct hit on a personnel or vehicle target on 1D10 (**TNE** 284-285); *Pen* is the penetration value of the unitary warhead or each separate submunition; *IF Rng* is the maximum Indirect Fire Range; *Cbt Move* is the distance in meters travelled by the rocket per five-second combat turn and the Target Movement Diff Mod (**TNE** page 294); *Price* is the price of each rocket in credits.

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the MRL Artillery Vehicle cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

TL15 Imperial Artillery Vehicle (Remote Drone)

TL15 IMPERIAL REMOTE DRONE MISSILE (RDM) ARTILLERY VEHICLE, RDMAV

Whereas the MRL Artillery Vehicle (previous page) is used for area saturation fire, the RDM Artillery Vehicle is used for precision strike and real-time reconnaissance-strike. Its primary weapon is the Imperial TL15 0.1-ton drone missile. The details of drone missile operation below refer specifically to this weapon, but the general principles are the same for all drone missiles.

Drone missiles are operated using a combination of three assets—RCV Operations, Sensors, and Tac Missile. They are a cross between grav vehicles, Tac missiles, and mobile remote sensors, and operate in all these fashions over the course of a single mission. Over most of its mission, a drone missile operates as an NOE grav vehicle with a maximum speed of 200 kph, and is remotely controlled by its operator, usually in the firing vehicle, who communicates with it either via its 300km radio or its 30,000km satellite uplink.

The operator has the use of a single-purpose TL15 flight-class computer which allows him to synthesize sensor pictures from the drone(s) and other sensors with which the operator is internetted. This sensor picture allows him to move the drone missile toward targets he is aware of, or, by using the drone's own on-board sensors, he can reconnoiter in real time via the drone itself. Use of the drone's on-board sensors, a 3km passive EMS sensor in the case of the 0.1-ton drone, is a task using Sensors *and* RCV Operations (i.e., the lower of the two, see **TNE** page 109). During this "cruise mode" the drone flies an NOE profile and never exceeds 200 kph. (This is also considered its safe speed for the Drive action, using the RCV Operations asset.) However, once the drone is in range of a target which is visible to the drone (via another sensor task as above), the operator may commit the missile to attack that target. At this point the drone missile is operated and resolved as a homing missile, using the RCV Operations *and* Tac Missile assets (i.e., the lower of the two). The listed short range of the missile is based on the distance it can cover in five seconds at maximum thrust. Given the very long short range of the 0.1-ton drone, especially as compared to the range of its sensor, it is difficult to imagine that it will ever be fired at any range other than short.

The drone missile may be commanded to hit a face of the target (i.e., the top, the far/rear side, etc.) which is not directly visible from its point at the commencement of the attack, but this increases the task one difficulty level. When drone missiles are fired at moving targets, they use their agility as a counteracting DM to the target's own speed. The TL15 0.1-ton missile has an Agility of 12: 7 for its own speed with a +5 bonus from its drone brain. However, only its own speed is used as a modifier for weapons attempting to fire at it during this terminal phase.

Drone missiles which are never committed to an attack and which are returned undamaged into friendly hands may be refuelled, recharged, and re-used. Any drone missile which is committed to an attack, even if it misses, may not be re-used.

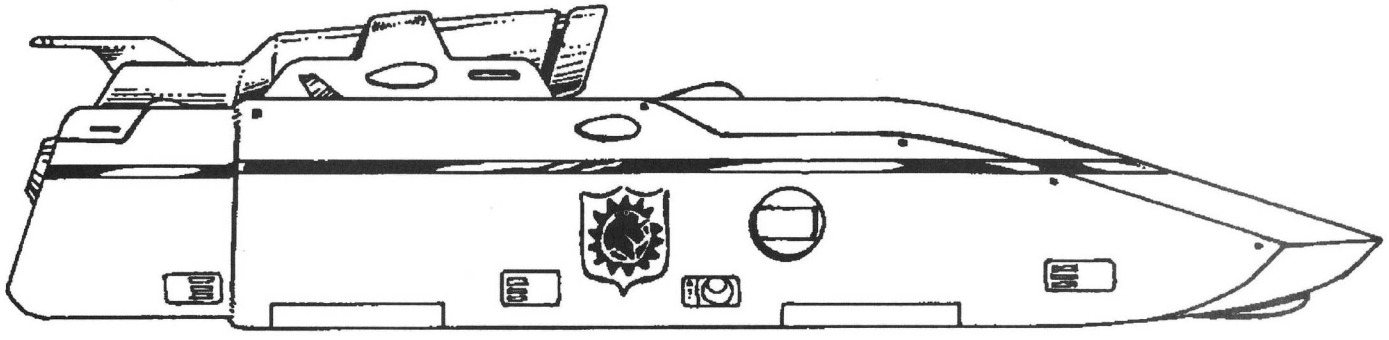
Because of the way that the RDM and MRL artillery vehicles complement each other, Imperial artillery batteries include at least one section each of 4 RDM or MRL vehicles, with the typical ratio being two sections of MRL to one of RDM for a total of eight MRL and four RDM vehicles per battery. Each battery is commanded from an FDC vehicle; there is no separate FDC vehicle at the section level. Unlike MRL vehicles, Remote Drone vehicles are not deployed in separate platoons.

Tech Level: 15
Price: MCr4.119341
Size: 168 cubic meters=12 displacement tons (VS)
Mass: 230.05 tonnes empty, 261.18 loaded
Power: TL15 7.2 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 86.62 tonnes of thrust (0.07592 MW excess power)
Maint: 44
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 4×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, TL15 300km meson communicator, TL15 30,000km maser
Sensors: 30km passive EMS sensor, 3×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock
Cargo: 266 kg of crew equipment (1.064 m³)
Crew: 3 (Driver, Commander, Gunner)
Passengers: None
Fire Control: Control station with TL15 Model FIt computer, TL15 300km radio, and TL15 30,000km maser to control remote drone missiles, up to a maximum of 6 at one time.
Armament: 34-round magazine launcher for remote drone missiles
Stabilization: None
Ammo: 34 remote drone missiles (price varies, see below)
Reloading Data: Drone missiles are 0.857 tonnes each, replacement requires 9 five-second combat turns each.
Speed: 1103 kph maximum, 827 kph cruising, 190 kph NOE
Travel Move: 3308/1140
Combat Move: 153 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +2 Diff Mods vs. HRT and Radar, +1 Diff Mods vs. Passive and Active EMS, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.332 G
Fuel Capacity: 21,113.625 liters reaction mass plus 60 liters for fusion reactor
Fuel Consumption/Endurance: 1082.75 liters/hour (endurance of 19.5 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: Standard
Susp: Grav
HF: 252
HS: 140
HR: 126
Deck: 126
Belly: 140

Security Clearance
Yes No
300-1202
Date



A sleek and attractive Remote Drone Missile Artillery Vehicle, in the markings of the Regency Army. Compare this view to the MRLAV on page 37 to see the details of the common hull shared by these two Imperial artillery vehicles.

The vehicle in this view is unusual in that it is missing its orbital maser uplink, which should be visible atop the rear deck housing between the communications/ECM blades. It has presumably been removed for maintenance. See the view of the Meson Artillery Vehicle on page 41 for correct placement of the maser dome.

