GURPS®

This is Free Trader Beowulf,
calling anyone . . .
Mayday, Mayday . . . we are under attack . . .
main drive is gone . . .
turret number one not responding . . .
Mayday . . . losing cabin pressure fast . . .
calling anyone . . . please help . . .
This is Free Trader Beowulf . . .
Mayday . . .

Traveller®

Science Fiction Adventure in the Far Future

Second Edition

By Loren K. Wiseman

STEVE JACKSON GAMES

GURPS®

Traveller®

Science Fiction Adventure in the Far Future

SECOND EDITION

By LOREN WISEMAN

Based on the award-winning Traveller science-fiction universe by MARC MILLER

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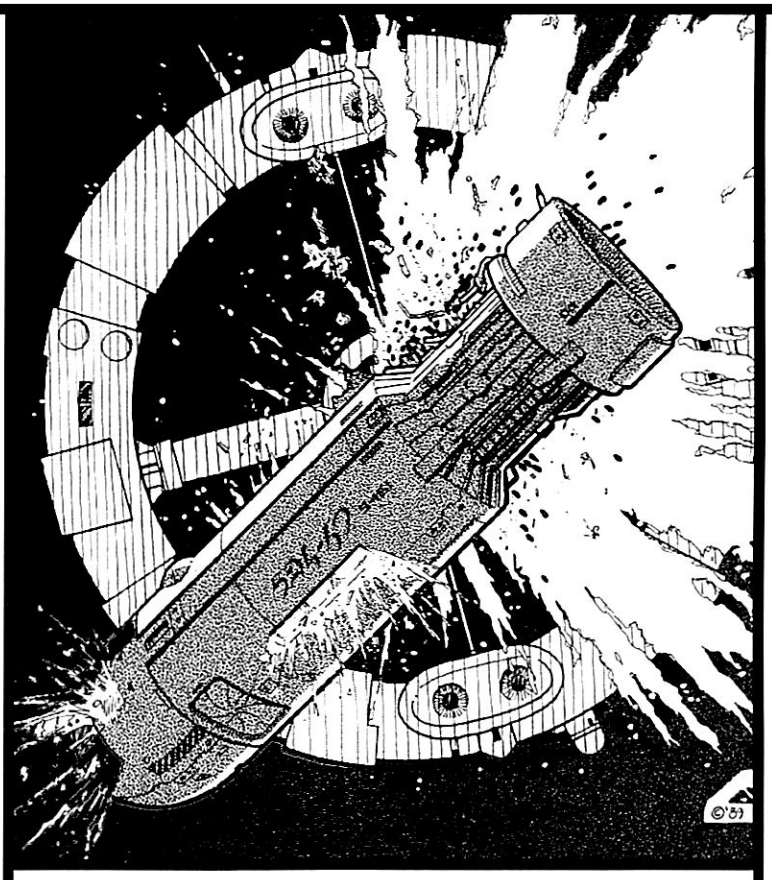

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STEVE JACKSON GAMES

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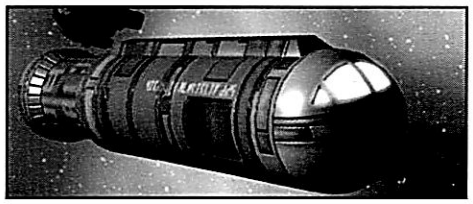

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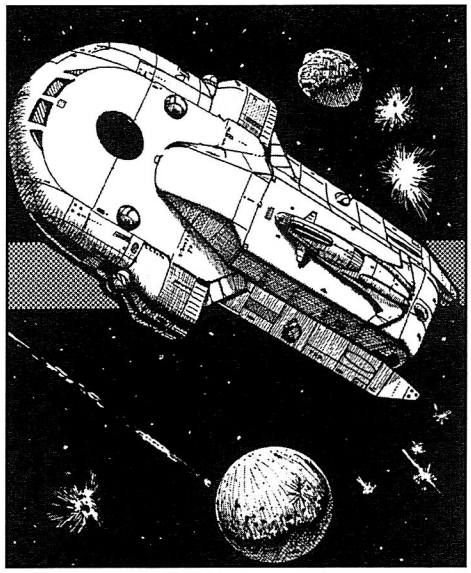

About GURPS

Steve Jackson Games is committed to full support of the *GURPS* system. Our address is SJ Games, Box 18957, Austin, TX 78760. Please include a self-addressed, stamped envelope (SASE) any time you write us! Resources now available include:

Pyramid (**www.sjgames.com/pyramid**). Our online magazine includes new rules and articles for *GURPS*. It also covers all the hobby's top games – ***AD&D, Traveller, World of Darkness, Call of Cthulhu, Shadowrun*** and many more – and other SJ Games releases like ***In Nomine, INWO, Car Wars, Toon, Ogre Miniatures*** and more. And *Pyramid* subscribers also have access to playtest files online, to see (and comment on) new books before they're released.

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Errata. Everyone makes mistakes, including us – but we do our best to fix our errors. Up-to-date errata sheets for all *GURPS* releases, including this book, are always available from SJ Games; be sure to include an SASE with your request. Or download them from the Web – see below.

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Internet. Visit us on the World Wide Web at **www.sjgames.com** for an online catalog, errata and updates, and hundreds of pages of information. The home page for ***GURPS Traveller*** is located at **www.sjgames.com/gurps/traveller**. We also have conferences on Compuserve and America Online. *GURPS* has its own Usenet group, too: rec.games.frp.gurps.

Much of the online discussion of *GURPS* happens on GURPSnet. To join, send mail to majordomo@io.com with "subscribe GURPSnet-L" in the body, or point your World Wide Web browser to: **www.io.com/GURPSnet/www**.

Page References

See ***GURPS Compendium I***, p. 181 for a list of abbreviations for *GURPS* titles. Any page reference that begins with a B refers to ***GURPS Basic Set, Third Edition, Revised;*** e.g., p. B144 refers to page 144 of ***Basic Set***. CI refers to ***Compendium I***, CII to ***Compendium II***, S to ***Space, Second Edition***, T:AI to ***Traveller: Alien Races 1***, T:FT to ***Traveller: Far Trader***, UT to ***Ultra-Tech***, UTT to ***Ultra-Tech 2***, and VE to ***Vehicles***.

Introduction

Traveller was first published by Game Designers' Workshop in 1977, and was one of the first science-fiction roleplaying games (indeed, one of the first roleplaying games of any sort). With one of the most extensive backgrounds of *any* RPG, ***Traveller*** quickly attracted many loyal fans (some of whom were inspired to add to the background themselves) and rapidly grew to became the standard against which other SF roleplaying games were measured. The broad scope of the game's milieu has given thousands a canvas upon which to paint, in broad strokes or fine, a universe all their own, but still one they could share with others. It is, after all, a big universe.

Traveller went through several editions over the years, and quite a few changes were incorporated along the way. One of those was the Rebellion. In the 1116th year of the Third Imperium, Emperor Strephon was assassinated by a power-seeking rival, and the Imperium split into several warring factions, shaking the very foundations of the game . . . and bringing conflict and excitement to languishing campaigns.

As fascinating as the Rebellion was, there existed a desire in the minds of many for the whole thing to have never happened! (GDW once parodied this sentiment in an April Fool's Day issue of *Challenge* magazine, wherein we described Strephon's assassin awakening to discover Strephon in the shower.) Over the years, GDW was approached by several outside authors, all with the idea for a sourcebook where Strephon lived and the Rebellion never happened – in essence, an alternate timeline for ***Traveller***. GDW never followed up on these proposals for various reasons. This same idea, however, is what Steve Jackson Games has undertaken: an alternate timeline, a parallel universe, if you will, where Strephon, the 43rd Emperor of the Third Imperium, lives. This is not to say that all is well with the universe. A story without conflict is not a very good story. So, expect things to happen in this universe . . . changes *will* occur.

There is another reason for ***GURPS Traveller***. Many of the original books that detail the history and background of the Third Imperium are long out of print. In this work, new players and referees can have access to the same information as 20-year collectors. Enjoy.

A number of individuals have contributed suggestions and ideas for this book. A few have gone above and beyond the call of duty. Thanks (in great profusion, and in no particular order) to Sean Punch (aka Dr. Kromm), David Pulver, Brett Slocum, and David Summers, as well as the ***GURPS*** Brain Trust, the ***GURPS Traveller*** Impromptu Cabal (you know who you are), and the ***Traveller*** Mailing List.

Lastly, the author would like to pay tribute to those giants whose shoulders have served him so very well. ***Traveller*** is, was, and always will be a collective creation, and I don't have space to even mention, let alone properly honor, all of the people whose talents and imaginations have contributed to the game. Thanks.

– Loren Wiseman

About the Author

Loren Wiseman was one of the founding partners of GDW, Inc., original publisher of ***Traveller,*** and spent over 20 years there as a game designer, developer, typesetter, and editor. After GDW closed, Loren freelanced for a time, and then came to SJ Games, where he is the art director and ***Traveller*** line editor and expert-in-residence.

The Traveller News Service

For many years a feature of the *Journal of the Travellers' Aid Society*, ***TNS*** chronicled the ongoing life and times of the Imperium. Loren Wiseman is once again writing ***TNS*** as the alternate history of the Third Imperium develops. It is updated regularly; read it online at **www.sjgames. com/gurps/traveller/news.html**. "Back issues" of *TNS* are also online.

The SJ Games ***Traveller*** page has links to the ***Traveller*** Web Ring, and thus links to most of the major ***Traveller***-oriented web sites that exist. For information on subscribing to the ***Traveller*** Mailing List, contact rwm@mpgn.com.

Chapter One
The Universe of the Third Imperium

The universe of the Third Imperium is similar to our own in two respects: the laws of physics, and the players' own society. These aspects will serve as familiar reference points from which to explore the universe of ***Traveller.***

The ***Traveller*** universe is an extension of our own, projected into the far future. As such, the laws of physics still apply – with a few exceptions necessary to the game. Jump drives, maneuver drives, and contragrav technology all violate one or more physical laws (at least as we currently understand them), yet they are major facets of ***Traveller,*** and will require some suspension of disbelief. Along the way a few aspects of other sciences will be ignored as well, all in the interest of a good, fun game. In general, however, players can count on physics to work for them in the ***Traveller*** universe as it does in their own.

From a societal standpoint, the basic culture more or less resembles that of present-day Terra (with a few more technological gadgets). This is intentional: Players are from this culture, and it makes it easier for them to relate to the characters they play. Another reason is to heighten the contrast between Imperial society and the more unusual societies the characters will encounter in their travels. As its name implies, ***Traveller*** is about traveling. Many exciting things can be done on a single world, in a single city, but eventually most characters move to other worlds and encounter alien cultures. To paraphrase Han Solo, they're going to see a lot of strange stuff . . .

Only a Dream

"I dreamt of horrors last night. The emperor murdered, the Imperium shattered into a half-dozen feuding shards – and over it all, some hideous, bestial face, all wires and pulleys and gears, swallowing the stars themselves, one by one, until the sky was completely, totally black. I am not usually given to nightmares, and normally I forget what I dream within minutes of awakening, but for some reason, this particular dream stayed with me hours later, and I vividly recall every detail."

– personal journal of
Prince Varian Paulo Alkhalikoi,
Entry for 133-1116

The Imperium

The Third Imperium (usually called "The Imperium" for short) is a far-flung interstellar community encompassing more than 11,000 worlds within a region approximately 700 parsecs across. It has ruled its territory for 11 centuries and looks to continue for many more. The present emperor, Strephon, is the 43rd person to hold the title and will soon celebrate the golden jubilee of his coronation.

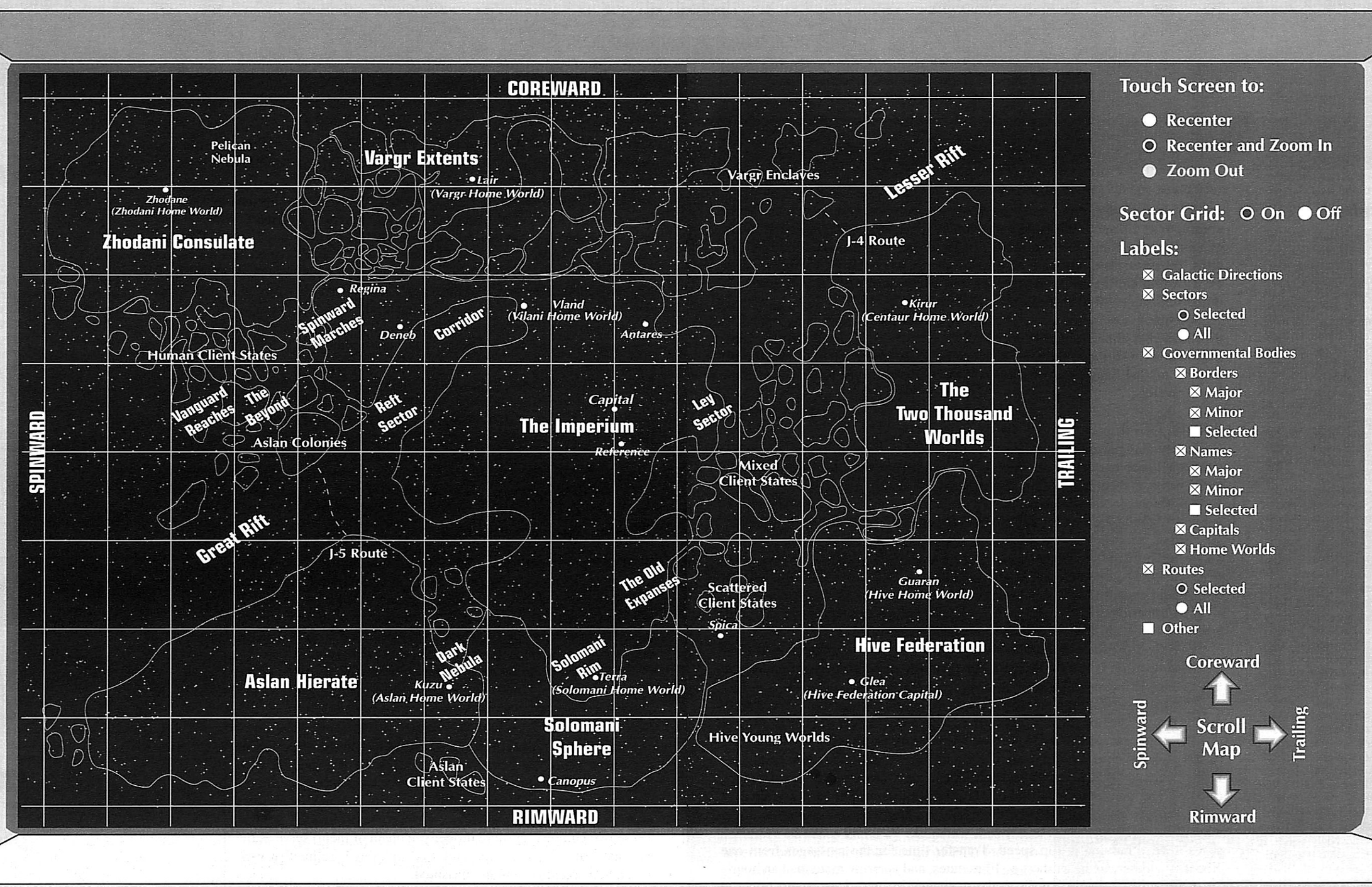
Three factors are worth mentioning in any brief survey of the Imperium: culture, travel time, and feudalism.



Culture

The dominant cultural tradition found within the Imperium is that of the Vilani, the branch of Humaniti that established the First Imperium. Second most widespread, and considerably intermixed with Vilani culture, is that of the Solomani: humans from Terra who overwhelmed the First Imperium and established the Second. These two cultures (or more properly, a blend of them) serve as the baseline culture of ***Traveller,*** and it is from this baseline that variant and divergent groups are measured.

Note: This chapter provides the players with a general history of the universe in which their characters find themselves. Consider it a briefing document on what the average character knows about the ***Traveller*** universe, and as such it should be freely available to the players.



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- ● Recenter
- ○ Recenter and Zoom In
- ● Zoom Out

Sector Grid: ○ On ● Off

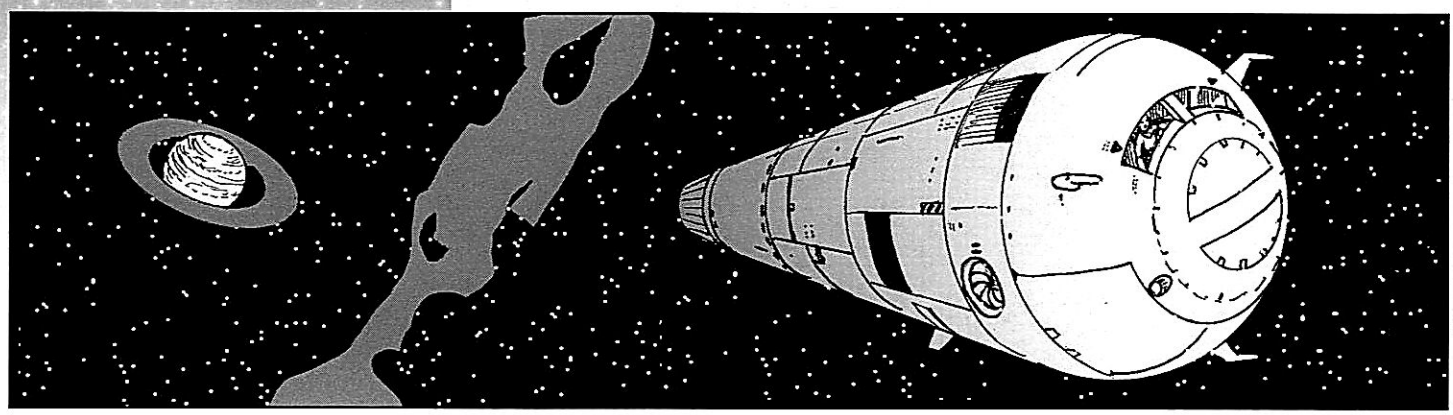
Labels:

- ☒ Galactic Directions
- ☒ Sectors
  - ○ Selected
  - ● All
- ☒ Governmental Bodies
  - ☒ Borders
    - ☒ Major
    - ☒ Minor
    - ■ Selected
  - ☒ Names
    - ☒ Major
    - ☒ Minor
    - ■ Selected
  - ☒ Capitals
  - ☒ Home Worlds
- ☒ Routes
  - ○ Selected
  - ● All
- ■ Other

Coreward

Spinward — Scroll Map — Trailing

Rimward



In a Nutshell . . .

In the not too distant future, Humans invent a means of faster-than-light travel. They have previously been exploring and exploiting the solar system in small, in-system spacecraft, and have established economic and scientific colonies and other outposts here and there. After a few years of exploration, an expedition to Barnard's Star encounters other Human beings, and a mystery that will not be solved for many centuries: How did they get there? Did Humanity originate on Earth, or was it planted there eons ago by a force or forces unknown?

The Terrans had encountered the outskirts of a vast interstellar empire populated mostly by Humans who called themselves Vilani (with quite a few non-Human intelligences represented as well). The Vilani were in a state of slow decline after ruling space for centuries. Almost instantly, conflict broke out, and against all odds, the Terrans conquered the Vilani Empire (later called the First Imperium) and managed to postpone its collapse for a few centuries. Humans from Earth become known as Solomani, and found themselves masters of a gigantic empire incorporating thousands of worlds. Scattered among these worlds were groups of non-Human intelligences, but there were a bewildering number of worlds populated by Humans. Some were identical to Terrans, some vastly different, but all were clearly connected by a common ancestry, and were clearly in a superior position vis-a-vis the non-Humans.

After a few centuries of Solomani rule (which the Terrans called the Rule of Man, the Vilani called the Ramshackle Empire, and historians call the Second Empire), the light of interstellar civilization was extinguished, and the 1,000-year period known as the Long Night begins. It was a time of political and economic chaos, during which many worlds completely lost their technological base, and all worlds lost the capability of interstellar flight.

Continued on next page . . .

The Imperium is *diverse.* A vast number of cultures, both human and alien, constitute its citizenry. With rare exceptions, each world in the Imperium chooses its own government, its own laws (within certain limits), and its own customs, behaviors, and fashions. As a result, nearly any society imaginable either exists within the Imperium or once did, and interstellar travelers will encounter things undreamed of by their planet-bound brethren.

The most widespread group with which the characters will likely interact is the interstellar community of starship crews. Equally widespread are the people who interact with *them*: officials, technicians, cargo brokers, clerks, bartenders, and the myriad hangers-on at starports who perpetually try to gain something from travelers.

Travel Time

Interstellar government over an area as large as that of the Imperium is a significant problem, which, at first, seems insurmountable. Vast distances, long travel times, and communication lags all conspire against a functioning, efficient system which can meet the population's needs. According to history this is nothing new: Around the first century Rome ruled all of Europe, and in the 16th century Spain ruled much of the New World, with travel times of up to a year between the seat of government and the new territories. In fact, through most of history, timely governmental communication, with both a rapid dispatch of instructions and an equally rapid response, has been more a dream than a reality.

The Imperium has come upon two solutions, which together lessen the problem of distance: the Xboat network and feudalism.

The Xboat Network: Like a living body, with its network of veins and arteries, the Imperium is crisscrossed by Xboat routes, or links, devoted entirely to the carriage of messages for official, commercial, and private purposes.

The express boat (commonly known as "Xboat") is a small, fast ship comprising a pilot's compartment, data banks, and jump drives. The fit is so tight that the tiny ships don't even have maneuver drives. Each is capable of jump-4 (four parsecs in a week); it jumps, relaying its messages to the station on arrival. It then waits to be picked up by a specialized vessel known as an Xboat tender, refueled, and sent on its way to the next station en route. The local station on a world accepts messages, encodes them, and transmits them to a station at the edge of the stellar system. The network works like the Pony Express, with messages always moving at top speed. Transfer time for the messages from one Xboat to another can be as short as 10 minutes, and is rarely more than an hour.

Ultimately, the little Xboats make their way to one of the many Imperial Way Stations scattered throughout the Imperium's subsectors. There they are refitted, overhauled, and refurbished, only to be sent on their way again.

The Xboat network puts the edge of the Imperium about 44 weeks out from Core/Capital; that represents a savings of better than 75% of normal travel time. And still the Imperium is straining under the effects of distance.

Feudalism

The vast distances separating stellar systems make individual responsibility and authority very important. The Imperium is divided into 20 sectors, each about 32-by-40 parsecs. Each sector is divided into 16 subsectors (8-by-10 parsecs). A subsector contains perhaps 30 or more systems, each with at least one star, worlds, and satellites.

Worlds and star systems are free to govern themselves pretty much as they desire, provided ultimate sovereignty over external affairs is accorded the Imperium. Interstellar government begins at the subsector level, on one world designated the subsector capital. The subsector capital is ruled by a high-ranking noble selected by higher levels of government. This figure, normally called a duke (technically a sector duke, but even in official documents the shorter title has come into vogue) has a free hand in government, and is subject only to broad guidelines from his superiors. At the same time, the duke owes fealty to the higher levels of government, ultimately to the emperor himself. The feudal approach depends greatly on a sense of honor, one cultivated by the hereditary aristocracy. This sense of honor is very strong within the Imperium; it has proven essential to the survival of such a far-flung community. The system has worked for a very long time.

We Are Not Alone

The known interstellar community encompasses thousands of worlds, many of them inhabited, and not all by Humaniti. The number of intelligent life-forms that has been contacted is quite high: within the Imperium itself, more than 100. When regions beyond the Imperial boundaries are included, the total number rises to well over 400.

Major and Minor Races: A superficial classification system for the various intelligent races has been created, based on empirical evidence and to some extent on tradition. In general, the dominant races of known space are those which have achieved faster-than-light travel by themselves, rather than receiving it through contact with starfaring civilizations. These dominant races are called major races; all others are called minor races. Thus, the term major race has become attached to a single technical development regardless of other merit. A somewhat sound reason backs this concept: Races that developed FTL rapidly expanded into space, spreading their influence across the stars. Slower races were contacted before they had a chance to discover the FTL secret and emerged into a universe already controlled by the major races. Indeed, the shock of being found by a superior race (often superior only in their knowledge of FTL technology) may demoralize that race as a whole, causing them to reluctantly accept a secondary role in interstellar society. The classification scheme is, of course, simplistic, but the major races tend to perpetuate it since it works to their advantage.



In a Nutshell . . .

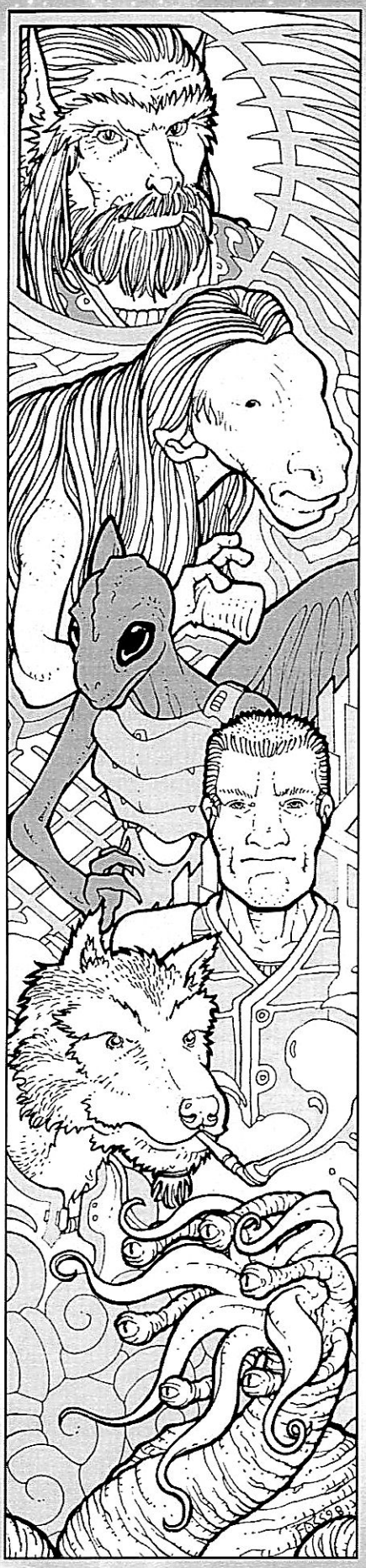
[Continued]

Recovery was slow, but some worlds finally clawed their way back up the ladder of civilization. Gradually, as interstellar travel was rediscovered, star systems coalesced into larger interstellar states, and these began to grow. Finally, over 1,100 years ago, on a world named Sylea, a Human named Cleon Zhunastu converted the multi-world Sylean Federation into the Third Imperium.

It is now the 1120th year of that Third Imperium, and Cleon's 42nd successor now rules an empire larger and more advanced than either that preceded it. The Third Imperium is not alone. Other interstellar governments stand on its boundaries as neighbors, allies, enemies, partners, and competitors.

Some think that the Third Imperium has also grown too large, and is headed for collapse, but others believe it will adapt itself to changing conditions and continue ever stronger.

And the answer to the riddle as to where did Humaniti originate? In 1120, it is known that all Humans in the universe descend from groups removed from Terra more than 100 millennia in the past, and carried to dozens of worlds by an unknown agency. Who was this agency? Who scattered Humaniti throughout the galaxy, and why? For every answer, it seems, there is another question.



The Six Races

Similar to the major/minor race division is the concept of the Six Races. The origin of the term is uncertain, but it appears independently in Aslan, Vargr, and Centaur sources. There is some disagreement as to the proper identification of the Six, but most commentators agree that all must be major races. The most common definition was once Aslan, Centaurs, Hive, Vargr, Zhodani, and Imperials (both Solomani and Vilani). The confirmation (in 790, Imperial date) of multiple worlds inhabited by the Droyne, and of archeological evidence that they possessed FTL travel before the entry of any of the modern dominant races into space, gave new weight to the Six Races concept. With the inclusion of the Droyne, Humaniti could be neatly categorized as one race, with six truly distinct races now included: Aslan, Centaurs, Droyne, Hive, Humans, and Vargr.

Aslan are roughly Human-sized and are descended from four-limbed, upright, bipedal carnivore/pouncer stock. The earliest Terran explorers saw in them a vague resemblance to the Terran lion, and they have been described (by Terrans, at least, and by some others) as lion-like ever since, although there is very little true similarity. They are native to their own biosphere, and no more related to a lion than they are to an eggplant. See full profile in ***GURPS Traveller Alien Races 2***.

Centaurs (they call themselves the K'kree) are among the most massive of the major races, and are the only examples of the major races descended from herbivores. K'kree are conservative, gregarious with their own kind (to the point of distress if isolated), and claustrophobic. These characteristics derive from their evolutionary origins as herd animals. See ***GURPS Traveller Alien Races 2***.

Droyne are a small race, both in stature and in dominion, with only limited settlements on a small number of worlds. The history of their evolution is a puzzle, as their home world is not known with certainty. The Droyne have no empires, and actually rule only a few worlds. In some few cases, they possess the technology to produce sophisticated machinery, including jump drives and starships, but they seem content to stay on their own worlds.

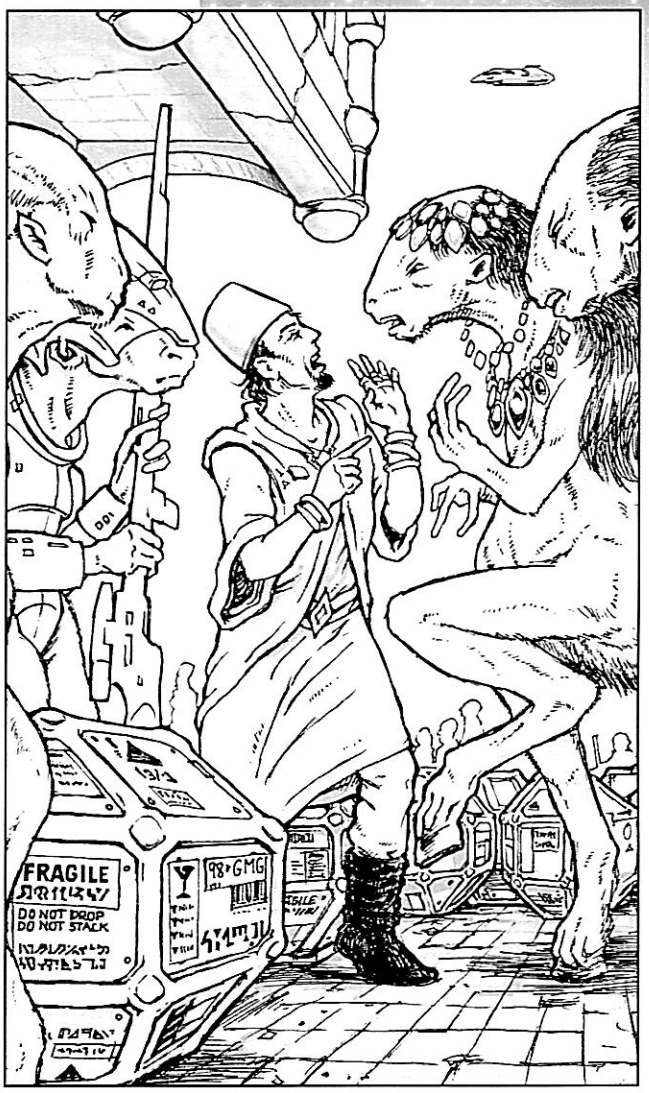
Humaniti (old spelling: Humanity) is a special case. Originally evolved on Terra, Humans were disseminated over nearly 50 worlds about 300,000 years ago by an unknown agency. These various examples of Humaniti then independently developed. Unlike non-Human races, individual Human races are classified as major or minor. Three Human races (the Solomani of Terra, the Vilani of the First Imperium, and the Zhodani far to spinward) are major races. The nearly 50 other races of Humaniti are all minor. The Zhodani are profiled in ***GURPS Traveller Alien Races 1***.

Vargr are an intelligent race genetically manipulated from carnivore/chaser stock by the same Ancients who disseminated Humaniti to the stars. Vargr have long suffered from an inability to organize themselves (to any degree or for any length of time) beyond the star-system level, and their empires tend to rise and fall with regularity. Vargr have an intense racial pride, and are easily insulted. They are prone to enter into fights without regard for possible consequences. Refer to ***GURPS Traveller Alien Races 1*** for a complete profile.

Hivers (a Human term applied to them – their own name for themselves has no spoken equivalent) are the most obviously alien of the major races: They are descended from omnivore gatherer/scavenger stock, and are unique in that they attained a form of agriculture before they became sentient. They exhibit a six-fold radial symmetry. The body has an internal skeleton consisting of a series of rings supporting the limbs, while a fused carapace protects the brain and internal organs. Hivers themselves are highly individualistic (the term "hive" is an early misconception) while driven by curiosity, parental instinct, and a desire to maintain the unity and uniformity of their race both within and outside their Federation.

Campaigns

A wide variety of campaigns are possible in the ***Traveller*** setting. Some of those discussed in ***GURPS Space*** pp. 4-6 are of particular interest, and are expanded on below:



Selling the Moon – Wholesale

Mercantile wheeling and dealing was designed into the original ***Traveller*** games, and remains one of, if not *the* most, popular pursuits for characters. The *Beowulf* mentioned on the original game box was a free trader, intended as a rough analog to the tramp steamers of the late 19th and early 20th century – a small merchant ship, eking out a living transporting cargo and passengers from world to world.

This sort of campaign works best in frontier regions where there are not a lot of established trading companies already working the trade routes for all they are worth, or in areas where the big guys have suffered a temporary setback that allows the little guys (the PCs) to get a foothold. On the other hand, once the PCs' starship line gets big enough, it can expand into other, more settled regions and come into conflict with the established companies. Merchant campaigns can blend into other types as well. Trade wars between rival spaceship lines can spark small wars where mercenaries are needed. Industrial espionage is as dangerous and as lucrative as the other variety. Merchant princes with enough cash can become powerful political forces.

The Game Master must work out the economies of the worlds in fair detail, figuring out what it is that one world wants that another (reasonably nearby) world has in abundance. ***GURPS Traveller Far Trader*** provides all the tools and tips needed to work up a mercantile campaign's setting.

Mercenaries – Travel to Distant Worlds, Meet Exotic Beings . . . and Kill Them

Of about equal popularity in the original ***Traveller*** games was the mercenary-based campaign, where the PCs were soldiers for hire. The background was set up so that the Imperium tolerated a fair number of low-intensity, localized wars, provided they never got to be a threat to the wider order. The Imperium would step in when things threatened to destabilize a whole region, but otherwise left things pretty much alone. Local governments or other groups hire mercenary units to fight other groups and other units. Players can be a small, elite strike force, or the senior officers of a larger company- or battalion-sized force. Individual specialists might be hired by units in need of a sniper, perhaps, or a demolitions engineer.

The Game Master must be willing to conduct a great many firefights and out-and-out battles (this is a wonderful type of campaign for people who are also military miniatures players). The players must be willing to start over again as new characters more often than in other types of campaigns (soldiering is not the safest of occupations). This is not a campaign type for people who have no interest in weapons and things military.

GURPS Traveller Star Mercs provides additional insight into the organization, conduct, and equipment of mercenaries in the Imperium.

Reflections of a Grognard

"There's nothing like a good war to ruin the merc trade. You get a lot of enthusiastic amateurs who think they know what they are doing because they managed to survive basic training, and who got hooked on the adrenaline when they finally see action. The problem is that they have not yet acquired sufficient instincts for self-preservation, which means that they are more likely to get themselves killed. This, in and of itself, is not necessarily a bad thing, but they have a tendency to take us grognards with them by accident."

– Captain Yunara N. "Jinks" Giancana, Imperial Marines, ret.

Good Guys and Bad Guys

The original ***Traveller*** was occasionally criticized (or lampooned) because many of the early adventures required or encouraged the characters to engage in some form of illegal activity (smuggling, breaking and entering, piracy, etc.) or acts of questionable morality (mercenary actions, espionage, state-sanctioned assassination). There were several reasons for this, but the main one was that these were the kinds of adventures people seemed most interested in. They were the type most often submitted, and were the most commonly encountered at conventions.

There is considerable pleasure to be had in vicarious law breaking. Most people are law-abiding, non-violent, and pretty much socialized, but it can be entertaining to imagine ourselves as otherwise. This is not the place to go into "bad guys" as heroes, but the character is well established in books and movies: Robin Hood, Frank and Jesse James, the Ringo Kid (as played by John Wayne), Bonnie and Clyde (as played by Warren Beatty and Faye Dunaway), Butch and Sundance (Paul Newman and Robert Redford) and several blockbusters' worth of smugglers, con-men, and "rebels against the empire" (or Earth Force as the case may be). ***Traveller*** was not alone in encouraging rule-bending heroes, but perhaps we went a little overboard in the early days.

As gamers became more sophisticated, they began to see the entertainment value in activities other than the criminal ones, and later versions of ***Traveller*** became more sophisticated.

Politics, Diplomacy, and Espionage

For Game Masters and players who are interested in politics and complex governmental interactions (or for those who just want to play spies), the Third Imperium presents a broad canvas upon which to paint a campaign of political action and diplomatic intrigue.

For example, frontier campaigns are possible where the players interact with the many political entities along the borders of the Imperium. The Imperium also has client states, governments that are not part of the Imperium for whatever reason, as well as large neighboring governments that must be interacted with. Politics *within* the Imperium can be the subject of long and interesting campaigns, too. PCs could become involved in complex court intrigues at the Imperial palace, or at one or more of the archducal or ducal courts. Private and public scandals, blackmail, plot and counterplot – all offer rich veins of adventuring ore to be mined. Why, one could stumble across a plot to kill the emperor and overthrow the empire!

Of course, espionage and diplomacy often go hand in hand. How many delicate diplomatic negotiations depend on one vital piece of information that tips the scales one way or the other? How many embassies have been embarrassed by spy scandals? Small actions can have large repercussions, and one or two well-placed people can change the course of an entire empire.

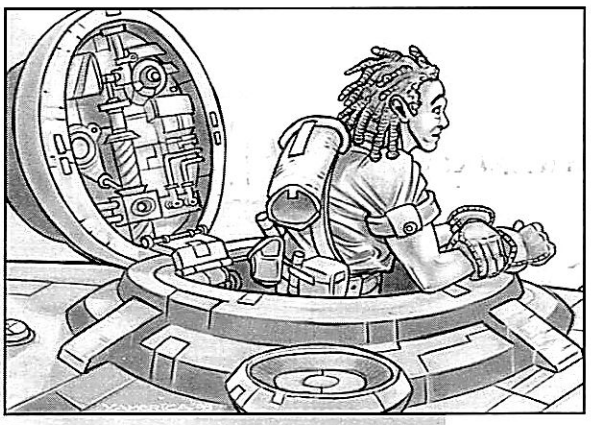
Be warned, political campaigns require even more work on the part of the GM than military or economic ones, and they are not for everyone.

Lawbreakers and Law Enforcers

The ***Traveller*** setting is well suited to this type of campaign. Any number of "less-than-legal" professions, such as smuggler, interplanetary cat-burglar, pirate, and world-hopping grifter, are open to players who wish to experience an illicit vocation without actually becoming a blight on society. Conversely, they may prefer to play the law enforcers whose job it is to serve and protect the Imperium from such scofflaws. Another possibility involves the characters being thrust by circumstance to one side of the law or the other. For instance, the details of the economic grind may tempt otherwise law-abiding merchants into smuggling or piracy as a means of getting the ledger back into the black. This sort of campaign can easily blend into a mercantile or political one.

Rebels Against the Empire

Taking a page from another book, the players may want to try to overthrow the Third Imperium! There are those who feel that the oligarchs that presently rule have lost touch with the best interests of the people and that the Imperium must become more responsive to its citizens' demands – *or else!* A rebellion requires leaders, soldiers, spies, and financiers – all pursuits that can provide many exciting adventures.



Strange New Worlds

There is little room left for exploring "where no one has gone before" in the year 1120 of the Imperium. Things are pretty much explored (in a geographic sense, anyway – there is still much to learn, otherwise). Campaigns can be set in previous years, however, when exploration and settlement of new worlds was a common endeavor – the history of the ***Traveller*** universe has many such eras ripe for exploitation. With a little work, a creative GM could devise a campaign set, for instance, in the first century of the current Imperium. No matter the period, ***GURPS Traveller First In*** will enhance an exploration campaign.

Chapter Two
Details of a Universe

This chapter discusses the details of the ***Traveller*** universe, and serves more as a Game Master briefing than a players' guide. Most of the information in this chapter was designed to be given out during a game session, as part of a character's background knowledge or as a result of their research. Some sections are intended for GMs only, and are clearly marked as such.

FTL Travel – The Jump Drive

The key to the stars is the jump drive. Without it, the space between the stars takes years, even lifetimes, to cross; with it, starships travel parsec distances in a matter of days. The development of a jump drive marks the beginning of interstellar travel for any race, including Humaniti.

A jump drive is both fast and simple. With one, it is possible to move from *here* to *there* (where both places are at least 100 diameters out from any large masses) in a period of about a week. The time in transit is independent of the distance traveled, which makes this system practical for interstellar travel, but for little else. The distance traveled with the jump drive depends on the drive in use – from 1 to 6 parsecs, with greater distances as yet unavailable. In point of fact, the current theory of jump drive actually precludes greater jump distances (these can occasionally occur by accident, but the destination is totally uncontrollable). See p. 44 and p. 157 for more about jump drives.

Another central fact of interstellar travel is that no method of information transfer faster than jump drives has been invented. Ships can carry messages, but radio still lags at mere light speed. Communication is always restricted to the speed of interstellar transportation. The very fastest ships have jump-6 . . . so news and commerce never travel more than 6 parsecs per week, and usually more slowly than that.

Government

It is often said that the Imperium rules the space between worlds and leaves the dirt to the worlds themselves, but that is (as with most sayings) a simplification. In point of fact, the Imperium governs all things it chooses to govern, which includes the space between the worlds within its boundaries, but also includes many worlds themselves, and a great many places besides. The Imperium controls and/or regulates:

- All interstellar commerce and relations within its boundaries.
- Any planetary commerce and relations that affect the control and/or regulation of the above.
- Anything that constitutes a threat to the stability or security of the Imperium as a whole or in part.
- Any planetary or near-planetary bodies necessary to control and/or regulate the above.

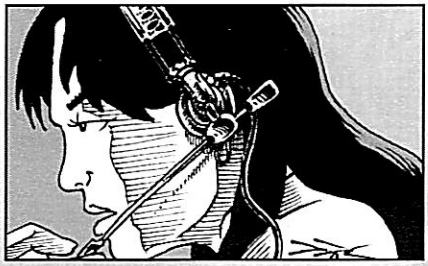
The Metric System

The original ***Traveller*** used – and in its present edition, still uses – the metric system of measurements. This was done to give the game a scientific basis, as well as a more international aspect and appeal. ***GURPS*** uses the imperial system of weights and measures in its American editions, but metric in its overseas translations (German, Spanish, etc.). ***GURPS Traveller*** will use the imperial system, for compatibility with other ***GURPS*** products.

Game Masters who wish to preserve the overall scientific feel of the original may make use of the metric system with the author's blessing, and a conversion table is provided herewith (please note that "imperial" on this table denotes the system of measurement used in the United States, and not that of the ***Traveller*** Imperium). The first column gives a "quick-and-dirty" conversion value, good enough for most gaming purposes, and the second gives a more precise value.

Imperial	*Game Metric*	*Real Metric*
1 foot (ft)	30 cm	30.48 cm
1 yd (yd)	1 meter	0.914 meter
1 mile (mi)	1.5 km	1.609 km
1 inch (in)	2.5 cm	2.54 cm
1 pound (lb)	0.5 kg	0.453 kg
1 ton (tn)	1 metric ton	0.907 metric tons
1 long ton (tn)	1 metric ton	1.02 metric tons
1 gallon (gal)	4 liters	3.785 liters
1 quart (qt)	1 liter	0.946 liters
1 ounce (oz)	30 grams	31.103 grams
1 cubic inch (ci)	16 cubic cm	16.387 cubic cm
1 cubic yard (cy)	0.75 cubic m	0.765 cubic m

Temperatures: To convert degrees Fahrenheit to degrees Celsius, subtract 32 from the Fahrenheit reading and multiply by 5/9. Note that -40 degrees is the same on both scales.



Nanotechnology

Physicist Richard Feynman first suggested the notion of atom-by-atom manipulation of matter in the late 1950s in his talk *There's Plenty of Room at the Bottom.* But it wasn't until the 1981 book *The Engines of Creation* that author K. Eric Drexler gave the notion a name and outlined the possibilities. This is not the place to go into a complete essay on the subject, but it is a good place to explain why ***Traveller*** does not directly incorporate most of the possibilities represented by *m*icro *e*lectrical-*m*echanical *s*ystems (MEMS).

Drexler's basic concept was that individual molecules (or even individual atoms) could be manipulated by microscopic machines, in any way that the laws of physics allowed. Cars, buildings, spaceships, whatever, could be grown out of whatever material was desired. MEMS could disassemble an object into its component atoms, and reassemble them as something completely different. Given enough atoms of the right sort, it would be theoretically possible to fabricate anything on the spot, the only restrictions being the energy needed for the job and enough atoms of the proper elements being present. A cloud of MEMS (the so-called "smart fog" of science-fiction stories) could grow a seven-course meal right in front of the diners, including the table, chairs, plates, tablecloth, utensils, and water in the fingerbowls. The leftovers (including the table, the plates, and so on) could be converted into a recliner couch for the diners to nap on after the meal is eaten. Furthermore, the MEMS could conceivably build other MEMS, so the technology of replication would be self-replicating. Infections could be dealt with by disassembling the infectious bacteria, injuries healed by rebuilding the tissues at a molecular level, surgery accomplished by a horde of microscopic repair robots that grow new heart valves or replacement limbs.

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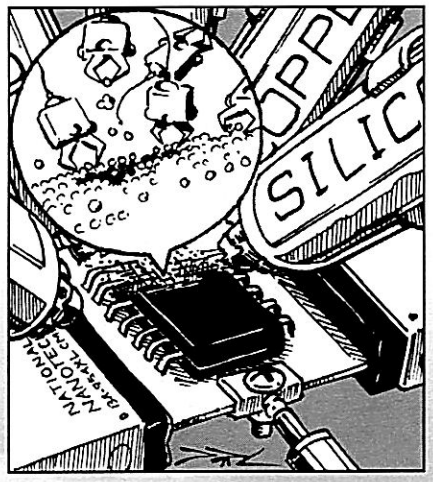
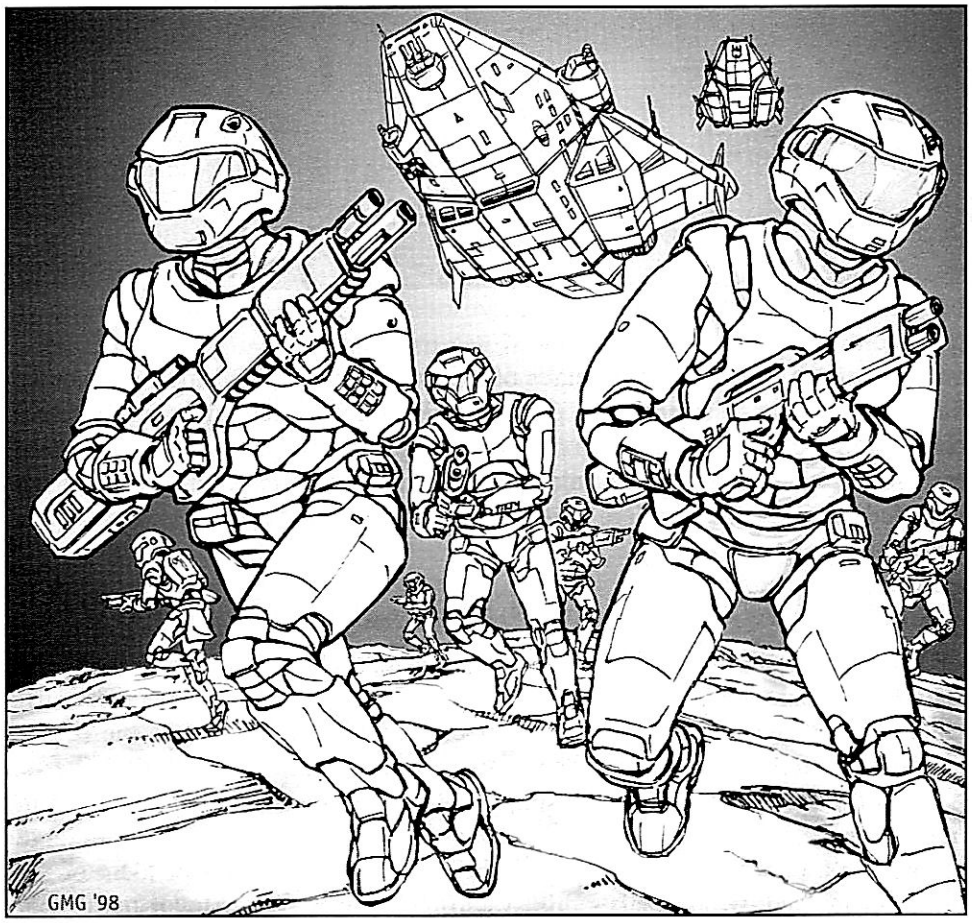




If this sounds vague and open to interpretation, it is. If it sounds undemocratic, it is. It does make for a relatively quiet and profitable climate for the empire as a whole, however.

It could be said that all Imperial government is military government, because the ultimate threat the Imperium can hold over anyone's head (literally and figuratively) is military. The Imperial Navy, the Imperial Marines, and (to a lesser extent) the Imperial Army are the "big stick" behind all Imperial control. However, the Imperium has vast economic, technological, and political resources that can be brought to bear as well, and these are not inconsequential.

Religion in the Third Imperium

Religion is a touchy subject, even in roleplaying games, and especially where existing religions are concerned. There is no doubt that religion can be a major factor in RPGs. It can motivate adventurers, and provide a source of both conflict and unity among characters. On the other hand, religion is a highly charged topic and many players may not like to see their religion "trivialized" in game form.

Also, religion poses a number of questions for those wishing to include it in their games: Will any current religion still exist in the ***Traveller*** universe thousands of years from now? How will the discovery of non-Human intelligent life change Human religions (i.e., can non-Humans have souls)? Will aliens be welcomed into Human religions (and vice versa)? What new religions and offshoots of existing religions will form? How will advances in technology change religion? No quick or simple answers present themselves to many of these questions. It is left up to individual Game Masters to decide what is best for their campaigns (and players).

A Chronology of the Traveller Universe

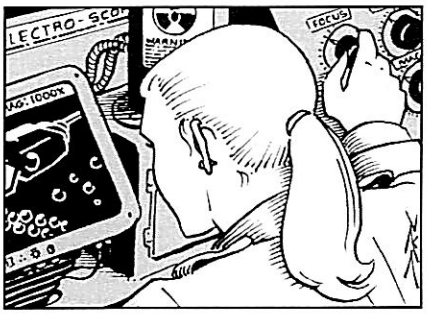
Dates in the distant past are approximate (the margin of error varies). Dates after 0 Imperial are accurate to within a year unless otherwise noted.

Imperial	Vilani	Solomani	Event
-310,000	233,000 P.I.	305,000 B.C.	Ancients arise on Droyne home world.
-300,000	226,000 P.I.	295,000 B.C.	Humans transplanted to various worlds throughout known space.
-290,000	218,000 P.I.	285,000 B.C.	Final war destroys Ancient civilization.
-20,000	12,000 P.I.	15,000 B.C.	Ancients' warbots on Vland run down. Vilani cultural development begins.
-15,000	8500 P.I.	10,500 B.C.	Solomani cultural development begins during the retreat of the last major glaciation.
-11,000	5300 P.I.	6500 B.C.	Flowering of Vilani culture.
-10,011	4547 P.I.	5491 B.C.	First Vilani space explorations. Approximate date of development of agriculture on Terra.
-9400	4081 P.I.	4880 B.C.	Vilani sublight interstellar colonization.
-9310	4013 P.I.	4790 B.C.	Vilani discover non-Vilani Human civilization.
-9235	3955 P.I.	4715 B.C.	Vilani invent jump-1 drive.
-7071	2304 P.I.	2551 B.C.	Egyptian civilization on Earth constructs the Great Pyramids.
-6731	2046 P.I.	2211 B.C.	First Psionic Games. Zhodani calendar begins.
-6720	1351 P.I.	1300 B.C.	Shang Dynasty rules China on Terra.
-5430	1054 P.I.	910 B.C.	Vilani invent jump-2 drive.
-5415	1043 P.I.	895 B.C.	Zhodani develop jump drive.
-5400	1032 P.I.	880 B.C.	Vilani Consolidation Wars begin.
-4698	496 P.I.	178 B.C.	Hivers develop inferior jump drive.
-4520	361 P.I.	1 A.D.	Solomani dating system begins.
-4404	272 P.I.	117 A.D.	Vega absorbed by Vilani. Dacians absorbed by Roman Empire on Terra.
-4305	197 P.I.	216 A.D.	Unification of K'kree homeworld.
-4212	126 P.I.	309 A.D.	Hivers invent standard jump drive. China in the midst of the "Three Kingdoms" era on Terra.
-4142	72 P.I.	379 A.D.	K'kree invent jump drive.

Nanotechnology

[Continued]

MEMS also present a dark side: They could be used as weapons. An enemy could be converted to a pool of constituent atoms by a cloud of microscopic attack machines. Since these attack MEMS could be self-replicating, it would only be necessary to send one in the attack force. The only defense would be other MEMS. The whole situation would be beyond the individual's direct control, and would somewhat resemble chemical/biological warfare – you just have to hope that your defensive MEMS remain superior to the attacker's offensive MEMS.



A good roleplaying game could be designed incorporating nanotech, but that game would not be ***Traveller***. If goods can be made to order on the spot, there will be no need for trade, which is one of the primary sources of adventure in the ***Traveller*** universe. (Indeed, much of what we know about supply-and-demand economics will cease to be relevant.) There would be no mercenary adventures: Why use armies to invade when you need only introduce a few self-replicating attack MEMS to the enemy world? After every living thing is dismantled to its component atoms, you send in your colonists and their MEMS grow their infrastructure.

In ***Traveller***, nanotechnology can be assumed to be present at a low level. It forms the basis of certain medical devices (more and more as TL rises), and is probably the means by which much high-tech manufacturing takes place. If we assume that MEMS are very, very expensive, and are not self-replicating (for whatever reason), we have the basis for excluding much of Drexler's nanotechnology from ***Traveller***. Imperial research stations (q.v.) are probably experimenting with nanotech, and GMs who wish to put their victims . . . er . . . players through a "nanites gone wild" scenario can look to these places for justification. Individual GMs, however, are free to make nanotechnology as widespread as they like (***GURPS Robots*** and the two ***Ultra-Tech*** books contain the relevant rules; indeed, the discussion of the Safetech technology path on pp. UTT9 pretty much describes how to set up the ***Traveller*** universe).

Cybertechnology

Prosthetics to replace damaged or defective body parts are common throughout the Imperium (where technology permits). Prosthetics that enhance performance beyond Human norms are viewed as scandalous in most of the Imperium (especially those which do not resemble the body part replaced), and are illegal in many places because of their obvious potential for criminal abuse (many worlds still harbor what used to be called a "Frankenstein complex"). Most of the larger passenger starship lines require passengers with any prosthetics to register them before boarding (even some normal prosthetic replacements can interfere with ship systems – or so it is claimed). Free traders, of course, are not always so picky. As a rule, the more an implant outwardly resembles its biological prototype, the less likely its user is to be hassled. An artificial hand covered in synthetic skin would be acceptable; a chainsaw would not.

Another potential problem is if someone accumulates too high a proportion of cyberware in their body, they may be classified as a robot, and subjected to regulations which restrict robot-carried weaponry. Robots are considered non-sentient beings in the Imperium and do not have the same rights as more meat-oriented citizens. ***GURPS Robots*** explores the line between man and machine.

Imperial technology is fully up to the manufacture of body enhancements, and many Imperial Research Stations are undoubtedly secret factories for the manufacture of cyber implants for use by Imperial intelligence agencies. Megacorporations are also capable of making such devices, and undoubtedly do so more often than they care to admit publicly.

Note that neural interfaces to computers are not forbidden by most worlds, but most such implants are designed to allow read-only access to public information databases (and they do not always work equally well everywhere).

Biotechnology

The Vilani, for reasons explained elsewhere (see p. 75), were very backward in certain of the biological sciences. The Solomani, however, have made great advances in geneering (genetic engineering), especially cloning. The Solomani have genetically altered several Terran lifeforms to bring them up to sentience, including dolphins and simians (gibbons and orangutans). While genetic alteration of Humans is frowned upon by most cultures of the Imperium, it has been known to occur (the minor races known as the Iziri and Wuan, for example). There are persistent rumors of extra-Imperial Solomani plots to geneer some horrible bioweapon and unleash it upon the Imperium.

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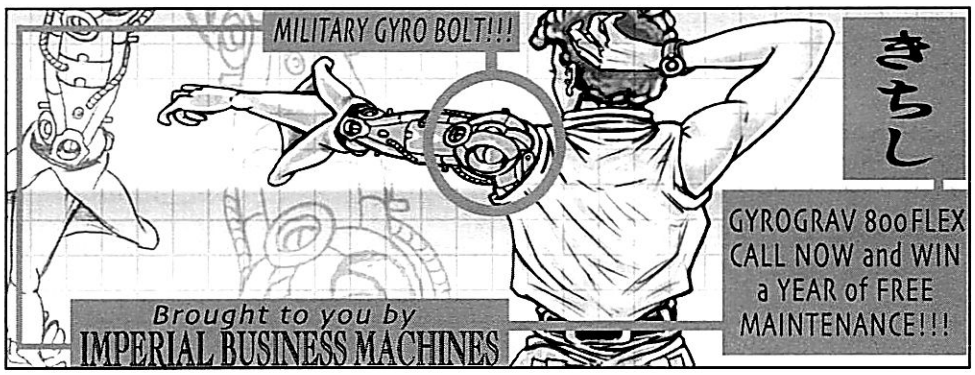


Imperial	Vilani	Solomani	Event
-4045	1 V.I.	476 A.D.	Consolidation Wars end. Ziru Sirka (First, or Vilani, Imperium) founded. Vilani calendar begins.
-4000	35 V.I.	521 A.D.	Vilani cease exploration.
-3810	180 V.I.	711 A.D.	Vargr invent jump drive. Maya civilization at its height on Terra.
-3500	416 V.I.	1021 A.D.	First (Vilani) Imperium reaches greatest extent.
-2562	1136 V.I.	1959 A.D.	Solomani space exploration begins.
-2460	1209 V.I.	2061 A.D.	Solomani bases throughout solar system.
-2431	1231 V.I.	2090 A.D.	Solomani invent jump drive.
-2424	1237 V.I.	2097 A.D.	Solomani visit Barnard's Star.
-2424	1237 V.I.	2097 A.D.	First contact between Solomani and Vilani.
-2408	1249 V.I.	2113 A.D.	First Interstellar War begins.
-2398	1256 V.I.	2123 A.D.	Establishment of Terran Confederation.
-2235	1380 V.I.	2286 A.D.	Nth Interstellar War begins.
-2219	1393 V.I.	2302 A.D.	Nth Interstellar War ends.
-2204	1404 V.I.	2317 A.D.	Terran Confederation ends. The Rule of Man (Second Imperium) begins.
-2190	1415 V.I.	2331 A.D.	Aslan First World War.
-2160	1438 V.I.	2361 A.D.	Aslan Nuclear War.
-2136	1456 V.I.	2385 A.D.	First Aslan space explorations.
-2083	1496 V.I.	2438 A.D.	Beginning of Aslan calendar.
-2045	1525 V.I.	2476 A.D.	First contact between K'kree and Hivers.
-2029	1537 V.I.	2492 A.D.	Hiver/K'kree War begins.
-2023	1542 V.I.	2498 A.D.	Hive Federation established in current form.
-2018	1546 V.I.	2503 A.D.	Hiver manipulation of K'kree worlds begins.
-2013	1550 V.I.	2508 A.D.	Hiver/K'kree War ends with complete withdrawal of K'kree forces from Hive space.

Imperial	Vilani	Solomani	Event
-2000	1560 V.I.	2521 A.D.	First contact between Zhodani and Vilani traders.
-1999	1560 V.I.	2522 A.D.	Aslan develop jump drive.
-1980	1575 V.I.	2541 A.D.	First Aslan/Human contact.
-1802	1711 V.I.	2719 A.D.	First Human/Hiver contact.
-1776	1730 V.I.	2745 A.D.	Collapse of the Rule of Man. Long Night begins.
-1690	1796 V.I.	2831 A.D.	Terran Mercantile Community established.
-1526	1921 V.I.	2995 A.D.	Interstellar trade ceases. Long Night deepens.
-1511	1932 V.I.	3010 A.D.	Solomani traders contact Darrians.
-1118	2232 V.I.	3403 A.D.	First Aslan Border War begins.
-1110	2238 V.I.	3411 A.D.	Old Earth Union established.
-1000	2322 V.I.	3521 A.D.	Zhodani Consulate reaches present size.
-924	2380 V.I.	3597 A.D.	Darrians reach TL13. Darrian sun destabilized.
-650	2589 V.I.	3871 A.D.	Sylean Federation established.
-200	2932 V.I.	4321 A.D.	First Human/K'kree contact.

Cybertechnology

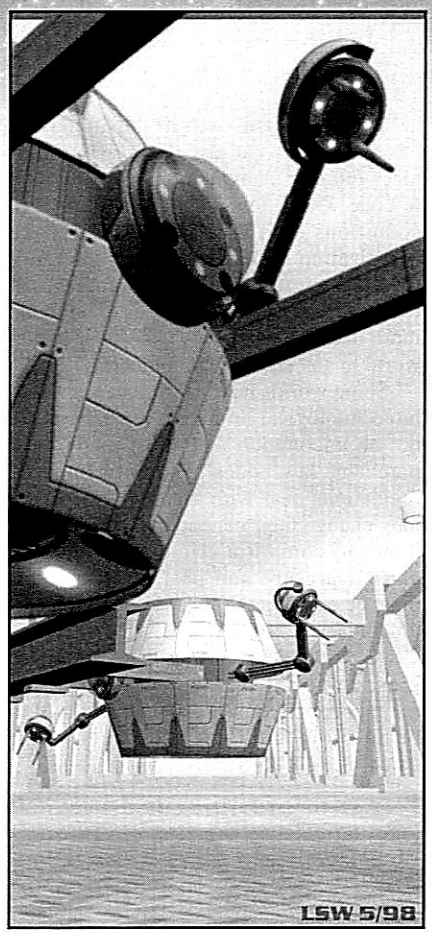
[Continued]

Several worlds within the Imperium have created what are effectively minor races through manipulation of their genetic code. Often this was to adapt them to conditions on a specific world to make colonization easier; sometimes the rationale was more unusual. It is uncommon for these geneered minor races to be found more than a few parsecs from their homeworld in any significant numbers.

Some worlds take a different view, and biotechnological limitation regulations are not an uncommon feature of many local planetary law codes. The only Imperial regulations deal with identity: No person may change their genetic makeup with the intent to commit a crime or to defraud, and all present and past genetic codes must be noted in the Imperial identity document (see p. 40).

As with other cutting-edge technologies, Imperial Research Stations and megacorporations are the best ways to bring biotechnological aspects to the game. See ***GURPS Bio-Tech*** for ideas.





Robots and Artificial Intelligence

Vilani conservatism and a prejudice against excessive experimental technology means that true artificial intelligence (self-awareness) is fairly rare throughout the Imperium, although robots are widespread in many areas. It is possible to program a robot to act Human, and to act fairly intelligent, but Imperial technology has stopped short of manufacturing artificial self-aware intelligences. As with nanotech, however, Imperial research stations *may* be working on the problem, unbeknownst to the public. Rumors of the development of a self-aware machine have circulated for many years.

Robots are considered non-sentient beings in the Imperium (at least under current laws) and are covered by a number of restrictions on their technology such as the Shudusham Accords (see p. 59), which ban robot-carried weaponry. Later laws have decreed that mechanical or artificial constructs are not eligible for Imperial citizenship (see *Cybertechnology,* p. 16, for some repercussions to PCs).

Machine intelligences could make their way into a game, and GMs can introduce them as plot devices (and all the more effectively, as players won't be expecting them). See ***GURPS Robots*** for ideas.

Imperial	Vilani	Solomani	Event
-110	3001 V.I.	4411 A.D.	Shudusham Concords.
-30	3062 V.I.	4491 A.D.	Cleon's campaign begins.
0	3084 V.I.	4524 A.D.	Third Imperium established. Imperial dating system begins.
50	3123 V.I.	4571 A.D.	First Zhodani contact with Imperial traders.
60	3130 V.I.	4582 A.D.	Colonization of Spinward Marches begins.
76	3142 V.I.	4597 A.D.	Pacification Campaigns begin.
114	3171 V.I.	4635 A.D.	Solomani Hypothesis proposed.
120	3176 V.I.	4641 A.D.	Pacification Campaigns end.
148	3197 V.I.	4669 A.D.	Imperial Interstellar Scout Service recontacts Darrians.
210	3245 V.I.	4731 A.D.	Vargr Corridor Campaigns begin.
348	3350 V.I.	4869 A.D.	Vargr Corridor Campaigns end.
380	3374 V.I.	4901 A.D.	Peace of Ftahalr. Imperial/Aslan border established.
404	3392 V.I.	4925 A.D.	First Shudusham Robotics Conference results in the Shudusham Accords regulating artificial intelligence and cybertechnology.
420	3405 V.I.	4941 A.D.	First Survey of Imperium completed.
426	3409 V.I.	4947 A.D.	Easter Concordat established.
588	3533 V.I.	5109 A.D.	Terra incorporated into Third Imperium.
589	3533 V.I.	5110 A.D.	First Frontier War begins.
604	3545 V.I.	5125 A.D.	First Frontier War ends. Civil War begins.
615	3553 V.I.	5136 A.D.	Second Frontier War begins.
620	3557 V.I.	5141 A.D.	Second Frontier War ends.
622	3559 V.I.	5143 A.D.	Civil War ends.
624	3560 V.I.	5145 A.D.	Xboat system established.
679	3602 V.I.	5200 A.D.	Solomani power broken at court.
704	3621 V.I.	5225 A.D.	Solomani Autonomous Region created.
799	3694 V.I.	5320 A.D.	Crisis of '99.
800	3694 V.I.	5321 A.D.	Psionic Suppressions begin.
826	3714 V.I.	5347 A.D.	Psionic Suppressions end.
871	3748 V.I.	5392 A.D.	Solomani Confederation established.
940	3801 V.I.	5461 A.D.	Solomani/Imperial friction increases.
950	3908 V.I.	5471 A.D.	Solomani Autonomous Region dissolved by Margaret.

Imperial	Vilani	Solomani	Event
979	3831 V.I.	5500 A.D.	Third Frontier War begins.
986	3836 V.I.	5507 A.D.	Third Frontier War ends.
990	3839 V.I.	5511 A.D.	Solomani Rim War begins.
1002	3848 V.I.	5523 A.D.	Siege of Terra. Solomani Rim War ends.
1005	3851 V.I.	5526 A.D.	Solomani Home Guard created.
1040	3877 V.I.	5561 A.D.	Destruction of Phoenix Project begins.
1045	3881 V.I.	5566 A.D.	Destruction of Phoenix Project ends.
1065	3896 V.I.	5586 A.D.	Second Survey of Imperium completed.
1082	3909 V.I.	5603 A.D.	False War (Fourth Frontier War) begins.
1084	3911 V.I.	5605 A.D.	False War (Fourth Frontier War) ends.
1107	3928 V.I.	5628 A.D.	Fifth Frontier War begins.
1110	3931 V.I.	5631 A.D.	Fifth Frontier War ends.

Library Data

"Library data" is a general term used to describe the information available from a typical computer using its library program. It represents the information generally available to player characters, and tends to be over-general and over-simplified. Game Masters may alter or add to Library Data as they see fit for their individual campaign purposes. Various entries later in this book supply additional details for use by GMs, and should be read only by them.

A

AAB: The abbreviation for *Argushiigi Admegulasha Bilanidin,* which in Vilani means the "Vilani Repository of All Knowledge." The AAB is a major scientific institution located on the world of Vland and its extensive facilities include a vast museum, a library, and several research centers and publishing houses. The term is also applied (by non-Vilani) to any extensive museum or library of Vilani origin.

Amber Zone: Part of a system used by the Imperial Interstellar Scout Service (q.v.) and the Travellers' Aid Society (p. 35) for classification of a nation, world, or system. An Amber Zone classification indicates a need for caution in contacts with the entity so classified. The Amber Zone classification may indicate chaos, upheaval, or xenophobia in local business, politics, society, or culture, or it may be applied for other reasons. Travelers should exercise caution.

See also *Red Zone, Travel Zone.*

Ancients: The name assigned by scholars to a highly intelligent race which gained prominence 300,000 to 400,000 years ago. Most of what is known about the Ancients has been gleaned from archeological excavations of Ancient sites: the remains of cities, bases, outposts, and settlements of the Ancients. Scientific dating techniques have established that a "Final War" spanning a 2,000-year period destroyed virtually all of the Ancients at that time.

The Information Age?

Players in ***Traveller*** expect information to be available to them in massive quantities. Computers are commonplace, right? Everything is interconnected, right? I can get any bit of data I need, right? An early review of ***Traveller*** remarked that the game was unique in that good play was primarily rewarded more in knowledge of the game universe than in experience or money, and was thus a departure from every other game then on the market.

However, the information age presents several problems to ***Traveller*** GMs, not the least of which is the perceived need to generate the gigantic amounts of data the players feel their characters deserve. Players being players, they want the full floorplans of every building (down to the secret ventilator duct leading into the room they need to sneak into), manufacturer's schematics of the alarm system (hopefully detailing that it does not cover the aforementioned ventilator grill), and a schedule of the security guards, including when the fat one goes out for doughnuts and leaves the ventilator duct unguarded. Unfortunately for everyone involved, this sort of information makes it difficult to surprise the players, and pretty much guarantees a dull game for the players and a frustrating one for the GM.

The solution is to try to design scenarios where having all the information is not necessary – don't let the database drive the adventure. Players should recognize that it is impossible *for them* to know everything their characters know, and should not overload the GM with demands for data.



Planetary Statistics

The library data contains several planets with ***Traveller*** statistics. Since these don't precisely translate to ***GURPS*** stats, the original data has been preserved to let individual GMs fine-tune their conversion with the charts on p. 123.

The stats consist of eight digits. In sequence, these represent: starport size, planet size, atmosphere type, hydrographic percentage, population, government, law level, and (after the hyphen) tech level.

The letters A through F represent the numbers 10 through 15, in sequence; i.e., A is 10, B is 11, etc.



Why the Ancients?

Why the Ancients? ***Traveller***'s designers wanted a large, decadent interstellar empire for the Terrans to encounter and conquer. This concept was first outlined in the board game ***Imperium.*** In this game, forces of Earth (one player) encounter a backwater province of a much larger empire. The governor of the province (the other player) must convince the uncaring central government of the true threat to the borders, fending off Terrans and battling incompetent bureaucrats for a budget at the same time.

Traveller players will recognize this situation as the period known as the Interstellar Wars (pp. 33, 51). In ***Traveller***, the empire that the Terrans encountered was to be Human. Humans evolved on Earth, so the only viable option for their lengthy existence on other worlds was for them to have moved there from Earth. In the absence of a star-faring civilization on Earth before recorded history (something the designers ruled out), Humans must have been transplanted by some other agency, and that agency was called the Ancients. Our version is as good as any, and better than most.

The influence of the Ancients is broadly felt in the universe. The vast majority of scholars now believe that the Ancients transported Humans from Terra to many worlds, where their descendants became the Vilani and the Zhodani, as well as the 47 known minor Human races. The Vargr have been shown (through genetic testing) to be descendants of genetically manipulated Terran canines (apparently, the canine stock was acquired at the same time as the Humans were taken from Terra). Ancient artifacts which have been discovered show a very high level of technology, and an equally high degree of sophistication; such artifacts often reveal previously uninvented or unexploited technologies.

The Ancients were responsible for several major features within the region now occupied by the Imperium. Their warfare resulted in the large proportion of asteroid belts throughout explored space, and there is evidence they created the multi-world rosette at Tireen (Knaeleng 2910, in the Vargr Extents). Scattered, empty cities (most severely damaged by battle) stand as evidence of their wars; most, however, are restricted areas under investigation by the Imperium and not open to the public. One notable exception is the world known as Antiquity (Corridor 0816). The Antiquity Ancients site is open to tourists; its fascinating museum displays many wondrous and mystifying artifacts, many of which are still in working condition. See p. 21.

See also *Humaniti, Solomani Hypothesis, Vargr.*

Andory (Spinward Marches/Five Sisters 0236 C695735-9): Prime candidate for the Droyne homeworld. Discovered in 802 and placed under interdiction (Red Travel Zone) by Imperial Interstellar Scout Service.

See also *Droyne.*

Anglic: The official language of the Third Imperium. A distant descendent of Terran English, Anglic was the language of the Rule of Man (-2294 to -1776). Anglic remained a common interstellar language for trade and commerce during the Long Night (q.v.). Its widespread use on the original worlds of the Third Imperium made it the natural language when the Imperium was established.

On many worlds, Anglic is only a second language used for system traffic control, commercial operations, and interstellar communications. Anglic is sometimes called Galanglic (for Galactic Anglic).

The Imperium has not been able to prevent the emergence of a wide variety of Anglic dialects. Interstellar communications, holocrystals, and recordings help to spread a uniform pronunciation of Anglic throughout the entire Imperium. Within the Imperium, any Anglic speaker can understand almost any other speaker, but isolated communities on worlds with limited contact with the interstellar trade lanes shift their speech patterns to form dialects. In addition, broad areas within the Imperium have established their own pronunciation patterns; accepted dialects include Rim (which includes Terra), Core (the central region of the Imperium), Riftian (the spinward frontiers), and Transform (the Antares region). Other minor variants exist, and are left to Game Masters to detail as they see fit.

Antares: Trailing region of the Third Imperium. The name Antares is applied to a variety of places at the trailing fringe of the Imperium. Antares is a domain of the Imperium, a sector within that domain, and the capital of that sector (in addition to the star of that name).

Antares, Domain of: A Domain of the Third Imperium, consisting of the Lishun, Antares, Mendan, and Amdukan sectors.

Antares, League of: The League of Antares (although it does not include the Antares system) is an autonomous region within the Imperium. The worlds were originally pressed into the Imperium during the Antarean Pacification Campaign. The worlds were occupied by the Julian Protectorate during the Julian War. When regained for the Imperium at the end of that war,

the peace terms included a mandate that the League of Antares be given limited autonomy for control of trade, commerce, and internal affairs.

The autonomy of the League of Antares served as a model for the later establishment of the Solomani Autonomous Region (see p. 60).

Antebellum: Literally, before the war (from the ancient Terran language Latin). General historical term referring to the period within the Imperium before the Civil War, specifically the years 210 to 604.

The antebellum period was characterized by expansion of the Imperium with large-scale colonization efforts, integration of numerous regions into Imperial society, and an overall mood of growth and exploration. With the end of the antebellum period, the Imperium turned more attention inward and devoted resources to internal development and consolidation.

Artifact: Any manufactured object. The term artifact is commonly used to refer to any object, item, or group of related items produced by the Ancients.

Antiquity (Corridor/Ian 0806 A223420-C): One of the best preserved Ancient sites in existence. Discovered in 385, the site is unique in that many parts of it are still operational. The biggest problem faced by researchers has been figuring out what things did and how they worked. Many items are still a mystery.

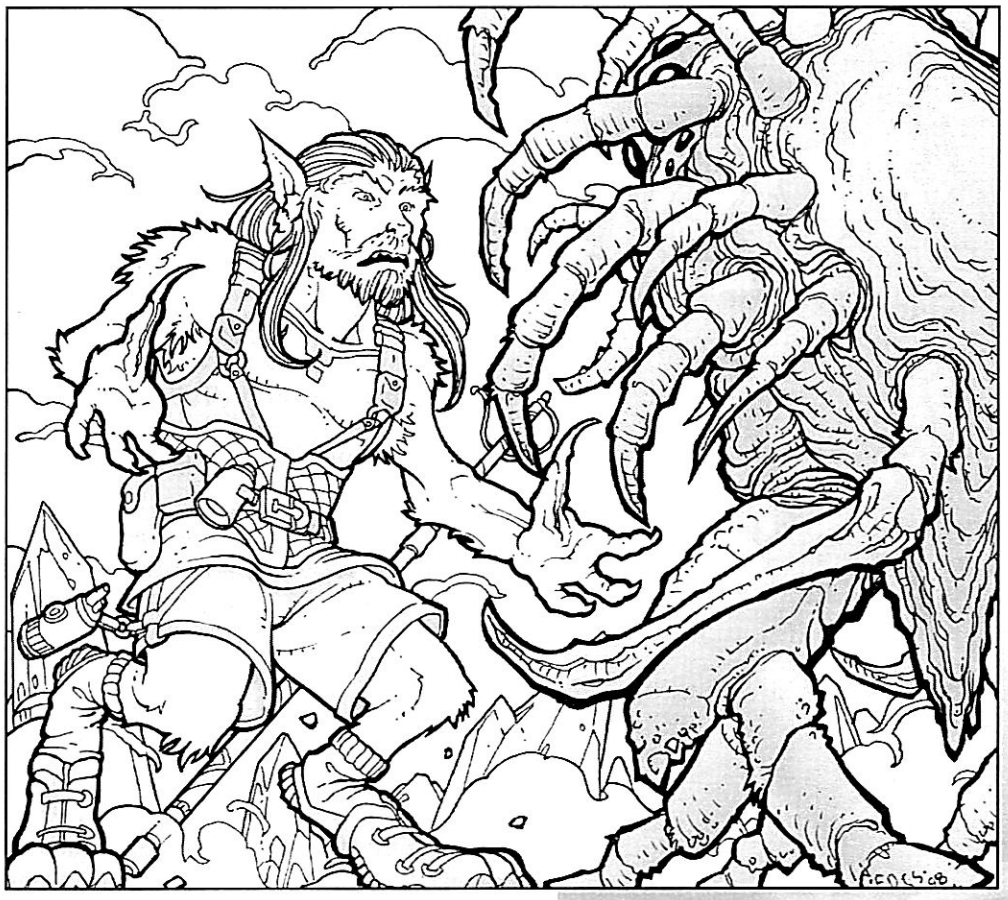
Aslan: The Aslan are a race of intelligent beings with an established interstellar empire spinward and rimward of the Imperium; in addition, large numbers have settled within the Imperium.

Aslan are roughly Human-sized, averaging 6 feet in height and weighing about 200 lbs. They are descended from four-limbed, upright, bipedal carnivore/pouncer stock originally adapted to a solitary arboreal existence.

The earliest Terran explorers saw in them a vague resemblance to the Terran lion, and they have been described (by Terrans) as lion-like or feline ever since, although there is very little biological similarity. The derivation of the word Aslan is unknown. There are two sexes, male and female. Externally, the male is most easily distinguished by his larger size and prominent mane. Females outnumber males by 3-to-1.

Aslan have a single highly specialized dewclaw at the distal end of each thumb which folds back jackknife-fashion into a horny covering along the ventral surface of each thumb and palm.

A vast Aslan-dominated empire (the Aslan Hierate) lies far to rimward, but Aslan themselves have ranged well beyond its borders, with many settling within the Imperium and attaining full status as citizens. As citizens, they subordinate themselves to Imperial authority, although they have remained culturally separated from Human society. Aslan serve in the Imperial armed forces, achieve nobility, pay taxes, and run businesses just as other citizens do.



Aslan

The origin of the word "Aslan" has two facets: that of the real world, and that of the fictional milieu of ***Traveller.*** Strangely enough, both are the same. "Aslan" is the name of the lion/Christ figure in C. S. Lewis' *Chronicles of Narnia*. "Aslan" means "lion" in several Turkic languages. Whether Marc Miller took the name from the novels or from a Turkish dictionary is something that none of us can remember clearly. It is not important, since Lewis drew his inspiration from a similar source, so the roots all lead back to the same tree.

In game terms, it has been pointed out that the first Humans to make contact with the Aslan must have been descended from Turkic speakers. This minor fact can speak volumes about the people who left Earth to settle space.

The notation that "the derivation of the word 'Aslan' is unknown" merely means that it was unknown to the compilers of the AAB. Scholars on Terra certainly have a better notion where the word came from, but the compilers of the AAB evidently didn't consult them. The PCs will run into contradictory information quite often in their adventures. Sometimes it will be minor and unimportant to the grand scheme of things; sometimes it will be of vital concern.

Aliens

There is a tendency to imbue alien creatures with the characteristics of the animals they most closely resemble on Earth. Show a SF gamer a drawing of a scaled quadruped and the name "lizard" is certain to be applied, with all that implies: forked tongues, egg-laying reproduction, and a tendency to bask on warm rocks after eating. It is worth remembering that scales and egg-laying do not go hand in hand, nor do fur, milk, and live birth. Aliens arose on other worlds, through different evolutionary pathways, and simply because they resemble Earth creatures superficially, they do not share other characteristics. Droyne are not lizards. Aslan are not cats. K'kree are not horses.



Aslan Society: An individual Aslan is usually a member of a family of two to 12 individuals under a patriarchal leader. Several families will combine into a pride with one family dominant. A number of prides form a clan, again with a top pride. Aside from military organizations and the ruling council (within the Hierate), the clan is the highest social and political organization among the Aslan.

A deep-seated territorial instinct causes the Aslan to have an inordinate (from a Human standpoint) concern with land. For male Aslan, owning land is a major goal in life. An Aslan's stature is determined by the amount of land he (or her husband) controls, or by the amount of land owned by any higher lord whom the Aslan serves as vassal. The lowest classes of Aslan society are landless, and provide the farmers, laborers, craftsmen, and factory workers. A holder of a large territory will often grant authority over it to vassals (usually sons, brothers, or male relatives by marriage) who administer the land in his name.

The sexes have very different roles in Aslan society. Males (in all but the lowest classes) are concerned mostly with military operations, acquisition of territory, and political affairs. Females are concerned with trade, industry, and the accumulation of knowledge. Upper-class males have little conception of money and are largely incapable of functioning in a technological society without aid, so they are thus seldom encountered without the supervision and/or assistance of a wife, mother, or other female relative or employer.

For instance, a typical Aslan mercenary unit will be organized by a wealthy married female, who will then assign its operation, for a share of the proceeds, to an unmarried female relative. The battle commander and most of the troops will be unmarried males (many of them also relatives) hired with the promise of land grants (and the opportunity to gain honor and reputation in combat). Staff, operations, supply, and intelligence officers will generally be female.

The clawed, deadly nature of any combat between primitive Aslan led to a rigid, ritualized pattern of behavior designed to reduce conflict. To this day Aslan are very polite, and while most have learned to be patient with non-Aslan, accidental fights still occur. Disputes between individuals are handled by the patriarchs; disputes between families are handled by the pride leader; disputes between prides are handled by the clan leader.

See ***GURPS Traveller Alien Races 2*** for more information.

Aslan Calendar: The Aslan calendar is based on the period of Kuzu (the Aslan homeworld) around *Tyeyo,* its star. The Aslan *ftahea* (year) is 319.98 standard days in length.

See also *Aslan Border Wars, Aslan Hierate, Kuzu.*

Aslan Border Wars (-1118 to 380): Series of conflicts between various Aslan clans and Human systems as the Aslan expanded toward already settled Human territory. The Aslan achieved jump drive late (-1999) and proceeded to expand into the available territory in their region of space. Contacts along their trailing border necessarily resulted in friction with the Human systems in that region.

Because the Long Night was already well under way by the time the Aslan encountered Humans, no central Human government existed to resist Aslan attacks. Since there was no united Aslan authority either, the sides were fairly matched, and numerous small wars erupted between Aslan clans and Human splinter states, with alliances constantly forming and dissolving.

The border between Human and Aslan space remained relatively constant, with a few systems changing hands after each war. At this time some clans also launched raids into the interior of the former Imperial domains, where they conquered and settled worlds as much as 40 parsecs beyond the border.

Once the Third Imperium expanded into the region (circa 200), its superior organization and technology gradually put an end to the Aslan threat. The final

treaties, known as the Peace of *Ftahalr*, were negotiated with all the major clans. They established a buffer zone about 30 parsecs wide between the Imperial border and the region of Aslan control. There has been no war since then (380), although the Solomani have violated portions of the zone and incorporated it into their boundaries.

See also *Aslan, Aslan Hierate.*

Aslan Hierate: Interstellar, multisector government of the many Aslan clans. Aslan society centers on the clan. Within the Hierate, the family structure of the Aslan and the governmental structure are the same. The highest governmental functions are performed by a council of 29 clan leaders chosen from among the most powerful clans.

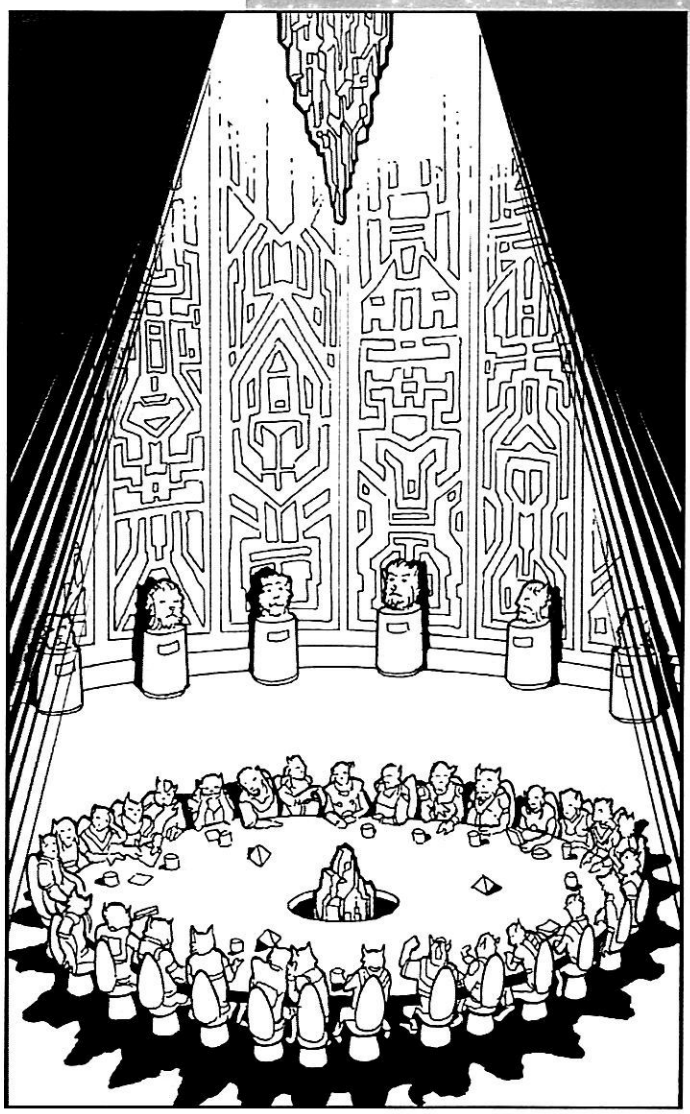
"The 29" (as they are called) have quasi-religious status and represent the essential unity of the Aslan race. To be chosen as one of the 29 is the highest honor to which any Aslan can aspire. The 29 meet continually on Kuzu to adjudicate interclan disputes and decide matters of group policy. No member of the 29 speaks for the Hierate as a whole, nor (for that matter) does the whole 29.

There are no Hierate military forces – each clan has its own, and they rarely act in concert with those of other clans. The Hierate itself can call upon military forces only insofar as the clans themselves agree to provide such forces (and a clan can provide forces only insofar as its constituent families provide them). Even the minor forces conveying the 29's decisions are actually under the control of individual clan leaders.

See also *Aslan, Aslan Border Wars, Kuzu.*

Astrography: The science of mapping interstellar space. Basic to any science of mapping is a coordinate system. The scientific system used by the Imperium is fairly technical, and not used by ordinary citizens.

In ordinary discourse, a world is referred to by its name, sector, and subsector. For example, the homeworld of Archduke Norris is Regina (Spinward Marches/Regina) – that is, the world Regina in the Spinward Marches sector's Regina subsector.



B

Barracks Emperors: Collective term describing the succession of emperors springing from military backgrounds (and usually seizing the throne by force) during the Civil War (q.v.).

See *Emperors of the Flag.*

"Behind the Claw": A slang term used by inhabitants of the Spinward Marches, Deneb, and Trojan Reach sectors to refer to these areas. The term derives from a supposed resemblance between a claw and the Great Rift, as seen on maps of the Imperium. Inhabitants of this region feel a certain pride in this designation, and it is used to imply that they share a camaraderie and common interest. The name was once used as the title of a popular news magazine with a circulation encompassing the three sectors named above. The term is rarely used by inhabitants of other areas of the Imperium. The entire area "behind the claw" is now part of the Domain of Deneb, under the rule of Archduke Norris of Regina.

See ***GURPS Traveller Behind the Claw*** for more information.

The Year of the Four Emperors

The notion of the Barracks Emperors is loosely drawn from the history of the Roman Empire, specifically the unfortunate year 69, the "Year of the Four Emperors." This single year saw the reigns of four emperors: Galba (who succeeded the infamous Nero), Otho, Vitellius, and Vespasian (who ruled until 79).

The 18-year period of the Barracks Emperors saw a similar wave of chaos and civil war sweep the Third Imperium. One year saw five different emperors occupying (or claiming) the Iridium Throne, and one two-year period had no emperor at all, demonstrating that military and governmental talents do not always overlap.



Belt Mining: The process of extracting useful minerals and other substances from asteroids. Asteroids fall into three basic categories, each of which is different in nature and value.

Nickel-iron asteroids are reasonably dense sources of metal, mostly sought after by local ship-building concerns for use as planetoid starship hulls.

Carbonaceous asteroids are the most common and have the lowest value in most marketplaces. These stony chunks are most useful in systems where space colonies and large stations can make use of the variety of useful elements – carbon, hydrogen, oxygen, and so on – that can be extracted from them.

Ice chunks are made up of various frozen volatiles, including methane, water, and the like. These "dirty snowballs" are a source of hydrogen fuel and hence support an entire specialty of "ice miners." In systems where gas giants cannot be mined for one reason or another, a starport or space station may pay reasonably good money for ice chunks, though they will never make a belter rich.

None of these three categories of asteroid is particularly valuable, and few belters ever make a fortune strictly from discovering and mining any of these. Other, more valuable resources are to be found. Many asteroids, most particularly nickel-iron rocks, contain varying amounts of the valuable minerals – platinum, iridium, and so forth, and sometimes radioactives. Occasionally an asteroid will be discovered with an unusual configuration that makes it valuable for scientific or even aesthetic purposes. And, finally, there are artifacts, which take in the entire gamut from the flotsam of a week-old wreck to a trove left by the Ancients, and which vary in value accordingly.

Belter: Strictly speaking, one who practices the profession of asteroid prospector and miner, usually working alone or with a small number of partners. Loosely, any resident of an asteroid belt (including citizens of civilized belts such as Glisten, some of whom have never been in a spaceship).

Brzk: Archduke of Antares, a Vargr. Brzk's great (to the eighth) grandfather, Admiral Soegz (q.v.), was a loyal supporter of Arbellatra in the final years of the Civil War.

Capital

The reason the Imperial capital world is named "Capital" is mere circumstance. On the first rough map of the Imperium, we labeled one of the worlds "capital" with every intention of coming up with a "real" name later on. Various names were suggested, but none seemed suitable. Finally, more by default than anything else, we left it "Capital."

There is ample historical precedent for this sort of thing. When the Roman republic annexed Macedonia, it split the kingdom into three provinces, named (in Latin, of course), Macedonia One, Macedonia Two, and Macedonia Three. It must be assumed that a similar lack of inspiration plagued Cleon I when he chose to rename his capital planet.

C

Capital (Core/Capital 2118 A586A98-F): Central world of the Imperium and seat of government since its founding. Situated in the center of the Imperium, Capital's position has given it prime importance as a communications hub, a cultural center, and an industrial focus. See *Sylea,* p. 66.

Centaurs: Common name applied to the K'kree, because of their resemblance to mythical Terran creatures. See *K'kree.*

Chirper: A minor race native to many worlds in and outside the Imperium, named for the sharp bird-like chirp which characterizes their speech. Chirpers are omnivore/gatherers weighing roughly 55 pounds. Living in small groups with limited social organization, they gather fruits and berries. They supplement their diets with occasional small animals, which they catch and kill with crude tools.

Chirper intelligence is at the low end of the scale and ranges from a few points above animal levels to a few points below the average for Humans.

It is well understood by scientists, though of little interest to most citizens of the Imperium, that Chirpers are genetically identical to Droyne (see sidebar, p. 29.) Nevertheless, Chirpers are recognized by Imperial authorities as intelligent, and as such, they enjoy the protections and responsibilities of intelligent species within the Imperium. Most Chirpers live in established reservations with only limited interchange with Humans.

Church of the Chosen Ones: A fanatical Vargr sect which believes that the Ancients not only "invented" the Vargr race by genetic manipulation of Terran carnivores, but that the Ancients also returned to the Vargr several times and improved the race to the point that it could take its rightful place as the leader of this part of the galaxy. Some Church members even believe that the Ancients will return again to bring this about. The Church has waned in influence since its founding 200 years ago, but it still has followers on many worlds. See pp. T:AI83-84.



Ciencia Iphegenia: (b. 1088) Grand Princess of the Imperium, daughter of Emperor Strephon and Empress Iolanthe. As heir to the Iridium Throne, Grand Princess Ciencia Iphegenia was educated from birth to eventually assume the mantle of authority for the Imperium. Her early fascination with the sciences prompted an extensive interest in the Imperial Interstellar Scout Service, which considers her its patron and staunch supporter at court.

As yet unmarried, Grand Princess Iphegenia is the subject of a great deal of speculation as to when and whom she will choose to wed.

Civil War (604 to 622): Fought between various factions within the Imperium for control of the bureaucracy. It had its origins in the strain on communications within the Imperium caused by the long lag times dictated by the very size of the Imperium. To cite one cause, however, would be simplistic. The diverse backgrounds of the many constituents of the Imperium had its effects, as did rivalry for power by major naval and military commanders and a lessening in the Imperium's expansionist tendencies.

The spark which started the Civil War came from the First Frontier War (589 to 604) in the Spinward Marches. Communication lags and a lack of preparedness forced the Marches to conduct most of the war on its own with little additional help or support from the Imperium. Grand Admiral of the Marches Olav hault-Plankwell forced the war to an end and found solid support for a new government. Advancing on Capital with his war fleet, he forced an audience with Empress Jacqueline I, supposedly for recognition of his war effort. In the course of the meeting in 606, he personally murdered the Empress, and then proclaimed himself Emperor by right of fleet control. The ensuing power struggle lasted through 18 years and 18 emperors.

The Civil War strife was of two varieties: fringe battles for power bases and central battles for power in the Core. The fringe battles were fought throughout the Imperium as rival factions recruited forces. Once any power bloc built up enough strength to make a victory seem possible, the forces were moved to the Core and used to either seize power or to wrest it away from someone else.

But there was also a cheaper, easier route open to many. The dynastic crisis of 244 had produced a precedent for the assassination of the emperor if he or she overstepped the bounds of legitimate activity. The concept was introduced

Starship Wayward Debarre (Spinward Marches/Darrian) 17/1120

"It'll be at least eight hours before this ice storm blows itself out. After that we can start digging – maybe another eight hours to dig the ***Wayward*** *out of the drifts."*

Darryn glanced out at the pine forest slowly being buried by several yards of snow, then turned to the engineer . . . who, as usual, was covered in grease and held his oversized mug of coffee in both hands.

"What are the captain's chances, SB?"

The engineer stared at his coffee mug and read the logo, which proclaimed "I Love Regina." He said, "Out there, in that? Poor. Out there, in that, if the bears find him? Zero."

"Damn. He still owes me another 600 credits from that craps game on Trifuge."

Both men knew what the astrogator meant. They stared out of the ***Wayward****'s view screen at the frozen forest and driving snow, hoping to see the familiar figure of their captain.*

■■■

The captain was remembering Trifuge, too. "You'd think I would have learned I'm a lousy gambler. But no, I had to come out in this." He aimed his pistol carefully.

The beast had a head the size of a man's body, weighed down by a thick plate of leathery armor. Its two eyes gleamed with an evil green light as it advanced on the stocky little captain. Then the pistol fired and one of the eyes became a mess of green and running red.

The Debarre bear staggered back from the hollow the captain had crawled into and roared its pain and hatred at the wounded man.

With frozen hands the ***Wayward****'s captain raised the pistol again, desperately fighting the shivering that spoiled his aim. Three rounds left in the clip, hands too frozen to reload. He stilled the shivers by an effort of will.*

In this storm he wasn't going to get far. But the bear was staying here for good.

Once again gunshots rang out throughout Debarre's frozen woods, but this time no roar followed them.

The captain pulled his inadequate coat around his shoulders, struggled to read his locator, and dragged himself back into the storm.

Roman Roots

As with so much of ***Traveller,*** the concept of a client state was drawn from history – specifically, the Roman Empire. To gain a stable frontier without the expense of conquest, Rome would install a friendly monarch in a small border state, and secure loyalty by subsidies, bribes, trade guarantees, or taking the monarch's children hostage. The hostages would be educated in Rome, as Romans, and would eventually succeed their parents as rulers. After a couple of generations, the rulers were Romans in all but name. ***Traveller*** incorporates a version of this same concept, using a series of allied states to act as buffers between major interstellar entities.

Interested GMs might find plot ideas for Imperial politics in ***GURPS Rome***.



to legitimize the elimination of Cleon the Mad and was never intended for any other purpose. Nevertheless, in the turmoil of the Civil War, assassination was introduced and accepted, at least by those utilizing the technique, as a way of promoting a succession in government.

The line of emperors during the Civil War came mostly from naval officers, and they are collectively called the Emperors of the Flag. Of these 18, seven were assassinated, 10 were killed in battle, and one survived: Arbellatra.

During the course of the Civil War, the Outworld Coalition (of Zhodani and Vargr) saw that their defeat in the First Frontier War at the hands of Olav need not be permanent. They attacked again in the Second Frontier War (615 to 620). Their defeat in that war had greater effects than they would know. Grand Admiral Arbellatra managed the meager forces of the Imperium against the Coalition and managed to force a second defeat.

Arbellatra's strategy after the war was (like Olav) to march on the Capital and seize power. She, however, did not make the mistake of seizing the throne. Instead, she defeated the putative emperor and then took possession of power, holding it in trust for a rightful successor. She held the post of regent for seven years while mounting a search for a member of Jacqueline's family to take the throne.

The stability she brought made an impression on the Moot and succeeded in establishing a broad power base. Ultimately, the Moot approached her to take the throne herself, which was probably in her mind all along.

With the end of the two Frontier Wars and the Civil War, the Imperium entered a period of renewed expansion and consolidation. The express boat system was established to enhance government, commercial, and private communications; the Solomani influence in the Imperium was lessened and replaced with a more cosmopolitan policy; renewed efforts at interior development of existing Imperial territories provided a new focus for the nobles of the Moot.

See also *First Frontier War, Moot, Outworld Coalition, Second Frontier War.*

Client State: An independent political unit which has elected (or had forced upon it) the patronage of a larger political unit. This relationship is generally mutually beneficial and is essentially commercial in nature. That is, the political or defensive ties which may be part of any patron-client relationship are ultimately intended to promote trade between the two.

Confederation: Group of independent states, worlds, or systems united for specified purposes while generally retaining more freedom of action than the members of a federation. Also a league or alliance (especially of princes, nations, states, worlds, or systems).

Corridor: Imperial sector containing 267 systems dramatically split by the Great Rift; 69 systems lie rimward of the Rift and 149 systems form the coreward third of the sector.

Corridor is named for its role connecting old, well-established Vland Sector with the frontier sectors Deneb and the Spinward Marches. The name Corridor dates from about 140 and has displaced the old Vilani name (Eneri, rough translation: "star salad") for the sector.

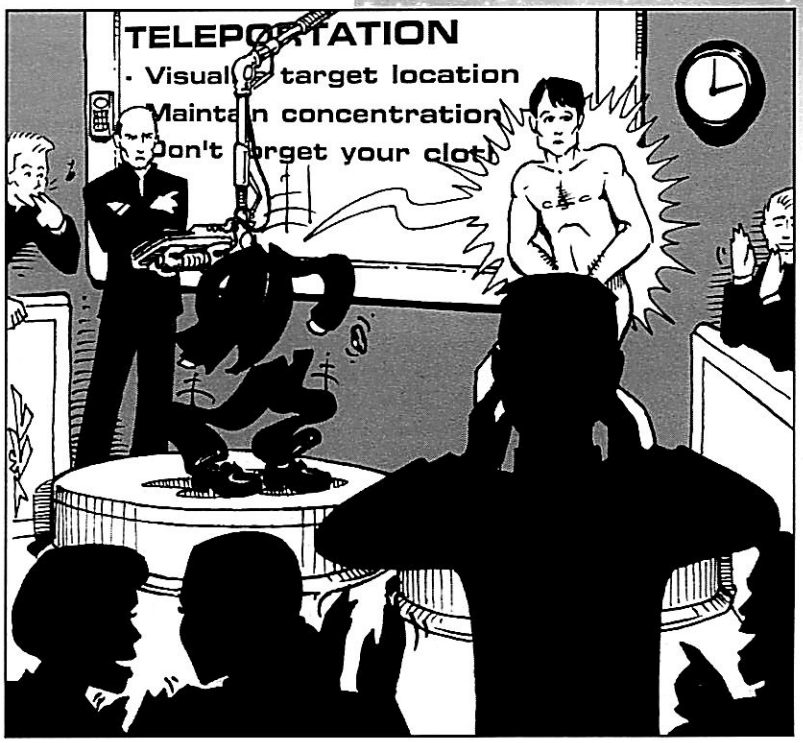
Coyns: Of the rare artifacts recovered from Ancient sites, the most common are coyns, small disks of metal engraved with various symbols. Their specific purpose is unknown. They may have served as money, jewelry, psionic focuses, or something completely different.

Original coyns have been found in various precious metals such as gold, silver, platinum, iridium, monadium, and even uranium. Sets range in size from six to 38 pieces, and are considered desirable to museums throughout the Imperium. Each coyn has a scrap value of Cr400 (if gold); to a museum, the value is closer to Cr4,000.

Copies of sets of coyns are made of aluminum, lead, or zinc and are more frequently encountered in the hands of unscrupulous merchants or traders. Such fake coyns have a value of about Cr2 each.

Crisis of '99: Albert Croale, in his book *Almost Disaster,* presents a hypothesis that the Third Frontier War (979 to 986) occurred two centuries too late. After reviewing the progress of events in the spinward reaches of the Imperium from the antebellum period to the late seventh century, Croale then analyzes the rise of the Psionics Institutes, their growing public acceptance, and their spreading power. Finally, he presents that a straight projection of events would predict a resurgence of the Outworld Coalition, increased hostilities, and finally, a Third Frontier War.

Instead, his hypothesis as stated in his book indicates that the Psionic Suppressions (800 to 826 and beyond) were a massive manipulation of the population of the Imperium, a form of psychohistory, intended to eliminate the power of the Institutes. War preparations were continuing, and the Imperium made representations of strength (in 799) to the Coalition. It backed down. But the psychohistory project went wrong and resulted in wholesale rejection of psionics within the Imperium, to the point that even the government had difficulty in using the science of psionics for its official purposes.



Currency, Imperial: The basic unit of legal tender in the Imperium is the Imperial credit. Individual worlds may issue their own currencies, and those currencies may or may not be acceptable on other worlds. Similarly, corporations and megacorporations may issue scrip, and its acceptance outside of the corporate environment varies.

Imperial credits are accepted everywhere in the Imperium and in many locations outside of it. The standard abbreviation is Cr, placed before the amount. In Solomani-influenced areas, it is not unusual to see the $ sign used.

Imperial credits are almost impossible to counterfeit because of their unique method of manufacture. Plastic fibers are combined under high temperature and pressure and extruded as a rectangular bundle of great length. The different colored fibers form the pattern of the bill. The bills are not printed; their characters and design are created by the mixture of fibers used. The bundle is sliced to paper thinness, and a 14-digit alphanumeric (letter/number combination) is added for uniqueness. Bills are issued in Cr10, Cr20, Cr50, Cr100, Cr500, Cr1,000, and Cr10,000 denominations. Plastic coins, manufactured in a similar manner in various shapes, are issued in Cr0.25, Cr0.5, Cr1, and Cr5 denominations. Coinage in precious metals is limited to special commemoratives and collectors' editions.

Imperial credits can be bulky in large quantities. Bills measure 3 by 5 inches; 1,000 bills stand 2 inches high and weigh 1 pound.

Other forms of money are common, both in Imperial credits and the currencies issued by worlds and large corporations. Checks, credit/debit systems (involving cards or other mechanisms), smart cards, and electronic systems of various sorts are all in use on various worlds. Interstellar exchanges of large amounts of money are accomplished by bank drafts and other financial instruments. These are essentially "checks" written from one large bank to another and involve extensive security procedures to prevent fraud.

Repeated efforts to remove "paper" money from Imperial finances have all been thwarted by coalitions of various political and free-trade interests.

Jesedipere (Spinward Marches/Aramis) 132/1120

Jesedipere downport's Joy Street is famous throughout the Aramis subsector for its bars, gambling dens, and other dives, but nothing could prepare me for the dirt, cramped streets, and overpowering smell of Vargr restaurants. It's even worse when you're out of cash and your home is a disused garbage can at the corner of Marquis Way and Extent Street.

I had been on Jesedipere for three weeks, since I used up my last credits getting back into the Imperium on board a Vargr trader after my job as a belter in the Thoelgling Empire failed to pay.

My papers show that I'm a pretty good engineer, but at Jesedipere no one seemed to be interested. Then my luck changed during one of Jesedipere's frequent rainstorms. I had waited amid the mud and street-scum to see if any new ships were landing at the pads.

I couldn't believe it as it came through the misty clouds. The battered hull gleamed in the rain, her old red and silver paint varnished by moisture to shine like new in the gray light. It was the legendary ***March Harrier*** *– the subsized merchant that humbled Tukera. This was my chance to get a ride in a legend!*

Even if the legend looked like it was held together by gum and good faith.

Faldor (Spinward Marches/ District 268) 68/1120

Ahead lay the statue of Queen Nabalus III, the first worldwide ruler of Faldor. It rose 45′ above the swampy terrain which passed as a park in Faldor's capital, Amballus. It was constructed out of millions of tiny animal bones. It was, however, a very detailed statue, and I had to admit Otarri bone sculpture was impressive.

At the base of the statue stood my welcoming party, a group of Otarri. Otarri are the natural race of Faldor. Many Humans call them Lung-Fish – they still resemble their swamp-dwelling amphibian ancestors.

The leading Otarri walked forward, his tail sliding in the mud behind him, a red headband marking him as a young male. In good Galanglic he stated that he was Ctariis of House Atoliis and that I was Darryn of the Scouts, which led me to ask him how he knew. It was of course my Ileshian black uniform, a mark of my military job and my belief in Virasa.

Looking pleased with himself – then again, with their upturned mouths Otarri always looked pleased – Ctariis stated that my friends of the Space Craft ***Wayward*** *were waiting at the house of Atolis to welcome me to Faldor.*

D

Darmine: Cultural region in the Zarushagar sector. Darmine had a separate but submerged cultural identity within the First Imperium and happily threw off that domination when the First Imperium fell. Allowed to flourish by the Rule of Man, the community of worlds survived the Long Night with little harm other than to its technology level.

Darmine was the primary focus of the Ilelish Pacification Campaign (76 to 120).

Darrian Confederation: Group of worlds in the Darrian subsector settled by Humans from Darrian (Spinward Marches/Darrian 0627 A463955-G) during the period -1137 to -927. The current capital is Mire (Spinward Marches/Darrian 0527 A665A95-B).

The Darrian Confederation contains 18 worlds within the same subsector and has a population of 17.19 billion. Darrians are Humans who developed independently on Darrian. Some Solomani blood is evident from Solomani traders who encountered Darrian in -1511 and provided them with sufficient technology to explore their subsector.

The Darrian Confederation is a client state of the Imperium. It has had long-standing conflicts with the Sword Worlds (q.v.).

See *Humans*.

Darrians: Minor Human race in the Spinward Marches, dominant race of the Darrian Confederation (q.v.). See ***GURPS Traveller Behind the Claw***.

Deneb: Imperial sector containing 385 systems lying beyond the Great Rift; named for the sector's brightest star, Deneb.

Deneb sector was sporadically settled by both Vilani and Vargr during the latter years of the First Imperium, but major development of the sector only took place after Third Imperium Scout Service explorations located major resource worlds in quantity. Industrial worlds that exploited those resources soon created trade routes and commercial ties that linked the Imperial core with the Spinward Marches.

Deneb sector is primarily Imperial. The Imperial border runs just within the coreward edge of the sector, and scattered Vargr systems (as well as non-aligned systems and client states) lie beyond the border.



Deneb is part of the Domain of Deneb, a region loyal to the Imperium under the leadership of Archduke Norris. See *GURPS Traveller Behind the Claw*.

Deneb, Domain of: A domain of the Third Imperium, consisting of the Spinward Marches, Deneb, Trojan Reach, and Reft sectors.

Directions, Galactic: North, south, east, and west are insufficient for referring to directions within the galaxy. Instead, the following conventions are used when referring to direction:

Toward the galactic core (toward Capital from Terra) is coreward; away from it, in the direction of the rim, is rimward. In the direction in which the galaxy is rotating (toward the Spinward Marches from Vland) is spinward, and the other direction is trailing.

These directions are in widespread use in describing Imperial features and businesses. For example, the Spinward Marches is a sector at the extreme spinward fringe of the Imperium; Rimward Lines is an important interstellar transport company.

Domain: Group of four sectors within the Imperium under the general control and direction of an archduke.

Droyne: Intelligent major race inhabiting scattered worlds within an area slightly larger than the region of the current Third Imperium. The Droyne are a small race derived from winged herbivorous gatherers. They vary in size depending on caste, but generally stand 3 feet tall (large workers and warriors can be larger than Humans). The history of their evolution remains a puzzle because their home world is not known with certainty.

Droyne society is divided into rigid castes determined when an individual reaches adolescence. The six castes of the Droyne all serve different functions within Droyne society. Although identical at the time of caste selection, caste members develop pronounced physical and mental differences by maturity. Different genetic programs are awakened by differences in diet and environment among the various castes. Young leaders, for instance, experience a nearly 30% increase in brain size in the first year after casting, drones develop sexual organs, and so on. The following are descriptions and definitions of the castes:

Worker: Manual labor and mundane ordinary activity are the province of the worker. Workers are not too smart and are temperamentally suited to contentment with ordinary labor and subservient tasks.

Droyne and Chirpers

Chirpers (see p. 24) are uncasted Droyne, which is to say they are a primitive version of the Droyne. As such they are less interesting in game terms, and it is for this reason that they have never been a serious contender for PC status. (In 20 years, I have never seen anyone seriously propose a Chirper character.)

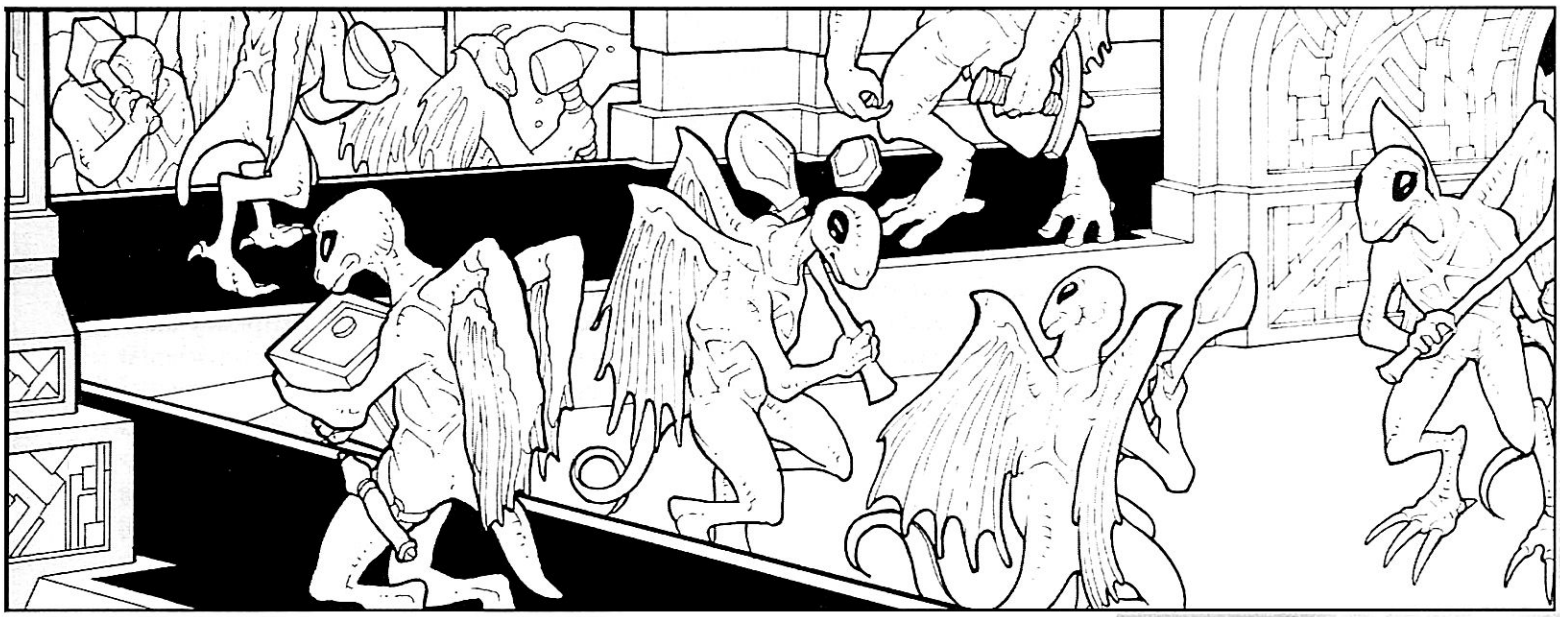
The fact that Chirpers and Droyne are the same is readily verified by close xenological examination, and proven beyond doubt by DNA analysis. It is also a matter of common knowledge, although it is not something that most people really care about. It is one of those boring facts they fill extra spaces in newspapers with – squib-fodder.

Consider, however, the following facts:

- An unknown agency spread Humans throughout a vast area of space, vaster than the borders of the current Imperium. These Humans take many forms, and are known collectively as Humaniti.
- It has been proven that all of the various races of Humaniti are descended from the inhabitants of a single world, and that world is Terra in the Solomani Rim sector. Since the Terrans are known to have been stone-age primitives when they were distributed throughout known space, it follows that another intelligence was responsible.
- It has been proven that the Vargr are also descended from a Terran life form, and they too were transplanted over a large area (although not as widely scattered as Humaniti).

And one final fact: When you look at Droyne and Chirpers together, they are almost as widespread as Humaniti.

Continued on next page . . .



Droyne and Chirpers

[Continued]

A logical conclusion from these facts is that the unknown agency which took Humaniti and Vargr from Terra also took the Droyne from somewhere. The Droyne homeworld has never been located – is that homeworld Terra? Are the Droyne descended from some Terran life form, either directly like Humaniti or through geneering, like the Vargr?

Most scientific authorities dismiss this notion. The Droyne biochemistry differs too radically from all known Terran organisms for them to be related. But some people ask: Are the Droyne the last surviving vestige of a totally different form of life, one that developed, flourished, and then vanished from the face of Terra before the current Terran life-forms developed? There have been several mass extinctions on Terra over the years – did one wipe out all life completely? And did a small vestige of that life survive because they were transported elsewhere by beings unknown?



The Alternate Dulinor

In the original background history of ***Traveller,*** Archduke Dulinor played a more substantial role: He assassinated the emperor (or at least he *thought* he had) and threw the Imperium into chaos. In the alternate universe depicted in ***GURPS Traveller,*** Dulinor himself is killed and the rebellion never comes to pass.

In the original timeline, Dulinor had actually killed a double, used on special occasions where the emperor had to be in two places at once. The reason Strephon was away from Capital remains the same in both universes, and will be revealed over the course of several books in the ***GURPS Traveller*** series.

Warrior: Trained for combat and possessing comparatively well-developed muscles and reflexes, the warrior is the security troop, the soldier, the marine, and the policeman of the Droyne culture. They are common in frontier bases, and less numerous in civilized areas.

Drone: Drones have a variety of purposes in Droyne society. They perform a reproductive role which makes them both fathers and mothers to Droyne young, and they have a role in the ceremonies which determine caste for maturing young. In addition, drones compose a sort of middle-management caste, which is responsible for many of the routine functions in business, trade, and administration.

Technician: This caste is the science-oriented portion of Droyne society, and is concerned with both research and practical implementation of technology.

Sport: Although the caste system of the Droyne is rather rigid, the sport is the deliberately accepted exception to caste structure. Sports are special individuals who cross caste lines to become individual scouts, messengers, representatives, hunters, and prospectors, and to take other occupations that require individual initiative or separation from Droyne society for long periods of time. Sports are the most commonly encountered Droyne away from a Droyne world.

Leader: Leaders are required to manage and direct society. They are ultimately responsible for everything that the Droyne as a whole do.

Society: There is little individual freedom in Droyne society, and as a result, society and government join into one concept. Workers work. Leaders lead. All of society is dedicated to continuing the existence that provides all members with food, shelter, and the other amenities that make life enjoyable. In addition, there is little discord in Droyne society when things are running smoothly, as each member of society has its own function to perform. Only when disaster happens is the group forced to strain.

A typical Droyne group consists of a variety of Droyne from the different castes. There will be many workers, a few drones and leaders, and technicians and warriors based on current needs. Each group will also have several sports, although they may not be present; instead they may be occupied with their own solitary tasks.

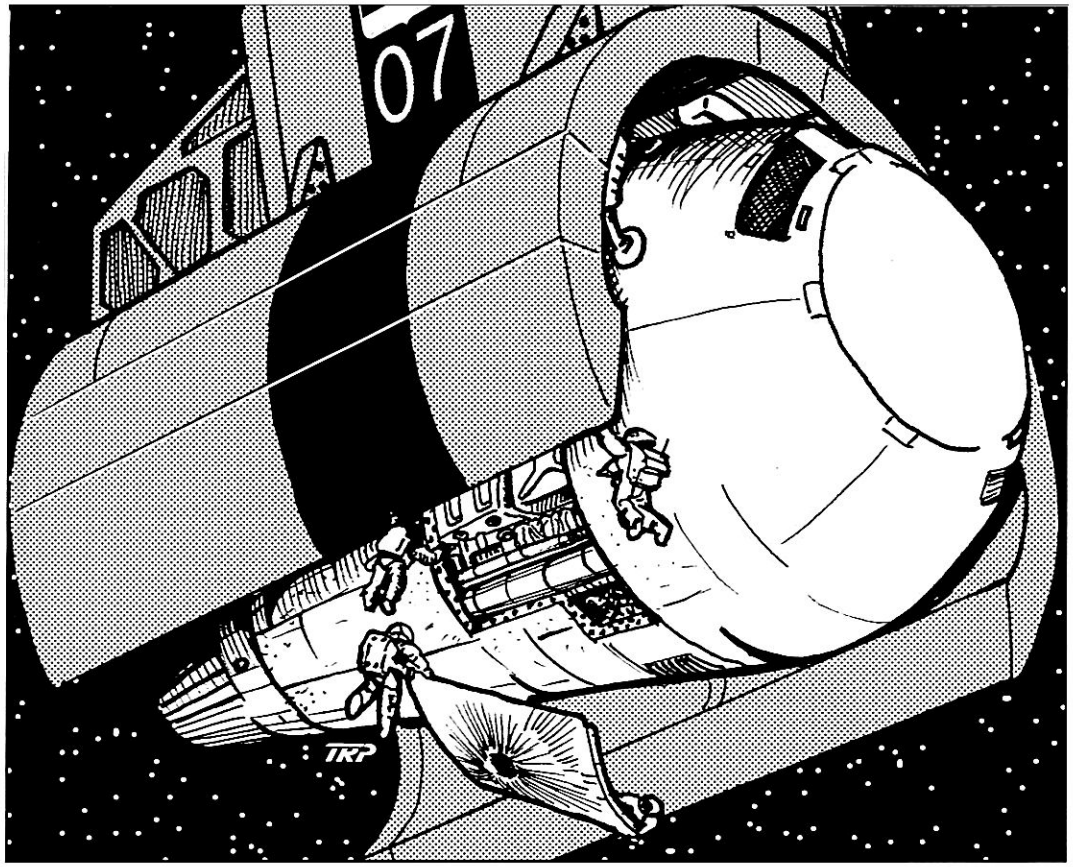
This is not to say that Droyne are mindless. Leaders are quite capable and responsible; warriors have strategic and tactical sense; technicians are inventive and clever. But all accept the central group as the purpose of their lives, and work for its benefit above their own.

Dulinor (1066-1116): Dulinor Astrin Ilethian, former archduke of Ilelish, killed in 1116 when the gig in which he was a passenger exploded mysteriously while taking him to Capital for an audience with Emperor Strephon. It is, of course, unusual and alarming when one of the Imperium's ranking nobles dies in a "mysterious explosion," especially before an Imperial audience. In the absence of any concrete evidence, three general theories circulate:

- The explosion was an accident.
- The explosion was intentional, and Dulinor was the target.
- The explosion was intentional, and some other passenger was the target.

Of these, the second is the most widely held. A number of conspiracy theories have sprouted over who would want Dulinor dead and why, and a small library could be filled with books about the incident. The final report of the Imperial Navy's investigation into the explosion was issued on 004-1117, and reported that there was insufficient evidence for any firm conclusion.

Why is this important to the campaign? See the sidebar. It may safely be concluded that there is more to Dulinor's death than the Navy will ever admit, and perhaps more than it will ever learn.



E

Emperors of the Flag: During the Civil War period (604 to 622), the Imperium was in the hands of a series of naval officers of flag (admiral) rank. These 18 emperors achieved the throne through assassination, fleet action, political maneuvers, and general mayhem. The year 619 particularly saw five emperors serve on the throne, none of them for more than three months.

The succession of Emperors of the Flag began with the seizure of the throne by Olav hault-Plankwell in 604, which precipitated the Civil War. It ended with the naming of Arbellatra as regent of the Imperium by the Moot in 622.

See also *Civil War.*

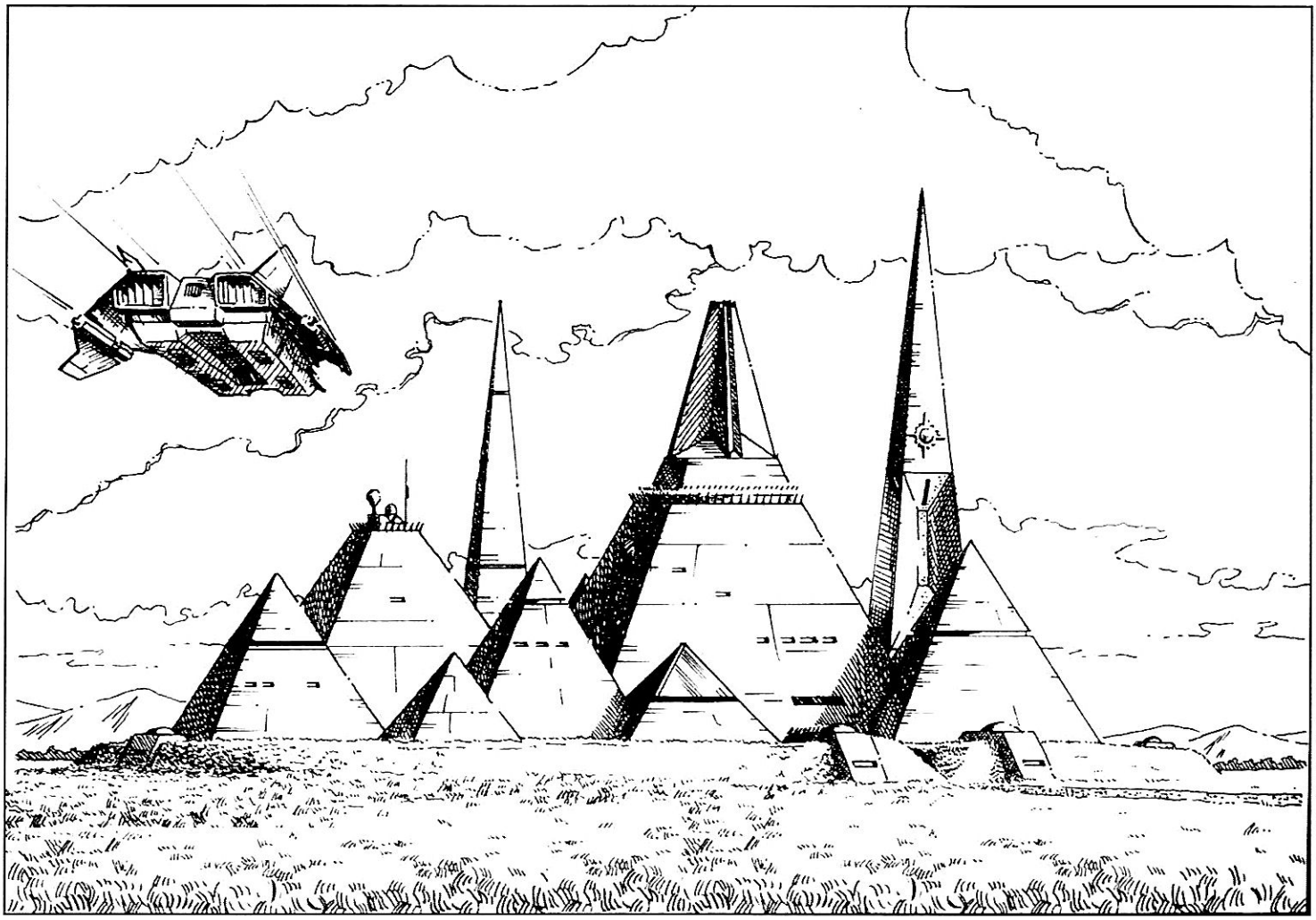
Express Boats: Rapid communication ships which are designed to make optimum use of jump technology in communicating information within the Imperium. Because the Imperium is so large, ordinary communication must depend on ships traveling along established trade routes, making Regina nearly four years out from the Imperial Core given routine jump lengths and layovers.