WEAPON CHARACTERISTICS

TL15 0.1-ton Remote Drone Missiles

Warhead	*Guidance*	*Conc-Brst*	*Dir Hit*	*Pen*	*Atk Rng*	*Crs Mv*	*Atk Mv*	*Price*
HE	Drone, 300km radio, 30,000km maser	225-155	—	38C	12.36km	278m/+4	12,360m/+9	208,120
Submun	Drone, 300km radio, 30,000km maser	NA-225	1, 1-5	4C	12.36km	278m/+4	12,360m/+9	218,120
Hmg Submun	Drone, 300km radio, 30,000km maser	NA-115	1-3, 1-7	4C	12.36km	278m/+4	12,360m/+9	226,120
HEAP	Drone, 300km radio, 30,000km maser	149-125	—	353C	12.36km	278m/+4	12,360m/+9	209,120

All missiles have a diameter of 60cm and a length of 4.95 meters, a mass of 857 kg, and a maximum flight-time duration of two hours. All missiles are equipped with 3km PEMS. All missiles have an Agility bonus of 12 used during the terminal attack flight to offset target agility bonuses. *Conc-Brst* is Concussion and primary Burst radius in meters (**TNE** 283-285); *Dir Hit* shows the chance of a submunition direct hit on a personnel or vehicle target on 1D10 (**TNE** 284-285); *Pen* is the penetration value of the unitary warhead or each separate submunition; *Atk Rng* is the maximum range at which the drone missile can begin its attack; *Cruise Mv* is the distance in meters travelled by the rocket per five-second combat turn while it is in cruise mode, and after the slash, the Target Movement Diff Mod (**TNE** page 294); *Atk Mv* is the same data except when it is in terminal attack mode; *Price* is the price of each drone missile in credits.

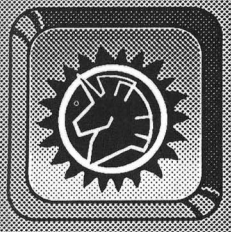
Note: On page 152 of **Striker II**, the rules for drone missiles do not mention the need for sensors. If no sensors are installed, the drone is treated as having the equivalent of "eyeballs" for on-board sensors. Additional capabilities can be achieved by installing and powering various sensors.

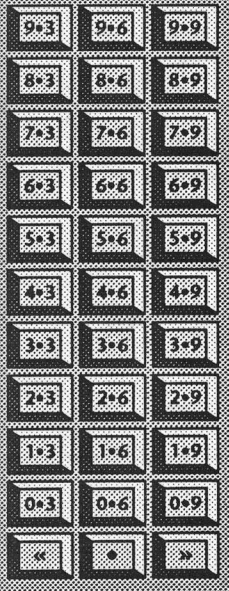
Decoys

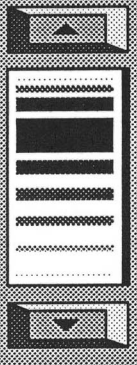
Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the remote drone missile artillery vehicle cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

Imperial Meson Artillery Vehicle







Security Clearance

Yes No

300-1202

Date

MESON ARTILLERY VEHICLE (MAV)

The Meson Artillery Vehicle is unique among the TL15 battlefield systems in that it is not built on the TL15 grav APC hull, but has its own purpose-designed hull. This was necessary to accommodate the vehicle's meson gun, which has a constant diameter of three meters, too large for the grav APC hull, and to carry the large power plant required to make a militarily useful meson weapon. (Even at a rate of fire of one shot every 20 seconds, the 3315 Mj input meson gun draws almost 166 MW of the vehicle's 174 MW total power requirement.) Unlike other Imperial Artillery Vehicles (see pages 36 and 38), the MAV does not carry the "TL15" designator. This is because there are no meson artillery vehicles at earlier tech levels. It was only the two-fold increase in fusion power plant output at TL15 that allowed the first battlefield meson guns to be created.

However, the current MAV is the result of attempts to create an Imperial battlefield meson vehicle that were made at the TL-14 level. This program quickly proved the impracticality of such an effort, but the MAV retains reminders of its tech 14 lineage in the use of the visually distinctive components of the TL-14 Trepida/Astrin grav vehicles in its hull. Although MAVs built by many manufacturers retain this original layout, many current production MAVs display the more angular lines current to TL-15 designs. However, in military circles, the TL-14 styled MAV is considered one of the more visually sporty designs of the Imperial/Regency vehicles currently in service.

Meson guns fire a stream of subatomic particles called mesons which do not interact with matter and have a very short lifespan, at the conclusion of which they disintegrate in a burst of radiation and other damaging particles. By firing these mesons at relativistic speeds, the meson's subjective passage of time can be altered, which controls at what distance from the firing weapon the meson will decay and explode. This means that these explosions appear as if by magic at some point downrange from the gun, although there is no visible mechanism linking the firing weapon and the point of impact. Although the concussion and burst figures listed on the weapon characteristics table seem quite small compared to conventional projectile and rocket artillery, the concussion values are completely unaffected by armor of any kind, as the exploding mesons materialize everywhere within the listed burst radius, on all sides of any armor that may be within that volume. Even personal armor does not protect its wearer when disintegrating mesons are appearing directly within his chest cavity.

Despite the fact that the meson gun fires in a perfectly straight line, it is used primarily as an "indirect fire" weapon because the straight line of the meson beam is capable of passing directly through intervening terrain and obstacles to hit objects hidden from line of sight. This requires the use of indirect fire observation and fire direction techniques, despite the direct fire nature of the weapon itself.

Nonetheless, the weapon is equipped with direct fire capabilities (the beam pointers required by all meson guns, particle accelerators, and nonsmall arms lasers automatically confer direct fire capabilities, see **Fire, Fusion & Steel** page 89), but the absence of weapon stabilization on the large gun mount prohibits the fire-on-the-move tactics of TL15 direct fire weapons. The MAV must come to a stop in order to conduct aimed direct or indirect fire, or suffers the adverse effects if attempting direct fire on the move (+1 Diff Mod for quick fire and +1 additional for movement, see **TNE** pages 275 and 294).

The three-meter-long meson tunnel actually yields an effective range of 3600 kilometers, but its short range is limited to 3000 kilometers by its beam pointer. When provided with the proper targeting information the MAV can actually be pressed into service as a planetary defense weapon, as its maximum range of 30,600 kilometers allows coverage of a full space combat hex. Note that at its longer range bands the battlefield meson gun has no appreciable concussion or burst effect, which makes it an ineffective area weapon at these distances. However, if it achieves a direct hit on a vehicle or spacecraft target at these ranges it uses its damage value against the vehicle or spacecraft directly. (For spacecraft use the normal space combat procedures as found in **Brilliant Lances** or **TNE** pages 311-326; for use against vehicles use damage value for the value "FPV–AV" on the Vehicle Damage Table on **TNE** page 299.)

MAVs are deployed in four-vehicle batteries. Each MAV constitutes a one-vehicle firing section, allowing a full battery to maintain one hit per combat turn on a given target. The battery headquarters consists of a command APC, a Fire Direction Center Vehicle (both of either the Marine or army configuration depending upon the service of the battery), and three forward observer sections each containing an air raft. Independent meson batteries deployed with a Marine task force (see **Striker II** page 138) also include a battery security section with two Marine squads, each mounted in an IM Grav APC (page 16) and an Imperial Cav Vehicle (page 34) for the section commander.