The express boat (abbreviated Xboat) system, established originally in 624 and expanded to cover the entire Imperium by 718, cuts this communication time by more than 75%. Selected locations along major trade routes are established as sites for Xboat stations (see p. 78), which are orbital facilities that service and refuel the Xboats on their communications runs.

As an Xboat arrives in a system, it beams its recorded data to the Xboat station, which then retransmits it to an Xboat standing by for a jump outsystem. Time between jumps is almost always less than four hours and has been recorded at less than seven minutes, making the speed of communication nearly the speed of jump (since Xboats carry jump-4 drives, this is basically four parsecs per week). In practice, this speed is reduced by the fact that trade routes do not follow straight lines and that not all jumps are made at jump-4. Nonetheless, the system achieves approximately jump-2.6 per week.

Emperors of the Third Imperium

Emperor	*Reign*
Cleon I	0-53
Cleon II (aka Cleon the Weak)	53-54
Artemsus	54-166
Martin I	166-195
Martin II	195-244
Cleon III (aka Cleon the Mad)	244-245
Porfiria	245-326
Anguistus	326-365
Martin III	365-456
Martin V	456-457
Nicholle	457-475
Cleon IV	475-555
Jerome	555-582
Jaqueline I	582-604
Olav	604-609
Ramon I	609
Constantus	609-610
Nicolai	610-612
George	612-613
Interregnum	613-615
Cleon V	615-618
Joseph	618
Donald	618
Emdiri	618-619
Catharine	619
Ramon II	619
Jaqueline II	619
Usuti	619-620
Marava	620
Ivan	620-621
Martin VI	621
Gustus	621-622
Arbellatra (regent)	622-629
Arbellatra (empress)	629-666
Zhakirov	666-688
Margaret I	688-736
Paulo I	736-767
Tomutov I	767-768
Paula II	768-836
Tomutova II	836-908
Margaret II	908-945
Styryx	945-989
Gavin	989-1031
Paulo III	1031-1071
Strephon	1071-present



Wars and Rumors of Wars

The various Frontier Wars fought between the Zhodani and the Third Imperium take their inspiration partly from the series of "brushfire wars" in the last half of the 20th century between the Eastern bloc (consisting of the Soviet Union and its allies) and the Western bloc (the United States and its allies). Another source of inspiration was the series of wars in the 18th century between Prussia under Frederick the Great and the rest of Europe (with a few exceptions).

Our purpose was to create a history of tension and conflict along a border area between two large political entities, and thus set the stage for the widest possible range of political, economic, and military adventures.

False War (1082 to 1084): The short, fourth war in the series of Frontier Wars between the Third Imperium and the Zhodani Consulate.

See *Fourth Frontier War.*

Federation: Group of states, worlds, or systems, each internally independent, joined into a union to which has been surrendered certain rights and responsibilities, most generally having to do with foreign affairs.

Fifth Frontier War (1107 to 1110): Latest in the series of continuing wars between the Zhodani and the Imperium. Following several years of unrest and provocation, Zhodani forces attacked across the Imperial borders while previously placed guerrillas on selected Imperial worlds began uprisings. Vargr and Sword World forces allied with the Zhodani also participated in the attacks.

The armistice, signed in 1110, resulted in the loss of no worlds to the hostiles and returned to the *ante bellum* status quo.

First Frontier War (589 to 604): The first of the modern border clashes between the Imperium and the Zhodani, which sparked the beginning of a continuing antipathy between the two major lines of Humaniti.

At the conclusion of the war, Olav hault-Plankwell drove to the Imperial core with his war fleet and took the reins of government, dispatching Empress Jacqueline and thus beginning the Civil War and the reign of its Barracks Emperors.

First Imperium (-4045 to -2204): The first major interstellar civilization, politically and culturally dominated by Humans originating on Vland. The jump drive was invented on Vland in -9235. Immediately the Vilani discovered a number of interfertile and technologically primitive Human races on worlds within 60 parsecs. These were gradually brought to a high-technology state with Vilani help and assimilated into a loose interstellar community bound by trade and common culture.

Eventually, the client races themselves explored beyond the local sphere, contacting and trading with still more races. These new races gained their technology without being assimilated into Vilani culture. The resulting increase in cultural friction eventually triggered a series of wars beginning about -5400.

In response to the threat, Vland began tightening its control of its trade sphere, finally organizing it into a centralized state in -5273. This marked the beginnings of the First Imperium, although there was as yet no emperor. During the 1,000-year period of the Consolidation Wars, Vland conquered and absorbed its enemies until no civilized states remained on its borders (except for a portion of the Vargr Extents, isolated from the Imperium by the Great Rift).

The last war ended in -4045, and the Vilani declared the establishment of an interstellar empire to govern all Vilani territory. Known as the Grand Empire of Stars or Ziru Sirka, Vilani dating begins at this point. With no exterior threats, the Ziru Sirka lasted for nearly 1,200 years; at its height, which was attained soon after the end of the wars, the First Imperium contained 27 sectors and more than 15,000 worlds.

The cost of maintaining centralized control over this vast expanse was cultural rigidity. Exploration had ceased with the beginning of the wars; now scientific research slowed to a halt and the beginnings of a hereditary caste system began to emerge. Civilization declined.

As long as no exterior threat surfaced, the Grand Empire was safe; but gradually technology leaked across the borders, despite all efforts. New interstellar states arose, and the Imperium could no longer afford to absorb them. Gradually, the Imperium lost territory along its coreward and trailing marches. Then, in -2422, the Imperium was contacted along its rimward border by the Terrans, who had recently emerged into space. Terran expansionism led to a series of interstellar wars, which ultimately resulted in Terran conquest of the Imperium in -2204 and the founding of the Rule of Man.

First Interstellar War (-2408 to -2400): The first military engagement between the Vilani of the First Imperium and the Solomani of the Terran Confederation. This began an on-again, off-again series of wars between the two major Human races, which ended in the defeat of the Imperium and the ascendance of the Solomani.

See *Nth Interstellar War.*

Fourth Frontier War (1082 to 1084): Also known as the False War, this was a short, inconclusive war fought primarily in the Jewell subsector of the Spinward Marches between the Imperium and the Zhodani Consulate. Initial assaults by the Zhodani against the Jewell and Regina subsectors stalled at the borders. Its final battle, the Battle of Two Suns (1084), was waged in the vicinity of Yres and Menorb and resulted in Imperial victory. The armistice was signed before instructions for the conduct of the war were received from Capital.



A Concise History of Ziru Sirka, Part I

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116.

The Vilani name for their Imperium was *Ziru Sirka* – the Grand Empire of Stars. They were able to create their great empire for one basic reason: They reached the stars first.

Early History

The Vilani first explored space in about 5500 B.C. by the Solomani calender. They ventured out into their own star system (from their homeworld, Vland) in a region of space about 300 parsecs closer to the galactic core than Terra. They visited every world and moon in their system, colonized a few, and put scientific bases on the rest over the course of a century.

By 5300 B.C. the Vilani had reached a point culturally and technologically where they were ready to reach for the stars. They launched sublight interstellar colonization missions aimed at the nearest stars. Tauri, a mere 2.17 light-years away, was the first system visited, but several more were explored in rapid succession. Over the course of the next 500 years, the Vilani created a small interstellar community of six systems, each with its own colonies and scientific stations.

Continued on next page . . .

A Concise History of Ziru Sirka, Part I

[Continued]

The first Vilani contact with intelligence took place in 4789 B.C. when an expedition to the nearby system of Tahaver discovered a race of aquatic mantas with a non-technological culture. The mantas, although intelligent, were easily dominated by the Vilani, and over several hundred years became a servitor (some say slave) race, assigned to fish-herding and kelp-gathering in Tahaver's vast seas. This first contact with an intelligent race set the tone for future contacts between the Vilani and other intelligent beings: The Vilani seemed naturally suited to rule and exploit others.

The dramatic key to the expansion of the Vilani was their invention of the jump drive in about 4714 B.C. A research team working on the outer fringes of the Vland system created the first working prototype and demonstrated its effects with a harrowing jump to the nearby Tauri system. The Vilani now had the key to interstellar travel.

Luck also had a hand in the future of Vland. The elementary jump drive which the Vilani invented was capable of transporting a starship across the vast interstellar distances at a speed of about 170 times light speed – a full parsec in about a week. The range of that elementary jump-1 drive was limited to a single parsec as well, given that early ships couldn't carry fuel for multiple jumps. Since the average distance between stars is closer to 2 parsecs, the first ships of most Major Races were greatly restricted as to which stars could be their destinations.

Vland, however, is one world in an immense chain of star systems, each of which lies within 1 parsec of the next – the Vilani Main. This Vilani Main became the highway over which Vilani ships traveled. Within 10 years, starships had been built and sent to every system within 20 parsecs. By 4400 B.C., the Vilani sphere had reached about 10 parsecs in diameter.



G

Galanglic: See *Anglic.*

Gas Giant: A large planet with an extensive atmosphere of hydrogen and hydrogen compounds. Starships can fuel themselves by diving into this atmosphere and skimming hydrogen from this atmosphere. Jupiter, in the Sol system, is an example of a gas giant.

Gateway, Domain of: A domain of the Third Imperium, consisting of the Ley, Glimmerdrift Reaches, Gateway, and Crucis Margin sectors.

General Shipyards: The largest starship manufacturer in Regina Subsector, with yards at Regina, Efate, and Pixie. Originally a military contractor, General no longer produces ships for military use; instead it concentrates on the more lucrative commercial market. The yard at Regina is capable of producing ships up to 5,000 tons, while the subsidiary yards at Pixie and Efate are limited to 600 tons, and devote most of their attention to annual maintenance.

Glea (Centrax/Glea 2609 A667800-F): Main coordinating center of the Hive Federation since 410. Center of the Glean Cluster, an unusually rich grouping of 16 Hiver-habitable worlds which are mutually accessible by jump-1 shipping.

Good War/Bad War: The terms "good war" and "bad war" are expressions used by mercenaries to differentiate between small-scale actions within the Imperium and full-scale wars between the Imperium and outside forces.

Small-scale actions are viewed as good because the Imperial rules of war are in effect, and a unit knows that it will not be subject to weapons of mass destruction as such. Good wars are usually short and not particularly bloody. A unit in a tight spot need merely surrender and activate its repatriation bonds to be removed from combatant status. Even anti-guerrilla actions are good, under this classification, because of the fact that although most guerrillas usually observe no restraint with captured government forces, captured mercenaries can usually be ransomed to serve as a source of income.

A war is bad when no such controls are in effect, and a mercenary unit will be subject to the full horrors of war. Mercenary units are understandably reluctant to accept bad war contracts, but they may be forced into them by circumstances.

Grand Prince(ss): Imperial title of the heir to the Iridium Throne. Under Imperial custom, the eldest child of an emperor is granted the title at the age of 12. An Imperial Edict (q.v.) is issued which actually confers the title on the heir's birthday, but the formal investiture ceremonies are normally delayed until the next Holiday (see p. 38) after the birthday. It is extremely rare, but not unknown, for an emperor to withhold the title for a few years or never appoint one. A childless emperor formally designates a successor by granting that person the title grand prince (again, a rare event). If a grand prince dies before ascending the throne, another is normally appointed as soon as possible. It is, of course, not required that an emperor be designated grand prince in order to take the throne. See *Ciencia Iphegenia,* p. 25.

Great Rift: Broad expanse of space with a very low density of stars lying spinward of the main region of the Third Imperium. The Great Rift is a pronounced impediment to interstellar travel, and it constrains jumps through Corridor sector to the Spinward Marches.

The Great Rift is one of many astrographic terrain features which have provided long-term security for the Third Imperium. By its very nature, the Great Rift has made outside incursions difficult, which has made the interior of the Imperium a secure population center.

Guaran (Ricenden/Guaran 0827 A565800-F): Homeworld of the Hivers. Guaran has no special political importance, although it attracts millions of tourists annually from all over the Federation. See *Hive, Hive Federation.*

H

Hive: Intelligent major race with a large federation trailing the Imperium. Individuals are called Hivers, average 4½ feet from ground to top of upraised head, and weigh about 75 lbs. Descended from omnivore gatherer/scavenger stock, they are the most alien of the major races from a Human standpoint. Hivers exhibit a modified six-fold radial symmetry; the body has a calcareous internal skeleton consisting of a series of rings supporting the limbs and a fused carapace protecting the brain and internal organs.

The head is a modification of one of the limbs, and contains six eyestalks and six manipulative tentacles, plus paired infrared sensor organs. The other five limbs are identical (except for slight modifications of the hand opposite the head) and are used as arms and legs indiscriminately. Each limb ends in a six-fingered radial hand. Fingers are very flexible and have muscular suction cups on the lower surface about halfway to the tips. Hiver arms and hands are generally weaker than a Human's, but are very tough and difficult to injure.

The mouth (digestive opening) is on the lower surface of the body. There is no sound-producing organ, but Hivers do have three ears placed around the neck near the head.

Hivers have only one sex. Reproductive cells are exchanged each time that Hivers meet, using the modified rear hand (the process has been termed by Humans "shaking hands"). The cells are kept in a reproductive pouch on the lower body surface where they conjugate and exchange genetic material. Once every 40 days or so, a cell will develop into a larva, which then drops from the parent's body.

Hive planets are mostly wilderness, and the larvae enter the wilds, where most are killed. After about a year, survivors return to civilization, where they are welcomed into any nest (the first they come to) and begin their education as citizens. Parental instinct in Hivers is very strong, and the entire nest adopts the young. (Note that this instinct applies only to the year-old returnees; Hivers have no concern for the younger larvae, and in fact they consider them minor pests.)

Hiver language is a combination of arm/tentacle waving and physical contact. The written language is ideographic and is used as a standard language among the races of the Hive Federation. Hivers talking among themselves use all three aspects of language (gesture, touch, and writing) at once, a process capable of great subtlety and sophistication, but unintelligible to the outsider.



Travellers' Aid Society

TAS is an interstellar organization dedicated to assisting its members as they travel throughout the Imperium and beyond. With offices at most major starports, TAS provides several services:

- Member hostels at all Class V starports (fees depend on local conditions).
- Free access to the *Traveller News Service* on all worlds with TAS offices, and free Travel Zone advisories (p. 70).
- One paid middle passage per *month*, redeemable on any starship line, or for Cr1,575 in cash.

A one-time MCr1 fee purchases a membership, or sometimes the Imperium awards one for long service or acts of extreme heroism. Membership costs no character points, but bestows Comfortable Wealth. Characters of lesser Wealth must pay for the upgrade.

Customs

Minutes out of J-space we were hailed and ordered to stand to for customs inspection. You don't argue with the customs service, so we meekly allowed their cutter to dock, cursing not a little as a MarchLines subbie that came out of jump just after us sailed straight in without an inspection. MarchLines must have negotiated docking privileges, the swine!

The inspection team came aboard: two techs, an officer-in-charge, and a pair of armored goons with rifles. Like we were going to start anything! Ever since those lunatics at Bevy tried to take the inspection team out they've backed up the cutters with an SDB. You can't do much with a battery of lasers aimed at your bridge.

The techs departed, each accompanied by a goon, to mess about with bits of my ship in the hope that they might find something interesting – like I could afford to buy anything worth smuggling! The officer asked for the ship's papers. Why do they call them that? It's just a set of data entries on the computer. Anyway, I handed over the datachip, and she went through the little ritual of inserting it in the reader and scrutinizing every line. Like she hadn't already interrogated the ship's computer from her cutter, read everything there was to know about us and cross-checked it with naval records.

I can see the point of the inspection. I could tell my computer to lie about the ship – falsify the papers if you like – but why read the same data twice? If it's on the so-called papers, it's in the computer!

Maybe they just do it to make us think we're getting our money's worth out of the customs service. Whatever.

She handed me the papers. "All in order."

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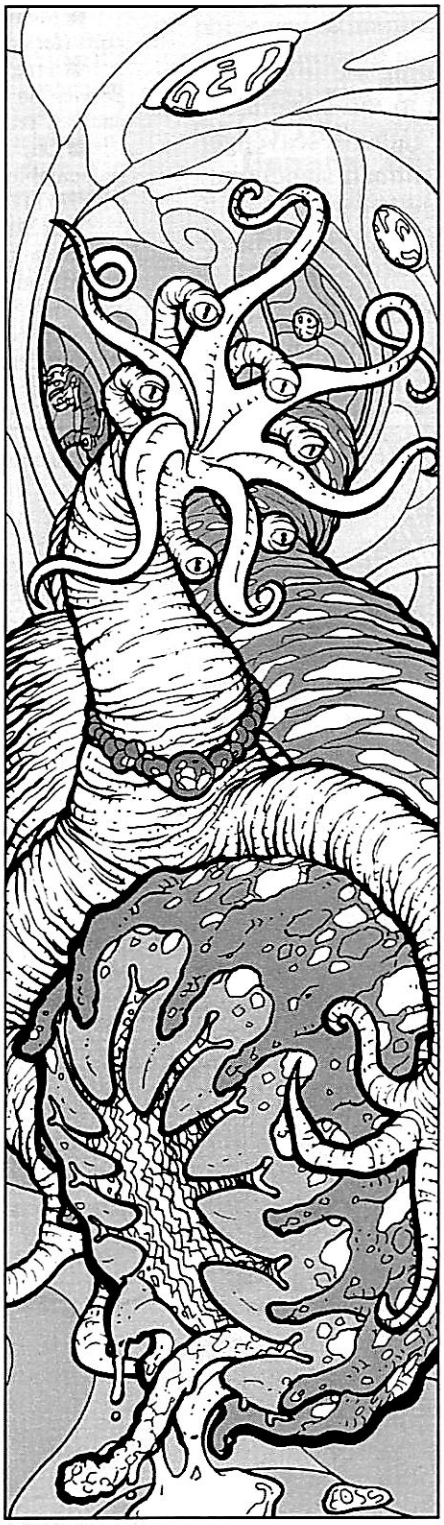


Hivers are unique among major races in that they had a complex culture before becoming sentient. Originally, they lived in the tunnels and built-up mounds of a large (2,000-pound) burrowing animal (known as *snohl,* or burrowers). In exchange for shelter, they gave food. They farmed fungus and foraged outside for decaying plants and dead animals as a source of food for the fungus.

Snohl were allowed to graze in the farm tunnels. Hivers ate the fungus and whatever fresh food they could find outside. Intelligence arose as the outside environment changed, forcing the foraging parties to travel farther to discover new sources of food and fertilizer; foragers advanced from simple scavenging and gathering efforts to complex cooperative efforts of hunting and trapping live game.

Today, fungus remains the staple of the Hiver diet; fungus-growing is a highly developed art. Most buildings retain the beehive shape and large underground tunnel complexes of the original burrowers, but they are constructed by machines; the burrowers are now reduced to the secondary function of keeping the tunnels clean. Hiver attachment to them is essentially non-rational; they just feel more comfortable with *snohl* around.

Society. Hive society is highly individualistic. The term "Hive" results from an early Human misconception stemming from the appearance of the Hivers' building and tunnel complexes, which were seen as resembling a nest of social insects, and labeled a "hive." Nests contain from five to 500 individuals, who are usually centered around some common endeavor.

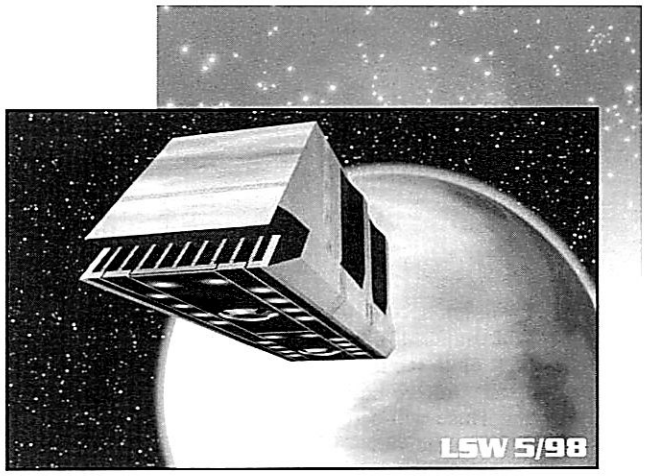
While 100 is an average size for a nest (and was the largest size in pre-civilized times), larger groups may come together for some civilized purpose such as large manufacturing companies or universities. Small nests are usually spaceship crews or isolated research parties. A young Hiver will spend his first 15 years in his home nest; thereafter, nest changes may take place as often as a modern Human might change jobs.

Because of the nature of their reproduction, Hivers never experienced the population pressures so important to Human history. The population of the homeworld is now only a few hundred million, only 10 times greater than it was in prehistoric times. Predators control the young; when the adult survival rate rises, thus increasing the numbers of young produced, the predator population increases proportionately and the balance is maintained. Space colonization arose not from pressure but from curiosity, with which Hivers are amply endowed.

The Hivers have colonized only those planets with climates most pleasant to themselves; if the planet has no predators that eat Hiver larvae, they are imported. Because of the high birth rate, a colony will rapidly reach its maximum population level of a few hundred million and then stabilize. Hivers like planets of diameter 6,500 miles or less, with thin or standard atmospheres and unvarying climates. Hiver enclaves for commercial or scientific purposes are found on worlds of more extreme characteristics.

Hive industry and business excel at communications technology and robot construction. Major exports include artificial and computer languages, translators, and sophisticated electronic hardware of all types. Hiver mathematical systems are much in demand for their power and elegance.

Hive Federation: Human term for the loose interstellar community dominated by the Hivers; Hive Confederation is also sometimes used. The Hivers have only one culture and one language; the Hiver genotype (with individual variations similar in degree to differences between individual Humans of the same race) is also constant.



The Federation government (if such a term is at all applicable) is mostly concerned with maintaining the uniformity of the Hiver culture and species. This is accomplished by frequent reproductive embassies from one planet to another. Members of many different nests will shake hands with everyone nearby in a sort of farewell party, and will then board a large embassy ship bound for a far-off world. Once there, they will meet with as many people as possible, shaking hands and exchanging news, art, gossip, scientific information, political views, and so on for about a year. They will then return home for another year-long round of parties, discussions, and handshaking.

Most disputes among communities are handled in these embassies; others, considered too urgent or transient to wait for an embassy, are settled by judges. There is a considerable body of Hiver common law and custom, and a judge is a person who has spent years in study of the law; judges' decisions are not necessarily binding and are open to compromise, but they carry a great weight of custom.

The discovery of alien races and their integration into society required a slightly more formal organization, which grew out of the coordinating body whose job it was to schedule embassies. Two additional bodies were established: the Federation Navy and a development agency.

The Hiver parental instinct was aroused by the discovery of numerous intelligent species less fortunate than themselves, and work began immediately to lift the "children" to civilization. An early experience with an aggressive race led to the establishment of a system of quarantined worlds, denied entry to (or knowledge of) interstellar society.

Covert operations are in progress on quarantine worlds to modify overly aggressive cultures into acceptable members of the Federation, and several quarantined planets have been opened since the beginning of the program. So far, no quarantined race is close to achieving interstellar travel on its own; public debate continues on what to do in such a case.

The navy is the main instrument of military force. Hivers came late to the concept of war and are more comfortable with high-tech, long-range violence; they dislike the personal approach of ground combat.

When ground forces are absolutely needed, other races of the Federation generally supply the troops. Federation armed forces are essentially a deterrent force and are seldom used as an instrument of policy.

Other races of the Federation are equal partners in society, although the structure of society is Hiver-generated, and those races able to adapt best to a Hiver way of life and customs have been most successful. All races participate in the embassies, although in a modified form.

Some associated species retain strong internal governments or police forces to regulate the aggressive tendencies of their members, but whatever solution is reached, all Federation member societies are non-aggressive.

Most worlds of the Federation have communities of several species; races inhabit the worlds they find most pleasant.

Customs

[Continued]

"Thank you, ensign," I said, trying to be nice in the hope of getting to the port a bit quicker. But no. Not a chance.

"Tell me, captain. Are you really shipping frozen prawns? Eighty tons of them?"

"Yes, ensign. Frozen prawns. Nothing but. You can have a free sample if you like."

"I don't think so. I have reason to believe you're carrying contraband. I'll have to order a full search of the ship. It'll take about three hours."

"Three hours!" I burst out. "But I have a buyer waiting. The ***March Eagle*** *is already in port. I'll lose the deal!"*

She smiled stonily, her right hand close to her sidearm just in case, "You could always try to bribe me. In which case the inspection will take all day."

"Did MarchLines pay you to hold me up?"

The smile went away as she snapped, "No. Just a routine inspection to keep cutthroats like you from shipping nerve gas or Gauss rifles to the peasants. Take me to your bridge and I'll call in the second inspection squad."

"Certainly, ensign." I was about to add something but bit it back. I had a feeling that the inspection would take twice as long if I said what I really thought.

Meanwhile MarchLines was already in port, selling their cargo. They'd nobbled me again. But I had an idea . . .

– Captain Rik Frain,
Free Trader ***St. Hilaire***

Other Holidays

We do not specify other holidays in the Imperial calendar; these are left up to the individual GM, who may or may not consider such details important. There will certainly be days of significance to individual worlds as well: veterans honored, battles lost and won, religious events, and so on.

Off to a Bad Start

We'd made a deal. The Human, Halsine, had outlined the job. I'd quoted our fee. He'd winced. We'd bargained. He handed me a datachip in its protective case, reached across the desk and shook my hand . . .

. . . and I heard someone breathe "Now!" outside the office door.

By the time the door slammed open, propelled by a heavy boot, I was out of my chair and diving for the far corner of the room. Before the two Human goons had cleared the doorway I'd landed hard and rolled up against the wall. My autopistol was already clear of its holster.

Halsine, moving fast for a pink, had time to reach into his desk drawer before they shot him. Both of them fired twice, throwing my new employer back in his chair. He slumped back, his unfired pistol falling from his hand.

They started to turn in my direction, but I wasn't waiting to touch noses. I fired from the floor, slamming a dozen rounds into the nearest one. His packmate tried to step to the side for a clear shot, but if he got one off, it went wide. I nailed him at least twice, in the neck and head. No question about that kill, either.

Or about Halsine. My employer had taken four heavy rounds in the chest. Humans are tough, but not that tough. The room stank of blood and propellant, and I had to get out of there. I closed his staring eyes – the Humans have that custom, too, did you know that? – and was out of the office and down the hall at a trot.

I had to find a phone and warn the others, and I didn't know who might be looking for us. There was more to this than Halsine had said, and I had the feeling that the datachip in my pocket was going to be a lot of trouble. But we'd made a deal.

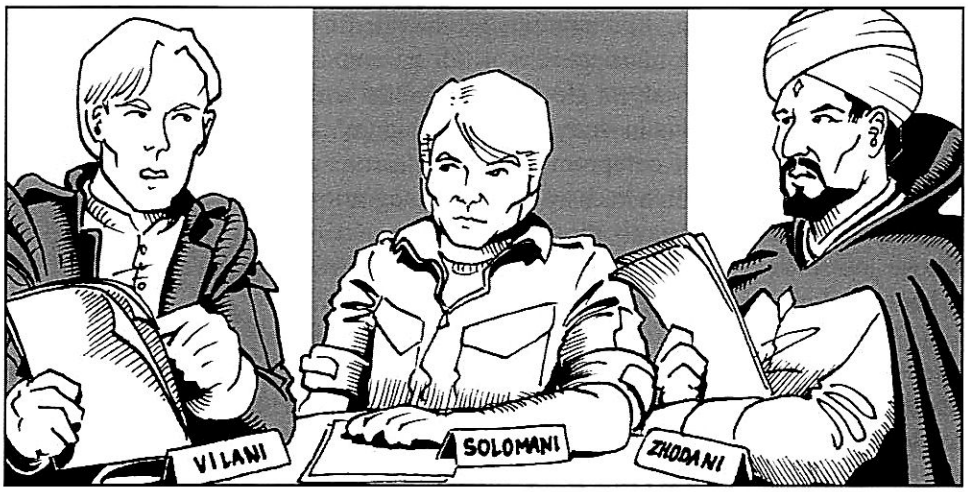
Holiday: The first day of the year, 001. A day of secular celebration in commemoration of the end of one year, but primarily celebrating the start of a new one. On most worlds, the day is one of rest and recreation, but some cultures choose to celebrate it differently, and a few not at all. All but essential Imperial offices are closed on Holiday, and most worlds follow suit.

Holiday Year: The year zero in the history of the Third Imperium, established by Emperor Cleon I to commemorate the establishment of the Third Imperium. Technically an aspect of calendar reform, the use of the year zero provides a central date point for counting years back into the Long Night and forward into the future of the Imperium.

The actual advantages of a holiday year are slight: Centuries begin in the hundredth numbered year instead of the first, and the number of years between any two dates before and after the year zero can be determined by simple subtraction.

More important at the time, the holiday year was used as part of the public-relations campaigns impressing the authority of the Imperium upon local governments. The minor nuisance of changing to the new calendar was used to gauge the cooperation of those governments. See *Imperial Calendar,* p. 39.

Humaniti (former spelling Humanity): Collective name for Human races, including Solomani, Vilani, Zhodani, and others. See *Humans.*



Humans: Intelligent major race dominating the Imperium and several additional interstellar communities. Humans stand approximately 5′10″ and weigh about 170 lbs. Descended from omnivore gatherers, Humans developed intelligence in response to shifting climatological factors.

The most unusual aspect of Humaniti is the fact that Humans are present on many different worlds and stand at various levels of development on those worlds. The Solomani Hypothesis (see p. 61) states that Humans evolved on Terra (Solomani Rim/Sol) from indigenous life, and were scattered to many different worlds by an unknown agency (now believed to be the Ancients) for reasons unknown. The result is that many different, parallel Human races exist and coexist throughout known space.

The three most widespread Human races are the Solomani (Humans from Terra), the Vilani (Humans from Vland), and the Zhodani (Humans from Zhodane). Most branches of Humaniti are interfertile, although some of the more extreme variants are not. For taxonomic purposes, all are included in the family Hominidae, and the vast majority are genus *Homo.* Solomani and Vilani are *H. sapiens sapiens*, Zhodani are *H. zhdotlas.*

See also *Ancients, Humaniti, Solomani Hypothesis, Solomani, Vilani, Zhodani.* See ***GURPS Traveller Alien Races 1*** for more on the Zhodani.

Ilelish, Domain of: A domain of the Third Imperium, consisting of the Ilelish, Zarushagar, Reaver's Deep, and Daibei sectors.

Imperial Calendar: Calendar established at the creation of the Third Imperium as a universal calendar reform. Dates count from the founding of the Imperium, the year "zero." Dates before zero are negative; dates after are positive. For example, Terra invented jump drive in -2431. The Imperium was founded in zero. Emperor Strephon will celebrate his Golden Jubilee in 1121.

Calendar Conversion Table

January	1-31	001-031	July	1-31	182-212
February	1-28	032-059	August	1-31	213-243
March	1-31	060-090	September	1-30	244-273
April	1-30	091-120	October	1-31	274-304
May	1-31	121-151	November	1-30	305-334
June	1-30	152-181	December	1-31	335-365

The year is divided into 365 standard days, which are grouped into 52 weeks of seven days each. The lengths of days and weeks is a legacy of Terran domination during the Second Imperium. Days are numbered consecutively, beginning with 1. The first day of the year is a holiday and is not part of any week. For example, the first day (Holiday) of the year 1120 is 001-1120. The last day of the year is 365-1120.

Imperial Edict 97: This executive order is the enabling act for the use of Imperial warrants. Unusually obscure for such a wide-ranging and powerful edict, it is nonetheless on file at all Imperial installations. The edict text runs to 34 pages, much of it pure legalese; when distilled down, it proves very direct. It requires all Imperial officials to assist the holder with all the power of their office. Only the emperor has the power to issue these warrants.

A similar edict (Imperial Edict 3,097) provides limited power to the archdukes of the Imperium to issue similar warrants, although they are limited in their duration and territory.

Imperial Edicts: Proclamations of the emperor, usually reserved for extremely important matters. Imperial Edicts are numbered in the order in which they are issued, and are commonly referred to by these numbers.

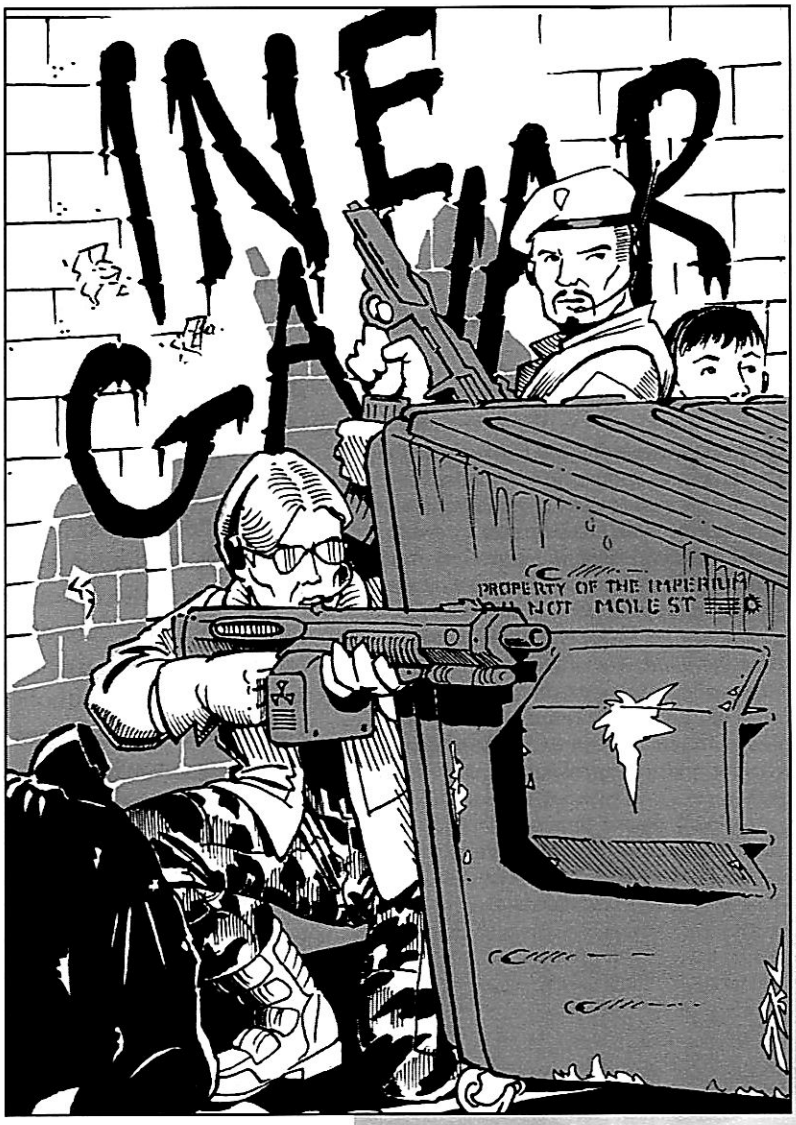
Imperial Identity Document: Also known as the Universal Identity Document, Universal ID, ID card, and a number of other names. The record of every citizen's identity, taken first when birth is registered, and supplemented and expanded as time passes. The record consists of a full genetic work-up, full body and head-and-shoulders holograms, retinal pattern, fingerprints, and other identifying information. The Imperial enabling legislation does not define the

Ine Givar

Every empire has its opposition, and the Ine Givar fill the bill for the Imperium. When we wrote up some of the first *TNS* dispatches, we needed someone to blame for an explosion and invented a band of terrorists. We continued to use them from time to time when we wanted "bad guys." The name was simply a couple of nice-sounding nonsense words.

The Ine Givar often find themselves in the role of scapegoat. Every two-bit criminal and half-baked crackpot revolutionary group prefers to blame their actions on the Ine Givar, and the Ine Givar goes along because it makes them seem larger than they really are. On more than a few worlds, the only Ine Givar presence is an underground propaganda cell taking credit for acts of violence committed by other groups.

Another terrorist group, Solomani in origin, is *Rule of Terra*, p. 58. Links between the two groups are a subject of much speculation. Also see *Ine Givar* library entry on p. 43.



At Standard Noon, 062-1120 . . .

They had bumped and jolted through the mountains for a whole day, until riding in the ATV felt like being inside a huge blender. Finally, they crested the last ridge, and there was the mining camp spread out below.

Sandra popped the hatch and breathed deep as she took in the scene: the prefabricated base sections, the vehicle shelters, and the humming of powered-up machinery.

And the bodies, scattered about the camp like a child's neglected toys.

■■■

It'd been years since he was here. The last time he'd seen Stanley Highport was as he climbed into a transport to go home with the rest of the battalion. They'd fought hard and well, and the war was won.

Sixteen years later the memories were blurred a little, but the faces hovered at the edge of memory. He saw few of them now, not since a terrorist bomb had earned him a medal and a medical discharge. Now there was a new life as medical officer aboard the Free Trader Harlequin. But he missed the army life, missed his old comrades. Missed the regiment. He turned back to the viewport with mixed feelings.

What would it be like, coming back to this place as a civilian?

■■■

The suit was bulky and just a shade too hot, the gloves clumsy on his hands. There was that worrying cold spot on his lower back where the environment control wasn't working properly. Danev put it all aside, tried not to look at the stars as they gyrated in his peripheral vision.

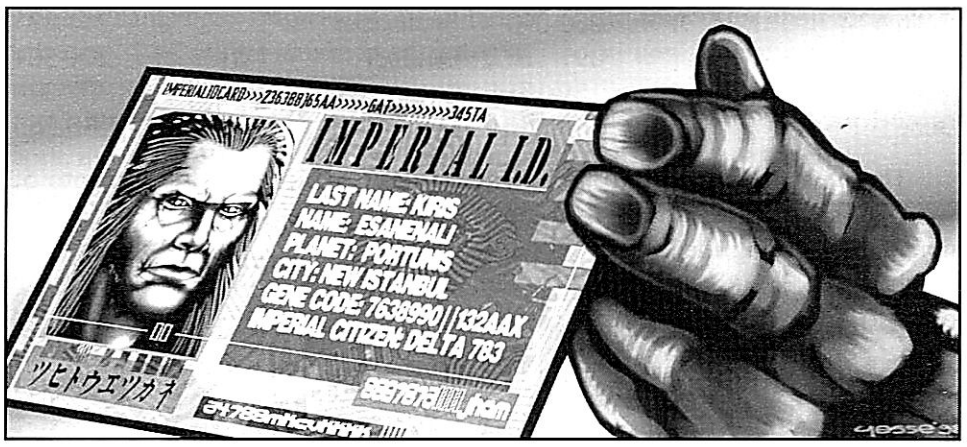
The last hit had screwed the maneuver drive but good. The ship was spinning in space without power, but that was the least of their troubles. In three hours they'd touch the upper atmosphere of Avastan and their problems would all be over.

Join the Scout Service and see the stars! Explore worlds! Meet Humans and aliens! Carry vital information! Serve the emperor! Travel and Adventure for All – never a dull moment! At least the last part was right.

Danev blanked out the stars and kept working.

form of the documentation, but does specify what data must be recorded for various sophont species, and how the data is to be verified at all tech levels within the Imperium. Additional information – such as criminal, medical, and educational records – may be recorded on the portable form of the document. Planetary governments at all tech levels are capable of issuing the most primitive form of the document, which consists of a plastic card incorporating a data chip with the minimum data recorded within, and with holographic images, thumbprint, and other features on the surface. Sophisticated versions of the ID are capable of carrying a virtual dossier in their data-storage systems, and are capable of projecting and displaying all of the data in a wide variety of formats.

Although in theory every citizen must have an Imperial ID, in practice they are needed only by those who engage in interplanetary or interstellar travel. Full ID checks are rather a nuisance, and their implementation is at the referee's discretion.



Imperial Research Station: The worlds of the Imperium manifest a wide range of technological levels. The Third Imperium has always allowed its member worlds a wide degree of latitude, and it meddles very little in local affairs. With communication limited to the same speed as transportation, a single off-world query can involve weeks, months, or even years before a reply is received. In addition, the cost of off-world transportation (in both time and money) tends to limit the interchange of information, the shipment of experimental prototypes, and other such activities that are basic to the dissemination of scientific knowledge.

Most worlds have found that simply purchasing advanced technology from a neighboring world is impractical. Not only is such high technology expensive, putting it to any cost-effective use requires that the technology be understood.

Consider: As useful as TL8 solid-state chip circuits are, they cannot be used on a large scale without the knowledge of electronics or the ability to provide supporting circuits (power circuits, circuit boards, and so on), which further implies a knowledge of photo processing, and even crystal culture. In the final analysis, attempting to jump to a higher tech level without passing through any of the intervening tech levels just doesn't work: One must pass through the lower stages of technological development on the way to higher tech levels.

Regardless of what the individual member worlds do, there are also certain large-scale interests in the Imperium which back research projects. Such research is generally privately backed (such as under contract by multiworld corporations), and it is sometimes performed in Imperial Research Stations.

The Imperium finances research into a variety of areas. Sometimes this is an attempt to duplicate technology observed or reported in neighboring cultures and not yet within the ability of the best known science in the Imperium. Other

times, the research covers an area of interest expressed by some Imperial body (such as spinal-mount weapons research performed by the Imperial Navy).

Imperial-backed research may delve into many areas. Some examples include black holes (both large-scale and miniature versions), instantaneous transmitter development (so far proving impossible), antimatter containment, new weapon development (such as disintegrator beams), black globes (force-field technology left behind by the Ancients), deep planetary scanning, psychohistory, mass population behavior prediction, genetic transformation of living organisms, self-aware robots and starships, stasis and time travel, personal shields, memory transfer, and total rejuvenation.

Imperial research stations may be located on worlds which need a boost to the local economy or in remote systems far from the potential disturbance of Imperial politics. Many different stations may be located in several systems of the same region, and many different areas of knowledge may be under investigation at one time.

In general, however, each station is constructed for one purpose, and it continues delving into a single area of knowledge for its entire span of usefulness. Its size, personnel roster, power plant capacity, and even visibility profile are dependent on its area of investigation.

Private Research: On a scale as vast as the Imperium, it's often cheaper to duplicate research than search out and contract for technology elsewhere in the Imperium. However, trade between worlds tends to introduce new knowledge and technology to those who do not yet have it. If a certain off-world item proves useful, local companies may try to achieve the same technology with the goal of entering into local manufacture. Local manufacture has the advantage of taking into account local preferences, as well as providing local employment. It also avoids potential problems with licensing agreements and arrangements.

Imperial Rules of War: To mitigate most of the potentially disastrous aspects of armed conflict, the "rules of war" evolved as an accumulation of unwritten concepts, which were established on a case-by-case basis.

The rules of war have never been officially codified, both to prevent them being seen as an Imperial endorsement of war and to keep formal precedent from preventing Imperial intervention whenever the Imperium deemed it necessary.

The main aim of the rules is maintaining the economic and military well-being of the realm. They give the Imperium the right to intervene only when local military action threatens this well-being. The primary causes of instability, as viewed by Imperial analysts, have been long-term economic dislocation and excessive extra-planetary influence.

Long-term social or economic dislocation is suffered when a region loses its ability to carry on at its prewar level of economic activity.

Excessive extra-planetary influence is even more vague. Historically, the Imperium has tolerated the use of force as an outlet for built-up sociopolitical pressures. In such cases, a short war is deemed preferable to continuing tension, sabotage, political agitation, etc. Attempts by extra-planetary forces, such as off-world governments or large commercial interests, to seize control of a world's affairs are beyond the scope of the "safety valve" rationale.

"Assistance" is tolerated so long as it is deemed appropriate to the level of legitimate interest in the affairs of the world held by the extra-planetary organization. For example, the Imperium has often tolerated the provision by mega-corporations of training cadres, arms, equipment, etc., on a limited scale, and even of providing fully equipped combat units to local governments. When it has appeared that the primary burden for the conduct of the war has been car-

"I Have a Bad Feeling About This . . ."

The city was old, very old. Maybe even Ancient. The buildings were low and rounded, as if built to last through the centuries. Vines and weeds and even small trees grew in the spaces between. The stone – if the gray-brown material the builders had used really was stone – of the buildings was weathered by countless years of rain and wind.

Kendall hefted his rifle and looked around again. There was definitely something alien about this place, like it was something Humans weren't meant to see. Maarien could feel it too. He could see it in her eyes. The profs, husband and wife, were just too curious to be wary, and Brindle had vanished a few minutes ago, probably looking for something to filch.

Kendall swore softly, his trained instincts warning of a danger he could not see. His eyes met Maarien's. He saw her hand pat the pistol holster at her side.

"What is it?" Kendall said softly.

"There's something here," she replied.

"How can you know?"

"I just do," she said, a little more loudly. "Kendall, I'm scared. Let's find the others and get away from here."

"Glad to. You think we're in danger?"

"Yes. It's this place."

"What about it?"

"It's . . . hungry," she whispered.

Coreward Encounter

*The starship **Menaiin** – Menagerie to anyone who's met her crew – is an oddity to end all oddities. She's part Aslan freighter, part Droyne scout, and part Imperial free trader. Presumably some madman found a collection of bits in a scrapyard and welded them together at random. I've run into her in a few ports, mainly in the coreward subsectors.*

Her crew seems to be a collection of waifs and strays picked up along the way – a Droyne sport, a couple of female Aslan, a Darrian or two, several Imperials. The crew changes all the time, except for that Droyne. Tskiloyi, they call him. No idea what that means.

They always seem to be going somewhere in a hurry, and always looking for something. Sometimes they're offloading a boatload of the strangest stuff you ever saw . . . other times they're shipping frozen seafood or disposable footwear like the rest of the free traders. I never have figured them out . . . but then nobody else has either.

*Last I saw of them was on Aramis, buying up a few tons of aluminum foil and portable heaters. Now what would they want **that** for?*

A Concise History of Ziru Sirka, Part II

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116

Exploration and Exploitation

Between 4400 and 1400 B.C., the Vilani explored, exploited, and settled virtually every world they contacted. Initially, their emphasis was on exploration and contact, but over the centuries, Vilani settlement inexorably followed. Worlds closest to Vland were settled first, but the star catalogs were bulging with worlds ripe for colonization and exploitation. Barren worlds were exploited for immediate gain; their resources were strip-mined and shipped off to feed Vland's growing industries.

Inhabited worlds were subjected to exploitation as well, but on a more subtle basis. Exploration revealed a number of technologically primitive races on worlds within 60 parsecs. None had developed interstellar travel; few had advanced even beyond the Iron Age. All were ripe for domination by the Vilani. The Vilani imposed their culture, their law, and their interstellar economic community on all the worlds they encountered. The subject races made few objections; the rewards were far too great when compared to the sacrifices they were called upon to make. Vilani help (or interference) gradually brought the subject races to a high technology level. The Vilani culture had no concept of a "prime directive" banning interference with local cultures. Instead, Vilani culture and technology were handed out wholesale to bring the many non-Vilani races forward. Early Vilani conquests were not military; they were more subtle exercises in economic subjugation.

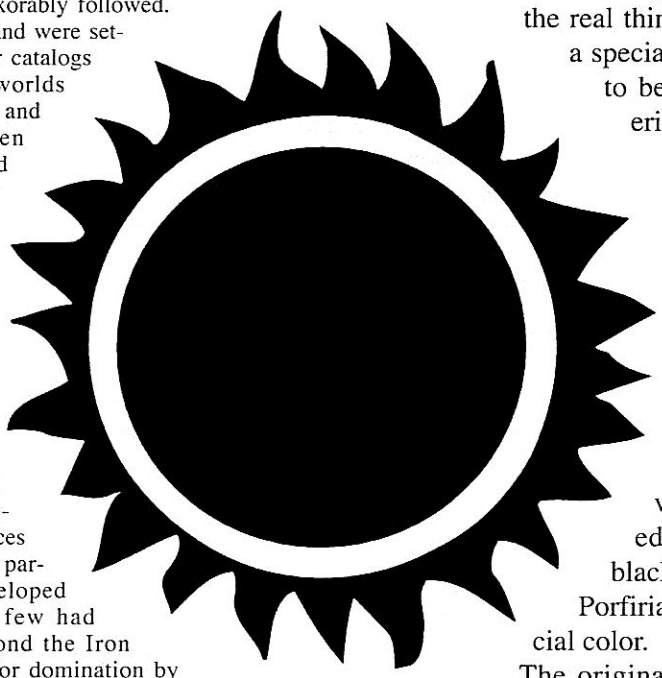
Continued on next page . . .

ried by an extra-planetary power, the Imperium has intervened, claiming the power is using the misfortune of a local dispute as a pretext for aggression.

Imperial intervention is also guaranteed if any group makes use of or possesses weapons of mass destruction such as biological, chemical, or nuclear weapons. Precisely what constitutes a weapon of mass destruction is not formally defined, and Imperial officers are given vast discretionary powers in enforcement of the restrictions.

Imperial Stationery: The Imperial family has reserved (both by custom and by law) a distinctive design for its personal stationery. Well-known throughout the Imperium through its use for routine messages and for Imperial appointments, the form is cream-colored, embossed with the Imperial sunburst in gold, and incorporates a watermark and other technological security features. Both physical and electronic versions of the stationery are used.

Because it is used for Imperial appointments (even when issued in blank for offices in the Marches and other outlying areas), all Imperial officials are familiar with the design and can readily tell physical forgeries from the real thing. Electronic versions are data-encrypted with a special code lock and require a special hardware key to be unlocked, thus making even electronic forgeries difficult.



Imperial Sunburst: The symbol of the Third Imperium established by Cleon (the first emperor) when the empire was proclaimed. Images show him standing before the original banner with a golden yellow sunburst against a black background, representing Capital's type G star against dark space.

In 247, the Eliyoh (a non-Human minor race) joined the Imperium. To that race the symbology was unimpressive. The Eliyoh vision centered in the far infrared, which resulted in distinction between the official colors of black and yellow being impossible. So the Empress Porfiria declared that the symbol would have no official color.

The original banner in the Imperial throne room is still black with a yellow sunburst. The Imperial Interstellar Scout Service uses a red sunburst, the Imperial Navy yellow, the Imperial Army black, and the Imperial Marines maroon.

Imperial Warrant: Instrument of power issued by Imperial dukes, archdukes, or the emperor. A warrant is a written or electronic document on Imperial stationery provided to trusted agents of the Imperium as a method of bypassing the bureaucracy. Typically, a warrant is provided to an individual who uses the power it provides to accomplish some mission of interest to the issuing official. Missions may include establishment of colonies in areas requiring development, the assumption of military command in the midst of a crisis, or the unilateral establishment of new noble lines to administer provinces which have suffered from war or economic collapse.

For example, Strephon sometimes exercises power through agents rather than directly through the bureaucracy of the Imperium. These instances are rare, although there is reason to believe that such agents are more numerous than it appears. The Imperial warrant would contain a statement similar to this example:

"Capital. The bearer of this warrant is acting for the good of the Imperium and the Emperor. Extend him every assistance. Strephon."

The most recent Imperial Warrant (at least the most recent known to the general public) was that issued to Duke Norris of Regina shortly before the outbreak of the Fifth Frontier War (q.v.), and used by him with great effectiveness during that conflict.

See also *Imperial Edict 97, Fifth Frontier War.*

Ine Givar: An anti-Imperial terrorist organization, primarily active in the domain of Deneb, but with branches throughout the Imperium. Little is known of the history and organization of these terrorists, but Imperial intelligence sources believe they are at least partly funded by the Zhodani (something which some cells of the Ine Givar deny, but which others acknowledge).

Also see *Ine Givar* sidebar, p. 39.

Interdiction: The Imperial practice of interdiction of worlds within the boundaries of the Imperium had long been a source of contention between liberal and conservative factions in the government. Interdictions must be approved by the emperor or one of the archdukes, but generally such approval is given in response to a request from an interested service, which is almost always the Scouts or the Navy, and is virtually automatic.

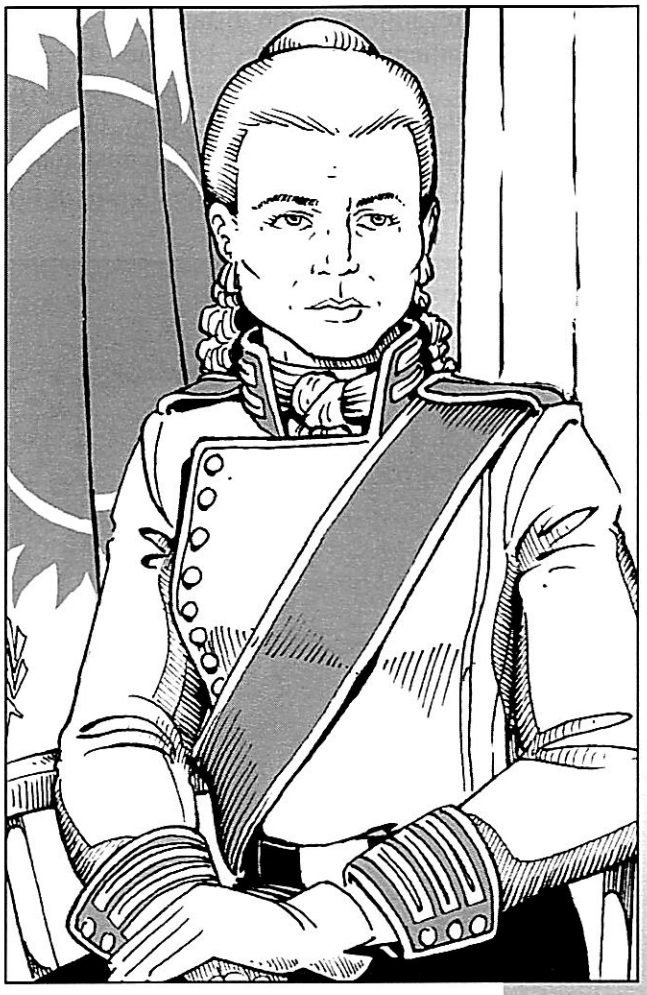
It is generally held that the Scouts recommend interdiction to shield a young or sensitive culture from the interference that trade and commerce will bring.

The Navy is held to be more vindictive in its recommendations, the accusation being that it uses interdiction to punish local governments or to hide its own mistakes.

Interdicted worlds are awarded "travel zone red" ratings by the Travellers' Aid Society (p. 35).

See also *Red Zone.*

Iolanthe (b. 1052): Imperial Empress Iolanthe Guuilbataashullibaa Alkhalikoi. Iolanthe, the daughter of the senior duke of Gushemege sector and member of a prominent Vilani noble family, married Strephon in 1079. Her primary avocation is the preservation of developing cultures within the Imperium. See also *Strephon, Ciencia Iphegenia.*



Iridium Throne: The symbol of the office of emperor of the Third Imperium.

The term originally referred to the physical throne, constructed of the metal iridium, but over time has acquired a larger meaning.

Isis: (b. 1088) Isis Arepo Ilethian, archduchess of Ilelish, daughter of Archduke Dulinor (q.v.) and Lady Jessica Ilethian. She was appointed archduchess 001-1117, succeeding her father, who died the previous year.

Archduchess Isis was born on the same day as Grand Princess Ciencia Iphegenia (see p. 25), and (being of families from the Imperial court) attended the same schools. Because of this, the two have become close friends.

A Concise History of Ziru Sirka, Part II

[Continued]

The Coming of the Bureaux

This 3,000-year period of exploration and exploitation was perhaps the most vital in Vilani history. But an empire more than 60 parsecs across is difficult for any government to rule. By 1480 B.C., a starship took more than 60 weeks to cross Vilani territory from border to border. It was impossible for the careful, constant control endorsed by the Vilani to be exercised across such vast distances. Over the course of several decades, the Vilani homeworld government established three subordinate governments – the bureaux – which were each assigned a portion of the overall territory to govern, defend, and exploit. Makhidkarun controlled the territory in the direction of the galactic core. Naasirka received territories nearer to Vland. And Sharurshid, controlled by interstellar merchants, was assigned territories in the direction of the galactic rim.

Each bureau was a complete interstellar government operated for a profit, but responsible for the welfare of its citizens, control of its subjects, and defense of its territory. Each bureau had rights of taxation, defense, and legislation in its territory. A bureau's fleets protected its shipping and trade; its armies defended its installations and conquered new worlds if necessary. Mutual assistance agreements allowed the bureaux to call upon each other for help. But while each bureau was a self-sufficient government controlling vast numbers of worlds, all three were nominally responsible to a central ruling council on Vland, the Igsiirdi.

The Igsiirdi ruled Vland. It received tribute (or taxation) payments from the bureaux and used the funds to administer public works on Vland. It also allocated newly discovered territories to the bureaux. The three bureaux appointed the Igsiirdi's members, and in practice, it served as a forum within which the bureaux could communicate, interact, and eventually reach decisions governing them all.

Alternate FTL Drives

If desired, Game Masters may incorporate other FTL interstellar drives than jump drives (as described on p. 13 and in the *Jumpspace* entry on this page), provided that they are slower than one week per parsec (3.26 light years). While this is not the case in the formal background history, no major violence will be done to the background if any number of alternate means of interstellar travel are allowed to exist, provided that the jump drive remains the fastest.

GMs may even introduce FTL radio, should they wish, provided that it is also slower than the speed of physical travel (although this may have unforeseen repercussions).

Further Research Is Needed . . .

"Many will think my next statement to be intended in humor, but I assure you that I am completely serious: Those who are not confused by the details of jump theory have not studied it deeply enough. I envy those of you who feel you understand what happens when a ship enters jump – I felt the same myself, 60 years ago when I was an undergraduate. By the time this course is over, you will be as mystified – and as fascinated – as everyone else in the field."

– Professor Chiraa Khoor,
Lecturer in the Physics of Jumpspace,
University of Regina

J

Jump Dimming: The transitions to and from jumpspace are momentous occasions during an interstellar trip. Following an old Vilani superstition, the pilot of a ship customarily dims the ship's interior and exterior lights before going into jump. Historically, this custom derived from the need for most of the ship's power to be diverted into the computer and jump-drive systems, so that the jump drive could be guided into creating the jump field properly. Non-Vilani pilots do not follow this tradition, which has not been necessary for centuries.

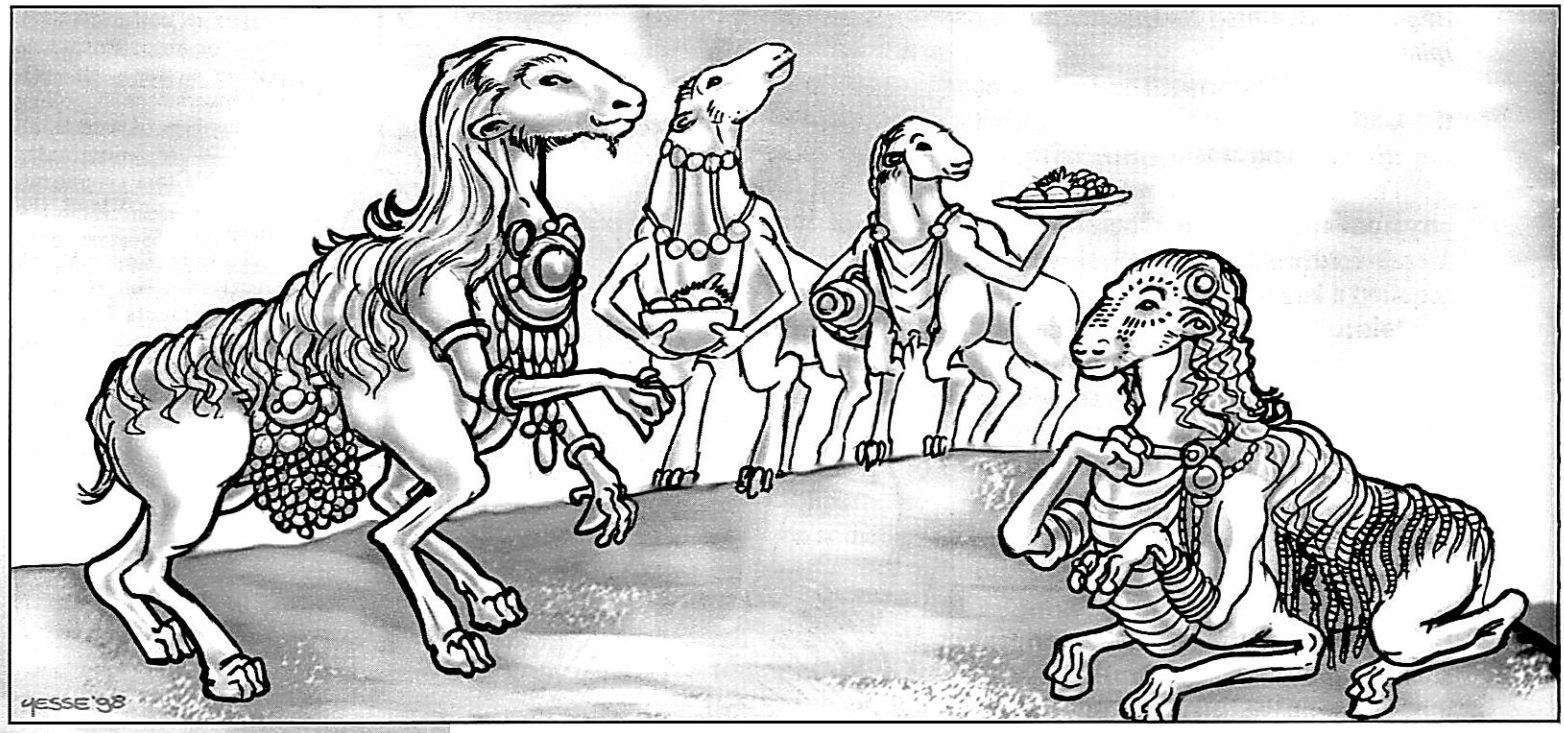
Lights on a ship are typically dimmed for a period of about two minutes; the lights are brought back up to full strength as soon as the ship is in jumpspace.

Jumpspace: The basic concept of interstellar travel, that of an alternate space. Jump is defined as the movement of matter from one point in space (called normal space) to another point in normal space by traveling through an alternate space called *jumpspace*. The benefit of jump is that the time required is relatively invariant – about one week. If the distance traveled is greater than can be covered in one week in normal space, then a gain has been made. Jumpspace makes possible enormous gains. Jump drives are described by the distance they allow, from jump-1 (1 parsec per week-long jump) to jump-6 (6 parsecs in the same time).

Entering jump is, in theory, possible anywhere, but perturbations due to gravity make it safest to begin a jump at least 100 diameters out from a massive body such as a world or star. Ships are naturally precipitated out of jumpspace before they get too deep into a gravity field.

Normal jumps take 168 hours (plus or minus up to 10%) to complete, regardless of the distance traveled. That range is between 6 days, 7 hours, 12 minutes and 7 days, 16 hours, 48 minutes.

Sometimes a jump goes wrong. Catastrophic failures (called misjumps) can destroy the ship and its crew. Other failures can destroy a drive or send a ship in the wrong direction. Some misjumps reduce a jump-6 to a mere jump-1, or convert a jump-1 into jump-10, -20, or higher, and in a random direction.



K

Kedzudh, Commonality of: Loose interstellar government in the Vargr Extents. The Commonality dates from 1044, when several world governments joined together in an attempt to suppress piracy. The Commonality government has limited powers of taxation; government institutions include a small navy/police force and a university. Individual worlds conduct their own interior and exterior relations. See pp. T:AI76, 78-79.

Kirur (Ruupiin/Thirty 1315 B863A03-F): Homeworld and capital of the Two Thousand Worlds, the interstellar empire of the K'kree. The planet's oceans are extremely shallow and the world exhibits almost no volcanic activity, which is very unusual for a world of its size. Kirur has one large continent, which was conquered in prehistoric times by the current ruling clan. Kirur is one of the most politically stable planets known. See ***GURPS Traveller Alien Races 2***.

K'kree: The K'kree (occasionally called Centaurs by Humans) are the most massive of the major races and are the only major race to be descended from herbivores. An adult K'kree stands about 5′ at the shoulder and between 6′ and 7′8″ tall when standing erect. Weight averages 1,000 lbs. They are bilaterally symmetrical, hexapedal, and homeothermic. They bear some resemblance to the centaurs of ancient Terran myth, a trait noted by the earliest Human explorers.

The arrangement of the manipulative organ (or hand) on the front limb is one of their most interesting features. Complex or cartilaginous tubes permit the fingers of the K'kree hand to telescope up out of the way when the hand is used as a weapon. Fully extended, the fingers are mutually opposable to each other and to the "thumb," which is in reality an extension of the ulna. The K'kree hand is very flexible, but somewhat weaker in grasping power than the Human hand.

Like mammals, the K'kree are covered with a short gray or black fur and with a dense black mane covering the head and neck and upper back of both sexes. Unlike mammals, the young are fed partly digested, regurgitated food instead of milk. Males average 15% to 20% larger than females.

Rightness

K'lat'rr cannot be closely translated, but gives the scent of far horizons beyond rolling and unbounded prairie, red-golden backek releasing its flowery-sweet pollen in waves before the gentle breeze, on which floats the dark, wet, and ozone-tingling smell of recent thunderstorms, mingled with the wet and comforting scents of family close by. Can such a scene fail to excite you, to set both hearts pounding in joy and . . . rightness?

Rightness . . . belonging . . . these perhaps best describe ***K'lat'rr****, which signifies that everything is in its proper place, in its proper order, as it should be. An old Terran songweaver spoke of "God's in his heaven and all's right with the world." If by "God" he meant* ***Ghik'keeriklk'ak T't'tkahk Xeng Kirr Tkexirr****, he scented the concept with perfection.*

– Noble Diplomat K'agzi, of the K'kree mission to Capital, in an interview transcribed 227-1110





K'kree are extremely conservative in all aspects of their culture. Ceremonial military units (such as bodyguards) are armed with equipment which K'kree military technology outdated centuries ago, and (aside from modifications made necessary by the invention of spaceflight) K'kree government has not changed significantly in centuries.

Because of their origins as plains-dwelling herd animals, the K'kree are claustrophobes; they cannot stand to be enclosed. K'kree cities are clumps of low, broad buildings; the interior is never more than one story in height, which allows the sky to be visible. Internal building divisions are achieved with curtains or tapestries, but these are very rare. Modern buildings incorporate walls and roofs of glass or other translucent materials. Internal ventilation creates artificial random "breezes" within the building to keep up the illusion of open space.

K'kree are extremely gregarious. They are never found alone, and will quickly sicken and die if removed from other K'kree for any length of time. Receiving a trade or diplomatic delegation from the K'kree means entertaining the entire family (one or more wives, servants, scribes, assistants, etc.) of the merchant or the ambassador. The K'kree word for "my" refers to a possession of an individual's herd, not to that of an individual. Privacy and individuality are exotic and little-understood concepts for the K'kree.

Society: K'kree society is divided into castes. The system is a remnant of ancient times which no longer fits K'kree culture perfectly, but the K'kree stick with it because it is traditional. There are hundreds of castes, but the distinctions are too faint for non-K'kree to understand. For simplicity, castes can be divided into three general groupings: noble, merchant, and servant. It is possible for a family to rise in caste, but this is a rare occurrence.

The lowest caste, the servants, has come to include farmers, factory workers, and unskilled laborers, as well as servants for all classes.

The next higher caste, the merchants, includes most skilled workers, scientists, engineers, technicians, scribes, and government administrators, as well as merchants and businessmen.

Nobles are the governmental officials (the Krurruna and others), the high military officers, diplomats, and heads of trade and manufacturing concerns. Nobles are usually garbed in much more ornate fashion than the lower castes.

Every male K'kree must serve a term in the military upon coming of age. Warriors are drawn from all castes; rank in the military is determined by the caste of origin (nobles enter the service as general-officer trainees, merchants as lower officers and non-commissioned officers, etc.). Upon completing the required term of service, a warrior returns to his original caste and position. Warriors are the only K'kree permitted to bear weapons, and they are further distinguished by their peculiar flared and horned helmets. They serve as soldiers, police, firefighters, and bodyguards for diplomatic and mercantile expeditions.

Female K'kree are casteless, and take on the caste of their father or husband. Females have no position in government or society other than the rearing of young.

Government: The basis of K'kree government is rooted in the traditional herd system. The basic unit of government is the herd, which consists of thousands of individuals of all sexes, castes, and ages led by *krurruna* (literally: bosses) under a single steppelord.

Disgusting?

"I always wondered if some of the hatred many Imperial citizens feel for the K'kree isn't really revulsion and disgust at the manner in which they nurse their young. I looked it up, and the standard references all have some circumlocution, but basically they barf and their kids eat it.

"Now, really – is this any more disgusting than a lot of things you Terrans eat? Do any of you know what honey really is? Think about that for a while next time you're dumping on the poor K'kree!"

– Humorist Anton Wilson Peale III

In recent times, most herds have been assigned specific geographic areas (several may be assigned to a city or a single herd may be assigned millions of hectares of farmland). A number of herds are governed by a single "lord of steppelords" (usually the ruler of a planet); and the K'kree race as a whole is ruled by a "Steppelord of the 2,000 Worlds."

Calendar: The K'kree calendar is based on the period of Kirur (the K'kree homeworld) around Gzang, its star. The K'kree *pimlbigr* (year) is 439.56 standard days in length.

See also *Kirur*, *Two Thousand Worlds*, and ***GURPS Traveller Alien Races 2***.

Kuzu (Dark Nebula/Kilane 0406 A876986-E): Homeworld of the Aslan race and capital of the Aslan Hierate. For more information, see ***GURPS Traveller Alien Races 2***.

L

Lair (Provence/Grnouf 2402 A8859B9-F): "Homeworld" and capital of the Vargr Extents. Lair has never been accorded any particular status in the hearts and minds of the Vargr race, unlike worlds such as Terra, Vland, Zhodane, Kuzu, and Kirur. Lair was only recently united; several sections of the planet boasted independence until only a few years ago – which is unusual for the homeworld of a major interstellar race. For more information, see ***GURPS Traveller Alien Races 1***.

Lancia: Cultural region in the Gushemege sector of the Third Imperium. The area was extensively ravaged during the Vilani Pacification Campaigns, and afterward resettled from the Vland sector under a special program sponsored by the Makhidkarun (p. 76).

Lanthanum: A rare earth element, the first of the inner transition metals. Vital to the construction of the inner coils of interstellar jump-drive units.

Lesser Rift: Broad expanse of space with a very low density of stars trailing the main region of the Third Imperium. This rift is a pronounced impediment to interstellar travel, for it constrains jumps through the Empty Quarter. The Lesser Rift is "lesser" only in comparison with the larger, more prominent Great Rift spinward of the Imperium.

The Lesser Rift, like the Great Rift, has provided long-term security for the Third Imperium by constraining access to the Imperium's borders.

Llellewyloly: Sophont race native to Junidy (Spinward Marches/Aramis 3202 B434ABD-9). Llellewyloly have five multijointed limbs which function as hands and feet interchangeably; main sensory organs are also located on the limbs. The spherical central body is covered with long, coarse hair. Many body features are adaptations to the extreme temperature variations of Junidy's day.

Llellewyloly have a complex society with many dimensions of social precedence; the same individual may be entitled to high status in one situation and low in another, and to make an error concerning propriety is a serious matter.

Loeskalth: Minor Human race from Gushemege sector; known only from ancient First Imperium records. During the early stages of the First Imperium the Loeskalth culture absorbed a great deal of science and technology indirectly from the Vilani and founded a small empire which embraced, at its height, most of their home subsector.

About 5,400 years ago, the Vilani consolidation destroyed the Loeskalth Empire and absorbed the civilization into the mainstream of Vilani culture. An aggressive and warlike race, the Loeskalth resisted but were ultimately overwhelmed. What is known of their culture survives only in Vilani records of the war, and in fables on several worlds in the region.

A Concise History of Ziru Sirka, Part III

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116

The Consolidation Wars

Although Vilani territory was 60 parsecs in diameter in 1480 B.C., Vilani influence was felt far beyond their established borders. Cultures on the fringes of the Vilani sphere received the benefits of Vilani technology without being subjected to Vilani government. Many such cultures acquired jump-drive techn ogy and explored territories even farther beyond the limits of Vilani exploration. It was inevitable that clashes would occur between the Vilani and these independent cultures.

In 909 B.C., the Vilani invented jump-2 and could travel directly to worlds 2 parsecs distant. Moreover, because of circumstances of stellar placement, many jump-2 routes took significantly less than half the time to run than comparable jump-1 routes.

Vilani ships after 909 B.C. had at least twice their previous speed and a vastly enhanced strategic mobility. The Vilani kept the jump-2 drive a jealously guarded secret for millennia: The drive immediately gave the Vilani the weapon they needed to keep the rest of the universe under control. In 880 B.C., after several centuries of sputtering conflict, the Igsiirdi (expressing the will of the bureaux) launched the Consolidation Wars and committed all of Vland's forces to subjugating the many states on the fringes of the Vilani Empire.

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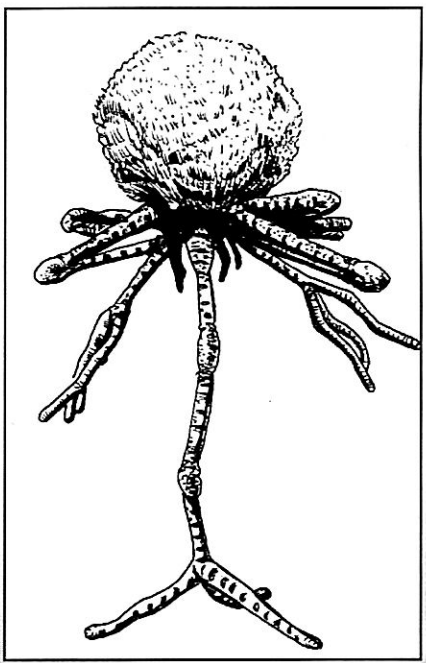

A Concise History of Ziru Sirka, Part III

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When the wars ended in 476 A.D., the Vilani had almost tripled the size of their domain. Consolidation brought a marked change in the texture of Vilani society. Before, it had stressed peaceful expansion as neighboring worlds were assimilated in a trade community and absorbed into Vilani society. Now, armed might and superior technology were used to force any and every neighboring culture into the fold. Over the next 1,000 years, the Vilani conquered all of civilized space and absorbed enemies, allies, and neutrals alike. The Vilani jump-2 advantage virtually assured their ultimate victory in the Consolidation Wars. The Igsiirdi arranged coordination between the bureaux, shared the burden equitably, and prevented overexpansion. The Igsiirdi also allocated new territory to the bureaux once it was conquered, although the bureaux generally agreed before the fact how such territories would be distributed. The Igsiirdi managed the absorption of conquered states. Interstellar states continued to exist as subject states. They were absorbed into Vilani society as much as possible. Races that were unable to fit into Vilani society were severely restricted.

The Grand Empire of Stars

Vland colonized widely between 700 B.C. and 521 A.D., through several decades past the end of the Consolidation Wars. Vland had expanded until no uncolonized civilized states remained on its borders. Beyond those borders were only uncivilized worlds and empty systems.

In 476, the Igsiirdi declared the Ziru Sirka. The Vilani calendar dates from this point. The peace imposed by this Imperium lasted for nearly 1,200 years, but the cost to the Vilani and their subject races was immeasurable. The Ziru Sirka initially had no emperor. Within 10 years, the chairman of the Igsiirdi (elected for life by the council) was the *ishimkarun* – the shadow emperor – an anonymous leader who accepted or rejected the decisions of the council. He ruled through published proclamations, never appearing in public. Upon his death, the Igsiirdi elected a successor from its members.

With cultural maturity, the Ziru Sirka reached a pinnacle of interstellar diplomacy. Client states under Vilani protection or patronage numbered in the thousands. This stability led to raised world tech levels, living standards, and trade levels. At its height (1000 A.D.), the First Imperium contained over 15,000 worlds (via worlds absorbed from conquered states, settled regions which graduated from "territorial" to "sector government" status, and continued colonization of explored space).

Long Night (-1776 to 0): The period of almost universal chaos following the break-up of the Rule of Man (q.v.). The Long Night continued until the establishment of the Third Imperium by Cleon Zhunastu in the year 0. See also *Twilight, Third Imperium.*

Longbow: Acronym for "Long Baseline Observation Window," the name for a system created in the 800s for observation of the galactic core and the Zhodani axis of exploration toward the core. The largest known application of aperture synthesis ever constructed, Project Longbow was a deep Imperial secret throughout its existence, but has since been de-classified. Longbow was created to observe the Zhodani core expeditions, and, after many decades of data accumulation and calibration, was actually able to measure Zhodani shipping activity along the core axis. Because sensor signatures propagate at the speed of light, the observations were not in real time. Rather, the deeper into the core the sensor "looked," the older the signatures.

The Longbow collector plane was located in the Depot/Lishun (1219 Lishun) system as part of the sprawling Imperial Navy facility there, aiding in its concealment. The collector plane was a disk of billions of linked receiver elements 26 billion miles in diameter. This collector yielded a resolution at 1,500 parsecs of 33′ in long-wavelength infrared, and of half a meter in visible light (meaning that objects larger than 1½′ in the smallest dimension could be detected, and two such objects more than 1½′ apart could be distinguished as two objects). According to the Imperial Navy public-relations office, the collector was dismantled when the project was shut down.

Persistent rumors of a second Longbow project continue to circulate.

M

Main: Any grouping of systems forming a chain of worlds all reachable by jump-1. This grouping provides a sort of "corridor" allowing jump-1 capable ships to travel to any world along the chain.

Many such groupings of worlds exist in the Imperium. Prominent examples include the Spinward Main in the Spinward Marches, the Vilani Main centered in the Vland sector, the Sylean Main in Core sector, and the Antares Main originating in the Antares sector.

Major Race: An arbitrary distinction based on the achievement of a specific intelligent race. A race which achieves interstellar travel (jump drive) through its own efforts is classed major; one which does not is classed minor.

To date, generally accepted major races include Humaniti (Zhodani, Solomani, and Vilani, but not other examples), Aslan, the Hive, K'kree, Vargr, Ancients, and Droyne.

The Suerrat (a Human race) are considered minor because their method of interstellar travel utilized generation ships. Similarly, the Geonee were originally thought to be a major race, but their development of the jump drive was based on recovered Ancient artifacts rather than on true racial efforts. Geonee dispute this and hold the (generally unshared) view that they are of major standing.

The Droyne have been demonstrated to be major, for they are now known to have developed jump drive as far back as -7000. At present, however, they do not build or use jump drives to any great degree (there are a few Droyne merchants), and most remain in their scattered systems of their own volition.

Mercenary: The remote centralized government of the Imperium is possessed of great industrial and technological might, but it is also unable, due to the sheer distances and travel times involved, to exert total control everywhere within its star-spanning realm.

Extensive home rule provisions allow planetary governments to choose their own forms of government, raise and maintain their own armed forces for local security, pass and enforce laws governing local conduct, and regulate (within limits) commerce. Defense has been a cooperative effort of local indigenous forces, which is stiffened by Imperial naval bases manned by extremely sophisticated forces. Conflicting local interests have often settled their differences by force of arms, with Imperial forces looking quietly the other way, unable or unwilling to intervene en masse. Imperial forces have been able to operate as a police force so as to not jeopardize their primary mission of defense of the realm. Only when local conflicts threaten either the security or the economy of an area have Imperial forces taken an active hand, and then with overwhelming speed and force.

In this environment, the soldier for hire has found active employment. The tolerance exhibited by the forces of the Imperium have made the hired military force a practical matter. Imperial policy has allowed the marketplace to provide military force to those who can afford it; one line of thought has been that a hired military can be more effectively controlled if it gets out of hand, as opposed to nationalistic or politically motivated military forces. See *Good War/Bad War* and *GURPS Traveller Star Mercs*.

Minor Race: An intelligent race which has not achieved jump drive through its own efforts. For most races, this classification is appropriate. Many are contacted before they have reached a technological level capable of even considering jump drive, thus permanently prejudicing their potential.

Indeed, the shock of such classification, and the realization that this classification pervades interstellar society, is often sufficient to relegate a race to a permanent role as shopkeepers and accountants. Some slump, while others violently resist the classification. The fact that the categorization is informal and arbitrary, and tends to elevate those already in power, has made resistance difficult, if not impossible.

Monadium: Impenetrable bluish-gray metal alloy used as the basic construction material by the Ancients at the site on Antiquity (Corridor/Ian 0816). It has defeated all efforts to determine its exact composition; some experts believe it contains titanium. Even modern TL12 plasma and fusion weapons have been unable to penetrate it, and it cannot be worked, melted, or modified by any known process. Paint can be applied but adheres very poorly, and flakes off within a few weeks.

Moot: The Imperial government's only deliberative body. It has few powers and rarely exercises them. In theory, the Moot includes all Imperial nobles of baronial or higher status, but most nobles do not find it convenient to travel to Capital, and so many of those seated hold proxy votes. Large blocs of these votes can be wielded by a single influential noble.

Technically, the Moot is supreme in the Imperium, but its power is extremely limited. In practice, its deliberations are advisory to the emperor, and he is wise to heed them. The one power of the Moot is to dissolve the Imperium. When this power is invoked, it compels compromise among opposing factions.

When an emperor dies, abdicates, or otherwise becomes unfit for office, the Moot becomes important as the validating body for the new emperor. It has the power to examine the qualifications and credentials of the heir apparent and, in unusual situations, to reject him.

The Moot holds its sessions in the Moot Spire, which, at 5,741′ high, is the tallest building on Capital. By tradition, the Spire is the only building allowed to tower above the Imperial Palace, which is 2½ miles away. Elevators with gravitic compensators can speed visitors from the bottom to the top in 18 seconds. At the top of the Spire is the High Moot, where select committees hold the most private deliberations.

A Concise History of Ziru Sirka, Part IV

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116

Stagnation

Vilani culture achieved stability at the cost of stagnation. Maintaining centralized control over this vast expanse created a cultural rigidity. The three bureaux became increasingly identical. The old Vilani culture which developed during the First Imperium adhered to a rigid caste structure. Hereditary positions became commonplace in all three bureaux. Each citizen had a specific and set place in the universe, and it was each citizen's duty to remain in that place. Society could not afford to let individuals do as they pleased.

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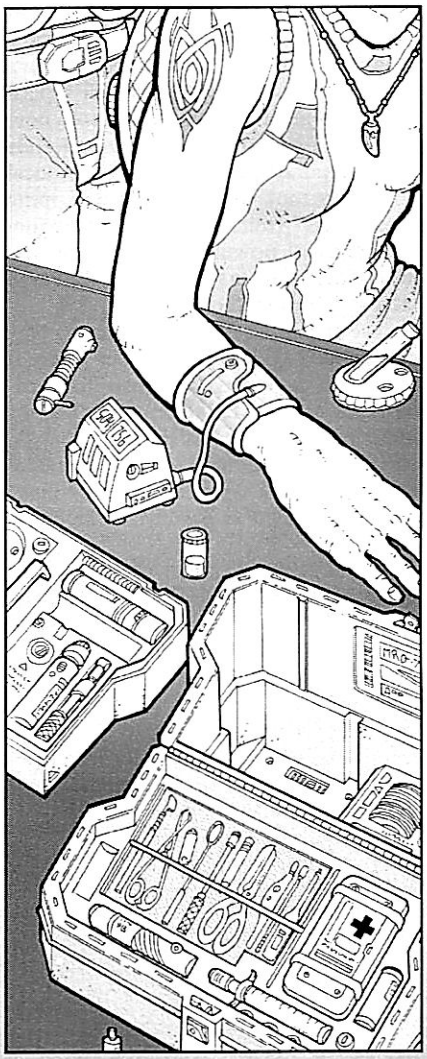

A Concise History of Ziru Sirka, Part IV

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The Ziru Sirka began a long decline about 1500 A.D. The many subject races of the Imperium grew restive, impatient with the imposed culture of the Vilani. Imperial power was waning and stretched thin, and the Ziru Sirka could no longer afford to absorb new interstellar states. The Imperium had been safe as long as no exterior threat arose. But now, despite all efforts, technology had leaked across the borders to aid new interstellar states developing outside of Vilani control. Many threats pushed at many different places along the border. Some detached small portions of the Imperium; Imperial reactions crushed others.

The Crumbling Empire

About 1800 A.D., it was clear even to insiders that the rigid Vilani culture was, in reality, brittle. The young governments took larger and larger chunks of territory, often with the open acceptance of the local citizenry. The texture of Vilani culture was decaying. Officials in the fringe territories began to fabricate their reports rather than reveal the truth to their superiors. Appeals for help or support cost heavily in personal power, so officials simply reported success. Meanwhile, local governors took to hiring and equipping "barbarians" from outside the Imperium for personal power plays. Civil wars, mutinies, and insurrections became increasingly common.

The Imperium used diplomacy to play off enemies against one another where it could. But there was still substantial territorial shrinkage over the centuries, and the Imperium gradually lost territory along its coreward and trailing marches. A movement away from the established, civilized territories started as the Ziru Sirka began to fail.

About 2100 A.D., the wolf-like barbarian Vargr began pillaging the Imperium's civilized territories in the direction of the galactic core. Between then and 2800 A.D., Vargr fleets were a significant factor in the Imperial retreat out of coreward territories. Other border territories were in revolt, and even some interior territories were becoming unruly in their demands for self-government and less rigid controls from above.

It was against this background of a decaying empire that the first Imperial contact with Terra took place. In 2097 A.D., Terran explorers encountered the Vilani at Barnard's Star. The Terrans were understandably surprised to learn that someone else already owned the stars. The Imperium, on the other hand, dismissed the Terrans as simply another barbarian race of little consequence.

Naval Base: Port facility for the support, maintenance, repair, and refit of naval vessels. Planetary surface facilities are generally provided for vessels of 1,000 tons or less; orbital facilities handle larger ships.

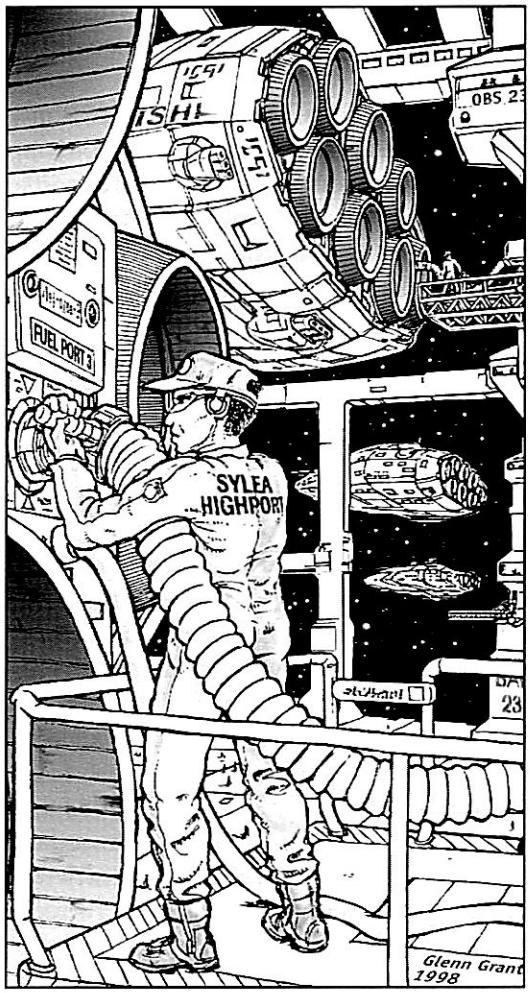
A naval base has several distinct parts. The typical naval base is composed of an orbital berthing area, a surface berthing area, a maintenance section, and an administrative headquarters.

Berthing areas provide locations for ships to lay over, for a day or for months. All berthing areas include provisions for refueling from storage tanks or fuel lighters.

Maintenance sections at naval bases vary from base to base. Where such a section would be redundant to the local starport shipyard, it is small, and repairs or alterations are carried out under contract by the local facility. Where adequate facilities do not exist, the naval base itself may have a large maintenance section capable of extensive repairs and refits. Maintenance is performed on the ships on the world surface or in orbit as necessary.

The administrative headquarters handles the day-to-day operations of the base, as well as its paperwork (including the allocation of funds, distribution of personnel, and disbursement of maintenance and repair contracts).

The naval base is not a tactical unit. It has no battle forces of its own, and it does not exert control even over local system-defense boats (which are under a separate command). The naval base is responsible for supporting the fleet and keeping it in optimum condition for its combat missions.



Naval Depot: Depots serve as focuses for naval efforts: supplying a fleet's every need, providing construction and repair facilities, and producing and testing experimental ship prototypes. A depot generally occupies an entire system. Facilities, material, and personnel are extensive enough to repair and resupply a large fraction of the fleet at any time. A depot may be isolated from outside contact for years at a time without serious setbacks. As depots cover large parts of a system, there is no distinction between orbital and surface berthing.

In peacetime, the main function of a depot is the design and testing of ships. For this reason a large staff of naval architects and construction personnel is maintained at every depot.

In wartime, depots serve as repair and resupply centers for the fleet. In emergencies, the depot's construction yards are sometimes pressed into service for production of military ships.

Since a depot is obviously a very sensitive installation, security is tight. An extensive array of both entry and exit codes are employed to ensure no unauthorized vessels enter or leave the system. Contingents of marines and system-defense boats are stationed throughout the system, and they are constantly ready for action.

There is usually no more than one naval depot per sector. Depots are placed in systems where they will be close enough to the expected action to be useful, but far enough back to ensure that they will not be captured.

Nobility: The foundation of interstellar government within the Imperium. The Imperium depends on nobles ranging from knights to archdukes to carry the chain of authority and the mantle of responsibility from the Emperor to the people (see p. 9).

Nth Interstellar War: Any one of an indeterminate number of interstellar wars fought between the Terran Confederation and the First Imperium during the period -2408 and -2219.

The First Interstellar War (-2408 to -2400) marked the initial clash between Terra and Vland. The peace that concluded the hostilities was both uneasy and short. The second through seventh wars were marked by seesaw exchanges of territory, mostly confined to the Dingir and Sol subsectors. These initial wars were fought, on the Vilani side, with only the forces available to the Vilani provincial governor; the central government was preoccupied with other problems. This was fortunate for the Terrans, as Vilani power, even at this late date, was sufficient to crush the Terrans in short order had it been applied.



The Eighth Interstellar War broke the stalemate; the Terrans took Dingir and reached farther. Finally, the emperor took notice, and dispatched major fleet elements to the area, but the time for action had passed. Terran invention of the jump-3 drive made the Ninth Interstellar War a crushing victory for Terra and forced the Vilani to relinquish most of the Solomani Rim. Thereafter, the Terrans were almost constantly on the offensive.

In the centuries after the conclusion of the wars, no consensus could be reached in the academic community as to when the later conflicts began or ended; all were interrupted several times by armistices, cease-fires, or shaky periods of peace (indeed, a new war would often break out along the front lines before the existence of a peace treaty could be communicated to the respective capitals).

Periods of warfare are lumped together or split apart depending on the historian's individual point of view, and a single war to one historian can be identified as two or more wars by others. The situation is complicated by the fact that records for some of the years in question are sketchy. To clarify matters, an accommodation was arrived at which simply labels all interstellar wars after the Ninth with the indeterminate variable N. Proper usage calls for the war to be defined with the actual years being discussed. Many history texts use this system to refer to all the wars except the first.

The Nth Interstellar War (-2235 to -2219) ended the series when the Vilani Grand Imperium collapsed, as much from its own weight, age, and decadence as from Terran victories. The Terrans moved quickly to occupy the remaining Vilani territory.

See *First Imperium, First Interstellar War, Rule of Man.*

Nuclear Damper Technology

Nuclear dampers are force-field devices that focus on nuclear warheads or isotopes to prevent or disrupt nuclear reactions by making atomic nuclei more or less stable.

Statistics for nuclear damper modules for spacecraft are in the design rules. Dampers are also described on p. VE72 and p. UT80. In the ***Traveller*** universe, bulky models are available as early as TL11, rather than being limited to TL15+. If designing dampers using ***Vehicles***, multiply weight, volume, and cost by 16 at TL11, by 8 at TL12, by 4 at TL13, or by 2 at TL14.

"Damper boxes" that prevent radioactive decay of unstable isotopes also exist. They weigh 80 pounds, take up 1.6 cubic feet, cost Cr40,000, and require 160 kW per cubic foot of cargo capacity that they possess at TL11. Halve all attributes at each higher TL.

The Regina System

Following Imperial custom, systems are most commonly identified by the name of the most important world in the system rather than the star. Almost without exception, this world contains the system starport (although the system may contain other, smaller ports and bases).

The Regina system, capital of the Spinward Marches, is a trinary star system – the primary Lusor and its dwarf companion Speck form the major system, while Darida orbits at about 5,000 AU distance. Among them, the three stars possess eight planets with 17 satellites.

Regina is only one of seven worlds in the trisystem that boast a breathable atmosphere, and only one of four habitable moons in orbit around the gas giant Assiniboia in the life zone of Lusor. With the best conditions of the group, it was settled first in 75 by an expansion wave of the Third Imperium. It soon became a trade center within the Spinward Marches, and was established capital of its subsector when it joined the Imperium in 250.

Regina supports the highest population. Its companion satellites of Brumaire and Harcourt have been extensively colonized as well.

The Darida system proved much less hospitable, and has been only minimally exploited. It does host a few small settlements devoted to prospecting and mining available ores, a few scientific and technical survey stations, and a small military base maintained by the Imperial Navy.

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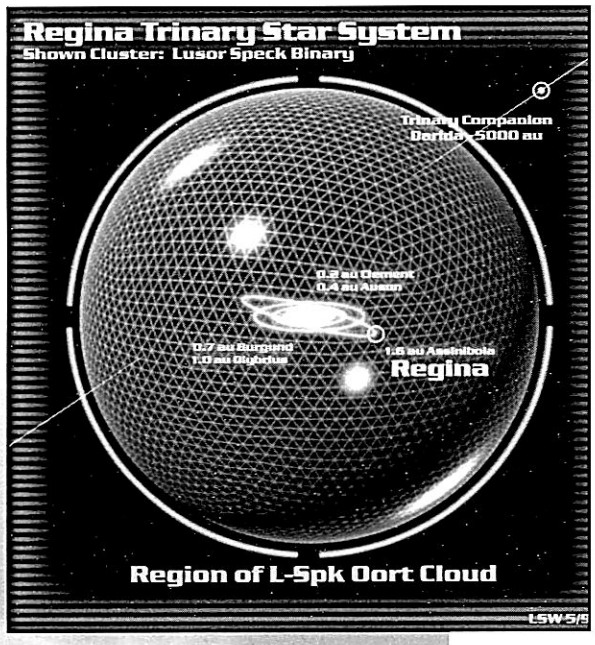


Octagon Society: Established in 342, the Octagon Society was the first major distressed-spacefarer assistance operation to appear in the Spinward Marches. The group thrived on public contributions and on some tax revenues for 150 years. It collapsed in the late 400s when scandals emerged over the quality of shelter construction and the disposition of certain funds.

Society shelters were generally of an octagonal shape. Large hostels were established on major worlds, while smaller weather shelters were placed on frontier or unsettled worlds. The characteristic octagon-shaped buildings are still visible on various worlds, although none are still in use as shelters for distressed spacefarers.

The Octagon Society was dissolved in 499, and its assets were sold at auction.

Oort Cloud: A spherical shell around most stars containing numerous small bodies of cometary material. A typical Oort cloud is about 0.5 to 1 light year from its primary and has an aggregate mass about that of Terra; density is thus extremely low. The main constituents of cometary bodies are ice and dust ("dirty snowballs"). Bodies in the Oort cloud are occasionally perturbed by collisions or by the influence of nearby stars into orbits which pass near the star; these form the visible comets. The Oort cloud around Terra was named after its discoverer, Terran astronomer Jan Oort, and the term was applied to other systems during the Second Imperium.

Outworld Coalition: Traditional name for the belligerent groups allied against the Imperium during the First and Second Frontier Wars. Commonly applied to any alliance of powers threatening the Spinward Marches and Imperial territories spinward of the Great Rift.

The original Outworld Coalition was formed in the early 500s at the instigation of the Zhodani Consulate. Vargr allegiances vacillated, but memories of the Imperial campaigns against certain Vargr states in the Corridor swayed some into membership. Zhodane, as the major partner, contributed military aid and assistance (such as technicians and advisors). While some Vargr governments contributed personnel and naval units, other Vargr remained neutral or sided with the Imperium.

The initial history of the coalition was one of continuing struggle for organization, as the Zhodani were constantly occupied in establishing Vargr governments, and then maintaining them in power. The intent was for the Vargr to raid the coreward edge of the Spinward Marches, especially Regina and Aramis subsectors, while the major thrust from Zhodane took Cronor and Jewell subsectors. The Vargr portions of the offensive failed dismally, which resulted in the collapse of the coalition.

The internal Imperial upheavals (the Civil War) which followed the First Frontier War (it was just called the Frontier War then) exposed a continuing weakness in the Imperium, and the Outworld Coalition reformed after a hiatus of five years. The reformed Coalition again attacked the Marches, this time taking portions of Jewell subsector. Although the Vargr again failed to take any territory permanently, their performance as a whole was considerably improved.

Traditionally, frontier wars in the Spinward Marches have involved coalitions of Zhodani and certain Vargr states. The Sword Worlds have also joined the coalition at times. See ***GURPS Traveller Behind the Claw***.

Pacification Campaigns (76-120): A series of economic, diplomatic, and military operations directed at forcing membership in the Imperium upon those worlds which resisted the initial efforts to annex them.

Although the campaigns were predominantly economic and diplomatic in nature, the Imperium was not averse to using force when peaceful methods failed. Imperial battlefleets and ground forces rarely failed when brought to bear.

By 120, the pacification campaigns ended, and the initial phase of the Imperium's growth came to a close.

Four specific Pacification Campaigns were undertaken, each by an archduke of the Imperium. The Vilani Pacification Campaign was targeted at portions of Dagudashaag and Gushemege sectors. The Ilelish Pacification Campaign was aimed at the Darmine region. The Antarean Pacification Campaign hit much of Lishun sector. The Sylean Pacification Campaign operated in Delphi and Fornast sectors.

Peerage: The hierarchy of nobles within the Imperium.

Phoenix Project: Reported plot by Solomani guerrillas on Terra to destroy Imperial forces occupying Terra. Imperial intelligence reported penetration of the project command in 1045, with subsequent compromise of its basic plans and dismantling of its structure.

The Phoenix Project was supposedly born in the final years of the Solomani Rim War (990 to 1002) as Solomani leaders saw the possibility of their defeat and the loss of the homeworld to the invading Imperials. The project was said to have consisted of two distinct parts: pre-positioned caches of military goods to supply the coming uprising and a continuing program for the training of guerrillas.

The caches were concealed in many different places on Terra in areas calculated to preclude accidental discovery over the years. Each cache contained large quantities of munitions, weapons, vehicles, and medical supplies, all of varying technological levels so as to be of use regardless of the technical knowledge of the users. Each cache was hidden with its location entrusted to a single local family. These families were to form the core of the guerrilla forces when the rising was to take place.

A massive Imperial counter-guerrilla effort in 1040 to 1045 was directed at the discovery and destruction of the caches and the arrest of the families entrusted with their secrets.

Persistent rumors of two additional aspects of the project – Lambda (a codeword to trigger the uprising) and Omega (the reinforcement of the uprising by off-world Solomani) – have been dismissed as baseless by Imperial officials.

Many historians believe that the extent of the plot was greatly exaggerated by Imperial authorities, and hold that it was little more than an extreme example of wishful thinking on the part of the Solomani leadership. At any rate, the Phoenix Project no longer threatens the security of the Imperium, if indeed it ever did.

Postal Union: A group of political units associated to a greater or lesser degree for the purpose of communication among citizens, businesses, and governmental units.

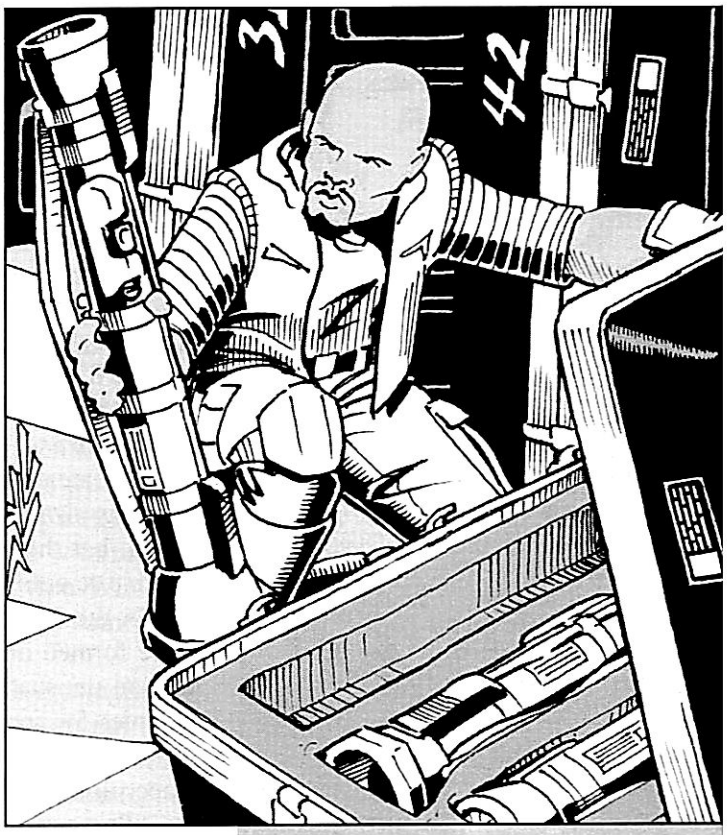
The Regina System

[Continued]

Most planets orbiting Lusor (the primary star) and its dwarf companion Speck are named for persons and places associated with St. Regina. Worlds orbiting Darida are named in the Vilani language after famous Vilani authors.

The Phoenix Project

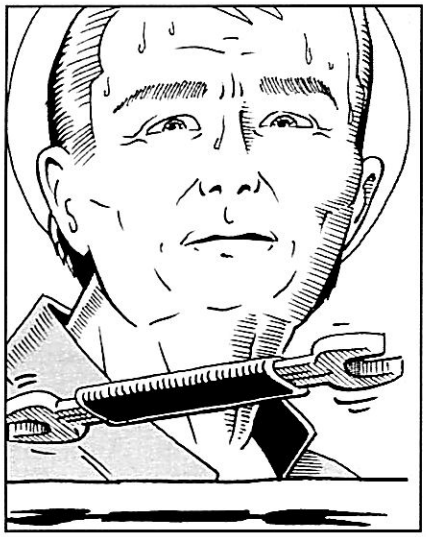
The notion of the Phoenix Project arose out of a need for a particular adventure to have what Marc Miller calls a "pull," an objective which the characters will seek out over the course of the adventure. In this case, the objective was to discover one or more caches of weapons and materiel accumulated to supply a planned rebellion against the Imperium by Solomani plotters. It represented something for the characters to hunt, in the process of which they could be drawn into the real adventure plot-line. There was never any intention of using the uprising itself as an adventure seed, but the possibility that such a centuries-old supply depot might still exist has proven compelling for many players.



Psionics

Psi powers have been a staple of science fiction since the inception of the genre, and ***Traveller***'s designers felt that the subject merited attention. We decided that a too widespread use of psionics would require our Imperial society to be too different for the vast majority of gamers to enjoy, but at the same time we wanted to show what effects such powers could have on society (and we knew that if we included them in the game, every power player on Earth would have them). Our solution to these mutually contradictory goals was to create two societies, one in which psi is common (the Zhodani) and another in which it occurred, but was uncommon (the Imperium).

Making psionics a crime in the Imperium gave every character who wanted to have the advantages of psi powers a corresponding disadvantage: You are persecuted and hunted by most of the population. Unless, of course, you choose to hide your light under a bushel, which means that your powers have to be used with tact and discretion. Non-psionic individuals view any trace of psi talents with suspicion: You can read their minds. You can kill them with a thought. You can plant thoughts into their mind and make them do horrible things. Society is better off without you . . .



Of course, the game reality is more complicated than this. The widespread public distrust of psi powers forces the Imperial government to publicly call for their suppression, but the extreme usefulness of the talents mean that they also promote and employ them secretly. Publicly, all psionic training institutes are clandestine, illegal underground organizations. In reality the Imperial government operates a number of them (albeit hidden from public view).

Continued on next page . . .

Nearly all star systems are members of one postal union or another. Governments cooperate along their borders in order to allow the efficient flow of communications between them. Members of a postal union forward mail through their territories (subject, of course, to local security needs, acts of war, and so on) to the proper addresses. On the average, communication is at the speed of the fastest available transportation, which means about 3 or 4 parsecs per week in theory or short-term application, much less routinely.

Psionic Suppressions (800 to 826): Between 772 and 798, a series of financial, ethical, and moral scandals within the Psionic Institutes of the Imperium shifted public opinion against them. At the same time, it became clear that a good number of the Institutes were under the control of the Zhodani Consulate. In 800, the Imperium moved against the institutes by canceling their charters, jailing their leaders, and passing laws restricting the teaching or practice of psionics. Many institute figures went underground to espouse their cause in a type of guerrilla war.

The Psionic Suppressions had a profound influence on Imperial opinion. Over the course of 26 years, the suppressions equated psionics with the Zhodani and established in the average Imperial citizen a distaste for both that continues to the present day. The average citizen will admit to a general dislike of psionics, and if pressed, will usually state that psionics violate a person's right to mental privacy.

Psionics: The criminal use of mental powers for the manipulation of matter and energy and for communication. It has been demonstrated that minds (Human or non-Human, conscious or unconscious, intelligent or unintelligent) contain some capacity to operate without apparent use of physical facilities. For an individual to seek out such training is a criminal act.

Until circa -1000, psionics was little studied in most regions except on a disorganized level (parapsychology, the occult, spiritualism, and so on). It was known and practiced among the Zhodani and by some minor races, but it was by no means widespread.

During the Long Night, many races (Human and others) turned introspective. As a result, many finally began to engage in serious research in psionics, which revealed much about the empirical nature of the phenomenon, although the principles involved were, and remain, little understood.

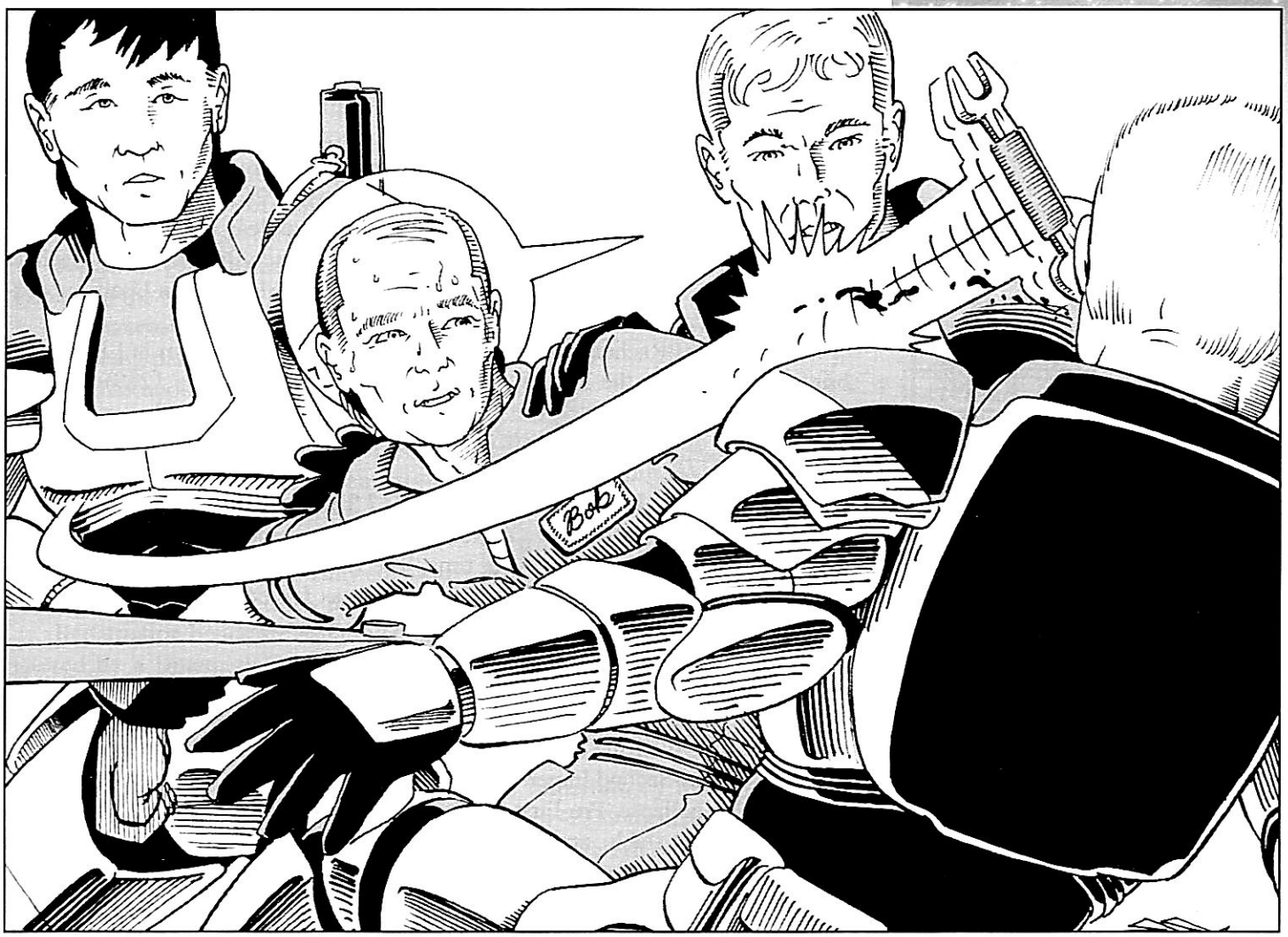
Even though it assumed scientific validity, psionics remained a backwater science until about 650, when it underwent a tremendous burst of popularity. Psionics within the Imperium reached its peak in the latter half of the 700s. In the 790s, however, the crest of popular opinion broke with the revelation of scandals within the Psionics Institutes; the result was the Psionic Suppressions (800 to 826), which shifted public opinion away from support of psionics.

Psionics Institute: Any clandestine organization devoted to the illegal training of individuals in the use of psionics talents. Active Imperial campaigns to eradicate the Institutes have been pursued for more than 200 years.

Organizations of this nature have existed since before the advent of space travel, but they attained prominence only during the Long Night, when reproducible scientific discoveries made psionics a teachable, learnable science.

In the Imperial antebellum period, psionics institutes were rare, and they were formed only on a few scattered worlds which, for one reason or another, had an unusually high rate of psionic talents appearing, or which encouraged psionics for social, political, or commercial reasons. In the years after the Civil War, institutes were organized on most high-population worlds within the Imperium.

"Psionics Institute" is a generic name; each institution was independently organized and maintained. Institutes were generally supported by that portion of



the population which had psionic talents; since that portion was small, they were viable only on high-population worlds (roughly 1 billion or more inhabitants).

During the Psionic Suppressions, the institutes' charters were revoked, and talented individuals were persecuted. In some cases, the individuals fled to assume new identities on other worlds; in others, whole families emigrated to the Zhodani Consulate or to other places beyond the frontiers of the Imperium.

Following the suppressions, there were theoretically no institutes remaining. In practice, however, illegal underground institutes are rumored to still remain on many worlds.

See *Psionic Suppressions*.

Psychohistory: The science of historical prediction and macrosocial manipulation. The main thesis of psychohistory is that the actions of trillions of individuals take on a fluidity and predictability which can be compared to that of molecules in a gas. The very size of the population being dealt with factors out individual peculiarities and allows the prediction of its behavior. With the ability to predict the reaction of a population to a particular stimulus comes the ability to manipulate that population, psychohistorians reason.

Psychohistory began as a combination of public relations/advertising techniques and behavioral science, and although its techniques have been put on a more rigorous footing, the basic principles are still not well understood. A number of minor experiments have confirmed the general validity of the science, but it was also shown to be too expensive to be of any practical utility. Research continues at a small number of Imperial universities.

Psionics

[Continued]

In the Zhodani, we present the opposite view: Psi powers are welcomed and supported by the populace at large. Zhodani citizens with psi powers realize that their talents are accompanied by a social responsibility. Telekinesis is used for delicate surgery rather than breaking and entering. Telepathy is used as a tool for the treatment of mental illness.

We introduced the Thought Police to keep Zhodani society from seeming too utopic. Thought Police read minds without permission, but only with the best of intentions. Feel like stealing? Willingly convey false information? Have lustful thoughts about your neighbor's spouse? The Thought Police will help you overcome these and other antisocial tendencies. You will no longer want things that are not yours. You will see no reason to lie. You will recognize lustful thoughts as common to us all, and feel no guilt over them (and certainly no urge to take improper action on them).

A Concise History of Ziru Sirka, Part V

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116

Arrival of the Terrans

Terrans, during this period of vast interstellar colonization, were pursuing their own history while confined to their homeworld. It was not until the 1960s that Terrans ventured into space, and not until 2000 A.D. that they were actually exploring space on a permanent basis. The Terran Confederation dates as a centralized world government to the signing of the Treaty of New York in 2022 A.D. (although it was not officially called that for another century). This treaty allowed the placement of the armed forces of the major nations of Terra under the centralized control of the United Nations (until then, a loose organization of nation-states, with no governmental authority).

In 2090 A.D., Terrans invented the jump drive. Initially, it was used only within the solar system, since the range of a jump-1 drive was insufficient to reach the nearest stars. Terrans remained restricted to their solar system for 43 years, and this long incubation period worked in their favor. They developed an extensive variety of jump-capable ships and had produced them for decades when they finally ventured to a neighboring star system.

Meeting the Vilani

An expedition placed intermediate refueling supplies and traveled to a nearby system, Barnard's Star, early in 2097 A.D. It encountered a Vilani mining outpost there. The tales its members heard of the Imperium's size staggered them. Joint international expeditions met with the Vilani and explored nearby systems. It came as a shock to the Terrans that most of the worlds beyond a few parsecs away were already claimed. More than a dozen Human races had already colonized the worlds around Earth. A quick effort was made to settle Barnard's Star even as Vilani prospectors were working on that world. Individual nations built starships and expanded their armed forces. Outposts were quickly reinforced and strengthened.

Interstellar War

The first interstellar war between the Imperium and the Terran Confederation began when a Vilani trade caravan ignored Terran traffic-control signals. Fortunately for the Terrans, the Vilani scarcely knew that a war was going on, as the UN exercised only tenuous control over the several national squadrons.

Continued on next page . . .

R

Rachele Society: Secret Vilani supremacist group founded on Pretoria/Pretoria by Zid Rachele in 992. Genocidal policies favored by the group culminated in the attempted takeover of the Pretorian government in 1010. An attempt at nuclear blackmail backfired when 26,000 people (including 1,900 Rachelean commandos) were killed by a nuclear explosion after the Society seized Imperial Scout facilities on Saki (Deneb/Pretoria). Zid Rachele disappeared in 1015 after escaping from the prison world Exile in Usani subsector (Deneb/Usani 1928).

In 1103, Zid Rachele and the Rachele Society surfaced again in Lishun in a brief power play at the Dynam Naval Depot (Lishun/Masionia 1219). Rachele and his followers attempted the theft of several mothballed naval warships, but were quickly defeated. Rachele's vessel was destroyed in the battle.

See *Rachelean Revolts*.

Rachelean Revolts (1010-1011): Major uprising on Pretoria (Deneb/Pretoria) fomented by the Rachele Society, which resulted in martial law under the Imperial Navy since that time. The Imperium as a rule does not interfere with local politics, but their intervention was forced when a Scout base on Saki (Deneb/Pretoria) was destroyed by nuclear weapons.

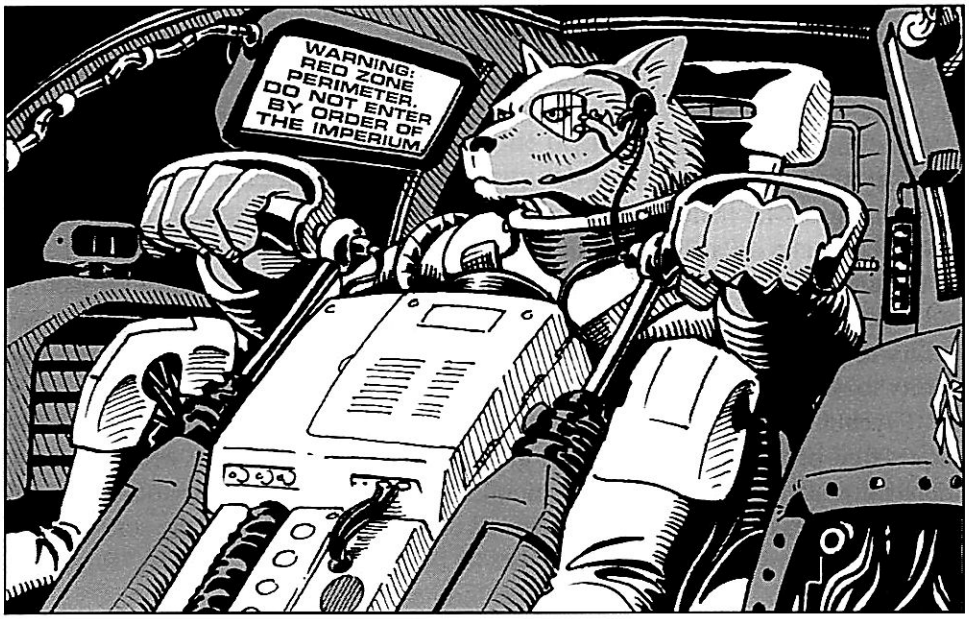
See *Rachele Society*.

Ramshackle Empire: Common term used during the Long Night to refer to the Rule of Man, also known as the Second Imperium. As the successor to the First Imperium, the Rule of Man took over the territories (and the problems) of its predecessor. Pro-Second Imperium histories contend that the Rule of Man delayed the inevitable collapse. Pro-First Imperium histories claim that the First Imperium was stagnant, but stable, and that the Ramshackle Empire actually precipitated the Long Night by looting subject worlds and promoting Terran superiority.

See *Rule of Man*.

Red Zone: The Travellers' Aid Society classification for a nation, world, or system which is dangerous to travelers. In general, the imposition of a red zone classification indicates the location is quarantined, interdicted by higher authority, or at war.

Quarantine indicates that a dangerous disease is present, and the danger of war is self-explanatory, but interdiction requires further discussion. Interstellar



governments often find it necessary to restrict access to worlds or systems for political or military reasons, and they do so by publishing interdictions.

Enforcement of interdiction varies with the reason for the restriction. Interdiction may be imposed on a world if it is a military base or other sensitive installation, a private reservation belonging to a powerful family desiring seclusion, a developing society which the government has elected to allow to evolve in isolation, or home of valuable resources being conserved for later development or exploitation.

Regina (Spinward Marches/Regina 0310 A788899-C): Capital of the Spinward Marches subsector. See sidebar, p. 52.

Repatriation Bond: A document guaranteeing passage of an individual to a specified location upon completion of contract work or upon suspension of contract work for any reason. Repatriation bonds are guarantees given as inducements to workers who might otherwise be wary of leaving their own worlds with no assurances that they could return. They are most commonly used by mercenary units.

Repatriation bonds are usually administered by a financial institution which holds the necessary funds in escrow.

Rule of Man (-2204 to -1776): A short-lived interstellar empire formed after the conquest of the Vilani Imperium by the Terrans. The conquered territories were under military rule from -2219 to -2204. Vilani military forces were incorporated into the Terran forces. Terran naval officers took over key posts in the Vilani bureaucracy (which was otherwise retained intact).

In -2204, the Terran Secretariat attempted to transfer control directly to Terra and to incorporate the conquered regions into the Terran Confederation. The commander in chief of the Terran Navy, Admiral Hiroshi Estigarribia, realized that the Confederation government could not possibly control the vast territories of the Vilani Imperium. He proclaimed himself Regent of the Vilani Imperium and Protector of Terra, so both states were now united in the Rule of Man. Nearly all the fleet sided with Estigarribia, both because it was composed largely of colonials (who were under-represented in the Terran Confederation government) and because of Estigarribia's careful preparation. The Confederation was dissolved without significant resistance.

The Terran fleet headquarters on Dingir became the capital of the Rule of Man. The bureaucratic center of the Imperium remained on Vland, although arrangements were undertaken to gradually transfer it elsewhere.

Upon Estigarribia's death, he was succeeded by his chief of staff, who crowned himself Emperor Hiroshi II. Estigarribia, even though he did not actually assume the crown, is therefore known to history as Emperor Hiroshi I.

Hiroshi II transferred all functions of government from both Vland and Dingir to a more centrally located world, renamed bilingually Hub/Ershur. This world was to remain the capital of the Rule of Man for the next 400 years.

During the Rule of Man, large numbers of Humans from Terra and its oldest colonies emigrated throughout the Imperium.

People of Terran ancestry or culture (many of them assimilated Vilani) assumed positions of power on most worlds and became industrialists and administrators.

A Concise History of Ziru Sirka, Part V

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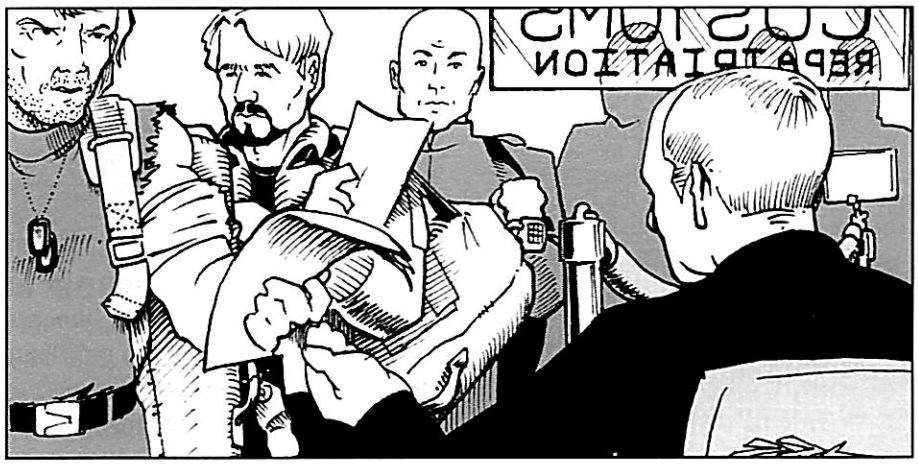
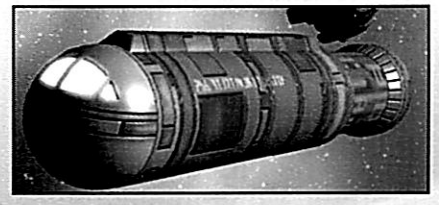
This war, considered a Terran victory, began the period of Terran ascendance and led to strengthening of the central Terran government. In 2123 A.D., representatives from the Terran colonies were admitted to the General Assembly.



The Terran government then changed its name to "The Terran Confederation."

The peace that concluded the first war was both uneasy and short. The second through seventh wars were marked by see-saw exchanges of territory, mostly confined to the Dingir and Sol subsectors. The Terrans applied every force they could bring to bear on their enemy, and believed that their successes in gradually expanding their territory were entirely of their own making. After winning the first three wars, they finally realized the Grand Imperium's immensity. They also realized that they could win in spite of that size.

Other problems than the Terrans preoccupied the Vilani central government. Vilani power, even at this late date, was sufficient to crush the Terrans had it been applied. But the Vilani fought these initial wars with only the forces available to the affected provincial governor. He was charged to win wars and maintain the empire's power on a limited budget. Appeals to the emperor were avoided because they cost heavily in personal power. The local governors often compromised, agreed to some territorial concessions, and then reported victory.



A Concise History of Ziru Sirka, Part VI

Prepared for Solomani readers by the Vilani Historical Documents Subcommittee, Kasiiga University Press, Ishimaga, Vland, 001-1116

A Major Victory

The Eighth Interstellar War finally broke open the frontier and ended in the first major Terran victory. After the capture of Dingir, Terran Grand Admiral Manuel Albadawi exploited Vilani confusion by reaching beyond Dingir to seize and fortify other worlds of the Imperium. The Treaty of Ensular (which ended the war) ceded all of the Imperium rimward of Vega to the Terrans. This series of interstellar wars ended when the Grand Imperium capitulated to a combination of Terran military successes and its own weaknesses. It collapsed when its leaders lost the support of the people and the will to resist.

Terran Occupation

The Terrans moved quickly to occupy the remaining Vilani territory. Many Vilani subject races, such as the Vegans, welcomed the Terrans. Terran naval officers were dispatched throughout the Grand Imperium. Between 2302 and 2317 A.D., more than 100,000 naval officers were sent to take control of the reins of government, direct local bureaucracies, and maintain peace and order. The Terran officers carried their technology with them. They occupied key posts in the Vilani bureaucracy, which otherwise retained intact. In some cases, Terran ensigns administered worlds, and mere commanders ruled whole subsectors. Vilani military forces were incorporated into the Terran forces.

The conquered territories were under military rule from 2302 to 2317 A.D. During this period, the Terran Navy learned to deal effectively with the Vilani and to be sympathetic to the Vilani people. That the Vilani openly accepted the Terrans made it easier to view them as friends deserving of respect and protection. The Terrans had to administer an immense empire that had already admitted it could not do the job itself. If the bureaucracy had collapsed (and trade ceased), hundreds of worlds would have died as supplies were cut off.