Combat Statistics

Config: No Turret
Susp: Grav

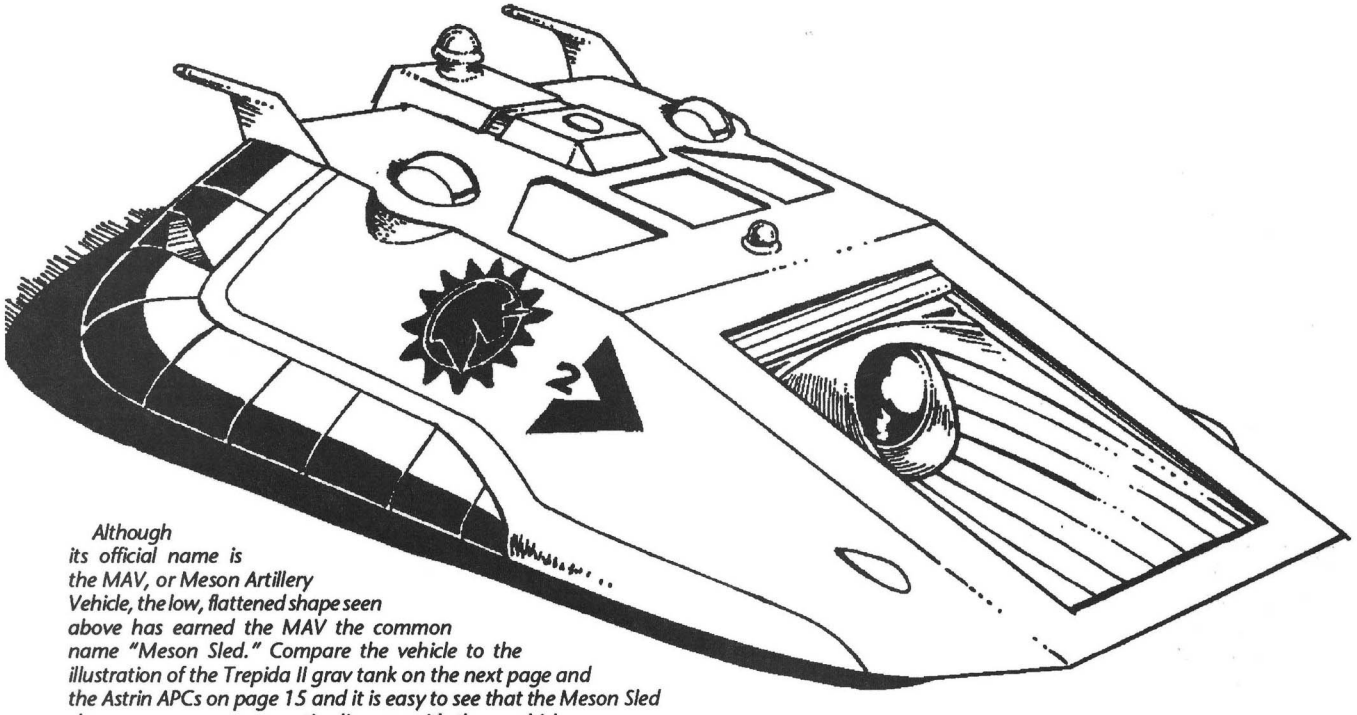
HF: 28
HS: 14
HR: 14
Deck: 14 **Belly:** 14

WEAPON CHARACTERISTICS

663-Mj 3 meter Meson Gun

TL	*Weapon*	*ROF*	*Dam Val*	*Pen Rtg*	*Pen Val*	*C-B*	*Range (DF Band)*
T5	663-Mj Meson Gun IFR=30,600km	1/4	129	NA	NA	33-15	0-3000km (Short)
		1/4	77	NA	NA	12-15	3001-6000km (Medium)
		1/4	39	NA	NA	3-5	6001-12,000 km (Long)
		1/4	19	NA	NA	1-0	12,001-24,000km (Extr.)
		1/4	15	NA	NA	0-0	24,001-30,600km (IFR only)

TL: Technology Level; *Round*: type of round fired; *ROF*: Rate of Fire in shots per five-second combat turn, where 1/4 equals one shot every four turns; *Dam Val*: Damage Value, used as "Final Penetration Value" (FPV) when scoring a direct hit on a vehicular target; *Pen Rtg*: Penetration Rating, not applicable to meson guns as they disregard armor; *Pen Val*: Penetration Value, not applicable to meson guns; *C-B*: Concussion value and Burst radius in meters, note that the concussion value is applied to *all* personnel targets within this radius, disregarding any cover or armor that may be between them and the point of the meson explosion; *Range (DF Band)*: The meson gun's explosive effects vary with its range. This column shows the maximum range at which the line's effects are used, and also show the range band used with that line for direct fire purposes. All meson fire beyond 24,000 kilometers is conducted as an indirect fire mission, and not as direct fire.



Although its official name is the MAV, or Meson Artillery Vehicle, the low, flattened shape seen above has earned the MAV the common name "Meson Sled." Compare the vehicle to the illustration of the Trepida II grav tank on the next page and the Astrin APCs on page 15 and it is easy to see that the Meson Sled shares a common automotive lineage with these vehicles.

The slatted cover on the hull's forward slope protects the sensitive focusing elements of the meson gun when not in use. Although the meson beam could as easily pass through this as it can pass through intervening terrain obstacles, the electromagnetic beam focusing elements work better without the interference caused by the electromagnetic properties of bonded superdense armor. These electro-magnetic perturbations, although hardly noticeable for most purposes, when close to the barrel can introduce tiny beam deviations that have tremendous impact on beam accuracy hundreds or thousands of kilometers downrange.

Tech Level: 15
Price: MCr12.29142
Size: 280 cubic meters=20 displacement tons (VS)
Mass: 342.55 tonnes empty, 343.34 loaded
Power: TL15 174.15 MW fusion power plant supplying 2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 90 tonnes of thrust (0.036 MW excess power)
Maint: 57
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model Flt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, 2×TL15 300km meson communicator
Sensors: 30km passive EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 10 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 224 cubic meters), and one air lock
Cargo: 98 kg of crew equipment (0.39 m3)
Crew: 3 (Driver, Commander, Gunner)
Passengers: None
Fire Control: TL15 3000km beam pointer, TL15 indirect fire control
Armament: 663-Mj Meson Gun
Stabilization: None
Ammo: Powered direct from power plant
Speed: 800 kph maximum, 600 kph cruising, 190 kph NOE
Travel Move: 2400/1140
Combat Move: 111 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mods vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +4 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.262 G
Fuel Capacity: 4500 liters reaction mass plus 1451.25 liters for fusion reactor
Fuel Consumption/Endurance: 1125 liters/hour (endurance of 4 hours), plus reactor fuel is sufficient for one month constant power

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the meson artillery vehicle cost Cr20,000 each regardless of type, or MCr0.8 for a full load of 40.

TL15 IMPERIAL GRAV SLED

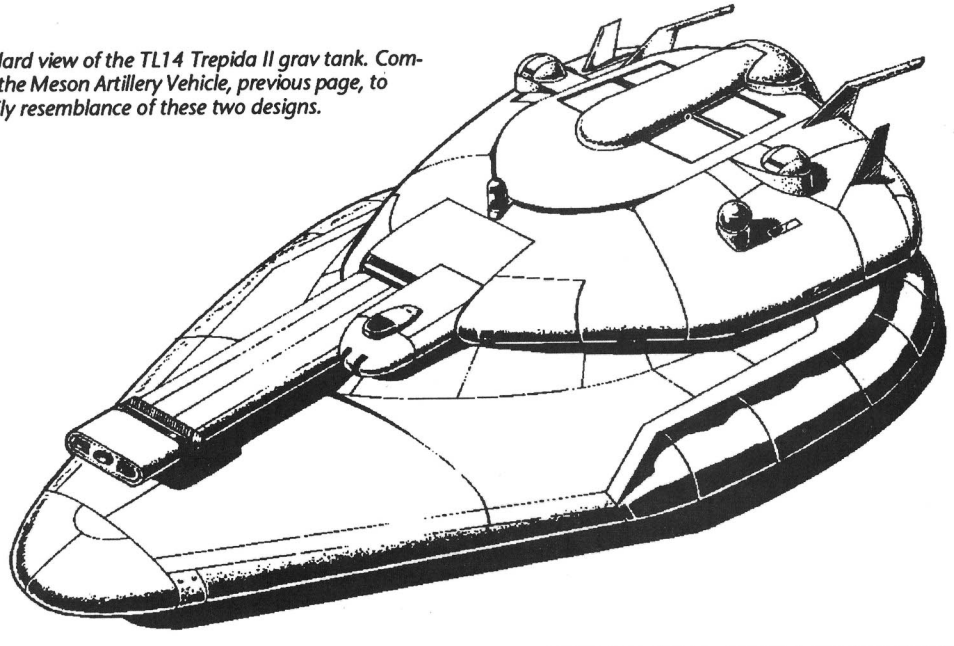
The Imperial Grav Sled was ubiquitous in the Imperium's high stellar units, and serves in large numbers in the Regency Army and Marine units in the logistics, liaison, maintenance, and "hack" roles. For this reason it is also known as the Utility Sled.

Although they are not armored to the standards of true TL15 combat vehicles, the grav sled is quite well-protected by most other standards, and the grav sled is often used as a surrogate APC, especially by planetary armies. It is usually fitted with some form of weapon (typically a VRF gauss gun in a remote turret) in this role. When pressed into service as APCs, grav sleds are generally equipped with adequate seats to allow more rapid "debussing" of armored troops in combat. Grav/Utility Sleds are often used as ammunition vehicles to resupply the AFVs described elsewhere in this book. The quantity of ammunition that can be stowed varies by ammunition type and can be determined by the table below. Mixed loads of multiple ammunition types can be determined by pro-rating the figures on the table. For example, a grav sled loaded with one-half RPW-15 rounds, one-fourth RPZ-15 rounds, and one-fourth 30cm rockets would carry 4865, 257, and 18 rounds of the respective types of munitions. Note that these densely-packed ammunition loads are much more massive than general cargo, and raise the vehicle's loaded mass considerably.

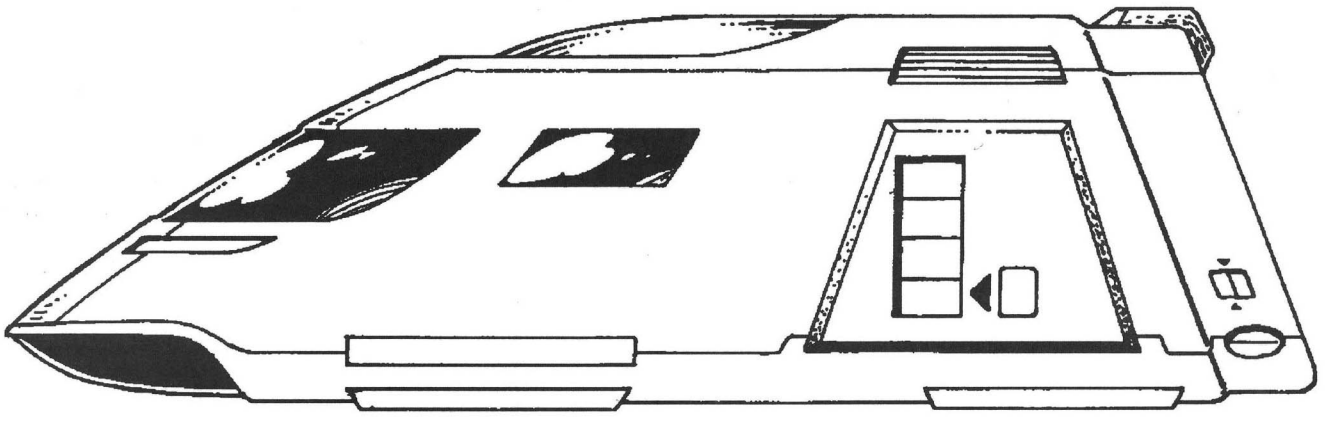
Grav/Utility Sled Ammunition Carriage

Ordnance	*Number Carried*	*Cost Each/Full Load*
Decoys (antilaser, antiactive, or antipassive)	18,000	Cr20,000/MCr360
VRF Gauss Gun cassettes (30,000 rnds each)	4235 (127 mill. rnds)	Cr320/MCr1.3552 (dart)
6.3cm 3Mj PFC cartridges (RPV-14)	60,000 rounds	Cr24/MCr1.44
11.6cm 18.5Mj PFC cartridges (RPW-15)	9730 rounds	Cr148/MCr1.44
18.5cm 74Mj PFC cartridges (RPX-14/15)	2432 rounds	Cr592/MCr1.44
22cm 125Mj PFC cartridges (RPY-14)	1440 rounds	Cr1000/MCr1.44
24.6cm 175Mj PFC cartridges (RPZ-15)	1028 rounds	Cr1400MCr1.44
30cm Artillery Rockets	72 rounds	varies by warhead (see pages 36-37)
60cm Remote Drone Missiles	25 rounds	varies by warhead (see pages 38-39)

The figures for PFC rounds are for individual rounds carried in bulk, while the vehicles listed in this book are usually reloaded with complete magazines. The volume and time required for this operation is listed with each vehicle. The number of these magazines which can be carried in the grav sled's 72 m^3 cargo area can be easily calculated. Used as battlefield refuelers, the grav sled carries 72,000 liters of transferrable fuel, enough for three Norris battle tank refuelings or four grav APC refuelings. Like the TL15 APC hull, the grav sled hull is the basis for a wide variety of purpose-built variants, although for reasons of space these are not detailed in this volume. Grav sleds are ubiquitous in the Regency armed forces, and war-weary or surplus examples can be found in nonmilitary hands, serving in mercenary units, in police, paramilitary, or internal security forces, as hostile-environment vehicles, or customized for use by explorers and adventurers.



Standard view of the TL14 Trepida II grav tank. Compare to the Meson Artillery Vehicle, previous page, to see family resemblance of these two designs.



Utiliy grav sled, unmarked. Note that in keeping with its primary cargo-carrying duties the grav sled is equipped with three doors, one on each side at the rear plus the traditional rear ramp.

Tech Level: 15

Price: MCr2.2407955

Size: 168 cubic meters=12 displacement tons (VS)

Mass: 54.3 tonnes empty, 74.14 loaded with general cargo, up to 200.14 loaded with ammunition

Power: TL15 4.8 MW fusion power plant supplying 1.2 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 43.31 tonnes of thrust (0.20642 MW excess power)

Maint: 12

Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system

Commo: TL15 30km radio, TL15 300km meson communicator

Sensors: 30km passive EMS sensor, 2×WSV goggles

ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)

Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 134.4 cubic meters), and one air lock

Cargo: Cargo area for 18 tonnes (72 m^3) plus 185 kg of crew equipment (0.743 m^3), with large cargo hatch

Crew: 2 (Driver, Commander)

Passengers: None, although cargo space can be allocated to 28 cramped (MCr0.0028) or 20 adequate (MCr0.002) seats. Large cargo hatch allows ingress/egress by 10 unarmored personnel or 5 armored (combat armor/battle dress) troops per combat turn with cramped seats or 20 unarmored personnel or 10 armored troops per combat turn with adequate seats.

Fire Control: None

Armament: None

Stabilization: None

Ammo: None

Speed: 1200 kph maximum, 900 kph cruising, 190 kph NOE

Travel Move: 3600/1140

Combat Move: 167 (high mode absolute speed)/26 (NOE safe speed) in 10-meter grid squares

Signature: +2 Diff Mods vs. HRT and Radar, +1 Diff Mods vs. Passive and Active EMS, None vs. other methods

Diff Mods vs. Fire: –1 Diff Mod stationary, +5 at maximum speed (high mode combat move), +5 at cruising speed (high mode travel move), +3 at safe NOE speed, +4 at 2× and 3×safe NOE speed

Maximum Acceleration: 0.361 G

Fuel Capacity: 17,324 liters reaction mass plus 40 liters for fusion reactor

Fuel Consumption/Endurance: 541.375 liters/hour (endurance of 32 hours), plus reactor fuel is sufficient for one month constant power

Combat Statistics

Config: No Turret
Susp: Grav

HF: 56
HS: 28
HR: 28
Deck: 28
Belly: 28

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

Decoys for the grav sled cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.