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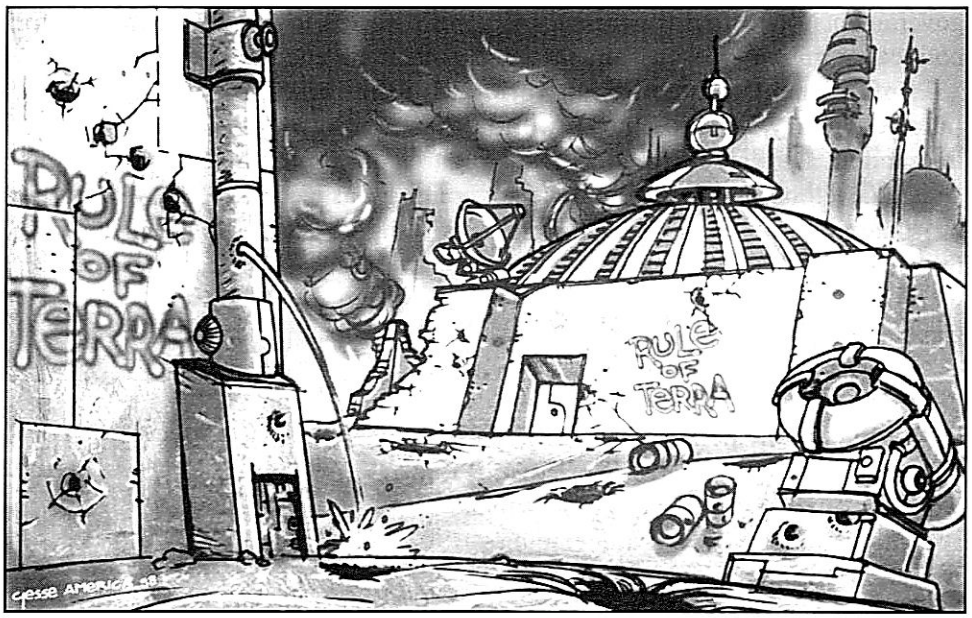


The problems of sheer size and scientific stagnation, which had brought about the fall of the Vilani Imperium, continued to plague the Rule of Man. The Vilani had coped with the problems of ruling a large empire by a rigid caste system with all citizens rooted permanently in their places, but this system could last only as long as there was no significant external threat. The Terrans did away with this system but were not able to replace it with a new social order. The destruction of the caste system swept away the foundations of society. Key industries fell apart as their workers became free to move elsewhere.

The -1776 date for the end of the Rule of Man is arbitrary; it notes the financial collapse of the central government, which occurred when the Treasury at Hub/Ershur refused to honor a monetary issue of the branch treasury at Antares. The resulting lack of confidence within monetary circles marked the end of large-scale interstellar trade and of effective governmental power within the Rule of Man. Although the Imperium did not completely fall apart for many years, the Rule of Man had effectively ceased to exist as a viable interstellar community, and the period known as Twilight had begun.

The Third Imperium refers to the Rule of Man as the Second Imperium, which emphasizes its own roots in the Solomani-dominated Second Imperium and the Vilani-dominated First Imperium. Anti-Solomani elements emphasize the failure of the Solomani-dominated Ramshackle Empire.

Rule of Terra: Solomani terrorist group active in selected regions of the Solomani/Imperial border. Violently anti-imperial even by the standards of most Solomani political groups, the Rule of Terra seeks to force the return of all "rightful Terran property" to Solomani hands through assassination and other acts of violence.

The organization, although interstellar in scope, apparently was not very strong in the beginning. Some of its claimed attacks have proven to be accidents, while others were the work of different dissident individuals or organizations.

The Rule of Terra's acts, although not its goals, have been disavowed by many other Solomani groups, including the Confederation government; in return, the Rule of Terra has attacked even Solomani populations, by stating that "all who do not contribute to the Manifest Destiny of the Race are not worthy to be part of the Race."

The group has claimed responsibility for many recent terrorist acts on the border, some of which Imperial authorities are sure were committed by others.

See also *Ine Givar.*

Scout Base: Port facility for the support, maintenance, and repair of scout vessels. The Imperial Interstellar Scout Service maintains a variety of scout bases scattered throughout the Imperium, with installations tending to be on less well-developed worlds with starports of type II or III. Scout bases tend to be surface installations equipped with basic facilities for fueling and for minor maintenance activities oriented toward ships of 1,000 tons or less.

Scout bases are positioned in systems more out of the way than are naval bases for a reason. The scout bases serve as a source of ships carrying dispatches from the well-traveled Xboat lanes to more remote worlds.

Scout bases also have other responsibilities, and most have an administrative responsibility in addition to the maintenance and refueling of scout ships. Within a subsector, one base will hold responsibility for cartography in the subsector, another will be responsible for technical developments, and still another for contact or liaison activities. The scout base is more extensive than an Xboat station, but less comprehensive than a way station.

See *Way Station, Xboat Station*, and ***GURPS Traveller First In***.

Second Frontier War (615 to 620): Fought between the Outworld Coalition and the Imperium during the period of the barracks emperors. Arbellatra (587 to 666) was named grand admiral of the Marches by Cleon V and led the combined local and Imperial forces to defeat the Coalition, and then proceeded to reestablish the central Imperial authority.

Second Imperium: The successor to the First Imperium, established by the Terran Confederation Navy to rule the territories conquered from the Vilani Empire by Terra.

See *Rule of Man.*

Sector: Mapping unit in astrography equal to 16 subsectors. Average density 500 to 650 worlds per sector. Sectors are named, and several synonyms are in common use, including march (or marches), region, reach (or reaches), quadrant, and matrix. The Spinward Marches, for example, is a sector.

As a rough means of comparing size, the sector counts of the large interstellar states and areas of settlement are: the Imperium 27, the Aslan Hierate 18, the Hive Federation 17, the Two Thousand Worlds 14, the Vargr Extents 14, the Zhodani Consulate 13, and the Solomani Confederation 11.

Shudusham Accords: A series of agreements and the laws arising from them concerning robotics, cybernetics, and artificial intelligence. The accords basically declare mechanical and artificial intelligence to be non-sentient, and not subject to the rights and protections accorded sophonts in the Imperium. See *Robots and Artificial Intelligence*, p. 18.

See *Shudusham Concords.*

Shudusham Concords: Agreement signed by 12 worlds of the Sylean Federation at Shudusham (Core/Capital) in -110 which dealt with weaponry carried by robots. The Concords have no legal force now, of course, but many worlds have adopted similar or identical standards using the Concords as a template, and most robots produced commercially in the Imperium are designed with these restrictions in mind.

See *Shudusham Accords.*

Signal GK: Abbreviation for *Gashimeku Kaalariin,* Vilani for "vessel in distress." The code signal GK originated on Vland as a distress signal in maritime and aviation activity, and it was one of the standard communications codes of the Vilani Imperium. When the Second Imperium succeeded it, signal GK was retained as a distress code co-equal with the Terran SOS and Mayday signals.

A Concise History of Ziru Sirka, Part VI

[Continued]

The Rule of Man

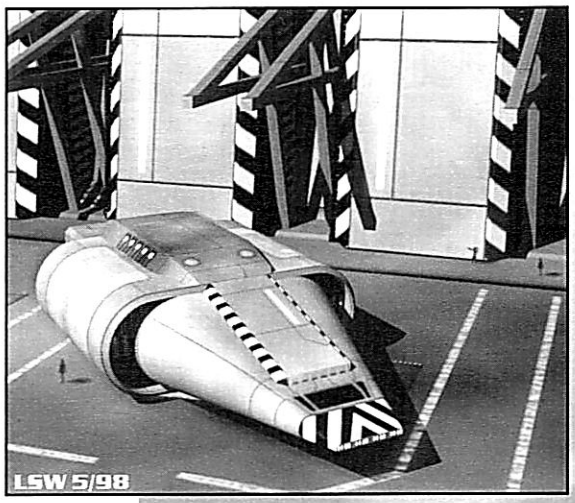
In 2317 A.D., the Terran Secretariat voted to transfer control of the conquered territories directly to Terra and to incorporate the Grand Imperium into the Terran Confederation. Such a move would have made every Terran a millionaire, but at an untold cost to the citizens of the Imperium.

Admiral Hiroshi Estigarribia, the commander-in-chief of the Terran Navy, realized that the Confederation government could not possibly control the vast territories of the Imperium. He proclaimed himself regent of the Vilani Imperium and protector of Terra, with both states now united in the Rule of Man.

The Confederation was dissolved without significant resistance. Terran fleet headquarters at Dingir became the capital of the Rule of Man. Upon Estigarribia's death, his chief of staff succeeded him and crowned himself Emperor Hiroshi II. Hiroshi II transferred all government functions from Dingir and Vland to a more centrally located world, renamed bilingually Hub/Ershur.

The Fall of Night

This world remained the capital of the Rule of Man for the next 400 years. Unfortunately, Terran rule was no more enlightened or progressive than that of the Vilani. From a tight, paternalistic economic empire, the pendulum swung to a disjointed military empire. Neither was really tenable over such a large domain. The drift toward disintegration was too strongly rooted in the fabric of the Ziru Sirka. All too soon the Long Night, the inevitable result of centuries of oppressive rule, descended over the stars which had been the Ziru Sirka.

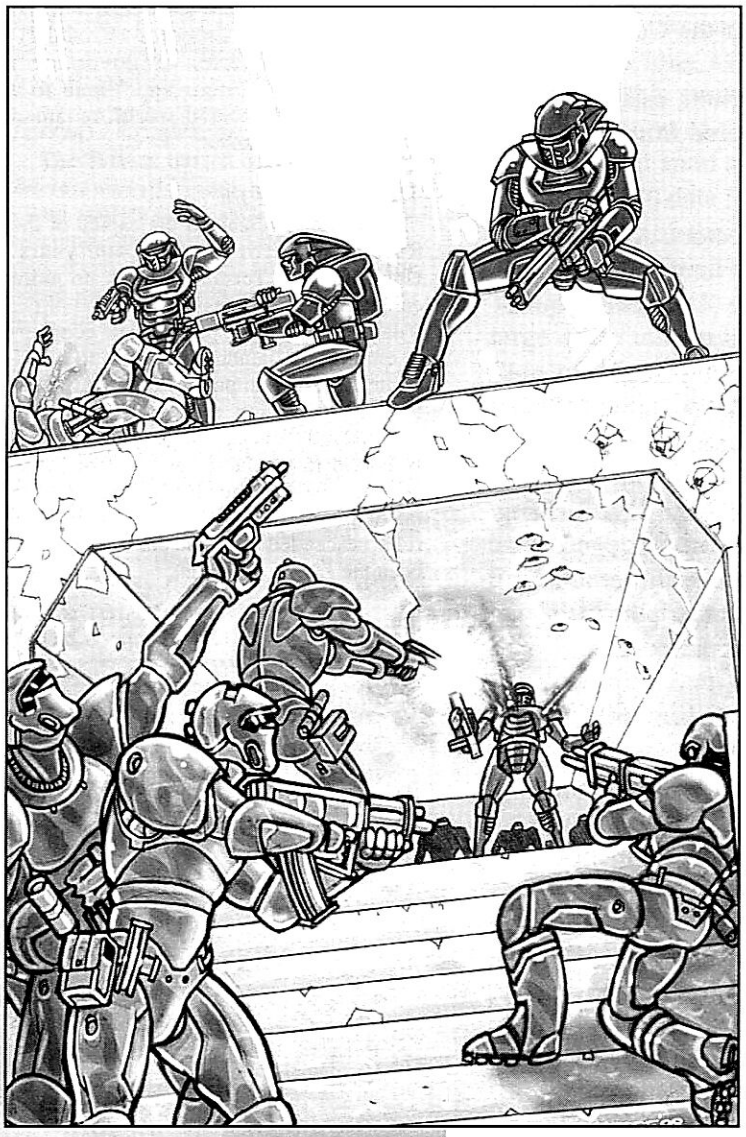


Peacekeepers

"It's hard, what we're doing now. Harder than the war, that's for sure. Then it was 'assault that bunker' or 'hold this town.' If it was armed and didn't wear Imperial uniform, we shot it. We knew who the enemy was and what they'd do to us if we didn't do it first. But this peacekeeping business?

"I'm not a peacekeeper. I'm a target. I have a card in my pocket that says I have to challenge three times before firing. They don't want us shooting civilians, you see. Laudable enough, unless those civilians are throwing rocks and firebombs. Unless they're hiding the sniper who's just shot the corporal. Unless it's ***your*** *friend lying dying in the street. Unless it's* ***your*** *barracks they just firebombed.*

"Then the issue gets a little cloudy."



The Imperial Navigation Act of 103 requires all vessels, whether military or civilian, to respond to the GK, SOS, or Mayday signals, provided such response does not endanger the ship and crew of the responding vessel.

Six Races: Traditional term for the intelligent races which dominate this region of the galaxy. It appears independently in Human, Aslan, Vargr, and K'kree literature.

There is some disagreement as to the meaning of the term and the identity of the races involved. Most commentators agree that all of the six races must be major races; the candidates are Aslan, Droyne, Hive, K'kree, Solomani, Vargr, Vilani, and Zhodani. Various racially based hypotheses have emerged, but none has gained ascendancy. See p. 10.

Soegz: Admiral Soegz was a loyal supporter of Arbellatra in the final years of the Civil War, and he was elevated to archduke of Antares by her decree, which incidentally and simultaneously ordered the execution of the previous archduke for the treason of not supporting her.

Soegz, a Vargr and a subordinate admiral under Arbellatra, commanded a task force during the fleet actions of the Second Frontier War and late in the Civil War.

Sol, Domain of: A Domain of the Third Imperium, consisting of the Diaspora, Old Expanses, Solomani Rim, and Alpha Crucis sectors.

Solomani: Strictly, a member of that Human race which developed on Terra from the original Human stock (*Homo sapiens sapiens*). The term Solomani is often used to refer to members of the Solomani race (or, more palatably to some, to members of the Human race of Solomani descent) or to members of the Solomani political movement.

Its original meaning is obscure, but the word seems to have originally meant either "men of Sol" or "sole men."

After the Solomani developed jump drives in -2431, Solomani Humans scattered to the stars in several waves. Early colonization efforts first settled the worlds closest to Terra; the later conquest of the First Imperium and the establishment of the Rule of Man sent more Solomani Humans out primarily to occupy the formerly Vilani-controlled regions.

See *Humans*.

Solomani Autonomous Region: Area within the Imperium granted self-government through a charter from Empress Margaret I in 704. The charter granted control of the region of space within a radius of 50 parsecs of Terra (hence the name Solomani Sphere) to a Solomani governing body, which was given broad powers of authority.

For 200 years, the Imperium effectively ignored the region and concentrated instead on its coreward frontiers.

By 940, Solomani oppression of non-Human (and non-Solomani) worlds forced Empress Margaret II to revoke the region's charter. After years of diplomatic actions proved fruitless, it was decided to forcibly reintegrate the region into the Imperium. The Solomani resisted, and the Solomani Rim War (990 to 1002) began.

See *Terra*.

Solomani Confederation: In 871, the government of the Solomani Autonomous Region reorganized itself as the Solomani Confederation in an attempt to strengthen its claims to the heritage of the old Terran Confederation. Although tantamount to a declaration of independence, the reorganization was officially ignored by the government of the Imperium until the increasingly belligerent and extremist policies of the Solomani caused many border worlds under Solomani rule to petition the Imperium for redress.

The branches of the Solomani Confederation's government took the names of the government of the Terran Confederation, but the present institutions have little resemblance to those of the past. The chief governing body of the Solomani Confederation is the Secretariat. The Secretariat is presided over by the secretary general, who is elected from its membership. The secretary general is the chief administrative officer of the Solomani government, and while the office holds great power, it is fully accountable to the Secretariat.

Representatives to the Secretariat are appointed by the governments of the individual districts. The number of representatives each district may appoint is determined according to that district's contribution to the Solomani economy.

A district typically consists of a single world, but low population worlds or depressed areas are combined into multiworld districts. In the case of a district such as this, an election is held to determine the representative from that district. These, however, are not elections in the normal sense; the governments vote, rather than the populace. Each government of such a district is allocated votes (again, according to its economic importance), which are used to elect a representative for that district.

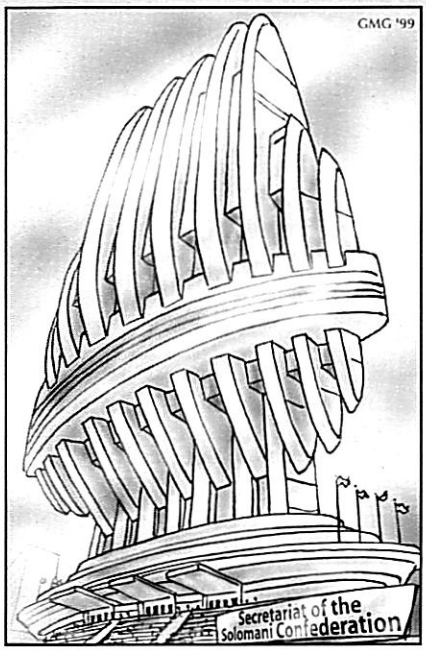
All government officeholders and officials must be members of the official party, the Solomani Movement. Although once waning in power and influence, the party is gaining in popularity as a result of successful Solomani incursions on the Imperium's rimward border. Still, the real power in the Confederation is held by the government and its factions.

Because of the greater degree of local autonomy that exists in the Solomani Confederation, interworld factionalism exists to a much greater degree than had been allowed in the Imperium. Coalitions of worlds exist outside the normal government channels, which sometimes give them equal political importance within a given region. For example, the Near Bootes cluster, in the Capella subsector, dominates large portions of the adjacent subsectors both economically and politically. Bootean mercantile interests have traditionally favored peaceful trade with the Imperium, and their influence has been held to be largely responsible for many peace negotiations between the Imperium and the Solomani Confederation.

Another example of this factionalism is the ongoing trade war (in Solomani Rim/Kukulcan) between Kukulcan and the coalition of Thetis and Laputa. The war has been causing severe damage to the economy of Kukulcan, but the Thetis coalition has thus far been able to muster enough power to prevent effective intervention by the Confederation.

Solomani Hypothesis: When the Solomani invented jump drive in -2431, they also discovered that more than a dozen Human races had already colonized the worlds surrounding Earth. At the time, there was no satisfactory explanation for the more than 40 genetically identical Human races.

The Solomani Hypothesis, first proposed by Magis Sergei haut-Devroe (64 to 141), theorized that all of the many widely scattered Human races of the galaxy originated on Terra. He thought that they were transported to their current homeworlds by an alien race (which haut-Devroe called the Ancients) for purposes which even today remain unclear. The approximate date of the scattering has been established as between -400,000 and -300,000.

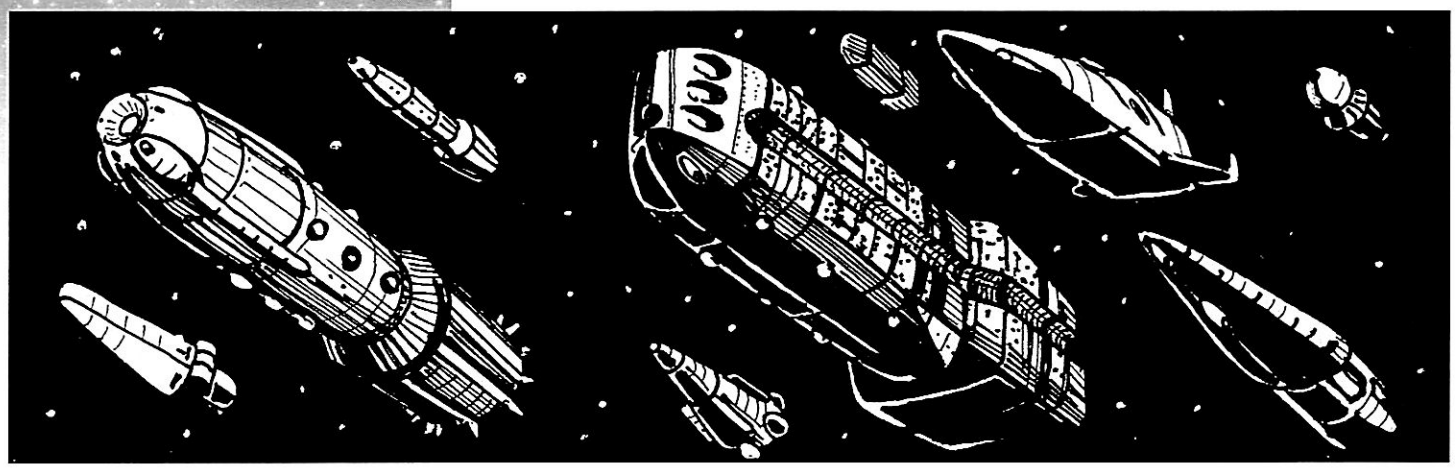


Quid Nomine?

Over the years, science-fiction writers have used a variety of terms to refer to the inhabitants of planet Earth. "Earthling" is one of the earliest, and now seldom used because of that. "Terran" seems to be the odds-on favorite for the last few decades – so why isn't it used in ***Traveller***? And why Solomani?

Firstly, we felt that the term Terran was becoming overused, and we wanted to use something different. "Humans" didn't seem quite right, but "Humanity" did find its way into the game, albeit with the alternate spelling of "Humaniti" (of which more below).

"Solomani" suggested itself from the phrase "Sol men" or "men of Sol" after the name applied to our own star (the Latin word for "sun"). The "i" ending of "Solomani" (and of "Zhodani," "Humaniti," and so on) came from rather a roundabout route. One of Loren Wiseman's early games was ***Eagles***, dealing with the interactions of the Roman army along the Rhine frontier with various German tribes. Because of the Latin forms plurals, the vast majority of Germanic tribal names were Latinized and recorded as ending with either a single or double "i" – for example Suebii, Hermandurii, Langobardii, and so on. Marc Miller liked the sound of these names, and applied the same principle to the names of the various Human races in ***Traveller***.



The Terra System

In the early years of space exploration, colonies were established throughout the Terran system. Every satellite was explored at least superficially, and expeditions even ventured into the depths of Jupiter's atmosphere. Although all colonies except Luna were abandoned during the Long Night, they have since been re-established.

Sol (G2V)

AU	World/Satellite	Notes
0.4	**Mercury**	
0.7	**Venus**	
1	**Terra**	Class V Starport
	Luna	Research lab, colony
1.5	**Mars**	Military base, colony
	Phobos	
	Deimos	
2.8	**Planetoid Belt**	Mining colony
5.2	**Jupiter**	(Only major satellites listed)
	Ring System	
	Io	
	Europa	
	Ganymede	Military base
	Callisto	
9.5	**Saturn**	(Only major satellites listed)
	Ring System	
	Janus	
	Mimas	
	Enceladus	Research lab
	Tethys	
	Dione	
	Rhea	
	Titan	
	Hyperion	
	Iapetus	
	Phoebe	
19.2	**Uranus**	(Only major satellites listed)
	Ring System	
	Miranda	
	Ariel	
	Umbriel	
	Titania	
	Oberon	
30.1	**Neptune**	(Only major satellites listed)
	Ring System	
	Triton	
	Nereid	
39.5	**Pluto**	Research lab
	Charon	

Worlds in the Terra system are named for various deities of old Terran religions, taken from the Greco-Roman pantheon.

When Terra was incorporated into the Imperium in 588, a small historical mission verified much of haut-Devroe's work. The hypothesis was already generally accepted by the majority of the Human population in the Imperium.

More than 40 known Human races have been located (and several more of them failed to adapt to their new worlds and are now extinct). Only three of these Human races have reached widespread prominence; they are the Vilani, the Zhodani, and the Solomani.

Most other Human races accept the hypothesis but lend it no special importance. The hypothesis is used by the Solomani Movement as a basis for its claims of Solomani racial superiority.

See *Humans*.

Solomani Movement: An organization devoted to the doctrine that Humans of Solomani descent are superior to all others and most fit to rule the galaxy.

Solomani Rim War (990 to 1002): War between the Third Imperium and the Solomani Confederation during which a large portion of the Solomani Rim sector was returned to Imperial control.

Hoping to profit from Imperial preoccupation with the Third Frontier War and the disorganization which followed upon the abdication of Styryx in 989, the Solomani reasserted their control over the complete Solomani Sphere, including those portions reabsorbed into the Imperium (see *Solomani Autonomous Region*). The Imperium declared war in 990.

The initial phase of the war went very well for the Solomani. Although the Imperium maintained sizable fleets along the border, they were inferior in strength to the massed naval elements of the Solomani Confederation. In most areas, the Solomani regained the border worlds lost to the Imperium in the last half century and even occupied a number of worlds that had never been part of the Solomani Sphere.

Solomani fortunes were checked in 993 when a large invasion force attempted to regain the worlds in the Old Expanses sector. It encountered near-fanatical resistance and was repulsed with heavy losses.

The period from 993 to 998 was one of stalemate. The Solomani abandoned their plans for further expansion in order to rebuild their forces. Their policy of inflexibly defending every border world was a constant drain on their resources, and the Solomani were not able to regain the initiative. By 998, the Imperial Navy had achieved strategic dominance as the greater industrial base of the Imperium made its power felt.

The last phase of the war, 998 to 1002, consisted of a near continual advance by Imperial forces into the heart of the Solomani Sphere. The basic Imperial strategy was to attack along two parallel axes of advance, with lesser task forces spreading out to create a huge pocket of Solomani territory to be reduced at leisure.

Although the Solomani occasionally achieved a tactical success against a task force (such as in the Battle of Kagukhasaggan in early 1002), they were unable to halt the main advances. With the liberation of the Vegan district in 1001, the Imperium gained the secure base envisioned in the reign of Styryx. The loss of the Vegan district prompted the Solomani to embark on a desperate gamble. Recalling the time when the outnumbered Terran Confederation was able to defeat the Vilani Imperium, the Solomani consolidated their remaining naval forces into a single fleet and struck at the Imperial fleet that was advancing out of the Vegan district.

At the Battle of Dingir, in early 1002, the Solomani Grand Fleet was scattered and substantially destroyed. The remnants of the Solomani fleet fell back deeper into the Sphere, and the Imperial forces firmly established themselves in Terra's own subsector.

The Imperial high command decided that Terra would have to be invaded in order to end forever all claims of Solomani superiority, and thus the use of Terra as a rallying standard elsewhere in the Sphere. In order to invade Terra, a sizable fraction of the Imperial forces in the Solomani Sphere were assembled into an assault force, which effectively ended the pursuit of the defeated Solomani fleet. The invasion began in the second quarter of 1002, and the hard-fought campaign lasted until nearly the end of the year.

In the end, the Imperium conquered the planet, but the battle for Terra had consumed so much of the Imperial military resources that the Imperial high command felt they lacked sufficient strength to resume their advance into the rest of the Solomani Sphere. Accordingly, they negotiated a temporary armistice with the Solomani military commanders, who were glad to gain a respite to regroup their remaining forces. The war ended on this basis as both the Imperial and Solomani civilian governments, who were concerned with the strain placed on their economies by the protracted war, informally agreed to extend the armistice indefinitely.

Scholars have debated the wisdom of invading Terra; some claim that the battle was a marginal if not a Pyrrhic victory for the Imperium. The general consensus has been that the war as a whole was a victory for the Imperium. A substantial amount of the Solomani Sphere was reabsorbed by the Imperium, and a vigorous Vegan Autonomous District was set up to oversee Imperial interests along the new border.

Solomani Security: Also known as SolSec, this organization is the secret police force maintained in service to the Solomani Confederation for the purpose of maintaining state secrets, conducting espionage, and implementing political policies of the government.

Solomani Security maintains both a network of contacts which provide information from outside the Confederation and a network of informants which provide information within the Confederation. Solomani Security agents themselves are highly trained individuals capable of conducting espionage and sabotage.

Solomani Sphere: The territory governed by the Solomani as the Solomani Autonomous Region.

See *Solomani Autonomous Region.*

Sophont: A generalized term for an intelligent life form.

Sophontology: Also called *xenology.* The study of intelligent life. Subsidiary branches of this science include *cultural sophontology,* the comparative study of sophont societies; *physical sophontology*, the study of the genetic and physiological makeup of intelligent life; and *developmental sophontology,* the study of the various means by which life forms evolve intelligence.

Solomani Names

The philosophy of names for characters in science-fiction games varies depending on the "style" of the players. Names like Lance Starhawk will be perfectly acceptable to some groups, and not to others.

Traveller was written with the assumption that characters of Solomani descent would represent the full range of the languages and cultures of Earth. When choosing names to use in adventures, articles, and the ***Traveller News Service*** – at **www.sjgames.com/gurps/traveller/news.html** – the authors tried to mix names from a variety of cultures: Stashu Nagoya, for example, is a combination of olish and Japanese names.

Those looking for a source of personal (usually, but not always the first) names can consult the myriad "baby name" books in the local library (they often explain the meaning of the name and give details of the ethnic and cultural backgrounds). There are a variety of books which explain the origin and background of family names. A search of the Internet will reveal a number of sites dealing with names.

Non-European ethnic and cultural backgrounds are especially encouraged, as it is the contention of ***Traveller***'s original designers that all of Earth's peoples participated in the settlement of space. This may result in the use of triple names from some cultures (Vasili Pavlovich Zhukov, Marcus Tullius Cicero) or names where the family name is the first name (Kim Sung).



Starports: Extrality

The major portion of a starport is surrounded by a barrier demarking the limit of Imperial extraterritoriality (often shortened to *extrality*). The region inside this is under direct Imperial authority and the local planetary laws do not apply. Goods may be be purchased here without duty, and taxes are limited to a small Imperial income tax and such customs duties as the Imperium levies. Violators of local laws, especially political "criminals," may find asylum and sanctuary from restrictive local regimes, but if the fugitive is sought for an offense that is also a violation of Imperial law (murder, most felonies, and so on), Imperial officials will hold and extradite the fugitive.

Depending on the nature of the planetary government, the extrality limit may be marked by a simple wire fence or more complex barriers resembling the Berlin Wall of old Terra. This usually is done to prevent citizens of the planet from leaving without authorization and to enforce local customs laws.

Although, strictly speaking, the law level of the starport permits any weapon to be carried openly, the Imperial laws against property damage, murder, and extortion are rigidly enforced by Imperial authorities, backed up by Imperial military forces as necessary. The owners of most businesses frown on open displays of weaponry and will usually refuse to serve walking arsenals . . . and are usually fairly well-equipped themselves.

Each facility has its own unique features, and the number of variants is almost equal to the number of downports (that portion of the starport located on the surface of the planet – orbital facilities, or highports, are all extraterritorial). Almost every downport has an associated urbanization surrounding the downport (in many cases completely). Residential areas are often allowed inside the extrality barrier for employees of the port and its associated businesses (which are as numerous as those associated with a terrestrial airport or seaport of the present). It shouldn't take much imagination to come up with adventures hinging on extrality.

An escaped criminal, for example, might seek asylum inside the extrality barrier. Since it is in the best interest of the downport to maintain cordial relations with local governments, if the crime was particularly heinous (in local terms), there might be a tendency on the part of the starport officials to overlook exculpatory evidence. The accused might seek help in eluding starport officials until he can gather evidence to clear his name. Adjust the details to fit an individual campaign.

See pp. T:FT66-67 for more information.

Spinward Marches: The Imperium's farthest frontier sector, containing 437 star systems divided along a coreward/rimward line by the Imperial border. The region is dominated by two major powers: the Imperial Spinward Marches sector and the frontier provinces of the Zhodani Consulate. In the independent territory between the two powers lie four small territories: the Federation of Arden, the Sword Worlds Confederation, the Border Worlds (a splinter state cut from the Sword Worlds during the Fifth Frontier War), and the Darrian Confederation. Each follows its own diplomatic line designed to maintain independence from both the Zhodani and the Imperium.

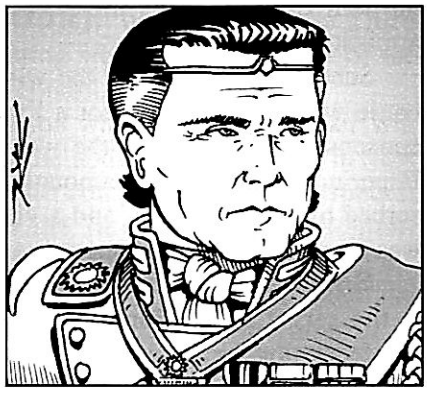
The Spinward Marches has been settled since the 400s and is still a frontier sector. High-tech worlds are scattered among empty, fallow worlds; there is potential for exploration, exploitation, and development for centuries to come.

GURPS Traveller Behind the Claw describes the Marches in detail.

Starport: An establishment for the landing, servicing, refueling, and control of starships. Starports range in quality from I (the worst, little more than a spot of cleared ground) to V (the best and most extensive).

Starports generally have two facilities, surface and orbital. The surface facility includes cargo-handling installations, a landing field, control towers, and other necessary areas. Surface starport components are frequently called Down (as in Credo Down Starport on Regina). Orbital facilities are present (usually in stationary orbit above the surface component) to enable handling of unstreamlined ships and to allow construction of heavy craft in orbit. The orbital component is often called Orbital (as in Credo Orbital Starport).

Type I and II starports have no extensive orbital facilities, but they usually have navigational satellites or similar equipment. Non-streamlined ships at these starports must be serviced by shuttles. Starports, being the primary point at which starships interact with a system, are usually the location for shipyards and additional bases, such as scout bases, naval bases, or other military installations.



Strephon (b. 1049): Strephon Aella Alkhalikoi, 43rd emperor of the Imperium; eldest son of Emperor Paulo III (981-1071); born 1049; coronation 1071. His Golden Jubilee (50th anniversary of his coronation) is to be celebrated in 1121. He married Iolanthe Guuilbataashullibaa (p. 43) in 1079. They have one issue, the Grand Princess Ciencia Iphegenia (p. 25).

Subsector: Mapping unit in astrography. Average density: 30 to 40 worlds per subsector.

Subsectors are noted within a sector by their position using the first 16 letters of the alphabet (A-P). In addition, they are named and may be called by a variety of synonyms for subsector, including province, cluster, or district. Imperial convention is to assign numbers to districts (for example, District 268) which are under Imperial protection because they are pending integration into the Imperium.

Superheavy Elements: Although elements heavier than uranium are increasingly unstable and radioactive (with half-lives measured in fractions of a second), quantum theory predicts an "island of stability," consisting of the elements with atomic numbers 114 to 122, which have half-lives measured in the millions of years. These superheavy elements, also called eka-metals or island metals, are generated in small amounts in supernova explosions. Only a few grams have ever been discovered in nature, which is just enough for scientists to determine that superheavies would be immensely valuable to industry if a source could be found.

Survey, First (published 420): The first comprehensive astrographic and demographic survey of the Imperium, which was performed by the Imperial Interstellar Scout Service. More than 100 years in the making, its publication in 420 made available the Imperium's records on its component worlds for public use.

Survey, Second (published 1065): The second comprehensive survey of the Imperium, which was performed by the Scout Service, and which updated the long obsolete and incomplete data in the First Survey. The Second Survey was 70 years in compilation, went to greater lengths than its predecessor, and included more world data as well as more complete astrographic data. In addition, the expansion of the Imperium since 420 had added many new worlds that had to be included.

Sword Worlds Confederation: A loose confederation of worlds in the Spinward Marches, spinward of Imperial space and coreward of the Darrians. The first settlement in the region was on Gram in -399.

By circa -200 the settlement of the area was largely complete, and the first interstellar government in the region, the Sacnoth Dominate, was formed in -186. Consisting of the 20 worlds settled up to that point, the Dominate lasted until -102, when it was fractured by rebellion into several smaller states.

During the ensuing centuries, various Sword World governments rose and fell; they sometimes coalesced all the worlds under a single world's domination and sometimes splintered into several small states. Contact with Imperial traders in 73 brought increased trade and had a stabilizing influence on the region, but this stability was short-lived.

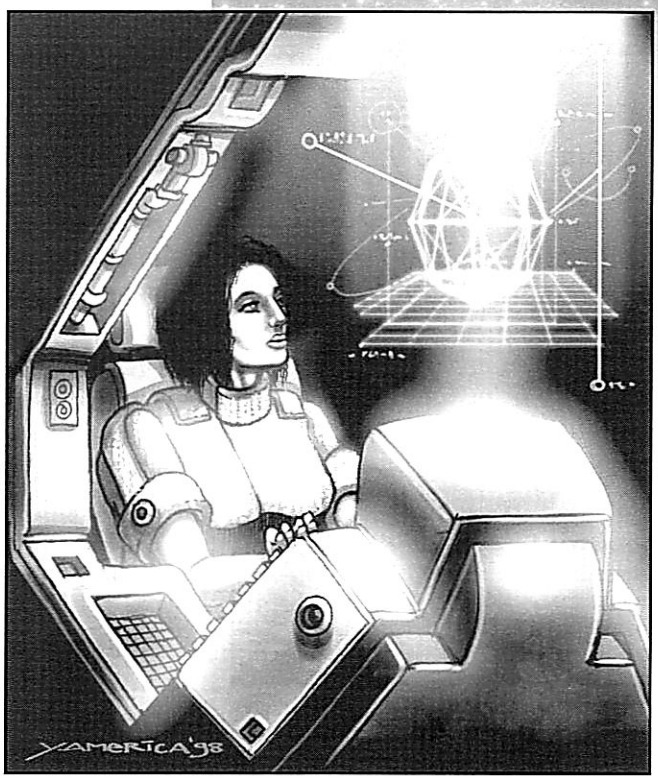
The First Frontier War brought a desire for cooperation among the various squabbling worlds, and the end of the war saw the formation of the first unified confederation in centuries, which was centered on Sacnoth and which was referred to as the Second Dominate. As a result of the Outworld Coalition's victory, the Sword Worlds annexed Terant 340, Torment, Trifuge, and Cunnonic, which are all in the Darrian subsector.

The Second Dominate held power until 698, when it was overthrown by a coalition headed by Gram. The Gram Coalition ruled until 788, when a short war with the Darrian Confederation resulted in the loss of the four worlds gained during the First Frontier War.

Public outrage at the mishandling of the war caused the subsequent fall of the Gram government. The replacement for the Gram Coalition was the Trilateral Alliance, a decentralized organization headed by Narsil, Sacnoth, and Durendal. The Alliance broke up in 848 due in large part to the inherent weakness of its organization, and an interregnum of essentially independent worlds lasted until Gram reasserted its influence (helped substantially by Zhodani money and advisors, rumor has it) in 852. This government has remained in control to the present.

The government allows almost complete local autonomy. Individual worlds maintain separate military forces, pass their own laws, and completely regulate their own internal affairs. The Confederation government regulates interworld trade, handles diplomatic relations with outside powers, and adjudicates interworld disputes.

In peacetime, the Confederation government maintains a pool of high-ranking military officers (selected from the military forces of all worlds) who are trained in large-unit command and staff operations.

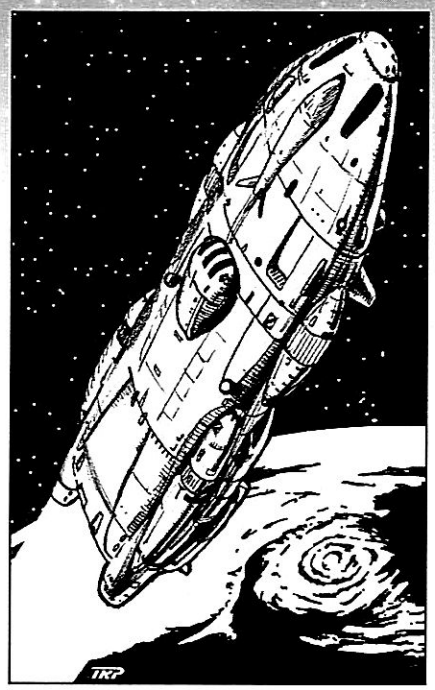


Blood Bonds

Soldiers get captured in any war, and elaborate procedures have been created over the years to deal with them. Often, one side trades prisoners with the other, usually on a 1-for-1 basis. In a mercenary war of the sort that takes place in ***Traveller***, the losing side is not usually able to conduct negotiations or provide funds. We speculated that part of the cost of hiring a mercenary unit would involve pre-paying their passage home after their services were no longer required, and the concept of a repatriation bond was born.

Repatriation bonds were partly inspired by the use of "documents" called *blood chits*, which evolved as a way of getting pilots home more or less intact. One prominent use was in China in 1940 by the American Volunteer Group (the "Flying Tigers"). Each pilot had a silk square sewn onto the back of his jacket with an American flag printed on it, and an inscription in Chinese, English, and several other languages announcing that anyone who helped the pilot get to American lines would receive a reward, usually paid on the spot in gold.

See ***GURPS Traveller Star Mercs*** for more information on repatriation bonds.



Square Pegs?

Cleon II: *Also known as Cleon the Weak; only Issue of Cleon I. Born 21, proclaimed emperor 53, abdicated 54.*

In fact, history testifies that "weak" may be an unfair description of Cleon II. Apparently unsuited to devious palace politics, but still recognizing the need to consolidate the power of the fledgling Imperium, Cleon abdicated in favor of his brilliant chancellor, Artemsus Lentuli.

Vitally concerned with the welfare of his former realm, Cleon spent the remainder of his active, colorful, and (from all accounts) happy life on the frontier as a self-appointed (and extremely effective) one-man fire brigade. His personal magnetism, combined with the romance of his abdication, made him an extremely effective advocate. The most famous example was in 56, when he single-handedly averted the potential rebellion on Thutmose by mediating a marathon 39-hour negotiation session between all three political parties on that world.

Cleon III: *Born 201, proclaimed emperor 244, assassinated 245. In the dynastic crisis caused by the death of Martin II without direct issue, Cleon Zhunastu, a great-great-great-grandson of Cleon II, appeared to be the most legitimate claimant to the throne. Since Cleon III was soon nicknamed "Cleon the Mad," it appears that while Cleon's claim to the throne was sound, he was not. His behavior in office soon convinced surviving members of the government that he was a homicidal maniac, and a decision to dispose of him was made and implemented in short order.*

– Chadwick, Miller, et al., "Emperors of the Third Imperium"

During time of war, all military forces are confederalized and placed under a single unified command. For ground forces, divisions will be commanded by generals from the individual worlds, corps and higher organizations by Confederation officers. The component forces of a division will be from the same world whenever possible. For naval forces, individual ships are under the command of local officers, squadrons or higher organizations under Confederation officers.

See ***GURPS Traveller Behind the Claw*** for more information.

Sylea: Capital of the Sylean Federation. Renamed Capital by Cleon I.

Sylea, Domain of: A domain of the Third Imperium, consisting of the Core, Fornast, Massilia, and Delphi sectors.

Sylean Federation (-650 to 0): Large interstellar federation which served as the basis for the Third Imperium.

Established on Sylea in -650, the Federation grew slowly, absorbing several surrounding worlds and increasing trade and interaction between worlds.

By -30, the real power in the Federation was an industrial consortium headed by Cleon Zhunastu. Cleon, a Solomani noble of great vision, used his family industrial base and the support of other families (obtained by the persuasiveness of his personality) to obtain behind-the-scenes control of the Federation government and to begin an active campaign to increase the number of worlds under its control.

After 30 years of economic and diplomatic maneuvering (and occasional military action), Cleon had increased the size of the Federation and extended its control to the edge of what is now Core sector. Cleon envisioned a territory larger than a single sector, however, and concluded that the tightly controlled, highly centralized nature of the government of the Sylean Federation was not suitable for a large, star-spanning empire.

Cleon decided the Federation had served its purpose, and he began plans for a more suitable form of interstellar government, which would allow greater local autonomy but maintain cohesion over large distances. In addition, to restore the past glories of the Rule of Man (and therefore lay claim to all former territories of the First and Second imperiums), Cleon proposed to revive the Imperium.

This was made possible by the fact that in the closing years of the period known as Twilight, one of the last claimants to the throne of the Rule of Man had made Sylea his capital. Cleon traced the legitimacy of the Sylean Federation backward through this emperor to the Rule of Man and (since the Rule of Man claimed to be the lawful successor to the Vilani Imperium) to the First Imperium as well.

In the 651st year of the Sylean Federation, the Grand Senate of the Federation "persuaded" Cleon to accept the Imperial crown. That year he was crowned First Emperor of the Third Imperium, and he proclaimed the 651st year of the Sylean Federation to be the Year Zero of the Third Imperium.

System: A star and its family of planets and satellites. The term "system" denotes a major world and its associated star, plus any other planets, satellites, asteroids, and other bodies.

System-Defense Boat: A non-starship specifically intended for defensive operations inside a star system. It was developed on the principle that a non-starship (because of the increased armament made possible by its lack of jump drives) can normally defeat a starship of equal tonnage. SDBs are typically stationed at the vital points of a system (the gas giants, the asteroid belt, the major world, and so on), and they attack invading vessels according to one or more predetermined plans.

System-defense boats range in size from 100 to 5,000 tons and are constructed at all tech levels from 8 to 12. There are hundreds of different types, which depend upon the specific mission for which they are designed.

Terra (Solomani Rim/Sol 1827 A867A69-F): Also known to its inhabitants as Earth, Terra is the origin world of the genetic stock from which all races of Humaniti are descended, former capital of the Terran Confederation, former capital of the Old Earth Union, and former capital of the Solomani Autonomous Region. The word Terran (used in the past to refer to an inhabitant of this world or to a citizen of the Terran Confederation) is derived from the name of this world. See sidebar, p. 62, for a discussion of the Terra system.

Terran Confederation (-2398 to -2204): Interstellar government consisting of Terra and its colony worlds. The Terran Confederation has its roots in the formation of the United Nations Space Coordination Agency (UNSCA) circa -2500. In addition to handling mundane responsibilities that helped avoid conflict, UNSCA soon became a clearinghouse for space operations.

One of UNSCA's natural directions was research. In 2087 A.D., UNSCA researchers in the system's asteroid belt who were looking for better drives to transport ores invented jump drive. The first jump drives were used only in the solar system – they were too weak to be used for interstellar travel. In 2096 A.D., for various reasons, the first interstellar jump expedition traveled to Barnard's Star rather than Alpha Centauri.

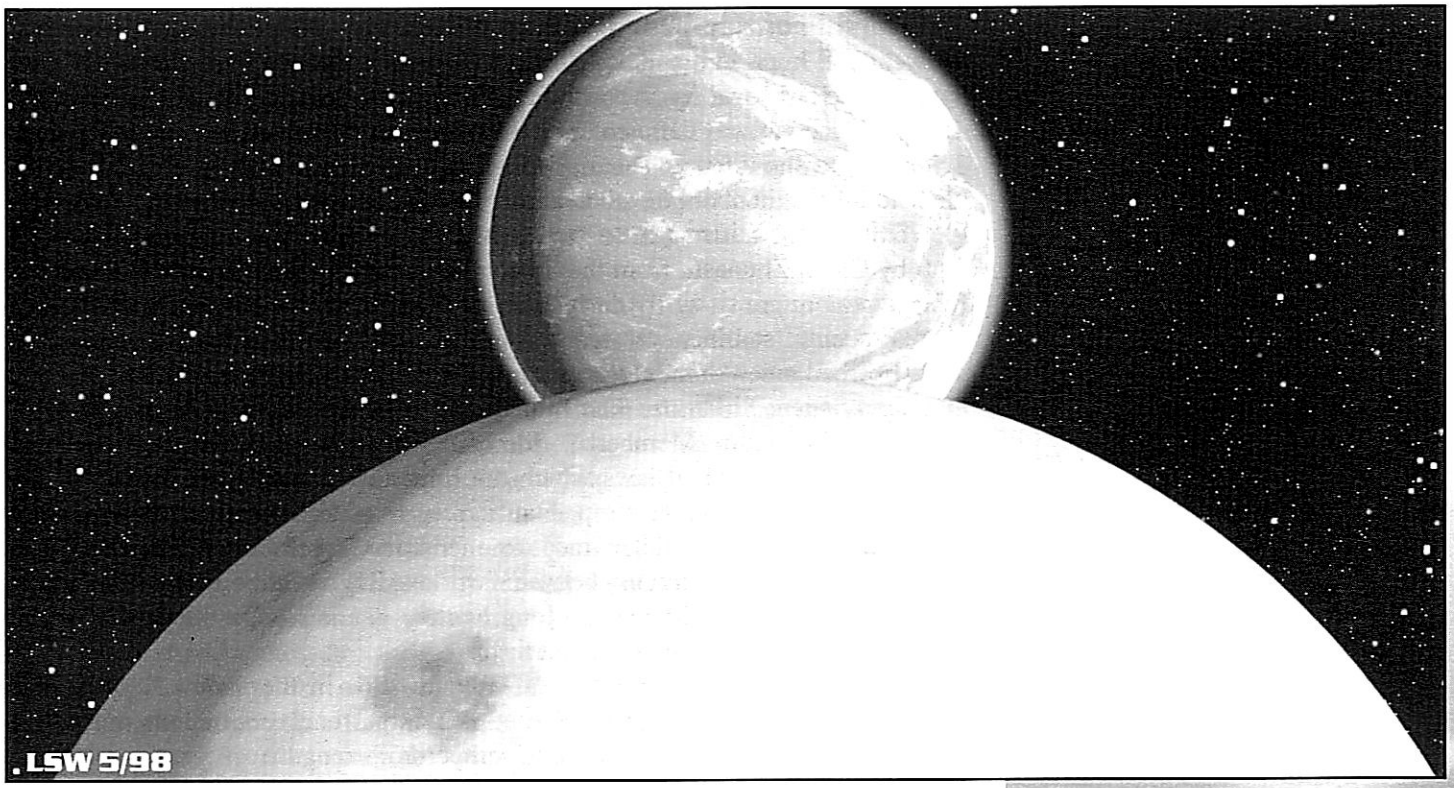
Upon their return in 2097 A.D., the expedition members were hurried into a hushed meeting with UNSCA. The expedition had encountered intelligent life – Human life! The expedition members had encountered a Vilani prospecting outpost, an outpost on the very fringe of a vast, advanced empire controlled by alien Humans. It came as quite a shock to the Terrans that many of the worlds only a few parsecs away were already claimed. Politicians echoed the popular sentiment that it was unfair for people from several hundred light-years away to claim worlds near Terra. Individual nations began expanding their armed forces and building starships.

Is the Truth Really Out There?

A question that is as hotly discussed among ***Traveller*** fans as speculations about angels and pinheads among medieval philosophers is this: To what extent did the Vilani have contact with Terrans prior to the official first contact in 2097? How could the Vilani have missed such an important world? Are all the 20th-century reports of ET contact really grounded in Vilani surveillance of Terra? If the Vilani knew about the Terrans, how could they have come as such a surprise in the various frontier wars?

Some ***Traveller*** fans hold that the Vilani did not know of the Terrans, but that a lesser Vilani subject race (perhaps the Vegans) did. Were the bodies allegedly recovered at Roswell, New Mexico, in 1947 Vegan merchants killed in some kind of accident? Was the Tunguska event in Siberia in 1908 a Vegan spacecraft crash? Did the Vegans or some other spacefaring group give the secret of jump drive to the Terrans in the late 20th or early 21st century?

Traveller canon has always avoided the question, but the present author has one fervently held opinion: Terran invention of jump-drive was through their own efforts – it was not given, taken, or acquired in any way other than through independent research.



A Great Golden Crown

"The Imperium is our contribution to the endless history of civilization that came before us and that will continue on after us. It is what we leave to the future, and is in some finite way better than what the past left to us. No great civilization is ever dead. They all remain as the foundations upon which future societies are built. The Terran Confederation, the Vilani Bureaux, Cleon's Sylean vision, the United States of America, the Roman Empire, the Gimmini city states. All are still with us.

"The Third Imperium is a great golden crown, the greatest achievement of Human history, and each of us are tiny gems set within it. But this crown is not meant to be worn by any emperor. It is a treasure that belongs to every Imperial citizen, and each of these must be free to fashion his or her own addition to this treasure, to attach him or herself to this priceless offering that we leave to the future."

– Emperor Strephon Aella Alkhalikoi, from a speech to the Imperial Moot, 1110, on the occasion of his order to lift martial law on Terra

The Lifeblood of Empire

"The only measure of this Imperium's value is its economic strength and vitality. We may aggregate all manner of high purposes and beliefs to this civilization, but we must not forget that it exists only to allow its citizens to effectively interact on an economic basis.

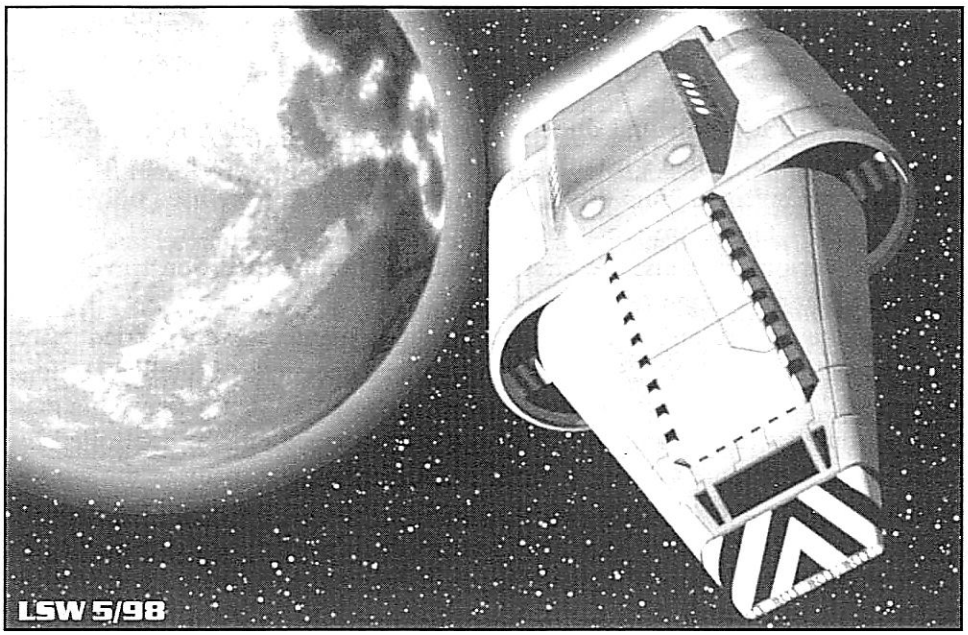
"All interactions between intelligent beings are economic because economics is the satisfaction of natural biological needs by social means. We create societies by trading; we do not create societies and then decide to trade to have something to do with our time. Politics, statecraft, religion, and our own glorious Imperium; these are all methods to create an environment within which beings can go about their most basic business of trading the necessities for healthy, meaningful lives."

– Duchess Margaret Tukera, address to the 500th Oracle, 103-1116

Over the course of the next three decades, UNSCA and the United Nations transformed itself into a true world government, which administered the defense of Terra against the Vilani Empire. Terran colonies formed on other worlds were granted membership in the United Nations. In -2400, the UN officially changed its name to the United Worlds. Two years later, the name was changed again to the Terran Confederation. Modern historians, for simplicity, use this term exclusively.

The Terran Confederation fought a series of interstellar wars with the Vilani Imperium over the period -2408 to -2219. These wars ultimately resulted in the fall of the Vilani Grand Imperium. The Confederation was dissolved in -2204 upon the proclamation of the Rule of Man to replace the Vilani Imperium.

See also *Rule of Man, Nth Interstellar War,* and *Solomani.*



Third Frontier War (979 to 986): The long period of uneasy peace between the Imperium and the Zhodani Consulate erupted into war in 979 with simultaneous blows by the Zhodani in the Querion and Jewell subsectors. Imperial reaction was deficient, and the hostilities continued for nearly six years with little to show for it. The armistice finally signed in 986 gave each side little, and it brought about the abdication of Emperor Styryx in 989.

Third Imperium (0 to present): Also called The Imperium. Founded in 0 by Cleon Zhunastu from the Sylean Federation in what is now Core sector. The Imperium grew swiftly during the pacification campaigns, and more slowly thereafter until stability was reached in the 600s, by which time the Imperium had absorbed much of the territory of the First and Second imperiums.

Government Structure: The Imperium can be best thought of as a form of feudal confederation. Member worlds of the Imperium agree to pay taxes and obey a few fundamental laws which the Imperium promulgates, known as the High Laws. In return, the Imperium agrees to patrol the space between the worlds, to protect interstellar trade, to encourage travel and commerce, and to arbitrate diplomatic relations between worlds. Beyond this, individual worlds are left to their own devices so long as they acknowledge the power of the Imperium to rule the space between the stars.

Imperial power is present on member worlds in the form of consulates, bureaucratic offices, and bases. Sometimes, larger enclaves of Imperial power are placed where they can enhance the emperor's strength.

The Imperium's territory is divided into sectors, which are in turn divided into subsectors and systems. Groups of sectors called domains have been created above the sector level.

During the Pacification Campaigns, Emperor Artemsus divided space into six regions, labeled them domains, and appointed an archduke over each of them. To each archduke, he assigned the continuing pacification of the domain's many systems and their integration into the Imperium. The domains were: Sylea (Core, Fornast, Massilia, Delphi), Vland (Corridor, Vland, Gushemege, Dagudashag), Gateway (Ley, Glimmerdrift Reaches, Gateway, Crucis Margin), Ilelish (Ilelish, Zarushagar, Reaver's Deep, Daibei), Antares (Lishun, Antares, Mendan, Amdukan), and Sol (Diaspora, Old Expanses, Solomani Rim, Alpha Crucis). Most of the domains were never totally absorbed into the Imperium.

In 589, during the First Frontier War, a seventh domain was established: Deneb (Spinward Marches, Deneb, Trojan Reach, Reft). The intent was to appoint an archduke to be responsible for their supervision. However, the Civil War broke out before an archduke was appointed, and it was not until over 500 years later that Emperor Strephon would be persuaded to appoint Norris Aella Alledon as archduke of the domain of Deneb.

Following the Civil War, the emperors expressed concern about individuals with powers equaling their own, so they moved to lessen the power of the archdukes in the Imperial government. As a result, the domains came to have little practical significance. Each archduke did retain the power to create knights and baronets.

In the years after the Fourth Frontier War, and after the problems it presented from lags in communication, Emperor Strephon felt a strengthened archduke position could enable the Imperium to more quickly respond in defending the realm. Against the protests and opposition of some prominent members of the Moot, Strephon reestablished the domain as a level in the bureaucracy of the Imperial Navy, and returned to the domain the ability to collect taxes. Still later, Strephon gave the archdukes the ability to legislate and enforce the desires of the emperor on the local level.

See *Sylean Federation.*

Thoengling Empire: Large, centralized state in the Vargr Extents. The Thoengling Empire is one of the most stable of the Vargr states and has existed in its current form since 792. The emperor, who has great governmental authority, is chosen for life by vote of an elected assembly; by law, no member of his family may succeed him. Sons and daughters of the higher nobility are brought up at the Imperial court, where every effort is made to inculcate personal loyalty to the emperor.

The Thoengling Empire has become a major trading partner of the Imperium and generally supports Imperial interests in the Vargr Extents.

Trade Routes: Routes which jump-capable starships travel between major worlds and which connect vital suppliers with essential markets, important government worlds with high-population worlds, and strategic resources with exploiting industry. Trade routes are a natural outgrowth of economic and market pressures. When a market is no longer profitable, the trade routes bypass it.

The trade routes are typically the territory of the Imperium's largest trading companies. They maintain fleets of commercial transports and merchants who serve these trade worlds, and they reap large profits in doing so.

But the trade routes directly serve fewer than a tenth of the worlds of the Imperium. The other 90% of the Imperium's worlds are served by feeder lines, tramp freighters, and free traders. These smaller companies and unscheduled ships carry passengers and cargo between worlds off the main trade routes.

Trade Routes

One of the problems with space is that it is essentially empty. Isaac Asimov once wrote that if star systems were atoms (he mentioned that our system would be a fluorine atom), the universe was an excellent example of a hard vacuum. What this means is that there is almost nothing resembling terrain for interstellar maps, and no one direction is superior to any other direction. An essentially random distribution of stars results in clumps and patterns, however, and this helps a little.

The concept of the jump drive creates limitations to free travel, however. Most ships in ***Traveller*** cannot travel more than 1 or 2 parsecs at a time, and this means that "roads" in space will follow the paths of these short-hop jump routes. An analogy can be made to rivers. Rivers are naturally occurring transportation routes, and cities located on them had greater access to trade than those not so fortunate. Worlds located on the "trade routes" formed by the strings of 1-parsec jumps will tend to be more prosperous than those not so favored.



K'kree Religion

"The K'kree are unlike the vast majority of sophonts in that their religious beliefs are monolithic throughout their culture, and essentially unchanged since the earliest K'kree civilization. They have been almost totally unaffected by exposure to outside influences, or the advancements of science and technology. K'kree religion is not so much a way of worship as it is a way of thought and belief. While K'kree religious writings abound in myths and legends, and there is a definite belief in divinity and in divine purpose, the K'kree never seem to have evolved the notion that their deities could be swayed by prayer, offerings, promises, or good behavior. As suits a harsh and militant people, the divine play is distant, inscrutable, and unrelenting.

"The K'kree religion is a fatalistic one – they believe that events have been long since preordained, and are quite unchangeable by any mortal agency. This fatalism, however, is tempered by an absolute faith in their own glorious destiny. Thus, fatalism does not hamper them; instead it makes them almost fanatical. If a K'kree soldier has been fated to die, he will die – no amount of running from destiny will stop him from being killed, or from doing what he is fated to do. Thus, he is more inclined to put his every effort into the battle.

"As befits their natures, the religion of the K'kree is perhaps the most supremely polytheistic religion practiced by any race anywhere. The K'kree believe that each and every living K'kree is the worldly counterpart of a divine being. The religion holds that there is an ideal universe, somewhere in time and space, in which all K'kree who ever were (or will ever be) live. It is a single, immense prairie, on which all can live in complete peace and harmony, under a divine steppelord who rules over all equally.

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Travel Zone: Standard form of classification for worlds in terms of relative danger. As a service to spacefarers, the Travellers' Aid Society (see p. 35) publishes travel-zone classifications which indicate the degree of danger a world presents to visitors. Standard classifications are green (no danger), amber (caution advised), and red (severe danger).

See *Amber Zone*, *Red Zone*.

Trojan Points: In a gravitational system composed of a small body orbiting a much larger one (such as a planet and star, or a moon and planet), there are two stable points lying in the small body's orbit 60 degrees ahead and behind it, and equidistant from the small and large bodies. These are called Trojan points (also LaGrangian points, which are abbreviated as L4 and L5).

The Trojan points of a gas giant near an asteroid belt commonly collect a cluster of asteroids. The name comes from the first such cluster discovered by Terrans at Jupiter in the Sol system; the asteroids were named after mythical heroes of the Trojan War.

Twilight (-1776 to -1526): The failure of the Rule of Man triggered the collapse of most interstellar civilization. While interstellar travel and commerce continued, it was at a greatly reduced rate, and the many worlds of the Imperium turned in on themselves. The period of collapse is termed Twilight, and it lasted for 250 years.

Modern historians consider Twilight to have begun in -1776 when the treasury on Hub/Ershur refused to acknowledge a monetary issue of the branch treasury at Antares, which triggered a financial collapse and the destruction of large-scale trade within the Imperium. The end of Twilight is commonly accepted as the year -1526, when the last governmental body claiming to be the Rule of Man ceased to exist. This ushered in the Long Night (see p. 48).

Twilight's Peak: Legendary or apocryphal story of lost starfarers on an unknown world who discovered fantastic structures and devices while surviving a terrifying winter. Phrased as an epic poem of execrable quality, the story is most notable only in that it may be based on fact: A task force was lost in the time period specified, and it has not been recovered or accounted for.

Two Thousand Worlds: Most common name in the Imperium for the region of space ruled by the K'kree. "Two thousand worlds" is a literal translation of the K'kree *T't'tkahk Xeng Kirr.* The same words can also be rendered idiomatically as "universe." In times past, the words meant "night sky," for roughly 2,000 stars can be seen from one hemisphere of *Kirur,* the K'kree homeworld. The name should not be taken to mean that there are exactly 2,000 worlds in the K'kree empire.

The K'kree government is highly conservative. The current dynasty ruling the Two Thousand Worlds has been in power since prehistoric times, and the form of the government has remained unchanged except for a few minor modifications made necessary by the problems inherent in governing an interstellar empire.

K'kree expansion into space progressed very slowly after the invention of the jump drive in -4142. The conservative nature of society and the technical limitations placed upon spaceflight by that society (K'kree spaceships must be very large, for example) combined to inhibit early exploration and colonization.

The discovery of other sophonts caused a xenophobic reaction in K'kree society. The realization that intelligent carnivores might exist somewhere in space sparked the K'kree obsession to convert the universe to herbivorism. This obsession stimulated the growth of the Two Thousand Worlds to its present size and still dominates K'kree culture. Local cultures are tolerated and other aspects of K'kree society are not heavily enforced, but all races within the Two Thousand Worlds are herbivorous.

K'kree contact with the Hive Federation was soon followed by the Hiver-K'kree war of -2029 to -2013. The military technology of the K'kree proved superior in the first stages of the war. The war ended due to nonmilitary considerations, however, when the Hive Federation demonstrated a plan to radically alter the K'kree social order through the use of psychohistorical techniques and threatened to implement it. The K'kree withdrew to the antebellum borders, and the border between the two states has remained stable to this day.

The K'kree Empire eventually stopped in its expansion. Increasing problems of administration over interstellar distances and contact with other starfaring races (such as Hivers and Humaniti) have stabilized the Two Thousand Worlds at its present size.

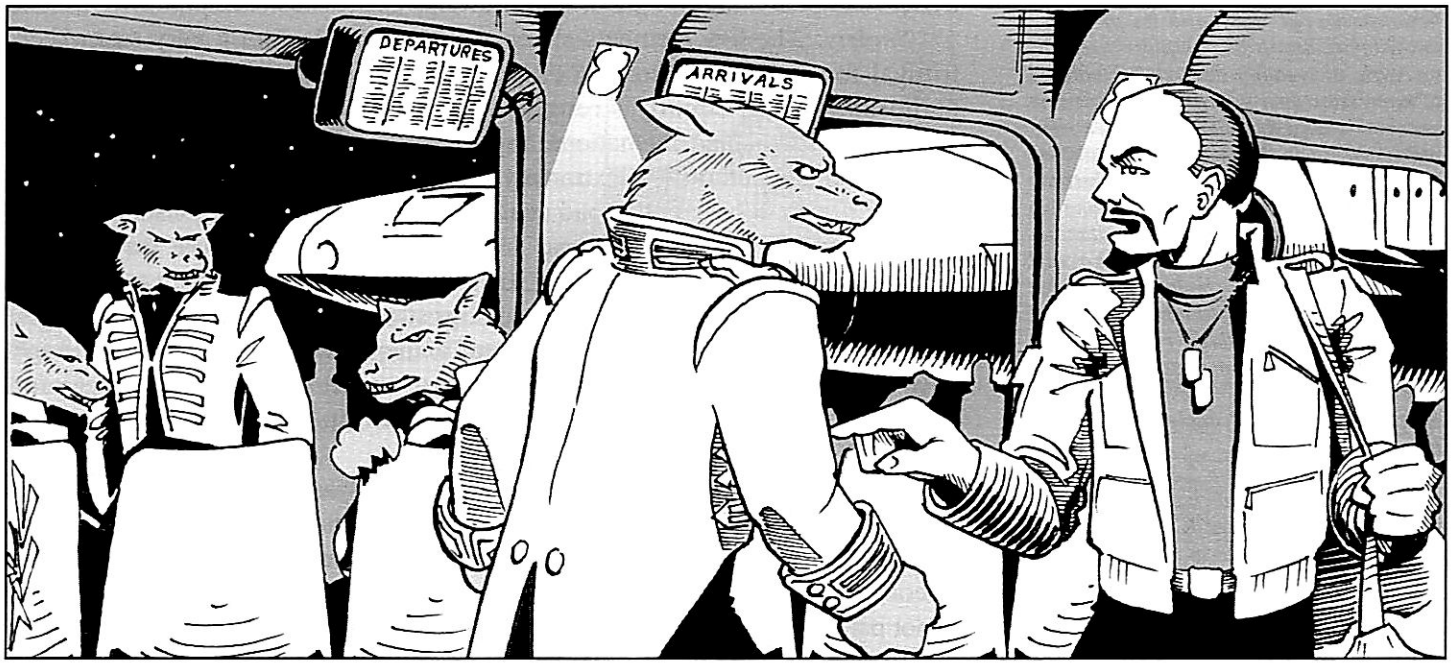
See *K'kree* and ***GURPS Traveller Alien Races 2***.

K'kree Religion

[Continued]

"Each mortal K'kree is a living embodiment of his respective divine counterpart, born into the world for the dual purpose of carrying forward the divine plan for this shadow world, and of testing the individual's worth.

"These divine K'kree become mortal once, live out a lifetime in this universe (which is but an instant in their own), and then return when their part is done. The way in which they stood up to the trials of this universe determines their standing in the other.



V

Vargr: Intelligent major race derived from Ancient genetic manipulations of Terran carnivore/chaser stock, which apparently dates from approximately the same time that Humaniti was scattered to the stars.

Inhabiting a region rimward of the Imperium, the Vargr were a puzzle to xenologists. The biochemistry and genetic makeup are almost identical with a number of terrestrial animals, but they differ radically from most of the flora and fauna indigenous to Lair, which is the purported Vargr home world.

Research during the early years of the Third Imperium concluded them to be the result of genetic manipulation of transplanted Terran animals of the family *Canidae,* almost certainly of genus *Canis.* The obvious conclusion – supported by the archeological evidence – is that the race known as the Ancients was responsible for this.

The typical Vargr is about 5′2″ and 130 lbs. They are upright, bipedal carnivores, with rear limbs digitigrade and hands very similar in size and appearance to those of a Human, although there are significant internal differences. They have approximately the same physical parameters as Humans, and are able to use the same equipment without modification or additional instruction.

"Details of these concepts are hard to translate to the Human mind. There seems to be little concept of a 'good' life or an 'evil' life, or of rewards or punishments handed out for conduct. Ethics and morals are not so much the object of judgment as the ability of the individual to play his part without complaint, doing what needs to be done. In many respects, these religious concepts can be acquainted with certain philosophical teachings of Terra's ancient Greek and Roman cultures, particularly certain of Plato's doctrines (see especially ***The Republic****, Book VII) and some aspects of Stoic philosophy.*

"That the K'kree believe themselves to be reflections of divine beings in temporary mortal form is an interesting concept. It is the basis for their extremely rigid dislike of other races, for the K'kree religion makes no provision for non-K'kree in their paradise world. Thus, all non-K'kree they meet, no matter how intelligent, are of the shadow world (our universe) alone, and hence inherently inferior.

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K'kree Religion

[Continued]

"Yet the K'kree know themselves to be mortal in this life; their divine essence is no more and no less immortal than the Human concept of the soul.

"The shape of the divine plan for this 'shadow world' in which the K'kree live out their mortal lives is also an interesting one. The closest approximation to the K'kree belief possible in Human terms (and the approximation is by no means exact) is that the K'kree come into this world to shape it into a new paradise, into which some other people will eventually emerge and, in turn, descend into another 'shadow world' to shape its progress toward paradise. It is an infinitely repeating cycle of creation through a multitude of universes. Just who is to inherit this universe is hard to say; some K'kree writings seem to indicate that it is another race of K'kree, but a few translations could be interpreted to mean that it is some K'kree client race that will ultimately emerge as the 'divinities' who will descend into the next shadow world from ours. This would seem to be at the core of the K'kree efforts to shape certain subject races into a pattern conforming with their own ways. All other shadow races are, of course, nothing but obstacles in this life to be overcome.

"K'kree religious belief, at least among the leaders, was badly strained by the results of the Hiver-K'kree War. The K'kree backed down from the conflict, but the details of the true nature of the conflict were never made public. A certain weakening of the faith in the upper classes of K'kree society seems to have taken place, but their conservative nature made the idea of religious innovation unthinkable.

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On the average their reactions are slightly faster than those of the typical Human, but individuals vary widely. The Vargr senses of smell and sight are superior to those of Humans.

Government: There is no central Vargr government; indeed, there is no governmental type that can be said to be "typically Vargr." Every conceivable form of governmental organization can be found somewhere in the Vargr Extents. The only cohesive force in the Extents is a fierce racial pride which causes a slight tendency toward racial cooperation.

The higher the level of the Vargr government, the more unstable it becomes because of the difficulty of obtaining consent of all Vargr involved.

Vargr in the Imperium: While only a few planets populated completely by Vargr exist within the Imperium, there are millions of Vargr citizens of loyal subject planets. Additionally, Vargr adventurers, criminals, mercenaries, and traders can be found throughout the coreward reaches of the Imperium.

Society: The key elements shaping Vargr societies are a very strong centrifugal force resulting from an emphasis on consensus and informal lines of authority, and an equally strong centripetal force resulting from a deeply ingrained family/clan/tribe/national loyalty.

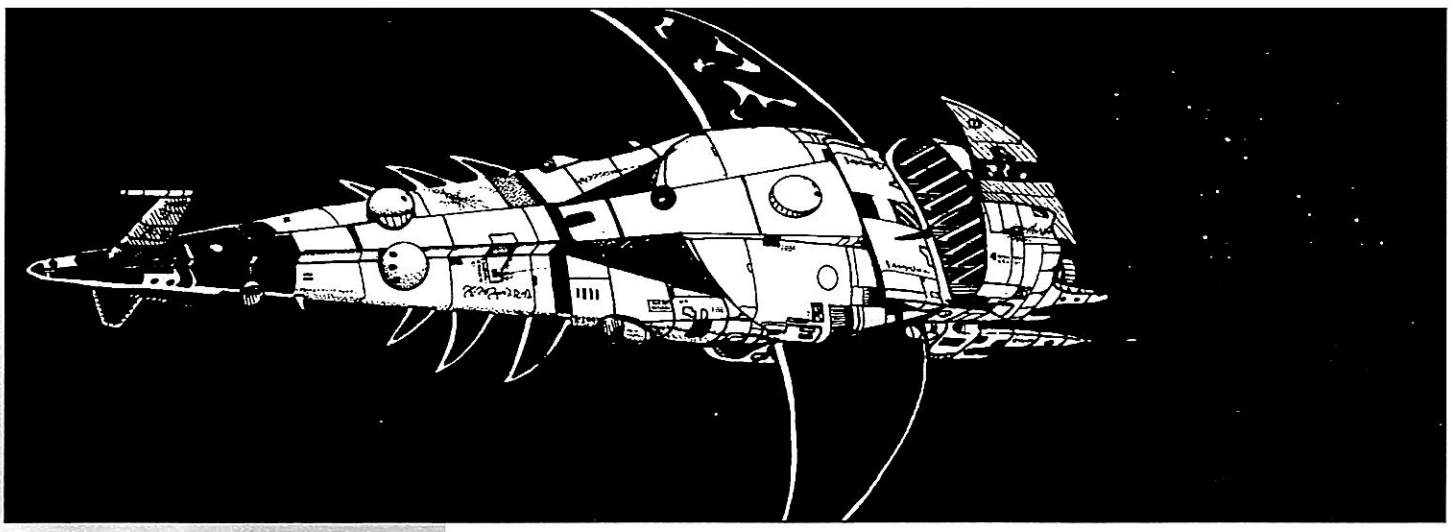
Centralized authority is extremely limited at the upper levels of Vargr society, and action is based on broad coalitional concerns, with a constant splitting and rejoining of dissident factions. Traditionally, this has made it very difficult for more centralized and organized societies such as the Imperium to deal on a meaningful basis with what passes for Vargr states.

The Vargr have little respect for formal authority, and what respect they might have decreases as that authority becomes more remote. Vargr tend to respect informal authority figures more, and they obey superiors who are better known to them.

The Vargr have an intense racial pride, and they are easily insulted. They are prone to enter into fights without regard to possible consequences. Vargr social organization is difficult to characterize in Terran terms, but it can be most closely compared to the Dakota Sioux of North America in the 1800s, if the analogy is not pressed too far.

Even among the most stable Vargr governments, a highly charismatic leader can attract followers for almost anything. The neighbors of the Vargr are constantly the subject of impromptu raids and scattered piracy by bands of Vargr (totally without government sanction, of course) who have been talked into a raid, a battle, or a war by a charismatic leader.

See ***GURPS Traveller Alien Races 1*** for more information.

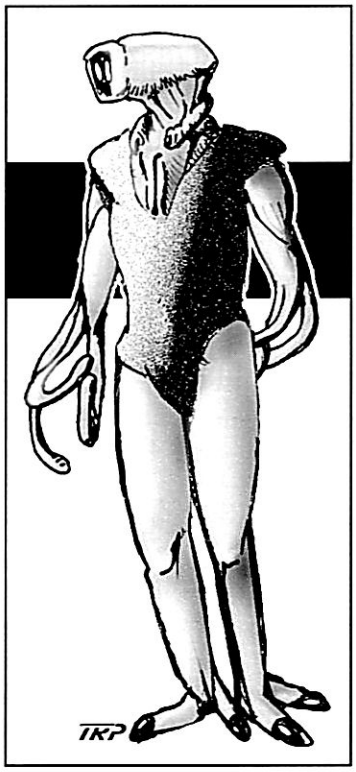


Vargr Campaigns (220 to 348): The series of wars, encounters, conflicts, and disputes between the Imperium and the various Vargr states in Vland, Corridor, and Deneb sectors along the coreward edge of the Imperium.

As the Imperium expanded, it initially recruited worlds which were former members of the Second and First Imperiums. As its borders reached still farther, the Imperial expansion met already established Vargr states of varying sizes. The Imperium struggled for over a century to secure its territory against the Vargr; the inevitable series of conflicts which resulted are collectively called the Vargr Campaigns.

Vargr Extents: The territory dominated by Vargr governments. The term Vargr Extents refers to those sectors with major Vargr populations. Extents are situated roughly coreward of the Imperium and especially coreward of the Spinward Marches, Deneb, Corridor, and Vland sectors. See ***GURPS Traveller Behind the Claw*** and ***Alien Races 1***.

Vegan: An intelligent race originating on Muan Gwi (Solomani Rim/Vega 1717 A456A86-F) and inhabiting the Vegan Autonomous District; they are named by Humans after the bright star near their homeworld.



General: Vegans are upright, bipedal, and bilaterally symmetrical, and they average 7′2″ in height. They are bisexual, homeothermic oxygen breathers with an average life span of more than 200 years. Because of their low-gravity origin, they are physically quite weak and are unable to live on high-gravity worlds.

The head serves both as braincase and as sensory appendage. Auditory organs are located in the collar-like structure around the neck. Despite external appearances to the contrary, Vegans have two eyes located inside the hood-like fleshy structure which dominates the head.

The paired eyes are covered by a transparent eyelid-like structure, which acts as a polarized light filter. This structure protects the eyes from glare, like built-in sunglasses, and also serves to keep windblown dust out of the eyes. This filter can be retracted when not needed. The eyes themselves are large and pick up radiation well into the infrared portion of the spectrum, an adaptation to Muan Gwi's small red sun. Since the skull is fixed solidly in place, a Vegan cannot turn its head, but the fleshy hood containing the eyes can turn through a large arc.

The mouth is a vertical slit in the upper thoracic region with paired breathing/vocal slits on either side of it. Two mandibles are located inside the upper chest, and they grind food between their opposing sets of teeth.

Where the forearm and hand would be on a Human, Vegans have three tentacles, which serve them as manipulative organs. Their legs end in broad, splayed feet, which prevent them from sinking into the soft sand.

The urogenital opening is a vertical slit located ventrally in the lower abdomen. There are no external differences between sexes.

Vegans have a number of adaptations to the arid dry region of Muan Gwi where they developed. Their tall, thin bodies are designed for maximum radiation of heat. The torso is covered with a thick integument. Its convoluted surface is richly supplied with blood vessels.

K'kree Religion

[Continued]

"By and large, today's K'kree still adhere strongly to the faith, though belief is weakest among the upper classes. The practical aspects of the religion – its influences on behavior – are largely independent of actual belief in the principles of the religion itself. K'kree are encouraged to be stoic, obedient, willing, and to live their lives in a way that will bring them merit (by accepting and overcoming everything that life throws in their path).

"Religion is a fairly private matter; worship is not as important to the religion as living a life in accordance with the principles of the faith. This is reasonable when one considers that the K'kree deities are the K'kree themselves, and anything paralleling worship or veneration of a 'patron deity' is a highly personal and private matter indeed, and one of the few uses of the concept of 'privacy' in K'kree culture."

– from a lecture by Dr. J. A. Keith, Professor of Comparative Sophontology, University of Terra at Glasgow

Epithets

Most sentient creatures assign nicknames for other races – derogatory epithets, mere vulgarisms, or attempts at humor. The examples below are translated into Anglic for clarity.

Imperial Nicknames for Zhodani: "Joes," "Zhos," "Joe Danny," "Sike" (or "Psike," referring to the fact that many Zhodani are trained psionics).

Zhodani Nicknames for Imperials: "Buzz," "dead-head," "blockhead" (a reference to the repression of psi powers within the Imperium).

Human Nicknames for Vargr: These aim at their perceived speech patterns, and include "Snarl," "Gral," and "barker." The ultimate insult, however, is "doggie."

Vargr Nicknames for Humans: The Vargr tend to refer to the color of human skin ("pinkie," "brown-hide"), to the human's relative lack of hair ("baldy") or to the peculiar odor of humans ("stinker").

Sword Worlders: The immensely proud Sword Worlders expect to be addressed as "Sir" or "Madame." A powerful insult, when it can be gotten away with, is to omit the use of any honorific, especially with officials. Similarly, an easy way to ingratiate oneself with a Sword Worlder is to adopt an attitude of deference; even an extreme or satiric pose ("Most Esteemed, Most Highly Evolved Sir . . .") will be mistaken by some Sword Worlders for sincerity. But many Sword Worlders have caught on to the trick over the years . . . and they have retained a dueling culture.

Other Times, Other Places

The vast background history of the ***Traveller*** universe provides many eras for adventuring, but this book is limited to just one – the year 1120. Some GMs, however, will undoubtedly find that this setting places too many restrictions on the types of campaigns they wish to run, but will still want to use the ***Traveller*** background as inspiration. Several options are open.

The Beginning: Many GMs are attracted to campaigns set in the first few decades of the Third Imperium, under the reigns of the two Cleons and Artemsus. This is a time of rebuilding, expansion, exploration, and recontact after a period of chaos and barbarism, with many opportunities for the aspiring empire-builder.

This is the time period covered by ***Traveller, 4th Edition*** in the 20+ published books produced by Imperium Games. It will require very little effort on the part of the GM to convert this material to ***GURPS***, since the adventures and campaign materials are usable independently of the rules system.

Interstellar Wars: Another popular period is the time of the first contact between the Terrans and the decadent Vilani Empire, around the 24th century. The "explosion" of the Terrans onto the interstellar stage provides an excellent backdrop for adventure. However, no material on this period has been published as yet, which means that GMs will have to create their own.

By increasing or decreasing the supply of blood to the integument, heat radiation from the torso can be regulated to optimum effect (more during the day, less at night). This arrangement obviates the necessity for sweating and its consequent water loss. All orifices of the body can be sealed to prevent unnecessary moisture loss.

History: The Vegans received the jump drive about -6000 from Vilani-influenced traders, and they colonized several nearby worlds before being absorbed by the First Imperium in -4404. They were severely restricted under Vilani rule, as were all races who resisted being integrated into the rigid Vilani culture. Because of this, they welcomed Terran victory in the Interstellar Wars and the advent of the Rule of Man.

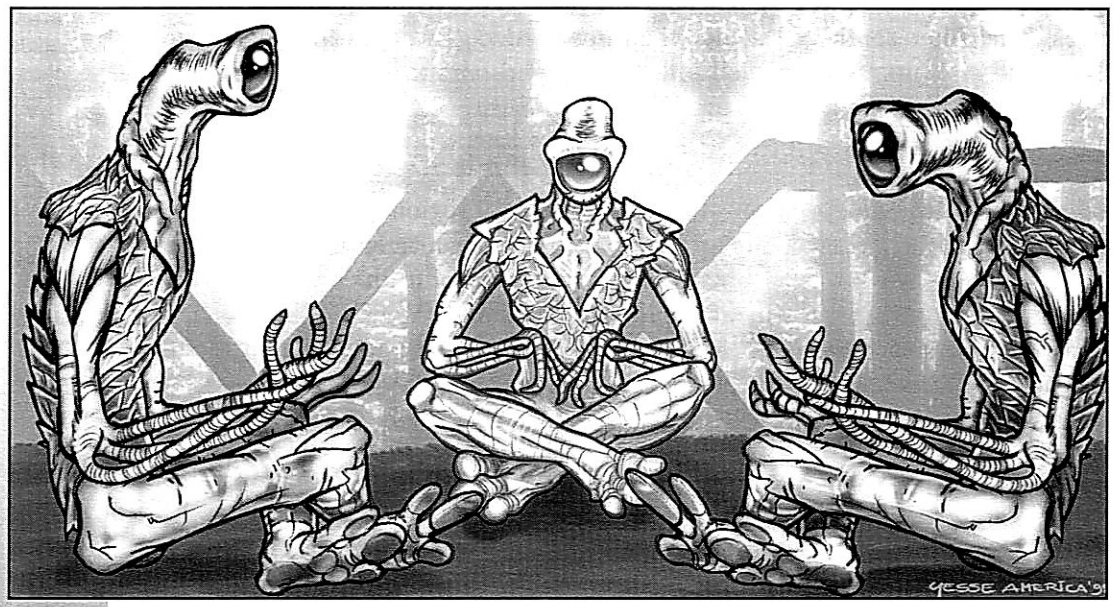
The Vegan Polity prospered under the Rule of Man and survived the Long Night largely intact. With the advent of the Third Imperium, the Vegan area was broken into individual planetary states in accord with Imperial policy; non-Humans were treated as full citizens, but – in order to cement Imperial authority – no multiworld governmental units were allowed.

Under the Solomani, the Vegans were again restricted. Human colonies were founded on many Vegan worlds to maintain Solomani influence there, and Solomani governors were installed on all Vegan worlds. After the Solomani Rim War, the present Vegan Autonomous District was formed as a counterweight to the Solomani.

Society: Vegan society is divided into hundreds of different *tuhuir,* which might be roughly translated as culture, philosophy, or tao. Each *tuhuir* has its own customs and traditions and its own interpretation of the proper way to live. The civil service which governs the Vegan District is a *tuhuir* which oversees and mediates among all the other *tuhuir.* Although rare, heretical and rebellious *tuhuir* do exist.

Archeology shows that the *tuhuir* were once separate societies and each was associated with a particular geographic location, like countries on ancient Earth. Now, however, they are mixed together in complex patterns.

Tuhuir are not hereditary; when a Vegan nears sexual maturity, he enters a period of search which may last for many years. Eventually, the individual chooses a *tuhuir;* once made, the choice is for life. In practice, about 50% of all Vegans enter the *tuhuir* of their parents (the exact percentage varies with each *tuhuir);* about 0.5% find that they enjoy the search as a way of life and never join a *tuhuir.*



Vegan Autonomous District: After the hard-fought victory over the Solomani at Terra in 1002, the Imperium found that it could not completely conquer and absorb the rest of the Solomani Sphere. The Imperial high command decided to create the Vegan Autonomous District to act as a counterweight to the remnants of the Solomani Confederation. The Vegans have complete internal control over their district, but free passage is guaranteed for Imperial citizens and goods.

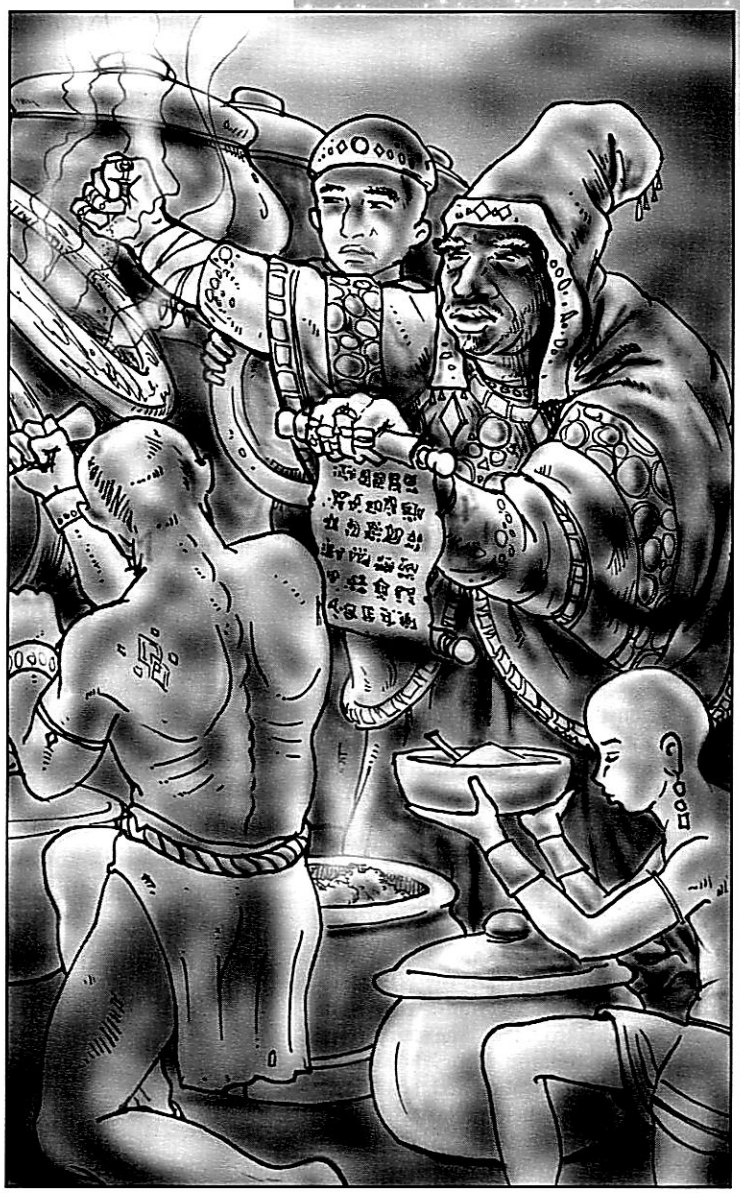
Although many factors have contributed to the present peace and stability along the Solomani Rim, it cannot be denied that the creation of the Vegan Autonomous District has achieved its original purpose.

The worlds of the Vegan Autonomous District are under a single, centralized government. State power is contained in a civil service and is chosen and promoted by competitive examinations.

Vilani: Human major race (*H. sapiens*) which developed on Vland from Human stock placed there by the Ancients.

History: The world of Vland, while possessed of a hospitable environment, boasted an alien ecology based on its own independently evolved biology, a biology that produced proteins, sugars, and amino acids that were difficult for Humans to digest and metabolize. The Humans could not use most local plant and animal life for food without considerable modification.

One of the oldest occupations in Vilani society is that of *shugilii* (which translates roughly as "miller"). The *shugilii* was a person who could transform raw food into edible food through special aging and chemical treatment. The *shugilii* task was more akin to shaman or witch doctor than cook. Since much food on Vland was inedible without some treatment, *shugilii* were powerful members of society.



The alienness of Vland was reciprocal. Humans were unsuitable as food for predators. Parasites and bacteria could not infect the Human system. Even most viruses were unable to invade and take over Human cells. Consequently, the primitive Human society found little need for medically oriented shamans. Vilani medical and biological science was very slow to develop because of this.

Vilani legends are full of accounts of the wars of the gods, terrible destruction, and occasional intervention in Human affairs by the gods. Legends exist of early explorers who found lands with great living stone-metal gods possessed of immense magical powers and immortality. Modern archeologists now believe these "gods" were actually great robot warriors and juggernauts used by the Ancients in their final war. Apparently, the last of these machines finally ran down circa -20,000.

Society: Early Vilani society was dominated by three groups: the *shugiliis,* the aristocrats, and the merchants. Aristocrats were the natural leaders of society, the *shugiliis* were the all-important food processors, and the merchants controlled trade.

With the flowering of Vilani society (circa -11,000) and its attendant industrial revolution, each of these three forces gained power rather than lost it; each participated in the creation of the industrialized wealth of Vland.

A Matter of Taste

While awaiting dinner, I was served a Vilani beer, which is something every gourmet should experience once. It was very dark, but not completely opaque. Light passed through it in a very diffused manner. The head was small, but persistent, and the aroma was heavy, yeasty, and faintly reminiscent of newly baked rye bread on Terra, with subtle hints of spices and seasonings that I cannot describe.

My first sip convinced me that I had been given water drained from aging sweatsocks. I thought for a moment it was a joke until I noticed my hosts swigging theirs with gusto.

– Kinmon Denisovitch, "An Innocent on Vland"

Vilani Conservatism

Q: How many Vilani does it take to change a lightbulb?

A: Six. One from the ladder carriers' guild of the maintenance bureau to bring the ladder in and set it up, one from the ladder holders' guild of the same bureau to steady the ladder once it is set up, one from the clerks' guild of the government bureau to make sure the proper forms are filled out for changing light bulbs and to pay the proper fee to the energy bureau, one from the lightbulb-changers' guild of the energy bureau to change the bulb, one from the wick-trimmers' guild because it is traditional, and one from the supervisors' guild because his presence is required by law whenever five or more workers are engaged in the same task.

When the Vilani first encountered the Terrans (now called Solomani), one of the chief surprises for the Vilani was the rapid pace of Terran technological change. Research was undertaken for its own sake, discoveries made as a result of that research, inventions devised based on those discoveries, and society changed by those inventions – all in a mere heartbeat as far as the Vilani were concerned. Why are the Vilani so slow compared to the Terrans, when both races originated from the same stock?

The most common theory holds that their distrust of innovation and technology stems from a dimly held prehistoric memory of conditions on Vland. Many scientists believe that a substantial number of Ancient war robots roamed Vland, fighting each other on behalf of a dead race for many centuries after the last of the Ancients had been destroyed. Until the power sources of these machines were exhausted, the Vilani led a shadowy existence in the hills, mountains, and jungles where the machines could not travel, developing civilization only after the last of the machines went silent. Technology is inherently chaotic, reasoned the early Vilani, and must be carefully controlled or it will destroy itself and everything else with it.

On a primitive world where interesting gadgetry lay everywhere (and could easily destroy the one who played with it, and all his family, too), and where even experimenting with a new food item was gambling your life, it's possible that the desire for innovation was literally bred out of the Vilani!

In -9235 the Vilani made their ultimate breakthrough – one that would assure their ascendance for the next 6,000 years. A research team working on the fringes of the Vland system created the first working prototype jump drive and demonstrated its effects.

The Vilani found intelligent life forms on other worlds within 60 parsecs of Vland. None of the races had progressed enough to have begun interstellar travel. The Vilani found it easy to dominate these less technically advanced races. The Vilani were able to impose their culture and law; however, the Vilani conquered through economic subjection rather than by military means.

As their sphere of influence was expanding, the Vilani found it difficult to maintain control across such great distances with jump-1 as their maximum rate of travel and communication. At the same time, each of the three power classes of Vilani society found itself threatened by the forces around it. Three bureaux were established, each independent of the other two, and each assigned a territory among the stars for which it was responsible. Each of the three bureaux was effectively identical, but they initially espoused different philosophies, based on their origins. The bureaux maintained their own governments within their territories.

Sharurshid, originating within the merchant class, emphasized interstellar trade. Makhidkarun, originating with the aristocracy, emphasized interstellar government. Naasirka, originating with the *shugiliis*, floundered after it found that it could not control food supplies on most of the worlds it dealt with, but it ultimately became a broad-line organization which emphasized energy, transport, and luxury goods.

In -5430, the Vilani finally invented the jump-2 drive. No other race had jump-2, and the Vilani maintained their monopoly by jealously guarding its secrets from all subject races. Beginning in -5400, a series of wars to subjugate the resisting fringe cultures was waged. This period of consolidation wars lasted until -4045.

Grand Empire of Stars: In -4045, the ruling Vilani council, the Igsiirdi, declared the Grand Empire of the Stars, or in the Vilani tongue, the *Ziru Sirka*. The Vilani calendar starts from this date.

At first, the empire had no emperor. Within 10 years, the chairman of the Igsiirdi (elected for life by the council) was the *Ishimkarun* – the "Shadow Emperor." He ruled through published proclamations, but never appeared in public. In -3610, the Shadow Emperor became the Emperor of the Stars, who was the absolute monarch of the empire. Successors were elected from the Igsiirdi upon the death of the old emperor.

For nearly 1,200 years the Grand Empire of the Stars kept the peace among its star-spanning population. However, the empire insisted on cultural rigidity. Exploration was stopped by -4000. Scientific research was controlled and then stopped altogether by -3800.

The beginning of the end of Vilani domination was signaled by the contact with the Terrans in -2422. By -2408 the Terrans and the Vilani were at war; by -2219 the Terrans had surpassed the Vilani technologically and were marching through the cities of Vland as conquerors, and the Grand Empire of the Stars was at an end.

Currently, Vilani is a cultural rather than a racial or national labeling, and it is applied to those within the Imperium who retain some of the old ways. Dialects of the old High Vilani language survive in certain places, along with a few fragments of Vilani culture, such as musical forms and other fine arts.

Certain of the old Vilani noble families have maintained more of the old culture, particularly the families who control the Vilani megacorporations. Some Imperial officials wonder how much of the old Vilani agenda they retain as well.

Vilani Calendar: The Vilani calendar is based on the period of Vland (the Vilani homeworld) around Urakkalan, its star. The Vilani *gurkala* (year) is 478.72 standard days in length.

See also *Vland, First Imperium,* and the *Concise History of the Ziru Sirka* sidebars on pp. 33, 42, 47, 49, 56, and 58.

Vland (Vland/Vland 1717 A967A9A-F): Homeworld of the Vilani, former capital of the Vilani Imperium, current capital of the Vland sector. Vland remains a major trade and cultural center for the Imperial core/spinward regions.

Vland, Domain of: A domain of the Third Imperium, consisting of the Corridor, Vland, Gushemege, and Dagudashag sectors.

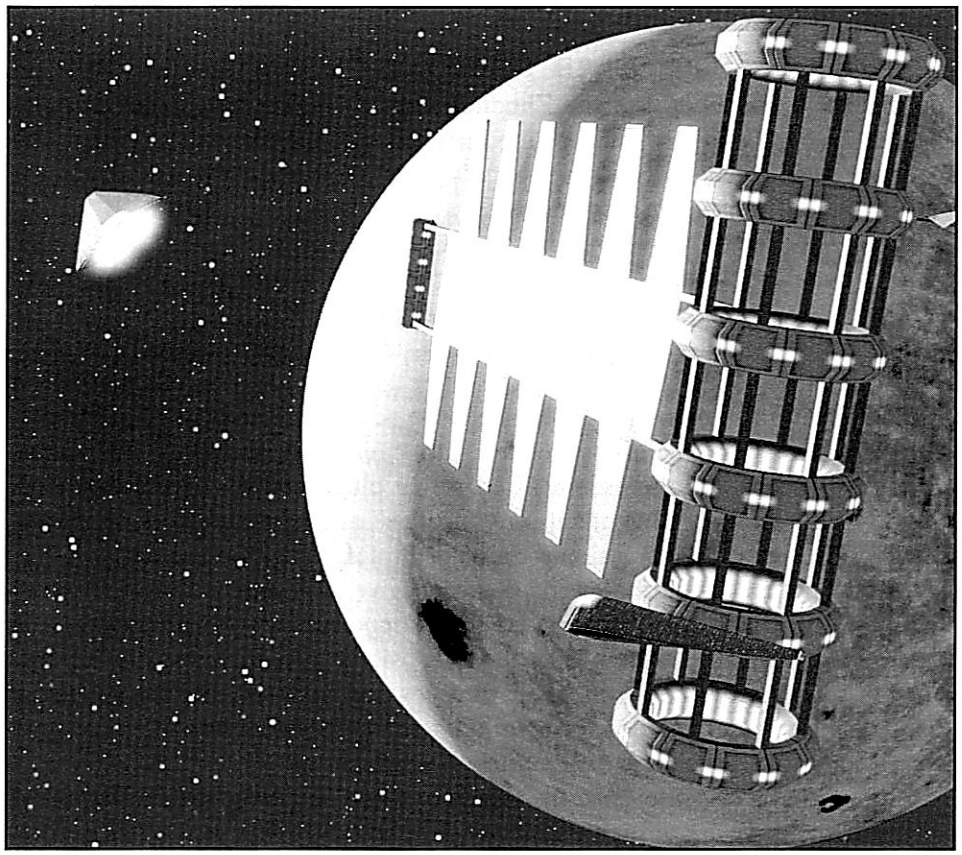
W

War: Major violent conflict between nations, megacorporations, or races. See *Good War/Bad War, Imperial Rules of War.*

Way Station: Link in the express boat network. The way station is a large (for the Scout Service) base devoted to the overhaul and refit of express boats at points in their journeys. During a normal tour of duty, an express boat will jump from system to system, and occasionally change pilots, but steadily work its way farther and farther down the line. At each stop (Xboat station), the Xboat is routinely checked, refuelled, reprovisioned, and sometimes recrewed. Ultimately, however, it must undergo maintenance and possible repair after the rigors of its mission. The way station performs this function.

Way stations have repair and maintenance equipment, as well as trained staffs of service personnel. They are the equivalent of naval bases, although they are capable of servicing only smaller tonnage ships (10,000 tons and less).

See ***GURPS Traveller First In.***



Vilani Names

Names for those of Vilani ancestry will of course be in Vilani. Space does not permit a full discussion of Vilani naming practices – simply pick a personal name and a family name from the list below.

Vilani Personal Names

The most common male personal names are: Adkhar, Eneri, Enli, Ganidiirsi (short form Gani), Shannash, Mazun, and Khugi, although they are not the only ones by any means.

The most common female personal names are: Gamaagin (short form Gam), Nashu, Sharikkamur (short form Sharik), Shana, Iikush, Musush; again, these are not the only ones.

Vilani Family Names

Vilani family names are like their Solomani counterparts, in that most of them have their origins in occupations long past.

Aadkashli
Aakmir
Aardashpiur
Aershugginkh
Akis
Ama
Anshii
Aru
Ashi
Ashran
Bamasmur
Biisana
Dargiimkam
Dashkhur
Digeruu
Direma
Dshurkemshirp
Durashnish
Durirrii
Ekiir
Enleshkaadshar
Gaakshirum
Gaarirra
Gaarrasa
Ganaare
Ganaran
Garshansem
Gashkhimkl
Gemana
Giinshiirnir
Giirdudshamsher
Gimmini
Iiken
Ilgud
Imgbukkhlum
Inshard
Irkirkhaamn
Kakaakam
Kakarku
Kamsash
Karise
Kdgergadm
Kerana
Khaasira
Khamkharlamdd
Khemiris
Khiikanu
Khiishimshu
Kigiisii
Kiigashshiim
Kiirumim
Lagkhuundaa
Lanashraa
Laragii
Linkirgir
Linuuksa
Lishenii
Maarera
Maariishe
Maasaaru
Madkashgerg
Makrus
Menkiin
Miigaki
Mimrak
Mirakru
Mirgakre
Murnas
Mushiiru
Namiirna
Nirkra
Numar
Nurashu
Riisha
Rishar
Sagaruu
Sargkham
Shaarshiim
Shaim
Sharama
Shasharshi
Shashiig
Shemi
Shgapgunshusgis
Shimannii
Shirika
Shirrushi
Shmeshkdumshir
Shumim
Shumma
Shuramshi
Siikuna
Uamdar
Uddenkhadsg
Umrunkkir
Zisduurkhaar

Low Passage

This is the fiscal and social equivalent of traveling steerage on a 19th century passenger liner. Low passengers spend the entire trip in suspended animation, and thus have no life-support requirements other than a trickle of power to run the low berth (see p. 108). Low passage normally costs Cr175 per jump, regardless of the number of parsecs traveled.

On larger passenger vessels, a ship's medical officer puts people into low berths and revives them at the end of the voyage. On smaller vessels, where stewards (with or without medical training) see to low passengers, there is a chance of death upon revival.

The Low Lottery: This last has led to a form of gambling on some vessels called the "Low Lottery," where crewmembers place small wagers on how many low passenger will not survive the trip. The winner receives all the wagers; if there is no winner, the prize rolls over to the next trip. By custom, the person actually "freezing and thawing" the low passengers is forbidden from betting, for obvious reasons. It is considered bad taste to mention the low lottery to the passengers themselves, but seasoned travelers will know of the custom, and sometimes place bets of their own.

Middle Passage

Middle passage is a step up from low passage, and is substantially more expensive (Cr1,750 per jump, again regardless of the number of parsecs traveled). On large passenger liners, middle- and high-passenger staterooms are segregated on different decks, each with separate lounge areas, galleys, and so on. Smaller vessels often mix the two types of passengers on the same level.

Aside from the bridge, the cargo deck, and engineering, passengers are normally allowed the run of the ship during the week in jump, although smaller vessels encourage them to remain in their staterooms or in the passenger lounge. Food service is provided as part of the passage, and is served in the lounge.

High Passage

High passage is more expensive than middle passage, and is virtually identical except for a higher standard of service and food. On large liners, high passengers have their own decks, lounges, and food service. Some ships give high passengers larger, more luxurious staterooms. On smaller ships, the main difference is in the quality of food and the behavior of the stewards. High passage normally costs Cr3,500 per jump, regardless of parsecs traveled.

X

Xboat: See *Express Boats* and *GURPS Traveller First In*.

Xboat Station: Facility for handling Xboats at a star system. At each system served by the Xboat network, an express boat station is maintained to handle the message traffic and to manage incoming and outgoing Xboats.

Usually located near the edge of a star system, the station picks up messages beamed to it by incoming Xboats and relays the data to the local world for delivery. Messages destined for worlds farther down the line are transmitted to a waiting Xboat which then jumps for the next world in the network.

The Xboat station contains receiving and retransmission equipment; refueling and support facilities for the local staff and waiting crew are also provided. The Xboat station maintains a local office on the system's major world for the acceptance of Xboat messages, as well as to handle delivery of the messages to addresses on the world.

Y

Year Zero: The base year of the Imperial calendar and the founding year of the Third Imperium. By selecting a base year numbered 0 (instead of the generally selected year 1), the Imperial dating system became a standard number line extending forward and backward in time.

Years before the founding of the Imperium become simple negative numbers, and the differences between dates before and after the founding of the Imperium can be determined by simple subtraction.

Z

Zhdant (Zhdant 2719 A6547C8-F): Capital of the Zhodani Consulate and homeworld of the Zhodani people. Unlike the capitals of other empires, Zhdant is largely divided into the estates of the members of the ruling Zhodani council, which makes the world's population unusually low. Zhdant is often spelled "Zhodane" in Anglic texts.

Also see *GURPS Traveller Alien Races 1*.

Zhodani: Human major race (*H. zhdotlas*) inhabiting the Zhodani Consulate, a region far spinward of the Imperium.

The Zhodani are a branch of Humaniti similar in most respects to other Human races. In general, they tend to be taller than Solomani or Vilani and lithe of build. Their most important difference is the acceptance and use of psionics.

Society: Zhodani society is divided into three classes: nobles, intendants, and proles. Nobles are the enfranchised ruling class, and they receive psionic training from childhood. Intendants are managers and administrators of society, and they also receive early psionic training. Proles constitute the masses; they are forbidden the use of psionics and do not receive training.

Within this rigid class system exist two opportunities for promotion to a higher class. All prole children are tested for psionic potential, and those showing high scores are taken from their families and adopted into the intendant class. Intendants are rewarded for great diligence, service to the state, or victory in the psionic games through the granting of noble titles.

The presence of psionics in the hands of those in power means that many aspects of society work at high efficiency. Psychology, behavioral science, com-



munications science, and education are more refined and exact than in other societies. Educational methods are finely tuned and capable of teaching concepts rapidly and accurately. Mental deviance or criminal tendencies can be detected early and corrected with facility.

Zhodani society is generally a happy one. Individuals are members of a functioning whole, and each makes a contribution to its success. The relative lack of upward mobility for the proles is offset by the possibility for their children to move upward if they have the proper potential. The burden of responsibility imposed on the intendants is lightened by the ever-present possibility of reward through elevation to the noble classes. The nobles themselves temper their burden of authority with comfort derived from their station in life.

Morality: The Zhodani have a general distaste for other Human races which do not practice psionics. Effective indoctrination and the ever-present possibility that one's mind is being read have removed dishonesty and deviance as common features of society. The *Tavrchedl'* (Thought Police) are a special branch of the government who are charged with maintaining right thought in the population.

Imperial citizens have a strong distaste for the Zhodani. Because the Zhodani practice psionics, an Imperial cannot be sure that a Zhodani is not invading his mental privacy at any time. Imperials feel exposed and uncomfortable when they are knowingly in the presence of Zhodani.

Because of their psionic abilities, the Zhodani have the most effective authoritarian rule in history. Imperial citizens, who are used to a great degree of local autonomy, fear Zhodani conquest because of the loss of freedom they believe it would entail.

Government: The Zhodani consulate is a participatory democracy in which only nobles are allowed to vote. Executive and judicial functions are the responsibility of a series of councils of varying sizes. Each council elects one of its number as executive officer and a number of its members as delegates to the next higher council.

A city, for example, will elect several of its council members to be representatives to the world council. The process continues upward through several layers of councils to the overall Grand Council of the Zhodani. Nominally, each member of a council serves for one olympiad (three Zhodani years), but in practice, each councilor serves until his replacement arrives and replaces him officially, or until word of his reelection to another term is received. Oftentimes, the district from which a councilor is elected will have only his relatives as voters, and his reelection is virtually assured.

Standard practice (when possible) calls for Zhodani councils to submit important questions to a plebiscite of those affected. The principle can be suspended where immediate action is required, but the official ordering the action stands responsible to the voters and must justify his actions as soon as possible.

Supreme executive power is vested in three consuls; one is elected each year for a term of one olympiad by and from the members of the Grand Council. No consul may be elected twice in succession, and retired consuls become life members of the Grand Council.

Zhodani-Imperial Relations

The history of Zhodani-Imperial relations has been a stormy one. Five major wars and many small conflicts have broken out in the 1,020 years since the two cultures made contact, and the political situation has always been tense.

The primary bone of contention has been the Spinward Marches, or, more properly, Imperial expansionism into that region. The Consulate stabilized itself at its present size around -1000. The Zhodani believe that their polity has reached its optimum size, and feel no current need for further territory When the Imperium entered the Spinward Marches, the Zhodani did not respond immediately, as a few settlers posed no significant threat. As the years passed, however, and the expansionist intent of the Imperium became clear, the Zhodani (and their Vargr allies) responded with what is now seen as a preemptive war to throw the Imperial timetable off-balance (the First Frontier War of 589-604). The Imperium won the war, but instead of taking advantage of his victory at the front, Imperial Admiral Olav hault-Plankwell took his fleet to Capital, assassinated Empress Jaqueline, and seized the throne. The resulting chaos and civil war effectively stalled Imperial expansion Spinward.

There is no evidence that hault-Plankwell intended to cause a civil war, or that he was intentionally furthering Zhodani political aims, but the results were certainly in Zhodani favor. The fact that the Zhodani did not take advantage of the civil war to expand into the Spinward is clear evidence that they had no territorial ambitions in the region.

Zhodani aims in the Second Frontier War (615-620) are more of a mystery. The Zhodani and Vargr attacked, the Imperial Navy under Admiral Arbellatra responded, and the Imperium was once again triumphant. Did the Zhodani see in Arbellatra a future empire builder, one whose aspirations needed to be deflected? There is no evidence Arbellatra intended to set up her own empire in the Spinward and expand into the Zhodani Consulate, but like Admiral hault-Plankwell a generation earlier, she moved to Capital and took over, first as regent, then as empress. What were Zhodani intentions? We do not know, but the result was a lengthy period of peace (albeit an uneasy one).

The peace was broken in 979 when the Zhodani/Vargr coalition (by then known as the Outworld Coalition) attacked once again. The war continued for six years, and ended in an armistice, but the allegations of Imperial incompetence brought about the abdication of Styryx in 989.

Continued on next page . . .

Zhodani-Imperial Relations

[Continued]

The Fourth Frontier War (1082-1084) was also inconclusive, though the Imperium claims to have won on the basis of its victory at the Battle of Two Suns. The Fifth (and last) Frontier War, (1107-1110), again brought no territorial changes.

Viewed from an expansionist perspective, the continual Zhodani aggressions have been singularly unsuccessful. However, it would seem that the Zhodani have succeeded admirably well in keeping the Imperium away from their borders. Is this what was intended all along?



Imperiallines

Imperiallines is a tramp-freighter operator with trade stations located at many type III starports throughout the Spinward Marches. The company maintains a low profile as the operator of a fleet of jump-2 Frontier Transports carrying cargo from outlying systems to the major trade route worlds.

The company operates elsewhere in the Imperium (under a variety of names), always using the *TI*-class Frontier Transport – and a smaller fleet of secret *TJ*-class transports. Ships of the *TJ* class are designed to be externally identical, but capable of jump-6 instead of only jump-2. *TJs* can carry cargo, passengers, and electronic messages.

History: The Zhodani date their empire from the traditional date of the first organized use of psionics on Zhodane, -6731 Imperial, the year of the first olympiad. They achieved jump drive about 1,300 years later, in -5415 Imperial.

The expansion of the Zhodani was gradual and uneventful. Although some states on the fringe resisted absorption into the Consulate, most were annexed peacefully. The Zhodani first came into conflict with the Third Imperium in the 500s, which started the First Frontier War in a dispute over present and future limits to settlement in the Spinward Marches area. Frontier wars over the next 600 years have failed to resolve the basic differences between the two empires.

Zhodani Calendar: The Zhodani calendar is based on the period of Zhdant (the Zhodani homeworld) around Pliebr, its star. The Zhodani *chten* (year) is 275.19 standard days in length. Zhodani dating uses three *chten* called the *the-quzdij* (olympiad). A Zhodani date is written as olympiad.year. For example, 3173.1 is the first year of the 3,173rd olympiad.

See also *Zhdant* and ***GURPS Traveller Alien Races 1***.

For Game Masters Only

The following sections are intended for the eyes of Game Masters only, as they contain information not generally known to the populace of the Imperium in general, or (in some cases) known only to GMs.

The Mystery of the Ancients

Who or what were the Ancients? The Ancient "race" started with one individual specimen, a Droyne who found he had remarkable mental and psionic powers. This individual, who calls himself "Grandfather," is still alive today, hiding out in his own private "pocket universe."

Grandfather was an incredible specimen of an otherwise fairly ordinary intelligent race. His psionic powers enabled him to regenerate any damage, including that leading to normal aging, which rendered him virtually immortal. His mental prowess, on the other hand, fueled a burning curiosity for anything and everything that he could learn.

He started researching, but realized that he needed competent assistants. He tried to fulfill this need in three different ways. The first method was that of procreation: Grandfather sired 20 children, each of whom had 20 children of their own, all nearly as intelligent as Grandfather. With 420 offspring, Grandfather decided he had enough and stopped.

His second method was to experiment with other species of life. In his attempt to find good help, he carried Humans from Terra to many other worlds in this part of the galaxy. He and his descendants also experimented with Terran canine stock, and genetically created intelligence in the race now known as the Vargr.

Last, Grandfather created a number of different models of super-intelligent robots to assist him in his research. Only this last method proved successful, with living beings proving to be unreliable.

Grandfather assigned research projects to each of his children and grandchildren, and progress was rapid, with many new discoveries made by the teams of scientists on their various worlds. Grandfather, basking in the light of this success, decided to take a vacation, and traveled about Droyne space seeing all that there was to see.

When he finished with this vacation, he decided to explore the remaining frontiers of existence. He called all of his children to come and help him, but they had started on their own projects and were too busy to show up.

Grandfather started his work anyway, but he soon found that his children's experiments interfered with his own. His decision to have children long ago was an error, he realized, and now he must rectify it. He began a campaign to eliminate all of his offspring.

The children found out about his campaign and resisted. The war of Grandfather against his children was a long and complicated one. Initially, his opponents did not understand that he meant to totally eliminate them; later, they adopted his tactics of total destruction.

The war went on for 2,000 years. Staggering weapons were used, including planet-busters, nova triggers, bombardment with asteroids, and such ordinary weapons as tailored plagues, poison gas, and nuclear devices.

The war ended when Grandfather had destroyed all of his children (he kept careful count). The galaxy was somewhat the worse for wear; it had many new asteroid belts and quite a few ravaged worlds.

Grandfather determined that he would, in the future, limit himself to more easily controlled assistants. He improved on the robots he had built before, and constructed a corps of robots and androids to help him in his experiments. Then he pinched off a pocket universe around his base world and retreated there to pursue his studies unhindered by the concerns of the larger universe.

Who in the Imperium today knows these facts? No one knows them all, but there are a few scattered sophontologists who have come to the conclusion that the Droyne are the modern-day descendants of the Ancients, and they are somehow not as intelligent as the earlier race. The fact that the "Ancients" still exist (in the form of Grandfather) is not known by anyone except Game Masters.

See *Andory, Chirpers, Church of the Chosen Ones, Droyne, Solomani Hypothesis, Vargr, Major Races (Solomani/Vilani/Zhodani, Vargr, Hiver, K'kree, Aslan,* and *Droyne).*

Longbow II

The Library Data entry is correct, although incomplete. A more ambitious project, Longbow II, based on the lessons learned from the first Longbow, was begun under Strephon's direction in 1103. This project will use the entire width of the Imperium as its long baseline. With its sensor termini located in the Spinward Marches and Antares Sectors, in resolution but not sensitivity, Longbow II replicates a passive sensor dish with a diameter of 160 parsecs (about 18 trillion miles), sensitive in all electronic bands, from gamma and X-rays down through visible light and infrared all the way to long-wavelength radio. Longbow II will be able to achieve a theoretical resolution of 0.0196 inches at a range of 8,000 parsecs, the distance to the galactic core.

Unlike the original Longbow with its disk-shaped receiver providing two-dimensional resolution (width and length), Longbow II's long baseline will lie only in the width dimension, along the galactic plane. This means that this spectacular theoretical resolution will be only in width, not height. Longbow II data will be collected at all of the listening points along the "bowline" and carried by jump-6 Imperiallines (see p. 80) couriers to its "focal point" at Depot/Lishun, where the data will be synchronized (by such methods as pulsar emissions within the common field of view of all the sensors), compiled, filtered, and enhanced by lengthy and demanding computer runs.

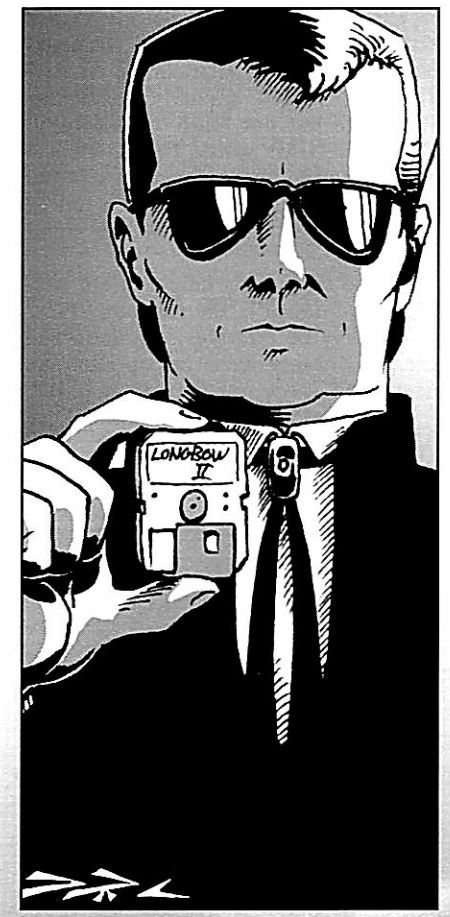
The calibration of such a complicated system is a massive undertaking. It will probably be decades before meaningful observations of the galactic core can be extracted from the raw data. The existence of Longbow II is not openly acknowledged, and it will be described only as a top secret communications project if it must be discussed at all. The Longbow data and all analysis of it has one of the highest security classifications in the Imperium.

Secrets

From the beginning, ***Traveller*** was a game of secrets. One of the rewards for adventuring was not an increasing pile of gold coins, but knowledge of the universe. One of the first secrets, revealed slowly, over the course of several adventures, was the flow of events leading to the Fifth Frontier War (see p. 32), which took place as the game timeline slowly advanced. Another secret was the true nature of the Ancients, the who and why behind Humaniti's distribution among the stars. We have another one building in ***GURPS Traveller***, but you'll have to wait to find out what it is going to be . . .

There is a problem with secrets in RPGs, however. If you tell anybody, it is not a secret anymore, but it is rather hard to tell just GMs (who really need to know such things) without also telling their players (who need to puzzle secrets out over the passage of time). No matter how well the GM strives to keep players in the dark, they all find out eventually.

So what's the solution? Create your own secrets. It's your campaign, and if every one of your players owns the books and knows that Grandfather still lives in his own little pocket universe, you make that fact the red herring, the false lead, and come up with something else equally exciting, but at the same time something that resides in your head alone.



CHAPTER ONE

The Scout Service

The Imperial Interstellar Scout Service is equal in stature to the military services. Some (not all of them scouts) would claim that the Service is the most important institution in the Imperium. After all, the Imperium isn't built entirely on a foundation of conquest. There is also patient exploration and comprehension, the stream of communication between eleven thousand worlds. Without the Scout Service, the Imperium could not exist.

For over a thousand years, the IISS has performed with great efficiency and considerable heroism. It has also maintained an *esprit de corps* that is the envy of many a military commander.

Structure

The IISS has existed since the first days of the Imperium, and has often had to take on new missions. This history has made it a very complex organization, requiring a diverse pool of talent. The major divisions of the Scout Service are the seven Offices. Each of these is further divided into two or more branches, which perform the Service's specific missions.

Overall control of the Service is in the hands of IISS Headquarters, located on Capital. Headquarters is normally concerned with overall policy and procedures, leaving day-to-day control of operations to local commands in each sector and subsector. Most scouts never deal with Headquarters, except as a distant source of general policy.

The seven Offices are divided into two broad groups. The first is composed of the Administration, Operations, Technical Services, and Detached Duty Offices. The task of these Offices is to direct and support the Service. The second division is composed of the Exploration, Survey, and Communications Offices. These Offices actually carry out the missions of the Service. Since the seven Offices are officially the highest-level divisions of the IISS, these two groups have no official name. However, most scouts know them as the Bureaucracy and the Field.

The Bureaucracy is a typical cluster of Imperial agencies, governed by regulation and policy directive. Most of its members work at the thousands of scout bases throughout the Imperium. They plan projects, keep records, collate data, deal with budgets and procurement, and maintain the facilities and ships owned by the Service. Their culture is typical for a bureaucracy, valuing conformity and loyalty above all. The usual reward for success is advancement up the ranks of the hierarchy.

The Field is very different, and may be unique among Imperial institutions. Members of the Field often work far away from any scout base, aboard small ships or as part of distant expeditions. Under those conditions, they must be independent and flexible in order to succeed. Members of the Field carry no rank. They work alone, or in small teams which are created for specific missions. They operate tiny ships in deep space, carry vital messages, make maps, explore new worlds.

Inspirational Reading

The *GURPS Basic Set, GURPS Compendium I,* and *GURPS Traveller* are required for any *GURPS Traveller* campaign. *GURPS Ultra-Tech I, GURPS Ultra-Tech II, and GURPS Vehicles* may be useful for their coverage of high-technology vehicles and equipment. For Scout campaigns, we also recommend *GURPS Space,* which includes a simple world-building system underpinning the more complete rules in this book.

Much great science fiction has been written around the theme of exploring new worlds. We strongly recommend the works of Poul Anderson, especially his "Polesotechnic League" and "Terran Empire" stories (many of which are out of print, but can be found in used bookstores). Aside from being rousing adventure stories, these series include a great deal of superb world-building. There's a reason why this book was dedicated to him . . . go, read, and see for yourself.

Possibly the best construction of strange alien cultures (and strange human ones) is found in the work of C. J. Cherryh. We particularly recommend her "Alliance/Union" series, including the "Faded Sun," "Chanur," and "Foreigner" spin-offs.

Continued on next page . . .



Inspirational Reading
[Continued]

Meanwhile, here are a few other fictional sources that you may find useful. This list should only be considered as a starting point. In particular, unlisted works by the same authors may be worth pursuing.

A Million Open Doors and *Earth Made of Glass* by John Barnes.

Startide Rising by David Brin. Also look for *Brightness Reef* and its sequels.

Mission of Gravity and *Star Light* by Hal Clement.

Citizen of the Galaxy by Robert A. Heinlein.

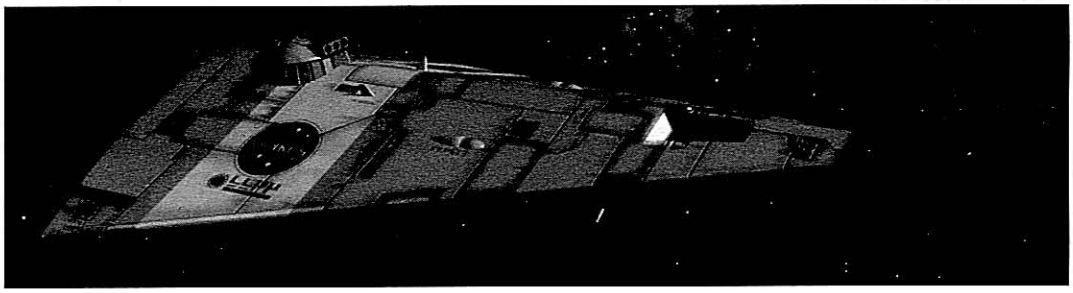
Destiny's Road by Larry Niven. Also look for the *"Known Space"* stories, especially the collections *Neutron Star* or *Crashlander*, as well as the novel *Ringworld* and its sequels.

The Mote in God's Eye and *The Gripping Hand* by Larry Niven and Jerry Pournelle. (*The Gripping Hand* was published as *The Moat Around Murcheson's Eye* outside the U.S.)

The Legacy of Heorot and *Beowulf's Children* by Larry Niven, Jerry Pournelle and Steven Barnes.

Red Mars and sequels, by Kim Stanley Robinson.

A World of Difference by Harry Turtledove.