TL15 Imperial Recovery Sled and TL15 Convertible Air Raft

TL15 IMPERIAL RECOVERY SLED

Most AFVs taken out of action during combat can be returned to service if they are repaired, but heavy grav vehicles without power or gravitic negation are extremely hard to move. The answer is another grav vehicle designed to pick them up and move them, and this vehicle is called the recovery sled.

Unlike many recovery vehicles, the grav recovery sled does not require winches or cranes to manipulate or extricate damaged or derelict vehicles. Rather, the bottom of its rear bed can be opened, allowing the recovery sled to set down around the disabled vehicle from above, and attach itself to it. This allows the recovery sled's contra-grav envelope and maneuvering thrusters to act directly on the now attached disabled vehicle without the use of winches or cranes. This open frame bed measures 15.6 meters long by 7.5 meters wide, and is large enough to easily accommodate the largest Imperial battlefield vehicles, the heavy grav tank and meson artillery vehicle.

Some units fit the vehicle with remote turrets mounting heavy machineguns or VRF gauss guns, but as these are seldom

Tech Level: 15
Price: MCr4.4009975
Size: 420 cubic meters=30 displacement tons (VS)
Mass: 37.99 tonnes empty, 463.28 loaded
Power: TL15 8.4 MW fusion power plant supplying 3 MW to high-efficiency contra-grav lifters, with HEPlaR thruster generating 43.31 tonnes of thrust (0.2513 MW excess power)
Maint: 6
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×TL15 Model FIt flight computers, TL10+ IGS navigation system
Commo: TL15 30km radio, TL15 300km meson communicator
Sensors: 30km passive EMS sensor, 2×WSV goggles
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 30 of any combination of antilaser, antiactive sensor, or antiactive sensor decoys (see below)
Life Support: Heat, light, extended life support, artificial gravity/G-compensators (for 420 cubic meters), and one air lock
Cargo: Cargo bed for 424 tonnes (327 m^3, 23.36 displacement tons) plus 244 kg of crew equipment (0.977 m^3). Mass of recovered vehicle is limited by sled performance. Heavier loads can be carried, but at much lower speed.
Crew: 2 (Driver, Commander)
Passengers: None
Fire Control: None
Armament: None
Stabilization: None
Ammo: None
Speed: 400 kph maximum, 300 kph cruising, 100 kph NOE
Travel Move: 1200/600
Combat Move: 56 (high mode absolute speed)/14 (NOE safe speed) in 10-meter grid squares
Signature: +1 Diff Mod vs. HRT and Radar, None vs. other methods
Diff Mods vs. Fire: –1 Diff Mod stationary, +4 at maximum speed (high mode combat move), +3 at cruising speed (high mode travel move), +2 at safe NOE speed, +3 at 2× and 3×safe NOE speed
Maximum Acceleration: 0.144 G
Fuel Capacity: 8662 liters reaction mass plus 70 liters for fusion reactor
Fuel Consumption/Endurance: 541.375 liters/hour (endurance of 16 hours), plus reactor fuel is sufficient for one month constant power

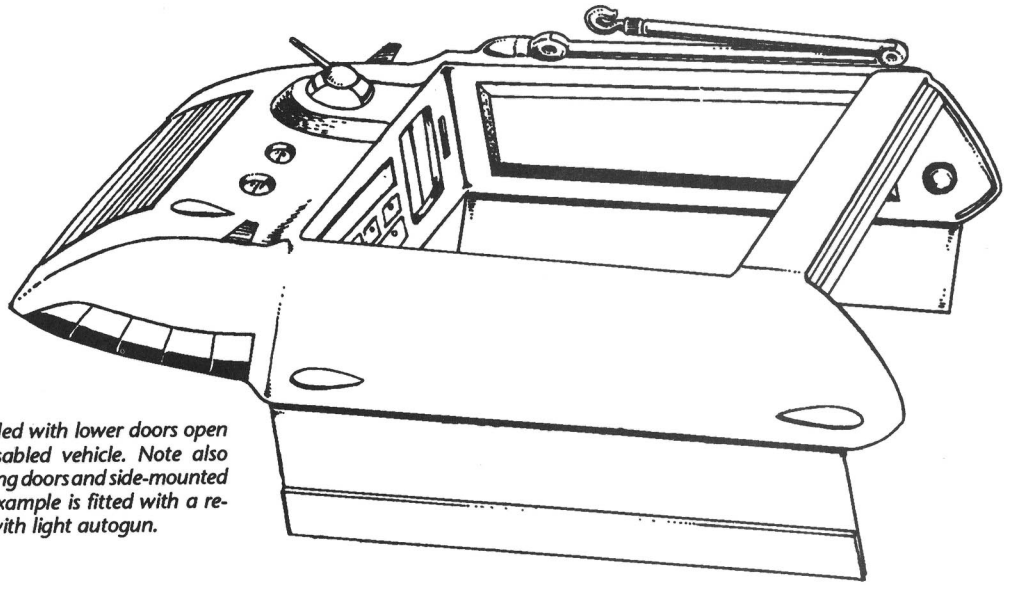
Combat Statistics

Config: Open
Susp: Grav
HF: 11
HS: 7
HR: 7
Deck: 7
Belly: 7

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL15 systems, or by two levels vs. TL14– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second.

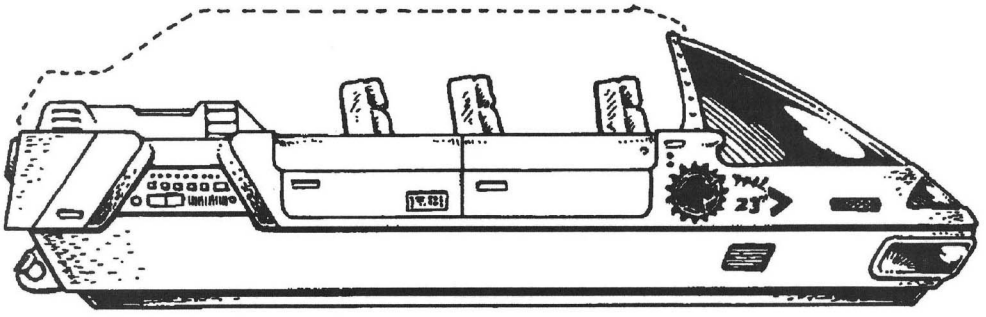
Decoys for the recovery sled cost Cr20,000 each regardless of type, or MCr2.4 for a full load of 120.



Recovery sled with lower doors open to accept disabled vehicle. Note also open rear rolling doors and side-mounted crane. This example is fitted with a remote turret with light autogun.

TL15 MILITARY CONVERTIBLE AIR RAFT

This is the military version of the standard civilian TL15 air raft with such militarized features as decoys, ECM, extra communications gear, and sensors. Compared to the civilian version the military version adds 5×WSV goggles, a second maser communicator, a third flight computer, electromagnetic masking (EMM), and decoy dispensers, giving it an electronics suite comparable to that of the TL15 armed air raft (see ICV page 34). This air raft can be used in an open-topped or enclosed configuration. With the top fitted it has a fully enclosed, pressurized environment with basic life support. The top alone masses 0.64 tonnes and is stored at 12.6 m³ (0.9 displacement tons). Although removing the top is quite simple and easily accomplished in the field, reattaching it is more complicated (in order to ensure airtight integrity) and requires two hours in a hangar or field maintenance facility. Like the grav sled, the air raft is used for a wide variety of combat support and combat service support missions, including liaison, headquarters vehicle, supply, maintenance, military police, etc. If used for ammunition supply, its five passenger seats are removed, increasing cargo volume to 18.45 m³. For figures on ammunition capacity, consult the table for the grav sled on page 42 but multiply the listed amounts by 0.25. Unlike the grav sled, the air raft is used for a large number of formal combat missions, including that of forward observer (FO) vehicles and section vehicles for grav belt-equipped light infantry. The most expensive portion of the militarized package is the EMM package, and this feature is often excluded from vehicles used for purely noncombat purposes. With this change the price becomes Cr541,090 and cargo capacity is increased to 6.79 m³ (with seats removed for ammunition carriage multiply the grav sled figures by 0.26).