Peer Review

The Field is famous for having no official system of rank. Field scouts work for respect, not for position. This collegial ideal only goes so far, of course – an IISS saying is that "you can't retire on respect." Without ranks, how does the Service assign higher pay to its best Field scouts?

Part of the answer is a set of skill assessments that Field scouts take throughout their careers, administered by Education Branch. Field scouts spend a great deal of effort on passing their exams, since that makes them eligible for higher pay.

Continued on next page . . .

Their culture values initiative and expertise. Field operatives are uninterested in rank, but will work hard to earn the respect of their peers (see sidebar).

Naturally, there is considerable tension between the two. Many an Operations officer has had to decide what to do about a Field operative who succeeded brilliantly in his mission, but did so by breaking half the regulations in the book. Meanwhile, every Field operative resents the paperwork he must file before going out in search of his next exploit.

Administration Office

Administration Office manages the resources of the Scout Service. Although many scouts despise Administration Office as a haven for "bean-counters," it is essential to the Service's activities. It's also surprisingly small relative to the size of the entire Service. The Administration Office uses advanced computer technology to make record-keeping and even some routine policy decisions automatic. This leaves administrative officers free for personal interaction and high-level planning. It also removes any need for platoons of paper-pushers. The Office is divided into the Personnel, Finance, and Procurement branches.

Personnel Branch is responsible for managing the career of every member of the Scout Service. It recruits, hires, and assigns new scouts. It manages the promotion and peer review programs (see sidebar), administers transfers, and processes retirements. It maintains the personnel records of every current and former scout.

Aside from its records-management function, the Personnel Branch has an important unofficial mission. The Service assumes that scouts are more productive when they are happy in their work. So Personnel Branch recruiters make sure that applicants have the right temperament for the Service, as well as the right skills. Once a scout is in the Service, he will find his Personnel officer to be a useful resource. Personnel may find a mentor for a new recruit, help a scout get necessary training, or find a challenging assignment for a scout who needs a chance to take on greater responsibility. It's this attention to personal detail that gives the IISS a highly motivated workforce, and a surprisingly low turnover rate.

Procurement and Finance Branches are closely related. Procurement is responsible for purchasing materials, equipment, and services to be used by the IISS. It maintains contact with suppliers and sets up contracts with them. Finance, on the other hand, is responsible for the flow of money. It prepares budgets, makes payment for items purchased by Procurement, and also handles the payroll for all scouts, including salaries, bonuses, incentive awards, and pensions.

Procurement and Finance Branches are probably the most traditional (one might say the stuffiest) sections of the Scout Service. Members of these branches are trained purely in administrative skills, and they rarely get caught up in the "mystique" of the Service. As a result, they are the most likely to leave the Service simply to take employment elsewhere. Such experience is highly sought-after by commercial firms, especially those megacorporations which bid on Imperial contracts.

Operations Office

Operations Office is the "brain" of the Service. It directs the construction, maintenance, and operation of IISS ships and bases. It also assigns missions and evaluates the results. It is divided into four branches: Maintenance, Security, Base, and Scout Fleet.

Maintenance Branch maintains and repairs all the installations, ships and equipment used by the Service. These services are also available to ex-scouts in possession of surplus IISS starships, at cost. Maintenance crew are trained in technical skills, and have a high reputation for competence and efficiency. Despite inter-service rivalries, even Imperial Navy captains are usually happy to place their smaller ships in the hands of IISS "yard dogs."

Security Branch is charged with internal security and law-enforcement tasks for the Service. Security officers serve as military police on IISS property, and as light marines on board IISS ships. They also have extensive law-enforcement powers among the general public. They may question, detain, or arrest suspects for violations of many Imperial laws. In particular, they hold the primary responsibility for enforcing the interdiction laws with regard to worlds which are under IISS jurisdiction. During such operations, Security officers may demand the cooperation of local authorities as necessary. Security Branch members also sometimes serve as clandestine agents for Intelligence Branch. In this role, they support covert activities, especially when firepower is required.

Security Branch personnel are trained in a wide variety of skills, including combat/weapon skills, tactics, law and police procedure, psychology, and sociology. They are not trained to be aggressive, but they are still highly respected for their integrity and their calculating approach to combat. Security Branch members tend to remain in Security for most of their careers, set aside from the rest of the Service by their special training and responsibilities. A few members are recruited for the Special Security Service, an elite commando detachment whose task is to recover IISS personnel or equipment when they fall under hostile control. "S-3" is not on a par with the Sylean Rangers or Imperial Marines, but within their limited sphere of responsibility they are quite formidable. For more on the Special Security Service, see ***Star Mercs.***



Base Branch is responsible for the operation of hundreds of IISS installations throughout the Imperium. This Branch has probably the most pedestrian mission of any part of the Service. Its members are ground crew, stevedores, motor pool drivers, contract technicians, and clerks.

Where possible, the Service tries to recruit most of the staff for each base locally, since it is rarely

Peer Review
[Continued]

The key word is *eligible.* To actually earn a higher pay grade, a scout must demonstrate the ability to work well under real field conditions. These abilities are not measured directly by the Bureaucracy. Instead, each scout is rated by his colleagues in a process of *peer review.*

Each branch of the Service maintains peer-review boards, composed of senior Scouts from that branch. Most experienced Field scouts (with at least twelve years of service) must spend at least part of their time serving on a board. This duty is regarded as necessary but unpleasant, since most Field scouts are uncomfortable "grading" their colleagues. Scouts who appear to enjoy this duty too much are jokingly referred to as "begging for a transfer" to the Bureaucracy.

At the end of each mission, every Field scout writes a personal mission report. As part of this, the scout names the team member (other than himself) who made the greatest contribution to the success of the mission, and adds a short note justifying his choice. These performance codicils are kept strictly confidential.

When a Field scout applies for a higher pay grade, he gathers evidence of his accomplishments and drafts a summary of his work since his last grade increase. His Personnel Officer attaches performance reports from his previous missions. This package of documents is submitted to the closest available peer-review board for the scout's branch of the Service. The board considers many applications at once, recommending that pay raises be granted or denied. Board decisions can be appealed to the seniormost Field scout available, but this rarely happens.

Actual pay raises are awarded by Personnel Branch. The only time a board's recommendations might not be followed is when the payroll budget is too tight. Otherwise the Bureaucracy simply administers the peer-review process and has no say in the results.

The peer-review process is subjective, but it usually works. Field scouts who are known for competence and teamwork are advanced, makeweights aren't. Peer review has the trust and support of most Field scouts.

After-Action Report

"We came in low and slow. The natives certainly weren't going to detect us, since all they had to work with was the Mark I Eyeball. Our target was another story, so we moved at nap-of-earth and kept an eye on our passive countermeasures. Never pays to be too careful.

"It worked. We saw the smuggler's base camp, a couple of pre-fab shelters next to a hacked-out landing strip. Better yet, we saw that intel had been accurate. Their Empress Marava-class was there, probably getting ready to onload gemwood in exchange for rifles and ammunition. IR gave me the locations of a couple of sentries, huddling in their parkas next to a campfire, not terribly alert. I had Corporal Nurashu look for active EM signatures and paint them on our HUDs. The results told me where automatic weapons were probably emplaced. My on-board computer and I ran through a few tactical projections.

"Good enough. They were amateurs. I gave the word.

"Three smart bombs took out their active sensors. I downed Happy and Dopey by the fire with a Vee-Two gas grenade. We reached the ship's hatch, slapped on the breaching charge, and were in. I tripped the riot-act recording then: 'You are under arrest for violations of the Native Cultures Protection Decree of 683. Drop your weapons and comply with the directives of the arresting officers . . . ' You know the one, with all the subsonics to trip the perps' fear-reflexes.

"I think a couple of the crew might have resisted if we'd given them a chance, but it was way too late for that. We were already inside, almost invisible against the bulkheads, and now all they had was the old Mark I. Corporal Ferris laid one out with the butt of his rifle. Another one actually managed to point his snub pistol at Nurashu, but I got it away from him. That was the only serious injury to report – I ended up crushing the bones of his forearm because I didn't have time to be careful.

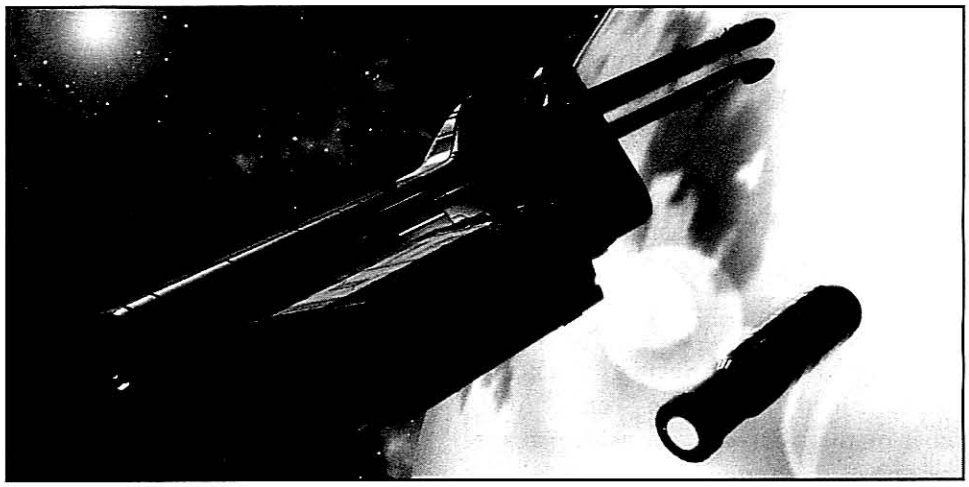
"Lance Iwashika reported the bridge secure and ship's logs undamaged, about ninety seconds after I'd given the attack order. Clean and neat. I wish they all went that smoothly."

– Sergeant Maryam al-Saddiq,
Special Security Service

cost-effective to bring such commonplace skills across parsecs. Of course, since scout bases are often placed on backwater worlds, this provides a rare opportunity for local people to enter Imperial service and perhaps get out to the stars. Many Base Branch personnel are young, working to complete their educations and try for assignment to another Office. Others are mature and experienced, unwilling to leave their home worlds but still proud to be in Imperial service.

Scout Fleet consists of all the spaceships used by the Service. The Scout Fleet supports the Field by providing ships and some crew. On paper, the Fleet is organized like a cohesive naval unit, although most of its ships are normally "on loan" to various other Offices.

Scouts permanently assigned to the Fleet have an unusual position. They are technically members of the Bureaucracy, but they spend most of their time working among Field operatives. As such, Scout Fleet personnel are trained to operate in both cultures. This often requires well-developed social skills, along with the ship-handling competence required by the Fleet's main mission.



Technical Services Office

This Office is responsible for scientific research and technical education within the Service. It is divided into the Education Branch and the Research and Development Branch.

The IISS relies on a workforce which is well-trained in a wide variety of skills. This is such an important feature of scout life that an entire Branch is devoted to the task of training Service members. The *Education Branch* (also called "the School") provides library data to any team or individual scout who needs it.

Education Branch ensures that the library computers of IISS ships and bases are kept current. It also develops sophisticated courses of study for scouts who need new skills, a much more demanding task than the simple provision of information. Finally, it sets standards for technical expertise in the Service. Education Branch often recruits subject-matter experts from other parts of the Service and from outside the Service, training them in educational techniques and putting them to work in course development.

Every scout deals with Education Branch on a continuing basis throughout his career. Even so, members of the Bureaucracy often have a very different experience with Education Branch than do members of the Field. Long-standing tradition leads the School to be very free with course material for Field scouts. Indeed, scouts who are on duty for long periods in deep space are allowed to take courses that have nothing to do with their duties, in the interest of keeping

them occupied and motivated. Meanwhile, members of the Bureaucracy must justify each course they take, showing that they have met a strict schedule of prerequisites and that the new skills are directly relevant to their duties. The possibility of a free education is one of the biggest selling points for Field duty, and also causes some of the tension between Bureaucracy and Field.

Research and Development Branch is responsible for scientific investigation of data acquired during IISS explorations and surveys. It is also responsible for the development of new ships or equipment used by the Service.

"R&D" has a reputation for being on the cutting edge of Imperial science. Many of the Imperium's foremost experts work for the Branch, in fields such as physics, astronomy, planetology, sociology, linguistics, naval architecture, and computer science. Many Field operatives transfer to R&D late in their careers, which may be why R&D has a reputation as the most free-wheeling section of the Bureaucracy.

Detached Duty Office



The Detached Duty Office's main mission is to keep track of all scout personnel on reserve status (see sidebar). It also controls surplus IISS starships, particularly the small survey and courier vessels which are loaned out to reserve scouts. Its major divisions are the Records Branch and the Intelligence Branch.

Records Branch maintains records on all scouts serving on detached duty. These records are used to reactivate scouts in time of war or emergency, or to find ex-scouts who have badly needed skills. Scouts in possession of surplus starships are actively monitored. Others are simply spot-checked on periodic (but rare) occasions, to ensure that they are meeting their obligation to stay in contact. Records Branch personnel are simple bureaucrats, trained primarily in administrative and computer skills.

Intelligence Branch is the Service's covert-operations arm. Its openly acknowledged function is to interview detached-duty scouts, gathering information on events both inside and outside the Imperium. Secretly, it also maintains espionage assets (spies and double agents) in regions where information is most needed. While Naval Intelligence is concerned with the military capability of foreign powers, IISS Intelligence is more concerned with political and economic forecasts. Aside from administrative skills, Intelligence Branch personnel are trained in interview techniques, intelligence analysis and spycraft.

Some of the most interesting (and dangerous) IISS missions involve covert intelligence-gathering. Scouts go undercover, posing as merchants or other legitimate civilian travelers, to gather economic or social intelligence in areas outside the Imperium. Other missions involve stealthy jumps deep into foreign territory, to sit in the outskirts of important star systems and pick up signals intelligence (the *Pytheas*-class exploration cruiser in Chapter 3 is particularly suited for such missions). Scouts from the Exploration Office or Scout Fleet are often involved in such data-gathering missions, under the direction of Intelligence Office.

Scout's Lament

"There were six of us then. We came here to the Last Post to drink to our first assignments, then we went our separate ways. We vowed to stay in touch, and we did, as long as we could.

"Keiran was the first. Got attached to the Duke's squadron during the war, jumping behind the lines to spy out Zho task force movements. Just dropped out of sight, never came back from his last run. I hear his name's on the Hero's Spire on Regina, etched in letters a few microns tall.

"Shana missed the war, but she caught a bullet anyway. She was working as a covert observer on Asgard at the time. There was a peasant revolt, the All-King sent in troops, and Shana didn't make it out in time. She's probably in an anonymous grave somewhere.

"Nobody knows what happened to Julian. Hey, we all know that sometimes a starship goes into jump and never comes back out. You have to figure that every Xboat drops into that black hole eventually, as much time as they spend in jumpspace. Julian went with his. Or maybe he misjumped and drifted in deep space somewhere until he suffocated. They only give you a few extra days of life support on those things, after all.

"I liked Hyalearl, even if she was a bit too vain about her Aslan heritage. She was doing a local-ecosystem survey when it happened. There was this ground-cover plant there, giving off fumes that ordinarily don't bother anybody. There was a temperature inversion that day, to concentrate the stuff in the little valley where she was working. By the time she realized what was happening, it was too late. Turns out the toxin affects Aslan a lot worse than humans. Ironic, that she was so proud of the thing that ended up killing her. At least she got a decent funeral with her clan.

"Michiko always planned to put in enough time to earn a detached ship. She had big plans to see the Marches on her own. She almost made it, too. At least until her team found something on a planet I don't have the clearance to know about. She's still alive, last I heard, but she'll never fly her own ship now. It's hard to do that when you're catatonic.

"I'm still here, at least. The things I've seen! Wouldn't trade it for the Iridium Throne. I just wish the others could have been here to share this with me.

"Here's a toast. To absent friends."

– Sergei Ilgud, IISS Administrator, retired

"Most people believe that the Scout service consists only of dangerously anti-social loners and detail-obsessed bean-counters. This is patently not true: we have our fair share of odd-balls, like every other service."

– Twenty Years in the IISS, Janos Projaska

Detached Duty

Most Scouts who leave the Service are considered on "detached duty" (reserve status) until retirement age. They must stand ready to return to active-duty status at any time. Generally, the Service only activates its detached-duty members in time of war or some other emergency. However, individual Scouts may also be called back to active duty when they have expertise that is needed for a specific mission.

A Scout on detached duty must keep the Service informed of his current location and (at least in general terms) his activities, so that he can be quickly found and reactivated if necessary. He is also required to go to an IISS installation from time to time and report on what he has seen while traveling. In return, he is paid for any time on active duty. He may also make limited use of IISS facilities for his own purposes. For example, he can use guest quarters at the local scout base on a space-available basis.

A few reserve scouts are loaned surplus starships, which can be refueled or given routine maintenance (at cost) at IISS bases. Naturally, the requirement to report in is much more stringent for any scout in possession of a surplus ship. In particular, the logbooks of each surplus ship are downloaded every time it stops at an IISS facility for service. These "books" are difficult for even the ship's captain to alter, and include a trace of internal and external sensor readings as well as the captain's command records. They therefore act as a check against the possibility of an IISS ship being used against Imperial interests.

Scouts who have reached retirement age (66 years old) are no longer required to remain on detached-duty status. If they are in possession of a surplus ship, they must turn it in upon retirement.

Exploration Office

This Office is responsible for exploration of new regions of space. It was once the largest of the Offices in manpower and resources, but has dwindled over the centuries. It is divided into the Exploration Branch and the Contact and Liaison Branch.

Exploration Branch performs the actual exploration of previously uncharted star systems. It compiles physical data on planets, studies local life forms, and uncovers unknown hazards to navigation or individuals. Its members tend to be trained in spacecraft handling, planetary survival, and the physical and biological sciences.

The Imperium no longer has open frontiers to expand into, so the Exploration Branch has little left to do. It is most active in the Spinward Marches region, and along the trailing fringes of the Imperium. It also mounts long-range expeditions from time to time, sending them hundreds of parsecs out to explore unclaimed space. Such expeditions are expensive and hazardous, but the Service considers them an investment in the Imperium's future.

Contact and Liaison Branch is charged with making contact with newly discovered foreign cultures. It also helps to maintain friendly relations between the Imperium and non-Imperial societies, by lending scientific support to the Diplomatic Corps. "C&L" members receive training similar to that of their Exploration Branch partners, although their scientific training tends to be in xenology and the social sciences.

Aside from the business of contact, C&L has several additional missions. It is responsible for controlling the dissemination of advanced technology to backward worlds within the Imperium. This usually means *limiting* such technology transfer. The goal of this mission is to minimize damage to local cultures while they are brought into the Imperial mainstream.

C&L Branch is also responsible for oversight of most worlds interdicted on the recommendation of the Scout Service. Such worlds are normally recommended for interdiction after C&L determines that the local culture needs to be protected from any contact with the Imperium.

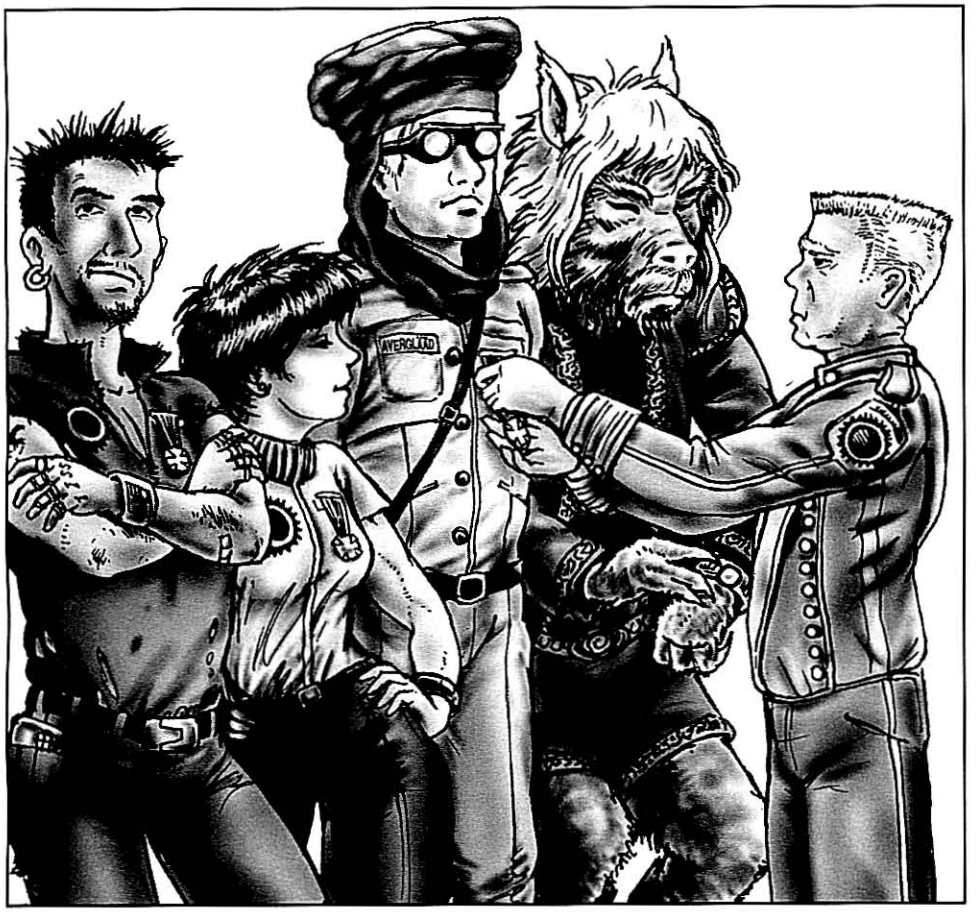
Unlike the Exploration Branch, C&L is a thriving and busy organization. Almost every world not fully integrated into Imperial culture is regularly visited by C&L personnel, or has a C&L team in permanent residence. These operatives work with local authorities and institutions to keep the process of integration running smoothly. If the locals wish instead to keep Imperial civilization at a distance, C&L will help prevent outsiders from interfering in local affairs. This sometimes makes C&L Branch unpopular with greedy merchants or would-be cultural imperialists. On worlds experiencing internal conflict, Contact and Liaison often finds itself caught in the middle, required to remain neutral even though almost any action will favor one side or the other.

Imperial Grand Survey

The IGS is more properly named "Survey Office," but only the stodgiest members of the Bureaucracy insist in calling it that. It is responsible for producing and maintaining maps of the Galaxy, of individual star systems, and of worlds. It is divided into the Internal Mapping Branch and the External Mapping Branch.

The *Internal Mapping Branch* is responsible for maintaining the Imperium's basic navigational charts and databases. It also maps the surfaces of worlds when necessary. Finally, it places and maintains beacons and other navigational aids. Most of this activity is done from space, in starships specifically designed for survey work. Internal Mapping experts are usually trained in spacecraft handling, astronomy and planetology.

The Imperium has twice mounted comprehensive Grand Surveys of its entire sovereign territory. Even between such rare events, however, Internal Mapping is an active organization. Survey scouts are constantly moving through Imperial space, verifying the most recent Grand Survey results, making any modifications that may be necessary. Such work can require great patience and attention to detail. For example, it isn't unusual for a survey ship to spend a year verifying the orbital paths of several thousand planetoids in a single star system. Somewhat more exciting are the "donation surveys," detailed examinations of a world or star system done as a favor to a local government. For these, Survey teams join with Exploration Branch to do an intensive "work-up" of a star system or individual world.



External Mapping Branch is responsible for maintaining maps of areas outside the Imperium. In peacetime, such maps are often used for navigation, for colonization, or for economic planning. They are also essential in wartime, especially when Imperial forces intend to mount an offensive into enemy-held space. As with Internal Mapping, most of this work is done from space, and the training of its members is similar.

External Mapping can be just as tedious as Internal Mapping, as during a survey of a friendly client state's territory. On the other hand, many of the Imperium's neighbors are more or less hostile, and are likely to object to an Imperial mapping expedition in their territory. Thus, some External Mapping survey ships are specifically designed for stealth, self-defense, and long-range independent operation. External Mapping also works closely with the Intelligence Branch, combing through the reports of espionage assets for astrographic data.

The Promise

Erin stooped low as she entered the tiva. It took the usual moment for her eyes to adapt to darkness, then she made the gesture of respect as best her two-armed physiology would allow. A clicking sound came from the shadows across from the entrance, inviting her to sit and talk.

"Have you reached your decision?" she asked in her best !tunghi, as always having trouble with the clicks and glottal stops.

"Not yet, visitor-female," came the voice. "We do not as yet grasp why we should be concerned about the visitor-others who have come. If they want to take the xighr plants, it means nothing to us. We have no use for the plants ourselves."

Erin suppressed a sigh, remembering in time that the noise would be considered rude. "Wise-female, it may be that you have no use for the xighr now, but that may not always be so. If you allow the visitor-others to harvest, they will come in great numbers. They will take all the xighr, leaving none to grow tall again tomorrow. While they are here, they will ignore your laws and cause much disharmony among the People."

"I have heard you," said the voice. There was a rustling sound, as if the elder shifted her weight on her fiber mat. "The visitor-others will not be here long. Their disharmony will be over quickly once the xighr is gone. Your arguments are like the wind, pleasant to hear but not worth following."

Over and over again, Erin had run up against the same obstacle. The People didn't need the xighr, so they saw no reason why SuSAG shouldn't harvest the plants for rare biochemicals. They had no concept of trade, either, no notion that they could bargain with SuSAG for things they needed. To the People, there was simply no problem, and that tied Erin's hands. Not for the first time, she cursed the short-sighted survey leader who had failed to recommend interdiction status for this world.

"I feel shame that I have not been able to convince you, wise-female," was all Erin said.

"I value your presence, even though I have ignored your arguments," the elder answered. "Will you and your siblings of the Great Monarch's Far-Ranging Voyagers Clan remain?"

"Yes, wise-female," said Erin with conviction. "We will remain, as long as you wish us to. If the time comes when you no longer want the visitor-others among you, we will be here to help you against them. So the laws of our People require."

Xboat Duty

The job of Xboat "pilot" is probably one of the most unusual available in Imperial service.

Express boats are highly optimized for their mission. Each contains a crew compartment, a large bank of computers and data storage, powerful communications equipment, and a jump drive. Notably missing is any maneuver drive beyond simple attitude thrusters. When an express boat arrives in-system, it must wait for a tender to pick it up. Thus, the term "Xboat pilot" is something of a misnomer. Express boat crew are trained in precision astrogation, but their actual piloting skills are rarely used.

The express boat network functions much like the Pony Express of ancient times on Terra. Messages are transmitted to a waiting Xboat, which jumps for the next system down the line. Upon arrival, it immediately transmits its messages to the local Xboat station, which records them and rebroadcasts them to other Xboats for the next leg of the trip. Meanwhile, the Xboat is picked up by a tender for refueling, maintenance, and crew rotation. Eventually, every express boat returns to a way station, where major maintenance and drive overhauls can be performed. There is one way station for every eight to ten Xboat stations throughout the Imperium.

Quarters aboard an express boat are comfortable but cramped. An Xboat crewman spends months in deep space between his rare shore leaves. He spends most of his time alone in jump-space. His ship practically runs itself, so aside from routine checks there is little for him to do. If his ship is attacked, he has nothing but a hand weapon to repel boarders, and no hope at all if the enemy uses ship's guns. It's no surprise that express boat crewmen tend to cultivate a stoic and independent mindset.

There are compensations for this lonely, almost monastic existence. Education Branch allows express boat crew the full range of educational and entertainment programming, on demand. Thus an Xboat pilot has plenty of opportunity to amuse himself or pursue an education. If the GM is using the downtime rules for skill development (see sidebar, p. B82), assume that an Xboat pilot can accumulate up to 40 hours of study per jump without neglecting his duties. This training can apply even to skills that are not related to the pilot's job, but the GM should restrict it to skills that have a significant "book-learning" component.

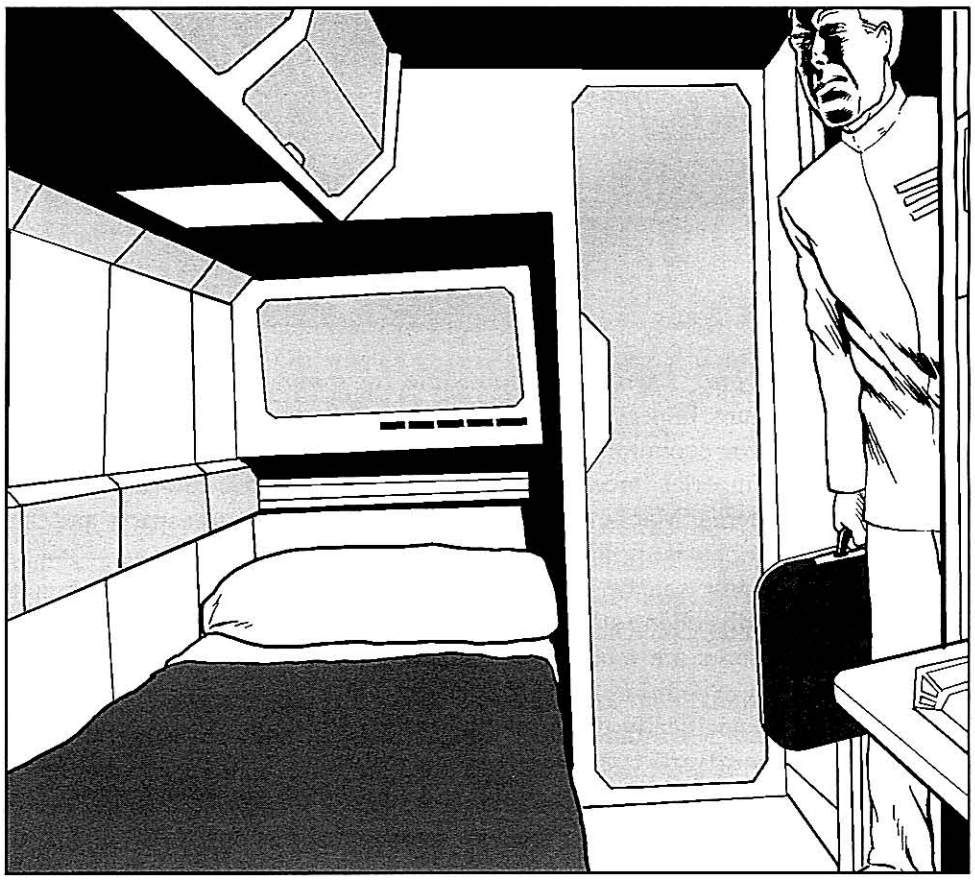
Communications Office

One of the Imperium's most important roles is that of an interstellar "postal union," providing for the free flow of information among all of its member worlds. This task is handled by the Communications Office of the IISS. The "Comms Office" handles almost all official interstellar message traffic within the Imperium, and a significant portion of the private traffic as well. It is divided into two branches: the Express Boat Service and the Imperial Courier Service.

The *Express Boat Service* operates express boats and tenders throughout the Imperium, and in those client states served by the Imperial Xboat network. Most of its members are trained in the odd mixture of navigation, engineering, and communication technology that is needed to manage an Xboat in operation. Express Boat Service members have a reputation for self-reliance unusual even for the IISS (see sidebar).

The *Imperial Courier Service* takes up where the Express Boat Service leaves off. The Courier Service carries small cargoes and important personnel which cannot travel by express boat. Meanwhile, the express boat routes are laid out so that few Imperial worlds are more than three or four parsecs from the nearest Xboat station. The ICS carries messages to worlds off the main routes as needed. Finally, the ICS maintains communication links with Imperial diplomatic missions in foreign regions.

Courier Service members receive training in ship handling and communications, but they also develop survival skills since they often visit backward worlds. They tend to cultivate an image as rakish adventurers, daring any peril to deliver the vital data or packages entrusted to them. In reality, their job is only occasionally dangerous, and is sometimes almost as dull as that of an Xboat pilot. Even so, the Imperial Courier Service may have the highest morale of any branch of the IISS.



History

To understand the Scout Service, one must look back to its roots, in the origins of the Third Imperium and before.

Before the Long Night

Among humans, the ideal of wide-ranging exploration first appeared among the Vilani. They were the first human race to reach the stars, and explored space for thousands of years. By the time the Vilani Empire was officially founded, however, the deeply conservative Vilani character had reasserted itself. The First Imperium tended to draw back behind its borders, abandoning exploration. The mere fact that stars existed beyond the boundaries was no longer of any consequence. For example, the Vilani had outposts within a few parsecs of Terra centuries before the Solomani attained space travel. Records show that the Vilani knew of the existence of Terra, and had been overhearing Solomani radio and television transmissions for decades. Yet it appears that the Imperium sent not so much as a cursory survey expedition to investigate.

The Solomani diaspora changed all that. The Solomani who settled new worlds and eventually conquered the Vilani Empire developed an ideal of the *truth*. The new rulers of the Empire came to believe that it was immoral to distort the truth, to conceal it or hide from it. Solomani administrators were determined to discover the truth in the wilderness of their new Empire, and hold to the truth when dealing with each other. Only by keeping those commitments could the vastly outnumbered Solomani rule an Empire full of strange worlds and stranger cultures.

Unfortunately, the Rule of Man never managed perfection in its ideals – not that even perfect idealism could have prevented the final collapse of the Imperium. Eventually, the Long Night fell.

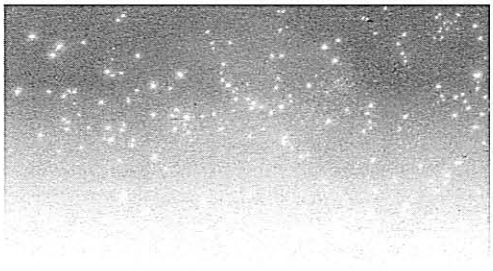
The Sylean Federation

The planet Sylea suffered less than most worlds during the Long Night. It never lost jump-drive technology, so it was able to maintain a few tenuous trade contacts with nearby star systems. Its culture was heavily influenced by the Solomani, and never ceased to look outward. Eventually, Sylea regained the ability and interest to travel beyond their own neighborhood. Under the Sylean Federation (established about -650), explorers began to move out into deep space once more.

The Federation government was tightly centralized, preferring to operate through bureaucratic agencies. This model proved unsatisfactory when it came to the control of exploratory ventures. Successful explorers needed to be highly self-reliant, able to operate on their own for months or years. Thus most ventures were privately mounted at first. Wealthy industrialists searched for new markets or resources. Members of the lower classes looked for places to settle, away from oppressive conditions on Sylea. Adventurers looked for backward worlds to reshape into personal domains. Romantics indulged their wanderlust.

Naturally, exploration and trade led to closer ties between Sylea and its neighbors. By the last decades of the Long Night, the Federation had member worlds scattered throughout Core Sector, though many "pocket empires" and individual worlds remained independent. On the other hand, expansion had put intolerable stress on the structure of the Federation. The bureaucracies were far too rigid, the Grand Senate torn by factions and unable to act. The Federation was on the verge of crisis, apparently doomed to civil war or foreign conquest.

Fatefully, the exploration of space, and the future of the Federation, fell into the hands of one man.



Emergence

There was a small burst of EM and gravitic radiation as the ship dropped out of jump. A few million miles away was a rogue gas giant, orbiting calmly through the dark fringes of the star system, pouring out a flood of radiation noise that ought to cover the telltale signs of arrival. The starship, a flat-black streamlined wedge, immediately went on silent running and listened with passive sensors. No sign of company nearby. Good.

"All right, come about to seventeen by one hundred thirty," the sensor officer requested. The helmsman nodded and touched his panel.

"How's reception?" asked the captain, trying not to lean over the sensor station too obviously.

"Coming in five by five." A flurry of quick adjustments. "Commercial traffic. Entertainment. More commercial. Aha. Here we go." He touched a key and a raucous squeal poured out over his station's speakers.

"Military?" asked the captain.

"The coding scheme is strong enough. I'd be willing to take a small wager, Great Captain."

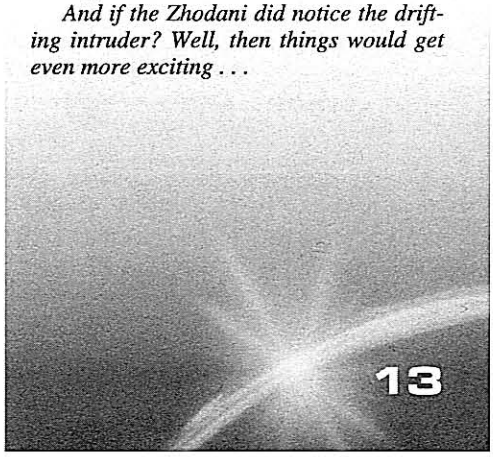
"No bet. And hang up that Great Captain bit, or I'll go see the Personnel Officer and stick you with the job."

"Forget it. I've served my time."

"Start recording, and get the computers working on the encryption. Good hunting," the captain concluded, and went away to bother someone else.

The sensor officer grinned in anticipation. Forty parsecs behind the Zhodani frontier, the IISS sneak-ship Khimar Amgush was ready to spend six weeks sampling Consulate communications traffic in this important industrial system. Meanwhile, telescopes would find, track and count the tiny flecks of light that represented ships and stations. As long as the turbans didn't bother scanning this far out, the haul in economic and military intelligence would be considerable.

And if the Zhodani did notice the drifting intruder? Well, then things would get even more exciting . . .



The IISS at War

When a war or other emergency begins, the Detached Duty office goes into high gear. Records Branch calls up the ex-scouts in reserve, assigning them to duties according to their skills and experience. Some of these ex-scouts return to their old branches of the IISS, others are reassigned to new branches, and still others are detailed to the military services. Meanwhile, Intelligence Branch works overtime to gather information relevant to the crisis.

Imperial Grand Survey remains in action during hostilities, augmented by ships and manpower taken from the Exploration Office. IGS is called on to provide up-to-date maps of the conflict zone, including the movements of enemy task forces. To accomplish this, scout ships are armed and formed into reconnaissance squadrons, attached to the Navy.

Communications Office is also busy during wartime. It creates new express-boat and courier routes, keeping Imperial military forces in touch with each other and with high command. Many surplus scout ships and their crews are assigned to Communications during times of emergency.

The other offices maintain IISS operations at a reduced level. In particular, IISS bases and other facilities are usually kept in operation, since they can provide refueling and shipyard facilities for small squadrons. Some branches of the Service are nearly shut down during wartime, so that their personnel can be reassigned as needed.

During wartime, the Scout Fleet is organized into squadrons under IISS command, supporting the Navy. Individual scouts who are detailed to the military services are assigned to specific army, marine or naval units. They receive temporary rank in their new service in accordance with their duties. For example, a Security Branch officer assigned to Naval Intelligence would be given a temporary naval commission, with all the pay and privileges thereof. Naturally, scouts are almost never placed in the line of command in the military services. They usually serve as staff officers or specialists even when they are granted commissioned rank.

Foundation of the Imperium

Cleon Zhunastu became hereditary President of the Federation in -30. Cleon was a visionary leader, with great charisma and a rare grasp of politics and human dynamics. He worked to reform or dismantle many of the Federation's institutions, building a new political structure more suited to the task of ruling a great interstellar empire.

One of the first institutions founded by Cleon was the Sylean Federation Scout Service. The Federation's exploratory efforts had always been sporadic and undirected. In contrast, Cleon's new Service would be a tool for the systematic expansion of the Federation. Scouts would push out from the Federation's borders, exploring, updating old charts from before the Long Night, renewing contact with local populations. Strong pocket empires would be located, screened and bypassed. Weaker worlds would be contacted and intensively studied. The lure of advanced Sylean technology would be applied to bring new worlds into the Sylean sphere of influence as quickly as possible.



Cleon had a second motive in founding the Scout Service. He intended it as a test of the kind of decentralized institution he knew would be necessary for the Imperium of his visions. The Service's support structure would be a traditional bureaucracy, but a very lean one. Most of the scouts would operate independently for long periods, relying on competence rather than conformity, teamwork rather than hierarchic control. The new Bureaucracy was recruited mostly from the great corporations of Sylea, while the Field gathered most of its members from the frontier worlds of the Federation.

The mix was an uneasy one from the very beginning. However, Cleon had personally recruited the leadership of both Bureaucracy and Field. He chose sentients who were committed to his vision and determined to make the new Service work. The result met all his expectations. By the Holiday Year, the Service had become one of the most effective institutions of the Federation. In one of Cleon's first acts as Emperor, he renamed it the Imperial Interstellar Scout Service.

In the early years of the Imperium, the scouts operated mostly to coreward and spinward of Sylea. One of Sylea's major allies, the Vilani Confederation, joined the Imperium very early on. This opened a path through Corridor and Deneb sectors into a new frontier area – the Spinward Marches. This region rapidly became a major hub of IISS activity. Scouts discovered many virgin worlds ripe for settlement, and made initial contact with new cultures such as the Zhodani, the Sword Worlds and the Darrians.

Back in the Imperial core, peaceful expansion gave way to a century of frequent warfare (the Pacification Campaigns). The Imperium now consolidated its territory by conquest. Since the Navy was for the first time mounting major offensive campaigns into non-Imperial territory, the IISS was crucial to the war effort.

The wars of Imperial expansion were not always successful from the military standpoint. Even so, the so-called Antebellum period (about 200-600) was a "heroic age" for the Scout Service. It was the time when the Imperium stretched to its current boundaries, mounting not only campaigns of conquest but massive colonization efforts. There was a heady mood of exploration and growth, astrographic and cultural frontiers falling back before the advance of Civilization. The high point of this period came during the reign of the Empress Porfiria. In 298 she integrated the Imperial Grand Survey (originally a separate institution) with the IISS. About twenty years later, she decreed the First Grand Survey of the entire Imperial territory.

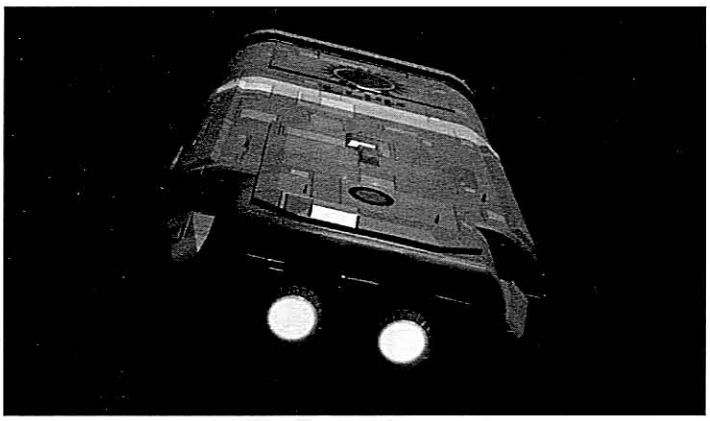
The First Survey was completed in 420, marking a change in the fortunes of the Scout Service. The Imperium had nearly reached the limits of its territorial expansion. Meanwhile, many sectors of the Imperium wanted an end to headlong expansion, in favor of a new emphasis on internal development. Even as the Survey neared completion, rebellion broke out in Ilelish sector, the first of many uprisings and episodes of civil unrest. Imperial society was beginning to fray.

The Empress Jacqueline took note of these trends when she came to the throne in 582. Her administrative style involved a great deal of cost-cutting, and the IISS often felt the bite of her attacks on the Imperial budget. The Service's presence in the Spinward Marches was slashed to the bone, while the Empress turned her attention to the Imperium's rimward frontier. Expansion toward Terra was driven by military considerations, with the IISS involved only in a peripheral role.

Acceptance Speech

" . . . I should also give due credit to the Imperial Interstellar Scout Service. By assigning me to the Express Boat Service, they placed me in a position of extreme isolation and boredom for six out of the eight years of my career. In such a circumstance, one either succumbs to tedium, or one finds a way to reach the wellsprings of creative power that all of us carry hidden. I read, I meditated, I hammered at the anonymous walls, I considered what purpose my life might serve in the Universe. Eventually, I began to write, and that set me on the path that has led me before you today. We rarely consider the ends to which our beginnings might bring us."

– Dame Ekaterina Ulyanov, on accepting the Archduke's Medal for Excellence in Poetry



A Field Scout Speaks

"People say the Scout Service has lost its shine. No more frontiers, they say. All we have to do now is carry messages and update maps. Well, I'll be the first to tell you that the Service isn't as glamorous as the holovids make it out to be. It's hard work, and sometimes it's boring as hell. But it's important work. You think it's easy, governing the Imperium? Eleven thousand worlds, hundreds of sentient species, trillions of individual beings, not to mention all the rocks and dust in between. The Imperium couldn't keep track of a fraction of it without us. You don't govern an interstellar empire with warships and guns. You govern it with information, and that's our business.

"Besides . . . no more frontiers? Nonsense. There are a thousand worlds that haven't been seriously explored, that almost no one even visits, just within the Imperium. And then there's the rest of the Galaxy. We'll have to turn outward again someday. There's just too much out there – we can't ignore it."

– Ganidiirsi Sagaruu, xenologist

Scout Service Emblems

Like all the uniformed services, the IISS uses the Imperial sunburst as its primary insignia. The Scout sunburst is blood-red against a black background. The Bureaucracy keeps no other emblem aside from the sunburst, but each of the three Field offices also maintains its own emblem.

The Exploration Office emblem is seven silver stars scattered on a black field, symbolizing the seven Domains of the Imperium. (Early examples used *six* stars, since the Domain of Deneb was established long after the others.) The motto is *First In* (in coreward portions of the Imperium, this is sometimes given as the Vilani *kimash* or "foremost").

The Imperial Grand Survey emblem is a white galactic spiral tilted almost edge-on, with a pair of golden dividers spanning the width of the spiral, all on a black field. The motto is *Truth and Perseverance.*

The Communications Office emblem is rather different in theme: against a light-colored background, the black silhouette of a human on the back of a running eight-legged beast. The background is white for the Express Boat Service, yellow for the Imperial Courier Service. The motto is *To Enlarge the Common Life.*

The animal in the Communications Office emblem is a *poni,* a riding beast used on Sylea and several other worlds in the Imperial core. It seems that a Sylean history professor of the Civil War period came across references to the Pony Express of ancient Terra. Unfortunately, her knowledge of Old English was faulty and she was unable to make the connection between "pony" and the Terran horse. Although her mistake was soon corrected, the new emblem portrayed the Sylean beast (which was more familiar to most IISS administrators).

IISS field uniforms include service and branch patches. The IISS service patch includes the red-on-black Imperial sunburst above the *poni* from the Communications Office emblem. Exploration Branch uses a single silver star on a black background, with the branch motto inscribed along the left edge. Communications Office, of course, uses its *poni.* Imperial Grand Survey uses an abstract design resembling a lemniscate or "infinity symbol," wrapped around two circles (gold on the left, red on the right).

Jacqueline's reign ended with the disastrous Civil War. The Scout Service was as involved as every other Imperial institution. The scouts of the Spinward Marches supported Olav hault-Plankwell in his march on the Capital, just as they had served under his command during the First Frontier War. In 609, however, both Olav and his betrayer Ramon were slain. IISS Headquarters then issued a directive requiring the Service to remain neutral, waiting for a legitimate Emperor to appear and take command. Although individual scouts and IISS installations sometimes broke this directive, by and large the Service stayed out of the scramble for power. Despite this, the Service was a shadow of its former self, demoralized and divided, scrounging for the funds necessary to keep its facilities and ships operational.

In 616, the Emperor Cleon V appointed Arbellatra Alkalikhoi as Grand Admiral of the Marches, in response to the outbreak of the Second Frontier War. IISS Headquarters accepted Cleon as legitimate, revoked its neutrality directive, and willingly supported both him and Arbellatra. A senior scout named Adrian Eshgaani, who was also a personal friend and advisor to the new Grand Admiral, was posted to the Spinward Marches as Sector Leader.

This move may well have saved the IISS as an institution.



Maturity of the Imperium

Eshgaani was invaluable to Arbellatra during the Second Frontier War. He revitalized the IISS in Deneb and Spinward Marches sectors, turning the dispirited local scouts into an effective intelligence network for Imperial forces. With information gathered by the scouts, Arbellatra was able to mount precisely timed raids in Jewell subsector. This strategy disrupted the enemy's timetable and prevented any large-scale push into Imperial territory. After the war, Eshgaani accompanied Arbellatra back to the Imperial Core, and was at her side during the final campaigns of the Civil War.

The new Regent was painfully aware of the glacial pace of communication between distant sections of the empire. It could easily take over a year and a half for messages to reach Capital from the Spinward Marches. From personal experience, Arbellatra knew how difficult this delay made things for commanders facing crises on the frontiers. She also knew how easily an ambitious admiral could prepare for a march against the Capital, unknown to anyone at the Core until it was too late. If stability was to return to the Imperium, something had to be done.

Her solution, announced in 624, was the express-boat network and the Imperial Courier Service. As planned, the new network would cut communication time to the frontiers by about half, enough to give the Capital a chance to react to a frontier war or an outbreak of imperial ambition. Easier communications would also knit the Imperium together, making it easier for different worlds (or different sectors) to find common interests.

To succeed, the new institution had to be politically neutral. Most of the contracts for the network's construction were given to General Products, a new megacorporation without existing political entanglements. The job of operating the network went to the IISS, under the leadership of Arbellatra's ally Adrian Eshgaani.

Construction of the Xboat network took over a century. The project gave the IISS a new lease on life, as money and manpower flowed into the Express Boat and Courier Services. Even more important, it gave the Service a new symbol to rally around. The frontiers had diminished in importance, but scouts could take up a new task: binding the Imperium together so tightly that the horrors of civil war would never happen again.

About 700, the Service developed the technique of maintaining an extensive roster of "detached duty" operatives. This enabled the Service to become a "flexing" organization, able to reduce costs in ordinary times, yet quickly tap into a pool of skilled manpower when needed. With this step, the modern Service began, a mature institution ready to serve the Imperium for the long term. Expansion efforts would surge and ebb, war and peace would alternate, but the IISS would never again be seriously threatened with extinction.

Scouts Outside the Imperium

The functions performed by the IISS are handled differently by interstellar polities outside the Imperium:

Zhodani Consulate

The Zhodani maintain no distinct equivalent of the Scout Service. Communications are handled by a system of express boats and courier ships, similar to those of the Imperium. Exploration and contact duties are handled by a branch of the Consulate Navy, and many military officers are also ardent explorers. The boundaries of the Consulate itself are static. Nevertheless, in the Core Expeditions the Zhodani are engaged in exploration on a scale that dwarfs any venture in Imperial history.

Vargr Extents

Vargr are often ready to strike out for new territory on a moment's notice. As a result, the Vargr may not explore in any organized fashion, but they do range very widely. Communications in the Extents are handled entirely by private concerns, which carry messages or important cargoes on a commission basis.

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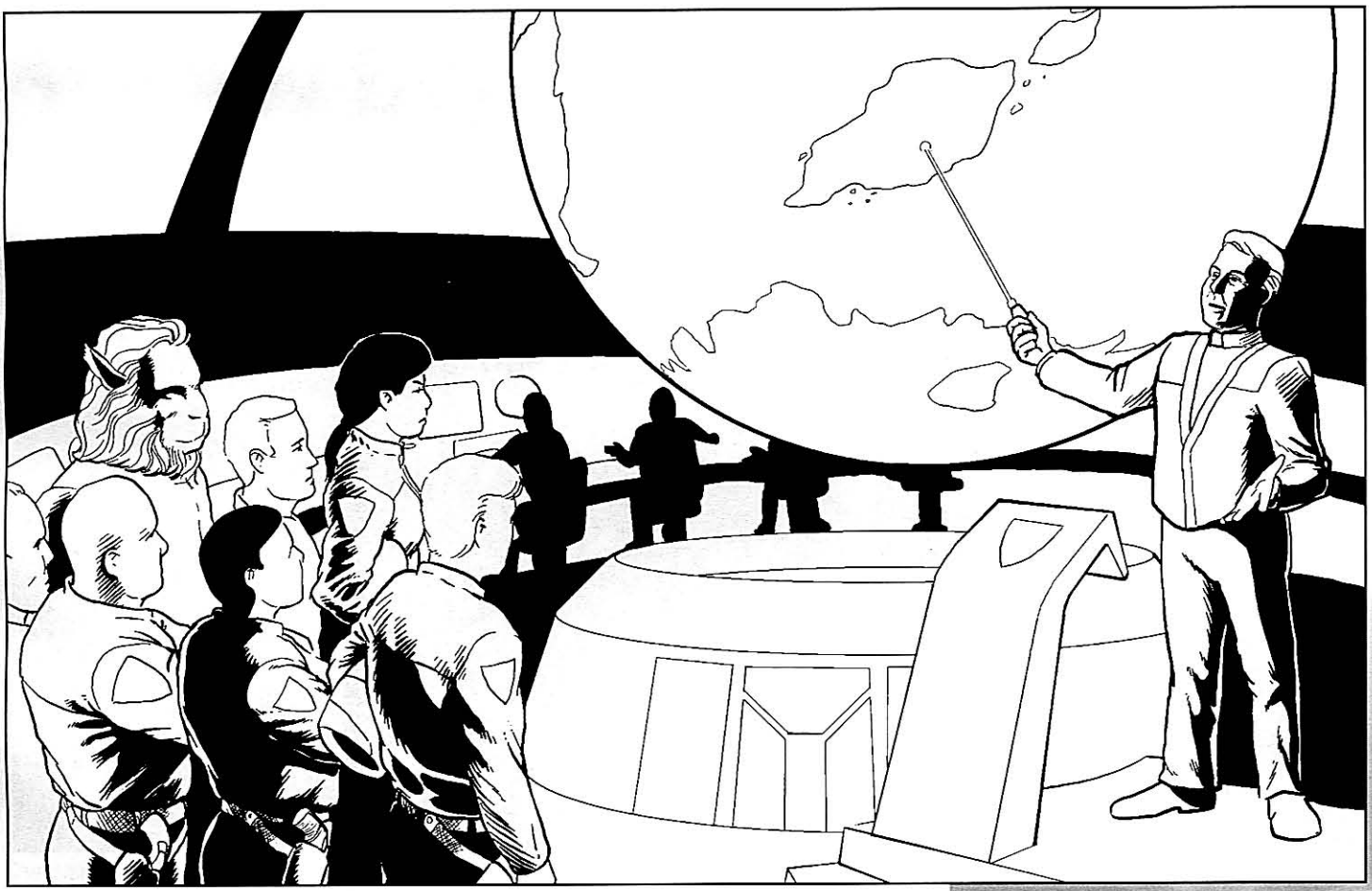


Scouts Outside the Imperium

[Continued]

The Two Thousand Worlds

The K'Kree are extremely incurious and conservative. Their empire expanded very slowly once they attained spaceflight, and all outward exploration halted centuries ago. Merchants and diplomats continue to interact with nearby interstellar powers, but otherwise the Centaurs are uninterested in scouting. The worlds of the K'Kree empire maintain a slow communications network based on interstellar trade.

Hive Federation

The Hivers are probably the only major race to exhibit *more* curiosity than Humaniti. The Federation Development Agency performs many functions that are analogous to IISS missions. The Federation maintains no equivalent of the express-boat network, although the constant circulation of so-called *embassy ships* disseminates information slowly. If faster communications are needed, the Federation Navy or a private concern provide it.

Solomani Confederation

The Solomani government maintains an express-boat network similar to that of the Imperium, and also undertakes exploratory ventures. These functions were once under the strict control of the Confederation Navy. However, the central government's grip has been slowly relaxing ever since the Solomani Rim War. Currently, several major worlds are competing to explore and colonize the Confederation's extensive rimward frontier.

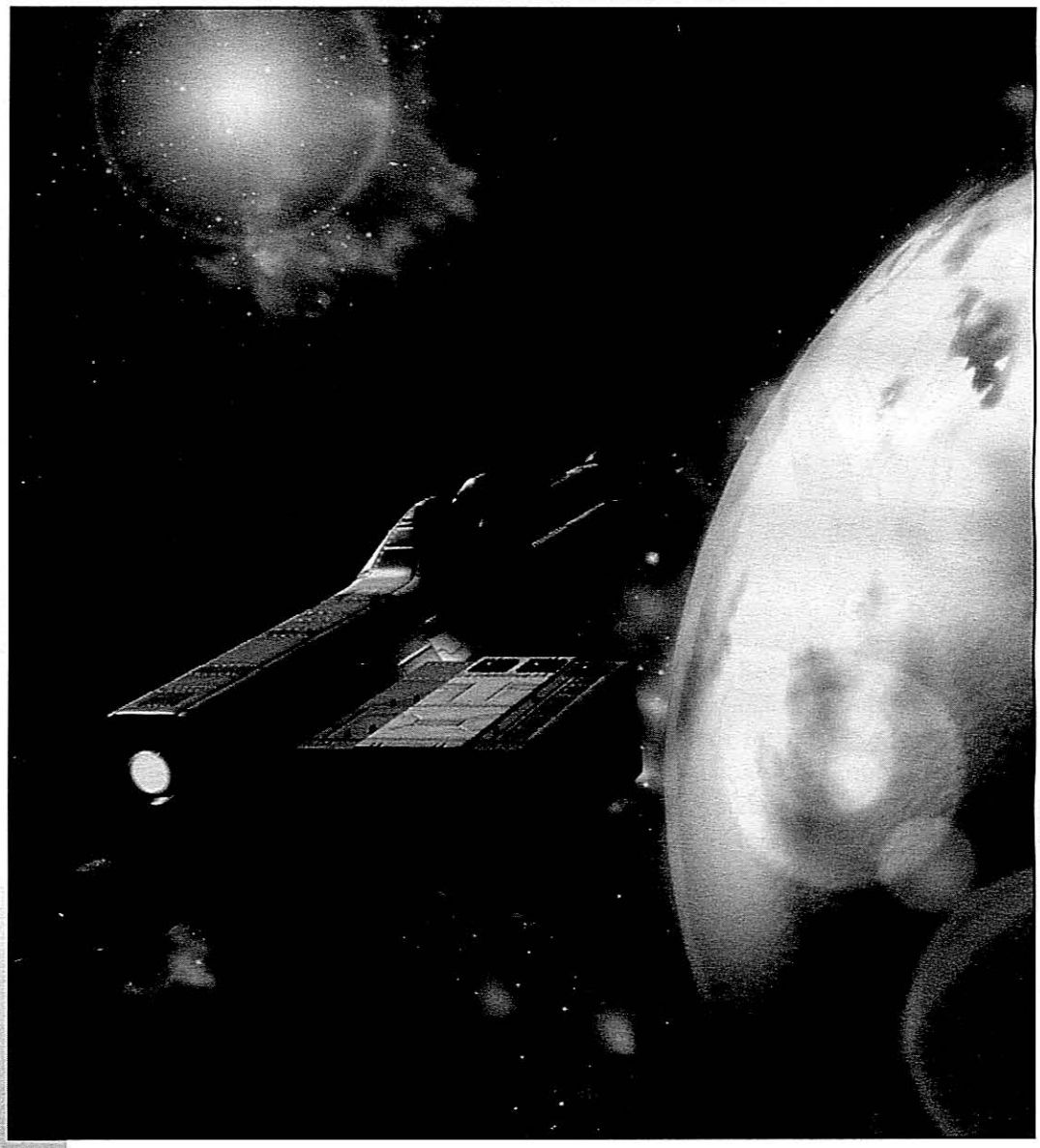
Aslan Hierate

The Aslan have no central government as such, and they don't maintain any equivalent of the express-boat system. Individual clans operate courier services on a for-profit basis. The Aslan are highly motivated explorers. Although they are not overly curious, their territorial hunger more than makes up for it. Bands of *ihatei* don't venture blindly into unknown space if they can avoid it. Instead, they explore carefully to find a good place for their new landholds.

The Present Day

The IISS remains critical to the stability of the Imperium. The Express Boat and Courier services are constantly busy, managing the flow of information that is the life-blood of empire. Meanwhile, although the Second Grand Survey was officially completed in 1065, survey work continues even today. Exploration and Survey ships are still filling in details and extending Grand Survey coverage into areas bordering on the Imperium. Meanwhile, Contact and Liaison continues the never-ending task of smoothing interaction between the Imperium's thousands of unique cultures.

The Service's mission of military support has become even more critical in recent years, even in peacetime. The old Imperial strategy of a "crust defense" has proven unworkable. Instead, the bulk of the Imperial Navy now operates as a strategic reserve, relying on colonial forces to delay the first blow of any attacker. Such a strategy requires advance warning and quick response. IISS intelligence and covert operations have therefore expanded considerably in the last 50 years. This growth is especially clear in the Spinward Marches, where Archduke Norris has taken a strong interest in the health of the Scout Service.



Chapter One
Outposts of the Imperium

Trade, Starports, and Starships

This book describes many activities and processes already portrayed in ***GURPS Traveller Far Trader*** – but from the perspective of the starport support services rather than the spacefaring merchants who rely upon them.

Readers interested in more information on interstellar commerce will find it in ***Far Trader***. That book focuses on the view from a ship's hold, covering the various expenses, administrative entanglements, legal restrictions, and other hazards that await free traders and megacorporate megafreighters across the Imperium. ***Free Trader*** touches on starport operations for the same reason that this book touches on merchant operations – because the topics coincide quite often. Readers of this book interested in the perspective from across the parts counter or visa desk will find it there.

Both books also will share topics with the upcoming ***Starships*** – the last of three planned ***GURPS Traveller*** books dealing primarily with star travel. That book will detail the operation of a ship. These deck and engineering functions will, of course, continue to overlap with the cargo-hold activities of ***Far Trader*** and port functions of ***Starports***.

Every effort has been, and will be, made to minimize the information shared among the three volumes, but a minimal amount of repetition will be unavoidable so that each can thoroughly cover its topic.

The Imperium operates a starport on each of its 11,000 worlds, as well as many client states and a few hostile worlds. These ports anchor the web of trade that provides both the reason for the Imperium and the means by which it exists.

As vital as that function is, starports play another role of arguably equal importance. Starports are where the Imperium and each of its self-governing worlds collide and collude. They usually represent the sole Imperial outpost on a world – and the world's sole lifeline to the stars. Given their critical function for both governments, Imperial starports transcend their mundane role as transit station. In most citizens' eyes, they stand as *the* symbol of the Imperial relationship. The details of this symbolism vary in accordance with the nature of each world's view of the Imperium . . .

Imperial starports exist to provide fair and equitable support of interstellar trade. This they do, with an astonishing degree of uniformity across the parsecs. At the same time, the intense Imperial, local government, and public focus on each port transforms it into a unique culture – a place unlike any other on the world, perhaps unlike any other in all of the Imperium. A star traveler can expect to find a fixed set of ship services at a fixed set of prices at a given Imperial starport. In every other venue – atmosphere, attitudes, attractions – he should expect the unexpected. Beyond the landing pads and control towers, no two starports are alike.

The Imperial Starport Authority

The Imperium uses a number of agencies to indirectly govern its vast reaches. None of these – not even the Imperial Navy in all its dreadnought glory – can claim greater importance than the Imperial Starport Authority.

The SPA manages all Imperial public starports, which is to say, the port facilities for well over 97% of trade and travel in Imperial space. The job requires equal genius in administration, diplomacy, and crisis response.

History

In its first few years, the Third Imperium almost solely built exploratory and military bases, under the command of the Imperial Scout Service or Navy respectively. The need for commercial ports was recognized from the beginning; it did not take long to realize that the Imperium would have to take on this responsibility for itself to ensure their quality. The scouts' Bases Division established a Civilian Starports Office to establish standards for taking over existing ports, formalize procedures for building new ones, and prioritize new-construction and upgrade needs.

In 422, after the completion of the First Survey, a decree of Emperor Martin III separated this office from the Scouts and established it as the Imperial Starport Authority. It is part of the Imperial Ministry of Commerce, though its chief executive (see p. 17) answers directly to the Emperor.

Authority

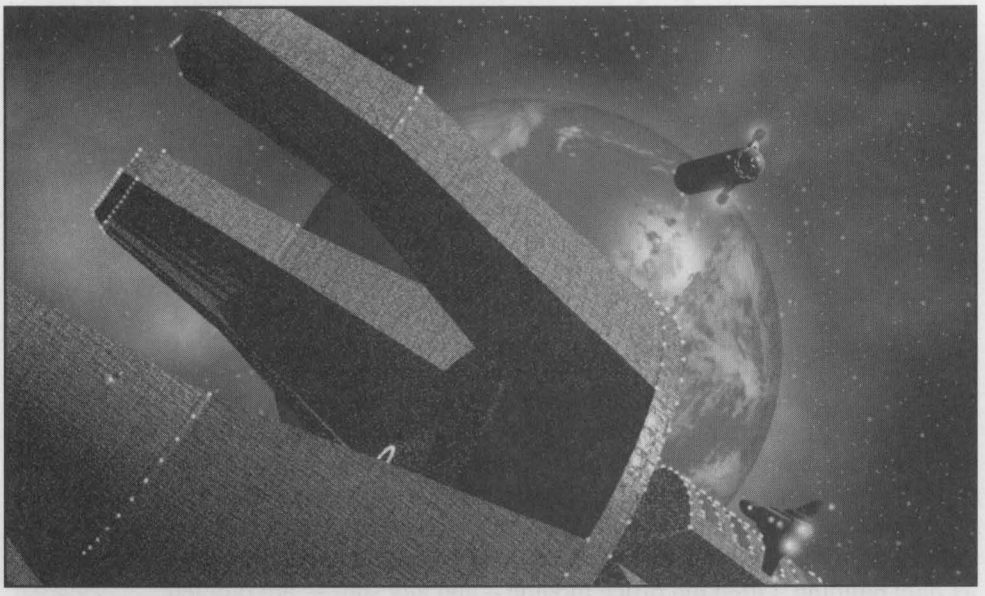
On paper, the SPA – as represented by each port's director – merely manages the starport. The SPA port, especially the shipyard, often hosts permanent scout or naval operations, but these remain under scout or naval control. (The entire port often falls under naval control during a crisis.) The port usually houses Imperial diplomatic offices, but the port personnel have no policymaking duties.

In practice, each port's director wields enormous influence on local relations. A saying goes that the navy can always point a gun to get what it wants, the scouts monopolize the euphoria of first contact then move along, the diplomats hammer out definitions of the *ideal* . . . but it's the SPA personnel that roll up their sleeves and make Imperial-member world relations work on a daily basis. However much truth underlies that statement, rare is the admiral, sector scout leader, or ambassador who does not consult with the local port director on matters of importance.

All Imperial starports are Imperial property, regardless of the allegiance of the system they occupy. This concept is known as extraterritoriality (usually shortened to extrality, or just XT). Within the port's boundaries – referred to as the XT line – local law and political authority are not in force. XT issues and relations with the host world will be discussed in Chapter 3, *Planetary Relations*.

Alliances

A side effect of the SPA's long association with the Imperial Scout Service is that scouts often consider the SPA an "auxiliary" of IISS. Some SPA personnel resent this (some laugh it off as just another example of scouts' outlandish chutzpah), but it means that scouts are willing to bend their already flexible rules to assist the SPA. Scouts who become unfit for active service through age or injury sometimes move to a job with the SPA; this is considered less of a "step down" than the private sector. Such ex-scouts are given the benefit of their service seniority on application with the SPA.



Starports and Imperial Policy

The SPA facilitates interstellar trade by reducing its costs nearly to the point of subsidizing it, and by enforcing Imperial policy on fair trade and ship safety. This careful balance of carrot and stick means that no alternative starship service has been able to compete with the SPA, though a few worlds and megacorporations still try.

The Imperium levies no routine tariffs on star trade, though it reserves the right. Occasionally a crisis will result in a temporary tax, though more often within a given subsector, sector, or domain than Imperium-wide. The SPA does collect all local tariffs from interstellar commerce prior to handing them over to the host government – or not handing them over. A primary Imperial intrusion into local policy is that all worlds hosting an Imperial starport must practice fair trade. It formally prohibits favoritism in planetary tariffs and trade practices *in regard to goods shipped via Imperial starports*. The Imperium has not yet claimed the authority to prohibit these practices altogether, the primary reason that a few local or corporate-owned ports still exist.

Seller Beware

From a profit-and-loss perspective, Imperial policy pampers interstellar merchants. Local starports and the occasional megacorporate starport often drive home that fact, with huge tariffs on products from star system X, corporation Y, or random factor Z. In fact, some observers suggest that the Imperium tolerates unfair trade outside its starports because the occasional rogue local port will advertise the relative merits of the SPA!

Many merchant ships travel for years without ever visiting a non-Imperial port, enjoying the SPA-enforced lack of transshipping tariffs or other friction along the way. While many local starports maintain a similar free-trade zone – to remain competitive with Imperial services – others expressly exist to void free-trade practices. These official measures can include heavy and non-uniform tariffs, close inspection of end-user certificates, safety inspections, etc. – even if the cargo isn't intended for the local market!

Even if the port claims to practice free trade, starship crews landing at them may be in for some surprises. If they carry cargo from a source that the local government would like to cripple or demand concessions from, any number of unofficial inconveniences may await. Ships carrying cargo from target worlds would always be last in line for fueling and freight-handling. Exports of fresh produce would be removed from their refrigerated containers for "inspection" and allowed to wilt. Rough handling and shoddy transportation would damage other goods. Personnel might be subjected to onerous and repeated medical inspections. Any number of small, informal barriers might be placed in the path of free trade by a hostile, locally controlled port authority.

Private ports can be even more difficult to deal with, since their officials usually have a much more limited set of priorities. A private port run by a megacorporation not only might refuse goods from a rival firm, it might refuse any service to a ship carrying those goods! Generally, wise merchant captains avoid private ports unless doing business invited by the port's owners.

Poor treatment of this sort isn't universal outside of Imperial starports. While some worlds with Imperial ports were reluctant to give up the power to so afflict their neighbors, most were more relieved to be protected from such treatment by others. They gladly protect this privilege by maneuvering commerce around protectionist neighbors. The extent of the Imperial starport network usually makes this countermeasure easy to perform, so only the most shortsighted or advantageously located local governments practice unfair trade.

The SPA Emblem

The Starport Authority emblem can be found on all official SPA stationery, buildings, vehicles, and uniforms.

The emblem consists of a large terrestrial world on which is placed the cartographic symbol for a starport: a device resembling crosshairs made up of a circle and a pair of crossed lines. Encircling the planet is a stylized starship with a thruster trail to indicate that it is launching.

This emblem has been in continuous use since the SPA was founded by Imperial decree in 422.



Childhood Memories

"I doubt that anyone forgets their first visit to a starport. It's usually a magical event: strange people rushing to and fro, new scents everywhere, cargo containers on lifts, blaring announcements, and starships – so many starships. There's no better way to get a sense of the immensity and diversity of space than to watch the starships at a port.

"I was always impressed by the Vargr merchant ships that I saw come to the station. I guess that's why I spent some time traveling in the Extents as a youth, even though my father never approved of my choice. Yet, I think it gave me some perspective that has served me well since then.

"My recommendation to anyone thinking of entering the service of the Imperium is quite simple: Spend some time at a starport. Trust me, you'll learn more in a few hours of observation there than you could in years of formal study. You'll see why this Imperium we have is a thing worth saving, a thing worth protecting. Nothing, nothing can be allowed to threaten that."

– from an interview with Archduke Brzk, conducted by the Journal of the Travellers' Aid Society, 156-1119.

Worlds cannot interfere *at all* with goods transshipping (i.e., just passing through) their Imperial starport. In an important extension of extrality, the goods never legally leave Imperial territory.

Host planets can impose uniform tariffs on goods destined for their world, and most do, ranging from 0% to more than 200% of market value (see p. T:FT13). The SPA monitors these tariffs, and takes an aggressive stance in adjudicating them. A world with an Imperial starport will be wasting its time in attempting to impose a special tariff on a product for which one of its rivals is a leading exporter – no matter how legitimate the grounds for the tariff. The *appearance* of Imperial fairness usually outweighs all other considerations.

This longstanding devotion to fair trade helped to sell thousands of worlds on the SPA system, and through it, on the Imperium itself. Despite any complaining, it still does. Many steadfast member worlds would not display nearly as much devotion without the immense, tangible benefits of hosting an Imperial starport. (This rarely protects the starport from being the target of displeasure at other Imperial policies, though.)

Therefore, a starport provides the Imperium a method by which to offer consistent commercial-starship service, regulate star-travel for safety, set trade policy, monitor local compliance with said policy, and levy taxes. Weighed against these many advantages are the extremely high cost of the port and its personnel.

SPA Starports

Over 97% of the starports within the Imperium and over 40% of those found on nearby non-member worlds are Imperial ports. The Starport Authority grades all of its facilities as falling into one of five classes. (For convenience, the Travellers' Aid Society applies the same grading to non-SPA starports when describing their service levels.)

This section expands on the evolution of ports from Class I to Class V. More complete details of port features appear in Chapter 5, *Starship Design*.

Class I

The Imperium usually creates a Class I starport by landing two modular cutters. One carries earth-moving and surfacing equipment, and a work crew. It clears and levels space for several small starships to set down, with at least one area large enough for a starship of up to about 1,000 displacement tons to put down without undue risk. If the Starport Authority has deemed it necessary, the crew will also string metal fencing around the port, defining an extrality line. The other cutter carries an office module (see p. 103), which becomes the new port's headquarters building – in most cases, its *only* building. Often the office module – and any staff – are omitted.

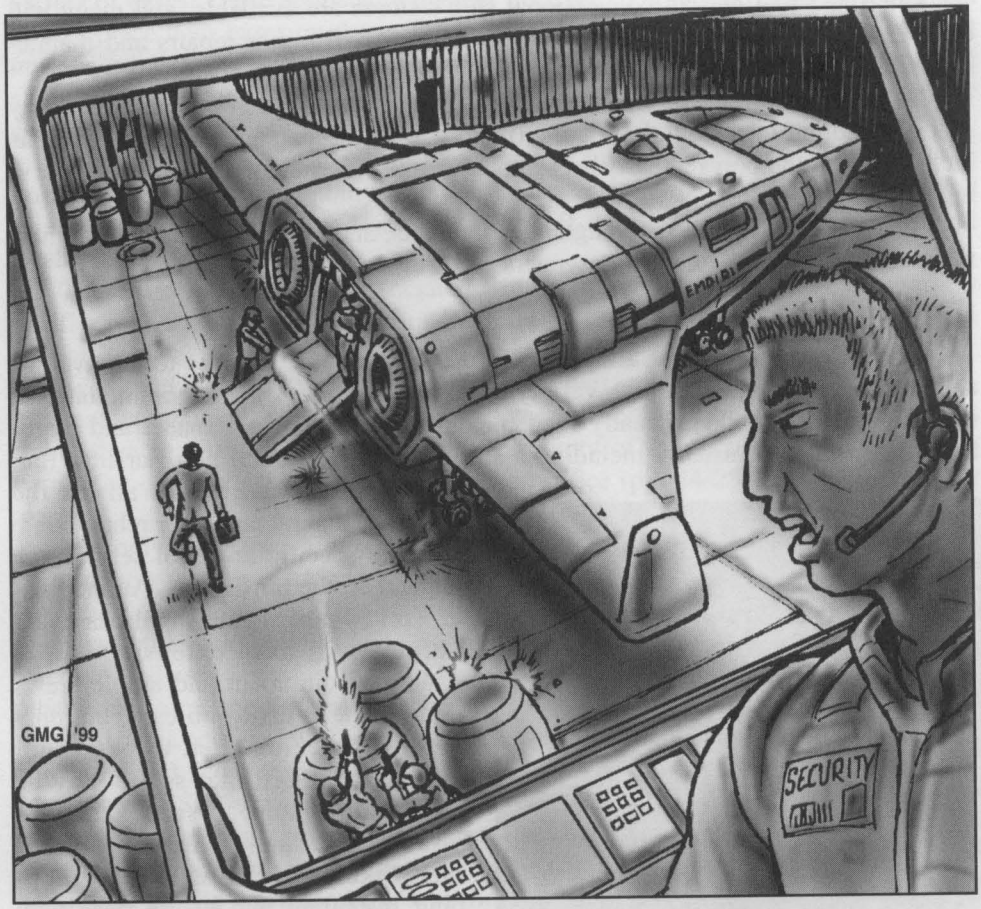
The office (if present) operates the landing lights and approach beacon, handles the standard paperwork on transient vessels, stores cargo of Imperial concern (mail, mostly), and provides a place for passengers to wait out of the rain or vacuum.

There are no facilities for fueling or routine servicing of ships. If convenient, the port will be located near a body of water from which properly equipped vessels may draw unrefined fuel. Some emergency parts and supplies are stocked. If there have been several emergency touchdowns recently, the supply may be depleted. This means the crew will simply have to send a message (provided another ship is outbound to carry the message) and wait for the supply ship.

The basic P/I has no surfaced or covered berths or hangars; some examples must temporarily shut down operations after a hard rain. Local residents may lease long-term berthing space, but must prepare and maintain any improvements themselves.

There are no retail stores or food service, though the general manager (the person staffing the office) may share his coffee. Directions will be provided to the nearest habitation, along with advice on local customs, law levels, and anything else likely to get the visitor in trouble.

A few P/Is may have more elaborate "terminal" facilities, such as one might find at local grass-field airports: a small general store, a snack bar. The existence of such ports is often more a matter of planetary pride than commerce. Many of them sport elaborate signs reading "Welcome to Old Hickory Interstellar Starport" or the equivalent, and an "artist's conception" of what the local populace would like the facility to look like in the undetermined future.



Class II

A Class II port will have 10 to 30 surfaced landing pads, and perhaps a landing strip for small craft incapable of vertical takeoff and landing. At least a few of the landing areas will feature covered hangars, more if the weather is generally hostile. Landing guidance is more sophisticated, and incorporates at least a minimal satellite network.

Mechanical service is available, but limited to minor repairs, standard spare parts, and essential ship's stores. Unrefined fuel is for sale. There will usually be no more than one service crewman on duty at any time, so ship crews in a hurry may need to buy parts and perform their own labor.

The level of passenger and cargo facilities is determined by traffic flow – smaller ports such as this often cater almost exclusively to one type of traffic or the other. In general, there will be no more than one or two cargo-handling crews on duty; a local firm sending or receiving a large shipment may need to hire temporary crews to expedite the transfer. This may include the off-duty local crews, idle starship crews, or idle cargo handlers from one of the few companies that will maintain a permanent presence at a port of this size.

Most Class II ports see only a handful of freighter passengers at a time, and have no special services for them beyond a waiting room. Where there is something to draw larger groups of travelers – a safari world, say, or an industrial plant that hosts visiting executives – amenities for them are usually provided by the host tour operator or corporation, and are not necessarily available to other visitors.

Starport Economics

Building and operating a major port is expensive. Slidewalks, grav shuttles, satellites . . . everything costs money. The income to pay these costs primarily comes from the sources below.

A major Imperial port does well to break even – that is, bring in income at least equal to operating expenses and debt service – after 20 years of operation. The average is more like 25-30 years, and some major ports never break even. Generally, larger ports with their larger traffic flow generate larger revenues, but some out-of-the-way minor ports end up doing quite nicely as the only option around. Class I ports very rarely make a profit.

Appropriations and Subsidies

Imperial starports receive their "core" operating funds from the SPA itself. (These funds come from Imperial taxes, which benefit from the increased trade generated by the Imperial starport system, which explains why the Imperium eagerly operates starports "at a loss.") Other Imperial services (notably the navy) may grant appropriations or subsidies on an individual or even systemwide basis. Local governments also can subsidize Imperial ports.

Ship-Servicing Charges

The Imperium operates starports as a public service, but not a free one. Nearly every service provided costs something. In most cases, ports can count on a steady flow of funds from such service charges.

Information on starship maintenance costs can be found on pp. T:FT74-76. Starport berthing fees, handling fees, and usage costs are found on p. T:FT66.

Shipyard Usage

Major Imperial starports possess shipyards. These produce huge revenue streams, but the shipyard was a huge expense to begin with. Generally, Class IV ports – limited to the non-starship trade – do well to service shipyard debt with their revenues. Class V shipyards, with a larger customer base, often produce tidy profits. Shipyards are open to private interests, unless under emergency naval control.

Concessions

A concession is a starport business operated by outside interests. Many of the "non-essential" services of a port will be farmed out to private businesses and entrepreneurs (see pp. 21-22). An Imperial starport will charge rent for the space a business occupies. This will usually be very expensive, even in comparison to prime, urban real estate elsewhere on the planet.

Glossary

A few specialized terms used in this book may not be self-explanatory at first glance:

Ground Element. The part of a port that sits on (sometimes under) a planetary surface. Also known as the downport, down, downside, or dirtside (the last slightly insulting, used by those who spend most of their time in space).

LASH. Lighter Aboard Ship, a type of cargo-hauling scheme. A lighter is a non-starship (usually of fairly large size) used to transport cargo to and from an unstreamlined starship and a world's surface. Some starships carry the laden lighters between worlds, allowing them to rapidly discharge and take on loads.

Local. Native to the system served by the starport. The term is most often used on non-Imperial worlds, where it is important to distinguish between port employees who are Imperial citizens (even though they may live outside the port's boundaries) and those who are under the planetary government.

Major Port. A Class IV or V port.

Minor Port. A Class II or III port. (As an example that the SPA suffers from bureaucratic logic as much as other agencies, Class I ports are – obviously – considered ports for the purposes of the numeric classification system, but not for the more general purposes of the major/minor designations. The average SPA administrator finds this completely natural. Countless attempts by starship crew members to explain the inconsistency have been greeted with nothing more than bewilderment.)

Orbital Element. Part of a port in orbit above a planet, usually stationary above the ground element. Also called a highport, highside, high, or sometimes over.

Startown. A community that grows up next to most starports, usually just across the XT line, to serve the particular needs of starport regulars and visiting starship crews.

Tariff. A tax levied on exports or, more commonly, imports. Starship captains tend to use the word in a more broad sense, applying it to all sorts of ship-servicing charges (as seen on p. T:FT66). Imperial law – and this book – only use the word to describe taxes imposed on trade goods.

Traffic Bias. Designates whether the port is oriented toward cargo handling or passenger service. Most starports are strongly biased toward cargo. The exceptions usually service resort worlds whose principal business is tourism.

Class III

The P/III starts to look like what people think of as a starport. It has 50 to 100 landing pads, most of them equipped with a proper berth, and possibly one runway if on a world with atmosphere. Its traffic control can handle multiple takeoffs and landings at once.

About half of P/IIIs have an orbital element, connected by shuttles to the ground, allowing service to unstreamlined ships that do not carry their own lighters.

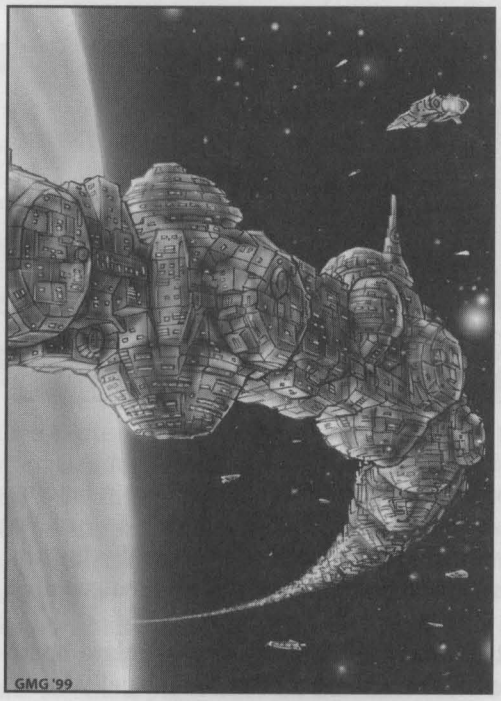
Unrefined fuel and all conventional ship's stores are available, and many will offer refined fuel, though tankage may be limited. All minor repairs and maintenance can be performed without undue delays.

Handling of ordinary container cargo is efficient, though goods requiring very special handling may slow the routine (there will be a separate hazardous-materials facility only if the port regularly sees large quantities of the goods, as at a port serving an ordnance plant).

Modest but adequate shopping and restaurants, and usually some kind of entertainment, will be available for passengers and crews.

Class IV

The P/IV usually offers a highport, and a full suite of services to the average small starship or passenger. A variety of shopping, overnight accommodations, entertainment, and food is usually available onsite. Full ship maintenance and cargo-handling is offered, usually including a shipyard that can build non-starships (but not starships) and handle all but the largest structural repairs or rebuilds.



The specific levels of service can depend on the traffic bias. An industrial world's port with a small passenger volume will have extensive cargo-handling equipment and ample crews on duty (with extras on call), but only modest space devoted to passenger comfort (though that space may be very comfortable, to suit executives visiting on business). A resort world is more likely to have extensive shopping, restaurant, and leisure areas, with commercial cargo handled to one side (if no less efficiently).

Class V

The P/V is the great crossroads of the spaceways, processing thousands of passengers and cargo containers every day, usually with a full commercial shipyard (as well as "Honest Khugi's E-Z Credit Used Starships" or the equivalent among the hundreds of private operations renting space at both the highport and downport). Hundreds of travelers find a temporary home here, either waiting for an interstellar connection, a shipboard job, or just a working passage to Somewhere Else. This is a natural place for groups of would-be adventurers to meet and combine forces (even, for the classically minded, in the traditional "tavern brawl that ends in lifelong friendship").

The transient accommodations are more varied at a Class V than any smaller port: plenty of luxury hotel rooms, but also more cheap hostel space (see pp. 107-108). The same is true of shopping; there are of course more high-end retailers, but also more, and more varied, goods at the budget shops. It is the shopkeepers' job, after all, to separate travelers from their cash (usually by fair enough means), and the port management, which draws much of its income from concessions, has no wish to discourage them.

Scout and Naval Starports

While most star travelers (and player characters) will exclusively utilize the services of SPA commercial starports, the Starport Authority isn't the only Imperial agency building starports.

Both the Imperial Navy and the Imperial Interstellar Scout Service maintain a variety of bases. These are usually distinct from the SPA starport. The scouts almost always place their bases on the main world, and usually the navy does, too, since it must coordinate extensively with the SPA port in its shared usage of the commercial shipyard. Sometimes the navy will place its bases on a remote world in a given star system, away from prying eyes.

In some respects, the presence of a scout or military starport in a system is as important to the local economy as is the commercial starport. After all, scouts and sailors at the port will spend some of their off-duty hours (and money) in local establishments.

There is also some pride associated with having a naval base. Like the starport itself, a military base is a symbol of Imperial power. Unlike the starport, it's also a sign of Imperial favor.

Scout and naval starports are, for the most part, self-sufficient entities. That is, the base commander governs his port in accordance with his service's protocols rather than the SPA's. There is, of course, plenty of interaction between the two ports. The commercial port's military liaison office (pp. 24-25) exists for this very reason.

The only thing for which a military starport depends on a commercial one is its construction facilities. As odd as it may seem, military starports generally do not have their own shipyards. The Imperium considers the duplication of such facilities to be wasteful – and in times of peace military construction can be slotted into otherwise unfilled capacity when civilian business is down. Of course, in times of war or other emergency, the military base commander may take charge of the commercial shipyard. This occurred with some frequency during the Frontier Wars.

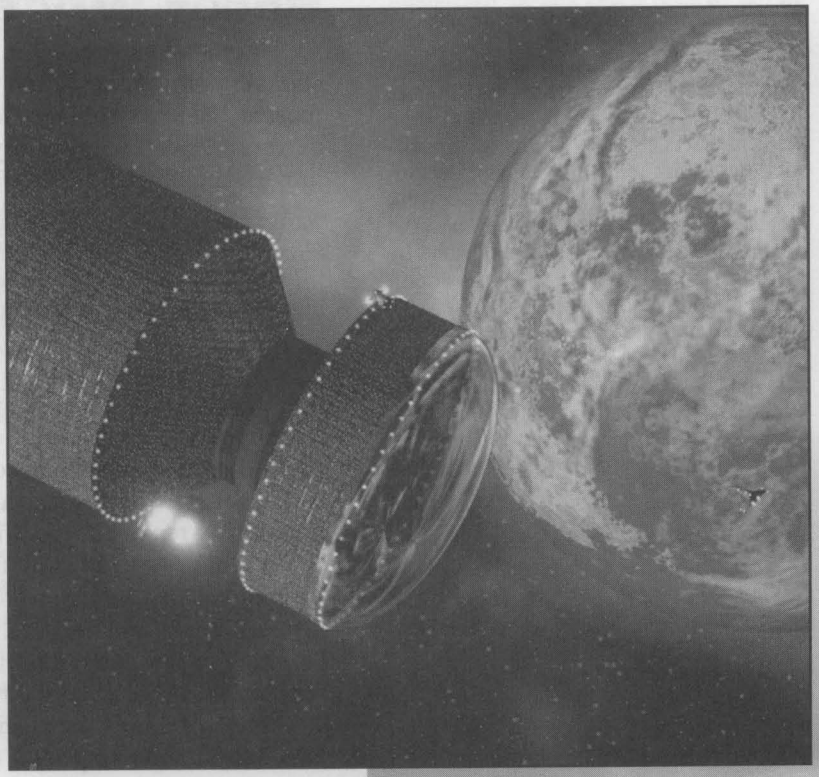
Navy and scout vessels in a system lacking their own installations can take advantage of SPA services, of course. In such systems, these services sometimes will maintain a small, permanent presence at the SPA installation. Even when the SPA hosts these sites, their personnel operate independently of the port director's authority unless specifically assigned there to garrison the commercial starport (see pp. 24-25).

The several types of scout and naval base are described in more detail below, as well as in sidebars on pp. 66-68.

Scout Base

Scout bases provide a place to fuel and maintain exploratory and communications vessels, to disseminate orders to individual scouts, and to allow those scouts who are so inclined to have a little human contact and time off a deck.

Bases are initially assembled from modules, as for a Class I commercial port. This both speeds construction and makes it simple to dismantle and move a base that is no longer needed. A long-established scout base will usually have conventional buildings added. Because scouts spend much time "at the sharp end," and often have to limp back to a station with damaged ships, all scout bases have at least a minimal orbital element, with supplies and a shelter to house crews until a shuttle can reach them.



Traffic Analysis

A great deal of useful intelligence can be gained simply from watching the movements of ships. If one can track the origin, quantity, and destination of cargo containers, it is often possible to determine what's inside the boxes, and from that make a good guess as to the regional economic situation – as well as spot clandestine military buildups and the movement of hijacked or contraband cargo. Traffic analysis is the main reason the location of a Sector Naval Depot (see p. 13) cannot be effectively hidden. There's just too much unmistakable movement to and from such a place, even if no spy ever visits the system itself.

Traffic analysis is something of an art form, even with computers to help sort through the raw data, but its existence and capabilities are well enough known. Anyone with an interest to protect may try to confuse observers with dummy ship or cargo movements.

Adventurers with their own ship may be hired at premium rates to haul worthless cargo, to distract hijackers from the real goods (or vice versa, and they may not be told whether they've got the real goods or not). Retired scouts given possession of a scout/courier are sometimes called on to play decoy. This may involve taking a roundabout route, or pretending to be a whole series of ships by changing registration and transponder numbers during jump – which is legal if the service orders you to do it.

Military Action

Seizure of the starport is a key element in planetary invasions. Without operational port facilities, the large numbers of ground troops and equipment necessary to take and hold the world cannot be landed. The defenders understand this equally well.

Operational Plan

*"To tell the truth, there ain't no **good** way to take a battery."*
– attributed to
Nathan Bedford Forrest

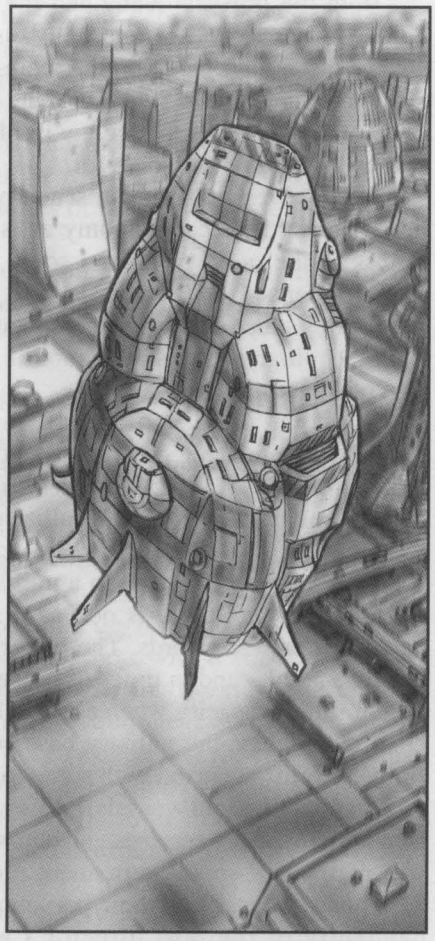
Navy and marine training always includes classroom, simulator, and field exercises on assaulting defended starports. It is understood that executing a textbook plan without making allowances for the local situation is a formula for disaster, but there *are* some generally applicable principles. The operation proceeds in the following stages:

- Stage 1: Enter system space. Surprise is invaluable. Complete surprise is unlikely to be possible unless the assault is launched by vessels already in orbital space, without a declaration of war; this is against Imperial policy, but some governments may not be so scrupulous. Otherwise, ships will jump in at 100 diameters and make all speed for their designated targets: troopships and their escorts to the port (and any other planetary targets); a battlegroup of fast, stealthy ships to take out tracking stations and orbital weapons; all other forces to deal with in-system vessels – which leads to Stage 2.
- Stage 2: Establish space superiority. This does not necessarily mean eliminating every hostile vessel or ground defense (though that is certainly desirable, if possible), but rather removing enough defenders to make it possible for the subsequent stages of invasion to proceed without unacceptable losses. This can be done by direct attack (destroying the opposition), containment (establishing a defensive sphere around the area of operations that enemy vessels cannot enter), or diversion (drawing the fleet away from the area of operations with a feint attack).
- Stage 3: Control orbital element (if any). The navy considers this stage a part of establishing nearspace control (and therefore its responsibility) while the marines think of it as a boarding action (and rightfully theirs). The actual balance of forces (and therefore the tactics used) depends partly on what forces are available for the operation, and partly on the persuasiveness of the naval and marine commanders involved.

Continued on next page . . .

Xboat Station

The communications system of the Third Imperium is serviced by express boats (p. GT31). An Xboat station exists primarily to sort the messages brought by Xboats to a given system. In addition, the station keeps track of the flights of incoming and outgoing express boats carrying messages for the next link in the chain.



Xboat stations are usually located at the edge of a star system, well away from the gravity wells of worlds and stars. They always possess powerful communications equipment, both radio and tight-beam, for receiving and transmitting hundreds of communiques simultaneously. This makes any Xboat station among the *very* first targets when a system is invaded, adding to the more general priorities described in the sidebar on this page.

Xboat stations always maintain a local office on the main world of the system – often at the SPA starport, but sometimes located in a major metropolitan area if the commercial starport isn't also adjacent to primary population centers. This office handles receipt of messages, pursuit of message recipients that can't be contacted via normal channels, etc. Xboat stations play a vital role in keeping a world connected to the larger world of the Imperium, making these ground facilities the favorites of terrorist or partisan attacks. The scouts do not discuss standard Xboat-station security, but it is believed to be formidable for all its subtlety.

Scout Way Station

Way stations are larger and more extensive versions of the Xboat stations. Whereas an Xboat station serves primarily to receive and send messages to incoming and outgoing Xboats, a way station serves as a "garage" with the capacity to repair, overhaul, and refit express boats. Given the importance of each and every mission, the Imperial Scout Service tries to maintain zero technical failure in its Xboats through very thorough maintenance. Way stations are the source of all this maintenance.

Because of their extensive facilities, way stations can, in times of dire need, be converted for use by the Imperial Navy.

Naval Base

Naval bases provide maintenance and support for anything from a single squadron to a sector fleet. Most Naval bases are constructed in systems with SPA starports. Since they share the commercial shipyard, SPA starports in systems with naval bases usually will have naval starships on site at any given time, though most will be undergoing repairs or modifications and subsequently possess low readiness.

Naval bases are firmly focused upon their primary role: keeping their squadrons operational. All of them provide the following support to their ships: resupply of stores, ammunition, and fuel; maintenance and repair; training; and shore-based crew facilities. Naval bases that lack a nearby SPA port will often provide the shipyard services normally obtained from the SPA port.

Ships of 1,000 displacement tons or fewer may use the ground facilities of the SPA base. Larger ships will be processed at orbital installations.

Naval bases maintain their vessels as completely as do naval depots (below). The difference is that the range of spare parts and diagnostic equipment is more restricted at bases.

Naval Depot

An Imperial Naval Depot is an entire star system devoted to servicing the Imperial Fleet. One depot handles the needs of an entire sector. There are shipyards able to construct the largest capital ships, vast maintenance areas, and mountains of supplies and stores. A well-established depot will have its own industrial base, refining metals from local resources, making it almost entirely self-sufficient.

During peacetime, the depot is used for naval research and development. An entire planet may be used as an orbital firing range, another for full-scale Marine landing exercises.

Most depots also house a Naval Academy as well. Because of the size of the Imperium, it is impractical for cadets to travel all the way to Capital for education and training. Instead, cadets take up their studies and basic training at the nearest depot to their homeworld. Thus, when a naval officer speaks of his time at "*the* academy," he is not necessarily referring to the same place as his fellow officers when they speak of their own time at the academy. There are exceptions, particularly in the case of specialized training, such as intelligence. Not all depot academies are capable of teaching every advanced skill, and a cadet may well have to travel some distance to learn them.

Security is paramount. Peacetime troop strength ranges from several regiments to several divisions of Imperial Marines. A sensor network blankets the system. Parts of it are connected to automatic weapon platforms. There is no local population or commercial traffic to get in the way. To deal with unauthorized vessels that jump in "accidentally," the depot maintains a small port isolated from any sensitive areas to refuel them, perform emergency repairs if necessary, and get them on their way (after some serious questioning). It would of course be nice if the locations of naval depots were secret, but the abilities of traffic analysts (see sidebar, p. 11) make this a practical impossibility.

A depot can operate for several years without being supplied from outside, and with the resources of an entire system available, many station staff and their families spend their working lives there. Psychological factors, however, call for some rotation of personnel, and this is unavoidable for non-military personnel such as industrial tech reps and consultants.

Local Starports

Most non-Imperial worlds have no Imperial port, of course, and even a few client states turn down the service, usually to keep Imperial relations at "arm's length." These possess local starports, usually administered in a fashion very similar to that used by the SPA. A few even elect to apply the principles of extrality. Locally administered starports usually have a far closer relationship with the local government than those run by the SPA, for better or worse. This can sometimes lead to concerns for offworlders. The Travellers' Aid Society generally classifies such worlds as Amber Zones (p. GT19), given the potential hazards, legal and otherwise.

Starports vs. Spaceports

While all Imperial star systems have an SPA starport, most of them retain several locally operated bases for intrasystem traffic of cargo and passengers. These are called spaceports, to distinguish them from true starports set up to handle traffic between the stars. Much of the traffic handled by the average spaceport is on its way to or from the system's starport. Spaceports can be operated by planetary governments or corporations; a populous star system can feature several examples under each kind of ownership, scattered across several worlds, moons, and asteroid belts.

Military Action

[Continued]

It is not always necessary to actually occupy the OE. It must be prevented from interfering with the attack – firing weapons, supplying defense ships, acting as an observation post/command center, etc. If these can be done by disabling weapons, keeping ships from using the docks, and jamming communications, the direct assault (or demand for surrender) can come later.

- Stage 4: Orbital drop on the downport. This often occurs simultaneously with Stage 3. Troops land at the port. These will mainly be marines, executing direct orbital insertion and/or shuttle landings. Some kind of interface lander is necessary to land vehicles. The spearhead elements will include a larger-than-usual proportion of engineers, and a number of ground controllers.

If possible, a special operations team may be inserted before the assault begins; their job is to sabotage defenses, disrupt communications, and in particular to delay the arrival of planetary reinforcements.

- Stage 5: Seize key targets. The essential task is to make the port usable by the main invasion forces. Ground-based defenses (anti-ship artillery) are neutralized either by destroying them or seizing their control centers. The landing pads are cleared, and a defensive perimeter established around them. Landing control is established. Ideally, this is done by seizing the tower in working order; if this is not possible, the controllers will set up portable equipment (dropped with them).

If resistance is light, and no major reinforcements are expected, a defense perimeter can be established around the port and main forces landed (next stage). The port does not have to be completely cleared of enemy forces before landing operations can begin. It doesn't matter how many personnel are in the warehouse area, even if they're armed combat troops, as long as they can be kept from crossing to the landing and control areas.

- Stage 6: Land follow-on units. These will be army forces in small craft (mainly shuttles and modular cutters, sometimes small starships). At this point the attackers should have overwhelming force at the starport, and any remaining resistance can be mopped up.
- Stage 7: Consolidation. The attackers secure prisoners, move casualties to hospitals, and establish defenses against any counterattack by off-port forces. At this point, the port is secured, and conventional ground operations can begin.

Starports of the Major Races

Starports operated outside the Imperium and maintained by non-Imperials may prove very different from those described throughout this book. Interested players and GMs are, of course, directed toward the ***GURPS Traveller: Alien Races*** volumes for specific information. Some general guidelines:

Aslan Starports

Aslan starports are extraterritorial enclaves, operated by corporations leasing the land from a local clan. Any bases present are naval bases, under the control of that clan. The corporation may be associated with the clan owning the land. If this is the case, females from an allied, vassal, or overlord clan probably run it.

Planetary trade routes are handled in a similar manner, owned by corporations in turn owned by a clan. Destinations are always in clan lands, or on land likewise rented by a corporation. Permission is needed to enter each route and each destination, unless one is a member of the landholding clan. Clan representatives who can grant this permission are found at the starport and other major transportation hubs.

The Aslan naturally have no equivalent to the Starport Authority. Like the Hierate as a whole, Aslan starports are owned and operated by the clans. In general, these starports provide more facilities for vessels of the same clan than they do to outsiders. This can make traveling within Hierate space extremely frustrating and can be used as the basis for an adventure or two.

Hiver Starports

The Hivers consider starports to be an important part of the benefits that their Federation bestows on its member worlds. Consequently, they have adopted a very Imperiumlike attitude toward the construction and maintenance of starports. While there is no equivalent to the SPA, the Federation Development Agency does perform many of the SPA's functions in Hiver space.

For this reason, Hiver starports have a level of consistency and efficiency that would make an Imperial feel very much at home. Nearly all of the information found in this book can be applied to Hiver starports. The only significant exception is that Hiver starports will rarely have a rough-and-tumble Startown or anything similar in their vicinity.

Continued on next page . . .

The distinction between a starport and a spaceport is not one that many travelers even consider, as they have few dealings with the latter. The Starport Authority, of course, has a very specific definition of each, and deals strictly in the primary starport for a star system.

Since 95% of a starship's support needs match those of a non-starship, a starship could seek service at a spaceport in a pinch, but the spaceport will not be able to provide extensive long-transit passenger service or any jump-drive repairs. Many do not maintain any reserves of hydrogen fuel, either.

Most starports also handle some intrasystem traffic, but very little beyond that necessary to provide connections for interstellar passengers and goods. Usually, a starport will take on the spaceport services native to its immediate locale, since it makes little economic sense to build an adjacent spaceport to provide the service.

In a populous star system with widely scattered populations, the locally owned spaceports may handle a large percentage of the downport functions for interstellar traffic. The SPA's highport will process all cargo and passengers destined for the system, then shuttle and lighter service will transport them to a local spaceport rather than the SPA downport, if this would be more convenient. Likewise, much of the outbound traffic arriving at the highport will originate directly from local spaceports. This, too, will be processed through customs at the highport – though processing at the local spaceport often would prove more convenient, the SPA never performs such functions except within its XT line, and never extends the XT line to encompass non-Imperial ports.

This system creates an extra level of planetary relations for the SPA officials at the starport to maintain . . . often negative ones, since some cargo gets processed more efficiently at the SPA downport. For instance, LASH cargo can clear customs at the SPA downport, but may have to be unloaded and reloaded to clear customs at the highport if inbound from a local spaceport. Speculative cargo picked up at a spaceport must then be transported to the SPA downport or highport to clear customs prior to leaving the system. These issues often lead to charges that SPA practices favor its own services. The SPA simply maintains that it must control the physical and legal environment in which customs and related administration processes are conducted, and that those who can't tolerate the inherent inefficiencies should take direct advantage of the SPA downport.

The spaceport system can also create some adventure opportunities for merchant player characters. Even a starship captain who never travels to non-Imperial starports will find himself every so often asked to relay a cargo directly to a local spaceport. At these local spaceports, the merchant crew can suffer all the aggravations and inconveniences that the SPA was set up to abolish . . .



Imperial/Local Competition

The Imperium does establish ports on select non-Imperial worlds. Often this is the first step in enticing a world to join; at other times it results from Imperial intimidation. The Imperium will not take this step unless the local government is willing to shut down or hand over any existing starport, and it will also require a commitment that the government won't open its own starport afterward.

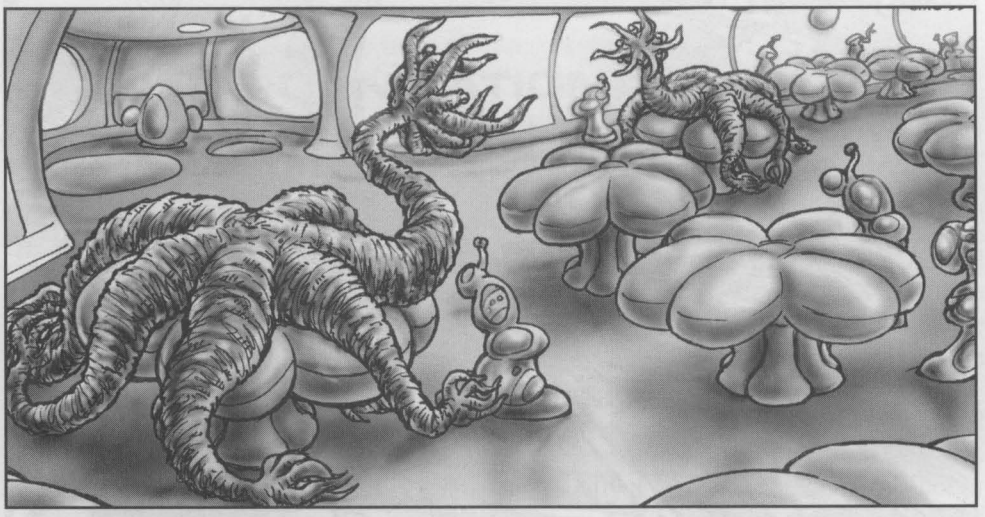
Over the course of decades attitudes can change, and non-Imperial worlds sometimes open their own starports in direct competition with the Imperium's service. Similarly, some worlds had no say in gaining an Imperial starport; the port may have been established before the population attained self-government.

More rarely, Imperial worlds or a megacorporation based upon them feel a need to open a competitive site. Strangely enough, the provisions prohibiting most Imperial worlds from opening their own major starports have largely expired, making this move legal on most worlds (if often unwise).

If these starports are of similar size, and serve the same traffic flows, the Imperial port will usually have a long-term advantage, because it doesn't need to show profits. In turn, the local port authority can influence local traffic to use their port – governments usually push the patriotism button while megacorporations suggest to vendors that orders are filled "more smoothly" through their own port.

The Imperium will not allow a world that has agreed to host an Imperial starport to charge *lower* taxes or tariffs at a local competitor. (It may charge *higher* rates. That's its own business.) Since the SPA collects tax and tariff revenues before handing them over to the local government, it enforces this by simply lowering its own port's collections to match the terms at the local starport.

Unless very unusual circumstances exist, opening a competing starport will signify (or at least start) diplomatic tension between the Imperium and the host world or megacorporation. Still, the costs involved mandate that the SPA not simply close its doors when rivals appear. In addition, the opening of an Imperial starport establishes a sort of guarantee of quality of service when traveling through that system. The Starport Authority hesitates to void that guarantee without excellent cause.



Research Stations

There is no standard configuration for an Imperial Research Station. An agricultural test field, a jump-drive developmental lab, and an isolation hospital for ultra-infectious disease will obviously require different buildings and arrangements. Almost all such stations will have their own starport, but it will generally be a small affair, capable of handling only very small research vessels.

Temporary Stations

These are constructed to study a short-term phenomenon, such as a period of unusual stellar activity, or to work on a particular "crash" project, usually secret. A temp station will be constructed from modular components (see pp. GT142-143 and p. 103), and may be designed for very rapid removal; in the case of a station studying an incipient supernova, this can be a prime consideration. When a planetary surface installation is not necessary, a temp station may consist of a standard *Kugashin*-class lab ship (p. GT145), sometimes with additional modules attached to the outer circumference for habitation, stores, and specialized laboratories.

A ground-based temp station will have landing pads of appropriate size for the largest vessel expected (usually of 500 displacement tons), a few berths, and spares and tools for any ships based at the station. There will usually be a supply of unrefined fuel, with a small refining plant to serve the station's power plant and transient ships.

Space-based stations have berthing connections for local vessels and one or two transients; in the case of the lab-ship station, one or more airlock/connector modules are fitted to the ship for this purpose.

Starports of the Major Races

[Continued]

K'kree Starports

K'kree starports follow the standard ***GURPS Traveller*** classifications. Classes IV and V have extensive orbital facilities, always far larger than outsiders would expect. The ground facilities are widely dispersed, separated by residential areas, warehouses, and chandleries. The facilities available vary with starport class, but even the meanest include a hostel for traveling K'kree. These are intended as the last resort for the desperate.

The Two Thousand Worlds does have a quasi-governmental body called *Ghi'rurrikara !kuug'ri* that oversees the construction and development of starports within the Two Thousand Worlds. This body does little more than ensure that all K'kree starports meet certain minimum standards, but it does this task quite well. The degree of uniform service among K'kree ports would surprise even an Imperial used to the oversight of the SPA.

Solomani Starports

The Solomani Confederation is a paradoxical place. It is at once more *and* less intrusive than the Third Imperium.

The Confederation government itself does not sponsor an organization like the SPA. This duty generally falls to the various governments that make up the Confederation. At the same time, the central Solomani government has issued a number of protocols that are expected to govern the operation of starports throughout its space. The implementation of these protocols thus varies with the zeal of the local government for such matters.

Travel between member states of the Confederation always requires the use of passports, issued by SolSec. Trade between them likewise requires extensive permits not required in the Imperium. While the Confederation government claims that these measures are for security purposes, many dissidents charge that it is part of an ongoing effort to suppress the free movement of people and ideas.

Consequently, traveling through the Solomani Sphere can be an eye-opening experience. Many worlds have starports to rival those of the Imperium. Others show a remarkable lack of concern for most of the issues that the SPA considers its mandate. Travelers to Solomani space are advised to stick to high-traffic routes for which general safety can be verified.

Continued on next page . . .

Starports of the Major Races

[Continued]

Vargr Starports

The Vargr do not have an overall port authority. Private firms operate most commercial Vargr ports, contracting with the local government for the rights to operate. A world with a unified government will usually license exclusive rights; a balkanized world may have several competing facilities. Licensing governments usually demand some standards of quality and performance, but may not be able to obtain guarantees in all cases, or enforce those that they do obtain. As a result, Vargr ports tend to be built, operated, and maintained as inexpensively as is practical, to maximize the contractor's return.

Humans generally find Vargr ports uncomfortable. Ceilings tend to be low, seating awkward. The Vargr tolerance of ambient smells is greater than that of many other races. This, coupled with the proclivity of Vargr diets to consist largely of raw meat, can lead to environments somewhat more . . . ripe . . . than humans find tolerable.

Vargr ports do open and regular business with corsair bands. The corsairs tend to be well-mannered while in port, since the port's well-being directly impacts their own. Some of the more successful corsairs are shareholders in port operating companies, and are fully aware that there is no profit in shooting up one's own business. And some corsairs are owned by their home port!

Zhodani Starports

The Zhodani Consulate oversees the development of its worlds much more closely than the Imperium. Thus, several different agencies of the Consulate have responsibility over starports. Each of them concentrates on a limited responsibility and coordinates with all of the others.

As in the Imperium, Zhodani starports are operated for the benefit of the Consulate without a need for profit, but like the SPA they prefer their ports to be as self-sufficient as possible.

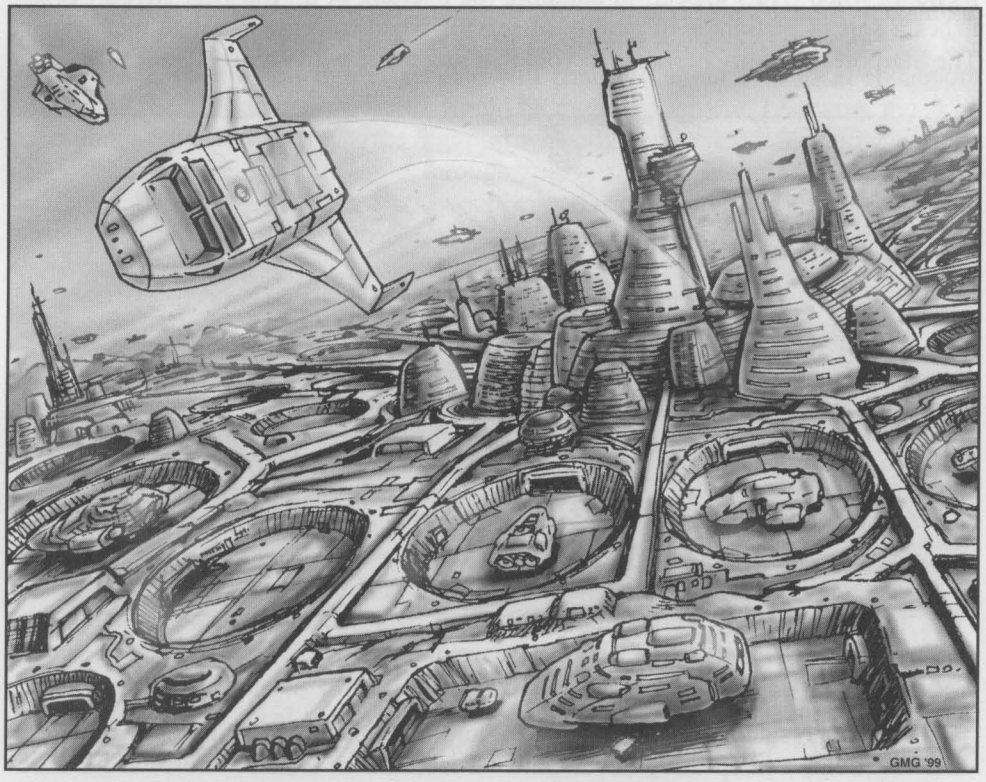
The typical Zhodani citizen views all non-Zhodani humans with suspicion. The Imperial visitor to a Zhodani starport may find himself openly followed by security personnel, especially if he insists upon wearing a psi helmet. ("Why use a screen unless you have something to hide?" is a common sentiment among the Zhodani.) Those detected plotting criminal acts will be detained and subjected to the relevant penalty under law.

The benefits of Zhodani starports are that there is almost no crime, and visitors can count on fair prices and honest treatment – from Zhodani at least.

Long-Duration Stations

Some research stations are designed as permanent facilities, either for indefinite study projects, such as a planetary climatological survey covering many years, or as "hot labs" conducting ongoing research that cannot be pursued at a conventional laboratory, either for reasons of secrecy or risk to surrounding populations should Something Go Wrong.

While some of these stations are built with modular parts, most are conventional university-style buildings (some universities, of course, are fancier than others). A secret station will at least be camouflaged from casual sighting, and may be very seriously hidden with underground construction, retractable surface antennas, sensor masking, and so forth. Port facilities are much like those of the temporary station – these stations by definition do not get a lot of ship traffic.



Private Starports

Privately owned starports are those constructed and operated for the sole use of the owner (or a small selection of tenants). They should be distinguished from local starports, which are owned by a local government or megacorporation (rather than the Imperium) but open to general traffic, and from spaceports (p. 60), which usually lack sufficient refueling service to qualify as private starports.

Many densely populated worlds have a few private Class I ports for the convenience of inhabitants (usually nobles) who routinely "commute" via small starship. Class II private ports are very uncommon and Class IIIs rare. (An Edenic world used as a private retreat for the fabulously wealthy might have a Class III private port with orbital element.) Class IV or V private ports are almost unheard of.

Restrictions on access vary. In the above example of a private retreat, the downport might be exclusively for the use of its patrons' yachts. For security reasons, freighters delivering supplies would be required to transfer them in orbit to the retreat's shuttles. Any unauthorized vessel attempting to approach might even be fired upon after an initial warning.

Other examples might be on industrial "company worlds," or ports used by starship constructors to build and test their secret, experimental designs.

Chapter Two
Inside the Starport Authority

"A starport is music, a sonnet, a song,
An instrument lovely to play on;
And properly managed it never goes wrong –
And I'm the Mad Emperor Cleon."

– attributed to Dorotea Pakar,
SPA board chairwoman under Margaret II

SPA Organization

The Starport Authority has four levels of organization, from its board that oversees the whole Imperium-spanning network down to each individual starport.

The SPA Board

The highest level of starport administration is the Board of Directors-General (usually just "the board"), based on Capital. Ten of the directorates-general share the same name as the 10 standard starport departments (see p. 19), and the sector Facilities departments. An Office of the Inspector-General (see below) makes up the 12th and final directorate.

The board chairman holds a tie-breaking vote over the 12 board members, and answers directly to the emperor. Traditionally, the emperor also appoints a new SPA chairman as a non-hereditary Imperial noble, usually a duke. He bypasses this honor if the incoming chairman already is a hereditary noble, but this circumstance has occurred only once. (Since the SPA certainly is not one of the Imperial services toward which the nobility gravitate, the vast majority of employees are of common origin.)

Observers from the Imperial Ministry of Commerce and Scout Service may be present at board meetings, and can participate in discussions, though they do not vote. Very rarely does either agency forgo this privilege. The SPA has a reciprocal privilege with those groups, which it attends to just as vigorously. This has resulted in the creation of a variety of permanent liaison officers between the three agencies.

SPA Inspectorate

The Inspectorate monitors the SPA's internal performance. This directorate does not follow the usual departmental hierarchy, nor does it often stoop to working through the traditional channels. Directors and coordinators in the other departments often complain that Inspectorate personnel go to great lengths to *avoid* normal procedures, even on the most routine requests . . .

The inspector general directly commands a number of inspectors. The *exact* number is not made public, but would be several thousands at a minimum. Each inspector operates a team of agents. Each team's work is compartmentalized, with the average inspector only vaguely aware of the work of a few of his contemporaries.

If this sounds like a covert intelligence service, in many ways it is, including a "black" budget. Starports serve as the setting for a number of sensitive issues, from prosaic smuggling to extremely delicate political intrigue. SPA chairmans past have determined a need to address these issues – and maintain deniability.

Starport Legend: High Stakes

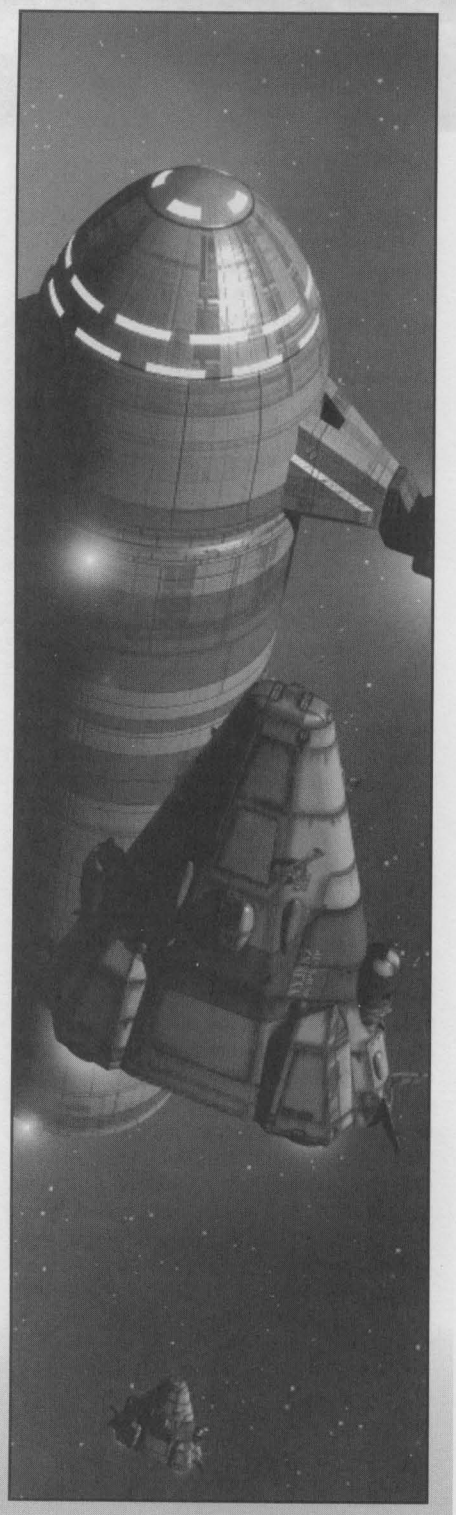
"OK, so I wasn't there. A friend of mine – who don't lie – tole me, and a friend of her'n – who I hear don't lie all that much – give it t'her.

"Anyway, there's this floatin' poker game, and it's on a ship so it really does float, if you get me. And the only people that play are the inspectors general – army, navy, marines, scouts, an' starports. They say an emperor – s'posed to be Arbellatra – tried to buy in once and got told no. Don't ask me how you tell an emperor no. Only exception is, there's a seat open for the IG of the Sylean Scouts, who they say is still out – but hey, that's another story. Maybe I'll be thirsty again sometime, heh.

*"How **this** one goes is, they play poker just like anybody, 'cept there's no money, chips neither. When the bet comes round to, say, the navy IG, he'll say, 'Sword Worlds secure frequencies.' And then it's the marine IG's turn, an' **she** says, 'The **Onondaga** explosion,' and that raises him.*

*"See, what's money to these jokers? They all got black budgets the size of the Great Rift, and if they were the littlest bit greedy for tin they'd have other jobs. Information, now **that** they all got a thing for, and this way they can trade it without gettin' the whole bureaucracy involved, tradin' favors for this or that, you know. It even works like money, cuz without any discussin' it, they can all agree on what secret trumps what mystery.*

"I heard one night somebody took the pot just by sayin' 'Dulinor.' But like I say, I wasn't there."



Inspectors have considerable freedom of action in employing their agents, though they usually avoid activities that would disqualify a prosecution, such as entrapment and unauthorized commtapping. Other semi-legal antics – false ID, impersonation, etc. – are tolerated as long as they produce results.

An inspector and "action team" would make an excellent framing device for a campaign; see Chapter Six, *Campaigns*, for further discussion.

Subsector and Sector Offices

The SPA maintains offices at the subsector and sector level to supervise and coordinate the operations of individual starports.

Each port director's reports go to the subsector office, which digests and filters them. The 16 subsector offices in each sector pass their digests to the sector office. The sector office then reports to the SPA board. Naturally, all the original reports are archived, so that should a question arise, the "paper trail" can be pursued to the source.

A subsector or sector director leads operations at these offices. Each has several deputy directors; a sector director near the Imperial core may have as many as 100! Both of these offices have departments corresponding to those at the ports (see p. 19). Each department is led by a subsector or sector coordinator. The "coordinator" title reflects that their jobs are more organizational than supervisory.

Sector offices include an 11th department beyond the 10 standard starport departments, called Facilities and led by a facilities coordinator. It has two divisions:

Survey and Siting examines possible locations for new starports in the sector, and considers major capacity alterations to existing ones: that is, those modifications that would raise – or in rare cases lower – the port's classification. Smaller improvements are approved and supervised at the subsector and local level. Survey and Siting is also the office that officially reclassifies a starport when an accrual of several minor modifications has effectively changed its classification. Many a port director denied an upgrade by Survey and Siting makes it his mission to slip under the red tape through a barrage of minor improvements on his own authority. Survey and Siting tends to frown on this tactic; bureaucratic infighting results.

Civil Engineering arranges for survey and siting's construction projects, either committing the SPA's own construction units (which are under its authority) or contracting with outside interests. Usually outside vendors are used, unless special technical challenges or political problems exist.

Individual Ports

All SPA ports of Class II or above have a chief executive officer, called the port director. Because of the interstellar communications lag, the director has considerable autonomy, although he is very much answerable to his superiors for the consequences of his actions. Specifically, many important port operations, including all takeoffs and landings, are conducted "at the director's discretion." This means that the director may deny lift or landing clearance to any vessel – even one operating on Imperial business – without stating a reason. When this power is exercised, a report must be made to superior authorities, and it will be expected to include the director's reasons, but even "a hunch" will pass muster as long as it turned out to be the right call. See the *Director's Discretion* sidebar, p. 20, for more details.

The director of a major port will have two or more deputy directors, who have authority when the director is ill, offworld, or otherwise unavailable. Technically, the deputies exercise their power in the name of the actual port director, who holds ultimate responsibility for their decisions. In practice, almost every port director is far too savvy to let his subordinates' errors reflect on his record, and higher authorities directly sanction deputy directors unless the port director's supervision included some glaring error too large for him to cover up. Rank, and mitigating circumstances, have some privileges.

Port operations are divided among 10 departments, each of which has a senior officer who reports to the director. The departments (and senior officials) are: Administration (administrative superintendent), Traffic (traffic superintendent),

Cargo (cargo superintendent), Ship Services (ship services superintendent), Passenger Services (passenger superintendent), Security (chief of security), Medical (medical superintendent), Flight Operations (chief of flight operations), Physical Plant (physical plant superintendent), and Emergency Services (chief of emergency services). The distinction between "supers" and "chiefs" is lost to tradition; the ranks are equal, and SPA documents usually refer to all such officers as superintendents.

Below this level, the departments have individual internal hierarchies: shift supervisors, crew chiefs, mechanics of various grades, assistants at all levels, etc. Promotions reflect both seniority and technical skill, determined through standardized tests in which length of service is added to the score (see p. 23).

The exception to this structure is the Class I starport. P/Is rarely have enough personnel to fill all the superintendent slots, let alone subordinate positions. The senior SPA official at a Class I port (who is sometimes the *only* official on the site) has the official title of general manager. This rank is half a grade above departmental superintendent, recognizing that, while there is not always much for the general manager to do, when there *is*, he's going to have his hands full. Any additional personnel are referred to as "officers" – e.g., communications officer. A single person may have several of these posts, though only receiving pay for the most senior job.

Starport Departments

Starports are extremely complicated organizations. They must provide a multitude of technical and service needs to exacting standards, with each port's staff struggling to do so in a unique cultural and physical environment. At the same time, the port must address a variety of legal and governmental concerns.

For these reasons, no one but the most utterly competent port directors can keep an eye on *everything* that goes into the operation of a starport, even a minor one. Day-to-day operations require a bureaucratic symphony of cooperating departments.

The SPA departments listed above perform the following functions. Some minor ports may not provide service in every office listed; major ports will.

Administration Department

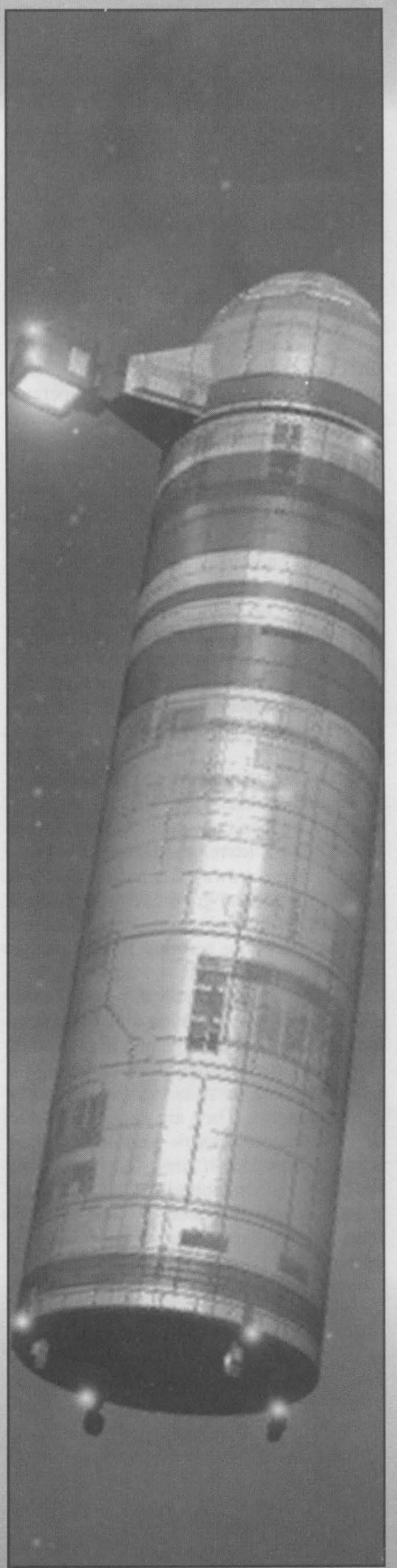
Essentially, this department notates, sorts, and files the immense amount of data created by starport operations. It includes most – but not *all* – of the bureaucratic personnel responsible for issuing permits and licenses, and at some point touches upon every piece of paperwork at the port, from ship registries and flight logs and cargo manifests to sales statistics for the vending machines.

Almost all of the work done by this division is tedious in the extreme, without a hint of the drama that the romantic might associate with running a "gateway to the stars." The inanity of their daily lives makes many administrative employees officious and self-important. As any free trader will tell you, it's best to get on the good side of these people.

While technically not as important as other service departments, Admin has enough power extending throughout operations to make life difficult for those who do not adhere to the rules as Administration interprets them.

Where Can I Get This Permit?

At the largest starports, Admin offices often are concentrated in a separate building connected to the main terminal. Even when not physically separated from the bulk of the starport, administrative offices tend to be otherwise isolated. That is, non-starport personnel rarely enter these areas or interact with their staffs. The rare traveler who needs to make contact with administrative personnel often has a hard time figuring out where to find them. A roll vs. Administration skill might help. A favorable reaction from the nearest Security or janitorial personnel will help more.



Director's Discretion

The SPA charter declares that all port operations are conducted "at the director's discretion." This is a deliberately vague legal concept, intended to give the port director a very broad range of emergency powers without an infinite list of particular conditions and actions.

This rule does not give a director dictatorial power; it pertains *only* to allowing or forbidding port operations. Thus, the director could not arbitrarily order security to arrest civilians without cause. (Security, of course, may make arrests *with* cause, usually without consulting the port director.) Nor can private property be seized directly. A director may, for instance, shut down public access to a privately operated shop, tavern, or casino on port property, but he cannot restrict the owner from access without cause (a tenant-business owner with his rent paid up has every right to access his inventory, fixtures, and such).

While a ship cannot be seized without some legal grounds (such as evidence of skipping or smuggling), takeoff clearance can be denied, indefinitely if necessary, conveniently amounting to nearly the same thing. Imperial diplomats often ask port directors to deny entry or exit to ships carrying individuals of political combustibility.

The most controversial application of director's discretion is the authority to waive or reduce tax or tariff *collections* at the port. This leaves the taxed party (who often is parsecs away when the liability is noted) in the local government's debt, not the SPA. Port directors taking this action will receive more scrutiny than for other uses of their discretion.

Port directors need not provide the slightest public explanation for calling upon their director's discretion, and because they have this privilege they tend to indulge it even when their reasons are perfectly understandable. They are expected to use their discretion wisely – and must answer to their superiors if they don't – but the long career in negotiating delicate situations required to become a port director tends to weed out most of the "cowboy" personalities.

Conversely, port directors have been known to get a little eccentric, particularly after spending many years in some out-of-the-way post, and develop some outrageous applications of their authority.

This kind of loose legalism bothers some people who want legal processes to be a precise and discrete system of levers, but the SPA finds the policy essential. If it seems to contain an element of "frontier justice," that's because it does – the nature of space travel makes every starport in some way a frontier, however close it is to Capital.

This department is the heart of the bureaucracy, and its environs usually reflect as much. Visitors to Admin offices will usually find tightly packed government-gray desks, cheap chairs, lighting that's either inadequate or too bright, and ancient computer terminals. The port director always has his own office (even at a Class I port, the general manager gets a little private space), and this might be *quite* comfortably fitted, but rank and file administrators usually make do with far more communal arrangements such as cubicles or open workrooms. Most Admin offices give off a dehumanizing air, adding to the general anxiety that probably accompanied the visitors' quest in the first place.



Executive

This is the top-level port management: the port director, deputy directors, and their personal staffs. Most port directors (though not all) spend their entire careers in the Administration department.

The executive offices set policy for a starport. The port director also sets the tone for the operation of a starport. The director's discretion (see sidebar, left) affords him many opportunities to do things "his way"; determining just how this translates into policy is a big part of the office's job. Some port directors and their staffs rarely interact with the operational departments except at the top level. Others can be found directly leading the smallest departmental office as whimsy strikes them.

The Line Office

Also called the planetary liaison office, this is the port's primary interface with the local government. At starports too small to have a separate planetary liaison, this may simply be a second hat worn by another Administration employee.

The line office's job is twofold. On the one hand, the office works to promote the importance of the local starport and the benefits that come from it. In the end, this responsibility is essentially a glorified form of public relations. The office advertises the port through public lectures, tours, educational media, and other methods. The line office usually does this in cooperation with the public relations office (p. 24). Sometimes this can lead to a rivalry between the two offices, something that is inevitable in the administration of something as large as a starport.

The office also deals with the more weighty matter of handling disputes between locals and the port. (Unless said dispute falls into general local relations that are being handled by an Imperial noble, the navy, or the like.) In cases with questions of jurisdiction (such as in police investigations), the office represents the director.

Problems and Protocols

The nature of these disputes varies according to the host planet. On Imperial worlds, the office primarily deals with environmental issues such as noise abatement, waste disposal, surface access, and occasionally aesthetics. ("Dear Director: Your new hangar is the ugliest thing I have ever seen, and I have to see it from my bedroom window . . .").

The nature in which the line office handles these complaints and liaison with local governments often depends on staffing. A large staff of lawyers and negotiators specializing in intergovernmental affairs may spend most of its time "out in the community," playing the local equivalent of golf with community leaders and officials, proactively heading off problems before they arise, and quietly becoming a major political player. A single beleaguered line officer who has to plead with the port's legal office to render the opinions he

needs may hide behind triplicate forms and an avalanche of frustrating "It's under advisement" responses.

On independent worlds, the job is much more delicate. Even governments that get on well with the Imperium differ with it about many details. On the frontier or newly integrated worlds, the line officer can be a very busy person, with a large and extremely overworked staff.

On "uninhabited" worlds – that is, those with no organized government and a small, thinly spread population of homesteaders, prospectors, etc. – this office may be replaced by a frontier office, which provides information to potential settlers and provides them with someone to call for assistance. Whether the port can render such assistance is another matter entirely.

Priorities

Smoothing over ruffled feathers is paramount, but the line office will not shrink from defending the prerogatives of the Imperium. In particular, the line office does not look kindly upon the mistreatment of Imperial citizens by local governments. While all Imperial citizens have certain universally recognized rights and privileges, the extent to which they apply in specific circumstances can sometimes be vague. This is where the line office steps in, providing a clear head to oversee these sorts of delicate negotiations.

Even more delicate is the question of local citizens claiming XT immunity. The SPA hesitates to intercede in local affairs not directly concerning its ports, but where human rights are grossly violated the line office may "look the other way" on the question of local refugees, or even subtly support their efforts to reach Imperial protection. The Imperium usually will not support such efforts, if exposed, but will just as subtly reward them, if not exposed.

The SPA's missions of promoting good relations with the local government and enforcing the XT line often directly conflict with one another. The port director and his staff will have to carefully balance these priorities.

Working for the line office is not considered particularly glamorous or prestigious, but does offer the opportunity to make a name for oneself if an explosive political situation can be negotiated with minimal fuss and fallout.

Planetary relations are further discussed in Chapter 4.

Concessions

This office oversees all port concessions (businesses operated at the starport by private concerns) and collects rents, licensing fees, and related income from them.

There are two main kinds of concessions, amenity services and business space. The former includes public needs such as hotels, restaurants, shops, and entertainment. The latter covers port-related private enterprise such as spacelines, travel agents, and cargo brokers. At most major ports, concession space will account for two-thirds to three-fourths of the port's operations. That is, most warehouses will be permanently leased to a particular corporation, most berths permanently leased to a particular starship line, etc.

Lease Arrangements

Space is rented to the concessionaire for either a flat fee based on floor area and location (some locations are more valuable than others) or a fee plus a percentage of gross income. Rents are usually due every 30 days, and contracts usually run from a year at a time for small retail shops up to 99 years for megacorporate starship berths. (Legend has it that a savvy port director once agreed to one of Tukera's renowned exclusive deals by getting the megacorp to lock in for *300* years, with a hefty upfront payment. A few months later, a Zhodani fleet arrived. The world was Jewell. Tukera's contract meant it had to keep making payments during the interval in which "port facilities" consisted of cleared patches of scorched earth, and its credits heavily subsidized rebuilding the starport. Duchess Margaret was not pleased . . .)

Planetary Liaison: The Few, the Frustrated, the Ignored

"Being liaison officer on a hostile world is easy. They never talk to you when things are good, and when they're bad they just throw a few mortar rounds to get your attention. It's the nice ones you have trouble with. There's always 'just a little problem' here, and 'something we hope you'll look into' over there, and 'an issue in need of adjustment' down yonder.

"And that's when they're being friendly. When they aren't – well, one mortar round looks a lot like another."

– Wellington Ozal,
liaison officer (ret.)

Concessions

The major sources of difficulty over concession agreements usually arise from:

- The operator discovers business is poorer than expected, and wants the rent lowered accordingly.
- A change in corridor traffic patterns increases the flow past the location, causing the port to want the rents raised or a rent-plus-percentage tenant to replace a flat-rate one.
- Disagreements over income reporting (and therefore payments) by percentage tenants.
- A problem with the behavior of the tenant, usually identified by customer complaints – from inferior service to open dishonesty.
- Tenant complaints about port services such as housekeeping and maintenance.

Most of these disputes are minor, or involve only tiresome wrangling between the starport's concessions office and tenant's legal representatives – not the stuff of adventures. However, an apparently minor complaint could be the first clue to something bigger. A casino is unlikely to simply admit that it is cheating its customers (and probably underreporting its income to the port management). Someone will have to go undercover to find out. Substandard maintenance might be an effort by less-than-honest port management to force out the present tenant. "Improved housekeeping" could also be a way for investigators to penetrate an operation believed to be running an illegal side business.

"I'm From Legal"

Often inspired by John Grisham, a lot of would-be bestseller writers have tried to prove that lawyers can have daring adventures just like . . . well, archaeologists.

The standard version of this plot has a clerkly type discovering evidence of dirty business among the contracts and balance sheets, attracting the attention of Those Behind It All, and spending the rest of the yarn dodging amateurish professional killers and the unhelpful police. This could be a perfectly good one-shot solo adventure.

Or the lone hero can be expanded to a group of people who, after stumbling over corruption, have to keep their throats unslit by means of their not-very-adventurous skills, long enough to expose the plot. The limits imposed on adventuring by white-collar day jobs can be gotten around by having them fired, either deliberately (an attempt by the Dark Plotters to get them out of the way) or indirectly (the Plot bankrupts their company, causing them to be made "redundant").

The considerate GM will set up encounters that call for mundane or hobby skills for survival – say, a chase that calls for a knowledge of the public transit system that the fat-cat limo-riding villains lack. They may also have a guardian spirit, perhaps a high-ranking official who can't help openly without solid evidence, but can provide transport and occasionally intercede with the cops. Resist the temptation to make one character an undercover agent; this person inevitably gets to do all the fun stuff, while the other players are demoted to sidekicks.

There's also the paranoid version of this story, in which ordinary folks discover that, for no apparent reason, someone wants to kill them. After the first attempt (which for obvious reasons fails), it starts to look like *everyone* from security guards to hot-dog vendors wants them dead (remember the mailman in *Three Days of the Condor*?), and will neither quit trying nor answer a simple question like, "What is your *problem?*" The only way out is to figure out just what they did in the first place, which leads inevitably to the Huge Hidden Conspiracy.

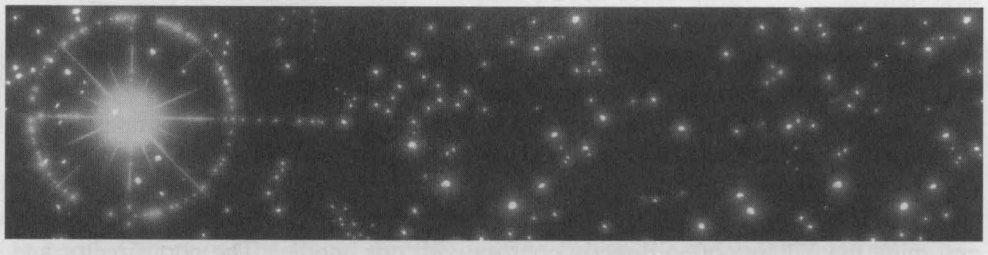
A more conventional adventure could begin with investigators being tipped by a legal or financial officer that something's rotten at the starport. In a noirish tale, the informant gets killed moments after handing over the first piece of evidence. Or the informant could himself be the key to the plot, requiring the team to concentrate on keeping someone with no survival skills alive against everything the villains can throw their way.

Other rent arrangements are possible; some spaces rent month by month or seasonally (a farmers' market, for instance), and some retail leases run for longer periods, especially those signed while the port is under construction and the concessions manager is under pressure to fill the space.

Concessions are an important source of income for starports, sometimes accounting for half or more of annual gross. The concessions manager is expected to monitor both the income from and the behavior of concessionaires, and may alter the terms of a lease up for renewal, or refuse to renew for operators who are habitually behind in payments or receive an excessive number of consumer complaints. Canceling an unexpired lease requires legal action, based on evidence that the concessionaire has seriously violated the lease terms (most often, by misreporting income).

Legal

The lawyers field questions of Imperial law, draw up contracts, and handle litigation by or against the port – competing insurance claims, accusations of excessive force by security, breach of contract, etc. Legal does not directly prosecute criminals apprehended on port property, though an SPA legal officer will confer with the proper Imperial or local authorities before a hearing or trial. Legal also coordinates with the line office in jurisdictional and other matters.



Financial

This office handles accounting and bookkeeping, and also manages investments in or by the port (such as bond issues). It collects and disburses payments to and from the port – including the all-important tariff collections for the host government (see pp. 7-8).

If Knowledge and Money Are Power, Knowledge of Money Is . . .

Like all Administration departments, the financial office takes in and reroutes streams and streams of information. But where a ship's cargo manifest might have some interest or use to a few outside parties, a megacorporation's income reports attached to its rental agreement could prove extremely useful to many of its competitors, tax authorities, pirates, etc. Given how much of a star system's government and commercial business filters through its Imperial starport, the financial office databases would provide a bonanza for various intelligence agencies, competing corporations, terrorist organizations, etc.

Despite this, most financial personnel become somewhat jaded about data security. After all, they see these figures every day, no matter how confidential they are. Most good Security chiefs realize the vulnerability of the starport's financial data, and run checks for illegal access more often than on other port computers, but espionage occurs all too frequently.

Personnel

This office recruits and interviews employees, maintains their records, and hears comments from supervisors on their performance, for good or ill. The personnel office does not make promotion or firing decisions, which are the responsibilities of the relevant department heads.

Concessionaires are responsible for hiring and firing their own employees; the personnel office is not involved (but see *Labor Relations*, below).

Getting a Job

Anyone interested in beginning a career with the Starport Authority would start at this office. The SPA only hires Imperial citizens (though contract workers often are not citizens; see sidebar, p. 26).

Though the scouts believe they get preferential treatment in acquiring SPA jobs, a well-kept Personnel secret is that all former Imperial-government employees receive credit for their former service. An entrance exam must also be passed.

If it matters (for instance, the PC is among four applicants for a single opening), roll a contest of IQ for all applicants. Those who fail the roll don't pass the exam. Those who make their IQ roll add 1 to their margin of success for every four years of Imperial employment (including previous time in the SPA itself). Applicants with the greatest modified margin of success fill any openings; in a tie, any seniority in SPA service, followed by any other Imperial-government service, serves as the tiebreaker. The same system can be used for promotions within the SPA.



Labor Relations

This office hears complaints from employees concerning working conditions, and from the port's department managers about worker performance. Every attempt is made to arbitrate disputes, and prevent actual lawsuits.

The labor office also is open to complaints from employees of concession operators, although these are not technically port employees. Again, attempts will be made to arbitrate. There is not much direct action the office can (or will) take against a concessionaire in these cases, unless SPA contract terms or Imperial laws have been grossly violated.

Records and Data-Processing

RDP maintains extensive reference databases, and has retrieval specialists to search for any required information. It also maintains archival backups of all the port's datafiles.

RDP has a cryptography section – and cryptanalysis section at those ports where it is considered useful, though the fact is never advertised. RDP often cooperates extensively with the executive office in carrying out its more sensitive tasks.

Sweating the Small Stuff

There are two ideas among port directors about contracting out support services such as housekeeping and commissary (employee dining) to locals who aren't Imperial citizens.

The argument from Security goes that housekeepers are the least observed of all port personnel; they go everywhere (indeed, they have to) and are, as G. K. Chesterton called it, "mentally invisible," even in sensitive areas, as long as they seem to be doing their jobs. The possibilities for spying or sabotage are clear. Similarly, it would be easy for a commissary employee to poison workers *en masse*.

The argument from local liaison offices says that treating non-Imperial locals as potential enemies is the best way to make them real ones, while allowing them to share in port operations increases good will (and creates local jobs, always a popular move). Proper security procedures, including rigidly enforced badge-checking, access control, and close observation of key areas – measures that are a good idea, anyway – will keep the risks at an acceptable level.

Most SPA ports don't address this issue, since the locals usually are Imperials. Among most of the rest, the "trust" argument outweighs the "security" argument, partly from the practical fact that there aren't enough Imperial citizens willing to travel interstellar distances for janitorial and cafeteria jobs. Also, locals at the most hostile worlds simply don't apply for work on Imperial territory, and are often considered "collaborators" by their neighbors if they do.

When neither Imperial nor local staffing can fill the port's labor needs, there are interstellar corporations that provide contract services of this type (see *Contracting*, p. 26).

One further point: When local contract employees do commit crimes, non-Imperial governments often insist that their citizens be turned over by the port for local prosecution. It is Imperial policy to comply with these requests in all but the most extreme cases – notably, crimes directly against the Imperium, such as attempts to assassinate major nobles or to seize the starport. Such local prosecutions do not always satisfy the Imperial idea of justice. Imperial military bases do employ civilian contract labor, but only Imperial citizens – not because they are necessarily more trustworthy, but because the legal rules are absolutely clear.

Contractors

Directors are encouraged to contract local services. This is considered good for port/world relations, as it gives the locals a stake in the port's success. It creates jobs, and a port whose employees are heavily local is harder to see as an "alien" or "colonial" presence. This policy has proven successful, but there are difficulties.

A non-Imperial local workforce may believe "we do all the work and the Imperials give all the orders." This is less of a problem in retail concessions, where the entire staff is likely to be local, as it is in port operations, where SPA employees will supervise non-citizens as contract labor.

If the world has an active anti-Imperial faction, local employees crossing the XT line every day may be perceived as a security problem. Clumsy attempts to tighten security, through more rigid use of ID checks and especially an attitude of "the landsiders can't be trusted," often only worsen the problem. (See *Sweating the Small Stuff* sidebar on p. 23.)

Interstellar corporations also provide contract services to starports (referred to as "offworld" contracts). These companies may be subsector-, sector-, or Imperium-wide, though the costs of moving workers from site to site (and the resistance to being moved too far from home) mean they are organized by regions.

Offworld contractors screen their workforce; they are in a competitive business in which reputation is critical. Occasionally, spies or smugglers who can beat the vetting procedure get starport jobs in this way – after all, if they do their "real" work properly, no one will ever suspect their true goals. Investigators (such as SPA inspectors) may have to hunt through a small army of sweepers and window-washers to find out who's been picking up certain parcels from the cargo area one step ahead of Security.

The Hidden Hand

A "hidden" reason for seeking local contractors is that it encourages planetary business rather than megacorporate franchises. The Imperium certainly recognizes the value of megacorps, and generally works cordially with them, but it also perceives the problems created by a company with too much power, especially over an industry so important.

A planetary food-service provider in a contract dispute can, at most, force port employees to eat military rations for a while. A megacorp that manages ground-vehicle service at 200 ports could threaten to shut down half a sector. For their part, megacorps quietly purchase interests in smaller service providers, and thus influence far more port business than they directly control.

The Bid Price for Fangabeans 37 Years Ago Was . . .

RDP's personnel are the "master librarians" of the Starport Authority. They tend to spend their entire careers in the department, often becoming detached from other port activities. (It might help to think of them as cloistered monks of an information age.) Finding oneself in the good graces of a veteran RDP employee can prove extremely useful for digging up the most obscure information. A major starport touches on most areas of Imperial life, and a good RDP department keeps tabs on *all* of them.

Unlike the financial office, RDP rarely suffers data piracy. Some of the department's own activities border on data piracy, and as masters of the trade RDP personnel often laugh at the amateurish efforts of others to crack their databases.



Public Relations

This is the port's image, voice, and spin control to the public at large. When there is a crash, a terrorist incident, or a major loss of passenger baggage, the PRO makes a statement. Some port directors prefer to make their own public announcements on important matters, some read what the PR office writes for them, and a few let a PR officer do all the speaking.

Less dramatically, PR publicizes port amenities and services locally (where the political situation allows). Those giveaway "Visit the Shining Streets of Capital" holoposters that university students decorate their walls with come from SPA. In this activity, PR cooperates with the line office.

Commercial Liaison

This office deals with the requests and customs complaints of the port's commercial users: shipowners, shippers and brokers, concessionaires, and contractors. Passenger complaints are the responsibility of the Passenger Services department's hospitality office, p. 32.

Military Liaison

This office communicates with the military services, including any bases in the system but separate from the commercial port. The military liaison officer is not directly responsible for the port's marine garrison (if any), as these troops are under

the command of their onsite officers (who report to the port director in the absence of higher command authority), but the MLO may make reports to the marines' off-world superiors on their performance.

The MLO is a common place for ex-Scouts and former military personnel to work. Indeed, many directors prefer to appoint ex-military personnel to this position, believing that soldiers prefer to deal with veterans instead of civilians.

Employee Residence

This office assigns and oversees staff housing.

On Imperial worlds and non-Imperial worlds with good relations, the majority of downport employees live outside the port boundary, and travel to work. Highport employees have the option of commuting to work from ground residences or living at the highport itself. Even groundside, there is always some kind of residential housing within the extrality line. Housing staff on-site makes them instantly available for emergency situations, and some significant percentage of offworld staff just won't be comfortable among the strange environs of the host planet.

On non-Imperial worlds of less than good relations, non-Imperial contract employees will still commute from outside the XT line, but Imperials generally live inside.

On opposed worlds (p. 41), the port will be a city unto itself; a few locals may cross the XT line to work, but life is not made very easy for such "collaborators." Highport workers either live in orbit full time, or alternate high and low shifts (typically three weeks each) with a vacation week between. (Some staff, mostly senior supervisors, "commute" as needed between high and low sides, but even with gravity compensation this is a wearing regime.) Naturally, if there is no downport, the entire staff must be housed in orbit.

On frontier worlds, there may be no town to live in, at least for some years. Some career employees live at the port even when there are other options, because they feel more "at home" within the XT line, or because it is less expensive than planetside housing plus commute.

Port Housing

At Class III and larger ports, apartment blocks are constructed, with circulator transport (bus, monorail, or direct pedestrian tunnel) to work areas. A P/II may have individual detached housing for superintendents and the director. At a Class I port, the general manager may live in the headquarters module, but often builds a house somewhere on the grounds, especially if there is a family to raise.

The majority of port apartments are built by SPA (directly or through contractors) to basic institutional-style plans. Long-established major ports needing to expand their housing have, in the last couple of centuries, brought in more sophisticated architects to produce something "less like a minimum-security prison." The rooms are still standardized, differing only in floor space (space assignments rise with family size and rank). Initial furnishings are also basic, but residents are allowed to furnish and decorate as they please. Entrepreneurial dealers periodically ship in container loads of furniture and interior elements, and hold a "wharfside sale" at the cargo facility, with near-wholesale prices; the cargo handlers move the purchases to their destination in exchange for free merchandise.

The port director naturally has first choice of living quarters, often occupying two or three combined apartments (some of which space is used as a "home office"). Some directors prefer to live in the port's office complex and commute to their workspace by elevator, corridor, or just walking into the next room.

Resident employees pay rent for their housing through payroll deduction, unless there is no off-port housing option, in which case housing is included as "frontier pay."

Employees of contractors and concessionaires housed on-site have their rent paid to the port by the employer, who may pass on part or all of the cost. SPA forbids employers from "subletting" for more than the actual rent, though some employers try to find ways around this.



Emergency Landings: The Rules and the Loopholes

Everybody knows that a port facility, of whatever sort, is required to grant immediate landing (or docking, in the case of a space facility) to a vessel in distress.

As with most things everybody knows, this is mostly true, most of the time.

The Imperial Navigation Act of 103 states that "the director of a starship service facility shall offer all appropriate assistance to vessels in distress." Space lawyers will immediately see the possibilities in this construction. Most importantly, it speaks of what the director is supposed to do (the distinction between "shall" and "must"), and does not supersede "director's discretion."

In the vast majority of cases, this breadth of action never applies. A ship issuing a Mayday call gets immediate clearance and the crash team is scrambled to meet it. The director is, however, perfectly justified in requiring the ship to pause a safe distance from the port and be met by a first-responder vessel, or post tac team snipers to cover the ground crew, or (in extreme cases) order the ship to ditch on a nearby body of water. After all, the Phony Distress Call/Trojan Starship trick is something else "everybody knows."

A director *is* answerable to SPA for this kind of "extraordinary caution," and will not use such measures without reasonable cause to do so – recent similar incidents in the subsector, a report from the registry that the vessel is on the "hot sheet," or advance warning from Imperial intelligence.

Such a high-profile response could also be part of a deception operation, to establish the crew's credentials as "villains" to enable them to infiltrate a *real* hijacking ring.

Private ports in Imperial space are subject to the same law, with the same discretionary loopholes; their directors (or whatever title the chief executive officer holds) may or may not be answerable for misuse of their "discretion," but most will meet questionable Maydays with armed caution rather than active hostility. Nobody likes bad publicity.

Contracting

This office selects and supervises contractors, outside individuals or companies hired to perform some service for the port.

The largest and most common contracting jobs are in construction – either in new facilities or improvements to the port. Services such as housekeeping and food service may be contracted out, especially at smaller ports where the cost of maintaining full-time staff and equipment for such work would be excessive.

At non-Imperial ports, an outside contractor often provides ship servicing and occasionally security is contracted to private firms, though many consider this a risky practice. Imperial ports never contract out either service.

Traffic Department

Traffic directs the movements of all aerospace and surface vehicles within the port's controlled area. It also has responsibilities for keeping track of ship movements and satellite operation.

Traffic Control

This office is responsible for all spacecraft movements within the port's controlled area. Given such, it provides the "heartbeat" of port operations.

Certain elements of traffic control have remained familiar for ages. During peak traffic periods, an SPA traffic controller requires nerves of steel and the self-confidence of a fighter pilot. Also tradition, SPA traffic controllers suffer an alarming rate of stomach disorders, nervous conditions, and the occasional mental breakdown . . .

As long as their Accel exceeds local gravity, starships are capable of true vertical takeoff and landing and require no minimal air speed, which makes life a whole lot easier for traffic control. Starships and non-starships are given an approach path and high altitude at which to lose all horizontal (orbital) velocity, then the ship drops straight down to its berth. Conversely, ships take off straight up, then at a specified altitude are cleared to move out horizontally, building up airspeed to exceed the high stall speeds of their lifting bodies and more rapidly reach orbit.

If a ship is so overladen that its Accel slips below the local gravity, it will be assigned to the highport. If it *must* land dirtside, traffic control will send a lighter to offload enough cargo to enable VTOL landing, or order the ship to jettison cargo to enable VTOL landing. In the latter case, a lighter will be sent to pick up the jettisoned material as quickly as possible.

For these reasons, most SPA starports have no runways. (Even if circumstances would best be served by a runway landing, most starships and non-starships have landing feet rather than proper wheels, making the effort rather non-practical.) The local government may maintain an airport with runways (though some high-tech airports don't use runways, either) that services the starport. This will be located close by – but not *too* close, so that airspace crowding is reduced.

At downports, starships and non-starships sometimes do need *taxiways*, which they cruise down hovering a few meters above the deck, for those occasions when they must transfer from their landing pad/berth to the shipyard for major repairs, or to a warehouse for convenience in loading cargo, etc. The GM can rule that starships are not at all agile in nap-of-the-earth travel (though technically, according to ***GURPS Vehicles***, their vectored thrust leaves them no less maneuverable than a grav vehicle). If so, most downports would minimize taxiway traffic. A sudden gust of wind at close quarters would turn routine "ground" traffic into a costly mishap.

A downside to all this is that higher technology allows less time to recover from pilot mistakes. A TL6-8 airliner takes time to veer off its approach. A vectored-thrust starship with a few gees of Accel to spare can cross another flight path before the first "oops" gets muttered.

The details of traffic control depend upon equipment and starport type. More information can be found in the sidebars on pp. 76-78.

Ship Registrar

This office keeps records of all vessels entering system space, and informs customs officers of any ship reported as skipped, hijacked, or stolen. Registry data is compiled weekly and sent by Xboat to the SPA sector office (p. 18).

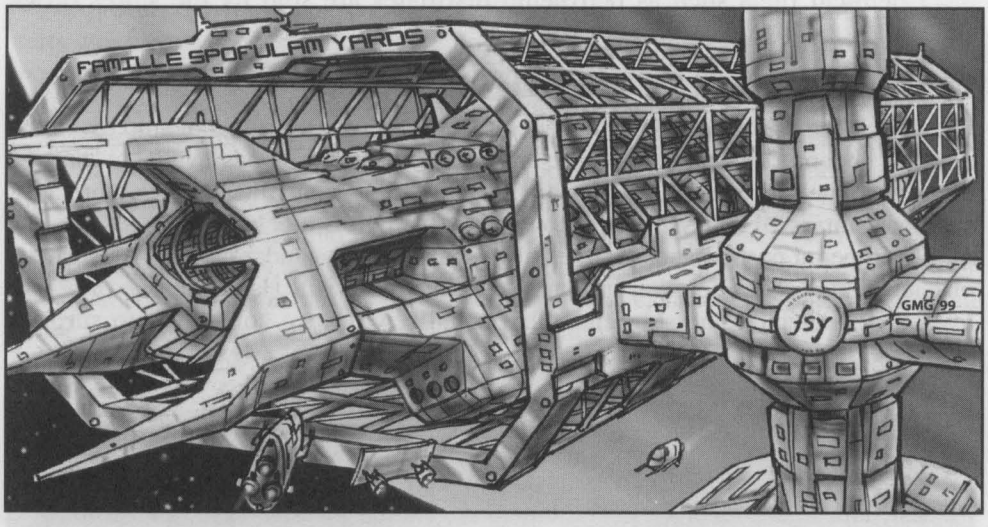
The ship registry office commonly cooperates with Administration in carrying out their duties. Especially in the frontier sectors of the Imperium, SPA is quite vigilant in checking out "suspicious" registries. This is not to suggest that stolen or otherwise illegal starships do not manage to get past SPA; they do all the time. Rather, SPA is keenly aware of the importance of assisting local and sector authorities in tracking down starships involved in criminal activities.

Vehicular Control

This office directs traffic for "ground" vehicles, which usually include small grav transports not normally used for orbital work as well as lower-tech wheeled or tracked conveyances.

Vehicular control is directly linked to ground control; at Class II ports they may be the same desk.

Ground-vehicle roadways and spaceship taxiways are separated as much as possible, but they inevitably must cross paths. As a rule, taxiing vessels have priority over ground vehicles, except for emergency vehicles.



Ship Services

These offices handle the mechanical part of starship operations: housing and repairing vessels while at the port. Because these operations are the source of a great deal of a starport's income, port directors usually make certain that they operate smoothly. Thus, travelers are less likely to encounter the kind of self-important officiousness that is the hallmark of Administration services.

At the same time, inadequate or rushed Ship Services functions can cause vastly more damage to a starport (and the surrounding area) than can a legion of smarmy bureaucrats. For that reason, SPA port procedures generally allow liberal time for Ship Services operations. This can create delays if many ships await the same service.

Berthing

Berthing maintains all landing pads and berths. Most SPA downports offer a combination landing pad/berth, in which the starship drops into a large, walled open space. Some of these will offer retractable roofs, often no more than the ultra-tech equivalent of canvas. Other arrangements can be found – some downports offer an unwalled landing pad adjacent to the roofed berth proper. Just before touching down, the starship changes from vertical to horizontal movement and slides into the berth. A few of these berths have no walls, offering only a roof.

"Get Us Out of Here, Now!"

Every now and then, people want to leave a starport in an extreme hurry, usually because other people are right behind them. Much of the time, the people in the big hurry are player characters.

It goes without saying that such departures are not cleared by traffic control. This in itself is enough to cost a pilot his license, whatever else he may or may not have done. Those trying this should either do it at a private port that they don't intend to revisit anytime soon, or they should be confident their actions will eventually make the Imperium very, very grateful.

A quick exit usually involves simply an open berth or an open hangar door, and ignoring traffic control (a *serious* offense).

This can be a lot more complicated if the ship is undergoing maintenance. A premature departure from a work cradle (pp. 78-79) requires three things: no important structural parts missing from the vessel (it *was* here to be worked on, remember); someone who knows how to release the hydraulics (if not, all that will result is a very expensive mess); and the hangar doors should be open.

Opening the hangar isn't automatic when in a cradle; often the port will seal the doors from non-SPA control to allow easy work in hostile environments, curtail theft, etc. If the ship's crew cannot open the doors in the conventional fashion, lasers may be used as a shortcut. Other ship's weapons either won't work or will damage the ship. Demolition charges are an alternative, if a risky one.

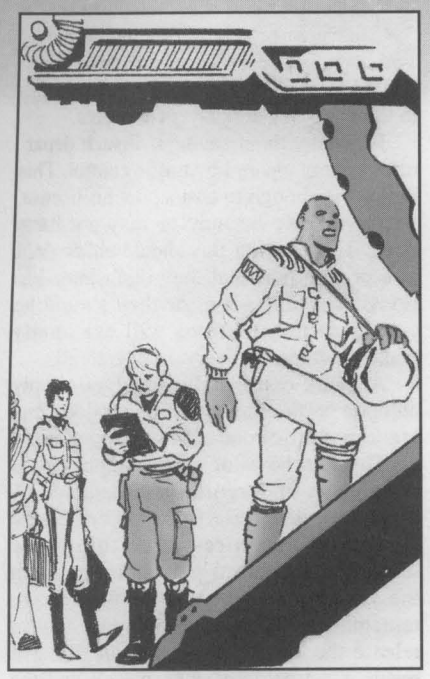
Those factors given, getting out of the cradle in a hurry is a test of Piloting skill at -2, worse if there are other things going on (people shooting at the ship, for instance). A failure damages the ship, but leaves it flyable. A critical failure ends the trip.

Leaving abruptly while on scaffolding (p. 78) is somewhat easier. A ship is held in the scaffolding mostly by gravity, with a few cotter pins and cables here and there. A Piloting roll at -1 is required to avoid damaging the ship. Whatever else happens, the attempt will scatter scaffold parts, stray tools, and slow-to-get-the-message mechanics all over the pad area, and possibly several adjacent ones as well.

In all cases, leaving a hangar (as compared to a roofless berth) *in a hurry* requires another Piloting roll at -1.

Once out of the hangar, the ship is in a "normal" pursuit situation. Even if it has weaponry at its disposal, the port authority will not fire on the vessel for fear of hitting a ship that's where it's supposed to be. The people chasing the ship may not be so rules-bound.

Once beyond dense traffic, the ship is fair game for customs cutters or any other official vessel.



The Travellers' Aid Society Certification

Many outsiders mistakenly believe the Travellers' Aid Society to be an organ of the Imperial government, partially because TAS provides a number of services of such high quality and efficiency that they have become default standards throughout many regions of the Imperium.

Chief among these is its vessel inspection regime. TAS has created a program designed to test starships and other craft in accordance with the specifications set down by the Imperium for spaceworthiness. TAS has even created a number of specialized instruments for the implementation of this program (along with training for the personnel doing the testing).

TAS sells both its specialized instruments and its regime to interested outside parties. TAS also offers its training course to starport personnel, to ensure that their own inspection of vessels meets the high standards that TAS employs in its own. TAS employees sometimes cooperate with starport personnel by providing them with methodologies and equipment.

For starship crew, TAS provides the most authoritative certification for their various job ratings and licenses. See pp. T:FT82-85 for more information. TAS offices at Class V ports usually provide this service.

At highports, smaller craft will berth in spacedock hangars within the highport proper; larger vessels will attach to external cradles mounted to the highport hull.

Except at Class I ports, where a berth is just an empty spot (often not even paved), berths have connections for electricity (so that the ship's plant may be taken offline for maintenance or adjustment), sanitary couplings (flushing the water and air systems), and area lighting. Charges for these services are included in the berthing fee.

Routine maintenance is performed in the berth, either by port workers or the ship's own crew (see below).

Fueling

Next to cargo-handling, this will be the most commonly seen activity at the average starport, and equipment related to fueling will be found all around the flight areas.

Some starships can provide for their own fuel, but even captains of streamlined ships with fuel processors usually find purchasing fuel at port less expensive than detouring to the local gas giant.

Almost all starports gather their fuel from a hydrogen source (water, ice, or methane) in the system. This may be available on the main world (though worlds with limited water resources may not allow the port to use them), or be transported from a planetoid belt or gas giant in the system.

Chemical fuels such as petroleum distillates are sold by the stores office (below).

Stores and Provisioning

This is the "ship chandlers," a general store selling necessities of ship operation and life aboard. The larger the port, the more varied the goods available, but the items absolutely needed to keep a ship running, such as air filters, basic lubricants, and vacc suits, will always be available unless the port is blockaded.

At Imperial ports, standard stores always are sold at standard prices. Most stores officials have great discretion in purchasing, therefore will also have one-of-a-kind inventory on hand. The ship chandlers usually will have something to surprise anyone.

Maintenance and Repair

Mechanical servicing of vessels at Imperial ports is performed for standardized prices (pp. T:FT74-76), which do not vary. Vessels are serviced in order of request, and this does not change unless a genuine priority case comes up, or a ship's master volunteers to move down the queue. Non-Imperial ports may vary their rates, and sell early-service positions (either by open auction or bribes to the chief of servicing).

Housekeeping

"Housekeeping," as it applies to the Ship Services Department, means cleaning the living and working spaces of a vessel: scrubbing surfaces, cleaning windows, and if necessary scouring the galley and laundering sheets and towels. (Standard ship's freshers use warm forced air for hand-drying, air being cheaper and lighter than water, but towels are still very useful things, as every veteran space traveler knows.)

Not every crew uses this service. Some keep their ships sufficiently clean that outside work is unnecessary; others don't like the idea of having their quarters "gone through" by strangers; some just don't care. Small vessels with a few passenger staterooms usually have these cleaned professionally between occupancies; it's one less chore for the crew, and avoids dealing with the passengers' sometimes messy leavings. Large passenger liners have onboard housekeeping staff, to provide regular maid service to staterooms.

All major ports have cleaning crews, and some Class III ports as well. At smaller ports, it is necessary to call in a planetside maid service, if one is available.

Certification

The Imperium certifies vessels for safe operation ("spaceworthiness"). A vessel arriving at a Class III or larger port without a valid operating certificate may be required to berth in a designated area away from other vessels, and undergo immediate inspection. If it fails this, it can be denied permission to leave the port until it can be brought up to standard.

A certificate is valid for five years, though ships usually undergo recertification as part of annual maintenance. The process takes one day (part of the maintenance time, if done then) and costs Cr1 per displacement ton of vessel, including all small craft carried aboard.

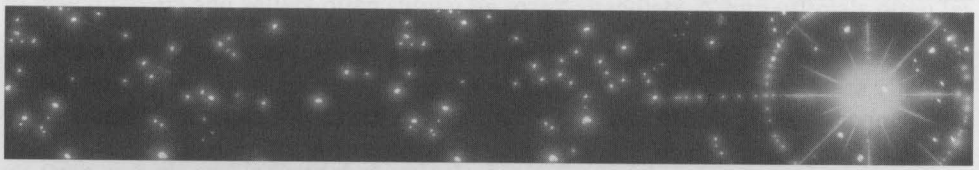
Certification inspectors may demand a spot inspection of any vessel of Imperial registry, at any time, for any reason. If the ship is found to be in compliance, there is no charge for the inspection, though there is also no reimbursement for lost time. If not, fines will be assessed, and of course the certification is canceled until the situation is rectified. Inspectors will not usually run a spot-check unless something about the vessel attracts their attention; there are just too many ships and too few inspectors. However, a random inspection is always a possibility.

Hiring Hall

All starports have some kind of facility for matching unemployed starcrew with ships. At Class I and some Class II ports, this is just an electronic bulletin board where prospective hires can post their qualifications and contact information. Larger ports will have an actual office where prospects can be interviewed. At major ports, the hall will have a hostel where crew who cannot afford private accommodations can get a bed, shower, and cafeteria meals at little or no cost.

Retired crew usually staffs hiring halls. At major ports, a representative of the Imperial Ministry of Commerce is available to hear complaints (or, once in a while, positive comments) about working conditions and hiring practices.

One should keep in mind that many worlds in charted space are serviced *only* by independent merchants and their ships. Corporations generally require economies of scale that prevent them from serving smaller markets. Consequently, hiring halls can be the site of considerable activity (and opportunities), especially on the fringes of the Imperium, where the population density is often not as great as in the core worlds.



Cargo

Observers tend to forget that a starport's primary business is moving goods and merchandise, not people. The Cargo Department is an important and often very busy place.

Freight Handling

Cargo handlers (still sometimes called "stevedores" or "longshoremen") move all cargo within the port. The exception is that an outside crew may load or unload on its own property, which includes property rented from the port. Thus, a ship's crew may load or unload the vessel in its berth, and a shipper with a warehouse or container park inside the XT line may use its own employees to stack and sort goods there.

The port's handlers, however, conduct any movements between these points. Generally, this means that "temporary" leases such as a berth require the port handlers to move the cargo past the XT line while long-term leases – such as megacorporate warehouses – allow the tenant to move their own cargo from start to finish. (The cargo must still clear customs on crossing the XT line, of course.)

Surprise Packages

"The label says it's salsa verde."

"I thought it ate through the concrete pretty quick."

Mislabeling cargo is illegal, but there wouldn't be a law if only honest mistakes took place.

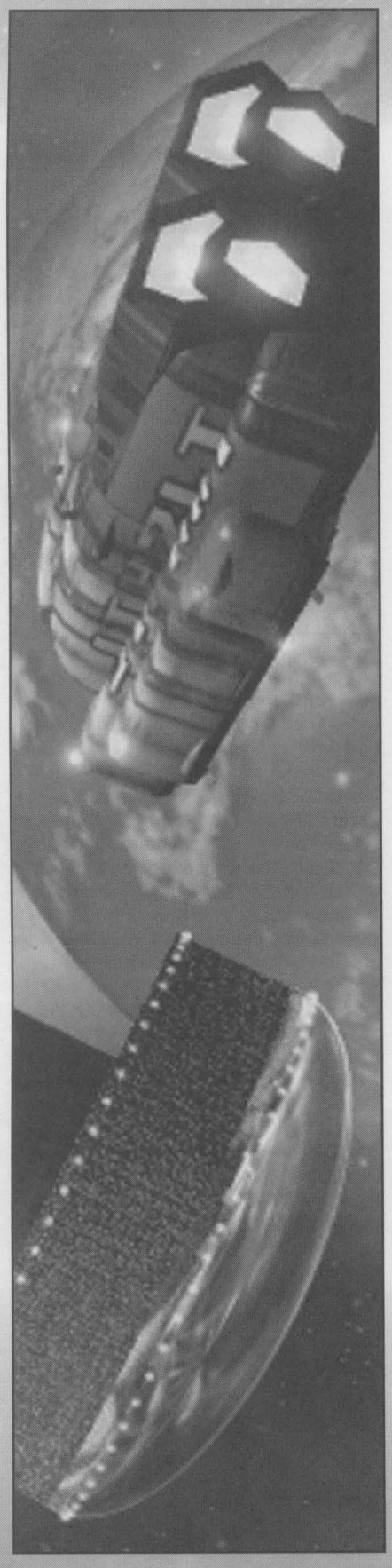
Most of the time, mislabeling *is* accidental and of concern only to the shipper and customer – a container of wingnuts marked as thrust washers. The cargo handlers are unlikely to ever know about these problems, and it makes no difference if they do.

This *is* a problem for the PCs if they're part of the shipping cycle. Having the wrong goods is likely to cost somebody money, and everyone involved will try to make sure it's somebody else. Things get more complex (and more adventurous) when the mislabeling was deliberate: an attempt to dodge customs duties or embargoes, or even to sabotage the recipient's business by depriving it of material stocks at a critical moment.

A gimmick that's been used in a million thrillers but is still worth an occasional try is the accidentally swapped label. Instead of the load of cheap portable computers the crew bought as speculative cargo, they get an identical batch that actually contains illegal control chips for military robots (or some other McGuffin).

Mislabeling is a problem for Cargo when it leads to improper handling. This may mean that fragile goods get broken, which is bad, but the port is not liable if the labels weren't there. It can also create a very dangerous situation, as when highly flammable goods, or those that react violently with moisture, aren't correctly identified. Again, sometimes this is accidental; more often, it's the result of a shipper wanting to avoid special-handling surcharges, or a captain in desperate need of money agreeing to haul a HAZMAT load for which his vessel isn't properly equipped. And once in a while the intention is purely illicit: incendiary grenades labeled as avocados.

An incident of this kind can lead to adventures for the port's Emergency Services (obviously) and the incident investigators; it may also involve unwary haulers losing their ship (or at least seeing it badly damaged) and going off on an "investigation" of their own.



The handlers can also load and unload ships, for an additional charge.

Most space freight is transported in containers, as described in pp. T:FT55-57. Starports (both downports and highports) possess a variety of devices designed to accept and transport these containers. Many of them are simply glorified forklifts and other cargo-loading vehicles.

These vehicles move the containers to craft that, in turn, transport the containers to the surface of the planet (if on a highport) or to other vehicles that will take them to their ultimate destinations (if at a downport).

Warehousing

Starports possess a large amount of empty space for the purposes of holding cargo until claimed and transported. In most cases, these are simply large, enclosed facilities. They may be located above or below ground at a downport, depending on needs and conditions. A *transit shed* is a warehouse located at a berth, for temporary storage of cargo just prior to loading or after unloading. In standard freestanding berths (see p. 76), the transit shed is simply the space around the landed starship, but still inside the walled berth.

Other warehouses are used for long-term storage, particularly of duty-free goods passing through the starport's XT zone. They are normally centralized, away from the high-traffic sections of the port, some within the XT line and some outside in the local startown. Those outside the XT line will be local, usually commercial, property and not operated by the SPA.

In all cases, warehouses are secured against theft by a variety of means. SPA realizes that the security of cargo awaiting transport is an important concern of merchants and corporations using their facilities. Standard SPA warehouse security measures are heavily automated, with a computer program linked to a variety of TL10+ sensors providing the first line of defense, and human security personnel only summoned when a problem is detected. Port directors have the authority to customize their security measures, however. A thief with all the electronic countermeasures for standard SPA sensors might find a not-so-easily-spoofed security guard on site . . .

Warehouse Needs

Standard shipping containers are weatherproof, and can be stored in the open on habitable worlds simply by stacking them; this area often will be fenced to control pilferage. On most worlds with hostile atmospheres, containers may be transferred directly from one vessel to another without special protection, but require environmentally sealed warehouses for extended storage.

Temperature-controlled containers, which run on power cells, are usually connected to line power for storage, to prevent damage due to cell failure.

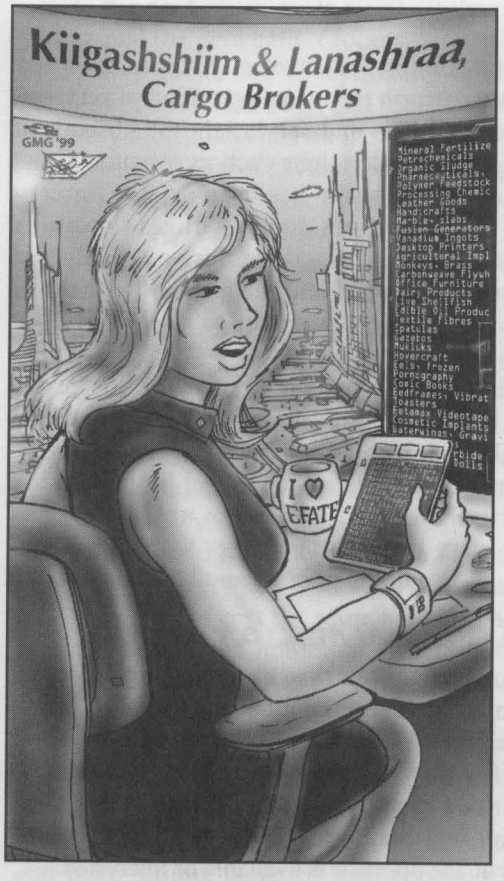
Breakbulk cargo – goods on pallets, or in individual bags or crates – needs some sort of storage structure, both for protection and to keep the shipment organized. This may be an open structure (a roof and racks), but enclosed warehouses are preferred for security reasons.

HAZMAT Storage

Hazardous material storage facilities are required at most ports. Where only small quantities of medium-risk materials are handled – fewer than 100 displacement tons per month of industrial chemicals – this can be a section of a conventional warehouse with fireproof bulkhead walls, limited access, and fire-control equipment, though most designers prefer a separate building.

If larger quantities of material pass through the port, or high- to extreme-hazard materials (such as high explosives) are included, a separate HAZMAT building will be utilized.

In addition to the HAZMAT facility itself, most major starports will also have a building devoted to storing chemicals and equipment for dealing with HAZMATs. These are, often enough, HAZMATs in their own right! This building may or may not also house a team of individuals skilled in dealing with hazardous materials. (Even the largest starports rarely have a full-fledged HAZMAT team on duty at all times. Most make do with seconding members of the CFR teams when necessary.)



Brokerage Office

Cargo brokers connect sellers of goods with buyers, collecting a commission on the actual sale. The port's brokerage office maintains a directory of local brokers; listing is not a certification (the port takes no responsibility for a listed broker's behavior), but a broker against whom many complaints have been received will be dropped from the list. Many brokers have offices at the port (leased from the concessions office; pp. 21-22). Others are based outside the XT line and visit the port as necessary.

There are always "brokers" in a startown as well. Most charge unusually high commissions in exchange for not asking questions about the source and destination of the cargo they handle.

Most minor and all major ports have a port broker. This person purchases goods, such as bulk food, for the use of the port and sometimes other Imperial agencies. He might also accept cargo in payment for port services, from shipowners who can neither pay cash nor sell the cargo on the local market. The cargo becomes SPA property, and may be used internally or resold by the broker. Naturally, port brokers prefer to buy goods the port can use (which, at a large port, covers a great variety).

Many ship chandlers feel this function belongs in the Ship Services department, and meddle extensively in this Cargo department function. Given the superior ability to match buyers and sellers often shown by many chandlers, Cargo officials often let them meddle away in exchange for other favors.

Special Handling Unit

All licensed cargo handlers are trained to move conventional hazardous materials such as fuels and industrial chemicals, but some goods are *extremely* risky: nitroglycerine, chlorine trifluoride, intense radioactives, military explosive ordnance, pathogenic biologicals, various kinds of toxic waste, etc. Special handling is trained and equipped to cope with this "hot stuff."

Moving extremely hazardous cargo requires planning to minimize disruption to port operations. Unless the port sees a large amount of such cargo (as at a weapons depot), the handlers will be employed with conventional cargo until a hot move is scheduled.

A route is cleared of people and vehicles, and the goods move with an escort of security and emergency services vehicles. As long as the material is properly crated, accidents are rare. In addition to the prospects of a thrilling fire or explosion (accidental or deliberate), the attention of security is sufficiently focused on such a special movement that other dirty deeds might pass unnoticed.

Passenger Services

Despite the large amount of cargo that moves through any given port, passenger transport *is* still an important part of its operations. For that reason, the port provides a number of services for those passing through.

Union Dues

Imperial law does allow trade unions at its non-military agencies. The Imperium isn't at the forefront of human rights, but it does have a steady need for skilled labor, particularly with high-TL backgrounds. Ensuring this supply requires extended guarantees of fair labor practices. TL12 starship-certified mechanics may join the Imperial Navy or Army out of pride, or the IISS out of a sense of adventure. The Starship Authority – and hundreds of other civil-service agencies – must instead offer a guarantee of fair wages and conditions.

The largest union among starport employees is the Alliance of Starport Mechanical Engineering Trades (ASMET). All Imperial ports have a chapter. Membership varies widely, averaging 75% of eligible employees. (Eligibility is negotiated between each port director and local.)

Smaller unions sometimes enroll those not eligible under the local ASMET agreement. Some port directors deal with dozens of local union chapters.

Along with the right to organize, the Imperium recognizes the right not to join unions. Port administrators are not supposed to act prejudicially for or against union members, and members are not supposed to be prejudiced against nonmembers. These are ideal conditions. They do not always apply.

Local governments vary widely in their attitude toward unions. Usually, the old saying applies that "unions are either illegal or compulsory." Many worlds engage in enthusiastic union-busting in the name of "right to work," while some totalitarian states have "unions" that are mandatory labor registries and political-monitoring agencies, and do no negotiation or bargaining for their members.

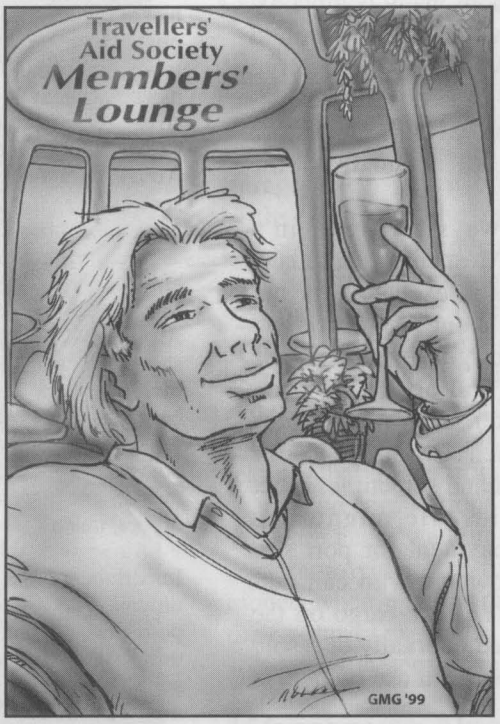
Labor issues can provide many adventure seeds, many of which will have no "right" or "wrong" side. A union walkout can withhold critical repairs to a tramp freighter – does keeping one's schedule justify hiring "scabs"? A repressive world may be practicing violence against embryonic union organizers, who could use arms to defend themselves, but can't find a megacorporation willing to sell to them. The PCs may be "asked" to hire union labor when substantially cheaper nonunion labor is available – and be frozen out of future transactions should they not comply.

GMs should be aware that players may hold widely different – but equally strong – views on organized labor, and many of these scenarios will be cause to act upon them.

TAS and the Weary Traveler

The Travellers' Aid Society provides a variety of services to the interstellar traveler. The following expands the p. GT35 descriptions.

TAS hostels at Class V starports offer rooms ranging from comfortable to mildly luxurious for a price averaging two-thirds market norm. These do tend to be fully occupied 20% of the time unless reservations are made.



Perhaps of greatest importance to the interstellar traveler are the TAS travel advisories describing hazards throughout the Imperium, including more detailed information on why a world has been classified as an Amber or Red zone. Every TAS office also has copies of *The Journal of the Travellers' Aid Society* for the use of its members. For a small fee, electronic or hardcopy versions of the *Journal* may be purchased. In addition, TAS provides access to the latest reports from the *Traveller News Service.*

Many TAS hostels have an on-site dining area that may be used by members and their guests. As with the rooms, the cost of the meals is partially subsidized by the society, making them comparatively inexpensive. Such dining areas are a popular meeting place for members and their guests.

At starports with TAS facilities, TAS leases space for a small member-reception area, essentially a customer-service room in which the TAS member can receive directions to the various services. TAS traditionally uses a real person to provide this aid, and these TAS agents take great pride in their conciergelike ability to obtain *anything* legal for a TAS member willing to pay the price. Sold-out concert tickets, the latest beta-analysis software for the local stock market, a platinum-cased laser cigarette lighter, *anything*. An interesting campaign could be formed by placing PCs in this role.

At other ports, TAS members must rely on the port's Passenger Services offerings, the same as anyone else.

Hospitality

This office is in charge of amenities and comfort for travelers: lounges, food service, entertainment. Concessionaires usually perform the actual operation of services, but hospitality inspects them for quality of facilities and service. In the absence of concession services, hospitality will run necessary operations such as restaurants and hotels directly. (This also happens when a concessionaire has been evicted for contract violations.) They also operate public waiting lounges. Large starlines sometimes maintain lounges for their passengers' exclusive use. Most of these are leased space equipped and maintained by the line, but the hospitality office operates some for a service fee, in addition to rent.

Hospitality also has charge of the port's interior design and decoration, including directional and informational signs. High-profile major ports employ professional architects and designers to create their "look," but hospitality has the task of buying the carpet, fitting the upholstery, and hanging the interior art. It also has authority to modify a concession's appearance to suit the port's overall design.

Hotel Accommodations

Travelers spend a lot of their time in starport hotels – probably more than anywhere else except aboard ship. It is where deals are done, missions planned, scams run – where people meet other people for every purpose from romance to murder.

A concessionaire usually operates transient housing, although hospitality will run hostels and a "standard" facility (see below) if no outside operator is available or interested.

Hostels provide minimum accommodations at a minimum price. The regulars call them "Warm Low" or "The Slushpond," indicating the usual clientele. The guest gets a bed with clean linen, a small locker, and the use of toilet and shower facilities. A few hostels are laid out barracks-style, with all the cots in one large room (some privacy is usually provided by curtains); most have rooms with four to eight beds; some are "slotshops" (see pp. 107-108). The manager will try to give groups (families or ship's crew) their own room, but this is not guaranteed, and sometimes depends on the willingness of earlier arrivals to move. Hostels do not serve food, and forbid bringing in outside food for the sake of cleanliness.

Starport hostels are not flophouses (which can readily be found in Startown); they maintain standards of hygiene and behavior. An excessively grubby individual may be required to shower before bedding down, and guests who become obnoxious can be ejected without refund by security – from the hostel, or the entire port.

A hostel room costs Cr10/night, Cr50 for a week (longer stays are discouraged, though not forbidden). Those willing to help sweep up, make beds, and scrub the bathrooms each day pay half price.

There are some charity hostels, operated by private organizations and religious groups, which do not charge for beds; they operate on donations, and usually require a little cleanup work from the guest. The charity may run an adjacent "soup kitchen" providing cheap or free meals, though not every port director allows this kind of operation. (Some port directors, recognizing the need but not wanting it on their property, subsidize charity accommodations in Startown out of their discretionary funds.)

Standard-class rooms are what one would expect to find from the name: basic, reasonably comfortable furnishings, video entertainment, and a dataport. About 90% of all starport rental accommodations are standard class; most such hotels have 200-300 rooms.

Some standard hotels, especially on highports, are built from modular starship staterooms; this is a quick and inexpensive method of construction, but most travelers get enough of stateroom life on the voyage, and want something more "building-like."

A standard room costs Cr50-100/night for one or two persons, depending on service and the demand for rooms, with a 10% discount for stays of a week or more.

Luxury rooms are exceptionally large and comfortable, with fireplaces, fancy bathrooms, oversized beds, and spectacular views (real or holographic). The presence of luxury rooms depends on the port's traffic pattern, though even a Class II port (if it has a hotel at all) will have one or two "imperial suites" just in case a customer shows up. (Old hands call these rooms "sucker plush," because of their popularity with interstellar con artists who rent the room to impress the locals before selling them stock in the Jump-10 Drive, FTL radio stations, or Great Rift Platinum Mines Ltd.)

A luxury room starts at Cr250/night and goes up; the super-plush suites at wealthy resort worlds can easily reach Cr1,000 or more.

Extended-stay rooms serve business travelers who need to stay at or near the port for several weeks, but not long enough to justify a regular apartment – for instance, a visiting engineer supervising a construction project for five or six weeks. In some cases, such as industrial-plant worlds, there *are* no suitable apartments; a company on such a world may rent rooms on a yearly basis to guarantee accommodations for its "visiting firemen."

An extended-stay room may be furnished to standard or luxury standard, but is generally larger (typically a two-room suite) and has a kitchen area.

These rooms cost the same per night as a conventional room of the same amenity class, but have a minimum stay of two weeks (longer if demand is very high), with partial or no refunds for early departure.

Passenger Assistance

This office answers questions from lost or befuddled travelers. It should not be confused with the Travellers' Aid Society (see sidebar, p. 32). Passenger assistance officers need to know the port's ground plan by heart, speak at least two languages, and have infinite patience with people who definitely need something but are not always certain what it is. PA officers are also familiar with TAS services available in the system, and will direct members to the nearest TAS representative.

Baggage

"Baggage" is passengers' personal belongings, defined as anything transported within the personal allowance of each class of passage. (Anything above this is treated as "cargo.") Baggage handlers have the same basic skills as cargo handlers and belong to the same union, if there is one. Because many of them come in direct contact with passengers, they are expected to maintain a tidier appearance, and politer manners, than freight handlers. Most, and all supervisors, have at least some minimal level of Savoir-Faire (Servant) skill. Some work "both sides of the port," moving between baggage and cargo as interests or traffic needs dictate.

Passenger Transport

This service moves people from the terminal building to their ships, and vice versa. At small downports, passengers may simply walk out of the building and onto the vessel. Large downports use a "satellite" system; the ship is moved from its berth to a staging area, and passengers are conveyed from the terminal to the ship by slidewalk.

For security reasons, off-port transport such as light rail does not cross the XT line; passengers must deboard outside and enter through the gate. Vehicular traffic (mainly pickup and drop-off of passengers) may be accommodated in a lot within the line, but separately fenced. For more information on off-port access, see p. 69.

Security

Starport security is a police force, not a military one. Most of the work consists of uneventfully waiting on station or roving the corridors. When security problems do occur, most are petty crime: shoplifting, pickpocketing and luggage theft, minor vandalism – and the officer rarely sees these things happening; they're reported after someone notices the crime.

Imperial CRs and Carry-On Firepower

The Imperium allows anyone to *own* any weapon short of thermonuclears and biologicals. It does not usually extend the privilege of *wielding* them in Imperial facilities; its starports and other offices generally have Control Rating 5 – visitors may not carry weapons.

Several exceptions exist. Starships may possess integral weaponry, of course. Anyone may possess weapons properly stowed as cargo, but that cargo may not enter certain critical and public spaces. Tenants usually have the right to set their own policy – so a free trader captain can allow sidearms in his berth for the week he occupies it, or a starline could allow weapons in its leased concourses. (Most starlines enforce CR 5 themselves, requiring personal weapons be checked to the ship's locker.)

Port directors have the authority to lower this CR. Most directors only enforce the *local* CR on the unroofed grounds of a downport, so that truck drivers on wild worlds don't have to check their weapons to pick up some freight. A few directors lower the CR a bit in terminals and public spaces, on worlds where everyone packs a pistol.

If bullets, laser beams, and the like do start flying, Security has the task of ending the situation *quickly*.

A few bystanders may also be armed, and feel the urge to help Security, thereby complicating the issue. The problem is that Security has no way to distinguish those helping out and those who started the situation – and rarely will bother to try.

In Imperial space, effective weapons CR becomes 0. Customs and other Imperial enforcement do not care what kind of personal weapon you carry aboard ship – as long as you don't point it at *them*.

Crime and Punishment

The crime found in most Startowns (pp. 44-47) can spill across the XT line and onto the starport itself. Security prefers to cooperate fully with local law enforcement in dealing with crimes that originate outside the port.

Unfortunately, worlds with low control ratings or with a high degree of corruption exist throughout the Imperium. These places can be sources of great consternation for a port director. Legal prosecution may be the only protection the port has from organized crime, and if the local government won't prosecute, then the only answer may be an Imperial charge (if one can be found – Imperial law does not cover many "low" crimes unless they take place on Imperial territory – i.e., the starport proper).

Local Contraband, or, Can You Import Fireworks on a Methane World?

Few items are illegal on Imperial territory, within a port's XT line. (The nuclear and biological weapons mentioned elsewhere are notable exceptions.) The rules are often very different outside the line on a non-Imperial world.

Worlds that have the will and ability to ban items can be expected to disapprove of those very things being freely available just on the other side of a fence, and there is often a steady stream of more-or-less-polite official protests filling the planetary liaison officer's in-disk. What does the PLO do?

This is one more case of "director's discretion," meaning that the director, after consulting with the PLO, and often the local government as well, sets a policy, and – at least as important – decides how it shall be enforced.

The policy chosen depends very much on the actual threat presented by cross-line smuggling. A government that bans red licorice whips as a threat to the dental health of its citizens will get a different response than a world plagued by violent gang warfare that wants to stop the import of large-caliber small arms. However, the director is not empowered to contradict Imperial law, and in the Imperium both licorice and 15mm Magnums are legal for sale.

The basic levels of response, from trivial to serious, are:

- One or more signs at the port reading (in all appropriate languages), "Compliance with local import regulations is the sole responsibility of the individual traveler," followed by a datapage code to read those regulations.
- Signs citing specific banned items, sometimes with a description of the applicable penalties (where appropriate, "death" is always mentioned).

At these levels, there is nothing to enforce – you can't *make* someone read a sign. Customs officers who observe passengers with contraband items may advise them of the legal situation (as they always will if asked), but cannot seize the items or take any other direct action.

- Labeling of items for sale with "May Not Be Imported to This World" or the equivalent.
- Labeling plus a form at point of sale, to be signed by the purchaser, affirming that the purchaser knows the item to be local contraband.

Continued on next page . . .



Despite the relative boredom of their job, security chooses its officers carefully. In starports without a marine garrison (the vast majority of them), security represents the only line of defense against would-be terrorists and other wrongdoers. A port director would be foolish not to ensure that he had the best trained and most vigilant security force at his disposal.

Tactical Teams

Some ports have SWAT-style teams to deal with hostage or terrorist situations. SPA has no internal consensus on the value of tac teams; some officials contend that military operations are properly handled by the military (the port's marine garrison), and maintaining a tac team keeps security personnel in expensive training.

The counter-position is that the majority of starport "tactical" situations call for minimizing casualties (even among the "hostiles") and collateral damage, neither of which are military priorities, and the military special forces trained in such "surgical" operations are almost never assigned to starport garrison duty.

The usual solution at minor ports is that the files of security officers with tactical skills such as marksmanship (usually these are ex-military personnel, anyway) are "flagged," and some special equipment, such as body armor and sniper rifles, is kept on hand to equip them in emergency situations. The chief will ask for volunteers for this special duty, calling on outside aid, if necessary. Hazard pay is, of course, earned for tactical duty.

At major ports, appropriately trained officers serve part of their time in rotation (typically one week out of eight to 10) as an on-call tac team, for which they receive a small pay bonus, plus hazard pay if the team is activated.

Imperial Customs

"What do Imperial customs officers hate most?"

"Smugglers, hijackers, pirates, terrorists, and planetary customs officers. In ascending order."

The Imperial Customs Service is a division of the Revenue Department, but most of its field personnel work at the SPA's starports. The customs office's primary task is not the collection of taxes or duties; in fact, most goods at most worlds are not subject to any Imperial duty. The main exceptions are "special levies" intended to pay for new construction that are supposed to – and usually do – end when the facility is paid off, and duties on "luxury items." The Revenue Department typically defines works of art, expensive private vehicles, and ultra-tech weaponry among the many items in this category.

Since few Imperial duties need be collected, customs personnel keep busy with other duties, including:

● Monitoring arriving vessels, looking for hijacked or stolen ships, or those wanted in connection with piracy or other Imperial crimes; similarly, apprehending wanted persons attempting to leave system space.

● Verifying medical records of arriving persons and biological cargoes, and enforcing any quarantines.

● Escorting vessels, and protecting Imperial officials and nobles, on Imperial business (usually in conjunction with other agencies).

● Dealing with matters involving the XT line, and conflicts with planetary sovereignty, including enforcement of the right to asylum and free interstellar movement, and cross-line extradition of persons denied asylum.



Many of these duties overlap those of the SPA's security personnel. Being that different Imperial agencies oversee each, there are separate administrative offices, with overlapping authority, for security and customs at all ports. The responsibilities of the line office likewise overlap in places with those of the customs service. This situation creates all manner of confusion at times, but is the price the Imperium is willing to pay for safety.

What customs may not do is interfere with customs procedures outside the XT line, *even if* those activities violate local law. A planetary customs station (it will be right outside the starport gate) may conduct any kind of search and charge any sort of duty it wishes. If the world has a customs fleet, it may stop vessels for whatever purpose (though most worlds have the sense not to interfere with vessels on Imperial business). Victims of shakedowns may file complaints with Imperial customs, and these will be forwarded to the local authority, though action may or may not be forthcoming.

Planetary customs offices have a reputation for corruption. Even though the majority are entirely honest, the bad ones tend to be very bad indeed, and get all the publicity. Because of this, the Imperial service is diligent, even ruthless, in keeping its own name clean. An officer caught on the take *might* not be prosecuted for treason, and *might* not get the death penalty, and *might* eventually see starlight as a free man again, but his subsequent life would not be a merry one. While all Humaniti is fallible, for the purposes of most adventures Imperial customs is incorruptible.



Local Contraband, or, Can You Import Fireworks on a Methane World?

[Continued]

These measures are the responsibility of the seller (including the port itself, if it is the seller). Security collects copies (paper or electronic) of the release forms every business day.

● All the above measures, plus an electronic background check on the purchaser, conducted by starport Security. If the check shows an outstanding warrant (a rare event), Security will make the arrest. If it shows an indication of possible trouble (e.g., suspicion of arms smuggling), Security may pass this information to planetary law enforcers. This is formally the decision of the director, though he may empower a subordinate to act on such cases. Usually the planetary liaison gets this responsibility.

Since the Imperium may not interfere with business unless it violates Imperial law, this is the maximum level of control allowed within the starport. Security officers have been known to push the rules by applying pressure to the suspected smuggler – maintaining highly visible surveillance, conducting "routine" spot checks on baggage – hoping to worry the subject into doing something actionable. Unfortunately, most career smugglers are unaffected by these maneuvers; it's political dissidents and other amateurs who lose it under stress.

A particularly delicate case of local contraband is intellectual material: literature or art with content the local government has labeled as politically or morally dangerous. The port staff may be profoundly in sympathy with the illegal ideas, or at least against censorship, but if they are perceived to be assisting its infiltration across the line, port/planet relations are likely to worsen dramatically (and in such circumstances they probably weren't very good to begin with).

This sort of conflict has considerable opportunities for roleplaying, with players as either the smugglers (presumably agents of a larger political campaign against the repressive planetary government) or the customs staff caught in the crossfire.

Trojan Hearses

An emergency call requires that some security procedures be bypassed for the sake of time – which in trauma care translates directly into lives. "Bypass security" is a phrase that puts ideas into some people's heads.

A fake emergency – or even a real one – can be used to get thieves, pirates, terrorists, or people who just want to park in the handicapped spaces past the starport's first-line defenses. No security system is infallible, and it just isn't acceptable to risk lives on the long odds that a distress call is phony. It doesn't always work, though.

Most ploys of this sort involve impersonating Medical or Emergency Services personnel. Some points to keep in mind, however:

- Security officers are always stationed at the port's medical facility, and they will not hesitate to send a silent alarm if things look fishy or a medical team isn't familiar.
- A large number of port Medical personnel are former soldiers – combat medics and regular troops who became orderlies or physician assistants after retirement. Even civilian EMS responders don't spook just because someone points a gun at them. Obtaining access to the gear with which to pull this stunt may be a fight in itself.
- Issuing a fake distress call is a serious crime even if you don't have further wrongdoing in mind. Shooting up hospitals is the kind of stunt that gets people classified as "terrorists," even if they were purely in it for the money. And terrorist acts don't bring out the best in the people sent to apprehend the actors.

Kinetic Containment Blankets

A K-blanket is a 10-square-yard sheet of multi-ply ballistic cloth. Its main purpose is to prevent debris from being scattered from a vessel that is outgassing or might explode.

One or several blankets are spread over the area at risk by a CFR crew in vacc suits with maneuvering thrusters, and fastened (generally directly to the vessel's hull) with mounting anchors fired from an explosive impact tool. It is usually left loose around the edges, so that gas pressure can escape while solid objects are caught.

K-blankets can also be used to smother fires in atmosphere, and to wrap explosive material – crates of ordnance or actual bombs. Crews on the spot have found numerous improvisational uses for them, such as catching vacc-suited survivors who are tumbling away from the rescue area.

This does not preclude adventures built around investigating possible corruption at a customs post, or swindlers pretending to be Imperial customs officers. When there *are* genuine bad apples, their motivation should be much deeper than, "I wanted the money." Needless to say, the incident described on pp. GT36-37 involves a planetary customs service.



Medical Department

All ports have some kind of first-aid station. At a Class I port, this will be a kit of supplies. Class II ports are required to have at least one person on duty with formal first-aid training. At Class III and larger ports, there is an infirmary with a nurse on duty. Major ports have at least one doctor on duty at all times, one or more assistant Medical officers, and a nursing staff. The infirmary of a Class V port will have a fully equipped surgical theater, several automeds, and usually a specialized trauma team on constant call. Low berths are not generally present: The infirmary's purpose is first response, not long-term care. Persons requiring freezing are either returned to their ships or moved to an off-port hospital.

Regulations require an emergency aid station in work areas – first-aid supplies, eyewash fountains, emergency showers, and so forth.

At small ports, CFR paramedics (see *Emergency Services*, below) will provide first-response care and bring patients to the infirmary for evaluation and further treatment. If many casualties are expected, additional Medical staff rides to the site on CFR vehicles. Major ports have a dedicated ambulance, usually a grav vehicle. If there is no planetary trauma center within easy reach (10 minutes or less by G-carrier), a major port will have its own, with a trauma team on continuous call. Class V ports usually have a rapid-response vessel at the highport (see pp. 95-96).

At freight-heavy ports, most of Medical's work is trauma: materials-handling accidents, falls, vehicle collisions, from the minor to the gruesome. Work in orbit has an additional set of hazards: decompression, radiation, docking collision, etc.

Where the major traffic is passengers, traumas tend to be minor – cuts and minor burns – but there are more internal problems: heart attacks, strokes, respiratory ailments (often aggravated by environmental changes in gravity, air pressure, etc.). Traffic bias therefore determines the type of equipment and staffing.

Where planetary relations allow, there will be cooperative treatment and care arrangements between Medical and local hospitals (see *Outcall Services* sidebar, pp. 38-39).

Emergency Services

All ports have some kind of disaster preparation. The level of staffing and equipment varies, but it is understood that an emergency is *always* first priority. Any operation that might interfere with disaster response will be suspended (unless, as with a vessel in the last seconds of approach, it would only compound the problem), and any port employee called on to assist with an emergency immediately complies.

Emergency Operations Center

Major ports have a dedicated emergency ops room, with comm links and data displays that allow disaster and rescue operations to be coordinated across the vast expanse of the port. During the operation, senior officers from all affected departments will be there to direct their subordinates, and usually the port director as well.

Minor ports caught in a large "incident" have a more modest (though not less professional) response. If central coordination is necessary, a desk with adequate data links will be taken over for the duration.

Crash, Fire, and Rescue

CFR is the primary emergency-response service – the port's firefighters, paramedics, and hazardous-material (HAZMAT) first-responders.

The main CFR emergencies are:

Fire. The first priority with fire is control – preventing it from spreading. Once the fire is contained, it can be extinguished or, if there is no risk of spread and nothing appears salvageable, allowed to burn itself out. Fire in public areas requires that people be guided out of danger; this is usually security's job.

Physical trauma. In an accident, people may be crushed by containers or machinery, or caught in fires or toxic releases. CFR's job is to get the victims out so that Medical can treat them. This may call for hydraulic or grav lifters to clear debris, access hardware to reach the victims, and always the right protective gear for the rescuers.

HAZMAT incidents. The list of hazardous materials around a starport is gloriously varied: toxic chemicals, volatile solvents, fuels, oxidizers . . . and that doesn't even take cargoes into account. HAZMAT substances are supposed to have ID code labels. A handheld scanner can read these from at least 10 yards and instantly display the proper handling procedures, including proper protective gear, fire control, and evacuation distances. Using powerful binoculars, labels should be readable from evacuation distance (usually *at least* 100 yards – 10 times that or more for extreme toxics or high explosives). Of course, sometimes the labels are out of view, or smoke blocks the scanner beam, or the labels are missing or wrong. The life of an emergency response team member is often exciting.

Crashes. A spacecraft crash is, at least potentially, every kind of disaster at once. Fire is common, crew or passengers usually need rescue, and anything hazardous on board is very likely to have its containment ruptured – a wave of liquid hydrogen fuel will severely injure anyone it washes over, turn objects brittle or shatter them, and is highly flammable for good measure.

Space hazards. Accidents in space have their own special features. Vacuum has one small benefit – decompressing an area will extinguish any fire that does not have its own oxidizer. Victims, however, must be protected from it (a human being can last four or five minutes in vacuum, especially if there is time to prepare, but not longer), and victims and hazards cannot easily be located by sound. Zero-gee can make it possible to surround a hazard site, but only trained personnel can operate effectively in weightlessness. Only the largest ports (and those with highport facilities) will have specially-trained team members capable of acting in zero-gee. Smaller ports often call upon skilled outsiders to assist them in dealing with these unusual hazards.

Another particular hazard is "foreign object damage" (FOD) – debris flying from an accident site, sometimes at considerable velocity, with nothing to stop it. A cluster of flying fragments across the path of an incoming vessel can have the effect of a fragmentation warhead. K-blankets (see sidebar, p. 36) are a method of controlling FOD releases; any space CFR operation will be followed by an FOD cleanup sweep.

CFR preparedness includes:

At Class I ports, personnel are cross-trained in emergency procedures, and there is protective and fire-control equipment of some kind. A disaster calls for shutting down the port, and everyone not absolutely required elsewhere donning protective gear and pitching in.

The Starport as Hospital

On some worlds, the starport infirmary may be the only real medical-care facility. The infirmary may as a result be larger and better equipped than the port's needs require. Such a facility cannot recover its costs, even if service fees are charged. The Imperium accepts these losses, writing them off as "frontier development" costs.

This can lead to interesting situations on neutral or hostile worlds. An adventure could involve smuggling a seriously ill relative of an important planetary figure across the XT line for treatment; the dignitary might ask for the aid or be completely hostile. Fanatically anti-Imperial locals would not approve of any "acts of mercy" that might soften local hostility – and the death of the patient while in Imperial hands would be just the thing to harden it.

Starport Medical staffs often are the first to discover new contagions arriving from offworld. On frontier worlds, they might take the lead in combating the menace planetwide as well.

The Starport as Disaster Agency

In planetary disasters, the starport naturally becomes a center of operations. It is where support from offworld – experts, equipment, food, and medicine – will arrive and be dispatched to where it is needed. It may also be the only place where large numbers of victims can be temporarily housed and fed – or, in the case of a plague outbreak, isolated and treated.

SPA has a special operations office that provides assistance to its ports (and, if requested, to non-Imperial ports as well) in such situations, by dispatching additional staff and supplies, and, if necessary, a fleet of "isolation shuttles" that allow commercial vessels to deliver cargo to quarantined worlds without risking a landing themselves.

If the port itself has been damaged, the SPA's first priority is naturally to get it operating again; this may not be properly understood by suffering locals.

A major disaster is one of the biggest, messiest, nastiest things it's possible to throw at a group of characters. There's always more to do than people or material to do it with; any number of people know for a fact that they need help, and disagree with varying degrees of politeness about how much more they need it than the next person. On single-industry worlds, the corporate owner may have a completely different agenda than the working population *or* the relief experts.

Outcall Services

On all but opposed or essentially uninhabited worlds, there is some kind of arrangement with the local fire and medical services for providing responses across the XT line.

Outcall services reduce the requirement for emergency staff and equipment at the port, and – at least in theory – creates a sense of mutual concern between port and world. Fires, after all, do not stop at political boundaries.

Over the years, SPA has established a series of protocols to aid a port director in dealing with local authorities on these matters. These protocols are not fixed rules; they are guidelines that *may* be ignored at the discretion of the director. With so many pressing concerns, however, a director rarely ignores these protocols.

The two key points of outcall agreements are the conditions under which responders can cross the XT line, and payment for services performed by emergency personnel from the "other side."

Mutual Aid

Emergency responders may cross the XT line freely in performance of their duties. Local ambulances take critical patients to the port infirmary if it is nearer than any planetside trauma center. Portside paramedics go to planetside hospitals if they have the most appropriate facilities (which could mean a severely burned patient needing a specialized burn unit, or locals who are not critically injured and can be moved to hospitals near their homes). Firefighters answer calls within a reasonable distance (defined on area maps; in practical terms, it means "close enough to get there in time to do some good and not to leave the port unprotected").

No special charges are made for these cross-line runs by either side. It is assumed that the costs will balance out, and it has been the experience of starport financial officers that this is generally the case. When an imbalance results, it is usually not the result of organized intent to misuse the system, but a demand imbalance. Good examples of this would be an unusual number of fires (on whichever side of the XT line), or local employees who are not seriously ill using port ambulances as taxicabs to their own doctors. These problems can generally be solved at low level – by finding the cause of the fires, or insisting that employees be triaged at the infirmary before calling an ambulance (or providing free taxi transport, which is orders of magnitude cheaper than any ambulance run).

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At a Class II, the emergency unit is mobile, typically on an air/raft (see p. GT147). There are unlikely to be dedicated CFR staff, but there will be a disaster plan with designated team leaders and responsibilities.

Class III ports and above have full-time CFR teams. Larger ports have more personnel and more equipment. All team members are paramedics trained in fire control, HAZMAT procedures, and rescue. As necessary, special-duty teams (space operations, explosive-ordnance disposal) are maintained.

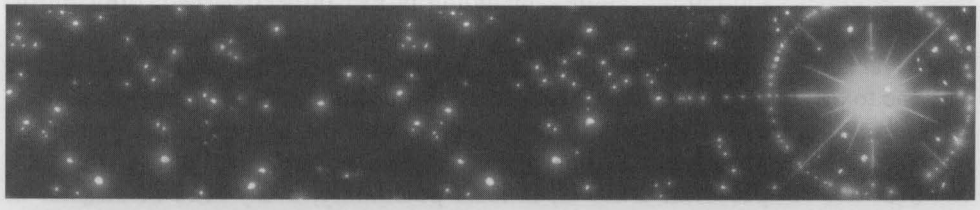
As with the Medical department, CFR has cooperative service arrangements with planetary emergency services wherever the political situation allows it (and sometimes when it allows no other kind of cooperation). See the *Outcall Services* sidebar.

Flight Operations

Flight Ops is the port's aerospace arm: the pilots and flight crews of shuttles, fuel carriers, tugs, and so on. The importance of a port's Flight Ops department is largely determined by the size of a port's orbital component. That is, ports without an extensive highport will not need a significant Flight Ops department.

Ports that do have a highport will require the services of a large number of pilots and crew for the operation of a port's own vehicles. Shuttles to and from orbit are the most common of these vessels. There are also a variety of maintenance craft, such as tugs and fuel carriers, that need certified pilots and crews.

Even at ports without a highport, there usually will be a small Flight Ops department to handle routine aerospace matters such as maintenance of traffic-control satellites.



Physical Plant

This department maintains and operates the port's infrastructure. Its operating divisions are:

Engineering

This is the maintenance service for everything belonging to the port, except spacecraft. Engineering lubricates and repairs machinery, changes light bulbs, resurfaces landing pads when somebody gets careless, etc. Engineering naturally works with every other department, and because every department thinks it needs an engineer, *right now,* more than any other, engineering staff usually have semi-permanent assignments (such as transport or power functions) so that no essential service gets stuck at the end of the queue.

Power

This division is in charge of the port's main electrical supply, usually one or more fusion plants. Large ports will have decentralized power generation, so that a failure (or attack on) one unit does not black-out the entire facility. At small ports, power and engineering operations may be combined.

Data/Communications

Of related interest are the data/communications facilities at a starport. Though Traffic Control has the greatest needs, nearly every department requires quick and up-to-date access to information about the vessels in the system, their flight plans, manifests, etc.

The primary communications net of a major Imperial starport is based on meson communicators, but secondary communications may use lower-tech methods, particularly on low-tech planets. Local concessions are usually given "telephone service" compatible with the local system, wireless or landline.

Data/comm is also responsible for monitoring the function of the network of navigational, meteorological, communications, and relay satellites, which at the largest ports cover space out to the 100-diameter jump limit.

Transport

Ports require large numbers of surface vehicles, to move people and property over the considerable distances between everything. In addition to grav buses and trucks, many large ports have a guideway system (light rail, monorail, or suspended). The vehicle operators belong to the transport office. (An exception is cargo-loading vehicles, which are operated by freight-handling drivers.) Transport also keeps track of the equipment, and checks for needed maintenance.

Central Stores

This division is where all the port's consumables are stored. At the smallest ports, this will be a storeroom or shed; at the largest, the stores fill a complex of warehouses – machine parts, chemicals, bulk food, refrigerated storage, and on and on. Storage is usually at least somewhat decentralized for convenience – commissary and restaurant food stores will be near the terminal building, starship parts close to the berthing areas.

Central Stores has a fleet of delivery vehicles (operated by transport personnel) to move supplies where needed. Other delivery systems, such as automated conveyors or electric subway trains, may be used to serve particular needs.

Supplies

All starports, to a varying degree, have a collection of storage units devoted solely to necessary supplies for the port itself, not its customers. Such necessities include spare parts, backup replacements, medicines, clothing, and even preserved food. Every eventuality is taken into consideration; SPA believes in being prepared *before* any of them happen.

Experience has taught that it is much more economical to set aside such supplies than it is to take a chance in not having them. This also serves the starport's tertiary function as an emergency base for Imperial Navy ships. Moreover, even if these stores are never needed by the starport itself, the locals may need them should misfortune strike them. Both the line office and public relations consider it a valuable service to provide these stores to those in need. Indeed, several possible scenarios relating to this are described in sidebars throughout this book.

Like everything else, the extent and depth of these stores will vary based on the size and needs of the starport in question. At the same time, every starport's stores will have sufficient materials to repair and/or modify the port's own systems, within reason. That is to ensure that no starport must ever rely upon the abilities or good will of locals in case of an emergency. SPA prefers to make each starport as self-sufficient as possible.

Commissary

This is the employee food service. Staff is usually allowed to eat in the commercial restaurants (and may receive a discount), but many prefer the cafeteria, especially if they spend their entire working shift around passengers and crew. Commissary services are often contracted to a private operator.

Housekeeping

This service is charged with keeping the place tidy: washing windows, vacuuming carpets, emptying trash cans, doing the laundry. Housekeeping also handles any painting or landscaping duties that arise in port. Like the commissary, housekeeping services are often contracted out. Credential checking is necessary here, as well.

Outcall Services

[Continued]

A mutual aid agreement usually requires an affluent world with adequate emergency services (and, of course, a friendly attitude toward the Imperium). On less technologically advanced worlds, the matter can become somewhat more complicated. In such cases, the locals may be especially ill-equipped to assist in a disaster situation. It is on these worlds that a port is also likely to have its own internal CRT and emergency teams. Despite this, port directors will generally instruct their own teams to assist locals on these worlds. While there may be no obvious financial remuneration for such errands of mercy, the good will it engenders is usually considered payment enough.

Request Call/Chargeback

Under this agreement, fire or medical crews cross the line only when requested by the other side, and a fee will be charged for the operation. This is the most common arrangement. The reason for the request is to prevent one side from dispatching crews "just in case" and then demanding payment. One side may voluntarily dispatch (particularly in the case of a fire that might spread over the XT line if uncontrolled), but reimbursement is not guaranteed. It may, of course, be paid anyway, just as neither side is obligated to ask for repayment.

Gravest Extreme

Even on the most fiercely anti-Imperial worlds, there is usually some sense that saving lives is more important than political disagreements. Agreements will be drawn up governing just when an emergency medical team can leave the port, and what kind of cooperation will be offered (from a straightforward "rescuers are inviolate" agreement to police guard). Sometimes this document is filed and immediately forgotten by both sides, at least until it becomes relevant – usually at an awkward time and under trying circumstances. There may be a reimbursement clause in such an agreement, but it will rarely be invoked.

Police Equivalents

There are no such arrangements with local police, since legal jurisdiction ends at the line. Of course, the line office and starport Security will cooperate with local law enforcement should the commission of a crime involve multiple jurisdictions.

Chapter Three
Planetary Relations

An Imperial starport symbolizes the benefits of allegiance to the Third Imperium in a way that few other institutions can. It represents not only the prosperity attendant to interstellar trade and commerce, but also a sense of *connection* to something greater.

As an Imperial outpost on non-Imperial territory, an SPA starport must maintain good working relations with the local government to function anywhere near full efficiency. The Imperium asks even more than that of the SPA; part of its mandate extends beyond smooth labor markets and into the realm of applying Imperial policy and diplomacy.

This holds true regardless of whether the port is based on an Imperial world, client-state, or non-member system. The general difficulty of representing the Imperium tends to go up as the number of ties between Imperium and host planet go down, but even the port directors on core worlds must address a number of concerns between Imperial and local authority.

Standard Relationships

The Imperium and the local government hosting an Imperial starport maintain one of the following relationships. The SPA authorities on that planet usually will possess the responsibilities and concerns described, though circumstances will of course vary in individual cases.

Imperial World

The local government is loyal and subordinate to the Imperium. The locals, other than terrorist or criminal groups, will not interfere with starport operations, and any request for support or assistance made by the port director will be met if it is practical to do so. Likewise, the starport is part of the planetary community, and is expected to assist the local authorities in any way that does not compromise safe port operations. It is important to note that, except for some core worlds, the Imperium does not micromanage its worlds. The local government has its own budget and political organization.

Friendly

The world either is not ruled by the Imperium or accepts Imperial hegemony while reserving the right to act independently on matters not of direct Imperial concern (for instance, allowing Imperial military operations to use the system as a base, but passing its own laws and printing its own money). The latter sort of world is what Imperials refer to as a client state.

The local government is satisfied with the presence of the Imperial starport, and generally tries to cooperate with it for mutual benefit. Most differences arise from economics – usually attempts by the locals to get the Imperium to pay for "port enhancements" such as inter-city highways that happen to go near the starport.

Friendly governments will ask for reimbursement when their emergency services assist the starport after a crash or other disaster, and are somewhat more likely than Imperial worlds to find ready excuses not to provide help. On the other hand, a director running at the limit of his resources can also draw the line on helping out the locals.

The Cleon Doctrine

"We sometimes like to think that Cleon Zhunastu was more than a man, but I think that'd do an incredible disservice. Don't misunderstand me. Cleon I was a remarkable individual, a genius even. Yet Cleon's genius didn't follow conventional patterns. Let's be honest. Cleon was hardly the first man to found a new 'universal empire' to last for the ages. But he **was** *one of the first to succeed so brilliantly.*

"Living as we do over a millennium after Cleon's founding of the Imperium, we tend to overlook the little things this man did to ensure the success of his empire. Little things like the doctrines of non-interference in local affairs and the extraterritoriality of Imperial possessions, especially starports. Together these two form what I like to call 'the Cleon Doctrine.'

"The genius of Cleon is that he created a way to simultaneously leave the governance of worlds to the people inhabiting those worlds and secure the presence of the Imperium on each and every one of them. In this way, no world is forced to accept a foreign master unless they wish it. At the same time, no world is left entirely to its own devices. Cleon found a way to balance both the laissez-faire and paternalistic tendencies that thwarted so many previous governments.

"That's why I say it does a disservice to consider him more than a man – a disservice to Humaniti."

– from a talk given by Archduke Norris Aella Aledon at St. Regina University, 099-1120.

Neutral

The world tolerates the port for the sake of its economic benefits, but considers that its responsibilities end at the XT line. The locals neither interfere nor cooperate with port management. Assistance, although sometimes given (especially if the world outside the line is threatened, as by a major fire), will never be voluntary.

Many non-aligned worlds will not have an Imperial starport in their system. To accept an Imperial starport is to accept the presence of SPA and all that it entails. Neutral worlds without an Imperial starport usually have their own starport; even those with an Imperial starport may build a competing starport.

The existence of an Imperial starport may have profound political repercussions. In a sector like the Spinward Marches, for example, the Zhodani Consulate or the Sword Worlds Confederation might well construe having an Imperial starport in an avowedly non-aligned system as a political statement. Given that the Fifth Frontier War is still fresh in people's memories in the Marches, it is easy to understand why many neutral worlds would prefer to make their own way.

Opposed

The world is opposed to any Imperial presence on "its" territory, including the starport. (The word "opposed" is used in formal documents to differentiate a political situation from worlds that are environmentally "hostile.") No overt action is taken, and the XT line is officially recognized – since to violate it would constitute an act of war against the Imperium – but there is no cooperation, and "unofficial" acts – ranging from insults and graffiti to vandalism and sabotage – may take place.

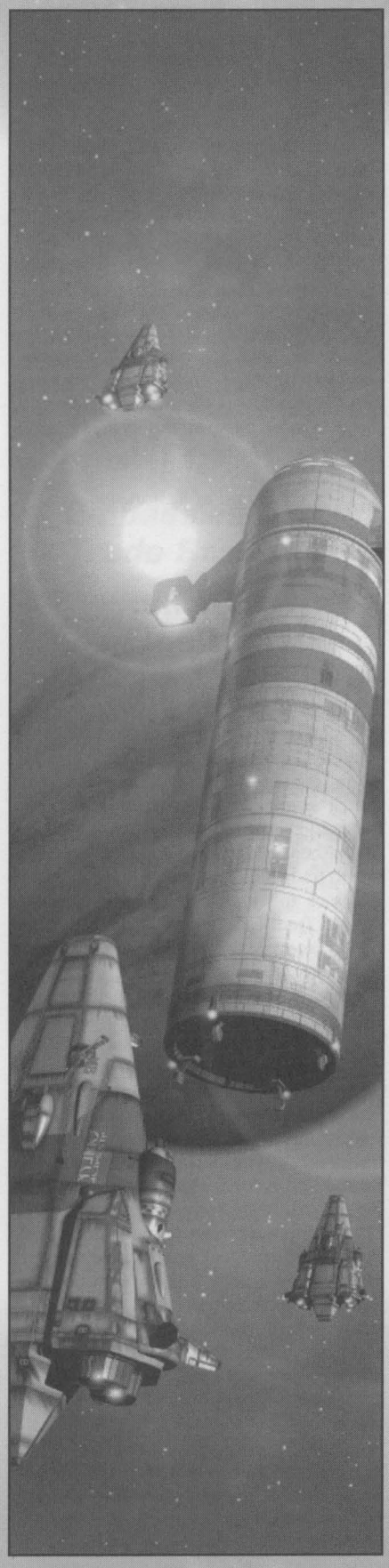
An actual disaster may force some joint action between port and planet. If the incident is within the port, the world may assist if fire threatens to spread across the line, or significant local assets (trade goods or locals' lives) are at risk. Of course, planetary authorities have been known to say that their own citizens who trade or travel through the Imperial facility "don't deserve" assistance. In planetside crises, Imperial policy is to assist local emergency services when possible. This as always is "at the director's discretion," and a port director is not required to commit the port's emergency medical personnel if there is reason to believe locals might attack them. These situations can provide interesting roleplaying for characters such as SPA staff, who may have to fight fire while under attack or planetary EMS personnel trying to protect the Imperials from their fellow citizens, or offworlders caught in the middle.

This category is a rare one. Worlds that are genuinely opposed to an overt Imperial presence tend not to allow the Imperium to build starports on their property. As with everything in charted space, one could cite numerous exceptions to this general rule. One of the more common exceptions is the case of a world whose *government* supports the Imperium, but whose citizenry do not. On such worlds, resentment and even violence against "offworlders" may occur. Worlds of this type will often be designated Amber Zones.

Another variation on this theme is an occupied world, conquered by the Imperium and not yet fully integrated into it. Similarly, an Imperial world can suffer a change in government. The new government may not be inimical to the Imperium, but is unwilling to antagonize it with acts of outright violence. If the world is important enough (on a trade or Xboat route, for example), the Imperium may maintain a starport, despite local feelings. Other possibilities, like the Border Worlds of the Spinward Marches, can be cited as well.

At War

The world has gone beyond simple dislike to overt acts against Imperial lives and/or property. The Imperium *always* responds to such actions with military force, though this may be limited to a marine garrison and economic sanctions (see below). It takes time for reinforcements to cross interstellar distances, or sometimes even to cross an orbit-to-ground blockade, and the port may have to endure two weeks or more of siege (for the fundamentals of seizing a starport, see the sidebar, pp. 12-13).



Extraterritoriality: The Law

Article VII – Extra-territoriality of Designated Imperial Possessions: *"The governance and operation of starports or other territories ceded to Imperial use is reserved to the Imperium. Movement of material and sentients between such territories and the member world shall be controlled by the member world, subject to Imperial laws governing such movement. Such territory shall be excluded from the jurisdiction of any member world, and no material or sentient shall enter such territories from any member world without the express consent of the governing Imperial authorities responsible for such territory."*

– the Warrant of Restoration, 001-0000

XT Line: The Reality

The extraterritoriality principle dates back well past the First Imperium, and its lessons were not lost on Cleon I and his advisers.

In the Imperium, goods often must transit several star systems to reach their destination. If each star system is allowed to tax the transshipping goods, a huge barrier to trade results, because the final price becomes too high. So Imperial starports create "free trade zones" – indeed, most observers agree this is their primary reason for existence.

But instead of stopping there, the Imperium took this right to suspend tariffs and duties and used it as the basis for suspending all local law, because the extrality principle has also proven extremely useful in matters not related to trade. The XT line makes the whole of the starport a safe haven for off-worlders. If nothing else, this provides a refuge when the natives turn hostile. Allowing Imperial companies and organizations a place to conduct their business free from local interference not only allows them greater influence on that particular planet, but also allows them to coordinate their activities across wider stretches of space. Everyone from megacorps to humanitarian aid agencies may have their offices in the starport on hostile worlds.

Imperial authorities may also use the safety of the XT line to protect more covert activities. All manner of "cultural attaches" or other undercover intelligence agents may use the legitimate activities of the starport to conceal their own nefarious doings.

This category is not only rare, but temporary. While the Imperial Rules of War permit (under certain circumstances) conflicts *between worlds*, they do not condone actions that call into question the supreme authority of the Imperium. Most worlds of this type will be designated Red Zones.

The XT Line

Extraterritoriality (shortened to extrality or just XT) is the concept of a piece of ground within a sovereign state being legally the territory of another, distant state. A national embassy and its grounds are the best-known example. When someone steps through the gate of an Imperial embassy, he is standing on Imperial soil, although the rest of the world around him usually will be under local domain.

In the same way, Imperial starports on non-Imperial worlds are part of the Imperium, and within the starport boundaries – the XT line – Imperial law replaces all planetary law, or lack thereof. Even an Imperial world has an XT line; though the world already should be enforcing all Imperial law, it usually will have thousands of its own laws that do not apply on purely Imperial property.

On an Imperial or friendly world, a simple fence may indicate the line. On worlds actively hostile to the Imperium, the line may be a heavily patrolled fortress wall. In either case, the XT line likely will create many of the port director's most complicated and delicate problems.



General Local Relations

The SPA's missions of promoting good relations with the local government and enforcing the XT line often directly conflict with one another. The port director and his staff will have to delicately balance these priorities. The line office (pp. 20-21) handles most of the street-level negotiations. More drastic options include:

Economic Sanctions

If political frictions cannot be smoothed over, the port director can take the rare step of imposing economic sanctions. A director can, by his own authority, shut down a starport and restrict access to it. In cases where violent activity or war has broken out, a starport will sometimes be closed to prevent the flow of weapons and other materiel. A director may also close a starport (or at least prevent Imperial citizens from crossing the XT line) to prevent the flow of *any* goods at all.

This is a dire power, and rarely exercised. To prevent even food and other essentials from arriving on a planet endangers the safety of the port and its SPA personnel. Shutting down extrality will drive most trade away from the planet.

A slightly more common example occurs on balkanized worlds with several distinct downports. On such worlds, a director may shut down one or more downports as part of a program of economic sanctions.

Marine Garrisons

Should a host world seem likely to use military force against an Imperial starport, the port director can request a contingent of Imperial Marines.

The garrison's commanding officer (usually a captain or major) will be under orders to obey the director's general commands. The director may *not* order specific tactics, simply overall strategic goals. The Marine officers retain their own authority to determine how those goals are to be obtained. The line between these split strategic and tactical commands can be hazy.

A military liaison officer (p. 24) handles most of the day-to-day management of the garrison's activities, but only the director (or a deputy to whom he has delegated the authority) can command the troops in action.

Marine garrisons are uncommon in the core of the Imperium; Security officers handle routine law enforcement. Some worlds require an Imperial military presence, however. Even then, garrisons are rarely larger than 500 troopers.

Hardline

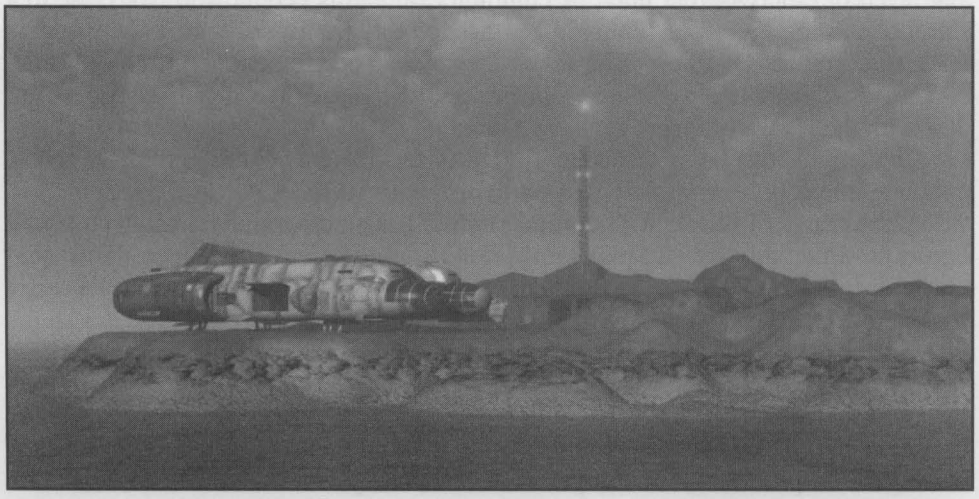
When a world is unfriendly or opposed to the Imperium (for whatever reason), the port is said to be in a hardline condition. Hardline is a political state, and does not always mean physical barriers between port and world, though such walls may become necessary. Of course, some ports with strong barriers on the XT line are no longer hardlined, due to a normalization of relations with the locals.

A Marine garrison or economic sanctions do not necessarily imply a hardlined state, as less-than-total opposition may call for either measure. Again, genuinely hardlined starports are a rarity within the borders of the Imperium itself.

Popular Concerns

While most people think of "planetary relations" as covering only the relationship between a starport and the local *government*, this is not the case. A port director must also contend with the concerns of the local *population*. In most cases, this means listening to complaints about noise and other forms of pollution, as well as meetings with local business and union leaders. Although the presence of a starport on a world is good for the Imperium and for the planetary economy, there are always those who have reason (real or imagined) to be dissatisfied.

Naturally, the line office handles many of these concerns, in conjunction with the port director, the public relations office, and any other SPA division deemed appropriate. These concerns often create headaches and much paperwork, but they do not generally threaten the operation of the starport. Nevertheless, there *are* plenty of individuals and groups who can make the life of a port director a living hell. A good portion of these people are not supported by the majority of the local populace. Yet a director cannot always afford to simply dismiss them and their concerns.



Environmentalists

No one can deny that downports are large and noisy things. Sprawling over vast tracts, they see a great deal of traffic and house a wide variety of substances, some of which can prove hazardous if accidentally introduced into the ecosystem.

For that reason, many starports find themselves besieged by groups concerned about the potential damage wrought by the starport's operations. Some of these groups, like the Pan-Galactic Friends of Life, have legitimate worries and possess a fair amount of influence in the Imperium. Others are truly fringe groups with unworkable agendas. Distinguishing between the two is one of many tightropes a director must walk.

Crossing the Line: The Promise

When seeking XT protection, it is not enough merely to grasp the XT fence and cry "sanctuary" – one must actually be across the line. The port's Security personnel will not interfere with local authorities pursuing the refugee unless the locals attempt to cross the line, or fire across it . . .

Even after crossing the line, a fugitive from the local authorities may still face extradition by the Imperium. As useful as players may find starport extrality, the Imperium intends it for its own purposes. Extrality allows each starport to be an outpost of Imperial civilization and culture. These values do *not* include harboring criminals.

Embassies and Trade Stations

The extraterritoriality status enjoyed by starports is identical to that possessed by embassies and other diplomatic structures. For that reason, it is quite common for Imperial embassies to be physically located behind a starport's XT line. This is especially true on worlds whose local situation is especially dangerous to Imperial personnel. Of course, this arrangement can occur for other reasons as well, as on worlds where land is a significant resource.

Similarly, many non-Imperial governments request that their own embassies be placed behind the line. The Zhodani commonly do this in the Spinward Marches. Their reason for doing so is obvious: security. With the Fifth Frontier War still fresh in people's minds, as well as the Imperial prejudice against psionics, the Consulate is concerned with the safety of its diplomatic personnel. Knowing that the extrality of starports is considered inviolate by most Imperials, the Zhodani prefer to make use of it for their own purposes. The same situation holds true among other governments where security is an issue.

Some starports are also home to trade stations. These establishments exist to promote interstellar commerce. No central authority within the Imperium maintains these stations. Some are run by private companies (on their own or under contract from the Imperium), some by the Imperial Scout Service, and some by branches of the Imperial government (such as the Ministry of Commerce).

All trade stations provide several important services in the course of their mission, including language translation, temporary warehousing, brokerage services, commodities exchange, and many others. All services are provided free of charge. Other related services are also available, for a fee.

Floaters: The Shadow Shift

All major ports have a floating population that lives, but does not work, on the property. As a group they will largely be local citizens with a sprinkling of starfaring refugees, and for that reason they're considered a local-relations concern.

These people live by handouts, eating leftovers from the restaurants (or scavenging the garbage), and sometimes petty theft. SPA does not mention these people publicly, unless an incident forces the PR office to make some kind of statement. In internal documents, they are referred to as Unattached Transients. The common term is "floaters."

Periodically a director (usually a new one) will order a "floater sweep." Security is mobilized to hunt through the port, rounding up all the floaters they can find. Sweeps are disruptive, but rarely violent – most floaters hide if possible but give up quietly if caught. Those picked up are ID'd – planetary residents are passed over the XT line, to the local authority if any; Imperial citizens from other worlds are handed to a social-service agency, though this may involve several weeks of detention until a transfer vessel arrives.

A sweep will catch from one-third to two-thirds of the total population before the disruption is no longer worth the return. The remainder lie low for a while, but they will soon return to their routine (the reduced competition for resources making life a little easier). Within two to three years, the numbers will be back to their pre-sweep levels.

Many floaters of local origin slipped into the port to escape their society, because of repression, intolerance, or just failure to "fit in." Some are refugees from war, disaster, or authoritarian governments. Others are ship's crew, unable to find work or no longer fit for it. Between 5% and 10% are combat veterans – more in the immediate wake of a war. Unreliable estimates (the only sort available) suggest that about half have some kind of mental instability.

From time to time someone finds a floater dead, from starvation, disease, or accident. Usually the body is discovered by Security or engineering; sometimes a passenger finds it, and the PR officer gets to make a statement.

Though all ports have rules against assisting floaters, they are sometimes fed by commissary or other employees, and many Medical personnel consider off-the-books treatment to be much less costly than having roving sources of infectious disease (leaving any moral issues aside).

Continued on next page . . .

Port directors find it in their best interests to treat environmentalists with care. While every effort is made to make the starport as safe and hazard-free as possible, there is always the potential for mistakes. Wildlife habitats can be disrupted, especially in the case of flying animals that might be adversely affected by landing starships. Similarly, fuel and other substances can be spilled, producing a hazard for everyone living near the port. In the interests of public relations, most port directors put on at least the appearance of concern about the issues raised by environmental groups.

Business and Union Leaders

Another common source of concern is planetary business and union leaders, worried about the impact the starport will have on the local economy. Though most port directors seek to maximize local employment, on some worlds the nature of the local economy might be precarious enough that the Imperial starport still could be viewed as "stealing jobs" away from the locals.

Nothing could be further from the truth in most cases. Even so, port directors and the public relations office commonly deal with perceived rather than actual concerns from locals. Unless a director is willing to generate bad public relations, he will do what he can to alleviate these concerns regardless of their merits.

This is a primary reason that the line and public relations offices hold public lectures and educational series. The more the locals know about how a starport integrates their world into the Imperial economy, the less likely they are to perceive it as something "alien" and harmful to the local economy. SPA encourages locals to view the local starport as "theirs," although it is legally an Imperial possession. Starports are a typical site of elementary-school trips. Indeed, childhood experiences on a trip like this are the origin of many careers in the SPA.

These endeavors on the part of the line and public relations offices do not always work, but they go a long way toward making a port director's life easier.

Annoyances and Trouble-Makers

In some cases, there is nothing the SPA administration can do to satisfy an intransigent local. There will always be individuals (or groups) that feel somehow aggrieved or otherwise put upon. A common example is people who live close to a starport and are therefore bothered by the noise level. Every legitimate effort is made to accommodate these grievances. However, a certain amount of noise cannot be abated. Consequently, the port director and the line office must be prepared to deal with the results of their own limitations.

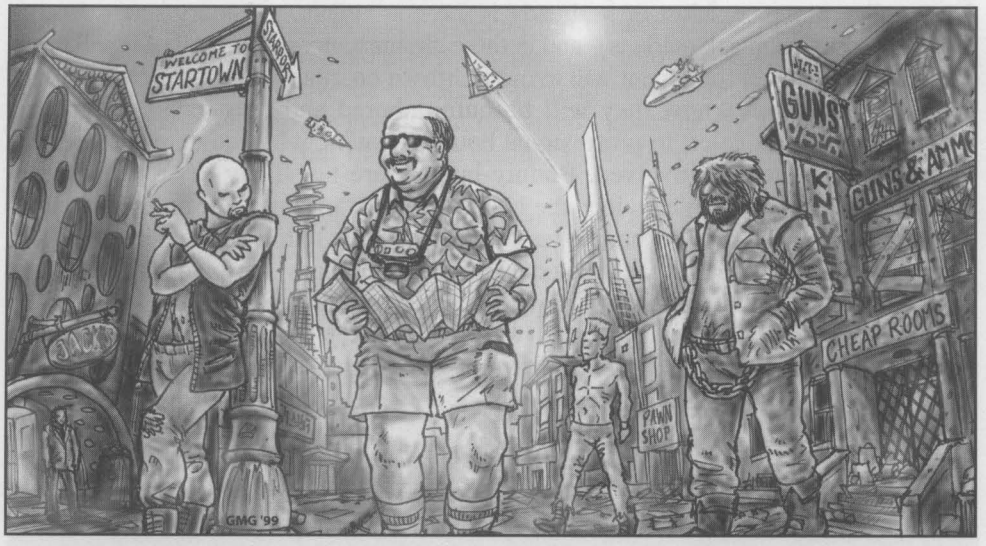
Concerns about noise are actually legitimate, if unavoidable, problems. Most public relations offices would be happy to deal with such problems, when compared to the true fringe of people with unusual problems. One need only recall the tale of a farmer on Emerald (Jewell/Spinward Marches) who believed that even the limited traffic to that world's Class IV starport upset his groats to such an extent that they would not mate, thereby endangering the future of his whole herd. There is also the story of the war veteran on Sarar (Sarar/Antares) who claimed that he could pick up control tower transmissions through his prosthetic limbs.

If asked, most port directors could regale you with dozens of stories like these. In almost every case, nothing could be done to deal with the problem, if indeed it was a genuine problem at all. Starports will, inevitably, inconvenience someone. It is the duty of the director and the line office to make certain that these people do not, in turn, inconvenience the port itself.

Startown

This is the generic name for an area – usually just outside the XT line – occupied by cheap hotels, grimy taverns, and even less savory places, serving the people who are not quite part of either the local community or the port, but associate with both: unemployed star crew and their employed brethren on leave, port laborers hoping for work, petty thieves and con men who work the port when they can get away with it, businesses that can't operate openly, etc.

Most planetary governments would rather just host an Imperial starport, without the Startown to go with it, but only the most draconian, high-CR measures will keep Startown from naturally evolving. The wiser planetary leaders – and SPA port directors – accept that startowns fulfill a necessary "outlet" function for an environment with a large transient population in which people are moving across cultures (i.e., from Imperial to local values, or vice versa).



Alternative Locales

Startowns are not always located just across the XT line. Many planetary governments purposefully keep this zone clear of "disreputable" establishments to form a "safe buffer" for middle- and upper-class visitors. On such worlds, Startown will arise a few miles down the road.

Conversely, though the Imperial Starport Authority frowns on this, a few startowns evolve on the port property itself, wholly within the XT line or straddling it. Most often, these towns already existed when the SPA took over management of an existing port site, or the local government insisted on provisions that ensured the local Startown would be mostly an Imperial problem.

Since all startowns tend to push past the limits of local laws, and Imperial law already is minimal, these can be some of the most exciting ports and startowns to visit. They tend to be low-rent commercial districts peppered with the SPA's freestanding starship berths (see Chapter 5, *Starport Design*). An SPA downport *can* operate with crowded streets between its berths; it is simply less efficient than clear fields and taxiways.

On worlds where Startown straddles the XT line, local Customs officials and starport Security will face a huge challenge in regulating cross-line traffic, unless the host planet has a very low Control Rating and minimal tariffs to enforce, in which case they simply ignore the issue.

Law Enforcement

Most local governments tend to "look the other way" when it comes to startowns, comfortable that those doing business there should know what they're getting into, and hoping that whatever vice takes place in Startown will stay put, and not spread to locales they actually care about. The effective Control Rating in a given startown averages half (round down) that of its host government.

The actual amount of violent crime in most startowns is exaggerated. Many of the people there are just waiting for a chance to gun down an "assailant," and even more are too poor to be worth robbing in the first place. Also, too much violence will eventually bring a show of force from the local law, or at least the local vigilantes. Despite this, odds of becoming a victim of violent crime are usually much larger in Startown than anywhere else on the host world.

Floaters: The Shadow Shift

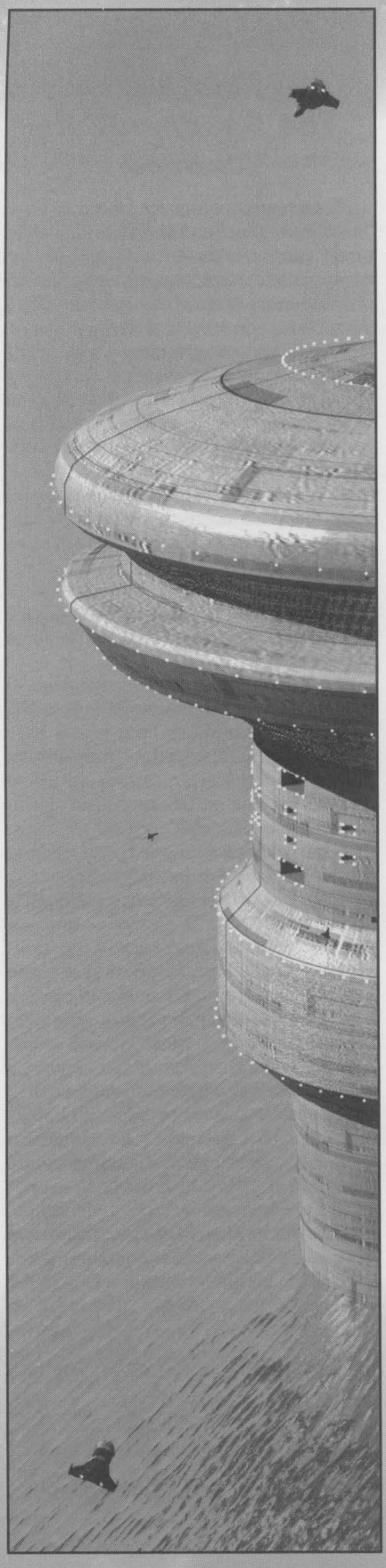
[Continued]

There is no consensus on the precise "nature of the floater problem." They rarely cause violence (those who do are easily spotted and removed), though some people see nothing wrong with attacking *them.* Many passengers find them annoying, repellent, or frightening. They cause a certain amount of mechanical damage, by breaking into containers for food, tapping water from pipes, or building small fires for heat or cooking. While these are definitely problems for the port, many directors consider them manageable, and less costly than the largely ineffective sweeps. No one has a solution to their existence, though solutions from every part of the political spectrum (from "build places for these people to live" to "kick them out the nearest lock") have been tried to some degree.

A Class V downport will have from 50 to 100 floaters, and can support up to 400 on Earthlike worlds. A P/IV would have half to two-thirds as many. Highports, or ports on hostile worlds, can support about half as many as on the equivalent downport with breathable air.

From an adventure standpoint, floaters can be sources of information, especially on illicit activities going on literally behind the scenes. They may or may not risk themselves to help someone in trouble, but they know better than anyone where the escape routes and hiding places are. Down-and-out travelers may find themselves living as floaters for a while. Agents or spies may prefer to be picked up in a sweep and hide out in the relative safety of detention rather than risk having their fake ID exposed. During a sweep, some of the port's non-floater criminal element will lie low to avoid being picked up, while others use Security's preoccupation to attempt more elaborate than usual thefts or swindles, which a group of transient adventurers may find themselves the only people in a position to stop.

Having been a floater is a 5-point Unusual Background that gives a +1 to reaction rolls from other floaters and allows knowledge of secret places. Survival (Urban) is a common skill among floaters, as is Area Knowledge (Starports) and Hidden Lore (Starports).



On some worlds, local law enforcement maintains a large station in Startown. This doesn't keep them from lowering their normal standards, should they be so inclined, but places them in good position to rescue a foolish tourist or respond to a particularly outrageous breach of local decorum. Many of these officers are overworked and underpaid; these factors – combined with the "double standard" that even honest Startown officers must respect – makes some of them quite susceptible to bribery. Consequently, the large volume of illegal activity seen in most startowns may take place in sight of a large police presence. Most of it already is the non-violent, voluntary sort – fencing stolen goods, vice, black markets – and in these circumstances almost all of it will be.

The local law enforcement will avoid Startown on other worlds, unless on a specific mission. They know they will be outnumbered and outgunned. Extracting wanted individuals is left to professional bounty hunters, who can demand payment appropriate to the risk involved. Bounty hunters are not likely to be welcome in Startown unless they can convince the locals they are "off duty," or unless the target has caused so much trouble that the residents are willing to look the other way.

Military police patrols are also a common sight in many startowns. The MPs are rarely present to arrest criminals or investigate wrongdoing. Rather, the MPs will be on the lookout for military personnel who have broken their curfew or have gone AWOL. On worlds with a nearby military base, Startown will attract many off-duty military personnel looking for "excitement."

There are a few "clean" startowns, on worlds with such high law levels that massive police efforts are used to prevent the conventional "wrong side of the pads" from springing into being. Such worlds tend to be intolerant of many sorts of people and behavior, and starport hangers-on usually fit the category. Startown, therefore, becomes a kind of quarantine area for those who work on port property, don't live there, yet are not wanted in the local community. The residents are mostly working class rather than down-and-outers, and keep their town as tidy as possible under the circumstances. There is inevitably an underworld, but the fact that they have literally nowhere else to go – along with a peculiar sort of "civic pride" – keeps the shady types' profile low. These places usually have names like "Starview" or "Waseca Down Village" to distinguish them from the more usual startowns (see also *Jesedipere Downport,* p. 47).

Doing Business

On most worlds, the planetary civic promoters would hate to admit the out-of-proportion amount of commerce that takes place in the world's startown. (Provided, that is, that they have some means of measuring the underground economic activity.) Most Imperial worlds tend to specialize in some economic activity, such as agriculture, mineral commodities, manufacturing, etc. This often creates surpluses of many goods and a scarcity of many others. Also, the Imperial markets cater to hundreds of local cultures, meaning that they include just about any product that can be imagined, despite the fact that in any given one of these cultures a large percentage of those products will not be welcome.

In short, this means that on most worlds many products are in short supply and/or restricted. This is exactly the sort of merchandise that the average startown exists to peddle. Hundreds of items that officially don't exist on a given world will be found in its Startown – for the right price.

Negotiating a startown purchase is substantially trickier than an entirely aboveboard transaction. Goods unique to Startown tend to be offered at 300% of their normal price. The purchase of these goods requires a buyer to make Merchant and Streetwise rolls. Use defaults if need be. An Area Knowledge (the particular startown) roll can be substituted for *one* of these rolls, if the Area Knowledge skill is higher.

Failure on the Merchant roll increases the price 10% per point of failure, or 150% on a critical failure. The buyer is being taken for a tourist. Failure on the Streetwise roll means the buyer can't find a seller (but can try again tomorrow). Failure by 5 or more brings police attention, with an arrest on a critical failure.

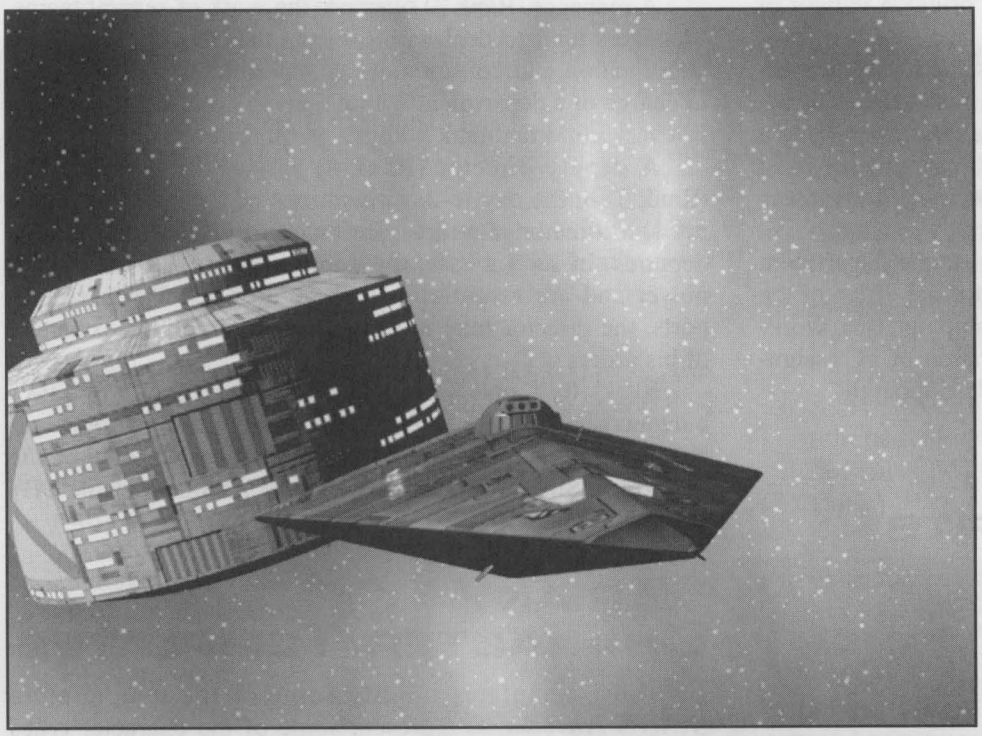
Success on either roll lowers the asking price by 10% per point by which the roll was made, down to -100% on a critical success. These modifiers are cumulative.