Military convertible air raft shown in open-topped configuration. Dotted line shows silhouette when fitted with pressurized hardtop.

Tech Level: 15
Price: Cr751,090 (Cr750,019 without lid, Cr1071 for top alone)
Size: 42 cubic meters=3 displacement tons (Mc)
Mass with Top: 5.13 tonnes empty, 7.53 tonnes loaded
Mass without Top: 4.49 tonnes empty, 6.89 tonnes loaded
Power: 1.2 MW fusion power plant, with HEPlaR thruster generating 7.6 tonnes of thrust (0.1658 MW excess power)
Maint: 1
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 3×Model 15-FLT computers, TL10+ IGS positioning navigation
Commo: 300km radio, 2×30km maser
Sensors: 30km passive EMS
ECM: Electromagnetic masking package, 4 decoy dispensers each with space for 20 of any combination of antilaser, antiactive sensor, or antipassive sensor decoys (see below)
Life Support: Light, heat, basic life support (pressurized with top fitted)
Cargo: 1.4875 tonnes (5.95 m³)
Crew: 1
Passengers: 5 in cramped seats
Speed: 798 kph maximum, 599 kph cruising, 190 kph NOE (safe speed), 300 kph maximum in any mode when top is removed and passengers have no protective gear or breathing apparatus
Travel Move, Open [Enclosed]: 1200/945 [2396/1140]
Combat Move, Open [Enclosed]: 42/22 (note that only 2×safe speed may be achieved in NOE mode) [111/26]
Signature: +1 Diff Mod vs. all methods
Diff Mods vs. Fire: No Diff Mod stationary, +6 at maximum speed (enclosed high mode combat move, not attainable with open configuration), +5 at cruising speed (enclosed high mode travel move, not attainable with open configuration), +4 at safe NOE speed (enclosed and open; this is also Diff Mod for maximum open configuration speed), +5 at 2× and 3×safe NOE speed (2× and 3× safe speed not attainable in open configuration)
Maximum Acceleration: 0.253 G
Fuel Capacity: 4380 liters liquid hydrogen (LHyd)
Fuel Consumption: 95 liters/hour (endurance of 46 hours), plus power plant fuel is sufficient for one month.

Combat Statistics

Statistics show air raft in its enclosed/open-topped configurations

Config: Standard/open topped		**HF:** 8/[8]
Susp: Grav	**HS:** 4/[4]	
	HR: 4/[4]	
	Deck: 4/open	**Belly:** 4

CIVILIAN VERSION

The civilian version of the TL15 air raft is identical to the militarized version with the following exceptions: Simply replace the entries for the vehicle above with those below.

Price: Cr504,450 (Cr503,379 without lid, Cr1071 for top alone)
Mass with Top: 3.77 tonnes empty, 6.68 tonnes loaded
Mass without Top: 3.21 tonnes empty, 6.12 tonnes loaded
Power: 1.2 MW fusion power plant, with HEPlaR thruster generating 7.6 tonnes of thrust (0.2408 MW excess power)
Controls: Holographic linked, TL10+ flight avionics, TL15 terrain following avionics, 2× Model 15-FLT computers, TL10+ IGS positioning navigation
Commo: 300km radio, 30km maser
ECM: None
Cargo: 2 tonnes (8 m³)

COMMAND VARIANT

The command variant is assigned to units such as the point defense section which require a vehicle for the section commander, but do not need a full-fledged command/coordination vehicle. Unlike true command vehicles, the tactical command air raft is not equipped with full-sized computers. Rather, it is simply equipped with a maser uplink that allows it to tap into the command-control network which the Point Defense APCs already directly access on their own. It thus functions as a repeater, allowing the commander to see the same information as his PD vehicles. It is identical to the militarized convertible air raft above with the following exceptions:

Price: Cr787,090 (Cr750,019 without lid, Cr1071 for top alone)
Mass with Top: 5.15 tonnes empty, 7.55 tonnes loaded
Mass without Top: 4.51 tonnes empty, 6.91 tonnes loaded
Power: 1.2 MW fusion power plant, with HEPlaR thruster generating 7.6 tonnes of thrust (0.0108 MW excess power)
Commo: 300km radio, 2×30km maser, 1×TL15 30,000km maser

Decoys

Decoys are of three types: antilaser (which affect attempts to detect a target with ladar or to designate it with a laser designator), antiactive sensor (which affect attempts to detect a target or designate it with radar or active EMS), and antipassive sensor (which affect attempts to detect a target with HRT or passive sensors, including infrared goggles and sights). Each decoy only works against its specified sensor, and increases the difficulty of a detection or designation task by one level vs. TL14+ systems, or by two levels vs. TL13– sensors. Each decoy lasts one combat turn (five seconds), and affects all appropriate sensor attempts against the owning vehicle, regardless of direction. Decoy dispensers may launch one decoy per second. Decoys for the air raft cost Cr20,000 each regardless of type, or MCr1.6 for a full load of 80.

Regency Military Units and Deployments

REGENCY MARINE REGIMENTS

Regency Marine regiments (frequently still called *Imperial* Marine regiments, especially by their members) are of two types: line regiments and armored cavalry regiments. The Regency does not maintain Marine divisions, and even the Imperium maintained very few of these on a permanent basis.

Line regiments are the standard multipurpose marine organization, heavy on grav infantry. Marine armored cavalry ("MArCav") regiments are fast-moving, hard-hitting, armored assault forces.

Line regiments are assigned areas of responsibility on the basis of one regiment per numbered fleet. MArCav regiments are assigned as mobile fire brigades to broad astrographic regions—two regiments each in the Spinward Marches and Deneb Sectors, and another two in the combined Trojan Reach-Reft area. Each MArCav regiment is complete with its own assault shipping.

The Regency Marine Corps (RMC) maintains 34 line regiments on its rolls, six MArCav regiments, and a number of reserve units which are primarily training organizations. Note that these regiments do not represent all of the strength of the RMC by any stretch of the imagination. Permanently assigned ship's troops, security detachments at embassies and naval bases, etc., are all organized separately and are not part of the regimental structure above. These 40 line and cavalry regiments are combat-organized military units, and do not have ship's or security troops drawn from their numbers.

Of the 34 line regiments, eight trace their lineage to Imperial Marine regiments of the antebellum period, and these retain their high-numbered Imperial designations, for reasons of history. Thus, in a reversal of typical military precedence, it is not the low-numbered Regency Marine regiments that have a place of pride in the corps, but the high-numbered regiments. All the MArCav regiments were raised by the Regency after the Collapse so are simply numbered 1 through 6.

Line Regiment Organization: The Marine Task Force organization shown on **Striker II**, page 138, is only one possible configuration that could be formed by its parent regiment. Each regiment contains three task force headquarters groups identical to that shown in **Striker II**. In addition, each regiment contains a pool of 18 companies that can be divided up among the three headquarters in any proportion desired. These comprise nine line infantry companies, five meson gun artillery batteries, two lift cavalry companies, a grav tank company and a commando company. When the regiment is committed to combat as a unit, one or two artillery batteries, a lift cavalry company and the commando company are often retained and commanded directly by the regimental headquarters.

The task force shown in **Striker II** (three line marine companies and a meson battery) is a common multipurpose organization.