Getting Into Trouble

Startowns offer a lot of opportunities, many of them involving getting into trouble. A bungled Streetwise roll on an illegal transaction is a popular method for drawing the attention of the local police.

So is the good old-fashioned bar brawl. Many on-leave merchant crews and military personnel like to let off a little steam in this time-honored fashion, so PCs looking for a scrape should be able to find one. As long as the donnybrook limits itself to fists and the occasional improvised weapon, most local law will take their time in appearing. They then apprehend everybody they can, turn over appropriate personnel to the MPs, and often allow the intelligent participant to compensate the bar owner for damages in exchange for getting out of custody immediately. If only a single PC is trying to buy his way out of trouble created by a 30-person free-for-all, this can become very expensive . . .

As soon as they receive a report that someone has produced a purpose-built weapon, the police attitude changes. They arrive quickly, with civil liberties not at the forefront of their decision tree. Everyone involved – weapon-wielding or not – will be arrested and have their appointment calendars ruined.



Getting Out of Trouble

A PC who gets into trouble short of arrest (a bungled but not critically failed Streetwise roll, a tardy exit from a good-natured brawl) can usually end the matter with a good reaction or successful Fast-Talk roll and any appropriate cash payment.

An arrest changes things. The PC will be detained for planetary Control Rating+1 days for a minor crime (soliciting a victimless crime in a startown where the crime is openly transacted, using fists in a brawl where somebody *else* pulled a gun). This will triple for average crimes (soliciting an illegal and incapacitating drug, doing serious harm with one's fists). It will increase by a factor of 10 or more for serious crimes (selling the illegal drug, pulling the gun oneself).

This is simply pre-trial detention. Posting bail and hiring an attorney (GM sets his fees . . .) usually can lower detention time by one day for each point by which a Law roll is made. Minor and average criminal charges usually can be settled with a plea, fine, and/or promise never to return to the planet. Serious crimes require a trial, and the PC's local criminal record will be reported to Imperial authorities – even if he avoids a prison sentence or flees while on bail.

Startown Is Where?

Everyone associated with space travel and trade – including those whose association is watching cheap adventure vids – knows what "Startown" means, but these districts frequently have local names as well. Often the name predates the growth of Startown, and sometimes even the port. Many ironically reflect a long-gone (or only hoped-for) splendor: Castle Hill, Parkside, Silver Grove.

Residents of the world – even residents of Startown – may insist on calling the place by its "real name," either as a way of denying the ugly suburb, or one more superfluous excuse for a Startown bar brawl. But those who hop into a taxi, flash some money, and say, "Take me to Startown, and step on it" – will get there. And stepped on, too, most likely.

Jesedipere Downport

A good example of the "rough around the edges" communities that can grow up around a starport is "Downport," located a few miles south of the true downport on the world of Jesedipere (Spinward Marches 1401). Downport is popularly considered a stereotypical Startown. Outsiders believe the place to be nothing but bars, gambling houses, and other unsavory establishments.

Yet, this is something of a misconception. While Joy Street does contain many such places, Downport also is home to many businesses of rather better reputation. Warehouses, small trading stations, and shops selling Vargr souvenirs can be found throughout the area.

In truth, Joy Street and its environs represent a very small segment of Downport. Admittedly, this segment is perhaps the most well known, being the source of great interest throughout the worlds of the Aramis subsector. Downport is the nexus for smuggling, fencing, and other illegal activities on the planet. Downport has not yet been posted as an Amber Zone, but visitors should be prepared for anything.

Like Jesedipere Downport, other Startowns may have only a small portion of their total area taken over by crime and vice. Yet, it is these small portions that are often the most interesting to interstellar travelers and adventurers. While the local Chamber of Commerce may not like to advertise these areas, they nevertheless are a draw for many outsiders.

Chapter Two

The Unified Armies of the Imperium

Master Sgt. Kevin Walsh looked up from his traffic-control table to admire the situation surrounding him. Issuing forth from gigantic ***Nakerkh****-class transports were the vehicles and troops of the 48th Lift Infantry Division, the Shadow Cats. Tanks and personnel carriers, already formed into battalion elements, were heading out toward the training area, trailed closely by brigade and division artillery units. Behind the grunts came the innumerable g-carriers, wreckers, and engineering vehicles of the support units. Air/rafts darted madly in and around the larger vehicles on unknown errands.*

Untangling this mess into a coherent fighting force was Walsh's job, and he wasn't getting it done standing here sipping his tea. With a sigh, he turned back to the chaos of the division traffic-control point.



The Imperial Army is more formally known as the Unified Armies of the Imperium. This body of troops is designed to be the heavy defense force on the surface of member worlds. Because the Imperium is so vast, and faced with different threats on every border, day-to-day control of the Army is given to the subsectors. Each subsector has its own army, and is expected to operate independently, organizing and planning for its own particular needs.

Imperial Command

The combined High Command for the defense of the Imperium is located on Capital. The High Command plans decades or even centuries in advance to try and anticipate the needs of the various armies.

Since the armies answer to their local dukes, there is no one single Unified Armies commander in chief. The High Command's only real influence is in advising the Emperor on military matters and evaluating the Army's performance.

The Imperial Guard is also stationed on Capital. This unit is unique in the Imperial force structure, being a mostly ceremonial unit with the duty of guarding the palace. The Guard's regiments are drawn from the sectors of the Imperium, with an additional full regiment of household cavalry and artillery. If deployed as a single unit, the Guard would make a formidable rapid interface division.

Sector Command

The Sector Command is the highest level of command that directly controls regular Army units on a daily basis, overseeing the logistics and reserve units for the Unified Armies when it mobilizes. In wartime, units leaving their home subsector come under the control of the Sector Command for the duration of their transit. Units leave this control only when they either return home or are attached to a subsector army for combat.

Imperial funding of subsector armies is also handled by Sector Command. Since planning is done decades in advance, each army submits an annual update on its projected needs over the next 10 years. Budget allocations are made based both on these figures and on the needs of the sector as a whole.

Finally, the Sector Command controls the strategic reserve for the sector. This consists of all army units out of their home subsector and in transit, Sylean Ranger battalions, and all colonial forces brought into Imperial service. In theory, the Sector Command has a say in Marine Force deployment as well, but this has been the subject of some dispute between the two services.

Unified Army Command (Subsector Capital)

Each subsector's Unified Army is the heart of the Imperial defense. The subsectors craft their forces to meet their individual needs and threats. Subsector Headquarters is where the actual purchasing of equipment and war planning takes place. The subsector commanders purchase equipment that meets the Imperial standards, many times using funds passed down from Sector Headquarters. Poorer subsectors receive enough aid to properly outfit their army.

Operationally, the Army HQ coordinates the actions of its forces, in addition to those assigned to it by higher command, in the defense of the subsector. If offensive operations are called for, subsector troops may be assigned to the assault force at the Sector Command's discretion. One problem that has hindered the Imperium's ability to mount offensives against the Zhodani is the reluctance of some subsector authorities to allow their forces out of their immediate control. Given the exposed nature of the Domain of Deneb, this is understandable. In contrast, during the Solomani Rim War the Imperium had little trouble getting the troops they needed.

The Unified Army takes its orders from the subsector's highest-ranking noble, who commonly appoints an experienced general to serve as marshal. This appointment to subsector marshal is for life, and most often is accompanied by a title and a small fief. One very important point often missed by the casual observer is that the units under the marshal's command actually belong to the subsector, not to the Emperor. While the troops owe allegiance to His Majesty, the chain of command ends with the local nobility. This frees border areas to defend themselves without having to wait for instructions from leaders that are over a year away. It also provides the peerage with a powerful tool balancing the Emperor's influence.

For the average foot soldier, none of this high-level maneuvering matters as much as when the next meal is going to arrive.

Army Organization

After the Solomani Rim War, the High Command at Capital adopted a modular approach to building units. Using standardized small formations, larger units could be constructed to fill specific mission requirements.

The smallest unit deployed is the brigade, which is made up of five combat battalions plus a support battalion and headquarters detachment. To create larger units such as divisions and corps, brigades are matched with additional combat and support units which serve as combat multipliers. These units enhance the combat power of the composite unit far beyond what their numbers would indicate. An example of this is the attack-speeder squadron attached to corps-level headquarters. While only present in battalion strength, the speeders' presence in conjunction with more conventional units can tip the balance in battle.

The Unified Armies command builds its combat formations around four basic types of combat battalion, along with a standardized support battalion. These battalions, and the equipment they use, are uniform throughout the Imperium.

The Command and Staff Sections

The commander of a combat unit is faced with the difficult task of having to direct the battle, plan for the next one, and still manage the unit's logistic concerns.

Regimental Lineage

While the combat commands are organized around brigades, the Army's history and honors are handed down through the various regiments. Each battalion is part of a regiment. These regiments are not actual organizations, but exist only as a source of esprit de corps and pride for the members of that regiment.

When the Sylean Army became the Imperial Army, many units resisted giving up their old unit ties for the new system. Also, as the Army grew, it became clear that without some new type of organization, the Army would soon be dealing with extremely large and unwieldy unit numbers. As early as the year 80, the number of divisions in Imperial service had reached well into the thousands.

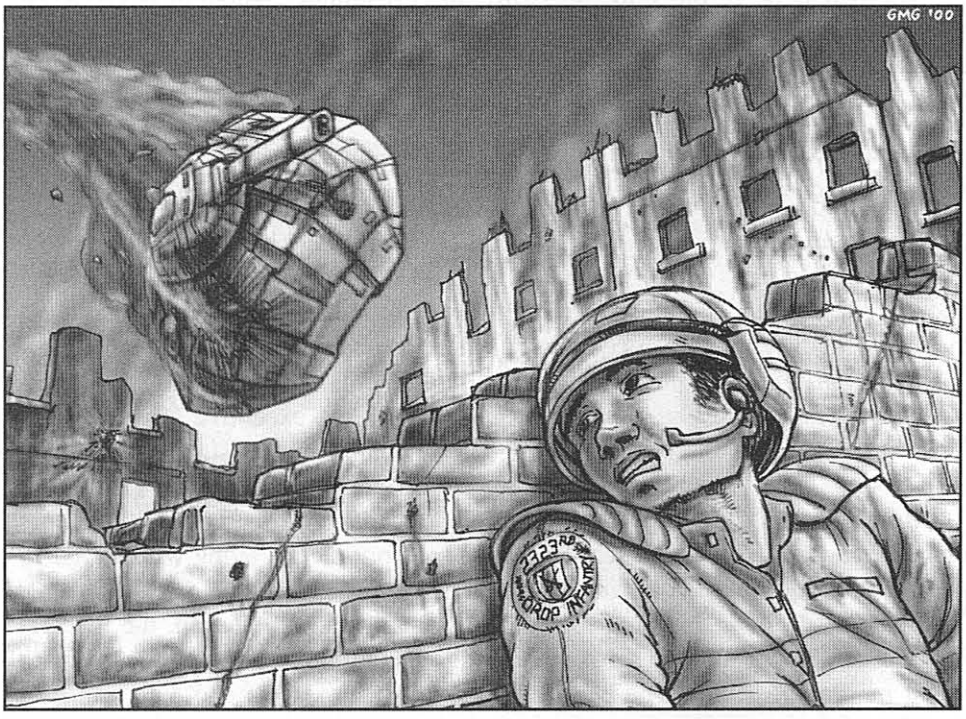
In the year 123, the Army High Command instituted the regimental system. Under this plan, each world of the Imperium raises specific regiments for the Imperial Army. These regiments are named for the world, or can be named for a specific region on that world where the bulk of the troops lived. Some units carry more colorful names, referring to a particular habit or notable trait of the troops. One hard rule is that the name has to identify the type of troops in the regiment, although even here some leeway is given. There exists a list of acceptable terms for infantry, cavalry, and other types of units.

For example, an infantry regiment from Mora could be called the 102nd Moran Rifles, or the 1st Culhoon Heights Regiment of Foot, or even the 4th Matriarch's Guards Rifle Regiment.

Regiments tend to be composed of three to five battalions. It is very rare to see all three battalions serving together in a brigade, since the presence of several different regiments encourages competition between the units to be the best soldiers.

For this reason, battalions and larger units have administrative staffs to handle these details. There are four basic staff sections:

Operations Section: Led by the operations officer, who is assisted by the operations sergeant and a team of lower-ranking NCOs and junior officers. This section is responsible for presenting the commander with plans for whatever endeavor the unit has been assigned. In this duty, the operations team relies heavily on the other command sections. In battle the ops troops have to work feverishly to adjust the plan to account for the changing situation.



The operations officer plays a vital role in his unit's successes (or failures). The job is considered to be a vital stepping-stone to higher rank and command.

Intelligence Section: The intelligence officer is required to present all the information received from sensors, reports, and higher commands in a clear, concise manner to his commander. The intelligence officer and his intel NCO will have very different resources depending upon their unit. A brigade intel shop will have over a dozen analysts and interception specialists. At the other extreme, a manpower-poor grav tank unit might be forced to make do with a captain and a staff sergeant, neither of whom have formal training in intelligence.

Adjutant: This officer and his small staff are concerned with managing the bureaucratic end of the unit's affairs. The adjutant is responsible for coordinating all personnel actions and organizing the flow of information for the commander.

Supply Section: Responsible for managing the flow of material into the unit, and ensuring that each sub-unit gets what it needs and what it is entitled to have.

The Battle Staff System

When in combat, staffs operate three command posts. The Primary Command Post – consisting of the commander, operations officer, intel NCO, and the fire-support NCO – is responsible for fighting the current battle. The Secondary Command Post is further back from the action, and consists of the executive officer, intelligence officer, and operations NCO. They plan the next actions, and stand ready to assume command if the Primary Command Post is unable. Lastly, the Logistics Command Post has the logistics officer and sergeant major working to keep the battalion running in terms of supply and support.

Gunbarrel Diplomacy

"I had been alerted by our sentries that one of the local religious leaders was approaching my headquarters and demanding to speak with the officer in charge, but nothing could prepare me for the circus that was to follow.

"A few minutes after the warning, an ancient, battered ACV crawled up Deela's dusty streets and settled by my command APC with a crash. Out came the damnedest assortment of courtiers, assistants, and general hangers-on, who seemed to a man dedicated to ignoring us. Finally, the Grand Seer and Most High Voice of God, Jussi Kenkkilï, deigned to exit his 'limousine.'

"He didn't come up to my chin, even counting the ridiculous headdress.

"'Heresy! Sacrilege! You defile the Holy Quarter!' he was screaming before he even recognized me as the commander. Once he had his bearings, he rushed over in a stride that would have flattened an ***Intrepid****.*

"'Do you know what you have done?' he cried in something approaching Galanglic. 'You have let unclean ones enter the Forbidden Areas! You hold the responsibility!'

"My first instinct was to don my suit helmet and turn the audio feed off, but my orders were clear: Be diplomatic and work with the local leaders.

"'Most High, may I inquire how we have offended you?' I said, hoping that I sounded a lot more sincere than I felt.

"'You need ask?! ***That*** *is the offense to God!' he howled, pointing at a comm tech, a* ***female*** *comm tech. Oh, boy. I seemed to recall something from the briefing . . .*

"'Women have walked unescorted into the Holy City! Some may have even laid eyes upon the Spire itself! They must be purged! Driven out with whips and fire!'

"Right. Enough of that. Grabbing him in mid-rant I pulled the Most High right into my face, using every inch of my height to loom in my most intimidating manner.

"'You listen closely, buddy. This city, and everything within 500 miles of it, is under the jurisdiction of the 4,760th Lift Infantry Brigade. Which is to say it's mine. You lost any right to make demands when either you or that other camp of maniacs here lobbed nerve gas into the starport. It's called an Imperial intervention, my friend, and unless you can produce some divine intervention, you don't make demands, you make meek little requests. Do you understand every single thing I've said?'

"I realized that I was holding him about 6" off the ground, and let him drop. Ashen-faced, he and his camp followers piled back into the ACV, which wobbled back down the street toward the city gates. Never heard a peep out of them again.

"I could get used to this diplomacy stuff."

– Graeme Batho, Major General (ret.), ***Four Decades a Soldier***

This plan allows the battalion to operate on a continuous basis by shifting overall command duties through the different CPs. For instance, when the Primary Command Post is changing locations or otherwise out of communications, the Secondary Command Post can take over during that interim. When command is taken over by the Logistics Command Post, the executive officer is usually sent to be the commander there.

Lift Infantry Battalion

The backbone of the Imperial Army, the lift-infantry battalion is given the task of taking and holding ground. The battalion uses equipment from a variety of sources, from TL10 to TL12. Each of these units has a headquarters company, three lift-infantry companies, and a fire-support company, totaling 648 troops.

Headquarters and Headquarters Company

The headquarters and headquarters company contains the actual command group, a medical platoon, a scout/forward observer platoon, a maintenance section, and a field mess section. The unit has 128 soldiers assigned to it. The operation of the unit needs to be separated into the actual headquarters, which leads the unit, and the headquarters company, which provides support to the battalion.

Headquarters: The command section is the actual leadership for the battalion, consisting of the battalion commander (O-5), the executive officer or XO (O-4), the battalion sergeant major (E-9), the four battalion staff officers, and their troops. The 56-man section travels in seven Command *Astrin* APCs.

Headquarters Company: Commanded by a captain (O-3). The small company headquarters has the first sergeant (E-8) and four clerks, along with an *Astrin* APC. The headquarters company also includes:

Medical Platoon: Nothing more than a small field aid station, the medical platoon is only concerned with stabilizing casualties before sending them to larger medical facilities. The battalion medical officer (O-2) and his 10 medics use five air/rafts modified to transport wounded personnel to the aid station, which is carried in an unarmed *Astrin*.

Scout Platoon: The scouts are responsible for patrolling to the battalion's front and flanks. They also are trained to adjust artillery fire. The six four-man sections operate from an air/raft each, with the platoon's lieutenant and platoon sergeant serving with the teams.

Maintenance Section: This section handles the battalion's vehicle park, and all the heavy maintenance and repair work that the vehicles require. The section is usually the domain of the park sergeant (E-8 or -9), who answers to the logistics officer, and a crew of 20 mechanics. The section has two g-carriers, and two heavy recovery vehicles.

Supply and Service Platoon: Contains three g-carriers, one with a field kitchen, tended by the service officer (O-2) and nine troops.

Lift Infantry Company

The lift infantry company is the unit most likely to be encountered in a conflict with Imperial forces. Quite often, the individual companies will have assets like electronic warfare support or engineers attached for a specific mission. The company has 154 infantrymen in three line platoons and the headquarters platoon.

Headquarters Platoon: Contains the company commander (O-3), his XO (O-2), the first sergeant (E-8), a supply sergeant, two company clerks/runners, and four vehicle crew members. The commanding officer and the exec operate from *Astrin* APCs, where they double as vehicle commanders. The first sergeant and supply sergeant, along with the two clerk/runners drawn from the ranks, operate in a g-carrier or air/raft.

Military Pay and Benefits

No one has ever become rich serving in the Imperial forces, but the Army and Marines attempt to pay their troops enough to survive. Along with their pay, soldiers and Marines receive several benefits. Troops have free housing in the barracks or officer quarters, three hot meals a day, free medical care and legal advice, and access to low-cost goods in the post exchange.

The basic pay for enlisted troops is:

Cr100+(Cr50 × Enlisted Rank number × (years in service/2))

A Marine with three years in service would be paid 100+(50×2×(3/2))=Cr250 a month.

An Army first sergeant with 20 years in will make 100+(50×8×(20/2))=Cr4,100 each month.

Officers make:

Cr200+(75 × Officer Rank number × (years in service/2))

A Marine brigadier with 27 years in the service will make 200+(75×7×(27/2))=Cr7,287.5 monthly.

Many soldiers will want to live away from the barracks, and some soldiers have families. These troops receive an additional block of pay called *separate rations*. This varies from place to place depending on the local cost of living, but is always enough to support the soldier (and any family) in minimal comfort.

Soldiers who serve honorably for 20 years may retire at half-pay. Those serving 30 years or more retire with their full pay as pensions. The pension will be delivered to the retiree's listed home address, or deposited into an account. Marine retirees receive vouchers, redeemable at naval bases.

Lift Infantry Platoon: Led by a lieutenant (O-1 or O-2), infantry platoons have a command squad with the commander, platoon sergeant, two snipers, and two field medics. There are three rifle squads, each led by a sergeant (E-5) with two heavy weapon specialists and seven riflemen. The four three-man *Astrin* crews are also organized as squads within the platoon. The 48 troops ride in four *Astrin* APCs.

In combat the platoon deploys as close as possible to the edge of the battle area. The *Astrins* stay to the rear, providing fire support as the troops advance. Whenever they can, Imperial infantry prefer to call in artillery or other heavy support, but that is not always feasible. Each squad is built around its heavy gauss guns, and moves as two closely knit teams. The platoon snipers, who are usually simply the best shots in the unit, work through the platoon's area of advance, placing fire on single targets while the others fire in a more general manner.

Fire Support Company

Infantry units too often find themselves pinned down and unable to call for help, or with no help available. For this reason, a fire-support company was added to each infantry battalion. The additional firepower generated by the 58 soldiers in this grav-tank company can make all the difference in a close engagement.

Headquarters Platoon: Contains two *Bergstrom* light grav tanks commanded by the company commander and the XO, while the first sergeant uses a G-Carrier to execute his duties. The platoon only has 10 soldiers in it, and the commander relies heavily on his subordinates to shoulder the work that would normally be placed on command staff.

Fire Support Platoon: Four platoons of four *Bergstrom* tanks, each with 12 tankers. Each is led by a first lieutenant; this unit is one of the smaller regular Unified Armies formations with an officer in command.

The tendency has been to split the platoons among the infantry companies, with one held in reserve. Some battalions have experimented with using the light tanks as a "pocket cavalry" force, able to immediately exploit an advantage without aid.

Lift Infantry Equipment

The standard Imperial infantryman carries a KG56A3 4mm Gauss rifle (p. 102) and five spare magazines. He also carries several RAM grenades or a MANPAT-60 anti-armor missile (p. 102). The trooper will also haul a spare ammo cassette for the squad Gauss light support weapon. He wears Army combat dress and the distinctive "teardrop" Army helmet. Along with this gear, the soldier carriers water, an aid kit, and an entrenching tool. The total weight carried by the infantryman averages 70 lbs.

Grav Tank Squadron

The arm of decision, grav tanks represent a brigade's heavy force. Standard practice is to use grav armor as a breakthrough element, forcing a breach in the opposing army's lines to gain access to the vulnerable rear-area units. The squadron (equivalent to an infantry battalion) has 44 of the powerful vehicles run by 325 soldiers in three tank troops, plus the headquarters and the headquarters troop.

Headquarters and Headquarters Troop

The squadron's headquarters contains a command post section, and the necessary support platoons. The HHT has 127 cavalry troopers assigned.

Command Section: This is the actual leadership for the squadron, consisting of the squadron commander (O-5), the XO (O-4), the squadron sergeant major (E-9), the four squadron staff officers, and their 28 troops. The squadron CO and XO both travel in personal *Intrepid* grav tanks, with the rest of the headquarters using five Command *Astrin* APCs.

Counting Cadence

Big drop ship sliding through the sky
Sylean Rangers on their way to die
Mission unspoken, world's name unknown
Ain't no way they're coming home
Seal up the pod and drop through the deck
Sylean Ranger's going to break his neck
At 40,000 AGL
Take a deep breath and pop the shell
What do we see as we look around?
Sylean Rangers heading for the ground
If my CG don't work for me
I'm coming in at point one c!
Colonel, Colonel, won't you look at me
From Sylean Ranger to ortillery!
Big drop ship she's sliding away
One more Ranger died today

Barracks Life

Most troops will live in a barracks, a large building holding a single company-sized unit. Depending upon the unit and the force, the barracks may be a single open room with rows of stacked bunks, or a collection of small two- and four-person rooms. Whatever the style of building, there are a few things that seem to be found in all barracks.

Barracks are crowded, noisy places. Home to several dozen young adults, they are always bustling with energy. During the business day, soldiers will be performing any number of tasks, from maintaining weapons to repainting stairwells.

Whenever possible, fire teams and squads will be bunked together. Living and working together helps to build the teamwork needed if the troops ever find themselves on the battlefield. The troops will also learn each others' strengths and weaknesses, and learn to aid each other. While the immediate reason for this is to avoid the wrath of their squad leaders, the long-term result is an effective combat team.

With so many different personalities thrown together, conflicts are inevitable. A major concern for a unit's leadership is directing these conflicts away from possible violence and into more constructive efforts. Many units hold competitions in hand-to-hand combat, or other military-oriented sports.

A major part of life in the barracks involves cleaning. Floors, bedding, outside areas . . . all require constant attention. Daily inspections for cleanliness and order are carried out by all levels of the unit leadership.

Regimental Mess

Each regiment in the Unified Armies keeps a regimental mess, a combination social club, dining facility, and post exchange that travels with the regiment's battalions. The mess provides a variety of services and goods to the officers of the regiment, charging mess dues to cover the expenses. Depending on the regiment, these dues can be quite high, as much as Cr2,000 per year. Generally speaking, older units with better reputations and social importance will have higher dues, while "unfashionable" units will have more modest dues. The average cost to an officer is Cr800 per year.

The most commonly discussed function of the regimental mess is to provide a social arena within the regiment. When in garrison, the mess will occupy a building, creating an officer's club and decorating it with holos of famous actions in which the regiment has fought, regimental and battalion staff photos, unit citations, banners, etc. The only consistent decorative item is the regimental crest, usually mounted on a large wooden plaque behind the bar area. Many social contacts can be made in the mess, and it is a place where officers may attempt social/political maneuvers. The futures of many children have been arranged in the back rooms of the officer's mess.

A curious feature of the regimental mess is the mess president. Elected from among the regiment's officers, the mess president is responsible for the smooth operation of the mess. Should an officer not pay his dues, it is the president who will inform that officer that his presence is no longer welcome in the mess. This is a dreadful social snub, and has led to scandals and duels. In matters regarding the mess, the president is the ultimate authority; accordingly, the mess president is often the highest-ranking member of the regiment present, such as a battalion commander. A new president is elected when the post is eventually vacated by resignation, retirement, reassignment, or death.

Since Army regiments do not campaign as units, the individual battalions form their own versions of the mess, electing a mess president and vice. The battalion mess is in most respects identical to the regimental mess, except of course for its smaller size. There is no tried and true formula to determine which battalion will host the true regimental mess; generally this honor goes to the most tenacious . . .

NCOs in a regiment sometimes create their own mess, similar to that of the commissioned officers, but tending to downplay the social maneuvering that frequently takes place in the officer's mess. Dues are lower than those for the officer's mess; fewer services are officially provided. In most cases, however, the NCOs themselves equip their mess to a standard that might even eclipse that of the official mess.

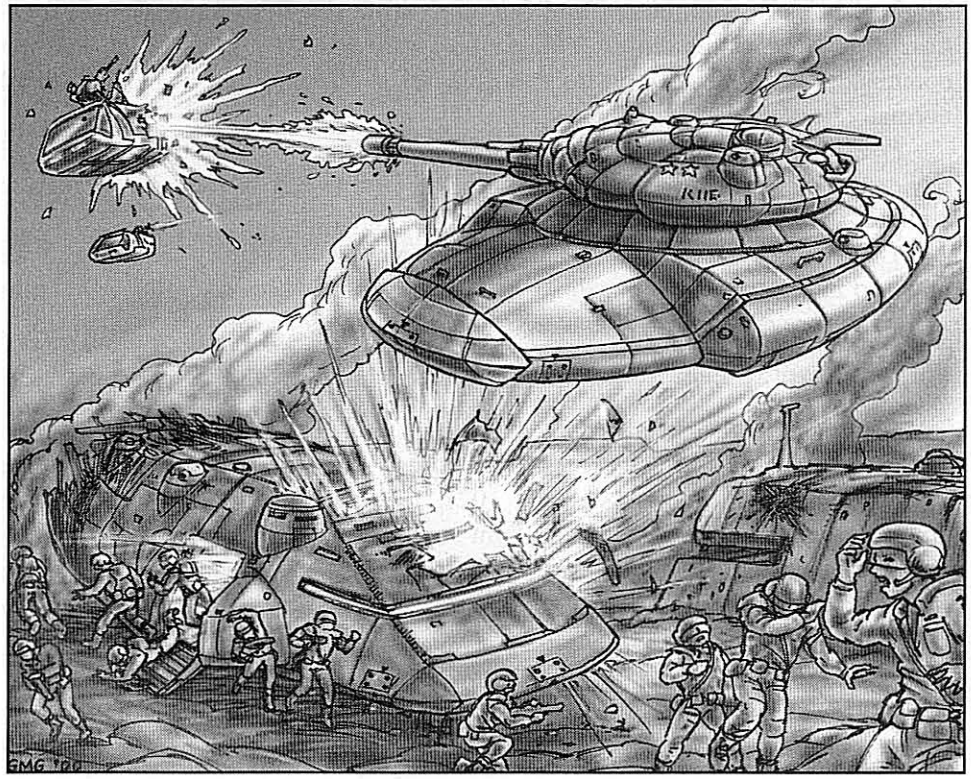
Headquarters Company: Commanded by a captain (O-3), the small company headquarters has the first sergeant (E-8) and four clerks, along with an *Astrin* APC. It also includes:

Medical Platoon: Like the infantry field-aid station, the cavalry medical platoon has the duty of performing the immediate life-saving duties that ensure a casualty will survive until transferred to a better hospital. The squadron medical officer (O-2) and his 10 medics use two air/rafts and two g-carriers modified to accommodate wounded personnel.

Maintenance Section: This section handles the squadron's vehicle park, and all the heavy maintenance and repair work that the vehicles require. The section is usually the domain of the park sergeant (E-8 or -9), who answers to the logistics officer, and a crew of 40 mechanics. The section has two g-carriers, and four heavy recovery vehicles.

Scout Platoon: The scouts are responsible for patrolling to the squadron's front and flanks. Given the nature of their squadron, the rule of thumb is to find a target, then get out of the way. The six four-man sections operate from air/rafts.

Supply and Service Platoon: Contains three g-carriers, one with a field kitchen There are 10 soldiers in this section.



Grav Tank Troop

Troop is the archaic term for a cavalry company, and remains in Imperial service. Each troop has 66 tankers manning 14 *Intrepid* Grav tanks, organized into three platoons.

Headquarters Platoon: The troop commander and XO command their own tanks, while the first sergeant and supply sergeant coordinate supply with two *Astrin* APCs, for which they also serve as commanders. Four soldiers are assigned as runners or clerical help; another 10 crew the four HQ vehicles.

Grav Tank Platoon: The basic four-tank element used for centuries. The 16 cavalry troopers in each platoon are responsible for the basic maintenance of their vehicles.

Tanker Equipment

Grav tank crews wear combat environment suits (p. GT118) hooked into the vehicle life-support system. For their personal defense if they are forced to abandon their vehicles, tankers carry Gauss SMGs.

Lift Artillery Battalion

Artillery has long been known as the "King of Battle." The awesome firepower available to commanders using modern missile platforms and meson vehicles ensures that this title will not go away soon. The standard artillery battalion contains two distinct weapons systems: the *Sunburst* missile sled with various launchers for a variety of missions, and the unparalleled destruction of the *Terrapin* battlefield meson sled. Missile sections can fire everything from dozens of small anti-armor drones to massive strikes using SATNUC warheads.

On paper, the battalion practices even more overkill in its quantity of fire direction available. In practice, the Unified Armies have learned that at least triple redundancy is required because of casualties, the loss of lines of communication in battle, and the need to set up targeting data five or six stops in advance to remain efficient when the "shoot and scoot" fire missions get frantic.

The battalion has 406 troops.

Headquarters and Headquarters Battery

HHB has 76 soldiers. Because of the requirements of the fire control and observation platoon, there is a higher percentage of junior officers in the artillery HHB than in most comparable infantry and armor units.

Command Section: The CO and the sergeant major, along with the battalion staff, use Command *Astrin* APCs. The XO uses a Fire Direction model. In all, the section contains 20 troopers.

Headquarters Company: Commanded by a captain (O-3), the small company headquarters has the first sergeant (E-8) and four clerks, along with an *Astrin* APC.

Medical Platoon: The artillery battalion's medical staff is usually smaller than those in other line units. Since the gunners are not supposed to become involved in direct combat, the need for forward aid units was deemed minimal. The medical officer has only two air/rafts and four medics to help him perform his duties.

Electronic Warfare Platoon: These troops are responsible for both fixing enemy locations for the combat units and shielding the artillery batteries from enemy retaliation. The electronic warfare platoon contains four EW-variant *Astrins*. Standard procedure is to send one of the vehicles to serve with each firing battery, while the fourth *Astrin* remains with the Primary CP.

Fire Control and Observation Platoon: The FC/O platoon is responsible for providing fire-support personnel to the units that the battalion is supporting. This platoon is staffed by teams of mid-level NCOs paired with low-ranking officers. These teams move forward with the infantry or armor unit, and provide a liaison back to the artillery. There are 10 teams, each with an air/raft.

Supply and Service Platoon: With duties akin to those of the SSP in the infantry and cavalry, the unit has 10 troops and three g-carriers.

Missile Battery

Two of the three firing batteries in the battalion are equipped with one of the variants of the *Sunburst* missile sled. As a matter of practice, most division-sized units keep a large stock of alternate weaponry in storage.

Headquarters Platoon: Like many other company headquarters, the battery headquarters is a skeleton organization. The two Fire Direction-variant *Astrins* are commanded by the CO and XO, and the first sergeant makes use of the single company g-carrier.

Regimental Associations

Current or former members of a particular regiment may join the regimental association. Sometimes little more than a dusty hall for veterans to meet in and swap stories, an association can be a valuable source of information about the past exploits of the unit.

Some associations, particularly those of the larger or more famous regiments, can wield enormous power. The backchannel deals and contacts made at monthly meetings can either expedite or severely hinder projects.

Associations also function as charitable organizations. The groups raise funds to assist local communities by building playgrounds, establishing scholarships, and other good works. In this aspect, the association provides good public relations for the actual regiment, which may be scattered light years from its home territory. Association members also act as historians, compiling extensive records of the regiment and its members.

Membership in a regimental association costs Cr200 per year on the average. Fees for some of the more prestigious associations can be much higher. Dues may be waived for members for reason of disability or at the agreement of the board. Recipients of the Starburst for Extreme Heroism usually have honorary membership.

The most famous of the regimental associations is the Veterans of the Matriarch's Guard Cavalry, on Mora. The Association was granted a large atoll in the southern hemisphere, which is used as a private resort by the Regiment's five battalions.

In game terms, membership can be seen as either Contacts (see p. B234) or a 5-point Claim to Hospitality (see p. CI21) for wealthier groups. In neither case will the association appreciate being constantly badgered for information, or putting up with extra guests who were not members of the regiment.

Uniforms

The Unified Armies make use of any number of different uniforms, but they can be grouped into four basic categories.

Utility Uniform

The uniform worn for most duties is the utility uniform, also called "slops." These uniforms vary according to the job, but all utilities share some common characteristics. Utilities are tough, long-lasting suits designed to stand up to very rough treatment. The most commonly seen suit is a two-piece set, shirt and trousers, in gray and black. Soldiers do not normally wear decorations on this uniform, just relevant skill badges. Boots are normally worn with this style uniform. The uniform has numerous pockets for the items that soldiers need on a daily basis.

Low Dress Uniform

One step above the slops is low dress. This is a uniform worn in an informal setting where work clothing would be inappropriate. Low dress is the uniform of choice for soldiers assigned to office jobs, recruiters, and the like. Low dress is made from better material than utilities, and soldiers are allowed to wear all skill badges. The Army's high-collared jacket, part of the low dress ensemble, is first worn with this uniform. Regulations require that low-dress uniforms be kept clean and pressed.

Army Dress Uniform

The generic dress uniform for the Imperial Army, this uniform is much like low dress with more attention paid to decorations and awards. All medals and skill badges are worn with Army dress, and officers are required to wear their dress swords.

The Army dress jacket is black, with slate gray trousers. The uniform is trimmed with the soldier's branch color. Officers have their branch color bordered by silver threads.

Army dress is worn by soldiers in units outside the regimental structure, support units and headquarters for example. Troops in the regiments usually are authorized regimental dress.

Regimental Dress Uniform

Most regiments maintain a distinctive uniform for their members. These uniforms can be of any design, as long as they display the wearer's rank and unit clearly.

Regimental dress is not a standard item of issue; officers are expected to maintain a set out of their own funds. Enlisted troops rarely bother with the expensive outfit until they reach staff sergeant. Some troops will be issued a set for a special duty such as a funeral procession. This is a one-time issue, but at least the soldier has saved several hundred credits.

Firing Sections: Each of the three 21-man sections contains three *Sunburst* sleds clustered around the section leader's fire-direction vehicle. In combat deployment, vehicles from a single section might be scattered over 20 square miles of terrain.

Meson Battery

This battery makes use of the deadly *Terrapin* meson sled. The battlefield meson gun made its first appearance a scant 50 years ago, but has proven itself to be the artillery weapon of the future. The meson gun is not blocked by terrain, and cannot be intercepted. The first clue that the targets have that they are under fire is when everything around them suddenly explodes.

Destroying these vehicles is such a high priority to opposing forces that many of the crews who man meson sleds develop an exceedingly morbid sense of humor, referring to their vehicles as "BUSTs" and themselves as "BUSTers." This not only alludes to their power, but to their vehicle's other combat characteristics: *B*ig *U*gly *S*low *T*argets. The BUSTers tend to develop an elite attitude, and it seems their commanders encourage this feeling in the three firing sections of the battery.

Headquarters Platoon: The headquarters for the meson battery operates two Fire Direction-variant *Astrins*.

Meson Sections: The two sections contain one FDC *Astrin* carrying the section leader and two *Terrapin* sleds. Though the section only has 17 troops, it is perhaps the most powerful in the Imperial Army for its size.

Service Battery

Because of the complexity of their vehicles, and the daunting need for resupply, each artillery battalion has a 114-man service battery.

Command Section: The company's captain, XO, and first sergeant use a trio of g-carriers to carry out their duties with the help of six enlisted drivers and clerks. More than anywhere else, the line between officer and enlisted is blurred in the service battery, where it is not at all uncommon for the officers to pitch in when an extra pair of hands could make the difference between success and failure.

Maintenance Section: Equipped to deal with the inevitable breakdowns of the delicate artillery systems, the 60 maintenance NCOs and troops operate out of five heavy recovery vehicles and five g-carriers.

Support Sections: Each of the three support sections in the company contains five g-carriers. Each carrier has two loaders, who are cross-trained as mechanics.

Artillery Equipment

Like tankers, artillery crews wear combat environment suits and keep Gauss SMGs in their vehicles in case they are forced to evacuate.

Rapid Interface Battalion

The lightest of the combat battalions, the jump troops are used for orbital assaults and missions where heavier units would be inefficient or otherwise inappropriate. All 513 members of a rapid interface battalion's four companies are trained in atmospheric re-entry using individual drop capsules. In theory, the RIBs are used for initial drops on hostile worlds, but tragically they are often misused by commanders who do not understand their weaknesses and strengths.

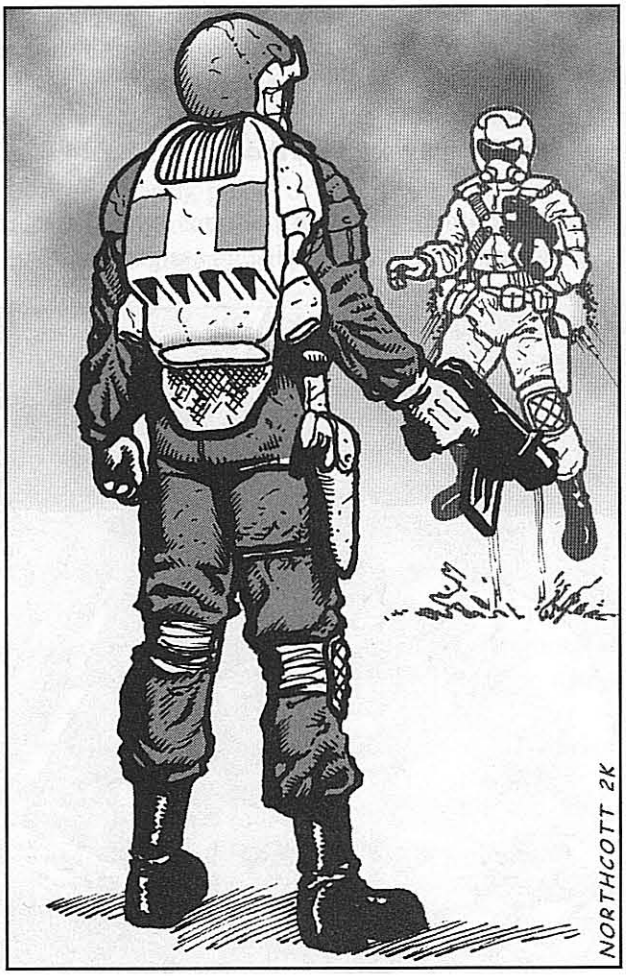
Most RIBs are attached to corps level or higher units as a quick reaction reserve, committed to situations where a speedy response is vital to the success of the mission. There is a clear and ongoing rivalry between the jump troopers and their Marine counterparts.

Command Section

The battalion is run from the small Battalion Command Post. The CO (O-5) and XO (O-4) depend heavily on their very small staffs, generally a skeleton crew of no more than 12 soldiers serving both officers. Attached to the HQ is a small medical section, with a battalion surgeon (O-3) and several medics, rarely more than 10.

Jump Infantry Company

Easily the most streamlined Army unit, the 122-man company consists of a tiny command group (commander, XO, and first sergeant), three jump infantry platoons, and the jump weapons platoon.



Jump Infantry Platoon: Jump troops are trained to fight as soon as they hit dirt, even if command and control has been disrupted. This makes the job of the platoon leader and his senior NCO quite a bit easier.

Jump Infantry Squad: Each platoon has three squads. These 10 soldiers tend to form close bonds. With good leadership, their tenacity and ability can surprise more heavily equipped foes.

Jump Weapons Platoon: These seven three-man teams handle all the support weaponry that might slow down the faster-moving infantry squads, such as anti-tank missiles and heavy lasers. They are led by a platoon leader and NCO.

Jump Infantry Equipment

The only Army personnel to make regular use of battledress, jump troopers employ *Rearden* medium battledress and either PGMP-11s or FGMP-11s.

Support Battalion

The support battalion is intended to serve the needs of the combat brigades; 589 soldiers handle everything from armored vehicle salvage to the investigation of crimes occurring within the brigade.

Headquarters and Headquarters Company

This HHC is smaller than most due to the fact that many of the services provided by the combat battalion's HHCs are part of the support battalion's normal duties.

Branch Colors

The Army gives each of its branches a distinctive color. This color is used as backing for insignia, distinctive signage at bases, and in other uses.

Branch	Color
Lift Infantry	Dark Green
Jump Infantry	Light Green
Cavalry	Yellow
Artillery	Blue
Sylean Rangers	Black/Gold
Administrative	Light Gray
Support & Service	Dark Gray
Military Police	Orange/White
Engineers	Burnt Orange
Medical	White

Different Eras

The future history of the ***Traveller*** universe is filled with strife and war. Players looking for a different feel to their games might consider one of the "historical" settings listed below.

The Interstellar Wars

We have met the enemy, and he is us. From the moment Terrans first met the Vilani, war was almost inevitable. Soldier PCs can take part in the early wars against the staggeringly large Ziru Sirka. Advance on Dingir, and raise the flag of the Terran Confederation over the Governor's Palace!

Or play out the later days when the Vilani were crumbling and Terran forces raced forward. Soldiers and Marines will be called upon to garrison worlds that have been stable for centuries, and to deal with an ancient culture that regards the occupying forces as interlopers.

The Rule of Man

The Humans of Earth have just won a stunning victory against the First Imperium. Now, the troops have to try and hold it together.

One of the prime facets of the Rule of Man campaign is the lack of knowledge about the current situation. The Ramshackle Empire is scrambling to govern a huge area, and sometimes forces will be sent into action with little or no useful intelligence.

The Long Night

The Rule of Man is dead. The promises of peace and stability under the Pax Terra are just more ashes blowing around the ruined cities. Army and Marine units are scattered everywhere, trying to make contact with anything close to a government. Your unit has the firepower to either make a stand, or contribute to the decline. What will you choose?

Continued on next page . . .

Different Eras

[Continued]

Think quickly, because your parts and supplies are drying up quickly! Perhaps the locals will be willing to barter for your services . . .

The Rebirth of Empire

Cleon has turned the Sylean Federation outward, and someone has to go forth to guard the new territories and to plant the Imperial flag on strange worlds.

Some of these places haven't seen a starship in millennia; anything could be down there. Troops might be assigned as escorts for Imperial diplomats or survey teams.

The Pacification Campaigns

All the areas that resisted before are going to learn a harsh lesson. They *will* become part of the Third Imperium. If it takes force, then so be it. A game set in this period can be full of moral dilemmas; the Game Master should read up on the results of large cultures forcibly absorbing smaller ones.

The Civil War

Side with one of the admirals or emperors as the Imperium tries to tear itself apart. Which faction will you back? Will you sell your services and honor for the promise of future rewards? Or even scheme to place yourself on the throne? After the war ends, will your actions receive praise or condemnation?

The Solomani Rim War

The Great Campaign. Troops could be part of the force that was stranded as the Solomani advanced, fighting a shadow partisan conflict. Perhaps the troops will have to organize and lead the locals against the foe. At the other end of things, they might be key players in the invasion of Terra. Just coordinating the campaign could fuel several adventures.

One possibility for a campaign is to have the PCs serving as Solomani troops responsible for defending the players' actual home town! The Game Master will have to decide what the area looks like in 5523 A.D.

The Frontier Wars

The Frontier Wars have been the most constant source of action for Imperial troops in the last 1,000 years. Army and Marine units can conduct strikes against Zhodani staging points or chase down Vargr raiders on a dozen worlds. Another possibility is to be one of the defenders of a fortress world, months (even years) cut off from the rest of the Imperium, slowly being picked apart by the Zhodani fleet and troops.

Command Section: The battalion CO and his XO use *Astrin* Command vehicles, while the sergeant major has an air/raft at his disposal. Six additional troopers crew the vehicles and serve as clerks.

Headquarters Company: Commanded by a captain (O-3), the company headquarters has the first sergeant (E-8) and four clerks, along with an *Astrin* APC.

Other support assets include:

Engineer Company

The engineers handle such important tasks as laying and clearing mines and booby-traps, light construction, and the building of temporary fortifications. Combat engineers have a tradition of defending their works with ferocity when attacked. The company is not capable of building structures intended for long-term use; for those purposes, the Army's heavy constructions battalions are called in. The support engineer company has 123 troops assigned to it.

Headquarters Platoon: This includes the company major (O-4) and first sergeant (E-8) along with the XO and supply sergeant and 17 additional troops. The platoon has three *Astrins*.

Engineer Platoon: Each of the company's three platoons operates three *Rusto* engineering sleds and 3 g-carriers, and has 34 engineers assigned to it.



Brigade Field Hospital

A front-line facility for performing any number of surgical and general medical procedures, the BFH carries a strength of 112 troops, many of them commissioned doctors and nurses. The hospital has the best equipment that can be used under combat conditions, including emergency cold-sleep capsules for those beyond the staff's ability to repair. The brigade surgeon can countermand the commander's orders in any situation relating to medical questions.

Headquarters: As noted above, the hospital's commander (O-6) has vast authority when it comes to medical matters. The exec (O-5) is most often not a doctor, but rather an administrative trooper. Eight administrative and logistics troops run the headquarters' business.

Surgical Unit: The actual surgeons and nurses, these 20 officers are non-combatants.

General Medical: This section deals with non-surgical matters, such as infectious diseases, orthopedic medicine, and maintaining the scheduled medical treatments for the brigades' personnel. The section has a strength of 40, about equally divided among doctors, nurses, and medics.

Field Hygiene & Sanitation Unit: A small but important part of the hospital, the field hygiene and sanitation unit's seven troops make sure that everyone in the brigade follows the correct regulations regarding things like latrines, clean water, and food storage. The FH&S team also works with local populations to improve conditions. It is a thankless job most of the time.

Support Troops: These 35 non-medical soldiers perform the functions required to keep the hospital in operation: food service, maintenance, even serving as litter-bearers.

Maintenance Company

The clearing point for any repair jobs that are beyond the mechanical capability of the line units, the maintenance company also keeps up brigade equipment. The company includes 200 soldiers.

Headquarters Section: The Company is led by a major (O-4), assisted by his XO (O-3) and first sergeant (E-8). Each of these soldiers has an air/raft assigned to him. The 12-man section also has two g-carriers.

Mechanic Shop: The primary large-vehicle repair facility for a brigade, the shop has 110 mechanics and 10 g-carriers equipped as mobile workshops.

Recovery Sections: Each of the three 26-man recovery sections has four heavy recovery vehicles, and a g-carrier in support.

Logistics Company

The motto of the logistics corps is "Keep 'Em Rolling!" The 52 troopers of this company pride themselves on always coming through, even under the harshest conditions. The company is split between a single warehousing platoon and three transport units.

Headquarters Section: This small but vital company is usually entrusted to a promising junior officer (O-2) and a seasoned NCO. The HQ element has eight troops in total, and four air/rafts.

Warehousing Platoon: As the name suggests, this eight-man platoon specializes in organizing supply depots and allocating supplies.

Transportation Platoons: Each platoon operates 12 massive *Teamster* carriers, able to carry the tons of resupply needed by a combat brigade on a daily basis.

Military Police Company

The MPs have the responsibility of enforcing the Army's laws and investigating crimes committed at Army facilities. The 48 military policemen of the company are often overwhelmed by the scale of the job they are expected to perform.

Headquarters Section: The MPs are led by a captain (O-3) with the assistance of his XO (0-2) and senior NCO (E-8). The company HQ has six additional soldiers and three air/rafts. One g-carrier is intended as a prisoner-transport vehicle, but is often used for different duties.

Patrol Platoon: This contains a three-man HQ and three 10-man watch sections, each with four MP patrol air/rafts. The "beat cops" perform the general policing duties of the brigade. These MPs also perform traffic-control duties when in the field.



"With the Gratitude of the Emperor," Part One

Army award citations for the Starburst for Extreme Heroism, described below:

Colman, Josef R.

Rank and Organization: Private First Class, Unified Army of Regina, Company B, 5th Battalion (Lift), 7th King Alferd's Yeomen, 86th Lift Infantry Division. Place and date: Santori Province, Regina/Heya, 285-1109. Entered service: Regina/Inthe. Born: 005-1087.

Citation: With the gratitude of the Emperor and the Imperium, for distinct valor in action at the risk of his life and beyond the call of duty. Pfc. Colman's platoon, while advancing through densely covered terrain to establish a blocking position, received intense plasma-weapon fire from close range. As other members maneuvered to assault the enemy position, Pfc. Colman was ordered to provide security for the left flank of the platoon.

Without warning, the left flank received intense fire from Vargr snipers located in a well-concealed trench. Realizing the imminent danger to his comrades from this fire, Pfc. Colman moved aggressively into the trench. His action silenced the sniper fire, enabling the platoon to resume movement toward the main enemy position. As the platoon continued to advance, the sound of heavy firing emanated from the left flank from a pitched battle that ensued in the trench which Pfc. Colman had entered. The trench was actually a well-organized complex of enemy defenses designed to bring devastating flanking fire on the forces attacking the main position. Pfc. Colman, in complete disregard of the danger to himself, advanced 100 yards along the trench and killed six Vargr, who were armed with captured Imperial plasma weapons. Having exhausted his ammunition, Pfc. Colman was mortally wounded when he engaged and killed two more Vargr soldiers in fierce hand-to-hand combat.

His unequaled actions saved the lives of many members of his platoon who otherwise would have fallen to the vicious fire from the trench, and enabled his platoon to successfully advance against an enemy force of crushing numerical superiority. Pfc. Colman's extraordinary heroism and supreme dedication to his comrades were commensurate with the finest traditions of the military service and remain a tribute to himself, his unit, and the Unified Army of Regina.

Continued on next page . . .

Criminal Investigations Platoon: A small section, with four detectives and two forensic technicians. This platoon investigates crimes against personnel or property.

Food Services Company

A large combination bakery and food-preparation unit, the brigade food-services company supplements the battalion kitchens. The company also deals with selecting foodstuffs from local sources, and has the responsibility for handling the brigade commander's meals. While Army food will always be Army food, the 36 cooks and bakers do turn out nutritious meals under difficult conditions.

Headquarters Section: The responsibility for the feeding of a brigade falls on the shoulders of the company's commander (O-3) and his cooks. The commander's small staff of five travels in either air/rafts or g-carriers, depending upon the circumstances.

Kitchen Sections: Each of these six sections has five cooks and a single g-carrier field kitchen.

Brigade Command Detachment

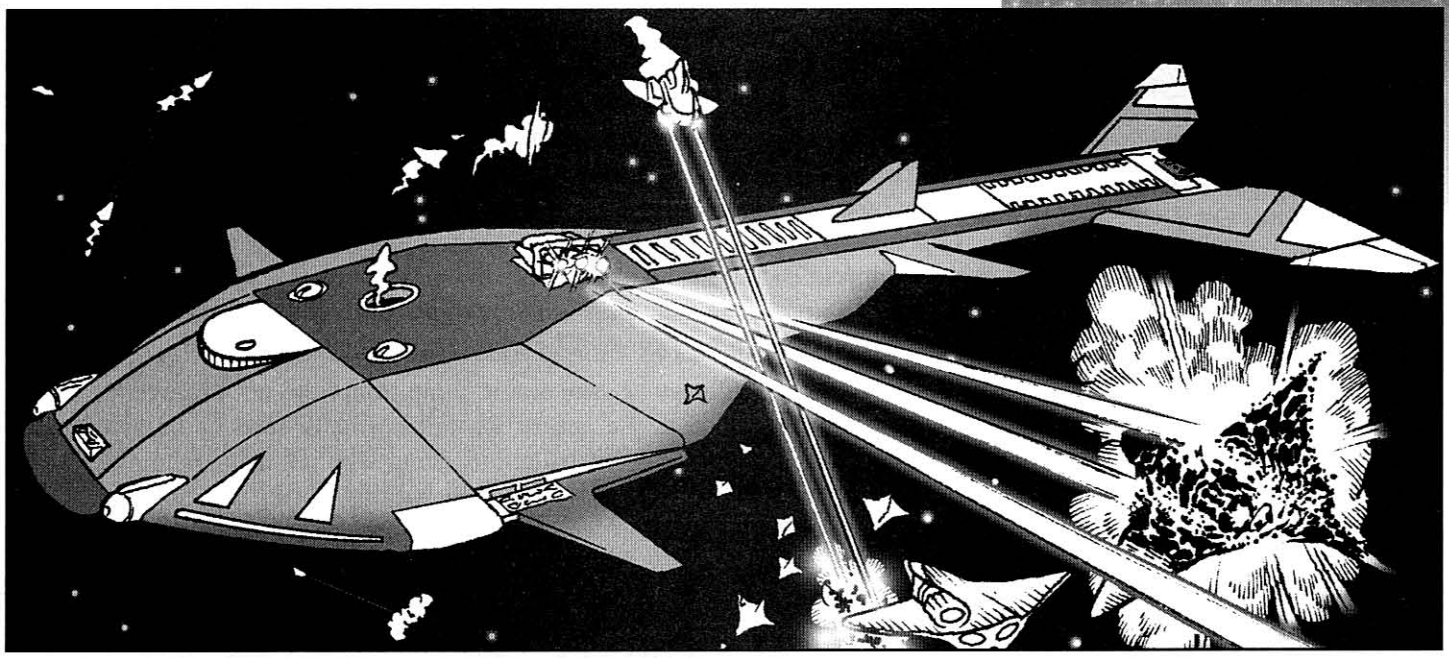
The brigade command detachment's 270 troops provide the command and control services that tie the individual battalions into a single unit. The detachment is not capable of being fielded by itself. Grav tank brigades often add an *Intrepid* for the commander's use.

Headquarters Company

Command Section: A line brigade is normally commanded by a brigadier general (O-7), less often by a colonel. The commander has a large staff, with both an XO (O-6) and a chief of staff (O-6). The brigade sergeant major and the four staff officers have large crews, 10 to 20 men in most cases. The brigadier will also have an aide-de-camp, a lieutenant who is assigned to perform "gofer" tasks for the commander. The command section uses 15 *Astrin* APCs of varying types to transport its 89 soldiers.

Headquarters Company: Commanding the brigade HHC is a mixed blessing. The lucky commander is in close proximity to a senior officer when he performs well. The other side, of course, is that he is in the same position should things go bad. The HHC is led by a major, and has 10 soldiers in its command section.





Scout Platoon: Brigade scouts are recruited from the best troops available, and tend to be rapid-interface qualified. They are responsible for deep recon of enemy rear areas, often on foot in four-man teams. The brigade scout platoon has 45 troops.

Security Section: These are the guards for the brigade command posts. Since one of the first rules of warfare is to disrupt the enemy command structure, the security officer (O-3) takes his job very seriously. The section has 35 ground troopers, as well as three air/space-defense vehicles and an EW-variant *Astrin*. In many brigades, the 85 overall troops of the security section will double as a regimental band and precision drill team.

Nuclear Damper Section: Working closely with the security section, the four nuclear-damper vehicles protect the brigade's assets from nuclear attack. They also work to decontaminate battlefields after the fighting.

Food Service Platoon: As with the other food-service groups, all 25 men of this group work hard to feed the troops under their care. They also provide long-term food-service logistics not incorporated in the food service at the battalion level. This platoon has the additional burden of having to cater to the tastes of the commander.

The Independent Brigade

The smallest Army unit the Imperium will deploy on a combat mission is the brigade. These units are built to be self-contained forces capable of handling most missions.

Lift Infantry Brigade

The most common brigade, making up 65% of the Imperial Army. Each lift infantry brigade has 3,534 troops. The tank and artillery battalions are normally split up among the infantry battalions to provide extra fire support.

1 Brigade Command Detachment
3 Lift Infantry Battalions
1 Grav Tank Squadron
1 Lift Artillery Battalion
1 Support Battalion

"With the Gratitude of the Emperor," Part One

[Continued]

Marsh, Alexander J.

Rank and Organization: Private First Class, Unified Army of Lunion, Headquarters and Headquarters Company, 1st Battalion, 506th Stroudense Infantry, 37th Armored Field Army. Place and date: Tecater Starport, Sword Worlds/Dyrnwyn, 008-1110. Entered service: Lunion/Strouden. Born: 103-1091.

Citation: With the gratitude of the Emperor and the Imperium, for distinct valor in action at the risk of his life and beyond the call of duty. Pfc. Marsh distinguished himself while serving as a medical aidman with Company D, 1st Battalion, 506th Stroudense Infantry near Landing Zone Puma. A heavily armed force of enemy engineers and infantrymen assaulted Company D's defensive positions, wounding and killing a number of its members. Disregarding the intense enemy fire and ground assault, Pfc. Marsh began moving toward the perimeter to assist his fallen comrades.

In doing so he became the target of concentrated enemy Gauss and plasma fire, which severed the lower portion of his left leg. After applying a tourniquet to his leg, Pfc. Marsh moved to the fire-swept perimeter, administered medical aid to several wounded, and helped move them to an area of relative safety. Despite his severe wound and excruciating pain, Pfc. Marsh returned to the perimeter in search of other wounded men.

Continued on next page . . .

"With the Gratitude of the Emperor," Part One

[Continued]

He treated another wounded comrade, and, using his own body as a shield against enemy direct fire and fragments, moved him to safety. Although weakened by loss of blood, Pfc. Marsh resumed his heroic lifesaving efforts by moving beyond the company's perimeter into enemy-held territory to treat a wounded Imperial soldier lying there. Only after his fellow wounded soldiers had been treated and evacuated did Pfc. Marsh allow his own wounds to be treated. These courageous acts by Pfc. Marsh resulted in the saving of many lives and inspired others in his company to repel the enemy.

Pfc. Marsh's heroism at the risk of his life are in keeping with the highest traditions of the service and reflect great credit on him, his unit, and the Unified Army of Lunion.

Groth, John E.

Rank and Organization: Staff Sergeant, Unified Army of Shumisdi, 2/311th Blackleg Infantry, 3,003rd Rapid Interface Division. Place and date: Mississippi River Valley Front, Sol/Terra, 200-1002. Entered service: Shumisdi/Duwamish. Birth: 185-970.

Citation: With the gratitude of the Emperor and the Imperium, for distinct valor in action at the risk of his life and beyond the call of duty. In charge of the leading squad of Company E, he heroically spearheaded the attack in furious house-to-house fighting in the old Normal-Springfield district. Early on 200-1002, he led his troops through intense artillery and small-arms fire in repeated assaults on barricaded buildings.

Although twice wounded, once when struck in the back, the second time when a laser shot passed through his left hand and rendered it practically useless, he refused to withdraw and continued to lead his squad after hasty dressings had been applied. His serious wounds forced him to fire his Gauss rifle with one hand, resting it on rubble or over his left forearm. To blast his way forward with hand grenades, he set aside his weapon to pull the pins by arming them on loose rubble while grasping the missiles with his good hand.

Despite these handicaps, he created tremendous havoc in the enemy ranks. He rushed one house, killing three Solomani troops and clearing the way for his squad to advance.

Continued on next page . . .

Grav Tank Brigade

With by far the heaviest striking power of any force type, the tank brigades make up 30% of the Army's combat brigades. Each has a roster of 2,888 troops.

1 Brigade Command Detachment
1 Lift Infantry Battalion
3 Grav Tank Squadrons
1 Lift Artillery Battalion
1 Support Battalion

Drop Infantry Regiment

Unlike the lift infantry or grav armor, jump troops are not deployed in independent brigades. Instead, the largest RI unit normally seen is the 1,600-man regiment, consisting of three RI battalions along with a small grouping of support and command units. In the past, most notably during the Solomani Rim War, units as large as divisions were assembled, but these were later judged to be impractical.

Larger Units

While independent brigades often are sufficient for localized duties on low-population, low-TL worlds, a real shooting war footing requires *much* larger units.

Divisions

Whenever possible, brigades are combined into divisions. The extra coordination and additional firepower from divisional assets (such as the extra divisional artillery battalion or *Thresher* squadrons organized much like grav tank squadrons) result in a phenomenal increase in combat effectiveness. Divisions are the unit most likely to be committed in combat due to their ability to independently stand in battle.

Divisions are made up of three combat brigades, plus a divisional artillery battalion and additional specialized support units. Lift infantry divisions have an extra grav tank squadron attached for exploitation of breakthroughs. Divisions in the field usually have numerous combat and non-combat support units attached. Typically, a division will have a battalion of engineers for both construction and combat duty, a full field hospital, a military police company, a signals and electronic warfare battalion, and myriad supply and maintenance units.

Along with the standard lift infantry and grav tank divisions, there are two other fairly common formations. The lift cavalry division utilizes three "pure" grav tank brigades, without any other organic infantry assets. The armored infantry division has two lift infantry and two grav tank brigades, along with a divisional artillery battalion for a heavier "punch," and often one or more speeder squadrons.

Attached to the division headquarters are companies dedicated to administrative concerns such as finance, legal affairs, and personnel. Soldiers often find negotiating the bureaucratic mazes of division HQ as challenging as combat, and only slightly less hazardous.

Many divisions develop organic special operations or reconnaissance teams. Not to be confused with such units as the Sylean Rangers, these volunteer units serve to give the commanders a "hands-on" supplement to the electronic surveillance methods generally used.

Divisions are commanded by major generals (O-8), with the assistance of large staffs. Commanding a division is generally seen as the capstone of a distinguished officer's career.

Army Corps

A group of three to five divisions, the corps is the largest organization that will normally exist in peacetime. Commanded by lieutenant generals, corps can muster tens of thousands of troops and thousands of combat vehicles. Corps are never committed to action lightly. The transport and supply needs of such a massive force can severely strain the economy of even the most prosperous subsector.

Along with the conventional combat units, corps carry with them a rapid interface battalion (p. 24) for orbital assaults. They also may have such units as attack speeder squadrons or specialized support units. The actual components of the corps might be scattered over several worlds, only forming together in response to a crisis.

In many of the sparsely populated subsectors of the Imperium, a single corps may be the largest Imperial unit available. Because of this, doctrine holds that corps must be flexible units capable of almost any mission. Corps include engineer brigades that undertake many of the large-scale public works sponsored by the nobility, along with complete hospitals capable of the most demanding surgical procedures.

Field Armies

Only mobilized during singular emergencies like extinction-level disasters or outright warfare, the field army is the largest mobile unit of the Imperial Army. Normally, the field army exists only as a headquarters and a number of support units. These headquarters command "phantom armies," units that theoretically would come under their command in mobilization situations, but do not normally answer to the headquarters.

Field armies are like corps, only much larger. Made up of three or four corps, field armies require a massive commitment of ships and material to assemble and move. A typical lift infantry army will field more than a half million sophonts and thousands of vehicles.

There are many critics of the current field army structure, claiming that the size of the units makes them unwieldy and too slow to react. To counter this view, the Army has published studies from the Fifth Frontier War, showing that field armies can react with speed when called upon to do so. One example often used is the 85th Army's raid on the Zhodani staging points on Farreach/Jewell.

Other Army Organizations

Along with the direct combat and combat-support units mentioned above, the Imperial Army maintains numerous other organizations. While not in direct combat roles, these units fill important support and service positions.

Army Base Management Command

Each Army facility has an extensive staff assigned to handle the required maintenance and administrative functions. ABMC personnel allow the combat troops to get on with their duties. Many bases contain vast equipment depots which have to be carefully managed and guarded.

The Army considers itself to be an extended family, and so makes reasonable attempts to accommodate service members who are married or in equivalent relationships, or who have dependents who rely on the service member for support. Army bases tend to be surrounded by housing taken up by these dependents. The availability of on-base housing depends on the location and the circumstances. Newly married corporals will be at the bottom of the list, whereas colonels are guaranteed an official residence, whether they need it or not.

"With the Gratitude of the Emperor," Part One

[Continued]

On approaching the next structure, he was fired upon from an upstairs window. He killed the sniper with a single shot and similarly accounted for another enemy soldier who ran from the cellar of the house. As darkness came, he assigned his men to defensive positions, never leaving them to seek medical attention.

At dawn the next day, the squad resumed the attack, advancing to a point where heavy plasma and small-arms fire stalled them. Despite his wounds, Staff Sgt. Groth moved out alone, located a Solomani trooper dug in under the wreckage of a grav vehicle, and killed him with rifle fire. He returned to his men and found that a Solomani heavy laser, firing from a well-protected position in a neighboring house, still held up the advance.

Ordering the squad to remain in comparatively safe positions, he valiantly dashed into the open and attacked the position single-handedly through a storm of laser fire. He was hit several times and fell to his knees when within 25 yards of his objective, but he summoned his waning strength and emptied his Gauss rifle into the Solomani position, silencing the weapon before he died.

The superb courage, aggressiveness, and utter disregard for his own safety displayed by Staff Sgt. Groth inspired the men he led and enabled them to penetrate the last line of defense held by the enemy in the Illinois corridor. His actions reflect the fighting determination and intrepidity in battle that exemplify the highest traditions of the service and reflect great credit on him, his unit, and the Unified Army of Shumisdi.

Inspector General's Office

The Unified Armies include countless non-combat departments. One of these holds particular roleplaying intentional: the Inspector General's Office.

The IG serves two major purposes in the regular Army. The office's primary mission is to ensure that line units are ready to execute their missions if called upon; it also serves as an investigative agency for crimes committed inside the military.

In their first role, IG personnel travel from post to post making in-depth inspections of everything from grav tanks to kitchen equipment. These inspections are dreaded by line troops, since IGs are legendary for being able to find the slightest flaw or error. Due to time and distance, most units only have to suffer through these events once every two years or so.

As a criminal investigative service, IG officers investigate both crimes against the Imperium and criminal acts committed by persons in Imperial service. The Inspector General depends heavily on support from the Ministry of Justice for this activity, and the two agencies have a close working relationship.

One major focus of IG investigations is corruption. With trillions of credits worth of equipment scattered over thousands of worlds, the temptation for a soldier to skim off a few thousand for himself can prove overwhelming. There are cases on record of entire shiploads of spare parts being diverted to unauthorized users. In addition, the IG takes a dim view of officers or NCOs who take advantage of their positions to peddle influence and good assignments.

The working relationship between the Inspector General and line units is best described as tense. Many troops see the IG inspectors and investigators as meddling busybodies, interfering in what is perceived as a smooth-running operation. Officers may have more understanding of the need for the inspections, but still resent the implication that they are slacking off. Units that have members under investigation for criminal acts may feel especially put upon, as soldier after soldier is subjected to repeated interrogations. On the other hand, many of those working for IG find themselves becoming more and more cynical over the years, and may have trouble believing that anyone is actually innocent.

Army Transportation and Material Corps

Barely a military agency, these soldiers work closely with the Navy and civilian shipping firms in maintaining the Army's ability to move when called upon. ATMC handles large-scale procurement of equipment and supplies and disposes of surplus equipment. ATMC troops are also responsible for overseeing the prepositioned supply depots found on many of the worlds of the Imperial fringe. Considering the vast amounts of material from different sources that flow through the Army's supply channels, it is not surprising that most ATMC offices are usually found in a state of near pandemonium.

Finally, the ATMC office is where a soldier goes when he needs to arrange an interworld voyage. The ATMC office will check to see if there are any space-available bunks on Navy or Scout Service vessels. If there are none available, ATMC will issue travel vouchers (high passage for senior officers, middle for everybody else) for passage on civilian craft.

Army Intelligence

Army Intelligence has the mandate to provide commanders with accurate and timely information on any threat, external or internal, to the safety of the Imperium. As can be expected for an Army organization, Army Intelligence is mostly concerned with information on the ground forces and tactics of potential enemies. While not strictly within their charter, Army Intelligence has run covert operations outside the Imperium to gather better data.

Army Intelligence is tied to Naval Intelligence and the IISS Intelligence Branch. There is also a strong rivalry between these organizations. Nowhere is the traditional rivalry between the Army and Navy so heated as it is in the respective intelligence services. Both sides are convinced that the other is holding back critical information, if not actively interfering in operations. There have been documented occurrences of Navy and Army Intel running operations against each other, both accidentally and with malice.

The Sylean Rangers

The Sylean Rangers have seen their role and numbers expand rapidly since the end of the Solomani Rim War. To the general public, the Rangers are expert reconnaissance and assault troops. The truth is something deeper.

During the long, slow Imperial advance toward Terra, commanders realized that many of the occupied Imperial worlds had rudimentary guerrilla movements centered around stranded Army troops and veterans. It was decided that Sylean Ranger units were the natural force to go ahead of the fleet into the occupied area to help organize and train these groups.

Months before the invasion of Terra, Sylean Rangers covertly landed and located many critical planetary defense sites. The information passed to the Navy allowed the massed Imperial Fleet to make devastating first strikes against what would have otherwise been a withering volume of defensive fire.

After the war, the Imperium faced many small pro-Solomani terrorist groups in Alpha Crucis and Sol sectors. The Scout Service's S-3 units were overwhelmed, and appealed to the Army for help in suppressing the terrorists. In reply, the Army deployed Ranger teams in what turned out to be a very successful campaign.

According to official Army records, the Sylean Rangers have one or two battalions per sector. The truth is each sector probably has a full brigade's worth of Rangers. The vast majority of these Rangers are deployed in small teams scattered in out-of-the-way corners. The Rangers answer only to the sector duke or archduke.

Each battalion (technically called a detachment) consists of a small headquarters group and several teams loosely organized into companies. The Rangers keep the exact details of organization to themselves, and some personnel in the more conservative regular forces wonder if even the Rangers understand the structure.

Sylean Rangers value their security, going to extreme measures to safeguard their secrets. When a Zhodani official made a courtesy visit to a base on Mora (home to a detachment) in 1118, he found all 16,000 base personnel wearing psi shields and Ranger insignia.



Sylean Rangers have three basic missions:

- Conduct long-range reconnaissance of non-allied or hostile planets that are of Imperial interest.
- Supervise the organization, training, and leadership of irregular forces on worlds held by hostile troops.
- Act as a strike force against high-value targets that need to be taken relatively intact.

The Rangers are often seen as a convenient force for black missions that violate some aspect of law or might be viewed unfavorably by the population at large. There is a level of mistrust between Rangers and the rest of the Army over the secrecy and glamour of Ranger units.

The popular media has latched onto the image of the Sylean Rangers as the perfect model for action heroes. Over the years, there have been an endless number of books and productions featuring what are purported to be "authentic" Sylean Ranger veterans or exploits. To date, the real Rangers have refused to comment.

The Rangers Unveiled

While the public and most regular Army veterans know little about the Sylean Rangers, those serving in the Rangers would of course know more.

The Sylean Rangers take on missions comparable to both the U.S. Army's Rangers and its Special Forces. For this reason, ***GURPS Special Ops*** could enhance a Rangers-based campaign.

The basic Ranger team is squad-sized, consisting of two officers – a captain and a lieutenant – and 10 NCOs. (*All* Sylean Rangers are at least Military Rank 1.)

When engaged in recon, the Ranger team can split into three four-man recon patrols. If wearing battledress, Rangers on deep-penetration recons are limited by the short endurance of battlesuited troops, so they use a modified version of TL7 protocol. A patrolling team will work in a "one-up, two-back" system, with one patrol suited up and advancing the recon and the other two patrols camped on its flanks. When it's time for the "point" patrol to settle down and unzip, the patrol whose turn it is suits up and advances between the two "inactive" patrols. This causes the team to advance in a zigzag fashion, but that usually isn't a problem when engaged in reconnaissance.

When engaged in cadre work, training friendly irregulars, the Rangers usually work in team-sized units. How many teams get inserted onto a particular planet is another question entirely. Generally, Ranger intelligence will attempt to define a geographical territory for each team from which intel believes one battalion of irregulars can be recruited and trained. This means a planet could host one, or 100, scattered teams.

In strike missions, the Rangers use larger units much like regular Army formations, with the noted exception that the Rangers have *no* vehicular support. Commanding officers can attach grav support to Ranger missions, but if grav vehicles can make it to the fight then it really isn't a mission for which the Rangers are the best option! Even more so than the Marines, the Sylean Rangers are raiders. Their equipment and training is designed to hit hard and move out before the opposition can strike back.

High commands that ignore this fundamental nature of the Rangers, and ask them to take and *hold* ground, usually end up with a very high body count among these very expensive troops.

Chapter Three
The Imperial Marines

"All righty, Marines! At this time, all weapons systems are cold, all active sensors are cold, enhanced power system is cold . . ." I tuned Gunny Hostman's bellow out. I know the checklist is important, but today would mark my 87th drop! It's not like I'm a 3rd class or something.

I managed to wake up just as Gunny came by checking my can. "Leaf, I know you were asleep," he growled, "and someday I'm going to catch you at it." Yeah, like the day I make Brigadier.

Known colloquially as the Emperor's Sword, the Imperial Marines have a long history of taking the dirtiest jobs and succeeding against the heaviest odds. The Marines are charged with making initial landings on hostile planets, boarding hostile vessels in deep space, and enforcing Imperial law, most notably violations of the Imperial Rules of War.

The Imperial Marines are an elite group, proud of their traditions and lineage. The Marines get the best equipment available, and all Marine personnel are trained to use battledress. A point of honor among the Marines is that every Marine is willing and able to fight, from the sector marshal down to the greenest recruit. The Marines also act as ship's troops, along with guarding Imperial installations and starports. In some places, Marines man ship's weapons alongside their Navy brothers. One of the little-known responsibilities shouldered by the Marines is providing bodyguards for VIPs.

The Marines are closely tied to the Imperial Navy. The Navy provides the Imperial Marines with all the various support activities they need, from supply to orbital fire on hostile targets. The Navy provides the Marines with the bulk of their administrative support, as well. The Navy has the people, resources, and time to do the job correctly, which frees up more Marines for combat-related duties. Of course, this means that any administrative foul-up will most likely be blamed on a perceived naval bias or incompetence.

The chain of command for the Marines comes directly from the Emperor through the Admiralty. Unlike the Army, Marines do not answer to the local nobility under most circumstances. Units are often loaned to local authorities for specific purposes.

The Marine Life

Because of the nature of their duties, the Imperial Marine experiences military life in a way very different from other ground troops.

Making a Marine

The Marines are very selective about the type of person they will accept into the ranks. A Marine prospect has to meet very strict requirements before being allowed to enlist. Human Marines of the average build (Solomani, Vilani) must be between 5'8" and 6'4" and have body shape and weight that is proportional to their height (no more than 10% off the average weight on p. B15). They must not have a criminal history, and must be able to submit references from three

Marine Traditions

The Marines trace their lineage all the way back to the Terran Confederation's Marines, and have several tightly held traditions:

The Marine Beret

Marines wear the maroon beret with great pride. The beret is only issued to recruits after they complete their training cycle.

Marines believe that the first beret you are issued should stay with you throughout your career. Another article of faith about the beret is that whenever possible the battledress helmet should be removed and replaced with that original beret. Needless to say, the "field berets" of long-serving Marines can be quite worn.

The Cutlass

Much has been made of the Marines' love affair with the cutlass. Detractors wonder why valuable training time is wasted on an archaic weapon that has no place on a modern battlefield. The Marines ignore the criticism and simply continue practicing their beloved sword drills.

The Marines train with the cutlass for many reasons; tradition of course is a major reason, but is only part of the picture. Swordwork is an excellent workout, and emphasizes body positioning, which is important to troops who have to operate battledress. In addition, fencing is a sport that easily adapts to cramped starship corridors. With electronic scoring, the cutlass can be used to settle shipboard disputes before they explode into more serious fights.

In the late 1000s, a weapons development firm introduced a cutlass manufactured from hyperdense metal. Far too heavy to be used by an unaugmented person, the weapons were supposed to be used by battledressed Marines in close combat. Force Headquarters politely agreed to study the concept, then quietly let the program die. Many of the cutlasses found their way into private collections or the hands of those strong enough to use them.

Continued on next page . . .

adults "of good character." The word of former Marines is taken very highly in this regard.

If the prospect gets this far, the Marines will take a good look at him. The recruiting sergeant will examine the youth's academic history in detail. They are not just looking for good marks. A Marine needs to able to think quickly, so participation in sports or debate is a plus.

Once the prospect has passed all of these examinations and submitted to a battery of medical tests, he will wait for the final decision. If the prospect is approved, a ceremony as old as the Marines will follow. The prospect will be visited at his home by his recruiter and his commanding officer, both in dress maroon, and in front of his family he will be sworn into the service of the Emperor and the Imperium. The recruiter will salute the new member of the Marines and congratulate him. Many Marines fondly remember this moment as the last time a sergeant was nice to them in a very long time.

Marine training is broken up into three distinct phases. The total training lasts almost a year, and will take the new Marine far from his home.

Phase I, or initial entry, is a crucible intended to shake out those who cannot make it, and harden those who can. Phase I is more popularly known as "the Grinder."

The new recruits, who are not allowed to say the word Marine under any circumstances, spend endless hours learning detailed histories of Marine lore, minutiae of the Marines' structure, and other meaningless facts. When they are not learning birthdates of all the Emperors' consorts, they are running up and down mountains. These seemingly pointless exercises are not for nothing. These Marines will pilot some of the deadliest hardware ever built. Their duties may require them to stay active and alert for days at a time. Attention to detail, and phenomenal reserves of stamina, are vital.

Phase II training takes place at a Marine training facility located on a central world. At Phase II camp, the Marines learn combat craft starting at the most rudimentary level. Future battledress pilots are expected to crawl through the bushes and throw spears at targets. Like everything before and after it, this training does serve a purpose. By the time the Marines pass this phase, they have learned to be far more aware of their environment; knowing how to stalk game in the forest helps a Marine understand how an enemy trooper will stalk him with an anti-armor weapon. In the Spinward Marches, Phase II occurs on Mercury/Trin's Veil at the Hopgood Training Facility.

Marine Traditions

[Continued]

Hyperdense Cutlass: cut sw+2d (10), imp thr+2d+1 (10), maximum thrust damage 3d+2 (10), Reach 1, Cr1,000, 6 lbs., Minimum ST 15.

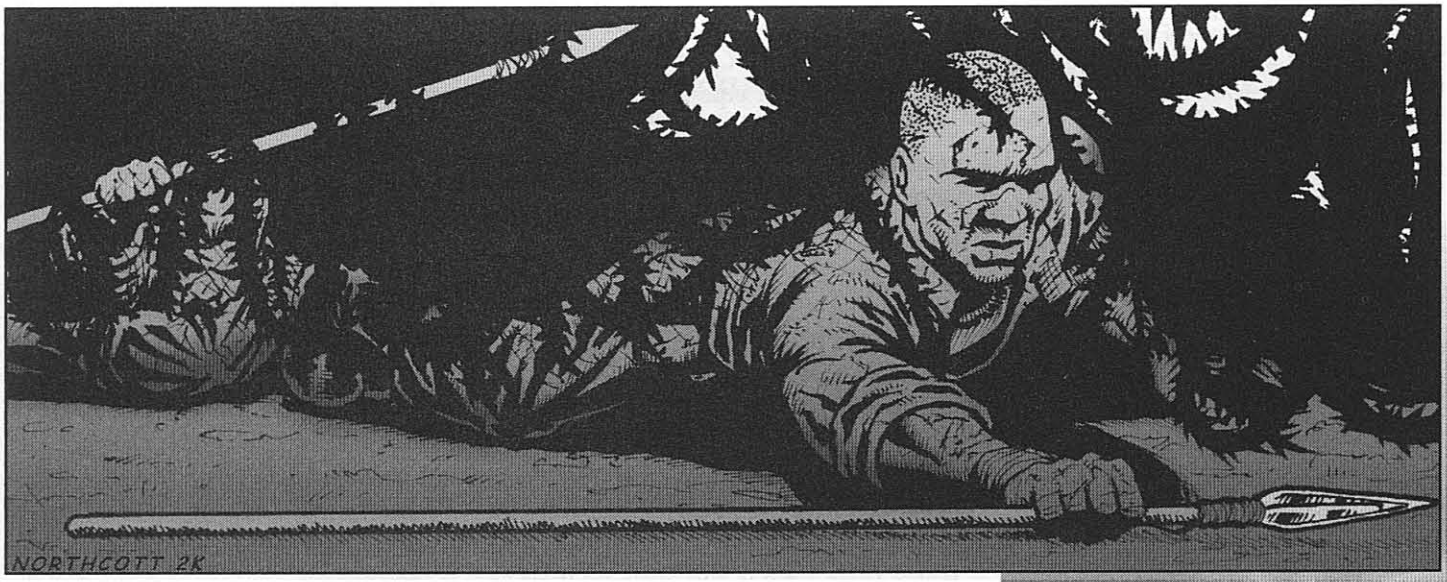
The Bagpipes

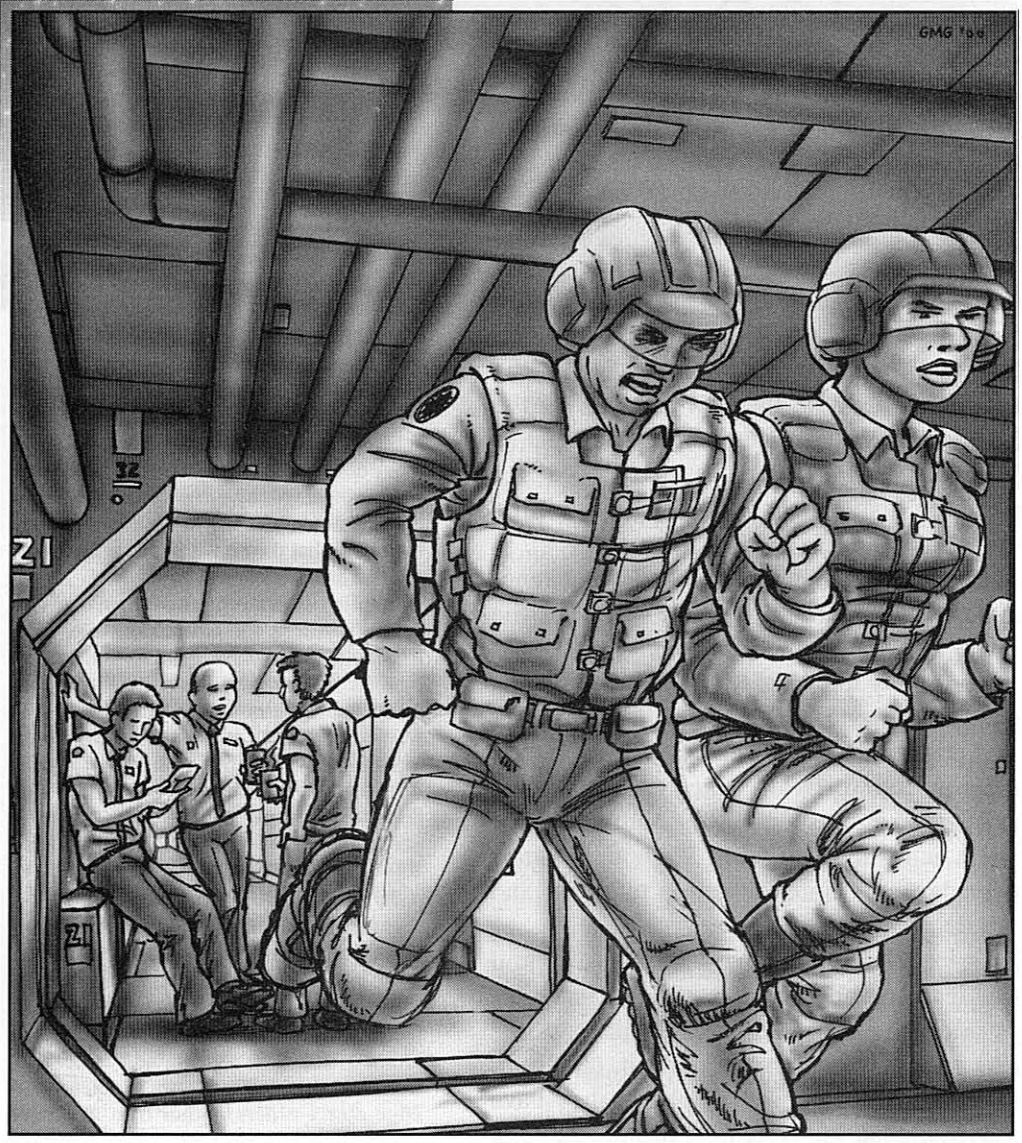
If there is one Marine tradition the Navy would dearly love to eliminate, it is the bagpipes. Nobody is quite sure where the Marines picked up the pipes, but it is certain that the Marines live their lives to them. Regiments strive to produce quality bands of pipes and drums, and one of the most coveted non-combat skill badges is master piper. Many naval officers are sure that the Marines cling to the pipes just for the effect that they have inside sealed starship walls.

While rumors of Marines landing with pipes modified for battledress are false, they have found one way to turn the music to their advantage in battle. When jamming enemy communications, Marines will flood the channel with prerecorded pipes and drums. This has a definite effect on the morale of the defenders, knowing that the wailing on their radios is a harbinger of an attack by Imperial Marines.

You Say "Lieutenant," I Say . . .

Marines pronounce the rank of lieutenant as "left-ten-ant" rather than the more common "loo-ten-ant." Observers note that the extremes of pronunciation increase directly proportionally to the irritation of the officer being addressed. The Marines also use "aye-aye" to acknowledge direct orders, rather than the more common, "yes, sir."





Phase III, the longest phase of Marine training, teaches the recruits to use battledress. This training calls on all the discipline and skills learned by the Marines in their short period of service. They progress from taking careful steps to firing at a full run while calling in supporting fire on a different target in 20 short weeks. At last, the former prospect receives his first beret and the title Imperial Marine.

Duties of a Marine

Once a new Marine joins his fellows in regular fleet service, he can find himself assigned to almost any job. Unlike the Army, the Marines believe that each Marine should be able to do as many jobs as possible, even if it is only a passing familiarity with the skill. An individual might find himself serving as a crewman on a meson sled for a few months, then being assigned to a grav tank, then back to a line infantry company. It is not strange to have a 22-year-old Marine at the end of his first term who has experienced each job in the regiment at least once.

The day-to-day routine of the average Marine is only slightly different from that of his maritime predecessors. The day begins with physical training. The Marines stress endurance over muscle development, so long runs are the rule. Shipboard, Marines either make use of treadmills, or find long stretches of corridor for this purpose. After this morning ritual, and breakfast, the Marine may find himself doing any number of things.

The complex equipment used by the Marines needs constant maintenance to ensure that it will function properly. The suits of battledress receive the bulk of this attention, with each Marine bearing final responsibility for his assigned suit of armor. Since the reliability of the suit is a life-and-death matter, all Marines take this very seriously. Marines also maintain their own vehicles, such as the *Astrin* APCs and the assault cutters. When serving onboard Navy ships, the Marine contingent is expected to shoulder part of the burden of basic shipboard tasks.

Along with basic maintenance, Marines spend a great amount of time training. Every skill needs to be constantly honed, and new ones learned. Much of the combat training takes place in combat-environment simulators, called "ghost cans" by the troops. These are mockups of battledress or vehicles that present the Marines with remarkably realistic virtual battlefields. Controllers can introduce mechanical glitches, surprise enemy elements, anything that can be imagined to push the Marines to their limits. After the exercises, the Marines can watch their actions and evaluate their own performances.

Inside Battledress

A Marine in battledress is not just an infantryman with bigger and better weapons; he is the pilot of an advanced weapons platform. A Marine can fly and knock down buildings by hitting them, and will often carry actual nuclear weapons along with his normal fusion rifle. The nature of this combat environment needs to be understood in order to understand a Marine.

The Bodysuit

The bodysuit is worn under the battledress. The suit is lined with pseudosilk, and beneath the outer skin is a network of tiny tubes for the cooling system. This system works by pulling moisture off the Marine's skin and running it through a cooling plant run off the battledress power system. Excess water is filtered and added to the battledress' drinking reservoir.

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The simulators are also used to prepare for actual missions while in transit to the mission objective. Using intelligence gathered from different sources, the simulator can usually provide at least a basic facsimile of the mission site.

While the simulators are a useful tool, nothing replaces actual experience, so the majority of training takes place in the real world. Marines are always on call to make meteoric entries, or be tested on their marksmanship with any weapons system.

When not training or repairing their gear, the members of the Marines suffer through the same indignities that have plagued troops for millennia. The decks are never clean enough for the ship sergeant, there is always something that needs to be polished or painted, and somebody has to walk guard duty at the main gate. For the most part, Marines accept this part of Marine life with minimal complaint. They seem to realize that it is all part of the military game, and they just have to play along.

The Marines do not maintain service academies to train new officers. The Marines prefer to draw officers from the ranks and teach them what they need to know. Despite this, a number of Naval Academy graduates are allowed to accept a commission in the Force rather than the Navy. Many of these officers are heading for assignment in the Force's fighter squadrons.

Regardless of their previous background or future assignment, all prospective Marine officers attend the Officer Candidate School, a six-month nightmare that makes the Grinder look like a vacation. Washouts are frequent and without rancor, the Marine being returned to his unit or offered a lateral commission to the Navy as appropriate. Upon graduation, the new officer spends his first 180 days as an extra officer in a line unit, learning the difficult job of commanding Marines.

Marines and Vehicles

The popular image of the Imperial Marines is that of an organization that works without the large number of vehicles that the Army uses. The truth is that the average Marine regiment will carry as many, if not more, vehicles than an Army unit of similar size. The difference is in how the two organizations employ their vehicular assets.

Unlike the Army, Marine doctrine calls for maximum firepower from a minimal force. Since the battledressed Marine can produce awe-inspiring fire on his own, the average Marine mission rarely requires the kind of heavy support the Army gets from its tanks.

"Whenever I had the pleasure of watching the Marines do their work, I was reminded of the avalanches I saw back on my home when I was a child. Fast, overwhelming, unstoppable, terrifying.

"There is an important difference, though. An avalanche of ice and snow does not operate with intelligence and cunning. The mountain won't hunt you down and find you. Marines will."

– Graeme Batho, Major General (ret.)

There is also the factor that inexperienced Marines would sooner go into battle naked than ride in an APC. The view is that the vehicles are an "Army thing," and that real Marines drop from orbit. A little time being shot at usually cures this attitude, but the stigma associated with riding to combat remains strong.

Inside Battledress

[Continued]

Along with cooling the Marine, the bodysuit is an important part of the suit's control system. The skin-tight suit and cowl track the smallest movements, activating systems in response to those motions. Many suit abilities are controlled by a combination of head and finger movements, too small to trigger the actual suit motors. A very primitive neural-induction system allows some very basic functions to be accomplished simply by thinking about them. For example, with practice a Marine can activate the zoom features on his visual sensors just by focusing on a distant object.

One bodysuit function Marines dislike speaking about is the sanitation hook-ups. While the systems have been made as user-friendly as possible, most Marines would still prefer to be able to turn their digestive tracts off for a drop.

The Body

This is the "meat" of a powered armor system. Working up from the bodysuit, the first layer is a padded sleeve that holds the Marine and also contains the negative feedback sensors. This tells the suit which direction the Marine is moving his arm, with how much force. The suit then responds with proportional movements of its own. The sleeve also keeps track of the body position, and will cut off any movement that is likely to injure the user. This isn't likely in a heavy suit like a *Redding*, but in the lighter suits inexperienced users regularly dislocate limbs.

Outside the padded sleeve is the suit's skeleton and guts. At this level, all of the working portions of things like computers and sensors are secured in place. All systems are spread out over the suit, so a single penetration has less chance of disabling a vital feature.

On top of everything are the slabs of laminate armor that give the suit survivability on the battlefield. Running under the armor is a fine layer of superconductive material that provides extra defense against energy weapons. The armor is, by necessity, weaker at the joints where the suit has to bend, and is pierced in several places for sensor antennae.

Arms and Legs

These are noteworthy mostly for their raw power. A *Redding* weighing close to 1,000 lbs. can run at a respectable 16 mph. The same suit's arms can lift one ton at maximum safe tolerances. Heavier weights can be attempted, but risk severe damage to the suit.

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Inside Battledress

[Continued]

Helmet

The helmet on a set of battledress is not so much a protective device as it is a sophisticated sensor station. The Marine can look at an unknown object, and the suit will immediately use its suite of active and passive sensors to gather details, then consult with the suit computer's database to provide the trooper with an identification along with information on speed, heading, distance, and a perceived threat rating. If the Marine decides to shoot at the target, the suit will determine what weapon is being used, and provide a "point of aim" reticule for the shooter. If the weapon chosen is inappropriate (Gauss pistol against a tank), the suit will warn the firer.

But that's not all. Not only will the Marine who made the sighting know about this target, but so will all the members of his squad or platoon. The suits constantly trade and update information. This makes voice reporting almost unnecessary, although most troopers still do report verbally.

The suit driver can run most of the suit's functions using voice commands and the pupil-scanning HUD. It takes practice, but for an experienced 'can jockey, the motions are as natural as walking.

Limitations

The primary drawback of battledress is the limited duration. Even with a regular power supply and the best comfort systems available, battledress becomes uncomfortable after about eight hours of use. After a full day, it starts to become intolerable. It is almost impossible to sit or lie down while canned up. The best a *Redding* can manage is to squat and lock the limbs, allowing the head to rest in a forward leaning position. After 24 hours, muscle cramps begin to set in, and after more than three days even the most experienced Marine begins to experience claustrophobic reactions.

Inexperienced battledress pilots often overestimate their abilities, leading to the second major shortcoming for the systems. Battledress is frighteningly vulnerable to a wide variety of battlefield weapons. Something as simple as a TL8 rocket-grenade can disable a suit if the firer gets lucky. The solution is simple: exhaustive, realistic exercises that thoroughly train the troops in the capabilities of their suits.

Despite these factors, the line Marine regiment retains two very powerful lift cavalry squadrons, and the Marine armored cavalry regiments are equipped with the finest grav armor the Imperium has to offer.

The Marine Line Regiment

"When the Marines arrive, the party is over . . ."

The highest level of Marine organization ordinarily seen is the line regiment. A Marine will join a particular regiment on enlistment, and will most likely spend the rest of his career in that unit.

The regiment is made up of a command company and a pool of line units that can be combined into various mission packages. The 5,184 Marines carried on each line regiment's roles are expected to be able to serve in any role, and often acquire a wide range of skills.

> *"Sure we carry plasma weapons, and sometimes thunderballs, but we are right there applying the force in a precise manner. The muddies take sniper fire and they flatten everything for miles around, then move in."*
>
> *– unidentified Marine during the relief of Lysen, 1109*

Line marine regiments are distributed throughout the Imperium – one regiment for each numbered fleet. As a rule, the bulk of a regiment's infantry companies will be dispersed in *Caen*-class assault ships, carrying out patrols and missions within their assigned subsector. Other regimental elements will be accompanying Navy ships or training with the Marine Commands.

Regiments are loosely organized pools of company-sized units that the regimental commander can use to build task forces for his assigned missions. The commanders of the three Force Commands within the regiment do not actually have command of any units until they are placed under their authority. This gives a very flexible, reactive structure.

Regimental Headquarters

The regimental HQ is optimized to handle the fact that many of its subordinate units may be light-years away from headquarters. This, and the large and diverse nature of the Marine regiment, results in the HQ being smaller than an Army headquarters of equivalent size. The headquarters has 126 Marines assigned to it.

Command Division: The regiment is commanded by a colonel (O-6), who is assisted in his duties by his executive officer (O-5) and adjutant (O-4). The regimental fleet sergeant oversees the mundane operations of the unit's staff. The section has 32 officers and enlisted personnel, and uses three Command *Astrin* APCs.

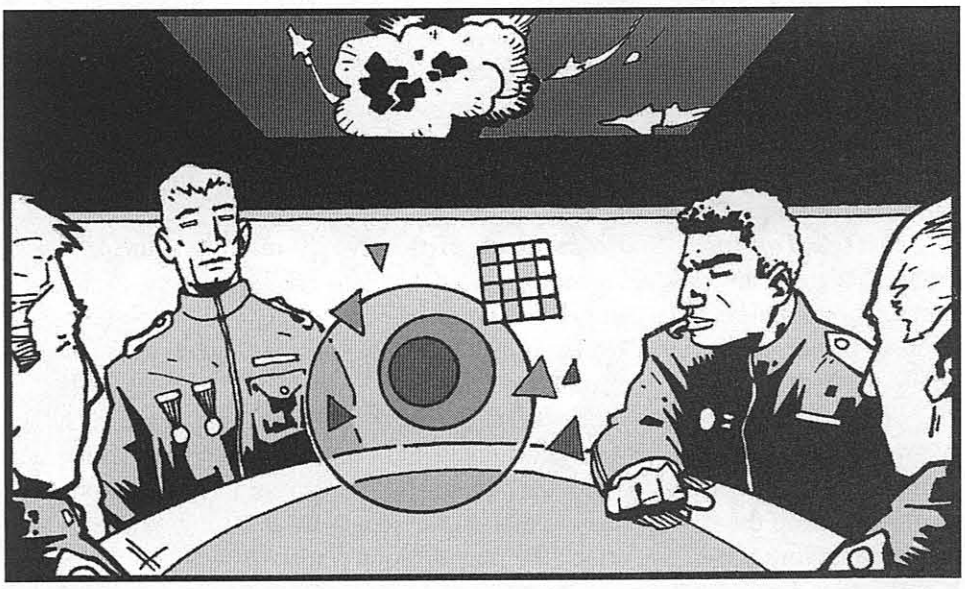
Regimental Headquarters Company: Organized and commanded by the adjutant. The small administrative division consists of only the adjutant (who is officially tallied as part of the command division), his XO (O-3), the company ship sergeant (E-8), and four clerks/vehicle crew. The six-man HHC command division uses a single Command *Astrin* in combat.

Plans Division: Led by the planning officer (O-5), this section produces the operational orders and logistical information necessary for the regiment to perform its assigned tasks. When the regiment deploys in combat as a single unit, the section operates much in the same way as an Army brigade's command section (see p. 28). Its 11 Marines operate from a Command *Astrin* APC.

Intelligence Division: The intel officer (O-4) in a line regiment is expected to work closely with Naval Intelligence along with the usual duties of such an officer. A line regiment's intelligence division will have 12 enlisted and commissioned Marines and a Command *Astrin* APC.

Supply Division: Often the busiest office in a HQ, the supply officer (O-4) must ensure that units spread out across a subsector have everything they need. In a technology-dependent force such as the Marines, getting parts to the correct place is vital. Three *Astrins* transport the 33 Marines in this unit.

Regimental Signal Division: Marines often find themselves operating over the entire face of a planet in small groups. To maintain effective command and control, a signals section of five Command *Astrins* is under regimental control. All 32 signals Marines must speak at least one language other than their native tongue.



Task Force Headquarters

The three task-force headquarters are the places where the real action of a Marine regiment occurs. Each task force has only its 41-member headquarters staff until support pool units are assigned to it by the regimental commander.

Command Post Division: This consists of the lieutenant colonel (O-5), the XO (O-4), and the fleet sergeant (E-9). The CP has three Command *Astrin* APCs assigned to it, and a total strength of 15 troops.

Plans Division: Like his regimental superior, the task force plans officer is required to think quickly in putting together acceptable mission orders, sometimes on very short notice. To assist this officer, a six-Marine staff and a Command *Astrin* are assigned for his use.

Intelligence Division: Since task forces are put together for a specific purpose, the intelligence officer (O-4) at this level has a slightly easier job than his superior at regimental HQ. The seven-man staff still has to work hard to make sure that information is processed and evaluated in a timely manner. In combat, they work from a Command *Astrin*.

Communications Division: This contains the task force's organic communication and electronic warfare assets. One *Astrin* Command APC and one Electronic Warfare-variant are used by the division's 12 Marines.

Support Pool

The 556 Marines in the support pool's specialized sections add their capabilities to their task forces.

Uniforms

Like the Army, the Marine Force uses many varieties of uniform, described below.

Utility Uniform

These are basically identical to the Army slops, although the Marines refuse to use that term. One item unique to the Force is the shipboard uniform, which is a modified Navy uniform issued to Marines serving as part of a ship's crew.

Undress Uniform

The common day-to-day uniform of the Force. Called "undress black" by the troops, it is a set of black trousers and a black jacket, both with maroon trim. Undress is the uniform worn by Marines any time they are not doing physical labor requiring the sturdier utilities.

Dress Blacks

The Marines have two levels of full-dress uniform. The first, more common outfit is dress black. This uniform is a variation of the Navy's dress uniform, and is cut in the same way, a black high-collared, single-breasted jacket, trimmed in maroon, with a prominent Imperial sunburst. Marines wear only their rank and awards for valor on their dress blacks. Cutlasses are worn with the uniform where appropriate.

Dress Maroon

Also called parade dress, the maroon uniform is worn only on very formal occasions. In direct contrast to the severe look of the dress blacks, the maroon uniform is designed to overwhelm the viewer. The heavy maroon jacket has extensive gold trim and braid, and all the Marine's medals and decorations are worn. Normally, a black kilt is worn with dress maroon. In situations where the kilt would be inappropriate – low-gravity for example – black trousers are worn.

Maroon is the standard uniform for honor guards, flag bearers, regimental pipe bands, and guards at Imperial Consulates.

Duty

Crunch, crunch, crunch . . .

The thin ice under Marine Gellert's boots made a satisfying sound, helping him to maintain his pacing. The freezing rain had slackened, becoming a tolerable drizzle.

Crunch, crunch, stop. Rifle from right shoulder to port arms; left face, come to present arms, hold 2, 3, port arms, left face, right shoulder arms, crunch, crunch, crunch . . .

The sun would be rising soon, a weak, distant thing compared to Gellert's own star. That's when the Gunny would come out to oversee the changing of the guard.

Crunch, crunch, crunch. A trickle of rain had found its way under Gellert's uniform, soaking him. Crunch, crunch . . .

The growing light of dawn revealed the cemetery. A few hundred markers, the remains of a Marine battalion that had fought here in a minor conflict a few centuries ago. Most of the markers were worn down by age, so that the names were illegible. But they were Marines. So Marine Inli Gellert would guard them. It was his duty.

Crunch, crunch, crunch . . .

Marine Snipers

While the Marines are most famous for their indiscriminate use of overwhelming firepower, the elite Marine snipers prefer to make use of single, precise shots to accomplish their goals.

Marines are selected for sniper training on the recommendation of their leaders. A prospective sniper must be a crack shot with the standard issue Gauss rifle and show he is an excellent trooper in all aspects of Marine life. If the Marine meets that criteria, he will be sent to the regimental sniper course.

Snipers are more than shooters; they are expected to also provide additional reconnaissance using the Mk. I Eyeball when possible. While the other Marines are storming around, the snipers will be in a position to view the entire operation from a distance.

The standard weapon for sniper teams is the LEMG-20. In the hands of a battle-dressed trooper, the weapon can destroy lightly armored vehicles at distances of over a mile.

Point Defense Divisions: Each of the five divisions contains three air/space defense vehicles, each with a crew of three. Normally, these are used for defending headquarters, but may also be committed to defending other high-value targets.

Nuclear Damper Divisions: One of the primary concerns for the Marines is the potential use of nuclear weapons. The five nuclear-damper divisions can suppress these weapons, as well as clean up after any unfortunate accidents. Each division has four Nuclear Damper-variant *Astrins* and 16 troops.

Scout Divisions: Often deployed in situations where orbital surveillance is not possible for some reason, each scout division has six scout sections with two Marine observers who use grav cycles or grav belts. Not surprisingly, the five divisions have some of the highest casualty rates in the Marines, since their job is to go out and find the enemy.

Medical Divisions: These three 20-Marine divisions operate a grav mobile surgical hospital and five ambulances each. As Marine medics have to deal with wounded wearing battledress, the interior of a mobile surgical hospital resembles a mechanic's shop more than an operating room.

Maintenance Divisions: The Marines are a heavily equipped force, and the workload on the five maintenance divisions can be onerous. Utilizing two heavy recovery vehicles and four g-carriers, the 24 Marines of each division have to hustle to keep up with demand.

Mess & Transport Divisions: Each of the five 20-man divisions operates four g-carriers and a single mobile field kitchen (a specialized g-carrier). Compared to their counterparts in the Army, Marines rarely complain about their food. Whether this is related to having to live off survival pellets in their suits for longer periods of time is not discussed.

Sniper Teams: Each regiment fields five two-man sniper teams. The 10 Marine snipers in this section are picked men and highly trained. Properly employed, a sniper team can have a devastating effect on the enemy. A normal tactic is to drop the snipers deep behind enemy lines, there to disrupt enemy formations moving forward to attack the main Marine position.

Combat Engineer Teams: There are three engineer teams in the regimental pool. Since the Marines' mission does not include construction, these are pure combat engineers. One of their strengths is clearing landing pads and reinitializing starport operating systems. The 39 Marine engineers in each team call this sort of thing a "doormat" job.

Special Weapons Teams: In Imperial circles, "special weapons" is a polite term for the weapons of mass destruction prohibited by the Rules of War. Each member of the three four-man SpecWeap teams is highly trained in biological, chemical, and nuclear warfare and munitions, and some have acquired knowledge of more exotic weapons, such as genetic or antimatter weaponry.

Regimental Medical Unit

This is a full hospital staffed by 153 Marine and naval medical personnel. It is commanded by a Navy captain, who must be a qualified surgeon.

It is interesting that a high proportion of the service members in this unit are Navy. Serving with the Marine Force is strictly voluntary, and often described as one of the greatest challenges a naval surgeon can undertake.

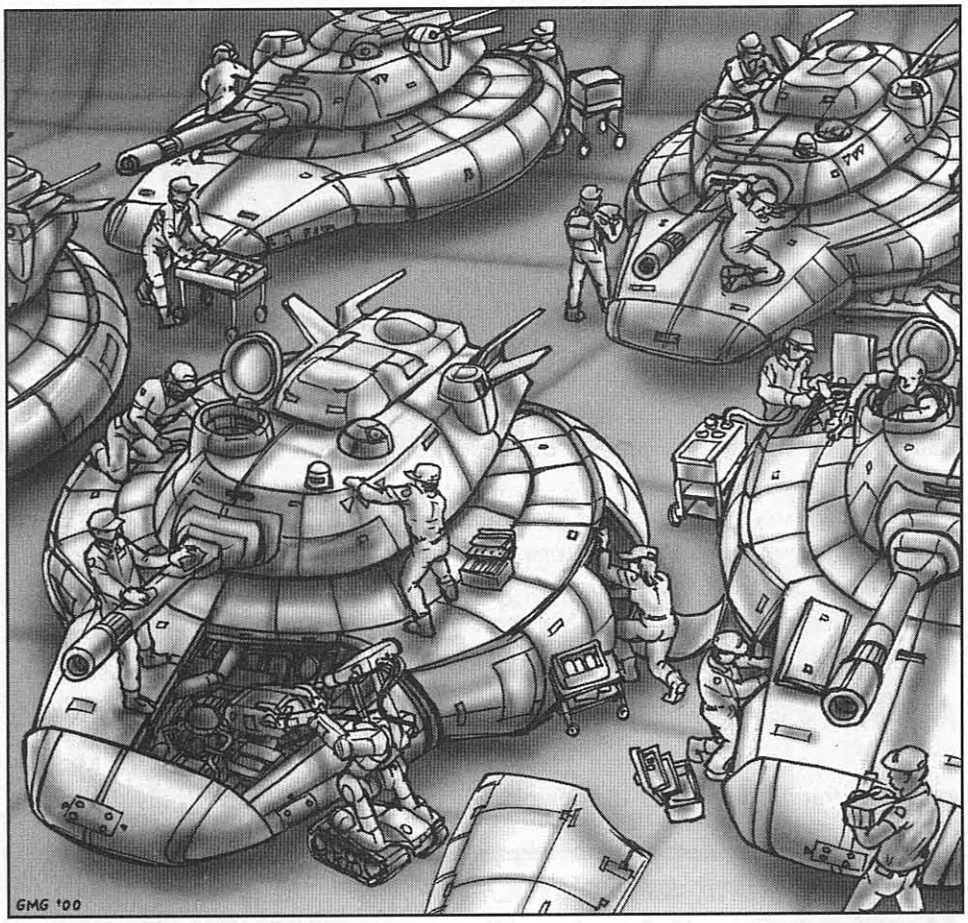
Headquarters Division: A typically small Marine HQ, it has only the CO, the XO (a Marine O-4), and four clerks.

Surgical and Dispensary Division: The Navy medical professionals, 35 doctors and nurses, work with close to 50 Marine corpsmen and assistants.

Medical Support Division: These Marines serve, like their Army counterparts, as the grunt labor of the hospital unit. The 62 Marines in this group also crew the unit's 10 *Astrin* ambulances and five g-carriers.

Regimental Transport Company

Supplementing the pool transport Marines, the transport company is capable of moving tons of supplies over vast distances quickly. The lieutenant in charge of this operation is faced with quite a challenge, as he is responsible for making sure that the supplies get through. Each of the five 33-Marine platoons contains 22 g-carriers and a single fuel sled (usually a *Teamster* with a tanker container).



Line Marine Companies

The nine line Marine companies are the Marines at the point of contact, and shoulder the majority of the regiment's combat duties. Sub-units as small as single squads can be deployed to undertake missions. The 309 Marines of a full company can lay waste to wide areas with only their personal weapons.

Command Post Division: Line Marine companies are commanded by force captains (O-3). The CO, the ship sergeant, and the exec all use a single *Astrin* APC along with the six members of the company command complement, who double as crew for the vehicle.

Marine Platoon: Usually the smallest force deployed by the Imperium, the 75 Marines of a line platoon represent the best regular fighting force in the Imperium.

Command Post Division: Each of the company's four platoons is commanded by either a force ensign (O-1) or force lieutenant (O-2), along with a section sergeant. A four-Marine fire team, a runner, and the crew of the skipper's *Astrin* fill out the 10-man section. A platoon has five squads of Marine infantry.

Marine Squad: Each of the five squads per platoon is led by a low-ranking NCO, usually a sergeant (E-5), with an aide, and has eight more troops organized into two fire teams of four, plus the three-man crew of the *Astrin* APC.

"With the Gratitude of the Emperor," Part Two

Marine Force award citations for the Starburst for Extreme Heroism:

Hostman, Dudeka F.

Rank and Organization: Force Ensign, Imperial Marines, INS *Chenery* (CA-50634). Place and date: Jewell/Jewell, 192-1083. Entered service: Mora/Duale. Born: 300-1058.

Citation: With the gratitude of the Emperor and the Imperium, for distinct valor in action at the risk of his life and beyond the call of duty. As commanding officer of the Marine detachment attached to *INS Chenery* (CA-50634) when that vessel was fiercely attacked by enemy fighters during the operations against Zhodani fleet elements in the Jewell system, 192-1083. Force Ensign Hostman was at his battle station on C deck when the ship was rocked by a series of violent explosions set off in the ship's missile magazines by the attack. Force Ensign Hostman unhesitatingly risked his life to assist several dozen men trapped in a mess compartment filled with smoke, and with no apparent egress. As the imperiled men became increasingly panic-stricken under the assault of incessant explosions, he confidently assured them he would find a means of effecting their release and, groping through the dark, debris-filled corridors, ultimately discovered an escapeway.

Staunchly determined, he struggled back to the compartment three times despite menacing flames and the ominous threat of sudden explosive decompression, on each occasion calmly leading his men through the blanketing pall of smoke until the last one had been escorted to a safe compartment. Selfless in his concern for his ship and his fellows, he constantly rallied others about him, repeatedly organized and led fire-fighting parties into the blazing infernos raging in the ship's engineering spaces, and when the emergency venting systems were found to be inoperable, entered the auxiliary engineering control spaces and supervised the rerouting of controls to allow the fires to be extinguished in the face of extreme difficulty and hazard.

An inspiring and courageous leader, Force Ensign Hostman rendered self-sacrificing service under the most perilous conditions and, by his heroic initiative, fortitude, and valor, was responsible for the saving of several hundred lives. His conduct throughout reflects the highest credit upon himself and upon the Imperial Marines.

Continued on next page . . .

"With the Gratitude of the Emperor," Part Two

[Continued]

Virta, Pekka NMI

Rank and Organization: Sergeant, Imperial Marines, 7th Line Company, 1,071st Line Marine Regiment. Place and date: Smithforge Mountains Regina/Efate (declared missing in action on 305-1107, and killed in action as of 305-1112). Entered service: Regina/Regina. Born: 030-1080.

Citation: With the gratitude of the Emperor and the Imperium, for distinct valor in action at the risk of her life and beyond the call of duty. While serving as a squad leader in a Marine line platoon, in action against enemy aggressor forces. Vastly outnumbered by a well-entrenched and cleverly concealed enemy force consisting of consular guards attacking her unit's open and unconcealed positions, Sgt. Virta unhesitatingly took charge of her platoon in the absence of the platoon leader and, exhibiting great personal valor in the face of a heavy barrage of hostile fire, coolly proceeded to move about among her Marines, giving words of encouragement and inspiration and skillfully directing their fire.

Ordered to displace her platoon during the firefight, she immediately placed herself in an extremely hazardous position from which she could provide covering fire for her unit. Fully aware that her voluntary action meant either certain death or capture to herself, she courageously continued to provide effective cover for her men and was last observed with battledress severely damaged, but still singlehandedly engaging enemy troops in close quarters grenade and hand-to-hand fighting.

By her valiant and inspiring leadership, Sgt. Virta was directly responsible for the successful completion of the platoon's displacement and the saving of many lives. Her dauntless fighting spirit and unfaltering devotion to duty in the face of terrific odds reflect the highest credit upon herself and the Imperial Marines.

Marine Lift Cavalry Squadrons

The two lift cavalry squadrons are a regiment's heavy force. This lethal mixture of tanks and APCs gives extra weight to the regimental punch, but has little recognition outside the Marines compared to the more glamorous infantry companies. Each squadron has four lift cavalry troops. In total, the squadron has 490 Marines assigned to it.

Squadron Headquarters: The 14-person squadron headquarters is an efficient, modest operation. The commander and his XO have their own *Intrepids*, while the rest work from two Command *Astrins*.

Lift Cavalry Troop

A very versatile part of the regimental arsenal, the 100 troops of a LiftCav company are often employed as "hunter-killer" teams. The scouts find the enemy, the tankers come in with heavy fire, and the rifle division sweeps the target area for prisoners or intelligence materials.

Headquarters Division: A cavalry troop is commanded by a force captain (O-3) from his *Intrepid*. The executive officer (O-2) and ship sergeant (O-8) have Command *Astrins*. The division has 19 Marines in all.

Lift Cavalry Platoon: Each of the troop's three platoons is led by a force lieutenant (O-2) with the support of his section sergeant (E-7). A platoon has 27 Marines including:

Tank Division: Two *Intrepid* grav tanks.

Scout Division: Two *Bergstrom* light tanks. The platoon sergeant normally commands one of the *Bergstroms*.

Rifle Division: A standard Marine squad mounted on an *Astrin* APC. The platoon commander is usually deployed as the APC commander.

Marine Grav Tank Troop

The squadron has a single grav-tank company. The unit fields 76 Marines and 16 *Intrepid* grav tanks in four platoons of four AFVs each, plus the two in the company headquarters.

"Target front, tank, 3300!" "Acquired, firing!" Another Zho tank blows apart. "Pudding! Drop us back and find cover, he's going to have friends!" The Intrepid was already moving; I have a good crew. Hell, I have a great crew. "Target left, tank, two carriers, 4500 and closing!"

Back to work.

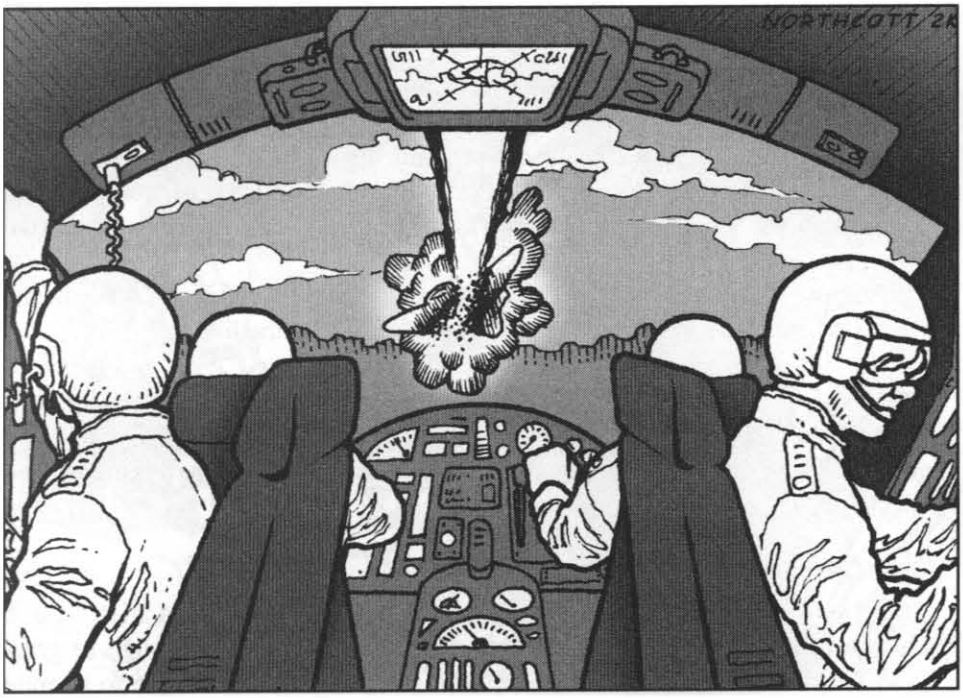
Headquarters Division: The tank troop is commanded by a force captain (O-3) and the XO (O-2), who both command their own *Intrepid* tanks. The troop's ship sergeant (O-8) operates from an *Astrin* APC with the small headquarters crew of three.

Grav Tank Platoon: Under the leadership of a force lieutenant (O-2), the four tanks and 16 men of the platoon are trained to support the rest of the squadron with devastating fire when called upon to do so.

Meson Gun Batteries

By the Fifth Frontier War, the Marines had made a complete break from missile-based artillery, switching to *Terrapin* meson sleds. The increase in firepower, along with the elimination of heavy resupply needs, has made the move very popular with the troops. The regiments' five batteries each have 60 troops.

Battery Headquarters Division: The battery HQ uses two Fire Direction-variant *Astrin* APCs for the commander and his 17-man staff.



Firing Divisions: The battery has four firing sections, each with one *Terrapin* meson sled and its crew of four.

Battery Security Division: To protect the valuable *Terrapins*, two Marine squads are assigned to the battery as a protective detail, mounted on *Astrin* APCs, for a total of 26 troopers.

Marine Armored Cavalry Regiment

The hardest-hitting of the Marine troops, the Marine armored cavalry regiment (or MACR) is something of an anomaly. The line regiments are configured to be fast-response forces, able to move to emerging situations without requiring extensive transport. An armored cavalry regiment, on the other hand, is a massive formation of grav armor which requires a great deal of transportation space for its gear and 1,967 Marines.

Headquarters and Headquarters Troop

Unlike the line units, the command functions of the MACR can be a little more centralized. Since the regiment is only committed in support of other Marine assets, it lacks many of the normal support structures seen in Marine formations.

*Command Division:*The MACR is commanded by a colonel (O-6). The commander and his XO (O-5) both lead from their *Intrepid* tanks. The regimental fleet sergeant and the colonel's adjutant use two Command *Astrins*. The section has 26 officers and enlisted personnel.

Regimental Headquarters Company: Commanded by the adjutant. In normal circumstances, the XO (O-3) and the company ship sergeant (E-8) handle the day-to-day affairs. The eight-man Command Division uses a single Command *Astrin* in combat.

Plans Division: This is often thought of as a dead-end assignment. After all, some Marines reason, how much planning does it take to order an all-out assault? The truth is that handling the unique capabilities of the armored cavalry requires a planning officer who can forget the traditional Marine methods. The division has eight officers and NCOs and a single *Astrin* assigned to it.

Marines and Nobles

Adm. Lord Wayne William Grant Boul hault-Ewart worked the party floor, greeting his distinguished guests as he went. His aide discreetly followed a few steps behind, whispering names and information into his boss' tell-all.

"The young gentleman at the buffet table is Jason Kemp, Baron Casttie, a younger son of the Duke of Star Bridge, he is . . ." The voice faded away as Adm. hault-Ewart rushed out of the device's short range. Star Bridge! Making this young fellow's acquaintance could be just the leverage he needed to become Sector Admiral!

"My dear Lord Kemp!" cried Ewart, drawing close to where the young man had begun devouring an amazing pile of food. Seeing no hands free to shake, he settled on merely patting the boy on his shoulder. He really was a boy, Ewart realized, barely past 20! What was he doing so far from home? No matter, on to business!

"I trust you find my little gathering to your approval? I must say that I was pleased when my seneschal told me of your presence in the system. I have to ask, did you enjoy the races?"

Around a mouthful of imported khoeilsae, the youngster responded. "Didn't actually see them. I had another engagement which occupied me and a friend for the entire weekend."

Ewart grinned in a knowing manner. "Ah! I understand! Why stand around watching kian run in circles when you could be with better company, eh?"

"Actually, I spent the last two days scrubbing your personal fresher onboard your flagship." Kemp replied, popping a deviled kian egg in his mouth.

Ewart's cheeks began to flush; he gave the boy a piercing glare. "What in the world are you talking about? Why would you be scrubbing my fresher?"

"Admiral, I'm a Marine in your personal guard detachment." Kemp, Imperial Marine and Baron Casttie, plucked the wine glass from Ewart's numb fingers. "In answer to your question, sir, it's a great party."

In the Navy, social status is very important in gaining rank; some assignments are unattainable without patronage or family ties. In the Marines, however, family title is not nearly as important as the title carried by the individual: Marine.

Given the Marines have no academy and all Marines start out as enlisted men, the aristocracy doesn't see the Force as a social ladder. In some areas, a noble child joining the Marines is an outright scandal! This is especially true if the child had "better prospects" arranged for him.

Some nobles in the Marines prefer to keep their family ties a secret, requesting assignment in a distant subsector or serving under an assumed name. A Marine could even take this as a Secret disadvantage.

Navy Relations

The Imperial Navy and the Marine Force work together, yet maintain separate traditions and organizations.

At worst the Navy tends to view the Marines as a mischievous younger brother, always causing trouble but sometimes very useful. The Marines sometimes see the Navy as a necessary evil.

Normally, the Marines and Navy maintain a professional relationship with each other. During wartime, the Navy and Marines become a single force bent on destroying the adversary.

The rivalry between the two forces rarely goes beyond good-natured joking and sporting competitions between Navy and Marine units. Taking the rivalry beyond this level is frowned upon by both services. This does not stop the occasional fight between Marines and starmen, particularly while on liberty.

The rivalry is less pronounced in the higher ranks, as the officers have more opportunity to work within each others' staffs. Senior officers will occasionally get caught up in the rivalry, especially when the opportunity comes for one service to settle a long-standing score with the other.

The naval crews who man the *Caen*-class Marine dropships live in a no-man's land between the two sides. Some starmen like the duty, and the Marines, so much that they spend their entire careers ferrying the Marines from place to place.

Army Relations

"The Marines, the Marines,
Those publicity fiends,
They cannot keep their weapons clean!"
– Army doggerel

Without the close relationship that the Navy enjoys, the Armies of the Imperium tend to have sharper feelings about the Force. In many areas, the Marines are seen as arrogant and condescending. The high-profile nature of Marine actions also gives the Force the image of being glory hounds. Marine opinions of the local Imperial Army forces vary, from profound respect to utter disdain.

As with the Marine-Navy rivalry, the competition with the Army rarely reaches the point of actual violence. Friendly competition is the rule, with frequent athletic competitions and other chances to face off with the "enemy" in controlled situations.

Despite these feelings, many Marines at the end of their terms of service are welcomed by their home PDF or local Unified Armies units. The training that a Marine receives, along with any actual combat experience, are an asset to the local force.

Intelligence Division: When committed to combat, the intelligence division is mostly concerned with channeling action reports to the regimental commander. The six Marines of the division have to depend upon outside sources for the majority of their non-combat information. They possess a single *Astrin.*

Supply Division: The supply officer and his 12 Marines deal mostly in repair parts for the regiment's vehicles. Feeding the hundreds of troops is also a concern in the fast-moving cavalry units. The division operates from two *Astrins.*

Regimental Signal Section: The crews of the five Command *Astrins* in the section perform the same duties as the signal section of the line regiment.

Marine Lift Cavalry Squadrons

The two lift cavalry squadrons are the heart of an armored cavalry regiment. These units are identical to the squadrons in the line regiment (see p. 42).

Marine Grav Armor Squadrons

The two grav tank squadrons are known as "the Iridium Fist." Each squadron has four tank companies that can exploit any breakthrough to great effect. These two squadrons are extremely streamlined, and unable to operate on their own, lacking all but the most rudimentary support services. Each squadron has 335 Marines and 74 *Intrepids.*

Headquarters and Headquarters Troop: A squadron's headquarters is very small, with only 15 Marines assigned. Much of the usual HHT duties are given to higher commands. The commander (O-5) and XO command their own *Intrepids*, while the fleet sergeant performs his duties in a Command *Astrin.*

Marine Grav Tank Troop: The basic maneuver group of Marine armor, the standard tactic is to use the massed formation as a "battering ram" on a single point. This tends to cause a number of casualties on both sides, but is very effective. Each troop has four platoons of four *Intrepids*, plus two assigned to the troop commander and XO that make up the troop HQ along with a Command *Astrin* carrying the troop's ship sergeant and seven other Marines. The 80 Marines in the troop are quite proud of their vehicles, and tend to program flamboyant and quite unauthorized nose and body art into the tanks' camouflage systems.

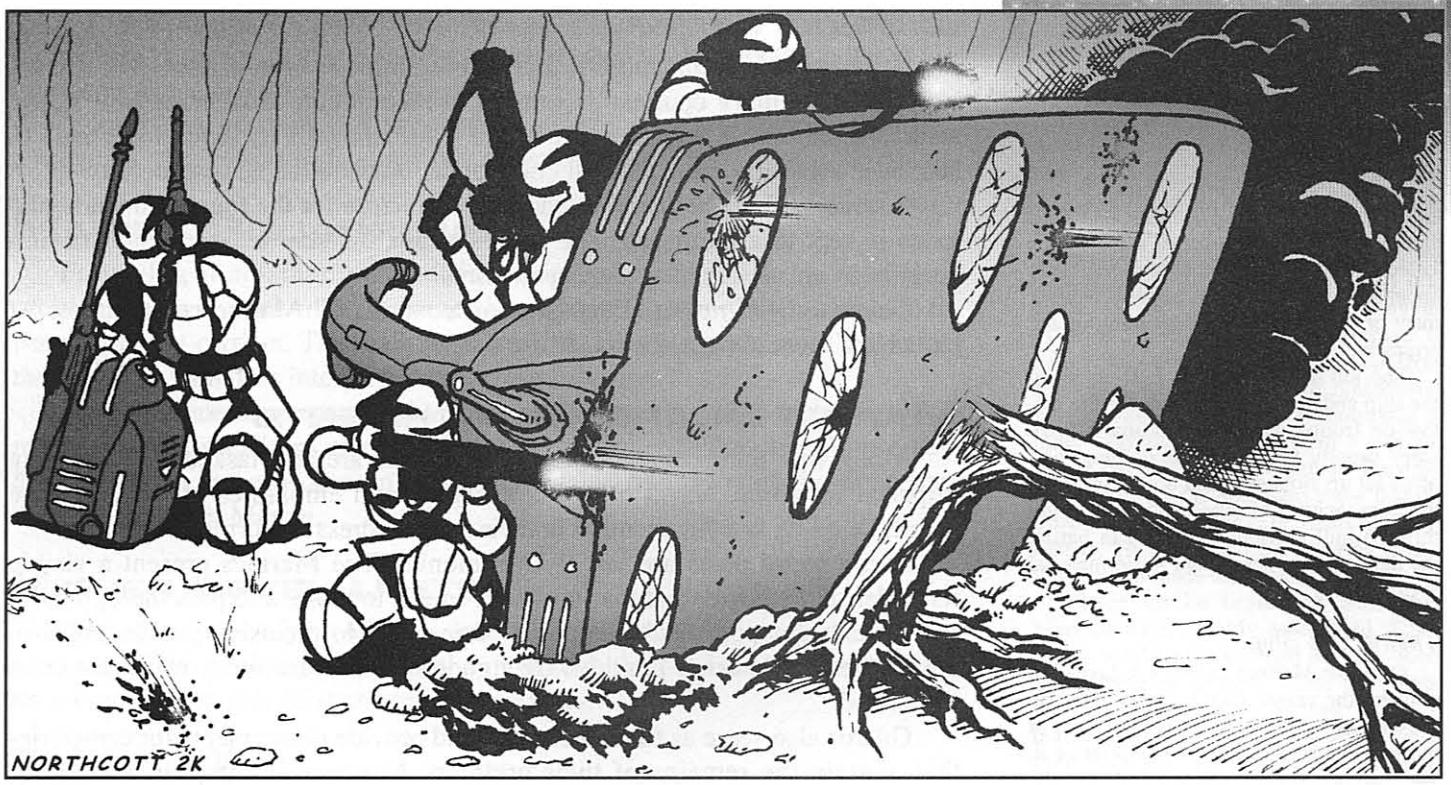
Support Troop

The support troop is undersized for the jobs that it is asked to perform. The troop's 181 Marines are under constant pressure to perform under harsh conditions.

Command Division: The platoon is effectively commanded by the regiment's executive officer. The regular running of the unit is left to the troop ship sergeant and his eight staffers. The division has a single *Astrin* APC at its disposal.

Medical Division: The division's 58 troops field eight Ambulance-variant *Astrin* APCs and run a small emergency hospital. Like much of the regiment's support units, this is far below what is needed for the regiment's most basic needs. A proposal is in place to add a full regimental medical unit to the armored cavalry.

Maintenance Division: The armored regiment requires constant upkeep to remain combat-effective. While much of the burden is borne by the vehicle crews, the heavy work is given to the regimental maintenance division. The 72 Marines utilize six heavy recovery vehicles and 12 g-carriers.



Mess & Transport Division: The 43-Marine division crews eight cargo g-carriers and two mobile field kitchens (a specialized g-carrier.)

Meson Gun Battery

Like the identical batteries in the line regiments (see pp. 42-43), the single meson gun battery in the armored cavalry regiment provides suppression fire for any target that the tankers can't handle on their own. The 60 men in this battery are often overworked, trying to answer the unending calls for fire support.

Marine Commandos

Separate from the regimental structure are the commando companies. It takes a very special sort of Marine to become a commando, and more than 60% of those who take the selection course either drop out or are medically unable to reach graduation.

Marines who do undertake this course find themselves challenged to survive and operate under the harshest conditions the Imperium can offer. One of the requirements of graduation is to successfully complete a suitless transition of a blacked-out corridor in vacuum and zero-g. Needless to say, those who wear the coveted green beret and gold sunburst have a reason to feel proud of themselves!

The commandos are used for extreme-risk missions that are outside the normal scope of a Marine regiment. These missions include pinpoint assaults, "personnel retrieval" (a fancy title for the kidnapping of individuals), or even attacks against Imperial nobles suspected of treason. After seeing their obvious fanaticism, secrecy, and high casualty rates, some have accused the Marines of organizing suicide squads.

There is no accurate guess on how many commando companies are currently active inside the Imperium. At least one company is assigned to each regiment and attached to the local Fleet Command. To keep matters confused, the companies often switch unit identities or adopt ridiculously high company designations to throw off any attempt to make an accurate census.

Boarding Actions

The most hazardous assignment given to the Marines is that of boarding hostile vessels in deep space. Casualties among the Marines performing this duty often top 75%.

The benefit in captured intelligence and material offsets the risk, so the Marines will still answer the call of "Boarders away!"

The requirements for boarding a ship are very strict. The enemy vessel must be incapable of maneuver, and have at least one approach where all point-defense weaponry has been destroyed. The value of an enemy prize is also considered; it is rarely worth the effort to seize a destroyer, while grabbing a battleship is a goal worth significant risk.

The Approach

When an enemy ship has been designated for boarding, the assigned Marines board assault cutters for the journey to the target. Whenever possible, the voyage time is kept to a minimum. Cutters make excellent targets in the chaos of a space battle. The flight crew must attempt to identify probable entry points, either designed (air locks or cargo doors) or through battle damage. When the cutter comes to within 30 yards, the Marine platoon will disembark and travel to the target ship on thruster packs.

Continued on next page . . .

Boarding Actions
[Continued]

Canary Teams

The Marines chosen to make initial entry into vessels being boarded are called canary teams. The number of these troops killed in the attempt to secure footholds is appalling, and the duty is either a punishment or a point of pride, depending on the regiment.

The job of the canaries is to open up the ship and set up a perimeter for the follow-on troops. Personnel onboard these ships usually know what is coming, and often set up ambushes and booby traps for the approaching Marines. When entering through hull sections damaged in battle, the danger from debris and loose material is extreme.

Taking the Ship

Once the Marines have a solid position onboard the vessel, they begin to move on the critical facilities. These are the parts of the vessel that give effective control of it. They are the bridge, engineering, and the computer center. Teams are given assignments by the boarding commander, and begin a methodical advance.

In the tight confines of a damaged starship, combat is fast and deadly. The average range at which combatants engage each other shrinks to less than 4 yards. Local environmental systems might be compromised, leaving the troops in the dark, zero gee, or vacuum. The clutter renders most sensors useless, making the Marines dependent on their eyes and instincts.

Many times, the fight has completely gone out of the crew remaining in the target vessel. They may offer only a superficial show of force, or actively seek out boarders for the chance to surrender. Other times, the crew retains good morale and order, and actively resists the boarders with all means necessary.

When the teams reach their objectives, they can make a quick assessment of the viability of salvaging the ship, and collect prisoners and intelligence. If the ship can be salvaged, the Marines shut down as many of the systems as they can, and leave a beacon. If the ship is not in any condition for retrieval, the Marines place charges to destroy any items that the enemy might salvage.

In any event, boardings are not supposed to last too long. The standard formula for figuring the clearing time in minutes is displacement tons × 15/number of Marines.

This presumes a close, careful search. A much more cursory "search and scuttle" takes only one-third as much time.

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Commando Company

A company of commandos is a very loose military organization. The normal structure of military courtesy is relaxed in recognition of the extremely select nature of the unit. Every one of the 236 commandos is expected to be able to take over a mission, from the unit commander down to the newest recruit.

*Command Post Section:*The leadership structure for the four commando platoons is kept to a minimum. The force captain, his ship sergeant, and six runners/clerks are all that the company requires.

Commando Platoons: Each platoon contains 57 Marine commandos. At least 10 of these are qualified as snipers.

Marine Guard Detachments

Along with their combat duties, the Marines are also tasked with guarding Imperial facilities. Naval bases, consulates, and embassies all have Marine guards standing at rigid attention in their maroon dress uniforms.

These guard posts are largely ceremonial. The Marines present a visible reminder of the power that the Imperium wields to those who pass through those gates. At larger postings, the guards often serve in precision parade and drill units. The morale boost provided by a good drill and ceremony team cannot be overstated.

Guards also serve as funeral escorts, and provide detachments for cemeteries that contain the remains of their brethren. Nowhere is the Marine ideal of brotherhood better expressed than in the devotion to all Marines everywhere, even those long since dead.

The standards for Marine guards go far beyond the already stringent demands of the Marines. Equipment and uniforms must be kept in immaculate condition, and the individual Marine will be subjected to continual close inspections. The guards are also expected to learn all the details of their regiment's history, so that they can appreciate the honor they've been granted.

Guards are all volunteers, and must pass the approval of their chain of command before going to their first posting. A new Marine guard can expect to spend a great amount of time standing in the dark at lonely sites. A Marine guard who has served his tour honorably can add the "guard" tab to his dress uniform when he returns to a line unit.

Ship's Troops

Marines serve aboard the warships of the Imperial Navy as guards, combat forces, and in some cases crewing weapon mounts. The size of a ship's Marine complement varies, with some ships having barely a squad to ships capable of carrying an entire regiment's worth of Marines. The proportion runs from as high as three Marines per 100 displacement tons down to three per 1,000 dtons. Factors like the ship's intended purpose, the political situation, and the likelihood of needing Marines are what define the size of the Marine company onboard.

"Think of boarding actions as house-to-house fighting, in zero-gee, inside a nuclear reactor, with the Big V outside."
– Gunnery Sgt. Shawn Fisher, Instructor, Camp Swanson Marine Training Facility

While on ship duty, Marines are considered part of the Navy crew for purposes of orders and discipline. For many Marines, a tour aboard a ship means a

year of standing guard at hatchways, and very little excitement. Others may find themselves in a type of battle they've never trained to fight, being pressed into service as damage-control workers.

Marines who serve as gunners onboard a Navy vessel are authorized to wear a badge on their uniforms denoting this achievement.

Marine Squadrons

Following long-standing tradition, the Force maintains its own close orbit/aerospace control units. There are also Marine fighter pilots serving on the Navy's mighty carriers. The main mission of the Force squadrons is supporting the line units with both interdiction and close support.

While Marine deep-space fighters are maintained by naval technicians, the majority of the squadrons are completely Force-manned. The flight crews have the same esprit de corps as seen in line companies, and maintain the same standards as any other Marine.

Higher Level Units

While the focus of the Marines is on the individual regiment, many situations require higher-level units. For the most part, the Marines rely on the Navy for administrative functions and medical services.

Brigadier's Office

The brigadier oversees the regiment assigned to each fleet. His job is to coordinate their actions and advise the fleet admiral and civilian leadership on the current status and possible uses of the Marines in any given situation.

In keeping with the Marines' streamlined structure, the brigadier has a fairly small staff. The main focus is on gathering accurate data for Naval Intelligence and passing it on to the units in the field. The brigadier's office is also responsible for recruiting and training new Marines in his fleet's assigned areas of responsibility (usually a single subsector).

Marshal of Marines

A rank that has disappeared and come back several times over the centuries, the marshal oversees a group of four or more subsectors. Marshals are found only in areas where the threat of war is high, carrying with it the corresponding need to quickly move regiments to cover hot spots. As of 1120, there are no marshals serving in the Imperial Marines.

The Gray Masks

A shadowy organization, whose actual existence remains mere rumor, the Gray Masks are said to be a secret cabal working inside the Marines. According to the various stories, the Masks have all sworn allegiance to the Emperor and his line as personal vassals. These oaths go far beyond the usual oaths of enlistment, since they bypass the usual chain of command. The Gray Masks answer only to their superiors in the organization and the Imperial Family.

The Masks are Imperial fanatics, willing to die to further the Emperor's cause. Stories abound of Gray Masks submitting to horrific deaths rather than dishonor their oaths. Some say that the Masks' influence goes beyond the Marines, while others swear that the group is made up solely of Marines. One thing most of the legends agree upon is that the Masks have few, if any, nobles among their ranks. The name comes from the gray cloth used to cover the faces of Marine dead who are not suitable for viewing.

Boarding Actions

[Continued]

For instance, it would take six Marines eight hours and 20 minutes to completely search a 200-dton ship, and two hours and 47 minutes to do a quick search of the same vessel.

A classic example of a boarding action took place during the Solomani Rim War at the Second Battle of Kagukhasaggan (1002). Solomani troops attempted to board the badly damaged *Azhanti High Lightning*-class cruiser *Bard Endeavour,* which was covering the withdrawal of other vessels from the system's sole gas giant. Interviews with captured Imperial servicemen let the Solomani know that the *Bard* was still capable of jump, pending repairs. The prospect of recovering such a large vessel made the decision easy.

Three strike teams of Solomani Marines were quickly assembled. Team Aleph would enter through the rear doors of the boat-dock deck, clear the jump-drive decks, and repair the jump drives, if that was possible. Team Beth would force their way into the ship via the fighter recovery lock on deck 69 to cripple the four remaining operational fighters on board (and prevent their use in case of an Imperial last-ditch effort to prevent enemy recovery of the ship). Lastly, Team Gimmel would force the air locks on deck 41, in the upper power-plant area, and clear deck 40 immediately above it. Everything forward of the third fuel area (decks 26 to 34) was either flooded with liquid hydrogen or heavily irradiated, thus eliminating the running bridge from consideration. A small emergency crew was known to be on the auxiliary bridge, however, directing the evacuation, and they would have to be dealt with before the Solomani could attempt the risky micro-jump.

The assault went according to plan initially, and both the hangar deck and the bridge assault parties gained their objectives. A handful of Marines and crewmen of the *Bard Endeavour* managed to organize hasty defenses around the jump drives, and despite horrific casualties, resisted complete clearance of the jump-drive decks and prevented salvage of the ship. The Solomani did manage to extract a number of valuable operational codes from the ship's computer and the strike teams evacuated.

Three hours later, the Imperial fleet intruder *Bard Endeavour,* with 43 of her defenders still aboard, suffered catastrophic re-entry into the atmosphere of Kagukhasaggan 2. In 1020, Emperor Gavin named the world a war grave, and commissioned a class of warships named for the *Bard's* crew. This action is used as a prime example of both how to conduct a boarding, and more importantly, how to defend against one.

From what can be pieced together, the Gray Masks formed during the Arbellatra Regency (622-629). In the chaos following the Civil War, the excesses of many Marine officers came to light. Hunting down these criminals became a priority for the shamed Marines, and the Masks were born to ensure that nothing like the Civil War happened again. In time, the Gray Masks changed to a more aggressive group, attempting to further the Emperor's ends, rather than just protecting the line.

Gray Masks undertake the blackest of black operations. They have been blamed for atrocities in a dozen subsectors, and for the disappearance of many Imperial critics. The death of Archduke Dulinor has been credited to the group by many conspiracy theorists. According to the traditions, those targeted by the Masks receive a warning in the form of a small gray piece of cloth. Since nothing of this sort has ever been found, the story is probably merely fiction invented to make the Masks even more menacing.

If the Gray Masks do exist, they are a very tightly knit group. Membership is offered only to those who would be able to keep the group's secrets, and are as dedicated to the cause as they are.

Those in a Marine-oriented campaign might run afoul of the Gray Masks in any number of ways. The easiest is to be recruited for membership, but this has its own drawbacks. Membership in the Masks is more perilous than most forms of combat, and is fraught with intrigue (in game terms, an Extremely Hazardous Duty). Marines might also unwittingly interfere in a Mask operation, and earn the enmity of the organization.

Possible the best use in a more straightforward campaign is to have the Marine PCs encounter the Masks in an odd situation, then be called into the colonel's office to be told "you never saw anything." This sort of gambit can quickly take ordinary troops down the road into a very different military world.

Marine Equipment

The Marines are equipped with the finest gear the Imperium can provide. A line Marine will wear a suit of *Redding* assault battledress, and carries a fusion battle rifle. Marine vehicle crews wear *Colom* battledress or combat environment suits, depending on the mission.

The Future of the Marines

Heading into the 1120s, the Marines continue their drive to be the greatest fighting force in history. The Force is always looking for ways to improve itself. One promising experiment is providing each Marine with a small group of drones slaved to his battledress. These would be mostly recon/intelligence modules, but could also be equipped with weapons or even warheads. The concept is to allow each Marine to effectively control more of his area by having better knowledge of his situation.

> *"As the weapons of war change, so will the nature of war change, and though this is an undoubted fact, tactically it must not be overlooked that weapons change because civilization changes; they do not change on their own account."*
>
> *– J.F.C. Fuller*

Another cutting-edge program is the highly secret *Swanson* experimental battledress project. Currently only in the prototype stage, the *Swanson* incorporates TL13 enhancements. Gridlore Technologies, the primary developer, expects to begin field tests of the various systems no later than 1122.

The Gray Masks

The actual existence of the Gray Masks (see pp. 47-48) is left to the Game Master's discretion.

For the most part, the Masks should be used sparingly, even when it comes to their members. A Marine may be involved for years, and only be told to ensure that a certain officer receives orders for a specific assignment. He may never be contacted again. Or he may be asked to kill his best friend.

Those who would investigate the Masks put themselves in grave danger. The Marines who belong to the organization are all long-service professionals, and have all the requisite skills for their jobs. In addition, they can make use of their connections to request aid. The Emperor serves those who serve him.

Those wishing to play members of the Gray Masks should take a -30-point Secret (the Masks will happily kill anyone who threatens their security) and upgrade their Duty to Extremely Hazardous Duty (if not already at that level). They also take 30 points in Patrons and Allies. Being a Gray Mask is a Very Hazardous Duty! A strong Vow or Sense of Duty would be appropriate. A Marine being groomed for membership would do well to take a Secret Patron (see p. CI28) to represent his hidden friends in high places.

Alternately, if the Game Master decides not to use the Masks, a player might take Delusion (I'm a member of the Gray Masks). Or perhaps the Masks *do* exist, but the PC is still delusional. The delusional veteran might even start recruiting new "members" for the organization, drawing the player's Marines into his private world.

Operations

The small assembly room of the ***Keith****-class transport* ***Sergeant Paolo Marino*** *was filled to bursting with the officers and senior NCOs of the 3,383rd Lift Infantry Brigade. At a nod from Col. Hughes, the lights dimmed and the Brigade Operations Officer began his briefing.*

"Good morning. As you already know, we have been ordered to move the Brigade to Strouden to participate in a Type 6-A3 operation, code-named Vigilant Thunder. The religious disturbances on that world have begun to affect the economies of the surrounding worlds, so the subsector government has called for intervention.

"As detailed in the download, our area of responsibility will be the Hamaman Down Starport, the arrival lane, and a 200-mile-radius clean zone centered on the starport . . ."

Mission Codes

As an aid to planning, the military classifies the missions it undertakes using a set of simple codes that define the type of mission and the nature of the world that the mission will take place on. These codes are general indicators of what the unit is doing; subunits will be executing different types of missions to support the main goal. For example, a division performing local defense might send out raiding parties while other forces train for an upcoming counter-offensive.

Type 1: Invasion

Invasions are outright attempts to conquer and control a world by means of force of arms with no current friendly presence on the surface. This type of mission is rarely undertaken due to the extreme risk of casualties. Invasions require enormous support and massive numbers of troops. They are never undertaken lightly. Only when the needs of the Imperium absolutely require that the planet be completely subdued are invasions considered.

Invasions are also used to dislodge enemy forces from occupied Imperial worlds. To cut down on collateral damage, High Command prefers to use naval sieges, but there eventually comes a point where the troops need to be sent in. During the Fifth Frontier War, the Sword World forces holding Lanth had to be attacked and destroyed by three field armies in a long and bloody four-month campaign.

Type 2: Raid

A raid is defined as a forced entry into an area held by active defenders to achieve a specific goal. Raids are short-term operations, designed to get in and out as quickly as possible.

The largest set of raids ever launched by the Imperium took place during the invasion of Terra in 1002. Over a period of five days, thousands of Marines and Army jump troops made dozens of lightning attacks to pave the way for the following forces.

How Missions Are Named

The voice of Force Cmdr. Jason Weiser rang through the passageways. Marines quickly moved out of the line of their commander's angry advance as he shouted into his comm unit.

"I don't ***care*** *how vital this operation is, or who ordered it, or the potential the situation has for destabilizing the Rim! I am* ***not*** *sending my Marines into combat in Operation Fluttering Butterfly!"*

Operations are given code names for the purposes of planning and organization. Often in the case of very large plans, each component of the operation will have a separate operational name.

These names are usually picked at random, and consist of one to three words. If the operation is very visible and politically significant, operational names may be assigned to reflect the mission's goal. An example from recent history was Operation Restore Hope in Somalia.

Imperial operations are named mostly in Galanglic, with some Vilani share words where appropriate. Many of these code names are reused many times.

You Are Not Cleared to Read This Sidebar!

Armies depend upon absolute security to survive. The loss of critical information to hostile forces can spell disaster, or even total defeat.

The Imperial services use *classifications* to indicate the sensitivity of particular documents or facilities. Personnel are given clearances based on what their assignments require them to have access to on a daily basis.

"Need to Know"

All classified information is handled with the stipulation that only people with the *need* to have access to that information can *have* access to that information.

Obviously, some things that are given low-level classifications will be known by so many people as to make the exercise moot. For example, the effective range of a commonly issued weapons system might be considered sensitive information, but every private knows it by heart.

Confidential

The lowest level of classified material, Confidential materials are those that won't cause extreme difficulty to the service if revealed. Almost everything produced in a military office is likely to be stamped Confidential as a matter of habit.

Confidential materials might be as mundane as a report on the repairs of the sewer system of a base. Since there is some reason to keep the information away from the public (the sewers could be used to infiltrate the base), but it also needs to be used by large numbers of people, the reports are merely Confidential.

Sensitive

Sensitive materials could, in the wrong hands, cause the Army or Marines some difficulty. The military pays a great deal more attention to the security of Sensitive materials than it does to Confidential. Personnel files kept at the unit level are an example of the types of material considered Sensitive.

Handling Sensitive materials requires that the person have a genuine need to know. For things like personnel files, this permission is automatic for clerks and the like. For some other areas, it might be more difficult. An old security trick is to hide a Most Secret file in plain sight by labeling it Sensitive and keeping the need-to-know list to a few "in" people.

Continued on next page . . .

A far more typical Type 2 mission is any of the raids made by the Marine Force against Vargr corsairs along the coreward edge of the Imperium. Rarely more than a few ships and a company of Marines are used in these missions, which disrupt the corsairs' bases of operation.

Type 3: Local Defense

Local-defense missions involve defending an area from an invading force. While the popular view of this mission is the brigade or division digging in alongside the local defense troops, the mission can extend far beyond the surface of one planet. The mission for the entire Unified Army of Jewell was local defense from the moment the last Frontier War started until the cease fire was announced.

Local defense is what the Army excels at, and throughout the history of the Imperium, invaders have learned that challenging the Imperial Army on its home turf is an expensive proposition.

Type 4: Police Action



Police action is a generic term for combat operations without a formal declaration of war, usually those fought inside the Imperium. Many interventions take the form of police actions. The Army is far more likely to be assigned to a police action, as the Marines are not properly equipped or trained for the long-term nature of these conflicts. The Marine Force's tendency to shoot first and not to even bother with the questions is a definite liability when involved in a police action.

These missions can prove to be very frustrating. In some cases the local government or population will, out of sympathy for the opposing force, prove to be a hindrance to the success of the mission. Moreover, the arrival of Imperial troops might be seen as nothing more than an invasion, with predictable results.

Type 5: Counter-Insurgency

Counter-insurgencies are an attempt to remove a hostile force from occupied territory. The classic insurgency is a guerrilla war with the troops suppressing the enemy while striving to eliminate the enemy leadership. Inside the Imperium, this usually means either rival nations on balkanized planets or forces in rebellion against either the planetary or Imperial government. Prior to the Fifth Frontier War, an entire field army was involved in a counter-insurgency on Efate/Regina against Ine Givar-backed rebels.

Type 6: Internal Security

Also called "baby-sitting." These missions put Imperial forces into a disputed area to maintain the peace or enforce treaties. This is usually accomplished by physically separating hostile powers along some boundary. Another method

involves holding a site important to both sides and regulating access. Internal-security missions are quite dull most of the time, with little chance to do much more than patrol and watch the locals watching you. When they do go bad, they can become extremely hazardous.

There are times, especially when the mission lasts for several years, that the local populace will accept the Imperial troops as members of the community.

Internal security is also a catch-all designation for civil-assistance missions. Army units are called upon to provide aid in cases of natural disasters or extensive civil upheaval. Many soldiers remember the 1116 assignment of the 2,130th Lift Infantry Brigade as security for a series of concerts by the legendary band VeedBack as one of the odder uses of Imperial troops in recent history.

Type 7: Training

Service members will spend the majority of their careers in training. The military strives to make the training experience as realistic as possible, and endeavors to get units as large as full divisions into the field as often as possible. On some worlds, the Imperium has rented subcontinents as training areas for use in exercises. There are even entire planets reserved for the military as giant free-fire zones.

Units are only assigned to the training category when the entire formation is involved in intensive exercises. It is expected that sub-unit commanders will take the initiative and carry out training programs of their own whenever possible.

Type 8: Garrison

When not engaged in another type of mission, troops are in garrison. The unit is at its home base engaging in the low-level training and maintenance that every military organization requires. This is also the time when individual service members can attended service schools or take leave. Army regulations require that every brigade spend at least a quarter of each standard year in garrison to maintain morale and readiness. The realities of operational needs sometimes make this difficult.

Subsector officials usually take the presence of a large number of Imperial troops as a chance to get some free security for vital facilities. Many Army bases are co-located with depositories, prisons, and other high-risk sites.

World Modifiers

Missions are further defined with a world type modifier, based on the tech level and population of the planet on which they take place.

Type A: High Tech, High Population

The most difficult opponent, worlds with more than 100 million inhabitants and near-Imperial technology (TL11-12), are classified as Type A worlds. These worlds tend to have large, lavishly equipped defensive forces and the resources to resist for long periods of time. Whenever possible, invasions of Type A worlds are discouraged, with extended sieges by Imperial Navy vessels considered an acceptable alternative. Imperial worlds of this category have a long history of defending themselves against attack with minimal assistance.

Examples: Mora/Mora (3124), Palique/Mora (3029).

Type B: Moderate Tech, High Population

These worlds have more than 100 million inhabitants and are TL8-10. Type B targets have the same dangerous numbers of defenders and stockpiles of supplies. The slight technological advantage held by most Imperial forces gives a slim edge in combat, but commanders still must act with extreme caution due to the possibility of higher-TL equipment having been imported.

Examples: Gram/Sword Worlds (1223), Jewell/Jewell (1106).

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Secret

When the authorities really do not want anyone outside a project to know about it, they label it Secret. At this level, learning about the project or file becomes exceedingly difficult. Secret documents are carefully tracked, and rarely stored on vulnerable data systems.

Battle plans, movements, and other vital information are listed as Secret. Bases, or specific buildings, can also be listed as Secret and off limits to all but the authorized few. In any event, a Secret will be well-guarded. Note that the building or base may be known to the community, may be in the middle of a city, but the guards at the gate will firmly deny entrance. An extreme real-world example of this was Onizuka Air Force Base in Sunnyvale, Calif., where the guards at the gate would deny that the sky-blue building behind them was even there.

Possessing a Secret file without authority, or trespassing in a Secret facility, is an Imperial crime. The nature of the Secret will determine how vigorously the Imperium pursues the case, and with what assets.

Most Secret

The highest level of Imperial secrets is Most Secret. Things are classified Most Secret when their content could threaten the stability of large regions of the Imperium. Some documents are labeled Most Secret in an attempt to bury the truth about an event until everyone who was involved is long dead. These files can remained sealed for centuries.

The security notes for Secret apply here, with much more intensity. The Imperium is willing to kill to keep these dark secrets quiet. Rarely will you find Most Secret information on any database for longer than it takes to compile the file. Documents classified Most Secret are always hand-carried by armed couriers, and exist only in carefully tracked, numbered copies.

Most Secret facilities will almost always be in desolate areas of inhospitable worlds. That, or they will be hidden in plain sight, disguised as some innocuous support group.

Higher Levels?

Rumors persist that there are even higher levels of Imperial security. The title most often claimed is "Ultra Secret," and is claimed to be beyond even the Emperor himself. In many cases, files identified as Ultra Secret are really Most Secret.

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Subheads

Secret and Most Secret files often will have a subhead, compartmentalizing the information and making it easier to control access.

For example, Operation Laughing Mongrel is classified Most Secret. To reduce the risk of security leaks, all the information regarding the operation is classified Most Secret: Laughing Mongrel. Unless he is on the list for Laughing Mongrel, even a subsector marshal cannot look at those plans.

Additional subheads will indicate any special handling for the information. The ones most commonly used by the Army and Marines are:

Not to Be Released to Non-Imperial Sophonts: This information needs to kept away from non-Imperials for reasons of state security. This could be because the information concerns an excursion outside the Imperial borders, or contains detailed knowledge of a hostile power, and the Army doesn't want the power to know that this information is loose. Other times it is used to conceal methods used in gathering information. Originally, all information about Project Longbow (p. GT48) carried this admonition.

Hard Copy Only. Not to Be Transmitted: The information being relayed cannot be transmitted by any means, and must be hand-carried from sender to recipient. In the Imperium, "hard copy" can include items such as read-once storage devices, or encrypted message pads. No matter what the form the information takes, it will almost always be packaged in a way to discourage tampering by self-destructing when improperly handled.

Warning! Reveals Intelligence Sources/Methods!: The document contains information that would compromise Imperial intelligence-gathering by either identifying sources for material or the means used to gather and evaluate that material. This label is often used on reports from agents in foreign states. Normally, any leak of the information gathered will place several sophonts in mortal danger, as well as cut off a good resource.

Type C: Low Tech, High Population

Known in military circles as "target-rich environments," Type C planets present a paradox. Rarely possessing weaponry of any use against modern armor, these worlds are not to be taken lightly. A hard lesson for many commanders is that primitive does not equal unintelligent. This classification covers everything from spear-wielding tribesmen to TL7 mechanized armies. However, TL7 worlds are classified as Moderate Tech if they have nuclear weapons.

A common theme in these tech levels is the inability to challenge Imperial forces for control of the skies. With complete air/space superiority, victory is often just a matter of time.

Examples: Louzy/Jewell (1604), Ruie/Regina (1809).

Type D: High Tech, Moderate Population

Worlds with 1-100 million inhabitants and Imperial levels of technology are classified as Class D worlds. While still dangerous, these worlds do not possess the raw manpower or infrastructure to offer extended resistance in a ground war. These worlds are fairly rare; for instance, none exist in the Spinward Marches.

Type E: Moderate Tech, Moderate Population

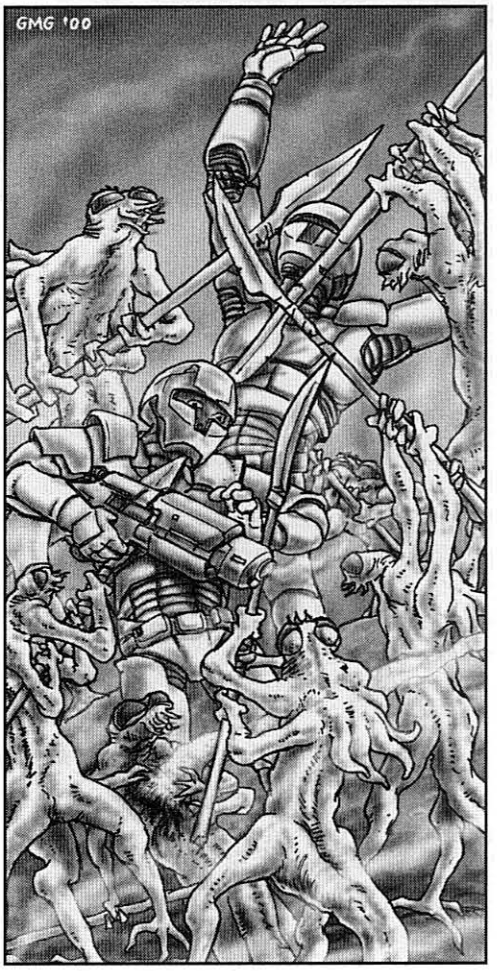
Typical of many struggling colonies, these worlds possess neither the population nor resources to fight a determined Imperial force. On worlds with favorable environments, there is a high possibility of extended guerrilla actions. The relatively simple technology coupled with extensive unsettled areas gives small cells of fighters a chance to hold off the Imperium until the Army finally gives up and leaves.

Examples: Zeycude/Cronor (0101), Sting/Sword Worlds (1525).

Type F: Low Tech, Moderate Population

Easily cowed by any show of force, Type F worlds are unable to provide any real fight. Typically, these worlds have only been garrisoned to protect valuable natural resources or because of their strategic location.

Examples: Penelope/Five Sisters (0533), Craw/Glisten (1939).



Type G: High Tech, Low Population

Often a single facility maintained by off-world interests, these planets are usually secured quickly and without much of a fight. With a population of fewer than 1 million, it is a simple matter to disrupt the regular routine. A common tactic is to isolate the skilled workers necessary to the survival of the outpost as a guarantee of cooperation.

Example: Tenalphi/Lunion (1826).

Type H: Moderate Tech, Low Population

The typical classification for a newly established colony or outpost. Very few people are present, and they are not able to maintain a high level of manufacturing. As with the Type G worlds, these small groups are not much of a threat to units as small as a rapid interface battalion.

Examples: Judice/District 268 (1337), Bael/Querion (0218).

Type I: Low Tech, Low Population

Rarely a factor in military planning, Type I worlds are defenseless when faced with any sort of modern military group. It is unusual for a planet in this category to even have the capability to offer surrender to forces in orbit, let alone organize a coherent defense.

Examples: Olympia/Lunion (1728), Talchek/District 268 (1631).

Mission Priority

The mission priority is based on the perceived importance of the mission, or the status of the authority requesting that the mission be undertaken.

Priority One: Vital to the stability of the Imperium, or directly ordered by either the Emperor or the holder of an Imperial Warrant.

Priority Two: Mission affects the stability of a sector, or has been ordered by an archduke.

Priority Three: Situation affects one or more subsectors, or a vital world. The mission undertaken at the direction of a sector or subsector duke.

Priority Four: Area affected by the mission is one subsector or an important cluster. Situation is not at crisis level yet.

Priority Five: Local situation, mission requested by officials on the planet or area affected.

Priority Six: Low-priority mission. Situation can probably be handled with non-Imperial assets.

Life Support

The final modifier is based on the ability of the planet to sustain life.

Worlds with no water but breathable atmosphere (desert worlds) get an *(X)*.

Worlds with available water, but an unbreathable atmosphere, have a *(Y)*. This includes ice-capped worlds.

Worlds without breathable atmospheres or useful amounts of water have the designator *(Z)*. This includes asteroid belts and most vacuum worlds.

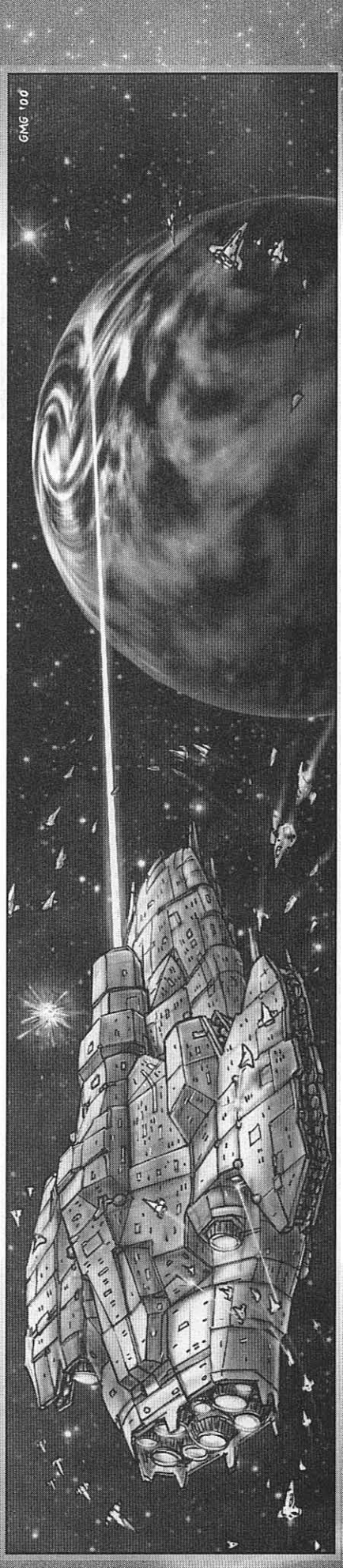
Example: *A police action on Regina/Yurst (2309), ordered by the subsector command, would have the mission code 5-F4(Z).*

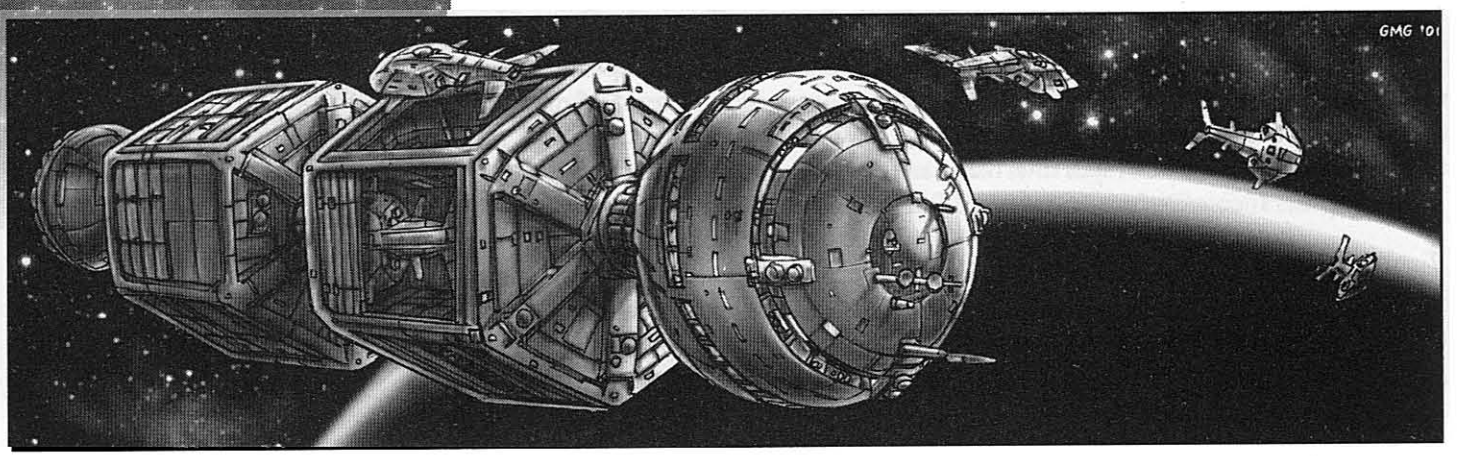
Logistics

Logistics is the art and science of supply. Success or failure in war is more often determined by the ability of each side to keep their forces adequately supplied than by sheer force of arms. Imperial logisticians face the task of routing supplies across interstellar distances.

Transportation

The Marines operate from their own vessels as part of the Navy fleet they support. This allows the Marines to cruise their area of responsibility on a continuous basis in relative comfort. Moving the Army, however, presents an almost overwhelming set of problems.





Military Justice

Military organizations have their own, specialized criminal-justice systems. In addition to the normal laws used by the Imperium, the military courts are called upon to enforce those regulations applying only to the armed forces. All of the Imperial uniformed services are under the authority of the *Manual of Military Justice (revised 1117).* This is the standard work on military law, and fills several dozen volumes of regulations, commentary, and case histories.

In the Army, criminal investigations are handled by military police for most routine matters. Disorderly conduct, petty vandalism, and minor thefts are the cases that will usually end with the provost (equivalent to a police chief) releasing the guilty parties to their commanders. More serious crimes against persons or property are examined by the local IG office. Crimes against the Imperium will immediately attract the full attention of the Ministry of Justice.

Marines regularly serve as ground police, particularly in situations where the crews of several large warships receive liberty at the same place and time. Marines facing court-martial are tried by the Navy.

Enforcement of military regulations is left to the local commanders. For minor breaches of regulations, or substandard performance, a commander can give an enlisted trooper a "Chapter 28" hearing. Chapter 28 of the *Manual of Military Justice* gives officers the right to prescribe minor punishments without formal charges.

These punishments are rarely more severe than the loss of a few ranks and a week or two of extra duty. Chapter 28 is intended as a corrective measure. The soldier being penalized knows that he made a mistake, and hopefully will learn from it. Many soldiers receive a Chapter 28 at some point in their career.

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The first problem facing the planners of any military operation is how to transport the troops to the objective. Logistical planners use the term "transportation slice" when discussing troop movements. The transportation slice is the space required to move one soldier and his share of equipment, vehicles, and supplies, along with the required space on the ship for drives, life support, etc.

The minimum slice required for each Army soldier not carried in low berths is 5 displacement tons, with an average mass of 50 tons. The soldiers will be living in very cramped quarters; vehicles will be packed and inaccessible. Soldiers in these conditions begin to lose their combat edge quickly. The preferred slice is 10 displacement tons per soldier carried. While not roomy, this level allows some small amount of privacy, along with space to exercise and maintain equipment.

A standard transport for the Army is the massive *Keith*-class assault transport. Each lander carries portions of the front-line combat battalions as well as a mix of brigade artillery and support units. The six landers per transport can carry a complete brigade to the world's surface.

Primary responsibility for these ships falls to the subsector navies, with the assistance of the Army Material and Transportation Command. During peacetime, the plan is to have most of the *Keith*-class ships in ready reserve, rotating in and out of active duty to ensure their spaceworthiness.

A soldier embarking on a *Keith*-class will find that he must quickly give up most of his notions of privacy. The ships, when fully loaded, will quickly overload the air scrubbers' ability to remove odors. Meals are eaten in shifts, and most soldiers find it nearly impossible to get any real sleep in the noisy berthing areas.

Other, older carriers use low berths to reduce the amount of space required to ship the troops. The drawback is the troops lose a week in cold sleep that could be used for training and acclimating to the destination world's gravity and air pressure. Cold sleep is also risky. Despite the best equipment and medical supervision, a few troopers die each year when the need for an emergency "crash wakeup" exceeds the transport medical staff's ability. (Troopers revived without medical supervision must make a HT roll, dying on a critical failure, per p. GT118.)

Supply

Once the troops have arrived at their destination and are on the ground, the next problem facing the commanders is supplying the troops with food, water, and other basic necessities. For Imperial commanders this is not the overwhelming priority eclipsing all other considerations that it is for a TL8- army. (In fact, Imperial tactics vs. low-tech forces take full advantage of their relatively nonexistent supply needs.)

Still, the supply requirements of an Imperial unit cannot be ignored. Commanders must address the following categories of supply. The consumption rates are for peacetime conditions – inactive police actions, garrisons with low-level training, or units held in reserve during combat. For purposes of calculating

consumption rates, units actively in combat will fall into one of three other categories: fighting on the defensive, fighting on the offensive, or pursuing a routed foe.

Food

Every Human soldier in a unit must be supplied with 60 lbs. per month (non-Human needs will vary by body weight and physiology). Sometimes these needs can be purchased locally, though not usually harvested – a TL12 Marine is far less prepared to serve himself from a wheat field than was a TL2 Roman legionnaire.

Multiply by 1.25 when on the defensive, 1.5 on the offensive, and 2 in pursuit. Mostly, this represents feeding the recently captured.

Water

Every Human needs 120 lbs. (60 quarts) of water per month (again, adjust for non-Humans). In hot climates this increases to 180 lbs., or to 300 lbs. in a desert-like environment. This is the *bare* minimum; anything less will create casualties. This *also* assumes soldiers with Panimmunity (see p. 50) who can skip hygiene if they must; otherwise, increase water needs by 120 lbs. per month. Imperial doctrine is to supply twice the minimum needs when possible. Often, water can be obtained locally. Troops that require life support already have a water supply and the equipment to recycle it; the Army often will install life-support on water-poor but otherwise hospitable worlds just to deal with this supply need.

Water needs do not undergo combat multipliers.

Fuel

Imperial units usually can ignore this supply category. For armies at TL8 or less, it is the No. 1 item creating their supply needs and constraining their operational range. Vehicles should be provided with 24 hours' worth of fuel per month.

Multiply by 5 when on the defensive, 10 on the offensive, and 15 in pursuit.

Ammunition

Again, given their heavy reliance on fusion weapons, lasers, and meson guns, Imperial units have relatively low ammunition needs. Lower-TL armies do not enjoy this self-sufficiency. Every fighting unit consumes 10 minute's worth of ammo (at the highest possible rate of fire) per month.

Multiply by 40 when on the defensive, 32 on the offensive, and 5 in pursuit.

Spares

Military equipment usually sees hard service. Gear requires 1% of its weight and cost in spare parts and consumables (lubricants, filters, etc.) per month.

Multiply by 5-80 when on the defensive (depending on how the unit fares in battle), 5-300 on the offensive, and 2-30 in pursuit.

Sundries

The little things make life in garrison bearable: toilet items, coffee and tea equivalents, video games, etc. Morale will slip in their absence, though no units will become "unready." Sundries take up 60 lbs. per trooper per month.

Sundries do not undergo combat multipliers.

Life Support

Imperial life-support systems can recycle oxygen indefinitely, but some wastage invariably takes place and certain filters and such will need replacing. Add 30 lbs. per man per month in locales requiring life support, but see *Water*, above. Life support installed just to recycle water can ignore these maintenance needs.

Multiply by 5 in any variety of combat.

Military Justice

[Continued]

More serious violations of regulations require a formal court-martial. A court-martial, while similar to a civilian trial, has several important differences.

Imperial courts-martial are heard by a board of at least five officers. The board is an active part of the inquest, free to ask questions of witnesses and ask for additional information from either advocate.

The charges are prosecuted by an officer referred to as the Emperor's advocate. The defense representative is the soldier's (or Marine's) advocate. Whenever possible, these officers are attorneys, but it is not a requirement. Individuals on trial may request a civilian lawyer. Most of the time these requests are granted.

The court-martial board will hear all of the testimony and examine all the evidence. After both sides have presented their cases, the board members will debate among themselves. Unlike civilian trials, there is nothing preventing the board from considering the political and public-relations effects of their decision.

Soldiers who disagree with the board's decision may plead their case to higher and higher court levels. The final destination for most appeals is the office of the ranking noble for the subsector, although some appeals have managed to reach the Emperor's desk.

Those convicted of crimes in the service will face a variety of punishments. The easiest route is to simply discharge the soldier. This is the result of many trials for petty graft or insubordination. Usually, the trooper is lowered to the lowest rank before the discharge is issued.

For more serious crimes, the Army maintains a number of prisons. These facilities are like regular Army bases, except the fences are to keep the troops inside, and those troops have lost all their privileges. Life inside a military prison can be harsh and dangerous. Several prison worlds in the Imperium are dumping grounds for military convicts.

The ultimate penalty is death. The *Manual of Military Justice* reserves this punishment for the most reprehensible crimes. Such things as treason or violations of the Rules of War are the only acts that merit the death penalty.

The last Imperial soldier executed was Gunnery Sgt. Farouk Chi of the 3,277th Line Marine Regiment. He was found guilty of war crimes for his actions in murdering 70 Zhodani prisoners of war. Gunnery Sgt. Chi was executed by firing squad on 131-1115.



Shipping

An Imperial unit's supplies will require 1 displacement ton of starship hold for every 5 tons (10,000 lbs.) needed per month. The extensive supply needs of large units often strains the Navy's carrying ability. It is common for the Navy to hire civilian shipping in times of war to keep the needed supplies moving. Merchant vessels that are government subsidized will be the first to be taken into service.

Amateurs study tactics. Professionals study logistics.

Without proper supplies, the effectiveness of units begins to deteriorate immediately. Losing supply for as little as a week can destroy units faster and more completely than any enemy force.

Opposing Forces

The Imperium faces threats on all its fronts, some more obvious than others. The Imperium constantly collects and updates information on its neighbors and internal threats.

External Threats

On almost every border, the Imperium faces large, organized states. Wars have already been fought with some, and the potential for war with others is high.

The Zhodani

By far the most well-known of the Imperium's foes, the Zhodani Consulate has fought five wars against the Imperium in the last five centuries.

The Zhodani Army is organized in a similar manner to the Imperial Army, with companies, battalions, and similar organizations. An important difference between the Imperial and Consulate forces is the quality of the officers. In the Consulate, the psionic nobility enter the service as officer-cadets, while the proles are restricted to enlisted status. This results in "social generals" who owe their high rank more to family status than competence. While a similar phenomenon is observed in the Imperial Academy system, the division is not quite as strict.

Moreover, the very nature of Zhodani society weeds out people who have the aggressive, individualistic natures needed by good soldiers and combat leaders. This leaves the Consulate with a military that depends heavily on pre-made plans and formations. The Consulate leadership recognizes this problem, and has responded by making robots a standard part of the combat arms. An average Zhodani infantry battalion will have around 30 warbots assigned to it, used for missions like reconnaissance, frontal assaults, and other high-risk duties.

One important aspect to bear in mind when evaluating the Zhodani military is the use of psionic specialists. All officers have some level of psionic ability, and certain elite units (the *Consular Guard*) are staffed by trained teleporters. The presence of these unusual abilities can upset the balance of a battle, more than making up for the slight disadvantage in troop quality.

More detail on the Zhodani can be found in ***Alien Races 1***.

The Vargr

Possibly the greatest headache the Imperial intelligence community has to deal with, the constantly changing Vargr Extents present a real threat to the stability of the coreward edge of the Imperium.

It is impossible to describe a "typical" Vargr military formation, but among the most interesting are the so-called Corsairs. These mercenaries/pirates have raided Imperial worlds on a regular basis for centuries. During the Frontier

Wars, the Imperium found itself fighting regular Vargr forces from several different nations. Typically, Vargr regular units place a great amount of responsibility on lower-level leaders, allowing company and battalion commanders great freedom to conduct operations as they see fit.

Standard practice is to react with retaliatory raids on the Corsairs' home bases. The usual force sent against the raiders is a Marine company. The tactics used are simple: destroy everything the Corsairs have, but leave everything else untouched. The implicit warning in these actions is rarely lost on the surviving Vargr. Mess with the Imperium, and expect to get burned.

Since it is sometimes difficult to tell a legitimate merchant from an actual Corsair, with mistakes having devastating consequences, Sylean Rangers and Army Intelligence are working constantly inside the Extents to pinpoint the bases.

The Vargr are also covered in greater detail in ***Alien Races 1.***

The K'kree

Many analysts agree that the gulf between the Two Thousand Worlds and the Imperium is a very good thing. The K'kree represent a dire threat not only to the Third Imperium, but to many sentient races throughout known space.

The K'kree consider all meat-eating sentients to be g'naak – vermin – who should be exterminated. They have, by their own accounts and those of witnesses, done so on many occasions.

While their genocidal urges make the prospect of fighting the K'kree frightening, several factors reduce their abilities as warriors. K'kree are large creatures, and completely claustrophobic. Even the highly trained tank crews need great amounts of space. This makes their vehicles far larger than similar Imperial vehicles. There is also a strong conservatism to K'kree society that leads to an extremely centralized command. All orders have to come from the home world, which makes for immense delays.

For more information on the K'kree, see ***Alien Races 2.***

The Hivers

While not considered much of a threat by most observers, the Hive Federation has had an interesting military history. Approximately 4,000 years ago, the Hivers fought a war against the K'kree. For reasons not commonly known outside the Hive Federation, the K'kree suddenly broke off operations and withdrew. This only happened after they had sterilized several of their own frontier worlds. While neither side's historians tell the whole story, it appears that the Hivers possessed the ability to turn away a K'kree invasion without much apparent ability to win a battle.

Hivers themselves are ill-suited for ground combat, preferring the long range, push-button nature of naval warfare. The ground troops of the Federation are the Ithklur, a large, bipedal reptilian race that not only is well-suited for combat but seems to thrive on it.

The Hivers and Ithklur are described in detail in ***Alien Races 3.***

The Solomani

While the Zhodani have fought more wars against the Imperium, no single conflict has caused more death and destruction than the 12-year Solomani Rim War. Since the fall of Terra, the Solomani frontier has existed under a shaky truce. Incidents along the border and on strongly Solomani worlds are common.

The Solomani Army is similar to the Imperial Army in that its forces are drawn from the member worlds and states. The important difference is that the uniformity of command and equipment found in the Imperium does not exist. In the Confederation, each state provides its own material, and the Confederation commanders are expected to make do with the odd mixtures of equipment they receive.

Battles in Games

A very difficult task for the Game Master is running a session where the player-characters are involved in a very large battle. It is far too easy to get bogged down in detailed combat sessions that take up valuable game time without adding much to the story.

For this reason, some choose to use the mass-combat system in ***GURPS Compendium II*** to resolve the fight. This method, while quick, tends to remove the PC soldiers from the situation by reducing the battle to dice rolls.

The problem is how to keep the battle moving while still keeping the players involved. The solution is to do both of the things listed above. How the flow of the battle is handled really depends on where the PCs are in the struggle.

In the Trenches

When running a battle, the Game Master should remember that the situation for those in the thick of things is going to be chaotic and confusing. Both sides will being doing their best to kill each other, and that means artillery, explosions, smoke, fires, and deafening noise.

For the average lift infantryman, an engagement means being stuffed into the back of the *Astrin*, bouncing around until the ramp drops, and then being told to either attack in a direction, or to expect an attack from a direction. Tankers will be darting back and forth, trying to pick targets while avoiding becoming one. The artillery is pouring out fire while changing positions to keep up with the front edge of the battle.

In short, soldiers in the heat of battle tend to have a very short focus. The only thing that matters to them is the survival of themselves and their team. An infantryman won't notice that a Zho tank unit is pushing up the valley from Kevrvli; he will notice that a Z-80 is suddenly fewer than 200 yards from him, and moving fast!

To simulate this, keep the game moving quickly. Players who want to stop and think things over should have to make a Tactics roll for their troopers, otherwise it is move or die. Doing anything that requires the trooper to stop and concentrate should be penalized.

To increase the fog of war, the Game Master (or an assistant) should keep track of the group's ammo usage. It is always an unpleasant surprise to pull the trigger and get nothing, and then not be able to find any full magazines.

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Battles in Games

[Continued]

When it does come down to the actual firefight, a good rule of thumb is to figure out the larger force ratio and use that to determine the number of opposing troops. If the players' party has five members, and their side is outnumbered 3-to-1, the players will face around 15 assailants in each firefight.

Running the Show

For those in command, the situation is a little better. The chance of being immediately killed may be slightly less, although headquarters of any size are always prime targets for artillery, but the lack of good information is the big problem.

Imagine trying to direct busy traffic through an intersection. You are wearing a blindfold, and all of the cars have their windshields painted black. You can take quick peeks from under the blindfold, but you have to rely on passers-by for information on what cars are where. This is a good approximation of what being in a battalion or higher command post feels like. Snips of information come in, some from your own troops, some from higher headquarters. Whatever your battle plan was, it has come apart for some reason and you are scrambling to keep up with a very fluid situation. (There has never been a battle plan that survived the first shot. Even Desert Sabre in 1991 had its big error. Iraqi resistance was too light, and the VII Corps had to start its move a day earlier than planned.)

If you are the commander, you are trying to make life-or-death decisions based on little or no good information. If you are staff, you have the commander breathing down your neck demanding numbers that you just don't have!

A command post game is best suited for gamers who prefer puzzle-solving to raw combat. Forcing them to think on their feet, using the Tactics skill as described above, makes for a tense game environment even if the soldiers are the staff for a division.

Even if the troopers are staff for a large unit far back from the fighting, it is important to keep the sense of danger high. Besides the ever-present threat of artillery, many armies use special-operations units to penetrate into the enemy rear specifically to attack headquarters camps. The Soviet Union's *Spetsnatz* were experts at this tactic. Or confront them with an enemy breakthrough. Having a sudden report of enemy tanks within five miles of your position is a wonderful motivator.

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The commander might also find himself in need of a translator to speak with his own troops! The various regions of the Confederation maintain strong cultural traditions and this extends to language. A division might have troops with four or more primary languages.

The Solomani Army and their Marines more than make up for these handicaps with their fierce determination. Ever motivated by agents of Solomani Security, the troops see regaining Terra as a goal capable of being achieved within their lifetimes, and are immersed in heroic tales of the "War of Imperial Aggression" on a daily basis. The Solomani Army also has a long history of border wars with expanding Aslan clans.

More information on the Solomani military can be found in ***Rim of Fire.***

The Aslan

The threat posed by the Aslan is not immediately obvious. The Imperium and the various clans have had peaceful relations for several hundred years. In this case, the threat posed is far more subtle. The *ihaeti*, or Aslan colonization fleets, are constantly seeking new lands. Ihaeti are willing to purchase or bargain for what they need, but will fight for the land they see as their birthright.

Aslan combat units are based on the family/clan. Aslan troops will be related to each other, and serve out of duty to both their family and their own honor. The Aslan excel at light infantry tactics, but lag behind in combined arms techniques employing heavy equipment.

Aslan soldiers who have not had much contact with Human troops will be unprepared for many of the "dirty tricks" that Humaniti frequently employs. Things like ambushes and decoys violate the rules of honorable warfare. In this case, Aslan troops may declare all-out warfare and not accept surrenders.

The Aslan are detailed in ***Alien Races 2.***

Internal Threats

While the main focus of the military is looking outward, there are significant threats to the peace and security of the Imperium within its own borders. Usually, these threats are best controlled by other means, but on occasion the military is needed to impose a solution.

The most common case of this is a violation of the Imperial Rules of War. Any combatants who blatantly violate these laws will quickly have their headquarters overrun by Marines, and then find regular Army units occupying their territory.

Another threat is that of piracy. The responsibility for the suppression of piracy lies with the Navy as a matter of course, but Marines are often called upon to destroy pirate havens both inside and outside the Imperium. When the haven is inside the borders, the planet is pressured to take action on its own. But on most occasions, decisive action by the Marines is required.

One role that few people speak of is suppressing rebellions. Although it is not mentioned in polite society, at least one such incident occurs each decade or so. Some world decides that it wants out of the Imperium and the troops have to go in and sort out the rebels. More often, a local anti-Imperial terrorist or guerrilla group begins stirring up local malcontents against a pro-Imperial regime or an "exploitative" megacorporation, and the Imperium gets called in to assist the civil power.

Against terrorist groups like the Ine Givar, the Marines are sometimes called on to support the Ministry of Justice and the Scout Service's S-3 teams. A Marine presence is only requested in cases where the usual law enforcement authorities would be completely out-gunned.

If the guerrillas are sufficiently agile or enjoy popular support, suppressing this sort of unrest may require a long-term "hearts and minds" program supported by a lengthy counter-insurgency and internal-security operation.



The Imperial Way of War

Since its founding, the Imperium has developed a body of common procedures for the waging of war. These methods were formed during the Pacification Campaigns, and perfected by the time of the Solomani Rim War.

Nexus Warfare

It is accepted among Imperial military thinkers that one cannot conquer any world worth having. One can, however, control it. This philosophy results in the doctrine of nexus warfare. Rather than attempting to dominate a planet, Imperial policy is to identify its critical points. These points are broken into basic categories.

Power Nexuses: Generating stations, transmission yards, and the control stations for the world's power grid are a vital objective. Having the ability to shut off the power can cause severe hardship for the defenders, as well as making it easier to identify military targets, since they will probably still have power.

The Imperium encourages member worlds to diversify their power grids for this reason. On high-tech worlds, the presence of many small fusion plants makes it harder to identify and neutralize power nexuses.

Communications Nexuses: Controlling the communications of a planet during wartime is as important as orbital superiority. Both private communications channels and public broadcasting facilities can be used to funnel information and propaganda. When attacking, taking out the world's news services can cause more panic than the actual invasion could. Without a credible source of information, rumors will begin to spread, leading to possible civil disorder.

Transportation Nexuses: Even on worlds using grav vehicles, there are usually recognizable points where the transportation web comes together. Many worlds use trains, from rail to maglev, to haul heavy loads. Most worlds have starports. Taking these nexuses allows an invader to inhibit the movement of the opposing force. If nothing else, these facilities can be destroyed to deny them to the foe.

A world's starport is usually the first objective of an invader. The starport usually is close to several other nexuses, and controlling it gives access to the world's traffic-control systems, which can at least make an attempt to track objects in orbit.

Governmental Nexuses: The actual leaders of the world, and the places that they work from. Taking out a beloved leader can cripple a world's will to resist. On the other hand, if the leadership remains free, with access to communications, they can rally resistance against the invaders.

Battles in Games

[Continued]

Playing Loose

The best way to run combat is with a light hand. If the players need to be told that the enemy is close at hand, and it is time to exit the area, have a spray of bullets hit the scenery. The Game Master should not have to roll for each burst fired in this situation.

Most passing combats can be handled like this. If the PCs and enemy troops merely trade a few shots while running in the opposite directions, just describe the action and move on.

There will be players who demand that every single round fired be accounted for. How the Game Master handles this is up to the style of the group, but a few sessions of unending combat tends to shake even the most dedicated rules lawyer.

Keep the Troops Busy

Lastly, the PCs should be the focus of the game. The Game Master may steer the battle to put the troops in the right place to win the day. For some players, it can be very depressing to hear about how another company saved the day. For others, it is more realistic and satisfactory to perform well, survive, and hear later about the "big picture."

Fatigue

Battles are *exhausting*. Soldiers spend hours in a nearly constant state of extreme tension, and much of that time will be spent in hard physical labor.

GMs should strictly enforce the Fatigue rules (p. B134) and consider the expanded rules on pp. CII173-174.

Situation Report: Spinward Marches

The current standing of the various Imperial forces, as well as notable trouble spots, as of 001-1117.

Cronor

Cronor subsector is home to a single Imperial world (Quar), and has no formal Imperial army assigned. Quar's "Home Defense Force" is equipped with Imperial standard equipment, though, causing many to wonder who is really financing an entire field army for this world.

There are persistent rumors of covert operations by the Sylean Rangers or Marine Commandos on various worlds. The local commanders have no comment on the subject.

Querion

No Imperial worlds, and no army assigned.

The Sylean Rangers and Marine Commandos man several military-assistance groups throughout the independent worlds of the subsector.

Darrian

A close Imperial ally, Darrian hosts several teams of Marine advisers at any given time. This advisers are present in a strictly non-combat role, and serve only to assist the Darrian's own Marines with Imperial technology. No Imperial worlds, no army assigned.

Zamine (Darrian 0421) has seen a rise in international conflicts. A Marine observation group of about 60 is on the world to monitor the situation.

Five Sisters

An astrogational oddity, Five Sisters is cut off from the rest of the Imperium by the Sword Worlds and District 268. The Unified Army of the Five Sisters ranks as one of the most elaborate in the Imperium.

The UAFS has three field armies of lift infantry and one grav tank army. It also maintains five elite armored divisions, each named for one of the "sister" worlds.

The forces in Five Sisters want for nothing. The subsector government spends freely for its army, and many of the infantry units are now equipped with battledress.

Ralhe (Five Sisters 0731) is occupied by the 718th Lift Infantry Brigade executing a type 6G5-Y mission. They have been in place for six months, and are expecting their relief to arrive near the end of 1117.

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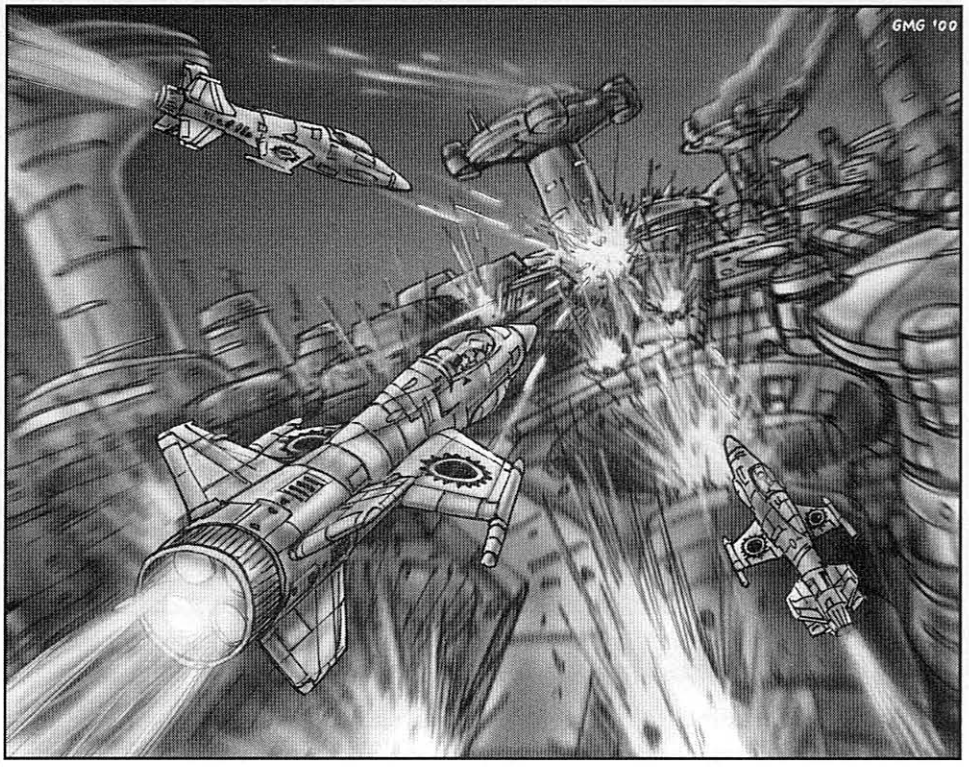

Military Nexuses: Not the actual forces on planet, but bases, headquarters, supply dumps, and other such objectives.

Economic Nexuses: The world's lifeblood. On industrial planets this will be the factories and plants, or the mines on a resource planet. This is more a long-term nexus, as control of these rarely offers an immediate advantage on either side.

Population Nexuses: The world's cities, arcologies, or any other population concentrations. It is Imperial policy to avoid fighting in cities if at all possible, due to the probability of massive casualties, both among civilians and Imperial troops.

Social Nexuses: An uncommon target, social nexuses are places that have a deep historical or religious significance to the population. Holding such a nexus can often ensure local cooperation through social blackmail.

In many places, a single point will be the location of several nexuses. A large city might be a population, governmental, communications, and transport nexus, and thus a very high priority objective.

Tactics and Combat

Each of the combat arms has a different view of war, and different methods of achieving their objectives in battle.

The Tanker Life

When the first shaky grav tanks and APCs came into service, generals had visions of an end to the days of slow, methodical advances through the mud and grime. Reality destroyed this vision.

The truth of the matter is that while vehicles like the *Intrepid* grav tank can fly at 600 mph and shrug off most attacks, they are vulnerable when flying in the open. Man-portable missiles like the MAA-756 *Mjollnir* can take down even the heaviest piece of grav armor. Also, operating in open flight makes a vehicle an easy target for any vessels in orbit.

So grav tanks hide in cover whenever possible, hugging the terrain as they sprint from one concealed position to another. Combat vehicles also need extensive suites of deception equipment to survive long enough to actually fire on the enemy.

When grav tanks do fire, they most often do so by "popping up" from behind a concealed position to engage a target that has been spotted by another unit. Imperial tankers fight a war of hide and seek, where quick reactions and sound judgment determine who lives and dies.

The dream of every armor commander is to suppress the enemy to a point where the tanks can come out and make best use of their speed and armaments. These breakouts can end a battle quickly as the tankers drive deeply into the enemy rear areas.

The Poor, Bloody Infantry

On every world where a mechanized army has been developed, the death of the infantry has been predicted. The argument is always that the tanks, aircraft, drones, robots, or whatever can do the job better. Yet the infantry remain.

The job of the infantry is to take and hold ground. Infantry are the force best used in confined areas like cities, and can defeat the enemy in detail, unlike the heavier forces.

> *"All combat takes place at night, in the rain, at the junction of four maps."*
>
> *– Murphy's Laws of Warfare*

Imperial infantry spend much of their time in the field spotting for tanks and artillery. A single soldier can be easily missed in the chaos of battle, and that soldier can bring in accurate fire from a variety of sources.

The infantry do fight, and what they do has not changed much in millennia. Squads are based around a support weapon, with the riflemen acting as ammo bearers and protecting the support-weapon's crew.

Artillery, the King of Battle

The main killer in combat, far beyond any other agent, is the artillery. For the Imperium, artillery weapons are meson sleds and rockets capable of devastating huge areas.

For all their power, artillery units are very vulnerable. The rocket-based units require constant resupply of ammunition, tying them to their support units. The value of artillery as targets requires them to move constantly to avoid enemy counterstrikes.

Send in the Marines!

The Imperial Marine Force is different from the other Imperial ground units. The Marines use total assault tactics. When the Marines attack, it is with the maximum force that can be brought to bear on the target. Armed with fusion weapons and in battledress, a squad of Imperial Marines is a threat unequaled in known space.

The Marines do have their limitations. They are not trained for long-term combat; they are raiders. Their tactics can backfire, causing resentment rather than the desired fear.

Invading a World

Since invading a planet capable of offering significant resistance is the most difficult and potentially lethal operation an army can undertake, the Imperium has codified the steps that need to be taken to successfully complete the mission.

Reconnaissance

The objective world must be scouted. Ideally, Army Intelligence will have maintained information on the planet's defenses for years before the conflict.

Situation Report: Spinward Marches

[Continued]

Jewell

The Unified Army of Jewell consists of three infantry corps, two grav armor corps, an elite infantry division, and an elite infantry regiment.

The focus of many Zhodani invasions, the Jewell cluster has fought and won every time. The military is very popular on most worlds, and military service is considered a social must.

Esalin (Jewell 1004), formerly held by both the Zhodani and the Imperium, remains a curiosity in military circles for its contribution to the regular Army: a single TL8 mechanized infantry division. During the codominion period, each side was limited to a single division of troops built at the local level of technology. While the wider war raged, the two mechanized groups tore at each other, with the Imperium coming out on top. The Esalin Division proudly wears its title as the most backward unit in the entire United Armies, and is in demand for exercises to train Imperial troops in facing low-TL opponents.

Vilis

The Unified Army of Vilis contains six lift infantry field armies, three grav tank armies, and an elite lift infantry corps.

Vilis is a hot spot for the Imperial Army, and subsector officials are happy that they are blessed with a large force. Half the Army is currently tied down in counter-insurgency and internal-security operations on Garda-Vilis (see below), while the other half strains to meet the obligations of defending the subsector.

Garda-Vilis (Vilis 1118) currently is occupied by three infantry armies (the 17th, 56th, and 57th) and a Marine Force Command optimized for counter-terrorist work. A company of Marine commandos is also in the system.

All of this force is to stop the near-anarchy that has prevailed for close to 20 years. The Tanoose Freedom League has proven itself to be expert in goading green Imperial troops into firing blindly, then making the most out of the resulting civilian casualties.

Sword Worlds

The Sword Worlds do not have an army assigned. Imperial troops in the region are commanded by the Unified Army of Lunion.

Nearly 10 years after the end of the Fifth Frontier War, Imperial troops still garrison several worlds of the old Sword Worlds Confederation.

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Situation Report: Spinward Marches

[Continued]

On Tyrfing (Sword Worlds 1324) the duties of occupation have recently been taken over by the 102nd Lift Infantry Division. The decision to send the 102nd was controversial, since the commanding general, Maj. Gen. Gordon David Duke, has been outspoken on his opinions about the Sword Worlds and the end of the last war. Observers fear that the notoriously temperamental general will destroy the brittle understanding between the people of the Sword Worlds and the citizens of the Imperium.

District 268

This subsector is not yet under Imperial administration. Army troops are drawn as needed from Five Sisters or Glisten; the 9,090th Marine Regiment is stationed at Mertactor.

Regina

The Unified Army of Regina contains three grav tank armies and three lift infantry armies.

Ruie (Regina 1809) has been a headache for Imperial planners for more than 20 years. Currently, there are several internal-security missions under way in various places on the world's surface.

The planetwide war on Feri (Regina 2005) has already led to several Imperial interventions to arrest leaders or to remove weapons of mass destruction. It is expected that Archduke Norris' patience will soon wear out and he will launch a full invasion of the world to stop the slaughter.

Lanth

The Unified Army of Lanth is relatively tiny compared to its neighbors. Lanth is a grossly underpopulated subsector, and its nature makes it hard to organize an effective defense.

Lanth has only four divisions of lift infantry to call its own. Troops are loaned from Lunion and Rhylanor subsectors in times of need.

Treece (Lanth 2311) is under the effective control of the Imperial Army. Units are drawn from the neighboring subsectors to keep order and allow the Navy to tend to the administrative concerns. Almost all vital functions are provided by Army troops.

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Sylean Rangers or Marine Commandos, with the assistance of the IISS, will attempt to infiltrate the world. What they are looking for is command-and-control centers, communications nodes, and planetary-defense sites. Of course, this information has to make it back to the Army commanders to be of any use. If possible, recon teams are extracted by the IISS ships that brought them. If extraction is not an option, the information is transmitted to IISS ships which then leave the system.

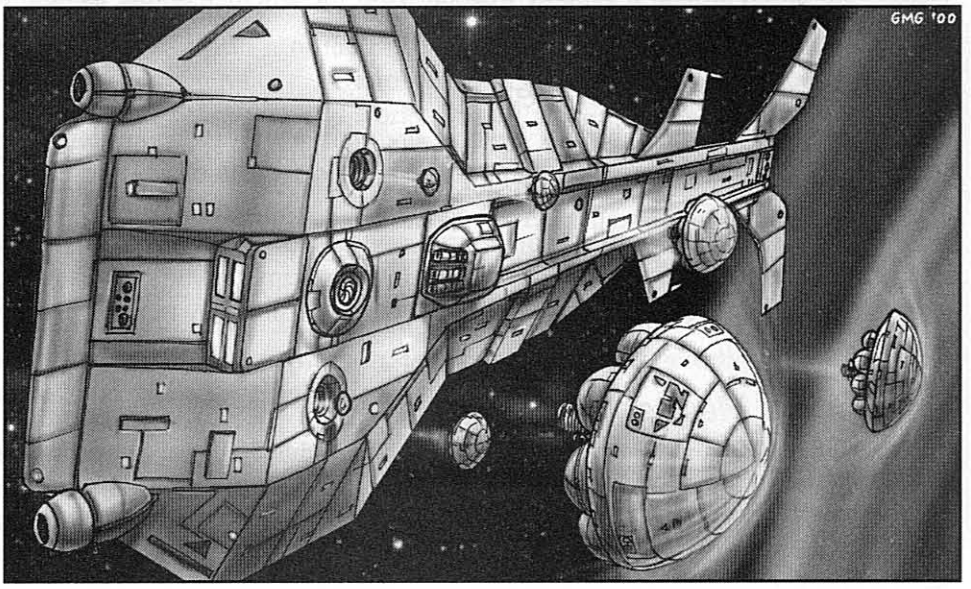
Space Superiority

For anything other than quick Marine raids, it is necessary to establish reasonable control over orbital space. It is rare to be able to completely clear enemy activity, but the commander cannot allow hostile vessels to penetrate the fleet screen.

Orbital Bombardment/Initial Raids

Once orbital control is established, selected targets are engaged by fire from Navy ships. Highest priority is given to planetary-defense sites that have the ability to damage the fleet. If possible, batteries are allocated to strike secondary targets such as power-generation centers or transportation nexuses. Imperial doctrine is to avoid unnecessary collateral damage when possible, so ortillery fire is closely controlled.

At the same time, Marine units begin making drops intended to seize high-value objectives such as the planet's starport. Other raids are launched to both distract and demoralize the defenders. At this point in the operation, the overall commander will make the final decision on where he will land his main force.



Pathfinder Landings

Rapid-interface and Marine units will attempt to seize the designated landing zone. At the same time, orbital fire will shift to suppression of any enemy presence out to 250 miles beyond the local horizon. The troops on the ground can count on heavy support from naval fighters as well as their own attack speeders.

Main Force Landing

Under cover of the fleet escorts, the main force transports begin entry. Supporting fire reaches its most intense level during this period. Electronic-warfare units attempt to reduce the enemy's ability to detect and communicate to such a low level that they are effectively immobilized while the transports land.

On the ground, the transports disgorge their loads of troops. The combat units form up and move to engage the enemy. At the original landing zone, beachmaster units begin the difficult job of setting up the necessary supply and medical units.

Movement to Contact/Consolidation

The Imperial mode of combat emphasizes quick action and overwhelming firepower. When in the attack, the Army and Marines use their firepower liberally. However, Army leaders are taught that the fleet cannot afford to linger over a single planet, so they must learn never to depend on endless support from the skies.

How to Build an Army in Eight Easy Steps

In any military campaign, the Game Master may need to know the state of the local forces and the number of Imperial troops available. The following rules are used to describe armies from that of a single world to entire subsectors and beyond.

Planetary Forces

The first step is to determine the raw number of battalion equivalents (BEs) a world can field. Each BE represents roughly 500 soldiers.

Step 1: Battalion Strength

A world's battalion strength is based on its population rating and tech level. Worlds with low levels of technology cannot afford to field many professional troops (but see *Levies* sidebar, p. 82). Conversely, worlds at the high end of the tech scale can afford smaller armies because each soldier is so much more capable than his lower-tech equivalent. Find the *raw* number of battalion equivalents on the following chart. (This chart varies in some respects from the Aslan-specific version found on p. T:AII24. Use that chart for Aslan worlds; for other non-Human worlds the GM should feel free to adjust this chart as he sees fit.)

BATTALION EQUIVALENTS

	Population Rating							
TL	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1-3	-	-	-	-	1	10	100	1,000
4	-	-	-	1	5	50	500	5,000
5	-	1	10	100	1,000	5,000	25,000	100,000
6	1	2	3	30	300	3,000	30,000	250,000
7-8	-	1	2	20	200	2,000	20,000	200,000
9	-	-	1	14	140	1,400	14,000	140,000
10	-	-	1	11	110	1,100	11,000	110,000
11	-	-	1	7	70	700	7,000	70,000
12-13	-	-	-	5	50	500	5,000	50,000

If the world in question has an atmosphere that is not breathable by its primary occupants, shift one column to the left, reducing the number of raw BEs available. The GM should use discretion in this. If the taint is a marginal one such as excessive UV light, feel free to keep the original number of raw battalion equivalents.

Examples: *Jewell/Jewell has a population of 6.3 billion (PR 9) and is TL10. Jewell's army has 11,000 raw battalion equivalents before making the adjustment for Jewell's polluted atmosphere. This reduces it to 1,100 raw battalion equivalents.*

District 268/Motmos is only TL6, and supports a colony of 7 million (PR 6). Checking the table, we see that Motmos has a small force of 30 raw BEs.

Situation Report: Spinward Marches

[Continued]

Icetina (Lanth 2418) has been taking an increasingly anti-Imperial stance; Sylean Rangers and Marine Commandos are beginning to gather the intelligence needed for a successful intervention. In a typical case of non-communication, Marines and Rangers opened fire on each other at a remote pick-up point in late 1116. Neither team had been told to expect the other's presence at the site.

Lunion

The Unified Army of Lunion has one lift infantry field army, two grav tank corps, two elite grav tank divisions ("Strouden" and "Lunion") and a single elite rapid interface regiment.

Several major combat elements of the Lunion Army are tied down in occupation duties inside the Border Worlds. Other than those duties, the subsector is at relative peace at the beginning of 1120.

Glisten

The Unified Army of Glisten has five corps of lift infantry. At any time, two of the corps are pulling duty in District 268.

Aramis

The Unified Army of Aramis has three lift infantry field armies, one grav armor field army, and a single elite Vargr-staffed infantry division, the *Onggezagzrighz* ("Bowing to hidden charisma").

The people of Aramanx (Aramis 3005) are suffering through their 14th year of murderous war. Curiously, there has been no intervention despite clear evidence of multiple Rules of War violations. The Marquis' office refuses to comment, only stating that all the combatants are member-states, and have not violated any Imperial laws.

In the meantime, the death count rises. Several sophonts-rights groups are desperately searching for any proof of the war-crimes allegations, or another excuse for intervention.

Rhylanor

The Unified Army of Rhylanor controls five lift infantry armies (one elite), three grav tank armies, and a single elite grav tank corps.

Rhylanor's powerful army is the envy of many subsectors, and is the centerpiece of planning for any major ground campaign. Since the end of the Fifth Frontier War, Rhylanor has been a remarkably peaceful subsector. The Army primarily concerns itself with supporting its Lanthian comrades in peacekeeping duties.

Continued on next page . . .



Situation Report: Spinward Marches

[Continued]

Mora

The Unified Army of Mora contains six lift infantry field armies.

Mercury (Mora 2624) is the site of the Imperial Marine Force's Phase II training camp for the Spinward Marches. Camp Corporal Hopgood Training Facility lies deep in a mountainous region. The instructors enjoy joking that: "Deserting is easy. Just walk out the gate, turn left, and the bus stop is 300 miles that way."

Trin's Veil

The Unified Army of Trin's Veil contains one lift infantry field army and one grav tank corps. The Army's small size is a reflection of the attitude of the locals, who haven't seen a serious threat in centuries.

Thisbe (Trin's Veil 2539) currently hosts the 720th Lift Infantry Brigade, which is carrying out an internal-security mission. The troop's presence is backfiring, as the locals are using the continued proximity of Imperial troops as a rallying call for more violence.

The soldiers are virtual prisoners in their encampment. Nothing has happened beyond pushing and shoving, but the tensions are rising on both sides.

Zephyr (Trin's Veil 3138) has seen a long-term peacekeeping mission drag on. The situation has become so predictable that the Trin officials regularly rotate a new division onto the world for "live fire training" before shipping them back to their home base.

Step 2: Battalion Equivalent Modifiers

The raw number of battalion equivalents may be modified by several factors.

If ***First In*** is being used to detail the planet, the Social Parameters (see p. T:FI98) will have an effect. Add modifiers together before applying them:

Worlds with High Solidarity (Collectivistic) will add +5% to the BE total.

Worlds with High Tractability (Submissive) will add +5%.

Worlds with High Aggression (Violent) will add +10%.

Worlds with Low Aggression (Pacifistic) will subtract -15%.

Balkanized worlds will tend to have more military forces than united planets. Each GM will have to decide what the political situation is on the world, but as a rule of thumb adding 1-5% for each *major* power works out pretty well.

On balkanized worlds in the middle tech ranges (6-8) and with large hydrospheres, wet navies become important. To account for these, apply a -1% modifier for each 10% of the world's surface covered by ocean to the battalion-equivalent count on these worlds. This represents resources diverted to the wet navy.

Examples: *Jewell does not fit any of these conditions, so the 1,100 raw battalion equivalents remain unmodified.*

Motmos is both Submissive and Pacifistic, so the total adjustment is (+5%-15%) or -10%, leaving the world with 27 raw battalion equivalents.

Earth in the 1980s had two major military powers, and one coming close behind. If designing Earth for this period, adding 8% to the total battalion-equivalent number would not be out of order. Earth also has oceans covering roughly 70% of the surface, so the total is reduced by -7%. The result would be 20,200 raw BEs.

Of course, the Game Master is free to declare that a particular world is far more militarized than shown, or perhaps has no army at all!

Examples: *Jewell has been hit by the Zhodani repeatedly over the past five centuries. Patriotism and anti-Zhodani sentiment make military service a social requirement. The GM gives Jewell a +5% for this reason, lifting Jewell to 1,155 battalion equivalents.*

The standard calculation for 1980s Earth results in "only" 12-13 million soldiers under arms. This is insufficient to portray the resources of the superpowers, much less the many other lesser armies of Earth. To accurately reflect the massive mobilization efforts of the Cold War (very roughly 40 million army troops worldwide), the GM would have to increase the raw BE figure dramatically (some +50% to +70% depending on the reserve ratios selected in Step 3, below).

Step 3: Regulars, Reserves, and Militias

Not all the soldiers of any Army are on active duty. Many serve in reserve units, part-time soldiers available in a crisis. In addition, the world's population can contribute a militia. The total raw BEs must be divided between the active and reserve components. For every raw battalion equivalent designated as reserve, the world actually gets three inactive raw BEs.

Most armies split their reserves and regulars on a 3:1 or higher ratio. If the GM desires, simply take half of the available raw BEs and place them in reserve. This will model how most current armies are structured. Governments without an obvious threat can fall to ratios approaching 21 reserve units to every active unit (to get a 21:1 ratio, for every eight raw BEs place seven in reserve). In most cases, a good way to judge the proper ratio is by gauging the threat the world faces. Planets in immediate peril of a war will have more active-duty troops.

Examples: *Jewell splits its Army into 755 raw battalion equivalents of regulars and 400 raw BEs of reserves, for 1,200 actual raw BEs in reserve and a total of 1,955 raw BEs.*

Motmos places all 27 of its raw battalion equivalents on active duty.

A militia is that portion of the world's civilians that will resist an invader by whatever means they have. In general, 25% of the population will attempt to resist. These are not regular, uniformed members of the military structure at the start of hostilities. They may field organized forces, form irregular bands of partisans, or even act alone to strike back. The number is an estimate of how difficult the population will be to subdue.

The 25% figure is modified as follows. Add all modifiers before applying:
Worlds with High Solidarity (Collectivistic) will add +5%.
Worlds with High Tractability (Submissive) will add +5%.
Worlds with High Aggression (Violent) will add +10%.
Worlds with Low Aggression (Pacifistic) will subtract -25%.
Worlds with a Control Rating of 5-6 will subtract -10%.
Worlds with a Control Rating of 0-1 will add +10%.
Worlds with PR 1-3 add +5%.
Worlds with PR 8-10 subtract -10%.

Examples: *Jewell has a population of 6.3 billion, and a CR of 5. Jewell has an available militia of (25%-10%) or 15% of 6.3 billion, or 945 million people.*

With its CR 6 and Submissive and Pacifistic tendencies, Motmos will have effectively no militia among its 7 million people. Individual PCs from Motmos may of course decide for themselves whether to fight an invasion.

Step 4: Tech Level Modifications

Each army has the base TL of its home world. Governments sometimes choose to spend available defense funds to buy higher-TL equipment and training from neighboring worlds. This can be done for any number of raw BEs at any number of TLs. For instance, a high-population TL8 world might field a TL8 army with a TL9 "first-line" core and elite units at TLs 10, 11, and 12.



So There I Was . . .

". . . Cpl. Campbell and I were sweeping a Swordy position on Lanth. There was this one sniper. Guy kept pot-shooting us from all over the place; sensor couldn't find him in all the junk and wreckage.

"Of course, nothing he shoots is getting through. But it's annoying! Your can freezes up and tells you that you're being shot at, like I hadn't figured that out yet. So the corp tells me to circle back about 500 and try to work around.

"So I do, and the next thing I hear is Campbell yelling 'Thunder!' and he pops a mini-nuke on the guy! Blows me flat on my back; suit goes nuts. I thought I was dead for a second.

"Campbell comes bouncing over as I'm getting up, and I tightbeam him. What did he think he was doing? That jerk didn't rate a nuke! Campbell grinned, you could hear it in his voice, and said that the sniper had a missile launcher.

"I tell him regiment is going to flay him alive if he tries to pass that story. He goes, 'They're more than welcome to search the body!' pointing at the crater . . ."



". . . Col. Eleri was out for blood. The Old Man was all over the place, threatening to bring in the IG, promising us that we'd never even see a promotion board, let alone get promoted, real end-of-the-universe threats.

"I just wish I could've seen his face when he heard it was Gen. Weir who had left that box on his desk . . ."



". . . and there was something ***knocking*** *on the hatch! Here we are, middle of nowhere, and something has crawled up on the* ***Intrepid*** *and is using my hatch like somebody's front door. Really strange, y'know?*

Continued on next page . . .

So There I Was . . .

[Continued]

"Thing is, it was a polite knocking. Not the banging you get when a dimbulb with a wrench wants you to crack open, but a polite tap tap tap. The crew and I looked at each other, and Kellie grabbed the SMG to cover me. I crack the hatch and peek out.

"It's pouring rain, of course, and I can smell the charred armor from the shot that took out the PESA, and there's this little guy, and about a quarter of the Squallian population, standing around and on our tank. He sees me, breaks into this huge smile, and asks if we want to buy souvenirs or food! Craziest thing I ever saw.

"Yeah, that's where I got this shirt . . ."



". . . You ever see a Virushi? Bloody great thing, like a K'kree wearing heavy plate. They rolled me into the brigade surgeon's, and I never expected to see anything like that. Seems he was a civilian doctor, and wanted to help out! Sounded like a grenade when it talked. But it did a job on my legs, and really seemed to be interested in me during recovery.

"Like my dear dad always said, every creature has a place in the divine plan. Lucky for my legs a Virush was there . . . ."



". . . I was helping out in the supply room while we were deployed on a 5. Whole division wandering around the Conterez Desert fighting the "Zhodani" opponents. But I had a bad knee, and couldn't run around with full gear. No tears in that beer.

"But anyway, me and Greene got sent to take the g-carrier to the central supply point to get that day's water rations for the company. Hey, it gets you away from camp and First Sgt. Mori for an hour or so.

"We're flying along, having a great time, when Greene sees another g-carrier. Just for fun, I shoot an IFF blip. Nothing, it's an enemy vehicle! So I shoot it.

"Now, these are training ranges, so all I did was plink it with a low-powered laser, but it knew it had been hit. A few seconds later, he plinked back. Now he's done it, Greene and I yelled, and we circled in for the kill.

"How much do you know about those training ranges? Combat vehicles are equipped with sensors to determine the effects of simulated hits. Hit a floater hard enough, the computer lands it and tells the crew they're dead. Fun stuff. What we had forgotten was that the g-carriers weren't equipped with sensors.

Continued on next page . . .

For each TL-upgraded battalion equivalent, a greater number of raw BEs must be "traded in." This represents the greater expense and maintenance required by high-TL units. To determine how many raw BEs are required to pay for each upgraded BE, find the exchange factor for both the army's base TL and the upgraded BE's TL, below. Then divide the upgraded BE's exchange factor by the world's exchange factor.

The exchanged raw battalion equivalents are gone. In effect, the world has spent more money on equipment, less on personnel.

TL	Exchange
13	2.0
12	1.0
11	0.50
10	0.31
9	0.20
8	0.12
7	0.075
6	0.05
5	0.03
4	0.02
3	0.01

Example: *Motmos (TL6) would like to have better protection than offered by its local weapons, so the government decides to raise a better, TL9 force. They have to use (0.20/0.05) four raw battalion equivalents for each BE raised to TL9. Motmos converts 20 TL6 raw BEs into five TL9 BEs. Since Motmos started with 27 raw BEs total, its Army has seven TL6 BEs left over.*

The GM can increase the effective exchange factor of a given TL if a source world for that TL isn't close by. This reflects the difficulty of paying for the shipping of spare parts and replacement systems. In extreme cases, the world's military might be entirely staffed by off-world mercenaries.

Most worlds cannot get more units by *lowering* the army's tech level! All that most planets get in that case is resentful soldiers and inquiries into where the procurement budget has gone. The GM might allow a few cultures to field units at one TL lower than the planet's TL; for instance, a fanatically religious society might deploy waves of low-TL infantry.

Militia are always fielded at the base planetary TL.

Step 5: Unit Types and Sizes

The next step is to define the types of units fielded, then group the resulting battalions into larger units. It would be very rare for an army to be organized around loose, independent battalions, though it has probably happened somewhere.

First, battalion equivalents are converted into one of two essential sorts of true battalions, infantry or armor. In this simple approach, both sorts of battalion are assumed to include their own integral artillery. In practice, infantry battalions created here may have modest armor assets and armor battalions may have modest infantry assets.

Each armor battalion costs double; i.e., it is paid for with *two* battalion equivalents.

Battalions of either sort can also be designated as "elite" by doubling their cost; i.e., paying two BEs for an elite infantry battalion or four for an elite armor battalion. No more than 20% of the regular BEs can be spent on elite battalions; reserves cannot be elite.

Example: *Jewell's army is beginning to take shape. The 755 regular BEs are spent on 80 armor battalions (costing 160 BEs), 20 elite armor battalions (80 BEs), 445 infantry battalions (445 BEs), and 35 elite infantry battalions (70 BEs). The 150 BEs spent on elite units are less than the 151 allowed. The reserves have 200 armored battalions (400 BEs) and 800 infantry battalions.*

Motmos decides that all 12 of its BEs will remain infantry battalions, with no elite units, leaving it 12 infantry battalions.

After this, organize the units. Battalions are used to "fill" different units. There is no requirement to use the largest unit possible. No matter what force structure is chosen, there is assumed to be an overall command present. If there is an odd number of units, they can be combined into a larger unit; as long as the actual

number of battalions is within about 10% of the listed size this is no problem. Such units might be noted as being under- or overstrength for additional color.

The standard unit sizes are 5 battalions per regiment or brigade, 20 per division, 100 per corps, and 500 per field army.

Example: *Jewell's regular Army is divided into two elite infantry divisions (one mildly understrength) and an elite armored division backed by 22 infantry divisions, four armored divisions, and a specialized infantry regiment (likely jump infantry). The reserves are more simply organized in eight infantry corps and two armored corps.*

The Motmos force is organized into a single TL9 infantry regiment, a TL6 infantry regiment, and two specialized TL6 infantry battalions (perhaps anti-armor units substituting anti-tank weapons for their conventional artillery).

Militias are also divided into battalions, though in practice it would take a great deal of combat experience for militia units to appear on the field in anything like battalion strength. To determine battalions of militia, divide the total militia strength by 500. Militia are always non-elite infantry, though individual units may have stolen or scrounged up minor armor assets.

Example: *Jewell's 945 million potential civilian defenders convert into 1.89 million militia battalions!*



Step 6: Finishing Up

The defense force for the world is now fully developed. The only thing left to do is to write the force up and add color details. Armies are known by their habits and traditions. Rarely is anyone satisfied with simply calling it "the Army." Army of the Potomac, People's Liberation Army, Le Grand Armee, The Immortals, Afrika Korps . . . these are names that grab attention.

Also consider the force's environment. Why is it so large or small? What is the largest threat it faces? Has it performed well in the past, or is it a traditional ne'er-do-well? All these things will help keep the armies encountered during a game from just being one more set of guys with guns.

The Defense Force of Jewell: TL10, 22 regular infantry divisions organized into four corps, four regular tank divisions. One elite armor and four elite infantry divisions known as the Gemstone Walls; each division is named for one of the worlds of the Jewell Cluster, and all five are organized as a single corps. One regiment of regular jump infantry, the 1st Meteorics. Eight infantry and two armored corps in the reserves. Potential 1.89 *million* militia battalions, some of whom already are loosely organized into "factory defense leagues" of battalion or even division strength.

So There I Was . . .

[Continued]

"So the other guy motions us to the ground, and we land. We all crawl out of our buggies, and they've been laughing as hard as we have. 'How do we resolve this?' one of their guys asked. I pulled a Cr1 coin out of my pocket. 'Call it in the air.'

"The forces of light vanquished the evil Zhos that day. I actually filed a contact report, though nobody ever got back to me on that one . . ."

". . . so Carlos hits it ***big*** *on the tables one night. I mean, he has more credits than half the Force. So we talk about what to do with it, and Carlos, he wants a big fancy air/raft.*

"Pretty stupid, huh? We could ship out in a day, and Carlos wants this big flashy floater. Nobody ever said the guy was smart, just lucky, right? So he heads out and buys this amazing float. An 1109 Sharurshaid Velocity with all the trim. You know, before they changed the front end and ruined them.

"Of course, we get shipped to Mora within the week. But Carlos is sneaky and lucky. He gets a tramp merchant to ship it, for free, in exchange for a little favor before we leave. I dunno, so don't ask.

"So the C-man has his fancy ride, and we start hitting the town. Doesn't matter that he's just another broke Marine; that raft attracts women by the bucketful! He started auctioning off the extra seats on liberty nights to mobility- and romance-impaired guys for kicks.

"Then we both get told to report to the Brigadier. That's real bad. Normally, if we had done something the brass would notice, we'd already have been busted and jailed. Weird thing is, she wants to see us in the raft lot at Fleet HQ, in our ride.

"We get over there and report, after our Ship Sergeant had inspected us 10 times. The Brigadier says, 'Gentlemen, I suppose you recognize this?' She's standing next to another 1109 Velocity, same color.

"You know that awful feeling of your insides trying to crawl up your throat at the very beginning of a drop during the transit to zero gee? Ten times worse, trust me.

"The Brigadier looks at us and in the coldest voice I have ever heard goes: 'We seem to share a taste in fine vehicles. However, our taste in after-hours amusements differs wildly. If my husband hears one more report about my air/raft being spotted in the seedier parts of Startown, you will both be placed on observation posts someplace so distant that the first light of creation has yet to get that far. Do I make myself clear, Marines?'

"Hey, what could we do? I think Carlos sold the raft a few months before that Vargr got him . . ."

The Motmos Guard: One TL9 regular infantry regiment of mercenaries, supported by a local TL6 regular infantry regiment and two anti-armor TL6 regular infantry battalions.

Step 7: Colonial Troops

On worlds of TL9 and up, about 10% of the world's army will be able to move off-world at any given time, assuming that the government is willing to let them go.

Subsector Armies

Once the planetary forces have been finished, the GM can look at the subsector army. The personnel are drawn from the same pool as the planetary forces.

Step 8: Mustering the Troops

The Imperial Army recruits from each world 5% of the number of raw BEs available to the world at the end of Step 2 on p. 78. This slice does *not* affect the world's own forces; the Imperium is taking the recruits it wants and the locals are left to fill in the slots with other troops. Reduce this levy by 10% for each TL the world is below TL11.

Example: *Jewell has 1,155 raw BEs. The Imperials would get 115.5 raw BEs from the planet but Jewell is TL10, which reduces this to 103.95 raw BEs.*

Many worlds will make fractional contributions to the subsector army. Save these numbers, and add them to the total size of the army. Use the same process used for planetary armies to allocate units. These units are already considered to be TL11, but may be (in rare circumstances) downgraded to TL10 or (frequently) upgraded to TL12 in Step 4. The Imperial Army has no reserves or militia.

At times, the GM may find that a subsector has, for various reasons, an extremely understrength army for the situation it faces. In these situations, units are sometimes loaned from the more populous subsectors in the area. If detailing an entire sector, take a look at the situation once all the subsectors are finished, and reinforce weak subsectors.

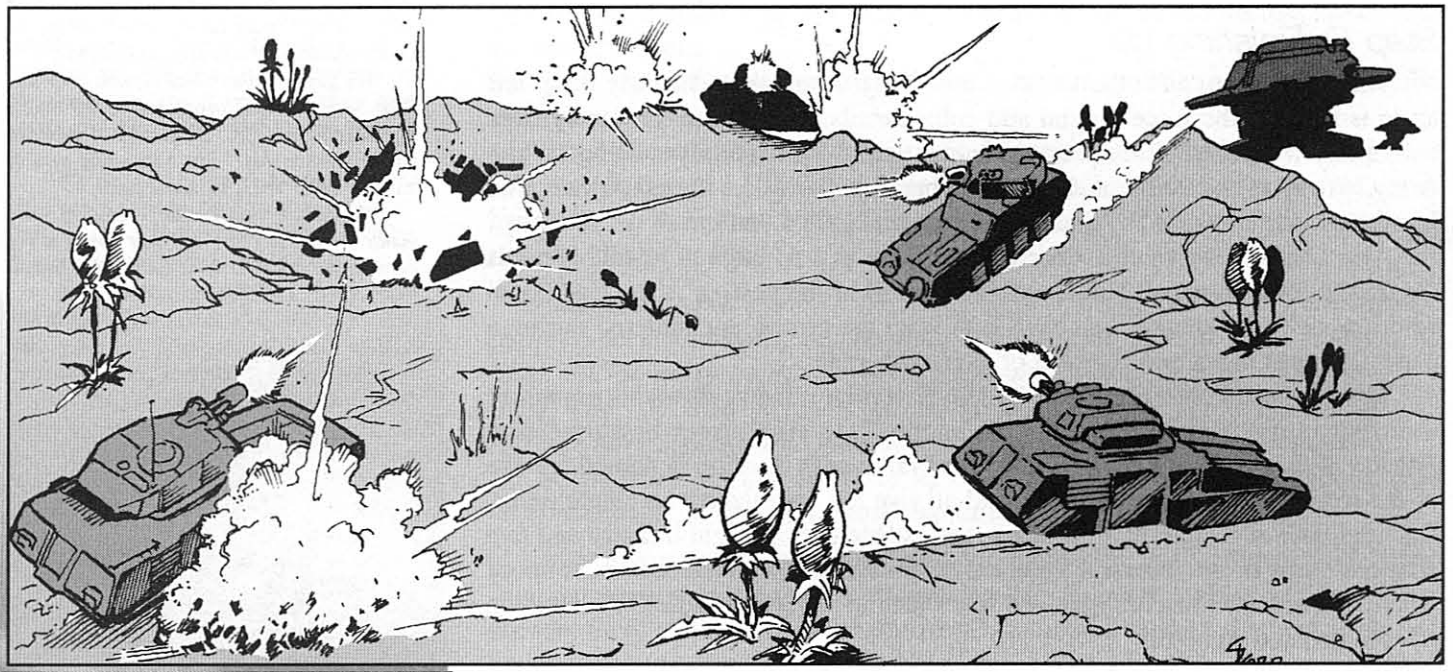
If a subsector consists mostly of worlds of TL10 or less, this may be one of the rare cases where the subsector army fields a large number of TL10 units to "flesh out its ranks," since every TL11 raw BE converts into 1.6 TL10 raw BEs.

Levies

Beyond all the regular and trained military organizations, there are untrained mobs dragooned into uniform and called "levies." For the most part, levies are used to free up more able troops for combat duties. In desperate situations, these levies might find themselves on the front lines. The most notable case of this in recent history was the German Volkssturm, old men and children given old weapons and used as a last-gasp measure to try and slow the Allied advance. As can be expected, very few of these units lasted more than a day in combat.

Another form of levy was seen in the United States, where numerous women went to work in "male" jobs so that the men could fight. Also, black Americans found new opportunities to advance as the war demanded more men and resources.

In the Imperium, levies are rarely used. It's much easier to hire mercenaries or call upon the Imperium for relief if the situation becomes too desperate. But the possibility of encountering half-trained troops cannot be discounted. An interesting dilemma for an Imperial commander would be to learn that his objective is being held by children. What does he do?



Chapter Seven

Survey and Exploration

What's the Difference?

In the Third Imperium, the popular image of the Scout Service is as a band of intrepid explorers, but the truth of the matter is that the IISS does a great deal more *survey* work than actual exploration. The Service makes a clear distinction between the two concepts.

Exploration involves the investigation of genuinely new and unknown territory. Explorers may have a rough map of a star system, from very old library data or from remote observations, but that is all. Their job is to gain a working knowledge of the star system and its contents, from scratch. They discover system bodies, place navigation beacons where none exist, visit habitable planets for the first time, open contact with the natives. Explorers must be prepared for anything.

Survey involves the mapping of territory that is already (more or less) well-known. When an IISS survey ship enters a star system, it already has a map that is normally no more than a few decades old. It expects to find navigational beacons already in place. The work involves verifying details, updating maps, and replacing worn-out beacons. Naturally, conditions *do* change between surveys in every star system, especially if it is inhabited. Such changes tend to be incremental rather than radical. Surveyors rarely face (or are prepared for) surprises.

Explorers will use all the procedures in this chapter. Surveyors will often stop with a surface map of major worlds, gathered from orbit. If surveyors visit an inhabited world, it is usually as a courtesy call or for shore leave.

Many of the information-gathering tasks described in this chapter are *uncertain* in nature. The character undertaking them can never be completely certain that he has succeeded or failed. The simplest way to handle such tasks is for the GM to make skill rolls for the players in secret (see p. B87). On a success, he will truthfully tell the players part or all of the information they are looking for. On a failure, he can conceal the truth or even mislead the players.

Bear in mind that players' tolerance for "scientific roleplaying" will vary. Some will find the gathering of scientific information interesting, especially if the GM avoids making it a dry die-rolling exercise. Others will want to skip to the action. The following should be considered *suggested* rules for playing out IISS activities. The GM should feel free to abstract or skip as much as he pleases to satisfy his players' taste.

Survey Operations

Survey operations involve a general evaluation and mapping of the worlds in a target star system. Many of the tasks involved in a system survey require using Electronics Operation (Sensors) to gather information, and a Scientific skill to interpret the information. In these cases, make the Sensors roll first. On a success, the follow-up science skill roll is made unmodified (with a +3 bonus on a critical success for Sensors). On a failure, some of the data gathered are incorrect, but a correct picture can still be built up with greater difficulty, with a penalty equal to the amount the Sensors roll was missed by. On a critical failure with Sensors, the follow-up skill roll may not be made until another attempt is made to gather data. Normally, any listed modifiers only apply to the science roll.

System Detection

Survey operations in a new star system begin long before the scout ship first jumps into the system. The first step is to get an impression of the contents of the target star system. This is normally done from one or two parsecs' distance.

Detecting Planets

Ship-based sensors are limited in their ability to detect planets from interstellar distances. A survey ship in flight can't use some of the indirect methods that are available to planet-based astronomers. The only available method is to try to capture images of the planets themselves, a difficult task even at high levels of sensor technology. Planets are small and dim, and they tend to huddle close to their large, bright primary stars . . .

Locating planets will take one day of observation time from one set of astronomical instruments (a "survey module" on a starship has four sets, so four attempts can be made at the same time). To perform the actual detection, roll against Electronics Operation (Sensors). Modifiers: +1 if at 1 parsec range, -1 if at 2 parsecs, -2 at 3 parsecs, -3 at 4 or 5 parsecs, -4 at 6 parsecs.

If the Sensors roll succeeds, large gas giants (50,000 miles or more in diameter) will be detected. Success by 2 or more will detect small gas giants as well. A critical success will detect the presence of large terrestrial planets (6,000 miles or more in diameter). The GM should never feel obligated to reveal the presence of all planets. Some of them may be in positions that make them impossible to detect, behind the primary star or presenting an unlighted face to the observer.

If any planets were detected, roll against Astronomy to produce a rough system map. Modifiers: +4 if more than one planet was detected. On a success, the astronomer can locate the ecliptic plane of the target system (the plane most of the planets will orbit in). He will also have a rough estimate of the orbit for each planet sighted.

Detecting Civilizations

Another task that is undertaken at this stage is to "listen" for signs of intelligent life. Detecting a civilization will take one day of observation time from one set of astronomical instruments. This observation cannot be "piggybacked" with the work for detecting planets, since the techniques involved are completely different. At interstellar ranges, only civilizations at TL7 and above can be detected using shipboard instruments.

Roll against Electronics Operation (Sensors) to detect signs of civilization. Modifiers: +1 if at 1 parsec range, -1 if at 2 parsecs, -2 at 3 parsecs, -3 at 4 or 5 parsecs, -4 at 6 parsecs.

On a success, the scouts will detect any population of at least 10 billion at TL7, 1 billion at TL8, 100 million at TL9-10, or 30 million at TL11-12. If the Sensors roll is made by a significant margin, smaller populations can be detected, down to one-tenth the size on a critical success. Also on a critical success, the process will gather 2d hours of language samples (see *Precontact Assessment,* below). Even if no detectable civilization is present, the GM should roll for the attempt anyway in case of a critical failure.

System Mapping

When the survey ship jumps into the target system, the crew may have only a rough idea of what planets are present and where they are. They must immediately establish their location in the system and pin down the exact positions of all major bodies. Once that's done, a more detailed study of the system's worlds can be done.

Establishing Location

This task is normally undertaken by the ship's navigator, using a roll against Astrogation. Modifiers: +4 if the ship has a command bridge, +2 if a rough system map is already available (either from library data or from astronomical observations at interstellar range).

On a success, the ship's position has been established with enough accuracy to allow further survey operations to proceed normally. On a failure, the navigator was inaccurate and all system-mapping skill rolls will be at a -1. On a critical failure, the inaccuracy is greater (-3 penalty). These penalties will last until the first success in a system-mapping task (the error was noticed and corrected).

Locating Planets

In one sense, mapping a star system from the inside is much harder than detecting planets from an interstellar distance. From a few parsecs away, it's easy to know which way to point the telescope. From inside the system, the entire sky needs to be covered.

The Gory Details

The rules in the main text are a workable system for IISS operations, assuming a scout ship is following standard procedures using the instruments in its TL12 survey module. GMs may want to vary the rules under special circumstances, at other tech levels, or in non-Imperial campaigns. Here are the assumptions which can be used to estimate the difficulty of exploration tasks in other cases.

To detect or study an astronomical object, sensor contact must be made with it. This requires a roll against Electronics Operations (Sensors). The effective skill used in the roll is modified by the Resolution modifier for the sensor suite, a Size modifier, and a Range modifier. If the sum of these modifiers is -10 or less, the task cannot be completed no matter how high the effective skill is (the sensor just isn't good enough). If the sum of the modifiers is +10 or more, then *sighting* of the object is automatic, although the skill roll should be made anyway to determine the degree of success.



Resolution Modifier: This modifier is based on the Scan factor, as laid out in the sensor rules from ***GURPS Vehicles.*** The difference is that astronomical instruments are optimized for scientific observation, and have a different performance profile than sensors used for weapons targeting. When the instruments are being used to affect vehicle action, use the rules from ***GURPS Vehicles.***

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The Gory Details

[Continued]

Naked eye: When doing astronomy using *no* instruments, substitute a Vision roll for Electronics Operation (Sensors). The Resolution modifier is +10 (reflecting the fact that astronomical objects tend to be bright against a black background).

Telescopes: Ordinary telescopes are available from TL4 on. They use lenses and mirrors to gather and focus light for the human eye. Again, substitute a Vision roll for Electronics Operation. Resolution modifiers are based on the magnification factor of the telescope (actually, several other properties of the telescope are involved as well). A partial table of Resolution modifiers is below.

Magnification	*Resolution Modifier*
×1.5	+11
×2	+12
×3	+13
×4.5	+14
×7	+15
×10	+16

If a telescope's magnification is between two values, use the lower. For higher magnifications, extend the above table by adding +6 for every factor of 10 magnification. For example, a telescope which provides x30 magnification is ten times better than one that provides x3, so its Resolution Modifier is 13 + 6 = +19.

When using a telescope to *search* for an object that hasn't already been sighted, magnification can be a hindrance (it reduces the field of view). In this case, any Resolution bonus due to magnification (anything above +10) should be halved, rounded down. For example, a telescope which provides x200 magnification is being used to search for a specific planetoid. Its base Resolution bonus is +24. The bonus due to magnification is +14, which is halved to get +7. For this search, the Resolution bonus is only +17.

Advanced Telescopes: At TL7 and above, astronomical instruments become far more effective due to electronic light amplification and digital image enhancement. Assume that the Resolution modifier is the same as for an ordinary telescope with the same magnification, but with a further TL-6 bonus. Double this bonus if the instrument is trained on the same target for at least one day. The undoubled bonus *can* be used in search mode.

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To produce a workable system map requires *ten days* of observations. Multiple sets of astronomical instruments can be used by a team of astronomers to reduce this time (two sets require only five days, for example). Roll against Electronics Operation (Sensors) to locate system objects. Modifiers: +2 if a rough system map is already available.

The mapping process will automatically detect all of the gas giants. On anything but a critical failure, all of the terrestrial planets will also be detected. On a success, all large moons in the system will appear. On a critical success, some of the small moons and larger planetoids will be detected, allowing the placement of planetoid belts.

The follow-up Astronomy roll is needed to produce a working system map. On a success, gas giants and terrestrial planets will be immediately identifiable, and the GM may reveal the specific type of some terrestrial worlds depending on the level of success. On a critical success, specific world types will be revealed. The approximate orbital radius will be available for each mapped system object, which will yield the approximate period assuming low orbital eccentricity. An accurate assessment of all orbital parameters for a given object requires observations over a longer interval, say at least one-tenth of the orbital period.

Detecting Civilizations

Once in the target system, it's relatively easy to detect native civilizations. Radio transmissions will be very clear, and spacefaring cultures can also be detected by visual observation of spacecraft and installations. Even an early industrial civilization can be detected by spotting the large-scale environmental changes it causes. Detection again requires one day of observations, using a dedicated set of astronomical instruments. Civilizations at TL5 and up can be detected at this range.

Roll against Electronics Operation (Sensors) to detect signs of civilization. On a success, the scouts will detect any population of at least 10 billion at TL5, 1 million at TL6, 100,000 at TL7, 10,000 at TL 8, 1,000 at TL9-10, or 300 at TL11-12. Again, if the Sensors roll is made by a significant margin, smaller populations can be detected, down to one-tenth the size on a critical success. A critical success will gather 2d hours of language samples. The GM should always roll, even if no detectable civilization is present or detection is automatic.

Planetary Survey

IISS expeditions don't always examine every world in a target system closely. Any planet in the habitable zone, however, is likely to get attention. Standard procedure is to do an initial evaluation of the planet while still at some distance (4 or 5 million miles), then move in to close orbit for a detailed survey and mapping sweeps.

Initial Evaluation

It takes very little time to establish a planet's general parameters. An hour's observations with a single set of astronomical instruments will suffice. Roll against Electronic Operations (Sensors) to use the array properly, then roll against Planetology (using the appropriate specialty) to interpret the results.

Success on this task will yield a great deal of information about the planet: its exact size; the presence of any small moons; the planet's rotation period and axial tilt; its exact world type; the approximate atmospheric pressure at the surface; the general composition of the atmosphere (some impurities may be missed); the approximate hydrographic percentage; the approximate climate range and weather factor.

The GM may want to reveal only part of this information if the Planetology roll failed or was only barely successful. If the pace of play would not suffer, he may have the players make multiple Planetology rolls to discover this information in pieces.

Orbital Mapping

To map the surface of a terrestrial world, an IISS ship takes up a close orbit (about 200 miles above the surface) and begins applying its planetary survey arrays. There are four such arrays in each survey module, but they are normally used in concert, each survey expert supporting and verifying the work of others.

The best orbit for mapping is some variation of the "ball-of-yarn" orbit. The scout ship orbits at a very high inclination to the planet's equator, actually passing over the north and south poles on each circuit. As the planet rotates, the ship finds itself always passing over new terrain, eventually scanning every portion of the planet's surface. If the planet is too small or its rotation is too slow, the ship may alter its trajectory slightly on each pass to get the same effect. Taking up an effective ball-of-yarn orbit requires a Piloting roll. The entire mapping process takes a number of hours equal to the diameter of the planet in thousands of miles, *squared* (minimum of 2 hours).

Sometimes the initial survey evaluation needs to be done from a greater distance. IISS policy with regard to interdicted worlds forbids casual close-orbit approach, for example. If the initial survey is done from high orbit (about 2,000 miles) then each Sensors roll is at -6, but the mapping survey takes the same amount of time.

To gather data for the survey, each surveyor must make an Electronics Operation (Sensors) roll. If at least one surveyor succeeds, a Cartography roll is needed to assemble the survey data into a working planetary map. Modifiers: +2 for each surveyor who succeeded in his Sensors roll, after the first.

A complete survey map will give a complete visual and thermal map of the surface, resolving features down to about 100 feet across. If there is no reason to avoid using active sensors, the survey will also yield a synthetic-aperture radar map of the planet, including nearly exact elevations. Densitometer scans will give some idea of what lies under any oceans, giving a rough map of the seafloor. The GM may simply wish to share the planetary map with the players at this point.

Further, the close-orbit survey will allow the expedition to make precise measurements of the world's gravity. This will yield the planet's exact mass, density, and surface gravity, and will allow the precise computation of the orbital parameters for its moons. Very precise measurements of changes in the world's gravitational field, combined with densitometer readings, will yield information about the structure of the planet's interior.

Detecting Civilizations

The orbital mapping survey is the last chance the scout team has to detect native sentient life, short of actually landing on the planet. Unlike the searches from long range, this can be done using the same data used to create a planetary map. At this range, sentient species can be detected even at TL0, while civilizations at TL6 and up are detected automatically. Once the mapping sensor results are in, make another Cartography roll. Modifiers: +2 for each surveyor who succeeded in his Sensors roll, after the first.

Success in this roll will detect any population of at least 10 million at TL0, 1 million at TL1-4 or 100,000 at TL5. Again, if the Sensors roll is made by a significant margin, smaller populations can be detected, down to one-tenth the size on a critical success. Note that some populations may be harder to find even at

The Gory Details

[Continued]

For example, the instruments in the standard IISS survey module (see p. 35) are TL12 advanced telescopes with x10,000 magnification. Their base Resolution bonus is 10+24+6 = +40 (+28 in search mode). If a full day's observations are available, the Resolution bonus rises to +46 (still +28 in search mode).

Size Modifier: For most astronomical objects, the Size modifier is a function of the linear size of the object, as in the ***Basic Set*** and ***GURPS Vehicles***. Typical Size modifiers for purposes of astronomy are as follows:

Object	*Size Modifier*
Small planetoid (10 miles)	+29
Large planetoid (100 miles)	+35
Average moon (1,000 miles)	+41
Small planet (3,000 miles)	+44
Large planet (7,000 miles)	+46
Small gas giant (30,000 miles)	+50
Large gas giant (70,000 miles)	+52



Note that most of the astronomical tasks don't involve searching for *stars*. If the situation comes up, stars should probably be given a substantial bonus due to their intrinsic brightness. A supergiant star, for example, can be spotted by the naked eye at a distance of thousands of parsecs!

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The Gory Details

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Range Modifier: This modifier is taken directly from the chart in the ***Basic Set,*** extended to astronomical distances. Again, to extend this table add or subtract +6 for every factor of 10 in range.

Range	Range Modifier
1 million miles	-53
10 million miles	-59
1 AU (100 million miles)	-65
10 AU	-71
1 parsec	-97
2 parsecs	-99
3 parsecs	-100
4 parsecs	-101
5 to 7 parsecs	-102
8 to 10 parsecs	-103

Each of the tasks described in the main text involves a specific set of instruments, target object, and standard range. From these, the final skill modifier for the task can be determined.

Locating planets at interstellar distances: Technically, this involves "searching" for an object not already sighted, but in this case the astronomer already knows where to point his telescopes. At a range of even one parsec, planets will appear so close to their primary star that they will appear in the same field even at full magnification. Use the full Resolution bonus of the instruments.

Building a system map: Here, the astronomer is at much closer range (the main text rules simplify by assuming about 2 AU from anything of interest). However, he no longer knows where to find system objects – when his ship emerges from jump, the planets can be anywhere in the sky from his point of view. The telescopes must therefore be used in search mode. The figure of ten days to finish the task is taken from ***GURPS Vehicles.***

"Baseball. It's a game. Solomani, pre-starflight. I don't know if anyone still plays it. I started studying it a couple of years ago. There's a lot of statistics and record-keeping involved. Just the thing to fill in the time during Xboat jumps. It's either that or stare at the walls."

– Marc Lurashu, Communications Office

this range (if they routinely live underground, for example). TL0 species that are on the border of sentience will have made very little impact on their environment, and may be impossible to distinguish at a distance from nonsentient animals.

If sentient life has been detected now or at any earlier point, then a successful Cartography roll will locate any major population centers. Even a culture lacking cities will have regions of unusually dense population (hunting ranges or good agricultural land) and these can be placed on the map.

Exploration Operations

Once the initial survey of a new world has been completed, the IISS gets down to business. Real understanding of any new world requires that scouts go down and get their hands dirty. After all, every new planet is a *world,* the end product of billions of years of isolated evolution, full of traits unique to itself.

Geological Survey

General information about planetary geological formations will be available due to the orbital mapping pass. More detailed maps of local terrain can be generated by low-altitude mapping flights. During these, a ship's auxiliary craft or grav vehicle passes over the terrain at a height of about one mile, using visible-light cameras, IR sensors, radar, and densitometer readings to build an extremely detailed map. Assume that one team can cover about 5,000 square miles a day. The task requires a lot of routine Piloting and Electronics Operation (Sensors) use, but the GM may not want to bother will skill rolls under normal circumstances. To assemble the final detailed map of any given area, a Cartography roll is required.

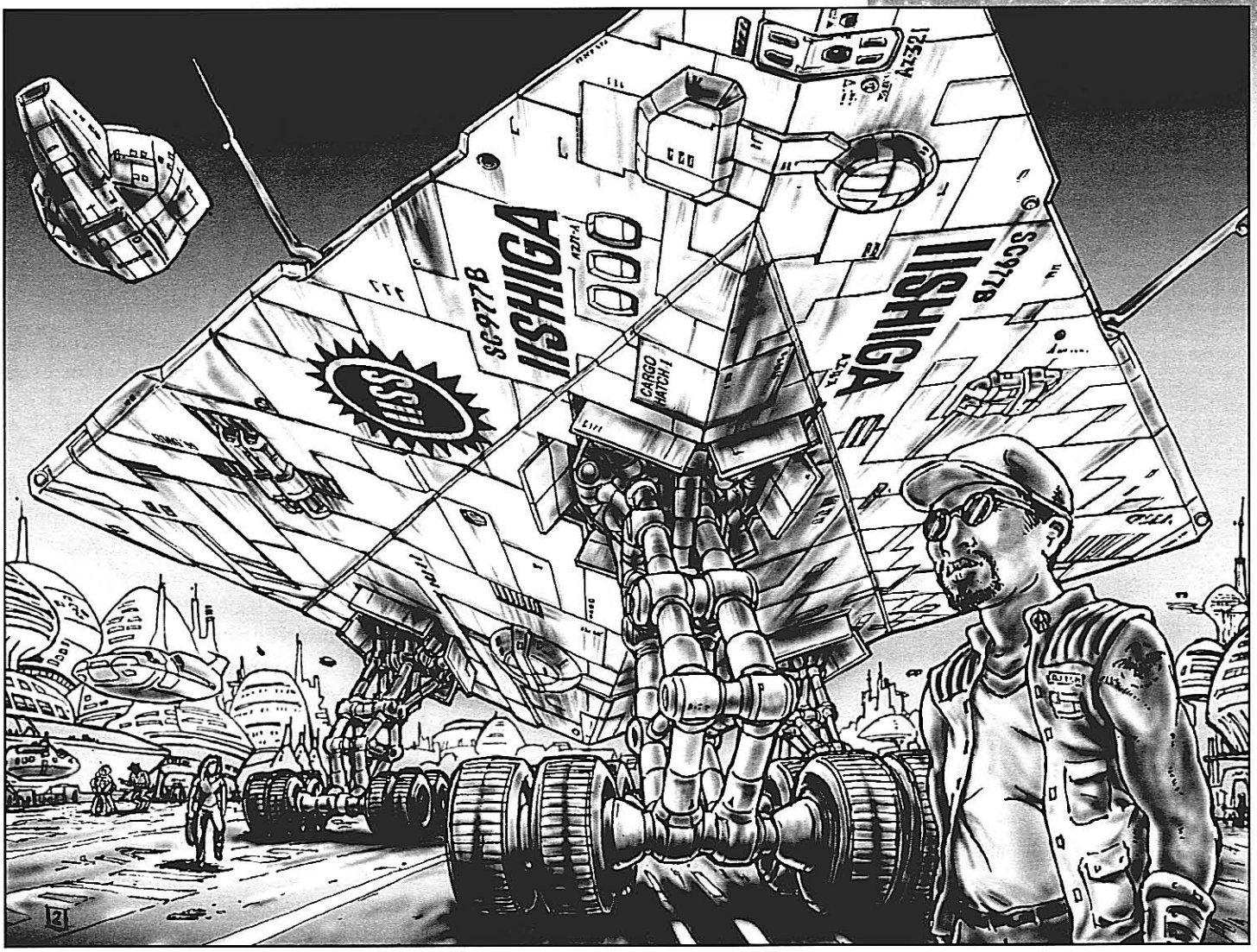
The detailed terrain map will give some information about subsurface geological formations and ore deposits, but getting a complete picture requires on-site inspection. In a given region, a geologist will drill core samples in carefully chosen locations, and will also use seismometers and a portable densitometer. This process requires 1d days for an area of about 500 square miles. The geologist must succeed in rolls against Electronics Operation (Sensors) and Geology. On a success the geologist will understand the broad outlines of local geological history, and will know whether there are any valuable mineral deposits in the area. Actually locating those deposits will take more time (and may not be a task for the exploration team in any case).