MArCav Regiment Organization: The Regency MArCav regiment is a modified version of the Imperial unit shown on page 142 of **Striker II**. However, the regimental fire support battery is deleted, and each armored cavalry squadron had been given its own organic artillery battery with one section each of MRL and RDM artillery vehicles (see pages 36-39 of this book and **Striker II** page 141 for an example of such a balanced battery).

Unlike the line regiments, which are part of a fleet, each MArCav is permanently assigned its own assault squadron (SaultRon) with sufficient shipping to move and land the entire regiment in one lift. These assault squadrons are not part of any fleet structure, but are independent units which can be attached to any command as required. They are named and numbered as Independent Assault Squadrons (IndSaultRon) 1 to 6.

MArCav assignments are: 1st and 2nd in Spinward Marches, 3rd and 4th in Deneb, and 5th and 6th in Trojan Reach and Reft.

MARINE LINE REGIMENT ASSIGNMENTS

(By Fleet assignment and Subsector location)

Spinward Marches
- 212th, Jewell (B): 2091st Line
- 213th, Regina (C): 1071st Line
- 214th, Aramis (D): 5722nd Line
- 193rd, Vilis (F): 3277th Line
- 18th, Lanth (G): 1st Line
- 23rd, "Axemen" Rhylanor (H): 1931st Line
- 151st, Sword Worlds (J): 8327th Line
- 43rd, Lunion (K): 3rd Line
- 73rd, Mora (L): 6th Line
- 208th, Five Sisters (M): 22nd Line
- 184th, Plankwell (N): 13th Line
- 100th, Glisten (O): 9th Line
- 207th, Trin's Shroud (P): 21st Line
- Swing Fleet: 88th: 8th Line

Deneb
- 194th, Pretoria (A): 14th Line
- 315th, Lamas (B): 6127th Line
- 61st, RQD 3: 5th Line
- 195th, Sabine (E): 15th Line
- 257th, Inar (F): 23rd Line
- 125th, Namidshur (G): 8041st Line
- 183rd, RQD 4: 12th Line
- 196th, Star Lane (I): 16th Line
- 258th, Vincennes (J): 24th Line
- 154th, Usani (K): 11th Line
- 74th, RQD 5 (and Macon, Reft B): 7th Line
- 303rd, Gulf (M): 26th Line
- 260th, Zeng (N): 25th Line
- Swing Fleet: 55th: 4th Line

Trojan Reach
- 201st, Pax Rulin (C): 17th Line
- 203rd, Sindal (G): 19th Line
- 202nd, Gazulin (D): 18th Line
- 204th, Tobia (H): 20th Line

Reft
- 19th, Vestus (A): 2nd Line
- 128th, RQD 5A: 10th Line
- 74th, Macon (B) (and RQD 5): 7th Line

REGENCY ARMY UNITS

As with the Regency Marines above, the Regency Army maintains its ties to its Imperial Army antecedents by perpetuating units that date back to the antebellum period. These units keep their unusually high numbers from the huge Imperial rolls, while the low-numbered units are those raised by the Regency since the Collapse.

Note the lack of any armored or tank divisions. Regency Army doctrine dictates a combined arms organization above the brigade level. Cavalry and infantry divisions contain armored components at a level corresponding to their designations (i.e., orbital cavalry is more lavishly supplied with tanks than is lift cavalry; armored infantry has more tanks than lift or assault infantry units).

Terminology: A wide variety of cross-cutting unit descriptions have been used in the Regency and Imperial armed forces. Many are misleading or incomplete, and many are used in confusing and contradictory ways. For example, lift infantry is gravitic in nature, but can be either heavy or light, and a mechanized infantry unit is clearly heavy, but could be either ground or gravitic in nature. The decision to limit Regency Army units to TL14/15 has allowed it to simplify this confusing terminology, as all its units are automatically lift or grav units, and all its infantry units are automatically equipped with combat armor or battle dress.

However, this clarity is limited, because although the army designates all its units raised since the Collapse in accordance with this system, it allows its former Imperial units to retain their historical names, which often defy orderly categorization. Furthermore, this clarity is limited only to the Regency Army. The Regency's world, subsector and sector forces perpetuate a bewildering welter of contradictory and misleading terms.

Armored: This term is no longer used as a primary designator by Regency forces, having been replaced by "tank." Armored is still used by the RA as a modifier, as "armored infantry."

Armored Cavalry: A heavy cavalry unit, with no distinction between

Regency Military Units and Deployments

ground or gravitic equipment. This term is still used by the Regency Marine Corps where its gravitic nature is understood, but it has been replaced in the army by the term "orbital cavalry."

Armored Infantry: Current Regency Army term for infantry mounted in well-armored grav APCs, and not jump-trained. This term is also used by other services to distinguish infantry wearing combat armor or battle dress from units not so-equipped, as well as to distinguish troops (either with or without personal armor) mounted in armored, as opposed to thin-skinned, transport.

Assault Infantry: Jump troops. Assault infantry can be equipped to lift infantry or armored infantry standards, but it is their capacity for meteoric assaults that gives them their name.

Drop Troops: Jump troops. This term is not a Regency Army term.

Grav Infantry: No longer used by the Regency Army, having been replaced by "lift infantry" and "armored infantry." Where still in use, the term can refer to grav belt-equipped infantry or infantry in grav APCs. In some usage, however, grav infantry refers to heavy infantry (equivalent to "armored infantry") as opposed to light infantry (i.e., "lift infantry.")

Grav Tank: Unit equipped with gravitic tanks. This term is redundant in the all-grav Regency Army, so the term has been replaced by simply "tank."

Jump Troops: Infantry trained for individual meteoric assault from orbit to the planetary surface. Now officially known in the Regency Army as "assault infantry."

Lift Cavalry: A cavalry unit mounted in gravitic vehicles. However, the term makes no distinction between light and heavy cavalry. In current Regency Army usage, the term refers specifically to light cavalry. Such units are small, such as battalion scout platoons or the divisional cavalry squadron in a lift infantry divisions. The term is no longer used in the Regency Army for large units, having been replaced by "orbital cavalry."

Lift Infantry: In general usage, an infantry unit equipped with gravitic vehicles. In current Regency Army usage, this specifically means light grav infantry without heavy APCs.

Mechanized Infantry: Infantry mounted in armored vehicles. It is no longer used for grav units, but is reserved for units equipped with ground vehicles. Hence the term has disappeared from use in the purely TL14/15 Regency Army.

Orbital Cavalry (OrCav): The new term used by the Regency Army for "armored cavalry." Note that the organization of these units is virtually identical to the Regency Marine armored cavalry (MArCav) units above, although they use army instead of marine equipment. The term emphasizes the unit's high mobility and ability to operate from the "high ground" of close orbit to rapidly descend to any point on the world's surface.

Tank: In the Regency Army, a unit equipped with gravitic tanks.

Organization: Regency assault and lift infantry units are organized along the lines of the Imperial Guard jump infantry regiment shown on page 139 of **Striker II**. Regency tank units are organized along the lines of the Household Cavalry Regiment (page 140, **Striker II**), except tank platoons contain only four tanks instead of five. Armored infantry organizations are organized like tank regiments but with the proportion of tank and infantry battalions reversed. As discussed above, OrCav regiments are set up like the MArCav regiment in **Striker II**, but with the modifications as discussed in the marine section above.

THE DUKE OF REGINA'S OWN HUSCARLES (4518TH LIFT INFANTRY)

Although the Regina ducal seat no longer exists, the Huscarles retain their historical name and are under the nominal control of Regent Caranda, a direct descendant of the last Duke of Regina. In the antebellum period, the Huscarles, officially the 4518th Lift Infantry Regiment on the Imperial rolls, consisted of six battalions, three of lift infantry, two of lift cavalry and one of jump troops (see **Striker II**, page 141).

Since then, an additional two battalions have been raised, the 7th and 8th-4518th, and the lift infantry and jump troop organizations have been merged. Now the Huscarles' infantry battalions are all identical: All are fully jump trained, but all are also supplied with grav APCs so they can perform in either the assault role or armored infantry role when called upon. In addition, the lift cavalry squadrons have been reorganized as "orbital cavalry" following the new MArCav organization discussed above.

The 4518th is no longer thought of as a single deployable unit, but rather a parent formation of battalions and support units which are deployed separately. To this end, the regimental support units have been beefed up. The regimental artillery battery has been expanded to a battalion containing two mixed MRL-RDM batteries and two meson batteries. The Huscarles' new organization is therefore five lift infantry battalions (1st, 2nd, 4th, 6th and 7th), three OrCav (3rd, 5th and 8th), and one artillery battalion ("Regina Thunder," unnumbered).

Although the unit had not been part of the Imperial Army, with the dissolution of direct noble rule, the Huscarles were taken over by the Regency Army, but have retained their mission of defending Spinward Marches sector. Three of its battalions are currently deployed in the Sword Worlds subsector as occupation/peacekeeping forces: the 1st on Joyeuse, the 3rd on Gram, and the 6th on Sacnoth (see **Regency Sourcebook**, page 45).

It is equipped with TL15 Imperial Army equipment and uses the Norris battle tank, appropriately enough.

FORMER IMPERIAL UNITS

The Regency Army includes a large number of Imperial Army units that simply turned into Regency Army units in 1132 (see **Regency Sourcebook**). Many of these units have illustrious histories in the Frontier Wars or the Civil War era.

The following is a selection of several former Imperial units with the current designations, tech level of equipment, notes on specific equipment (where applicable), current location and duties.

317th Aero-Mech Brigade (OrCav): TL15, Norris Battle Tanks, Efate (Spinward Marches 1705), reaction force.

2012th Lift Cavalry Division (OrCav): TL15, Heavy Tanks, Esalin (Spinward Marches 1004), ceremonial/garrison.

2013th Lift Cavalry Division (OrCav): TL15, Heavy Tanks, Duale (Spinward Marches 2728), police action.

3012th Armored Cavalry Division (OrCav): TL15, Heavy Tanks, Durendal (Spinward Marches 1523), counter-insurgency.

3013th Armored Cavalry Division (OrCav): TL15, Norris Battle Tanks, Lanth (Spinward Marches 1719), school unit, Regency Army Combat Arms University.

850th Lift Division (Infantry): TL15, Frenzie (Spinward Marches 1116), civil affairs/refugee relief.

3014th Lift Infantry Division: TL15, Heavy Tanks, Deneb (Deneb 1925), garrison.

3512th Armored Infantry Division: TL15, Heavy Tanks, Fist (Trojan Reach 2918), reaction force.

3513th Armored Infantry Division: TL14, Trepida I, Islands (Reft/J, /K), peacekeeping.

85th Lift Infantry Brigade (Armored): TL15, Norris Battle Tanks, 88th Fleet (Spinward Marches/G), mobile force.

86th Lift Infantry Brigade (Armored): TL15, Heavy Tanks, Sacnoth (Spinward Marches 1325), security and peacekeeping.

87th Lift Infantry Brigade (Armored): TL15, Heavy Tanks, Violante (Spinward Marches 2708) security and peacekeeping.

88th Lift Infantry Brigade (Armored): TL15, Heavy Tanks, Tobia (Trojan Reach 3215), garrison.

1197th Light Infantry Brigade (Lift): TL15, Islands (Reft/J, /K), peacekeeping.

45th Assault Infantry Regiment (Lift): TL14, Trepida I, Asilah (Trojan Reach 2916), security and peacekeeping.

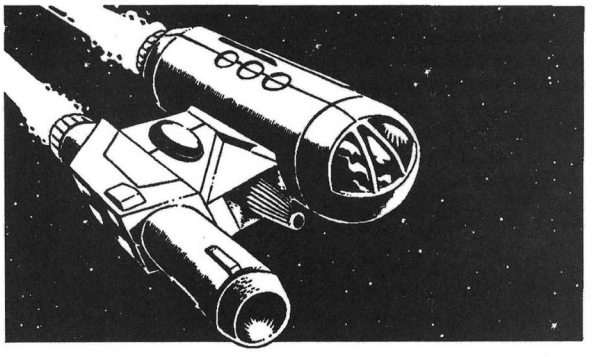
3122nd Assault Infantry Regiment (Armored): TL15, Norris Battle Tanks, 193rd Fleet (Spinward Marches/F), mobile force.

3123rd Assault Infantry Regiment (Armored): TL15, Heavy Tanks, Lamas (Deneb 1309), reaction force.

444th Armored Regiment (Tank): TL14, Trepida IIB grav tanks, 61st Fleet (RQD 3), mobile force.

616th Grav Tank Regiment: TL15, Heavy Tanks, Mora (Spinward Marches 3124), garrison.

The Regency Starship Guide



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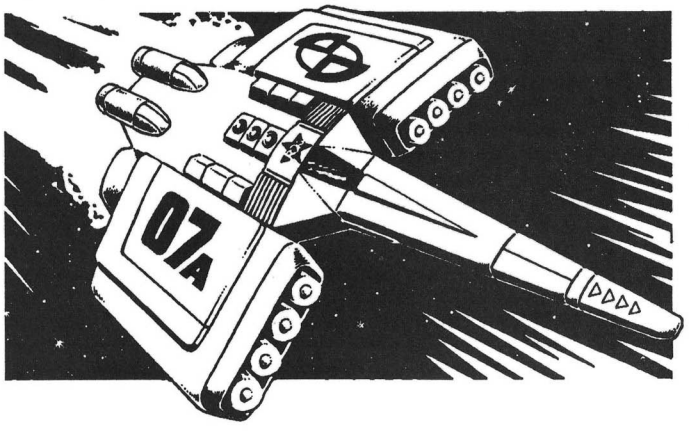

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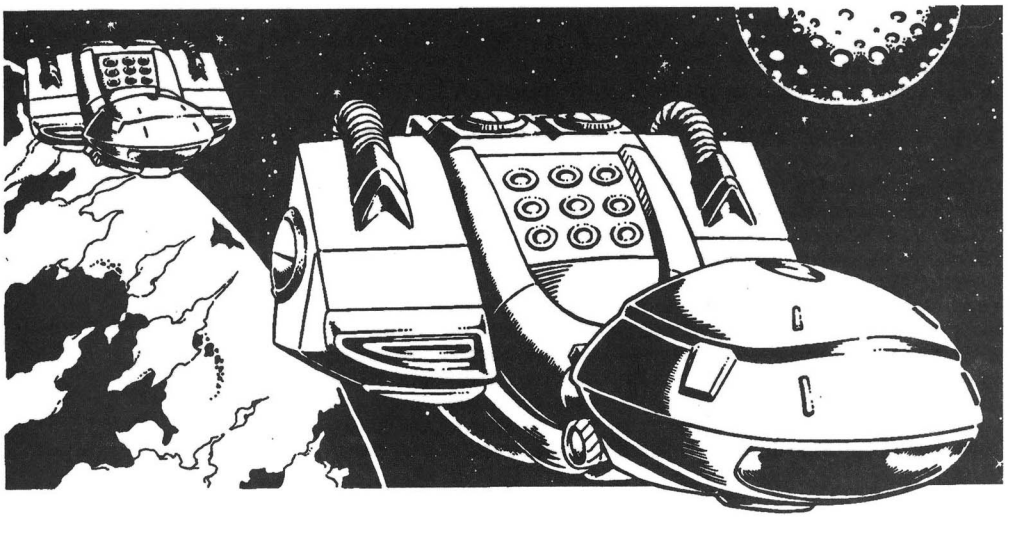

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The Regency

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