Biological Survey

Meanwhile, if the world's ecosphere includes at least "simple animals," biologists will fan out to gather information about native life forms. Such a biological survey takes about 1d days per region and terrain type covered.

During the biological survey, the scouts will collect samples of plant life and soil for later analysis. They will also try to study at least three examples of each major animal category (herbivore, omnivore, carnivore) in each terrain type. Small animals can be captured for intensive study. Large creatures will be anesthetized or killed, so that gross anatomic studies can be done and tissue samples can be taken. The scouts will also try to make holographic records of as many species as possible, exhibiting normal behavior in their natural environment.

Assume that a biologist working in the field must make a Botany, Xenobiology or Zoology roll to complete each task during the survey (evaluate a set of soil or plant samples, record the physiology of an animal specimen, and so on). Photography skill may be useful in taking holographs of species. Capturing or hunting animal specimens should be played out as a set of mini-adventures, using as much detail as GM and players are comfortable with.



Some local life forms are not affected by standard tranq rounds. Tanglers are often used to restrain large specimens when tranq is not available (see p. UT23). Another alternative is to formulate a new tranquilizer for the local biochemistry. This requires that tissue samples or whole specimens be gathered from at least 1d+3 local animal species, at least one of which should be large. A successful roll against Biochemistry will yield a tranq formula specific to local animal life, which can be synthesized in the nearest lab facility using Chemistry skill.

Ecological Survey

The biological survey will yield enough information to get a broad view of a world's natural history. Major animal and plant orders will be understood and the most prevalent large species will be identified. To get a real understanding of how local ecosystems work, however, a full ecological survey is necessary.

An ecological survey takes 2d standard *years* to complete. The surveyors must painstakingly identify local species down to the smallest animal and plant forms. Further, the team must observe how all of these species interact over several local years, to make sure that any seasonal changes are noticed and understood. The survey will involve many rolls against various biological-science skills, especially Ecology.

IISS doesn't always perform the ecological survey itself. If the world is to be turned over to a colonization effort, then the Service may leave the full

Is Anyone Home?

The rules for detecting civilizations are similar to the astronomy rules in the previous sidebar. The "Size" modifier is calculated using different assumptions, however. Instead of indicating a physical size, it indicates how obvious the target civilization is from a distance (the "signature"). It is the sum of two modifiers, one based on the TL of the target civilization, and one based on its *population*.

The most important factor is the base TL of the target civilization. Cultures at TL6 and above generate radio emissions that can be detected from a great distance. At TL7 and up, nuclear power and spacecraft drives create neutrinos that can sometimes be detected against the background neutrino flood from the primary star. At TL9 and up, reactionless thrusters and gravitic technology produce their own characteristic radiation. Finally, high-tech cultures tend to *build things:* lighted cities, space stations, terraforming projects . . .

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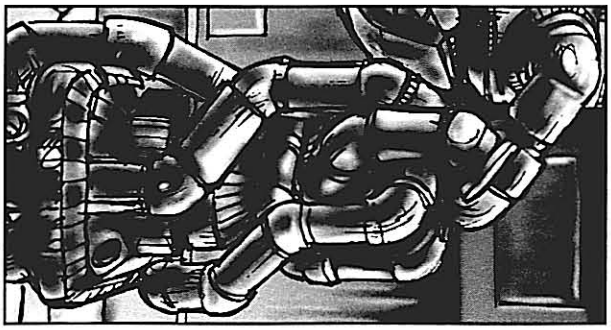
Is Anyone Home?

[Continued]

Target TL	Signature
0	-2
1-4	+4
5	+10
6	+34
7	+40
8	+46
9-10	+52
11-12	+55



Populations numbering in the millions or billions will be more obvious from a distance. On the other hand, colony worlds with only a few thousand people present will be hard to detect until the scouts are in the same system, no matter how high the local technology.

Target Population	Modifier
100 or less	-36
1,000	-30
10,000	-24
100,000	-18
1 million	-12
10 million	-6
100 million	+0
1 billion	+6
10 billion or more	+12

Note that these factors follow the usual "+6 for a factor of 10" rule. If you want more detail, add +1 for a factor of 1.5x, +2 for 2x, +3 for 3x, +4 for 4.5x, and +5 for 7x.

Add these two factors together to get the effective Size modifier of a given civilization. When trying to detect a civilization, always use the full Resolution bonus for the instruments. Even insystem, once planets are located it's easy to know where the best places to search are.

At short ranges, high-powered astronomical telescopes are no longer the most useful instruments for finding civilizations. Instead, explorers use planetary survey arrays from orbit around the target world. Assume that a standard array (called a "high-resolution array" in ***GURPS Vehicles***) has a Resolution bonus of +36 for this purpose.

ecological survey for the colonists to do. If the scouts do perform the survey themselves, possibly in conjunction with long-term liaison activity (see below), then a large team of Exploration Branch scouts will be posted to live on-world for the duration of the survey.

Contact Procedures

Once the scout team has determined that sentient life is present, the question of contact arises. This section describes typical contact procedures for the IISS.

Precontact Assessment

Scouts almost never go in to contact a new society "cold." If possible, the scout team will study the natives for weeks or even months from hiding.

Linguistic Assessment

The most important precontact task is a study of the local language. If the native society is at a low tech level (TL0-5), samples of the language must be gathered via direct monitoring of conversations. This is normally done using stealth reconnaissance drones (see p. 31) placed in inhabited areas. At TL6 and up, it becomes possible to gather samples by monitoring radio communications from orbit.

Stealth drones are almost impossible for a low-tech society to detect in flight, but at higher tech levels the local sensor network begins to have a chance at detection. In any case, it's more difficult to deploy drones where they will have a good vantage point and yet will not be discovered accidentally. Use the appropriate Piloting skill to deliver a stealth drone undetected to the observation zone, at a -1 penalty for each native TL above 6. A failure indicates that the flight had to be aborted, a critical failure indicates that the probe was lost or shot down. Once the drone has reached the target area, use Camouflage to find a good place from which it can eavesdrop. Robotic drones may use their own skills rather than those of the remote pilot.

Radio monitoring can be done without undue risk of detection. Use Electronics Operations (Communications) to tap into the local radio net using a ship's communicators. At higher tech levels the signals themselves may be hard to interpret. As analog signals give way to digital (in late TL7) the eavesdroppers must first break the "protocols" encoding voice, video, or text data. This requires several hours' worth of samples and a Cryptanalysis roll, at -2 for each native TL above 8. The Cryptanalysis skill has a number of modifiers of its own (see p. B245).

Each flight of a stealth drone can gather 1d-2 hours of useful language samples (minimum 0). Each ship's communicator can gather one hour of useful samples per two hours of monitoring. The GM should determine how many hours of samples will be needed before a working knowledge of the language can be derived. If the language is related to a known language (as for a lost colony of some kind) then 2d hours of samples may be enough to "break" the new dialect. If the language is completely unknown, then at least 100 hours of samples will be needed, possibly more if the language uses unusual syntax (if the language skill is Mental/Hard, for example).

In any case, Linguistics rolls are needed to analyze the samples properly, and to create a database for the new language. At this point, the database is incomplete and will not permit anyone to spend more than half an experience point on the new Language skill (IQ-2 level, in most cases).

Sociological Assessment

Once the local language has been "broken," the contact team must make an initial estimate of the local cultural parameters. Again, this is based on information gathered through stealth reconnaissance and radio monitoring. However, even if the language was trivial to break it will take an extensive collection of samples to gain insight into the local culture. The rules below assume that enough language samples have been gathered to build a working language database, or a minimum of 100 hours of samples. If less than this is available when the sociological assessment is made, apply a -1 penalty to each skill roll for every 10 full hours of deficit. Extra samples give +1 bonuses for every 20 full hours of surplus. Video samples or stealth-drone photography will count double if they *show* natives interacting socially.

Technology Level: Probably the easiest parameter to assess from a distance is the level of technological advancement. The overall Tech Level for the society should be obvious by the time the language database is complete, without need for any skill rolls. To determine the precise Tech Levels for individual sectors, make History rolls. The GM may apply bonuses to some of these if he judges that a given technology sector is in common, visible use (most will be, as few societies hide available technology away).

Political Structures: During this phase, the team can probably determine the basic political structure. The language will include words relating to politics, and examples of those words in context will give clues to how power is structured. When applied to intercepted communications, the Traffic Analysis skill will help the observers to reconstruct patterns of power and authority by seeing who communicates with whom. Covert observations of political activity will give clues to who makes decisions, and how. Roll against Anthropology or Xenology to determine the overall political type and Control Rating.

Specific Political Institutions: The overall political type may be fairly easy to determine, but the *details* are not always obvious. At this point, the team is most interested in some specifics of local law. After all, any kind of public behavior that tends to get natives arrested will be important for a landing party to keep in mind. Roll against Anthropology or Xenology at -4 to determine what local laws will require special attention.

Cultural Parameters: Each of the eight cultural parameters can be estimated at this point, based mostly on observed behavior. Roll against Anthropology or Xenology for each parameter, giving a general assessment (high, moderate, or low) on a success.

Instead of resolving the precontact assessment through simple die rolls, the GM may wish to game out the process in more detail. In this case, once the language database has been built (or even before), the GM may provide clues to social parameters by describing the scout team's observations.

For example, rather than rolling dice and telling the players "the society has high Pluralism," the GM may describe a crowded city square, observed by a stealth drone. Dress and appearance are diverse. Some of the natives are apparently putting on a political demonstration, with signs and chanted slogans, but although there are angry expressions no one is moving to stop it. Indeed, some natives in uniform are apparently protecting rather than arresting the dissidents. Of course, some of the PCs' observations may be misleading . . .

This kind of treatment can give the PCs more latitude to direct the investigation, perhaps using other skills to ferret out specific pieces of evidence. Once the players have drawn and stated their conclusions, the GM can make skill rolls, granting bonuses if the players have been perceptive, penalties otherwise.

The Fermi Paradox

In the early 20th century, a scientist named Enrico Fermi remarked on the strange fact that there was no evidence of extraterrestrial life. He reasoned that the universe was very old and vast, and there had been plenty of opportunity for some sentient species to attain starflight and overrun the Galaxy. Yet Terra had apparently never been visited, and astronomers had found no evidence of other civilizations out among the stars. Fermi concluded that there *were* no starfaring civilizations, that intelligence itself was so rare that humans might well be the only sentient inhabitants of the Galaxy.

In the ***Traveller*** universe, of course, Fermi turned out to be wrong. Yet scientists and philosophers of the Third Imperium have grown aware of a new "Fermi paradox" of their own. There are hundreds of sentient races within known space, and presumably many more throughout the Galaxy. Interstellar travel isn't *that* hard to accomplish. So why does it seem that there are no other "islands of civilization" elsewhere? A TL12 civilization with a few billion citizens should be detectable thousands of parsecs away, to a determined search. Yet beyond the borders of Charted Space, the Galaxy seems to be silent and empty.

One possibility is that starfaring species normally destroy themselves quickly. Certainly the Ancients seem to have done so, and human history has had its own lapses. Alternatively, perhaps after a period of starfaring, a few thousands or tens of thousands of years long, species tend to turn inward and lose interest.

Another possibility is that advanced civilizations tend to *hide.* Instead of pouring radio and other emissions out into the Galaxy, they try to blend in to the background, using tight-beam communications and avoiding the kind of big engineering projects that could be detected over interstellar distances. The major races of Charted Space have never bothered to do this, but other cultures may have different priorities.

Of course, some have suggested that there may be *good reasons* for a high-tech culture to keep a low profile . . .

GURPS Traveller GMs may wish to surprise their players with such "hidden" civilizations. Assume that any civilization above TL6 can reduce its "signature" to that of a TL6 culture. More advanced technologies generate more emissions, but can also hide them more effectively. Note that civilizations which are trying to hide will also restrict their populations, making them even harder to detect.

When Things Go Wrong

The IISS is painfully aware of the 57th Century equivalent of Murphy's Law: "Anything that goes wrong will do so at the worst possible time."

A contact team, in particular, may find itself suddenly needing rescue. When that happens, the gloves come off and Security Branch goes into action.

During covert or first open contact, it's standard procedure for a squad of Security Branch troopers (called the "watch team") to be on call. While the Alpha or Beta Team is armed lightly if at all, the watch team will be ready to apply overwhelming force. The watch team will most likely be in Scout Expedition Dress (see Chapter 3) and will be armed with whatever weapons would be necessary to overcome native resistance. This may include nonlethal weapons, if the local technology is backward enough.

The watch team waits out of sight of the contact point, in the wilderness or in low orbit, as close as they possibly can without being immediately discovered. The watch team stands by at all times throughout the contact procedure. If this period is likely to be more than a few hours long, extra Security Branch operatives will relieve the first watch team on a regular basis so that the team on call is always alert.

If the contact team yells for help, the watch team responds. The emphasis is on rapid mobility and the attainment of surprise. Ideally, the watch team reaches the trouble spot within five minutes of being called, much less if it's able to stand watch close by. The watch team's job is to apply exactly what force is necessary to overwhelm those threatening the contact team and get all IISS personnel to safety – not an ounce less, and not an ounce more.

Once the contact team has met with local officials, and there appears to be no immediate danger of attack, the watch team stands down to a lesser state of readiness. They will be moved back to a position that's safer from accidental discovery, possibly to the expedition's base camp or starship. If SED suits are in use, the watch team will wait without wearing them, ready to don them if needed. A prudent expedition leader will keep a watch team formally ready for action any time that a contact team is in the field, long after contact has given way to routine liaison work.

Covert Contact

Once the precontact assessment is finished, the commander of the scout team may authorize covert contact. This is not intended to open communications with the new culture. Instead, the scouts involved will be sent to gather more information *without* revealing themselves to the natives.

Procedures

The "Alpha Team" assembled for a covert-contact mission will include specialists in anthropology, xenology, and linguistics. At least one member will be highly trained in negotiating skills. There will also be at least one security specialist, armed with concealed weapons.

Members of the Alpha Team will carry translators (see p. 28), but IISS policy demands that all members of the Alpha Team also have some exposure to the native language and customs, as gathered from the precontact assessment. Effectively, this means that every member must have spent a half-point (the maximum possible at this time) on the native Language skill. Unless the GM is using Quick-Learning rules (see p. CI114), this implies 100 hours of study. Characters with Language Talent or high levels of Linguistics skill will be very useful in an Alpha Team.

If possible, Alpha Team members are provided with clothing and items of personal equipment that fit local styles. Money is often a problem, especially if the local technology can produce elaborate currency that is hard to counterfeit without a close examination. The Alpha Team is provided with compact items that might be of value in trade. Precious metals are a common choice. High-technology equipment may be carried, but only if it can be concealed very easily (covert-contact experts often have high levels of Holdout skill). The Alpha Team may carry weapons for self-defense, but those weapons must also blend into the setting.

An inhabited area is chosen for the mission, preferably a frontier or rural region which allows a landing close to a population center with minimal risk of detection. Once the Alpha Team lands, they make their way into contact with the local population. Naturally, the course of the mission should be played out as an adventure!

Goals

The overall goal of a covert contact mission is to smooth the way for further contact. The Alpha Team must decide what items or information later teams will need to better interact with locals. They should obtain examples of local currency, identity documents, clothing, personal equipment, and so on. They can also obtain scrolls, books, newspapers, downloads from library computers, any kind of documentation which will improve the expedition's grasp of the local language and social situation.

Naturally, all of this will mean interacting with the local population, unless the Alpha Team resorts to stealth and theft. If a PC must speak to natives, he should also roll against the local language skill to see how well he makes himself understood. Remember that any Alpha Team member lacking high levels of Language Talent will probably speak with some level of an accent!

Imitating a member of another culture is very difficult, even if the language is understood and spoken fluently. Each time the team interacts with natives, each member should roll against Acting to see how well he imitates a native's carriage, gestures, and speech patterns. The GM can apply bonuses or penalties to this roll, depending on the situation. In particular, anyone who speaks with more than a faint accent should have a penalty of at least -1. Success means that

the PC arouses no suspicions. On a failure, the native(s) will notice *something* strange about the PC. This may or may not cause Reaction penalties, depending on how tolerant the local culture is of nonconformity.

Follow-up

Once the Alpha Team returns home, its members are extensively debriefed and any materials it recovered are analyzed. A Linguistics roll will improve the language database so that up to 2 experience points may be spent on the associated Language skill. Anthropology or Xenology rolls may be applied to gain more detail on local political institutions and cultural parameters.

Depending on the success of the first contact mission, the expedition commander may call for more covert reconnaissance. These later forays are sent out with specific goals in mind, filling in gaps in the team's understanding of the local culture. Only when the expedition's contact experts are satisfied that there are no sociological "time bombs" in store will the team leader authorize open contact.

With some worlds, the Scout Service never gets beyond covert contact. Instead, on the recommendation of the discovering expedition's commander, the nearest sector-level IISS command will invoke the interdiction laws (see sidebar).

Overt Contact

The Imperium does not have a "noninterference" policy as such. Many low-technology worlds have been openly contacted and brought into the Imperium. Naturally, Contact & Liaison Branch tries to make that process as smooth and mutually beneficial as possible.

Procedures

Overt contact is handled by a "Beta Team," which may include some of the same specialists as the Alpha Team. Beta Team, however, includes at least one diplomatic expert. Beta Team procedures are even more stringent than those followed by Alpha Team. Only a few items of high-tech equipment may be carried, usually a radio link and a pocket computer for each person. Most importantly, Beta Team carries no weapons, not even concealed ones, unless local law and custom permit it.

Goals

The goal of first overt contact is to reach the local governing authorities, make them aware of the existence of interstellar civilization, and reach an agreement with them allowing future Imperial activity on their world. How this is done is almost entirely up to the contact team leader, since the circumstances can vary *widely.* A few general guidelines are almost always adhered to.

First "open" contact is almost always handled with great discretion. The Beta Team uses covert-contact procedures until it can reach local officials. The existence of Imperial civilization is not demonstrated to the population as a whole until the local government agrees that this can be done. Even then, the announcement is normally made by local officials, with the contact team acting only in support.



Interdiction

The IISS is one of the two institutions that has the authority to invoke and enforce Imperial *interdiction laws.* Generally, the Service uses interdiction as a *protective* tool. It's most often used to defend worlds whose native culture or ecology would be endangered by full-scale Imperial contact. Asgard/Vilis and Pscias/Regina are two worlds in the Spinward Marches which fall into this category. It can also be used when a world is so hazardous that only expert explorers should be allowed to expose themselves to its dangers. Algine/Regina is an example of this situation. In contrast, the Imperial Navy tends to use interdiction as a *punitive* tool for enforcing Imperial policy.

The procedure for interdiction requires a direct appeal to the Emperor, or (if the Emperor has delegated the authority) to some other member of the Imperial family. Such an appeal is never made lightly and is not normally done by any scout below the rank of Sector Scout Leader. If the appeal succeeds, a Decree of Interdiction is issued, authorizing the Service to muster a patrol squadron and maintain it on-station in the interdicted system. The Service could legally end the interdiction on its own at any point. Historically, however, whenever a world has been placed under interdiction status by the IISS, the understanding is that it is under the direct protection of the Imperial family. Therefore, the Service traditionally consults the Emperor or his agents before lifting an interdiction.

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Interdiction

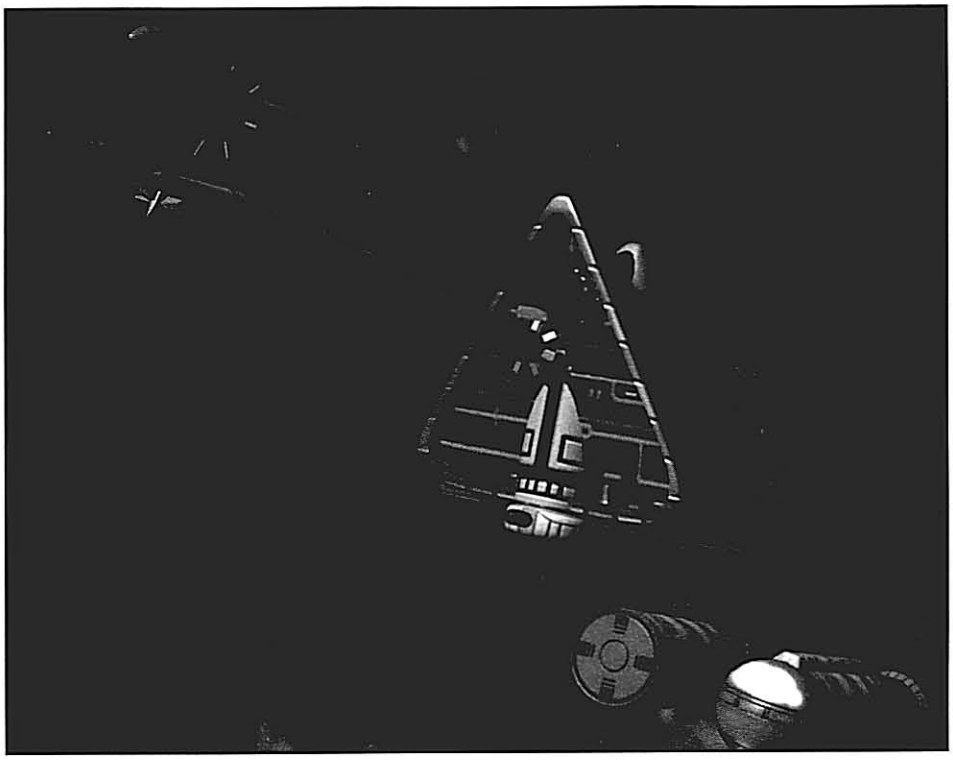
[Continued]

While a star system is under interdiction, only the IISS has the authority to visit. The system is patrolled, often by squadrons formed around the largest ships in IISS service. In some systems, the scouts may allow visitors to refuel in the system, escorting them to and from a designated gas giant or ice moon. Visitors should be aware, however, that the scouts have the authority to shoot on sight. Meanwhile, an interdicted world is often a focus of exploration or covert-contact activity.

The team should not reveal any details of Imperial scientific or technical knowledge. High-tech may be *demonstrated,* as part of the process of proving the contact team's assertions, but *how* devices work must be left to later discussions.

The team also may not discuss Imperial politics or institutions. Beta Team may admit to being from a star-faring civilization which is interested in continuing contact with the local society, but the details should be left as vague as possible. The team may promise that more information will be made available once a good working relationship seems likely.

Once local authorities are coping well with the implications of contact, the Beta Team should conclude an agreement with them, laying out how further contacts may proceed. This may require considerable negotiation. The scouts should gain free access to the local population, enough to complete in-depth linguistic and sociological surveys. This normally requires that the local authorities cooperate, and that the scouts' presence be made known to the general population. The relationship should be set up so that the existing social and political situation is left as intact as possible. Beta Team should avoid being used in any local power struggles, withdrawing entirely if that appears necessary.



Follow-up

Overt contact normally continues until the expedition commander is satisfied that the local culture is ready for talks with other Imperial institutions. The IISS prefers to take at least a standard year to reach that decision, even in cases where the local culture is technically advanced, immediately understands the Imperium and is eager for trade. Of course, if the world is that promising there are usually outside interests pressing for a faster result. In less favorable cases, the Overt Contact phase has sometimes lasted for over twenty years.

Overt contact can also end with invocation of the interdiction laws. This can occur because of serious but subtle cultural problems, which only become apparent after months or years of interaction. Interdiction after overt contact can also occur if the local authorities demand that they remain isolated from outside contact. Finally, the IISS may recommend interdiction if a *contact disaster* happens, a catastrophic mistake on the part of Beta Team which alienates the local society.

Note that these results will sometimes have a negative effect on the careers of the scouts involved. Contact disasters, in particular, are rare but almost always end the expedition leader's career in disgrace. This encourages contact leaders to be cautious. The Service prefers that a world be kept in covert-contact status or under interdiction until it is clear that the reaction to contact will be at least neutral. Few expedition leaders are willing to "jump the gun" by moving to overt contact too quickly.

IISS Deployment

Regina subsector in the Spinward Marches is a center of scout activity. It can be considered a typical frontier region, and a good example of how IISS activities are distributed.

Efate (1705) is host to an IISS way station, and is therefore the subsector's control center for the Xboat network.

Knorbes (1807) is in long-term liaison status. A team of experts from Exploration Branch is also on-world, working with the Imperial Ministry of Conservation.

Ruie (1809) is a recent addition to the Imperium, annexed after the Fifth Frontier War. It is in long-term liaison status, with an unusually large Omega Team working with Imperial diplomats.

Continued on next page . . .

Contact with Balkanized Worlds

Many worlds, especially high-population worlds at low tech levels, are balkanized. This can complicate contact procedures considerably.

When a potential new-contact world is found to be balkanized, IISS policy is to identify "major" societies and study them each independently. This implies a precontact assessment and series of covert-contact missions for each. The definition of "major" is deliberately left vague. As a general rule of thumb, the highest-population and highest-technology societies on a world must be studied fully. Any other societies which seem to hold local importance must also be examined. These might include widespread trading cultures, or "diasporas" which have no homeland of their own but retain distinctive language or traditions. Naturally, simply identifying what societies exist and determining the relationships between them can be a challenge.

When there are several major societies on a given world, a different overt-contact strategy is used. Quietly appearing before the leaders of several different societies makes the probability of mishap or misunderstanding much greater. Instead, the contact expedition will simply announce itself to as many people as possible, in every major society at the same time. This may involve radio transmissions or blatant spacecraft landings, depending on the situation. Such a "shock contact" often causes widespread disruption, but it actually *reduces* the risk of setting off conflict between competing local states. The contact can't easily be seen as a local rival's ruse, and it doesn't appear to play favorites. Shock contact also reduces the risk to individual scouts, who are not faced with the dangers of a standard Beta Team mission.

"For over a thousand years, the IISS has performed with great efficiency and considerable heroism. It has also maintained a spirit that is the envy of many a military commander."

– Celeste Vitzor, Security Branch

Liaison Activities

Once the Overt Contact phase ends, the IISS gives up primary responsibility for Imperial interaction with a world. This begins the Liaison phase.

Short Term

Liaison activity is handled by another team from Contact & Liaison Branch. This team is officially called the Liaison or Omega Team, but scouts generally call it the "handover team." Omega Team for a given world will be much larger than were the Alpha or Beta Team, normally consisting of at least 10-60 members. Omega Team includes specialists in diplomacy and economics, as well as the usual linguistic and sociological experts.

Omega Team arrives on-world at the same time as the first Imperial ambassador and his staff. Soon afterward, the planet will be visited by other members of the Imperial nobility, megacorporate factors, speculative traders, and a variety of other citizens. The team's job is to support the Imperial embassy, advising the Ambassador of details of the local social and economic situation. If the Ambassador directs, the IISS will lend similar aid to other visitors as well (particularly the nobility).

IISS Deployment

[Continued]

Boughene (1904) has no IISS installation, but its position at the junction of several Xboat routes means that an unusually large number of *Purcell*-class tenders are present in-system.

Hefry (1909) is host to a scout base which is the subsector headquarters for Contact and Liaison Branch. A team of Exploration Branch scouts is attached to the local Colonial Office.

Regina (1910) is host to a scout base, local headquarters for Technical Services Office and (temporarily) for Exploration Branch. Local IISS personnel are often associated with the Regina Center for Research.

Pscias (2106) is an interdicted world. The IISS maintains a patrol squadron in-system, based at Hefry. The developing native society is usually left alone, but every few years a covert-contact team is sent to check on its progress.

Dentus (2201) has a scout base and (before the Fifth Frontier War) was a center of Exploration Branch and Intelligence Branch activity. The planet is currently interdicted by the Imperial Navy. The situation has given rise to considerable interservice tension, and the IISS has drawn down local activities as far as possible.

Shinothy (2306) is a Red Zone system due to extreme navigational hazards, but is not officially interdicted. A team of IISS experts from Exploration Branch is involved in study of the unusual system.

Algine (2308) is an interdicted world. The IISS maintains a patrol squadron in-system, based at Regina. Covert-contact teams are almost always present on the planet, studying its diverse cultures and looking for ways to turn them away from their common xenophobia. An S-3 squad is officially based at Regina, but is actually stationed here more or less permanently to cover ongoing covert-contact operations.

Yurst (2309) is in long-term liaison status. An Omega Team is present to study the native minor race and help mediate between it and the Imperium.

Keng (2405) is also in long-term liaison status, with a small Omega Team present. The world is actually well-integrated into the Imperium, but IISS maintains its presence as a guard against interference from the nearby Freeport.

Inthe (2410) has a scout base, and is subsector headquarters for the Imperial Grand Survey.

Xmail

The express boat system is available to individuals and private concerns. Only messages may be sent by Xmail, of course. Packages and small cargoes must be sent via the Imperial Courier Service or a private carrier. The standard rate for Xmail traffic is Cr10 per gigabyte of data per parsec. Assume a minimum of Cr1 for any given message, no matter how short – every message has a minimum "handling fee." Messages generally travel at about 2-3 parsecs per week along the Xboat network lines.

Standard data storage requirements for various items can be found in several ***GURPS*** supplements. Here are a few examples of what that 10-credit-per-parsec gigabyte can carry: 10 minutes of high-resolution video, an hour of ultra-fidelity audio, personal dossiers for 100 people, the executable code for a Complexity 3 computer program, the complete text of all the books on a 6-foot shelf, a year's full financial records for a medium-sized business, or the schematics for a complex device such as a large vehicle.

In practice, the vast majority of the traffic on the Xboat network is between high-technology, high-population worlds. Worlds with medium or low technology levels get a nearly free ride, generating and receiving so little data that the cost to the system is essentially nil. The flat fee has the effect of causing high-traffic segments of the network to subsidize low-traffic segments (where the express boats don't travel with a full load of data).

Note that the Xmail cost given here is *hundreds of thousands* of times lower than that published in early versions of ***Traveller.*** Today it seems reasonable to expect Imperial data storage technology to be many orders of magnitude more advanced than was once imagined. GMs can assume that the major worlds which make the most use of the Xboat system will generate enough traffic to make up the difference. The main effect on PCs is that they will be able to send and receive full-video "letters" rather than terse telegrams.

It's during this period that the scouts are often called on to perform "donation surveys" of the new world. The local government is usually interested in developing exports to the Imperium, but may not be aware of all local resources that might be worth exporting. In such a case, the Survey Office will be asked to do a comprehensive workup on the planet. A megacorporation, contracted to do a similar survey, would be too tempted to use the information gained for its own advantage. If the C&L teams have done their work properly, however, the locals will trust the IISS and regard it as an "honest broker."

Long Term

Contact & Liaison Branch usually maintains an Omega Team in place until a world is fully integrated into the Imperium. This implies that local technology has reached a stable level against imports, exports are steady and profitable, and the local society has adjusted to new situation. Such a situation may take many years to appear.

Some worlds are resistant to integration, either because of isolationism or because there are local cultural traits repugnant to the Imperium. If it appears that the world will be a valuable addition aside from these obstacles, the Imperium may openly offer economic inducements for change, combined with a discreet campaign of cultural adjustment. The Omega Team usually acts in support of these efforts, although if the situation appears likely to go badly wrong the IISS is usually ordered to remove itself from involvement in the problem. The Imperium finds it useful to have at least one major institution which will be trusted by as many member worlds as possible.

Contact with Aliens

Much of the above assumes that the culture being contacted is *human.* Since the foundation of the Third Imperium, that has always been the best bet for the Scout Service. Although human races are outnumbered by nonhuman species in Imperial space, the major human races were spread to many more worlds under the First Imperium and the Rule of Man. As a result, most of the new worlds contacted by the expanding Imperium have been occupied by humans. Naturally, nonhuman civilizations present the IISS with unusual challenges.

Precontact

For example, the precontact assessment becomes much more difficult with nonhumans. Although human languages are very diverse, they are all subject to the limits of human physiology and psychology. Even the differences between minor human races are trivial compared to the gaps between species.

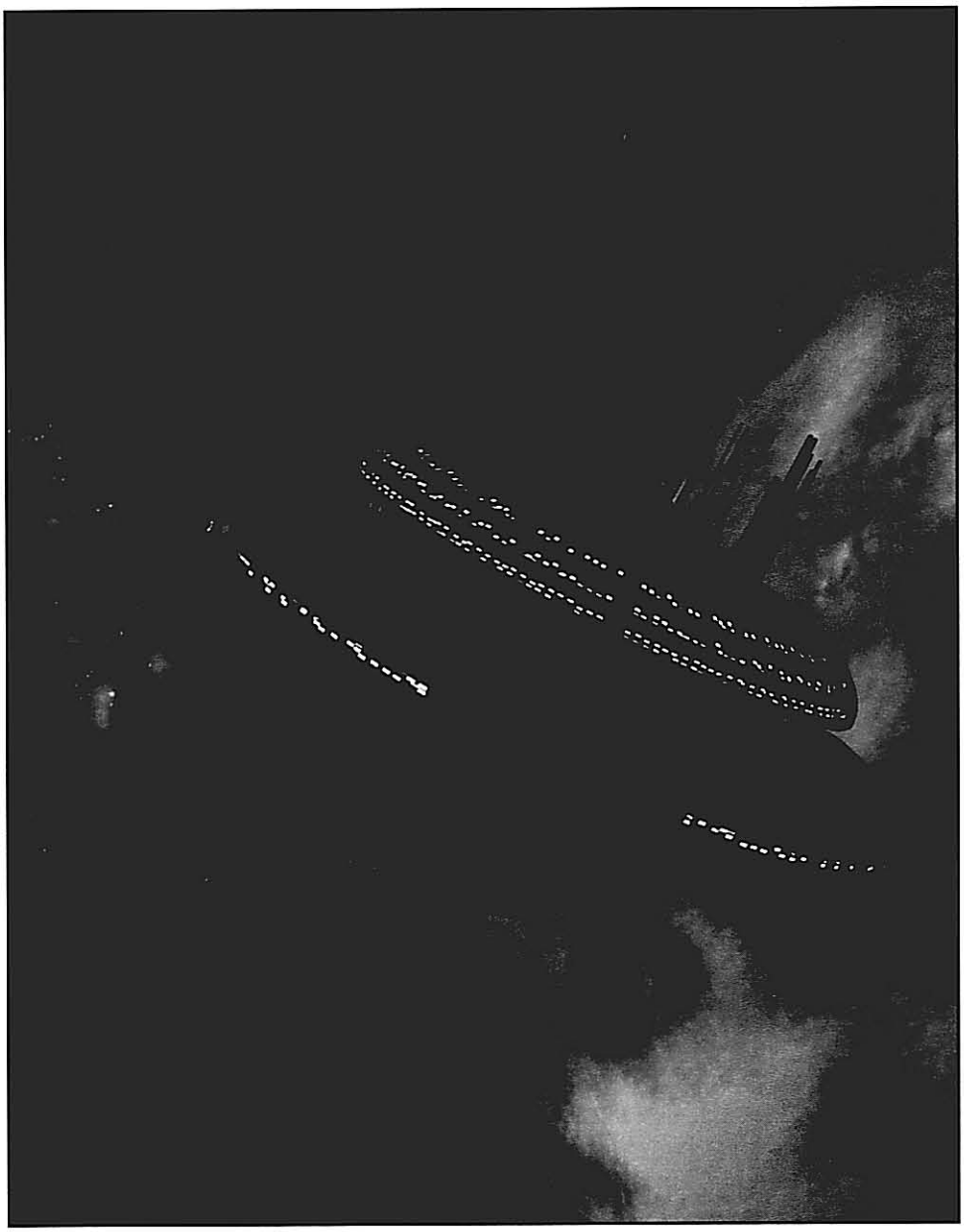
A native language doesn't even have to be based on *speech,* semantic content encoded as a sequence of sounds. If the natives communicate in some other way, the usual linguistic procedures will work only with greater difficulty, if at all. Stealth probes may be able to see gestures, but they cannot interpret unusual communication forms such as pheromones or telepathy. Intercepted radio transmissions may be much harder to interpret or analyze if they encode a communications form other than speech. The GM will have to decide how to handle such cases, but *at a minimum* the task will require several times as many language samples. In any case, no matter how much information human scouts can gather, it will be difficult for them to produce any non-spoken language themselves.

The difficulty of understanding a nonhuman language is, by itself, a severe or even insurmountable obstacle. Once that obstacle has been overcome, the sociological assessment is actually no harder for a nonhuman culture. Once the language is understood, it yields the basic information needed to evaluate a culture, and it allows observers to interpret the activity they see.

Contact

Naturally, Imperial scouts (most of whom are human) may not be able to use extensive covert contact when dealing with a nonhuman civilization. Surgical alteration and disguise can only go so far in allowing a human being to imitate an alien of different physiology. The IISS has made a few experiments with custom-built robots, operated from a distance by Contact & Liaison specialists, but the results have been uniformly poor.

As a result, the Service's approach to contacting nonhuman species is rather different. Two overall strategies are available. The usual approach is to place the world under interdiction without even making any attempt at covert contact. The period of remote observation and interdiction is intended to last until the native civilization itself manages to attain spaceflight, at which time they will presumably be ready for contact at a distance from their homeworld. More rarely, the scouts go directly to overt contact, possibly using the "shock contact" strategy. This approach is used only when the native culture appears unusually ready for contact with outsiders, or when interdiction is not possible for reasons of Imperial politics.



Trading Stations

One of the lesser-known activities of the IISS is the maintenance of *trading stations* in scattered regions of the Imperium. A trading station is a small establishment intended to promote interstellar commerce, usually in a backwater or frontier region where robust trade routes do not yet exist. Most of them are operated by private companies, either on their own or under contract to the Imperium. Others are operated by branches of the Imperial government, particularly the IISS.

Trading stations operated by the Scout Service usually have a small staff of no more than 15-20 scouts, mostly from the Finance and Contact & Liaison Branches. Their services include brokerage, arranging warehouse storage, small-scale commodities exchange, linguistic and cultural translation, commercial database access, and so on. These services are free, and available to anyone on a first-come, first-served basis.

The Imperium's reasons for maintaining trading stations are complex. The Imperium has always spent a great deal of effort on promoting interstellar trade, as a matter of policy. Worlds that are bound together by prosperous trade are more likely to contentedly support Imperial power. Also, Imperial trade stations act as a small (but important) check against the megacorporations. The control of information can be a powerful weapon for a large, widespread corporation against its local competitors. The presence of a trade station prevents anyone from completely monopolizing information flow. Finally, many IISS trade stations are set up in border regions, and act to encourage trade with potentially hostile neighbors.

There are a number of IISS-run trading stations in the Spinward Marches. Most notable are the stations in the coreward sections of Regina and Aramis subsectors, posted to encourage trade with the Vargr. Several of these stations were damaged or destroyed during the Fifth Frontier War, but have returned to operational status now that peace has returned. There are persistent rumors that IISS Intelligence officers use the trading stations as cover for their own operations in the Vargr Extents. This seems unlikely, although Intelligence would certainly find the stations useful for information gathering.

Chapter Three

Characters

Careers

In the original ***Traveller***, a character's pre-game career greatly shaped him. ***Classic Traveller*** offered six careers (Navy, Marines, Army, Scouts, Merchants, and Other). This grew to 18 types in ***Megatraveller*** and 40 in ***Traveller the New Era***. Careers limited the skills a character could acquire, and helped generate a background story. Certain careers gave benefits upon leaving them.

The career templates in this chapter are optional, but usage is strongly recommended to maintain the flavor of ***Traveller***.

Tech Levels

The Imperium's base TL is 10. In ***GURPS***, people from worlds with lower TL should take Primitive (p. B26). Those with higher-TL backgrounds should take High Technology (p. CI26).

Classic ***Traveller*** did not distinguish between TL backgrounds once characters began adventuring. First edition ***GURPS Traveller*** "fudged" similarly, mentioning Primitive but not High Technology. Therefore, GMs would be justified in adjusting High Technology's cost – but this second edition will assume a full 20 points for TL11 characters and 50 points for TL12.

These high costs help explain why TL10 equipment is the standard. TL12 goods may be relatively common and cheap; TL12 technicians and operators are neither. See *Technical Difficulties*, p. 108.

The advanced wealth rules (p. 83) can help offset High Technology's cost.

Characters in ***GURPS Traveller*** will emerge from two backgrounds. Some will be created directly for ***GURPS Traveller***, using ***GURPS Basic Set*** and the notes in this chapter. Others will be converted from pre-existing campaigns in a previous version of ***Traveller***. The latter process is discussed in *Character Conversions*, pp. 124-129.

Creating a Character

The GM should have access to the ***GURPS Basic Set*** and (optimally) to ***Compendium I***. The discussion below is for Solomani (p. 75) and Vilani (p. 60) Humans, and applies to both unless otherwise noted.

The Vargr and Zhodani are dealt with briefly in sidebars in this chapter, and in more detail in the ***Alien Races 1*** sourcebook. The sidebar information should be sufficient for GMs to explore the two races as NPC characters.

GURPS Traveller is designed for 150-point starting characters. This allows a "standard" 100-point character with a TL12 background, a standard TL10 PC with a nice ship, an elite background such as Imperial Marine commando with a few points to spare, or plenty of room for unique concepts.

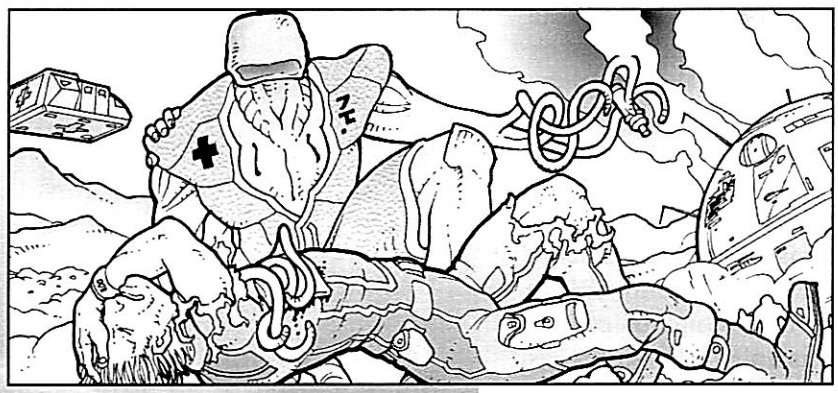
Basic Attributes

The Solomani and Vilani both possess the normal Human attributes defined by ***GURPS***. The normal limitations apply to characters from these races – no more than 100 points in attributes, no more than 40 points of disadvantages, and no more than 5 quirks at -1 point each.

Minor Human races may have small (or even radical) differences in their racial template at the GM's discretion.

Physical Appearance

Physical appearance follows the standard guidelines on p. B15. Solomani run the full panoply of appearances as on 20th-century Earth. Vilani racial appearance (hair, eyes, skin color, etc.) has the same extremes as Solomani – their differences are primarily cultural and social. For all physical purposes, Vilani and Solomani are the same (Vilani tend to be a few pounds heavier for a given height).



Careers

Careers are presented as templates, beginning on p. 86. ***GURPS Traveller*** pre-game careers don't generate service histories or carry the risk of death as in classic ***Traveller*** character generation. Players should create their own service history. Those who miss the other feature may roll 1 die. On a 1 or 2, crumple up your character sheet and start over.



Wealth

Average starting wealth is Cr15,000.

For more advanced economics, adjust average starting wealth for the character's TL, per p. T:FT48. TL0 is Cr150, TL1 Cr250, TL2 Cr350, TL3 Cr500, TL4 Cr1,000, TL5 Cr1,500, TL6 Cr2,500, TL7 Cr3,750, TL8 Cr6,000, TL9 Cr10,000, TL10 Cr15,000, TL11 Cr25,000, and TL12 Cr50,000. The GM could rule this a one-time penalty/bonus for Primitive and High Technology respectively, or actually charge for starting-wealth adjustments per p. T:FT100.

For more starting-wealth options, including an ownership stake in a starship, see ***GURPS Traveller Far Trader***. Controlling interest – though not ownership – in a starship is discussed in *Ship Patron*, pp. 84-85.

Status

Status roughly equates with the Social Standing characteristic of ***Traveller***.

STATUS AND COST OF LIVING

Level	Status	Monthly Cost of Living
8	Emperor/Empress	nil
7	Archduke/Archduchess	Cr50,000+
6	Duke/Duchess	Cr30,000
5	Marquis/Marchioness	Cr15,000
4	Count/Countess, High Official	Cr8,000
3	Baron/Baroness, Middle Official	Cr4,000
2	Knight/Dame, Low Official	Cr2,000
1	Doctor, Industrialist, etc.	Cr1,000
0	Average Individual	Cr500
-1	Poor, Non-Citizens, etc.	Cr200
-2	Beggar, Known Outlaw, etc.	Cr100

Players purchasing high Status can assume it includes the noble title indicated on the table, should they so choose at character creation.

Reputation

Reputations tend to be campaign-specific, and need be crafted in consultation with the Game Master.

Vargr

The wolflike Vargr (see p. 71) are found throughout known space. Vargr make good player characters. Enthusiastic, curious, egotistical, and quick, they are natural scouts or pilots.

Vargr average 4″ shorter than a Human of the same ST, and weigh proportionately less. Their hearing is in a higher range than that of Humans.

Attributes

ST -1 [-10]; DX +1 [10]. Vargr are significantly smaller than men, but have faster reflexes on the average.

Advantages

Acute Taste/Smell +3 [6]; Acute Vision +1 [2]; Alertness +1 [5]; Claws [15]; Enhanced Move 1 (doubles Move, with the limitation that running fatigue starts applying after 5 seconds, -30%) [7]; Fur [4]; and Teeth (1d+1 bite in close combat) [5].

Disadvantages

Cannot Kick [-5]. Their digitigrade posture probibits Vargr from kicking in close combat (except stamping on prone foes). This disadvantage was set at -5 points, offsetting the cost of their Teeth.

Chummy [-5]. The Vargr retain a certain "pack mentality," and are happiest in groups . . . not necessarily just groups of Vargr, but any group they have come to consider trustworthy

Curious [-5]. Even more than Humans, a Vargr will go out of his way to investigate new things. This is one reason their race is so widespread.

Easy to Read [-10]. Vargr society is far more open than that of Humans; disguising their feelings is quite alien to them. Emotional signs (posture, facial expression, ruffled fur) are obvious even to Humans . . . especially since Vargr are descended from earthly canines, and humans have been reading their dogs' body language (and vice versa) for millennia.

Proud [-1]. Vargr are always concerned with their own status within their individual group, and with their group's status in society. They are also quick to take offense at racial slights.

Reduced Fatigue -1 [-3].

Reduced Hit Points -1 [-5].

Reputation -2 (Flaky, easily swayed, potentially even disloyal) [-10].

Special Effects

Reaction bonuses and penalties for Charisma are doubled with Vargr. Success or failure at important tasks will affect a Vargr's self-esteem much more than they would a Human's, and Vargr self-esteem is contagious, especially to other Vargr! This can justify a Vargr buying added levels of Charisma (or giving them up) during play.

See ***GURPS Traveller Alien Races 1*** for more information.

Zhodani

Zhodani (see p. 78) are thought of by most Imperials as tall, swarthy, frightening mind-readers, by many as the enemy (and may have Social Stigma or a Secret because of it).

Zhodani are standard Humans, and are built as Human characters with only a few changes. The most important is height. Calculate a Zho's height normally for his ST; then figure weight from that height; then go back and add 7″ (!!) to height. They are lithe and slender, but not skinny.

Zhodani tend toward darker skin, eye, and hair colors, with less variation than the Solomani, but all skin and hair colors are known. They have 28 teeth instead of 32.

In the Zhodani Consulate, Status 2 is a prerequisite for psionics (if you don't have it before your talent is discovered, you get it immediately), but you may buy psionic skills without any Unusual Background. (Campaigns in the Imperium follow the rules as given under *Psionics*, even for Zhodani characters.)

Almost all Zhodani will have Honesty and Truthfulness, unless renegades or officials dealing routinely with non-Zhodani.

See ***GURPS Traveller Alien Races 1*** for more information.

New Advantage: Ship Patron

Your former service (or some patron appropriate to your past) gave you the use of a ship. You don't own it (the patron does), and you must pay for all expenses, but it's yours to do as you please. The patron *must* make sense with respect to your background. Usually this means a former employer.

Cost depends on the ship and terms of control. A basic ship – jump-1 with fuel for 1 jump, either streamlined or with a ship's vehicle, with up to 1 G acceleration – costs 10 points. To this, add:

- If the ship can carry jump fuel sufficient for more than 1 parsec (regardless of how many jumps it takes):

Fuel Cap. in Parsecs	Cost
2	+5
3	+10
4	+13
5	+15
6	+16
7	+17

- In addition, add +3 points for each jump-drive level after jump-1.
- Add +1 for each +0.5 Gs acceleration after 1 G, rounding down. Figure this with total loaded mass (see p. 158) assuming 5 tons per cargo space. (Sample ships list this as their Accel.)

Continued on next page . . .

Advantages, Disadvantages, and Quirks



The universe is a vast, often unusual place. Most advantages, disadvantages, and quirks have their place somewhere in the Imperium. Those that don't:

Literacy is assumed for citizens of ***Traveller***'s empires; therefore it costs no points. Barbarian sorts and others may take Illiteracy as a disadvantage.

Magic only manifests in the superior technology left behind by the Ancients, so Magic Aptitude, Magic Resistance, and most mystical advantages and disadvantages have no place in Traveller.

Military Rank applies to those currently serving in a military. Those with Imperial military experience should take the appropriate Courtesy Rank (p. CI23), though the GM may rule it isn't mandatory. ("I never mention that I used to be *Captain* Blugh, because I don't want people to recall the *De'stre A'toll* incident.")

Bionics are very rare, and subject to considerable social stigma in the Imperium, especially if unconcealed. Medical replacements that do not enhance function are tolerated, especially if cosmetically concealed.

Skills

Some GMs may wish to restrict certain skills (and advantages such as Jack-of-All-Trades, p. 125) to certain careers. This is in keeping with the original game.

Psionics

Psionics face a Social Stigma through most of the Imperium (see *Psionics* and related subjects on p. 54). A 10-point Unusual Background is required to buy psionic powers and skills. In general, enhancements are not allowed without GM approval; limitations are common. The specific powers and skills available – and their further restrictions – are detailed below.

Psionics Institute: Upgrading to a 15-point Unusual Background will also give the psi access to a Psionics Institute. Other psionics must hunt for one . . . and the GM may rule they must pay the extra 5 points if they establish a stable, long-term patronage once one's found.

Psionic Training: Characters who have not undergone training at a Psionics Institute may only purchase latent powers: All skills can be bought at Power 1 only, and are unreliable (per the sidebar on p. B176). A teacher must be had to buy off a power's unreliability and to learn any new skill. Generally, instruction can only be found at a Psionics Institute, though the GM may allow for lone masters willing to take on a new student.

Telepathy: The skills of Mind Shield, Life Detection (see p. T:AI137), Emotion Sense, Telereceive, Telesend, Mental Blow, and Mental Stab may be acquired.

ESP: Clairvoyance, Clairaudience, and Seekersense skills may be acquired.

Psychokinesis: The skills of Levitation and Telekinesis may be acquired.

Teleportation: The skills of Autoteleport and Exoteleport may be acquired with restrictions. The -50% limitation that objects retain orientation and speed is mandatory. The "carry nothing and arrive nude" -50% limitation is an option. Exoteleport must include the -40% limitation, "only to carry along more weight



with Autoteleport." GMs may wish to implement the ruling that failure at Exoteleport still deposits the psi at the destination, but without clothing or equipment. Teleportation over any significant distance on a planetary surface carries other risks (as noted by Larry Niven in his SF collection *All the Myriad Ways*). Teleportation on a world's surface is limited to 300 miles or less. Teleportation from 30 to 300 miles carries with it great risk of disorientation: -6 to Body Sense rolls. For distances of from 3 to 30 miles roll at -4, under 3 miles -2, and under 300 yards roll vs. Body Sense skill normally.

Teleportation at ranges greater than 300 miles is not allowed because of the problems of conservation of momentum. The potential injury is huge; a teleport traveling from sea level at Earth's equator to sea level at one of the poles would arrive with a total velocity over 1,000 mph different from that of the ground at his destination. Changes in altitude (and any other changes in gravitational potential) will result in potential energy changes, manifesting themselves in changes in body temperature. Teleports who lose altitude will increase body temperature; teleports who gain altitude will lose body temperature. Teleports may not make altitude changes of more than 400 yards in one jump, and cumulative jumps of more than 600 yards up or down per hour may not be undertaken without death or serious brain damage.

Healing: The "self-only" limitation is mandatory. All skills except Sense Aura are available.

Ship Patron

[Continued]

- If both the ship and one of its vehicles can land on planet surfaces: +2.
- Four low berths: +1.
- Additional low berths: +1 point for each 20, round down.
- Fuel processors: +2.
- One armed turret: +5.
- Each additional armed turret: +2.
- Cargo capacity: +1 for every 3 spaces, round down. Count empty turrets here (3 spaces per turret, or +1 apiece).
- Staterooms, if ship suitable for commercial passenger service: +1 per 2 staterooms after the first 3.

Terms of control vary. The one universal constraint is that the ship can't be legally sold; a small duty usually is attached as well for 0 points. A more serious Duty (on 9 or less) is worth -5 points. A mercantile patron will share in any profits, giving -1 point for every 5% taken. See p. T:FT p. 102 for more ideas.

Some patrons will pay for crew salaries, maintenance, or upkeep, or some combination thereof. The GM should add to Ship Patron cost depending on the value of this support, generally between +2 (free fuel) to +25 (all expenses on a large ship).

For full or partial ownership of a starship, see Ship Owner, p. T:FT 101.

Scout Ship — *24/28 points*

Imperial Interstellar Scout Service veterans (p. 99) with at least 12 years' service may receive a 100-ton *Sulieman*-class scout/courier as a mustering-out benefit. Just like the user, the ship is subject to recall to active service at the discretion of the IISS; the user must therefore inform the IISS of their location each time they enter a starport. This reduces ship cost by -5 points. The ship is not fitted suitably for commercial passenger service. The ships are issued unarmed (24 points), but weaponry may be installed (+4 points).

Free Trader — *36+ points*

A company may hand over an older ship to a former employee with at least 12 years' experience. (Note that most *current* employees have little say in their ship's operations, so rarely pay for it with Ship Patron.) This *Beowulf*-class free trader's cost is reduced -5 by its mix of patron profit-taking and upkeep. Add +1 to cost if an air/raft is carried; +4 to arm one turret; +5 to arm both.

Yacht — *33+ points*

Those with Status 3+ may be given a 200-ton *Vanderbilt*-class yacht as a personal interstellar transport. The staterooms are not set up for commercial service. Add +4 to arm one turret, +5 to arm both. If the patron pays all (routine!) expenses, +10.

Letters of Marque

Letters of Marque and Reprisal (to give them their full name) are documents by which a government authorizes private persons to fit out armed vessels and seize civilian shipping belonging to that government's enemy. Such vessels are known as privateers. They are legally distinguishable from pirates in that they operate under color of authority, and operate only against a specified foe. The value of a letter of marque is twofold. It usually entitles you to use (non-secret) military bases, though not without paying for what you receive. And it keeps you from being executed out of hand if you're caught by the foe . . . if, that is, he recognizes your letter as authority to make war on him!

Historically, a government issues letters of marque when it needs a fleet of commerce raiders and doesn't have the time or money to create it. A privateer is even better than a mercenary, because the privateer doesn't have to be paid; he just keeps what he takes from your foes! The problem with privateers is that they often get out of hand, embarrassing the nation that "authorized" them. (On the other hand, a privateer may be scrupulous about following the laws and courtesies of war, just to build up a good reputation against the day he needs mercy from his foes.)

A true letter of marque, if issued in a form likely to be respected by its foes, can be considered a form of Patronage: a single powerful patron, whose assistance is sometimes available, worth 10 points. The Imperium has not issued a true letter of marque for many, many generations. However, some surrounding governments still do. And, outside Imperial borders, some megacorps issue letters of marque against their rivals!

The Imperium does, very occasionally, hire private warships to suppress pirates or smugglers, in times and places where its own forces are stretched thin. This would represent Legal Enforcement Powers (p. B21) worth 15 points.

The Extremely Hazardous Duty (p. CI78) to go a-privateering could be the condition under which a Ship Patron offers you a vessel! This will *reduce* the cost of a ship by 20 points.

Character Templates

A character template is a list of attributes, advantages, disadvantages, and skills that a player can use in order to quickly build a specific type of character without neglecting important abilities or getting bogged down in the rules. The point costs of these abilities are listed, and the sum is given as the "template cost." The player pays this cost, specifies the options he wants, writes those abilities down on his character sheet, and spends his remaining points to customize his character (see below).

Templates are never required – they simply purchase many abilities at once, have no in-play effects, and offer no "package discount." ***GURPS Traveller*** GMs may require them, because they can emulate the semi-limited character generation that provided part of classic ***Traveller***'s flavor. If not required, templates can be treated as nothing more than recommendations, exactly like those listed in the *Character Types* sections of other ***GURPS*** books.



Skills

In the templates in this section, *primary skills* are skills that are absolutely required, *secondary skills* are helpful skills that it's hard to imagine the character not having, and *background skills* are skills chosen for descriptive reasons rather than utility. Skills are listed in the following format:

Skill Name *(Difficulty)* Relative Level
[Point Cost]-Actual Level

Customizing Templates

Once the template has been purchased, the player must customize it by spending any remaining character points. The template does not influence how these points are spent. If the template has fewer disadvantages than the campaign permits, more may be taken, giving extra points to spend.

Quirks are rarely listed on templates, and are always optional; they should be selected by the player.

Altering Templates

Templates are *guidelines,* not rules. When customizing a template, the player is free to alter any or all of the items that came with it. Subtracting items from a professional template may result in a character who will be regarded as incompetent by his peers, however.

Character Templates vs. Racial Templates

Character templates are *not* the same thing as racial templates, such as the Vargr template on p. 83. Racial templates use attribute modifiers instead of attribute levels, may include advantages unavailable on a less-than-racial basis, and include disadvantages that don't count against the campaign disadvantage limit.

When using character templates with other races, simply add or subtract any racial attribute modifiers from the template's attribute levels.



Athlete — 90 points

A former professional athlete, in whatever sport the player chooses. For whatever reason, he has retired – perhaps he suffered an injury, ran afoul of professional gamblers, or grew bored with his former occupation.

Attributes: ST 12 [20], DX 12 [20], IQ 10 [0], HT 12 [20].

Advantages: A total of 20 points in Ambidexterity [10]; Double-Jointed [5]; Extra Fatigue [3/level]; Fit or Very Fit [5 or 15]; High Pain Threshold [10]; Rapid Healing [5]; Reputation (Famous athlete) [varies]; Toughness (DR 1) [10]; Wealth [10 or 20]; and +1 ST, DX, or HT [10].

Disadvantages: A total of -20 points chosen from Bad Back [-15]; Code of Honor (Sportsmanship) [-5]; Compulsive Gambling [-5 to -15]; Enemy (Gamblers, 6 or less) [-10]; Greed [-15]; Jealousy [-10]; Overconfidence or Glory Hound [-10 or -15]; Selfish [-5]; and Sense of Duty (Anyone on his "team") [-5].

Primary Skills: Tournament Law (sport) (M/E) IQ+2 [4]-12, plus any one of Bicycling or Swimming, both (P/E) DX+4 [16]-16; Boxing, Fencing Sport, Sports (any), or Wrestling, all (P/A) DX+3 [16]-15; Judo Sport, Karate Sport, Skating, or Skiing, all (P/H) DX+2 [16]-14; and Lifting (P/H; ST) ST+2 [16]-14 or Running (P/H; HT) HT+2 [16]-14.

Secondary Skills: A total of 6 points in any of the above and any of Jumping (P/E); Climbing or Dancing, both (P/A); Hiking (P/A; HT); and Acrobatics or Throwing, both (P/H).

Background Skills: A total of 4 points in any of Acting, Gambling, Intimidation, or Leadership, all (M/A); Sex Appeal (M/A; HT); and Carousing (P/A; HT).

Customization Notes: A "star" athlete should consider spending most of his remaining points to boost an Athletic skill, ST, or DX up to a very high level. He should also use at least some of his designated advantage points to buy a Reputation. Note that it's rare for athletes to be cross-trained in many disciplines.

Attorney — 60 points

A lawyer. Perhaps not the most appealing character from a roleplaying standpoint, but one which can have certain advantages in some kinds of campaigns.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: Comfortable Wealth [10] and 10 points chosen from among Charisma [5/level]; Sanctity [5]; Single-Minded [5]; Status 1 [5]; Voice [10]; and more Wealth [10].

Disadvantages: A total of -20 points in Bully [-10]; Code of Honor (Professional ethics) [-5]; Compulsive Lying [-15]; Greed [-15]; Honesty [-10]; Odious Personal Habits ("Pedantic," "Shameless," etc.) [-5 to -15]; Overweight [-5]; Reputation (Lawyer) [-5]; Secret (Dishonest) [-10]; Sense of Duty (Clients) [-5]; and Workaholic [-5].

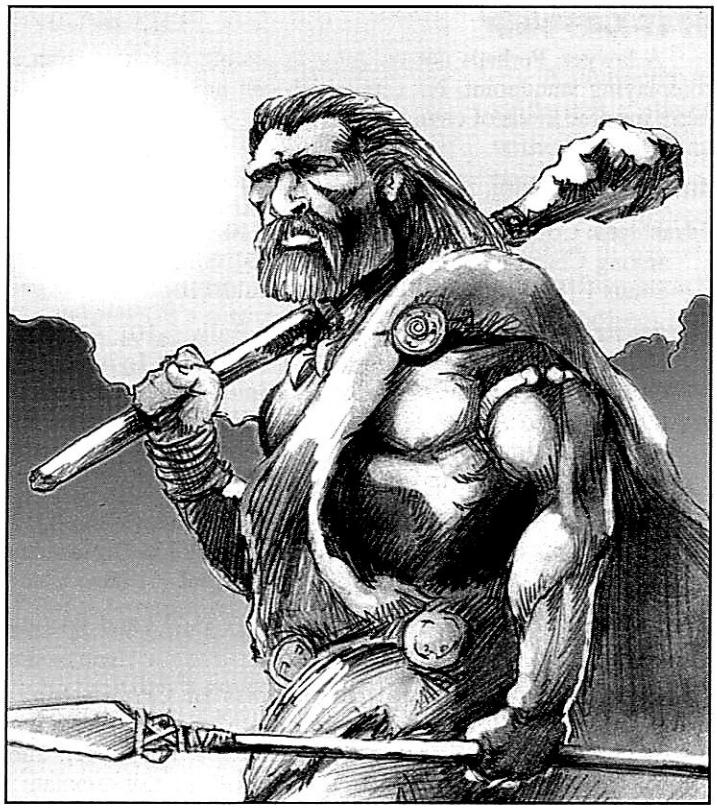
Primary Skills: Law (M/H) IQ+3 [10]-16; Research (M/A) IQ+2 [6]-15; and one of Bard (M/A) IQ+2 [6]-15, Diplomacy (M/H) IQ+1 [6]-14, or Fast-Talk (M/A) IQ+2 [6]-15.

Secondary Skills: Administration (M/A) IQ-1 [1]-12 and Writing (M/A) IQ-1 [1]-12.

Background Skills: A total of 6 points in Criminology, Interrogation, Intimidation, or Politics, all (M/A); Accounting, Detect Lies, or Psychology, all (M/H); and improved levels with any of the other skills on this template.

Customization Notes: Pick a specialty and choose your skills to reflect this. E.g., a corporate lawyer is likely to have Accounting and extra points in Administration, while a district attorney is more likely to have a very high level in Politics. A successful attorney of any kind will spend some of his remaining points on Reputation and additional Wealth.





Barbarian — 50 points

This template represents a standard fixture of science fiction: a character from a primitive world, forced to cope with things beyond his ken. He's not stupid; he's just unacquainted with life in a technological society.

Attributes: ST 11 [10], DX 12 [20], IQ 10 [0], HT 11 [10].

Advantages: A total of 10 points chosen from Alertness [5/level]; Animal Empathy [5]; Fit [5]; Immunity to Disease [10]; Night Vision [10]; Pitiable [5]; Plant Empathy [5]; Rapid Healing [5]; and Resistant to Poison [5].

Disadvantages: Primitive (-4 TLs) [-20]; plus another -15 points in Confused [-10]; Curious [-5 to -15]; Gullibility [-10]; Innumerate [-5]; Non-Iconographic [-10]; Semi-Literacy [-5] or Illiteracy [-10]; Social Stigma (Barbarian) [-15]; Space Sickness [-10]; Technophobia [-15]; Uneducated [-5]; and more levels of Primitive [-5/level].

Primary Skills: Survival (any) (M/A) IQ+2 [6]-12; 10 points in low-tech Combat/Weapon skills (Bow, Brawling, Broadsword, etc.) and one of Hiking (P/A; HT) HT+1 [4]-12, Riding (P/A) DX+1 [4]-13, or Running (P/H; HT) HT [4]-11.

Secondary Skills: Camouflage (M/E) IQ+1 [2]-11; Cooking (M/E) IQ+1 [2]-11; Stealth (P/A) DX [2]-12; Swimming (P/E) DX [1]-12; and Tracking (M/A) IQ+1 [4]-11.

Background Skills: A total of 4 points in Animal Guise (M/A), Animal Handling (M/H), Climbing (P/A), Fishing (M/E), and Mimicry (any) (P/H; HT).

Customization Notes: If enough skills are taken, it will probably be more efficient to raise DX or IQ by one or more levels. This is in keeping with the archetype: SF barbarians always seem to catch on fast!

Belter — 75 points

Belters are rude, crude, rough-and-tumble space prospectors who hunt among the tumbling rocks of the asteroid belt, looking for the strike that will make them rich and let them retire. Some tire of the quest and take up other pursuits.

Attributes: ST 11 [10], DX 12 [20], IQ 12 [20], HT 10 [0].

Advantages: A total of 20 points in 3D Spatial Sense [10]; Alcohol Tolerance [5]; Alertness [5/level]; Fit [5]; G-Experience [10]; Improved G-Tolerance [5 or 10]; Intuition [15]; Light Hangover or No Hangover [2 or 5]; and Luck [15].

Disadvantages: A total of -20 points in Alcoholism [-15]; Compulsive Carousing [-5]; Compulsive Gambling [-5 to -15]; Greed [-15]; Lecherousness [-15]; Loner [-5]; Obsession (Finding the big strike) [-5]; Odious Personal Habits ("Doesn't wash," "Foul mouth," etc.) [-5 to -15]; and Social Disease [-5].

Primary Skills: Area Knowledge (Belt) (M/E) IQ+2 [4]-14; Engineer (Mining) (M/H) IQ [4]-12; Free Fall (P/A) DX [2]-12; Geology (M/H) IQ [4]-12; Navigation (M/H) IQ [4]-12; and Prospecting (M/A) IQ [2]-12.

Secondary Skills: Astrogation (M/A) IQ-1 [1]-11; Piloting (Starship) (P/A) DX-1 [1]-11; and Vacc Suit (M/A) IQ-1 [1]-11.

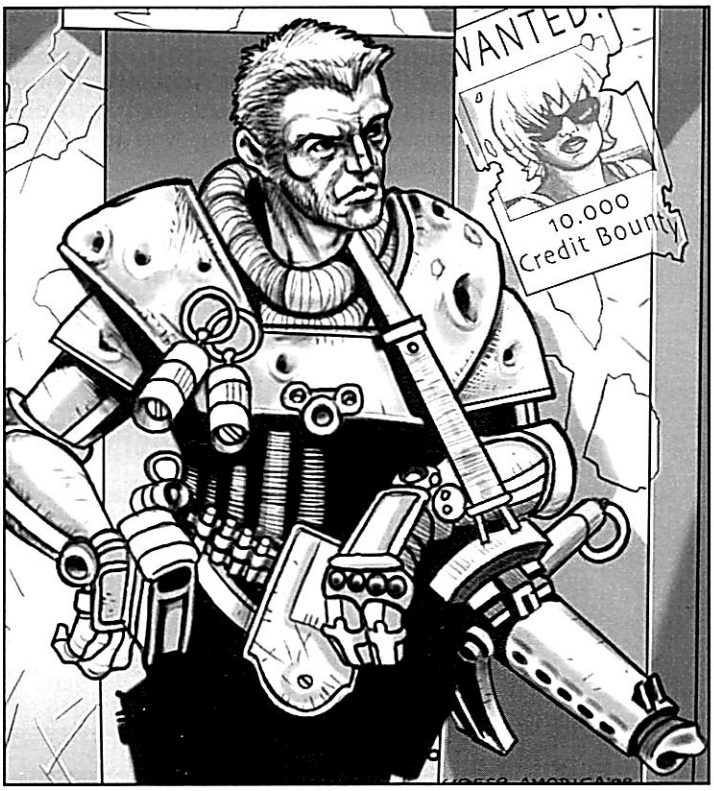
Background Skills: A total of 2 points in Cartography, Gambling, Merchant, or Planetology (Rock/Ice), all (M/A); and Brawling (P/E) and Carousing (P/A; HT).

Customization Notes: Long-time belters should spend some additional points on higher levels in Free Fall and Vacc Suit. A successful belter might actually have some Wealth! Since belters spend a lot of time in space and live in cramped quarters, neither Claustrophobia nor Space Sickness is appropriate.



Bounty Hunter — 65 points

A bounty hunter makes his living finding people who don't want to be found: bail jumpers, escaped criminals, merchants who "skip out" on scheduled starship payments, and fugitives of all kinds. The hunter takes custody of the fugitive and escorts him to the nearest legal authority.



Attributes: ST 11 [10], DX 12 [20], IQ 12 [20], HT 10 [0].

Advantages: Legal Enforcement Powers (Bounty-hunter's license) [5], plus 15 points chosen from Acute Senses (any) [2/level]; Alertness [5/level]; Combat Reflexes [15]; Contact (Police; skill-15, 9 or less, usually reliable) [4]; Intuition [15]; Reputation [varies]; and Single-Minded [5].

Disadvantages: A total of -20 points chosen from Bully [-10]; Callous [-6]; Delusion ("I'm a cop!") [-5 to -15]; Enemy (Rival or escaped criminal, 6 or less) [-2] or (9 or less) [-5]; Greed [-15]; Honesty [-10]; Intolerance (Crooks) [-5]; No Sense of Humor [-10]; Reputation [varies]; and Stubbornness [-5].

Primary Skills: Area Knowledge (any) (M/E) IQ [1]-12; two of Interrogation, Research, or Streetwise, all (M/A) IQ [2]-12; one of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-14*; and a total of 3 points in Blackjack (P/E), Brawling (P/E), Judo (P/H), and Wrestling (P/A).

* Includes +2 for IQ.

Secondary Skills: Stealth (P/A) DX-1 [1]-11; one of Detect Lies (M/H) IQ-2 [1]-10 or Intimidation (M/A) IQ-1 [1]-11; and one of Shadowing or Tracking, both (M/A) IQ-1 [1]-11.

Background Skills: A total of 3 points in Criminology, Fast-Talk, Gambling, or Holdout, all (M/A); as well as Fast-Draw (any) (P/E) and Carousing (P/A; HT).

Customization Notes: A bounty hunter can be an honest "free-lance cop" or a low-life who is no better than those he hunts; consider spending some points on skills from the Law Enforcer (p. 94) or Rogue (p. 98) template, respectively. Successful bounty hunters may also want to spend a few points on Wealth.

Bureaucrat — 50 points

Paper-pushers sometimes leave their jobs to take up the traveling lifestyle. There are many reasons for this, most of them involving boredom and the lack of a sense of purpose. Bureaucrats are invaluable in certain situations; i.e., anything involving paperwork.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 20 points in Administrative Rank [5/level]; Common Sense [10]; Imperturbable or Unfazeable [10 or 15]; Security Clearance 1-2 [2/level]; Single-Minded [5]; and Wealth [10 or 20].

Disadvantages: A total of -20 points chosen from Bad Sight (Correctable) [-10]; Cowardice [-10]; Hidebound [-5]; Honesty [-10]; Incurious or Obdurate [-5 or -10]; No Sense of Humor [-10]; Odious Personal Habits ("Boring," "Officious," etc.) [-5 to -15]; Overweight or Skinny [-5]; Stubbornness [-5]; Unattractive (Geeky) [-5]; Unfit [-5]; and Workaholic [-5].

Primary Skills: Administration (M/A) IQ+2 [6]-15.

Secondary Skills: Computer Operation (M/E) IQ [1]-13; Research (M/A) IQ+1 [4]-14; Speed-Reading (M/A) IQ-1 [1]-12; and Writing (M/A) IQ-1 [1]-12.

Background Skills: A total of 7 points in Savoir-Faire (Servant) (M/E); Politics (M/A); Accounting, Law, or Diplomacy, all (M/H); and Typing (P/E).

Customization Notes: Choose your background skills to reflect your former job; e.g., a civil servant might have Politics and Savoir-Faire (Servant), an accountant should have Accounting, and a low-level secretary would have Savoir-Faire (Servant) and Typing.



Computer Technician 60 points

Another character with a variety of reasons for traveling, ranging from ennui to pursuing enemies. Computer technicians have many skills of immediate value, but most are light on combat skills and reflexes, and need backup in tense situations.

Attributes: ST 10 [0], DX 10 [0], IQ 14 [45], HT 10 [0].

Advantages: A total of 15 points chosen from Claim to Hospitality (Contacts on the net) [1 to 10]; Less Sleep [3/level]; Lightning Calculator [5]; Mathematical Ability [10]; Security Clearance 1-2 [2/level]; Versatile [5]; and Zeroed [10].

Disadvantages: A total of -20 points in Addiction (Stimulants) [-5]; Bad Sight (Correctable) [-10]; Clueless [-10]; Curious [-5 to -15]; Delusions ("Computers are people," "The net is real life," etc.) [-5 to -15]; Klutz [-5]; Low Empathy [-15]; Oblivious [-3]; Overweight or Skinny [-5]; Shyness [-5 to -15]; Unattractive (Geeky) [-5]; and Unfit [-5].

Primary Skills: Area Knowledge (Net) (M/E) IQ [1]-14; Computer Operation (M/E) IQ+1 [2]-15; Computer Programming (M/H) IQ [4]-14; and Electronics Operation (Computers) (M/A) IQ [2]-14.

Secondary Skills: Computer Hacking (M/VH) IQ-1 [4]-13; Electronics (Computers) (M/H) IQ-1 [2]-13; Mathematics (M/H) IQ-2 [1]-12; and Research (M/A) IQ-1 [1]-13.

Background Skills: A total of 3 points in Administration or Hobby (Computer Games), both (M/A); and Artificial Intelligence or Cryptanalysis, both (M/H). Note that hobby skills are taken at half price; see p. B54.

Customization Notes: This template is intentionally on the cinematic side to make it interesting. This can be taken even further (if the GM permits) by adding Neural Cyberdeck Interface [20 to 30] and Cyberdeck Operation (M/VH).

Corsair 75 points

There is a certain romance in vicarious law-breaking, hence the rather romantic term "corsair." Call them what you will, these people are *pirates* (although those who operate under a Letter of Marque, p. 86, are more correctly called "privateers").

Note: Piracy is hotly debated among ***Traveller*** fans. Decisions over the long-term viability of piracy in a given campaign rest with the GM and players.

Attributes: ST 11 [10], DX 12 [20], IQ 12 [20], HT 11 [10].

Advantages: A total of 20 points in 3D Spatial Sense [10]; Alcohol Tolerance [5]; Ally Group (2-5 75-point pirates, 9 or less) [10]; Charisma [5/level]; Combat Reflexes [15]; Contact (Military; skill-18, 9 or less, somewhat reliable) [3]; Daredevil [15]; Fearlessness [2/level]; G-Experience [10]; Light Hangover or No Hangover [2 or 5]; Luck [15]; and Zeroed [10].

Disadvantages: Enemy (Imperium, 6 or less) [-20]; and -15 points chosen from Alcoholism [-15]; Bad Temper [-10]; Callous [-6]; Code of Honor (Pirate's) [-5]; Compulsive Carousing [-5]; Compulsive Gambling [-5 to -15]; Greed [-15]; Laziness [-10]; Reputation [varies]; Selfish [-5]; and Trademark [-1 to -15].

Primary Skills: Either Beam Weapons (any) or Guns (any), both (P/E) DX+3 [2]-15*; and Intimidation (M/A) IQ+2 [6]-14.

Secondary Skills: Free Fall (P/A) DX [2]-12 and Vacc Suit (M/A) IQ [2]-12, plus any two of these 6 options:

1. Astrogation (M/A) IQ [2]-12 and Piloting (Starship) (P/A) DX+1 [4]-13.
2. Armoury (Spaceship weaponry) (M/A) IQ [2]-12 and Gunner (any ship-mounted) (P/A) DX+3 [4]-15*.
3. Engineer (Vehicles) (M/H) IQ [4]-12 and Mechanic (any) (M/A) IQ [2]-12.
4. Electronics Operation (Comm) (M/A) IQ [2]-12 and Traffic Analysis (M/H) IQ [4]-12.
5. Electronics Operation (Sensors) (M/A) IQ [2]-12 and SIGINT Collection/Jamming (M/H) IQ [4]-12.
6. Leadership (M/A) IQ [2]-12 and Tactics (M/H) IQ [4]-12.

* Includes +2 for IQ.



Background Skills: A total of 6 points in Area Knowledge (System) (M/E); Electronics Operation (Security Systems), Gambling, Heraldry (Ship's markings), or Streetwise, all (M/A); Brawling or Knife, both (P/E); Shortsword (P/A); and Carousing (P/A; HT).

Customization Notes: Choose secondary skills to reflect your specialties: (1) pilot, (2) gunner, (3) engineer, (4) comm, (5) sensors/ECM, and (6) captain. Two choices are required because most pirate crews are small and experience heavy attrition.

Diplomat — 80 points

The problem with being an ex-diplomat is that no one you run into is *quite* willing to believe you're retired. Are you the former under-assistant trade attaché to Regina, or are you really a spy? Nevertheless, diplomats have a wide variety of useful skills.



Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 30 points in Administrative Rank [5/level]; Alternate Identity [15]; Legal Immunity [5 to 20] (20 points is Diplomatic Immunity); Patron (Agency, 6 or less) [15]; Security Clearance [2/level]; Status 1-4 [5/level]; and Wealth [10 or 20]; plus 10 more points in Acute Hearing [2/level]; Charisma [5/level]; Fashion Sense [5]; Language Talent [2/level]; Sanctity [5]; and Voice [10].

Disadvantages: A total of -20 points chosen from Duties [-2 to -15]; Enemy (Rivals, enemy agents, etc.; 6 or less) [-10]; Fanaticism (National or political cause) [-15]; Overconfidence or Glory Hound [-10 or -15]; Secret (Spy) [-5 to -20]; and Sense of Duty (Nation, planet, or system) [-10].

Primary Skills: Administration (M/A) IQ [2]-13; Bard (M/A) IQ [2]-13; Diplomacy (M/H) IQ+2 [8]-15; Savoir-Faire (M/E) IQ [1]-13; and a M/A language at IQ [2].

Secondary Skills: Politics (M/A) IQ-1 [1]-12; Research (M/A) IQ-1 [1]-12; and Writing (M/A) IQ-1 [1]-12; one of Acting or Fast-Talk, both (M/A) IQ-1 [1]-12; one of Detect Lies or Psychology, both (M/H) IQ-1 [2]-12; one of Economics, History, Intelligence Analysis, or Law, all (M/H) IQ-1 [2]-12.

Background Skills: A total of 7 points in Chess (M/E); Disguise, Holdout, Lip Reading, or Photography, all (M/A); Beam Weapons (any) or Guns (any), both (P/E); Fencing (P/A); and Carousing (P/A; HT).

Customization Notes: Choose an agency, planet, political cause, etc., and build your character around it . . . or the goal of destroying it! Pick options that suit an archetype: Diplomatic Immunity, Law, and Chess for a top-hat-wearing traditionalist; Alternate Identity, Intelligence Analysis, and Guns for a spy, etc.

Engineer — 60 points

In the days of steam-powered surface ships, the engineering crews were known as "black gangs" because the coal dust and smoke turned their uniforms black. Engineers still have a tendency to get dirty, even though they deal with liquid hydrogen instead of coal.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 15 points in Double-Jointed [5]; G-Experience [10]; Lightning Calculator [5]; Manual Dexterity [3/level]; Mathematical Ability [10]; Temperature Tolerance 1-2 [1 or 2]; and Versatile [5].

Disadvantages: A total of -15 points chosen from Curious [-5 to -15]; Delusion ("The engines have feelings!") [-5]; Duty (As crewman) [-2 to -15]; Loner [-5]; Odious Personal Habit ("Dirty") [-5]; Sense of Duty (Ship) [-5]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Engineer (Vehicles) (M/H) IQ [4]-13; Mechanic (J-Drive) (M/A) IQ+1 [4]-14; Mechanic (M-Drive) (M/A) IQ+1 [4]-14; and Mechanic (Power Reactor) (M/A) IQ+1 [4]-14.

Secondary Skills: Computer Operation (M/E) IQ-1 [½]-12; Free Fall (P/A) DX+2 [8]-12; Mathematics (M/H) IQ-1 [2]-12; Scrounging (M/E) IQ-1 [½]-12; and Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Any two of Armoury (Spaceship armor), Armoury (Spaceship weaponry), Electronics Operation (any), Mechanic (other), or Shipbuilding (Starship), all (M/A) IQ-1 [1]-12; or Electronics (any), Engineer (other) or Photonics (any), all (M/H) IQ-2 [1]-11.

Customization Notes: Consider spending a few points on additional technical skills such as Mechanic (Robotics) or Engineer (Electrical). In a larger-than-life game, the GM may also permit Gadgeteer [25]. High Technology is essential for servicing TL11 or TL12 equipment. Finally, an engineer should never have Technophobia unless he acquired it after beginning his career!

Entertainer — 80 points

The entertainer-turned-traveler can be useful to a group with more than gunfights on their agenda. Depending on specific talents and local tastes, entertainers are often more able to earn pocket change than many other spacefarers.

Attributes: ST 10 [0], DX 12 [20], IQ 12 [20], HT 11 [10].

Advantages: A total of 20 points chosen from Appearance [5 or 15]; Charisma [5/level]; Empathy [15]; Fashion Sense [5]; Luck [15]; Manual Dexterity [3/level]; Musical Ability [1/level]; Rapier Wit* [5]; Reputation [varies]; Versatile [5]; Voice [10], and Wealth [10 or 20].

* With GM's permission!

Disadvantages: A total of -20 points chosen from Chummy or Gregarious [-5 or -10]; Compulsive Carousing [-5]; Jealousy [-10]; Lecherousness [-15]; Overconfidence or Glory Hound [-10 or -15]; Poverty [-10 or -15]; and Trademark [-1 to -15].

Primary Skills: Any two of Acting, Bard, or Performance, all (M/A) IQ+3 [8]-15; Musical Instrument (any) (M/H) IQ+2 [8]-14; Singing (P/E; HT) HT+3 [8]-14 or Dancing (P/A) DX+2 [8]-14.

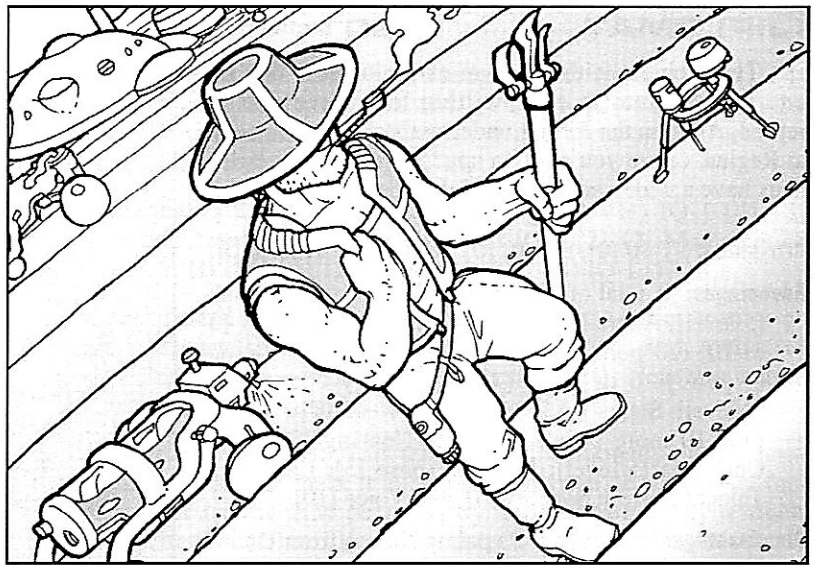
Secondary Skills: Any two of Musical Notation (M/E) IQ+2 [4]-14; Poetry or Snake Charming, both (M/A) IQ+1 [4]-13; Musical Composition or Ventriloquism, both (M/H) IQ [4]-12; Juggling (P/E) DX+2 [4]-14; Fire Eating or Stage Combat, both (P/A) DX+1 [4]-13; Acrobatics or Sleight of Hand, both (P/H) DX [4]-12; or a total of 8 points in any of the primary skills.

Background Skills: A total of 6 points in Make-Up or Savoir-Faire, both (M/E); Scene Design, Video Production, or Writing, all (M/A); Sex Appeal (M/A; HT); Fireworks (M/H); and Carousing (P/A; HT).

Customization Notes: Choose a profession and pick your skills accordingly; e.g., a traveling vaudeville performer might take Acrobatics-12 [4]; Dancing-14 [8]; Juggling-14 [4]; Make-Up-13 [2]; Scene Design-13 [4]; and Singing-14 [8]; while a classy opera star is more likely to have Performance-15 [8]; Savoir-Faire-15 [6]; and Singing-15 [16].

Entertainers who know Leadership (M/A) at 12+ can also learn Choreography (M/A) (requires Dancing at 12+), Conducting (M/A) (requires two Musical Instrument skills at 12+), Directing (M/H) (requires Performance at 12+), or Fight Choreography (M/A) (requires Stage Combat at 12+).





Farmer — 25 points

Another classic sci-fi character: the bucolic youth infected with wanderlust who leaves his backwater world and becomes caught up in the excitement of interstellar adventure. He can bring either youthful enthusiasm or comic relief, depending on the situation.

Attributes: ST 11 [10], DX 10 [0], IQ 10 [0], HT 11 [10].

Advantages: A total of 15 points chosen from Animal Empathy [5]; Common Sense [10]; Extra Fatigue 1-3 [3/level]; Fit [5]; Less Sleep [3/level]; Luck [15]; Sanctity [5]; Serendipity [15]; and Strong Will [4/level].

Disadvantages: A total of -25 points chosen from Bowlegged [-1]; Charitable [-15]; Clueless [-10]; Curious [-5 to -15]; Easy to Read [-10]; Gluttony [-5]; Gullibility [-10]; Hidebound [-5]; Honesty [-10]; Impulsiveness [-10]; Low Self-Image [-10]; Overconfidence [-10]; Poverty [-10]; Shyness [-5 to -15]; Truthfulness [-5]; and Youth [-2/level].

Primary Skills: Agronomy (M/A) IQ+2 [6]-12; Driving (any) (P/A) DX+1 [4]-11.

Secondary Skills: Any two of Carpentry or Gardening, both (M/E) IQ+1 [2]-11; Blacksmith, Mechanic (Gasoline Engine), or Weather Sense, all (M/A) IQ [2]-10; Animal Handling (M/H) IQ-1 [2]-9; or Riding (any) (P/A) DX [2]-10.

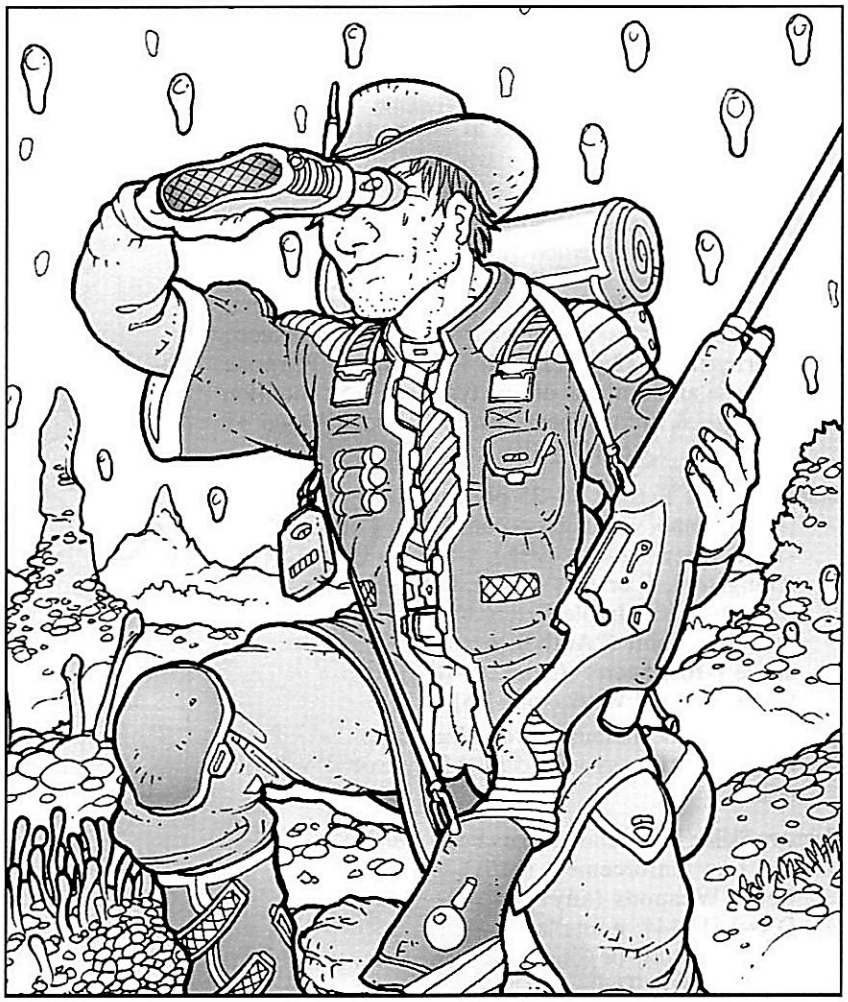
Background Skills: Any one of Fishing (M/E) IQ [1]-10; Distilling or Merchant, both (M/A) IQ-1 [1]-9; Swimming (P/E) DX [1]-10; Guns (Rifle or Shotgun) (P/E) DX+1 [1]-11*; or Bolas or Lasso, both (P/A) DX-1 [1]-9.

* Includes +1 for IQ.

Customization Notes: Of course, the farmer who becomes an adventurer is liable to be exceptional! Given the low price of this template, a farmer could have much higher attributes and more of everything. If you choose Youth, though, remember that points in skills cannot exceed (2 × age).

Hunter/Guide 90 points

Any group that plans to spend much time in a wilderness area should include a skilled hunting guide. Even if the guide isn't familiar with the specific territory, there are certain general skills that carry over.



Attributes: ST 11 [10], DX 11 [10], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points chosen from Absolute Direction [5]; Acute Senses (any) [2/level]; Alertness [5/level]; Combat Reflexes [15]; Composed or Imperturbable [5 or 10]; Danger Sense [15]; Fit [5]; Night Vision [10]; Peripheral Vision [15]; and Temperature Tolerance 1-2 [1 or 2].

Disadvantages: A total of -15 points in Claustrophobia [-15]; Demophobia [-15]; Guilt Complex [-5]; Loner [-5]; Overconfidence [-10]; and Sense of Duty (Those he's guiding) [-5].

Primary Skills: Area Knowledge (any) (M/E) IQ+1 [2]-14; First Aid (M/E) IQ [1]-13; Orienteering (M/A) IQ [2]-13; Survival (any) (M/A) IQ [2]-13; and one of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-13*.

* Includes +2 for IQ.

Secondary Skills: Leadership (M/A) IQ-1 [1]-12; Naturalist (M/H) IQ-1 [2]-12; Tracking (M/A) IQ-1 [1]-12; and any two of Driving (any), Powerboat, or Riding (any), all (P/A) DX+1 [4]-12, or Hiking (P/A; HT) HT+1 [4]-12.

Background Skills: A total of 5 points in Camouflage or Savoir-Faire (Servant), both (M/E); Animal Handling (M/H); Knife or Swimming, both (P/E); Climbing or Stealth, both (P/A); Skiing (P/H); and higher level with Beam Weapons or Guns.

Customization Notes: Consider higher DX or other Area Knowledge and Survival skills. The hunter can be everything from a boy scout leader (Climbing, Hiking, and Swimming) to the Great White version (Guns, Riding (Elephant), and Stealth).

Journalist/Reporter 50 points

Travel is grist for the writer's mill, and the average group of travelers will provide more than enough subject matter! Of course, the journalist may be a news-maker himself, the driving force behind the group.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 20 points chosen from Alertness [5/level]; Charisma [5/level]; Contacts (Any kind; skill-18, 9 or less, somewhat reliable) [3/contact]; Imperturbable [10]; Intuition [15]; Patron (Publisher or network, provides "press pass," 9 or less) [15]; Reputation [varies]; Serendipity [15]; Single-Minded [5]; and Strong Will [4/level].

Disadvantages: A total of -20 points chosen from Curious [-5 to -15]; Delusion ("I'm immortal when I'm carrying a note pad, camera, microphone, etc.") [-5 to -10]; Impulsiveness [-10]; Jealousy [-10]; Obsession (Get the story) [-5]; Odious Personal Habits ("Aggressive," "Rude," etc.) [-5 to -10]; Reputation [varies]; Stubbornness [-5]; Vow ("Always publish the truth") [-5]; and Workaholic [-5].



Primary Skills: Research (M/A) IQ+1 [4]-14; Writing (M/A) IQ+1 [4]-14; and native language skill at IQ+2 [2]-15.

Secondary Skills: Speed-Reading (M/A) IQ-1 [1]-12; and any two of Savoir-Faire (M/E) IQ+1 [2]-14; Bard or Fast-Talk, both (M/A) IQ [2]-13; Detect Lies (M/H) IQ-1 [2]-12; and 2 more points in Writing.

Background Skills: Any one of Conspiracy Theory (M/VH) IQ-3 [1]-10; Literature (M/H) IQ-2 [1]-11; or Shadowing (M/A) IQ-1 [1]-12; plus a total of 4 points in Computer Operation (M/E); Electronics Operation (Comm), Photography or Video Production, all (M/A); and Typing (P/E).

Customization Notes: Decide what kind of journalist you are and choose skills appropriately: Paparazzi will want Shadowing and Photography, a tabloid writer will have Conspiracy Theory, and a learned author might focus on Literature. A successful journalist should consider adding Wealth.

Law Enforcer — 90 points



Cops and ex-cops have many reasons for traveling: an unsolved case from years past, vengeance over justice denied, or perhaps even a need to escape from enemies acquired in the line of duty.

Attributes: ST 10 [0], DX 12 [20], IQ 12 [20], HT 10 [0].

Advantages: A total of 30 points chosen from Alertness [5/level]; Combat Reflexes [15]; Contacts (Street; skill-18, 9 or less, somewhat reliable) [3/contact]; Fearlessness [2/level]; Fit [5]; Higher Purpose (Oppose all criminals of one type, etc.) [5]; Intuition [15]; Legal Enforcement Powers* [5 to 15]; and +1 to ST, DX, IQ, or HT [10].

Disadvantages: A total of -25 points chosen from Bully [-10]; Cannot Harm Innocents [-10]; Curious [-5 to -15]; Duty* (To force) [-5 to -15]; Enemy (Gangsters, 6 or less) [-15]; Guilt Complex [-5]; Honesty [-10]; Intolerance (Criminals) [-5]; Odious Personal Habit ("Authoritarian") [-5]; Overconfidence [-10]; Secret (Crooked) [-10]; Sense of Duty [-5 to -15]; and Workaholic [-5].

* Police officers must have at least 5 points of Legal Enforcement Powers and a -5-point Duty; ex-cops will have neither.

Primary Skills: Area Knowledge (Beat) (M/E) IQ+2 [4]-14 and Law Enforcement (M/A) IQ+2 [6]-14; one of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-14†; a total of 7 points in Brawling, Fast-Draw (Pistol), or Shield (Riot Shield), all (P/E), or Judo, Short Staff, or Tonfa, all (P/H).

†Includes +2 for IQ.

Secondary Skills: Administration (M/A) IQ [2]-12; Computer Operation (M/E) IQ [1]-12; Criminology (M/A) IQ [2]-12; First Aid (M/E) IQ [1]-12; Holdout (M/A) IQ-1 [1]-11; Research (M/A) IQ-1 [1]-11; Shadowing (M/A) IQ-1 [1]-11; and Stealth (P/A) DX [2]-12; any three of Interrogation, Intimidation, Leadership, or Streetwise, all (M/A) IQ [2]-12, or Detect Lies, Diplomacy, or Psychology, all (M/H) IQ-1 [2]-11; any two of Motorcycle (P/E) DX+1 [2]-13, Driving (any) or Riding (any), both (P/A) DX [2]-12, or Running (P/H; HT) HT-1 [2]-9.

Background Skills: A total of 6 points in Armoury (any) or Electronics Operation (any), both (M/A), or Animal Handling, Explosive Ordnance Disposal, Forensics, Law, or Tactics, all (M/H).

Customization Notes: Choose skills to suit your service specialty. A K9 officer will want Animal Handling, a bomb-disposal expert will want Explosive Ordnance Disposal, etc. Many policemen train outside the force; thus, extra Beam Weapons, Guns, and unarmed combat skills are likely.

Manager — 55 points

Like *Attorney* (p. 87) and *Bureaucrat* (p. 89), this may seem an odd choice. Why would a normal businessman choose a life of excitement and danger over one filled with mind-numbing boredom and tedious attention to minor details?

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 20 points in Administrative Rank [5/level]; Common Sense [10]; Intuition [15]; Single-Minded [5]; Status 1-2 [5/level]; Strong Will [4/level]; and Wealth [10 or 20].

Disadvantages: A total of -20 points in Age [-3/year]; Bully [-10]; Compulsive Spending [-5 to -15]; Extravagance [-10]; Greed [-15]; Hidebound [-5]; Incurious or Obdurate [-5 or -10]; Migraine [-5 to -20]; Miserliness [-10]; Overweight [-5]; Secret (Dishonest) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Administration (M/A) IQ+1 [4]-14; Leadership (M/A) IQ+1 [4]-14; and any two of Bard, Fast-Talk, Intimidation, or Teaching, all (M/A) IQ+1 [4]-14, or Detect Lies or Diplomacy, both (M/H) IQ [4]-13.

Secondary Skills: Accounting (M/H) IQ-1 [2]-12; Computer Operation (M/E) IQ [1]-13; Economics (M/H) IQ-1 [2]-12; Merchant (M/A) IQ-1 [1]-12; and Writing (M/A) IQ-1 [1]-12.

Background Skills: A total of 2 points in Carousing (P/A; HT), Savoir-Faire (M/E), and Sports (Golf) (P/A).

Customization Notes: Select skills that reflect your management style. A tough, self-made, owner-operator type might have Fast-Talk, Intimidation, and Carousing, while a graduate from a posh business school is more likely to have Bard, Diplomacy, and Savoir-Faire. Any manager can justify lots of Wealth in the form of bonuses or stock options.

Martial Artist 90 points

Depending on the campaign, there may be use for someone whose previous career was learning how to kill people with his bare hands or a large wooden club.

This template may be combined with *Athlete* (p. 87) or *Entertainer* (p. 92).

Attributes: ST 11 [10], DX 13 [30], IQ 10 [0], HT 11 [10].

Advantages: A total of 20 points chosen from Combat Reflexes [15]; Daredevil [15]; Enhanced Block* [6]; Enhanced Dodge* [15]; Enhanced Parry* [6 or 10]; Fit or Very Fit [5 or 15]; High Pain Threshold [10]; Iron Hand* [10 or 15]; Strong Will [4/level]; Style Familiarity [1 to 15]; Toughness (DR 1) [10]; +1 or +2 to ST or HT [10 or 20]; and +1 to DX [15].

Disadvantages: A total of -20 points chosen from Bad Temper [-10]; Bully [-10]; Code of Honor [-5 to -15]; Obsession (Become a master) [-5]; Overconfidence [-10]; Pacifism (Cannot harm innocents) [-10] or (Cannot kill or Self-defense only) [-15]; Post-Combat Shakes [5]; and Vow (Never use weapons) [-15].

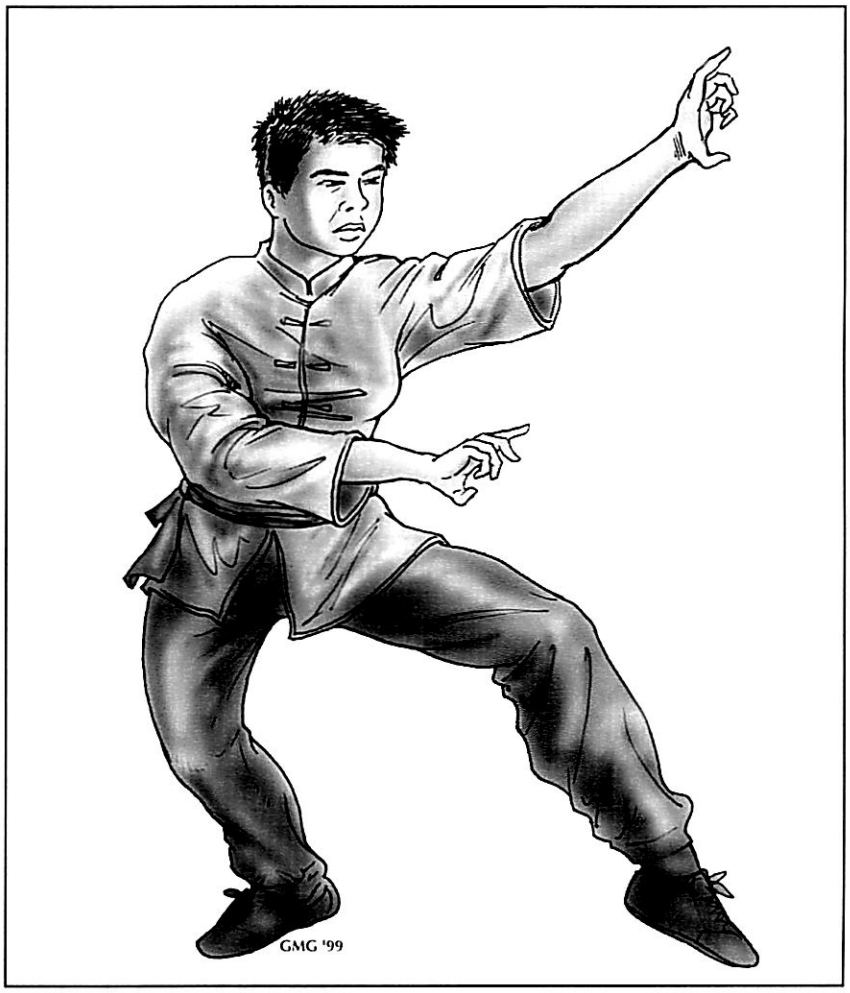
Primary Skills: A total of 24 points in the skills and maneuvers of a martial-arts style from ***GURPS Martial Arts***; see Spacer Kung Fu (p. MA115) for a style especially useful to travelers. Alternatively, take any three of Brawling DX+3 [8]-16; Boxing, Sumo Wrestling, or Wrestling, all DX+2 [8]-15; or Judo, Karate, Short Staff, Staff, or Tonfa, all DX+1 [8]-14.

Secondary Skills: Acrobatics (P/H) DX [4]-13; Jumping (P/E) DX [1]-13; and one of Intimidation, Leadership, or Teaching, all (M/A) IQ+2 [6]-12.

Background Skills: A total of 5 points in First Aid, Savoir-Faire (Dojo), or Tournament Law, all (M/E); Armoury (Hand Weapons) or Holdout, both (M/A); Body Language, Style Analysis, or Tactics, all (M/H); Meditation* or Physiology, both (M/VH); Garrote or Knife, both (P/E); and Stealth (P/A).

* With GM's permission!

Customization Notes: The biggest decision to make when customizing a martial artist is choosing the style he uses. As a result, this template really only comes into its own with the addition of ***Martial Arts.***



Mechanic/Technician 60 points

Although less respected (and less well-paid) than engineers (p. 91), mechanics and techs fill a vital role in any group.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 15 points in Common Sense [10]; Intuition [15]; Less Sleep [3/level]; Lightning Calculator [5]; Manual Dexterity [3/level]; Single-Minded [5]; and Versatile [5].

Disadvantages: A total of -15 points chosen from Bad Sight (Correctable) [-10]; Clueless [-10]; Curious [-5 to -15]; Duty (As crewman) [-2 to -15]; Overweight or Skinny [-5]; Shyness [-5 to -15]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Scrounging (M/E) IQ+2 [4]-15; and any two specialties of Armoury (see list, p. B53), Mechanic (p. B54), or Electronics Operation (p. B58), each (M/A) IQ+2 [6]-15.

Background Skills: Computer Operation (M/E) IQ [1]-13; and three additional specialties of Armoury, Mechanic, or Electronics Operation, each (M/A) IQ [2]-13.

Secondary Skills: A total of 7 points in Armoury (any), Electronics Operation (any), Lockpicking, Mechanic (any), Vacc Suit, or Video Production, all (M/A); Mathematics or Metallurgy, both (M/H); and Driving (any), Free Fall, or Piloting (any), all (P/A).

Customization Notes: Choose skills that reflect your area of expertise. A Marine armourer will have Armoury (Beam weapons), Electronics Operation (Weapons), and a few points in Free Fall and Vacc Suit; a robot repairman is more likely to have high skill levels in Electronics Operation (Computers) and Mechanic (Robotics). Like engineers (p. 91), the GM may permit techs and mechanics to take Gadgeteer [25] and should usually forbid Technophobia!

Medical Doctor — 90 points

Passenger vessels all have medical requirements, and no group of any size can afford to be far from a trained physician.

Attributes: ST 10 [0], DX 10 [0], IQ 14 [45], HT 10 [0].

Advantages: Comfortable Wealth [10]; and a total of 20 points in Composed [5]; Disease-Resistant or Immunity to Disease [5 or 10]; Higher Purpose (Heal the sick) [5]; Less Sleep [3/level]; Manual Dexterity [3/level]; Sanctity [5]; Sensitive or Empathy [5 or 15]; Single-Minded [5]; Status 1-2 [5 or 10]; and more Wealth [10 or 20].

Disadvantages: A total of -20 points in Addiction (Stimulants) [-5]; Charitable [-15]; Code of Honor (Hippocratic oath) [-15]; Greed [-15]; Guilt Complex [-5]; Honesty [-10]; Nightmares [-5]; Pacifism (Cannot harm innocents) [-10] or either (Cannot Kill or Self-Defense Only) [-15]; Selfless [-10]; Sense of Duty [-5 to -20]; and Workaholic [-5].

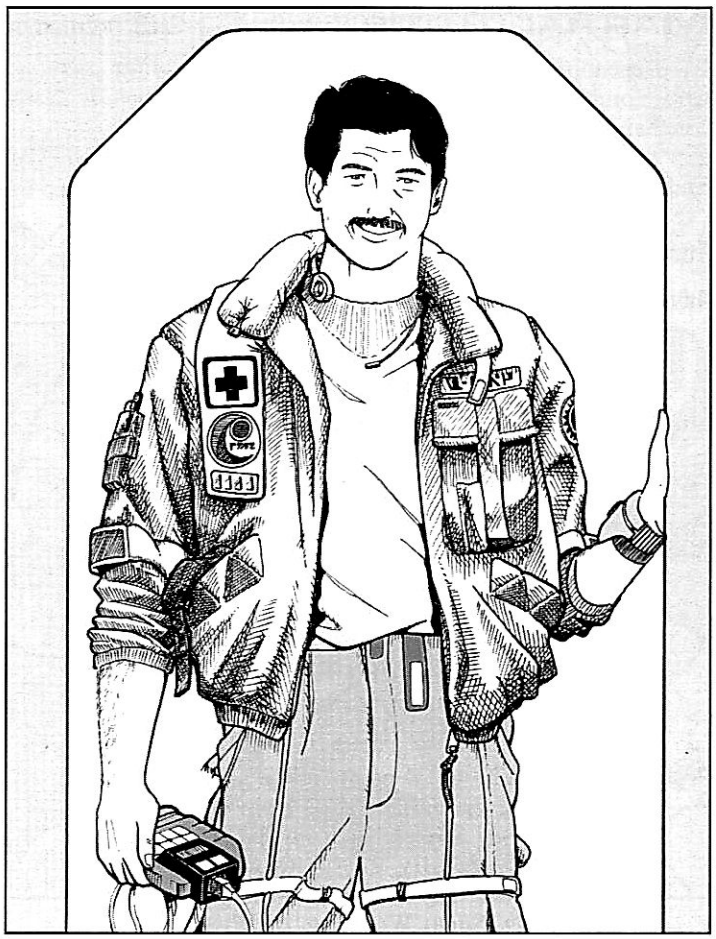
Primary Skills: Diagnosis (M/H) IQ+1 [6]-15; Electronics Operation (Medical) (M/A) IQ+1 [4]-15; and Physician (M/H) IQ+1 [6]-15.

Secondary Skills: Any two of Hypnotism, Pharmacy, or Psychology, all (M/H) IQ [4]-14; or Genetics, Physiology, or Surgery, all (M/VH) IQ-1 [4]-13.

Background Skills: Administration (M/A) IQ-2 [½]-12; Computer Operation (M/E) IQ-1 [½]-13; and Diplomacy (M/H) IQ-2 [1]-12; plus another 9 points in Leadership, Research, Tattooing, or Teaching, all (M/A); Poisons or Veterinary, both (M/H); or any primary or secondary skill.

Customization Notes: Use secondary skill choices and the flexible background skill points to reflect your specialty. An army field medic might pick Leadership-13 [1], Psychology-14 [4], and Surgery-15 [12]. A "doctor" at a seedy starport clinic would probably get more mileage out of Hypnotism-14 [4], Pharmacy-15 [6], Poisons-15 [6], and Tattooing-13 [1].





Medical Technician — 45 points

As noted under *Medical Doctor* (above), characters with medical skills are almost mandatory in a group of adventurers. Smaller passenger vessels tend to have medical techs rather than full-fledged doctors.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 20 points chosen from Combat Reflexes [15]; Disease-Resistant or Immunity to Disease [5 or 10]; Less Sleep [3/level]; Sensitive or Empathy [5 or 15]; Single-Minded [5]; and Versatile [5].

Disadvantages: A total of -20 points in Addiction (Stimulants) [-5]; Charitable [-15]; Chummy [-5]; Delusion ("I'm a doctor!") [-5]; Guilt Complex [-5]; Honesty [-10]; Overconfidence [-10]; Pacifism (Cannot harm innocents) [-10] or (Cannot kill or Self-defense only) [-15]; Selfless [-10]; Sense of Duty [-5 to -15]; and Workaholic [-5].

Primary Skills: Diagnosis (M/H) IQ+1 [6]-14; Electronics Operation (Medical) (M/A) IQ+1 [4]-14; and First Aid (M/E) IQ+1 [2]-14.

Secondary Skills: Pharmacy (M/H) IQ-1 [2]-12.

Background Skills: Computer Operation (M/E) IQ-1 [½]-12 and Scrounging (M/E) IQ-1 [½]-12.

Customization Notes: On very small ships, "medical technician" is probably a part-time job. If so, this template could be combined with Mechanic/Technician (p. 95) or (for pirate crews) Corsair (p. 90), with the GM's assistance.

Merchant — 75 points

Many campaigns will focus on the crew of the futuristic equivalent of a tramp steamer, moving from place to place and eking out a living on the edge of the frontier. A keen eye for a bargain, and a sharp sense of profit and loss (and, in some places, a quick draw!) are vital job skills.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 30 points in Ally Group (2-5 75-point crewmen, 9 or less) [10]; Charisma [5/level]; Claim to Hospitality (Trade guilds, etc.) [1 to 10]; Contacts (Business; skill-18, 9 or less, somewhat reliable) [3/contact]; Cultural Adaptability [25]; Empathy [15]; Intuition [15]; Language Talent [2/level]; Lightning Calculator [5]; Luck [15]; Strong Will [4/level]; and Wealth [10 to 30].

Disadvantages: A total of -20 points in Code of Honor (Merchant's) [-5]; Compulsive Gambling [-5]; Compulsive Generosity [-5]; Compulsive Spending [-5]; Enemy (Bounty hunter, 6 or less) [-5]; Extravagance [-10]; Greed [-15]; Jealousy [-10]; Miserliness [-10]; Overweight or Fat [-5 to -20]; Selfish [-5]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Merchant (M/A) IQ+2 [6]-15.

Secondary Skills: Accounting (M/H) IQ [4]-13; Administration (M/A) IQ [2]-13; Computer Operation (M/E) IQ [1]-13; Economics (M/H) IQ [4]-13; Fast-Talk (M/A) IQ [2]-13; Freight Handling (M/A) IQ [2]-13; and Leadership (M/A) IQ [2]-13.



Background Skills: A total of 12 points in Area Knowledge (any) or Gesture, both (M/E); Astrogation, Gambling, Holdout, Language (any), or Streetwise, all (M/A); Detect Lies, Forgery, or Law, all (M/H); Appreciate Beauty (M/VH); Beam Weapons (any), Brawling, Fast-Draw (Pistol), or Guns (any), all (P/E); Piloting (Starship) (P/A); Carousing (P/A; HT); or any primary or secondary skill.

Customization Notes: Background skills should reflect your market, goods, and the size of your operation. A "lone wolf" selling stolen military technology out of the back of a scout ship will want Astrogation-13 [2], Piloting-12 [8], and Streetwise-13 [2]; the master of a corporate trading vessel is likely to use those points to get Administration-16 [8] and Economics-16 [10].

Professor — 70 points

This template represents an academician who spends more of his time teaching than in research (compare *Scientist*, p. 98).

Attributes: ST 10 [0], DX 10 [0], IQ 14 [45], HT 10 [0].

Advantages: A total of 20 points in Claim to Hospitality (Universities) [1 to 10]; Language Talent [2/level]; Lightning Calculator [5]; Mathematical Ability [10]; Reputation (Famous academician) [varies]; Status 1-2 [5 or 10]; Strong Will [4/level]; Tenure [5]; Versatile [5]; Voice [10]; and Wealth [10 or 20].

Disadvantages: A total of -20 points chosen from Absent-Mindedness [-15]; Age [-3/year]; Bad Sight (Correctable) [-10]; Clueless [-10]; Duty (Teaching; non-hazardous, 12 or less) [-5] or (15 or less) [-10]; Hard of Hearing [-10]; Indecisive [-10]; Intolerance (Uneducated people) [-5]; Oblivious [-3]; and Sense of Duty (Anyone who needs tutelage) [-10].

Primary Skills: Teaching (M/A) IQ+1 [4]-15; plus either **two** of Anthropology, Archaeology, Artificial Intelligence, Astronomy, Botany, Chemistry, Computer Programming, Cryptology, Ecology, Economics, Geology, History, Law, Literature, Mathematics, Paleontology, Philosophy, Physician, Physics, Psychology, Theology, or Xenology, all (M/H) IQ+2 [8]-16, or **one** of Genetics, Linguistics, or Physiology, all (M/VH) IQ+2 [16]-16.

Secondary Skills: Computer Operation (M/E) IQ-1 [½]-13; Research (M/A) IQ-1 [1]-13; Speed-Reading (M/A) IQ-1 [1]-13; and Writing (M/A) IQ-1 [1]-13.

Background Skills: Bard (M/A) IQ-2 [½]-12; Language (any) (M/A) IQ-2 [½]-12; and Savoir-Faire (M/E) IQ-1 [½]-13.

Customization Notes: If choosing two fields, make sure the combination is logical; e.g., Archaeology and Paleontology, Botany and Ecology, Philosophy and Theology. Professors often have skill in advanced fields like Biochemistry (M/VH) (requires Chemistry at 12+), Hyperspace Physics (M/VH) (requires Mathematics, Nuclear Physics, and Physics at 15+), Nuclear Physics (M/VH) (requires Mathematics and Physics at 15+), and Paraphysics (M/VH) (requires Physics and Biochemistry at 12+).

Rogue 85 points



"Rogue" is a more romantic term than "criminal." Literature is filled with lovable, roguish criminal/heroes, from Robin Hood to Simon Templar, touching base with Jesse James and Butch Cassidy along the way, and culminating in a merchant/smuggler-turned-rebel named Han Solo.

Attributes: ST 10 [0], DX 13 [30], IQ 13 [30], HT 10 [0].

Advantages: A total of 30 points chosen from Alertness [5/level]; Charisma [5/level]; Contacts (Street; skill-18, 9 or less, somewhat reliable) [3/contact]; Danger Sense [15]; Daredevil [15]; Double-Jointed [5]; Luck [15]; Manual Dexterity [3/level]; Night Vision [10]; Sanctity [5]; Versatile [5]; and Wealth [10 to 30].

Disadvantages: A total of -30 points chosen from Callous [-6]; Code of Honor (Rogue's) [-5]; Compulsive Gambling [-5 to -15]; Compulsive Lying [-15]; Enemy (Law-enforcement agency, 6 or less) [-15]; Greed [-15]; Kleptomania [-15]; Laziness [-10]; Light Sleeper [-5]; Loner [-5]; Overconfidence [-10]; Paranoia [-10]; Reputation (Crook) [varies]; Secret (Almost anything!) [-5 to -20]; Selfish or Self-Centered [-5 or -10]; Social Stigma (Outlaw) [-15]; Status -1 [-5]; Trademark [-1 to -15]; and Trickster [-15].

Primary Skills: Area Knowledge (any) (M/E) IQ [1]-13; Stealth (P/A) DX [2]-13; and Streetwise (M/A) IQ [2]-13.

Secondary Skills: Computer Operation (M/E) IQ [1]-13 and Running (P/H; HT) HT-2 [1]-8; and three skills off each of these two lists (or just spend a net 12 points on them):

I. Panhandling (M/E) IQ+1 [2]-14; Acting, Courtesan, Fast-Talk, Fortune Telling, Gambling, Intimidation, or Merchant, all (M/A) IQ [2]-13; or Sex Appeal (M/A; HT) HT [2]-10.

II. Electronics Operation (Security Systems), Holdout, Lockpicking, Shadowing, and Traps, all (M/A) IQ [2]-13; Brawling (P/E) DX+1 [2]-14; Beam Weapons (any) or Guns (any), both DX+3 [2]-16*; Climbing or Filch, both (P/A) DX [2]-13; or Escape, Pickpocket, or Sleight of Hand, all (P/H) DX-1 [2]-12.

* Includes +2 for IQ.

Background Skills: A total of 6 points in Gesture (M/E); Disguise or Survival (Urban), both (M/A); Forgery or Poisons, both (M/H); Computer Hacking (M/VH); Fast-Draw (any) or Knife, both (P/E); Carousing (P/A; HT); or Mimicry (Human Speech) (P/H; HT).

Customization Notes: This template is *adaptable*. Decide on what kinds of crimes you'd like to commit, then pick skills (and disadvantages!) to match. A mob knee-breaker might take Brawling, Fast-Talk, Gambling, Guns, Holdout, and Intimidation; a sweet-talking street girl might lean toward Acting, Courtesan, Holdout, Pickpocket, Sex Appeal, and Sleight of Hand.

Scientist 70 points

The term "scientist" is applied to those academicians who spend more time in research than teaching (compare *Professor*, p. 97).

Attributes: ST 10 [0], DX 10 [0], IQ 14 [45], HT 10 [0].

Advantages: A total of 20 points in Ally (76-100 point grad student, 9 or less) [5]; Claim to Hospitality (Universities) [1 to 10]; Imperturbable [10]; Intuition [15]; Language Talent [2/level]; Lightning Calculator [5]; Mathematical Ability [10]; Reputation (Famous academician) [varies]; Single-Minded [5]; Status 1-2 [5 or 10]; Strong Will [4/level]; Tenure [5]; Versatile [5]; and Wealth [10 or 20].

Disadvantages: Curious [-5]; and -20 points chosen from a higher level of Curious [-5 or -10]; Absent-Mindedness [-15]; Age [-3/year]; Bad Sight (Correctable) [-10]; Clueless [-10]; Delusion (Crazy theory) [-5]; Dependent (26-50 point grad student, 9 or less) [-3]; Hard of Hearing [-10]; Intolerance (Uneducated people) [-5]; Oblivious [-3]; Obsession (Proving his theory) [-5 to -15]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Either **two** of Anthropology, Archaeology, Artificial Intelligence, Astronomy, Botany, Chemistry, Computer Programming, Cryptology, Ecology, Economics, Geology, History, Law, Literature, Mathematics, Paleontology, Philosophy, Physician, Physics, Psychology, Theology, and Xenology, all (M/H) IQ+4 [12]-18; or **one** of Genetics, Linguistics, or Physiology, all (M/VH) IQ+4 [24]-18.

Secondary Skills: Research (M/A) IQ [2]-14; Writing (M/A) IQ [2]-14; and either Computer Operation (M/E) IQ [1]-14 or Electronics Operation (any) (M/A) IQ-1 [1]-13.

Background Skills: Any two of Language (any) (M/A) IQ-2 [½]-12; Leadership (M/A) IQ-2 [½]-12; Savoir-Faire (M/E) IQ-1 [½]-13; and Teaching (M/A) IQ-2 [½]-12.

Customization Notes: All notes given for Professor (p. 97) also apply here.



Scout — 90 points

Veterans of the Imperial Interstellar Scout Service share a problem with ex-spies and ex-diplomats: Nobody really believes they're no longer working for their "former" employer. And, of course, sometimes they are.

Attributes: ST 11 [10], DX 11 [10], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points in 3D Spatial Sense [10]; Acceleration Tolerance [10]; Alertness [5/level]; Claim to Hospitality (Former scouts) [10]; Collected or Imperturbable [5 or 10]; Combat Reflexes [15]; Common Sense [10]; Danger Sense [15]; Daredevil [15]; Fit [5]; G-Experience [10]; Improved G-Tolerance [10]; Intuition [15]; Luck [15]; Strong Will [4/level]; and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5]; and -20 points in Code of Honor (Scout's) [-5]; Curious [-5 to -15]; Impulsiveness [-10]; Loner or Reclusive [-5 or -10]; Overconfidence or Glory Hound [-10 or -15]; Shyness [-5 to -15]; Stubbornness [-5]; Workaholic [-5]; and Xenophilia [-5 or -15].

Primary Skills: Astrogation (M/A) IQ [2]-13; Cartography (M/A) IQ [2]-13; Electronics Operation (Sensors) (M/A) IQ [2]-13; and Piloting (Starship) (P/A) DX+2 [8]-13.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12; Computer Operation (M/E) IQ-1 [½]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Engineer (Vehicles) (M/H) IQ-1 [2]-12; Free Fall (P/A) DX+1 [4]-12; Mechanic (J-Drive) (M/A) IQ-1 [1]-12; Mechanic (M-Drive) (M/A) IQ-1 [1]-12; Photography (M/A) IQ-1 [1]-12; and Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Astronomy (M/H) IQ-2 [1]-11; First Aid (M/E) IQ-1 [½]-12; Intelligence Analysis (M/H) IQ-2 [1]-11; Navigation (M/H) IQ-2 [1]-11; Planetology (any) (M/A) IQ-2 [½]-11; and Survival (any) (M/A) IQ-2 [½]-11; plus 3 points in Area Knowledge (any) (M/E), Beam Weapons (any) (P/E), Gunner (any ship-mounted) (P/A), Guns (any) (P/E), and Tactics (Space) (M/H).

Customization Notes: A scout can justify having been almost anywhere. Use extra Area Knowledge, Planetology, and Survival skills to reflect the systems, planet types, and terrain types (respectively) that your scout has encountered. The Scout Service isn't intended for combat, but some Scouts are "cowboys" and may have decent levels in Gunner and Tactics (also see ***GURPS Traveller First In*** for combat-oriented branches of the IISS). Remember that scouts often work alone: It pays to be versatile rather than specialized.

Undercover Agent — 90 points

For obvious reasons, a retired spy often needs to keep moving. The talents, contacts, and enemies acquired during an active career as an agent can make life exciting for anyone who comes into contact with him!

Attributes: ST 10 [0], DX 13 [30], IQ 13 [30], HT 10 [0].

Advantages: A total of 25 points in Alertness [5/level]; Alternate Identity [15]; Appearance [5 or 15]; Charisma [5/level]; Collected or Imperturbable [5 or 10]; Combat Reflexes [15]; Contacts (Any; skill-18, 9 or less, somewhat reliable) [3/contact]; Danger Sense [15]; Intuition [15]; Language Talent [2/level]; Luck [15]; Sanctity [5]; Strong Will [4/level]; Versatile [5]; Voice [10]; and Zeroed [10].

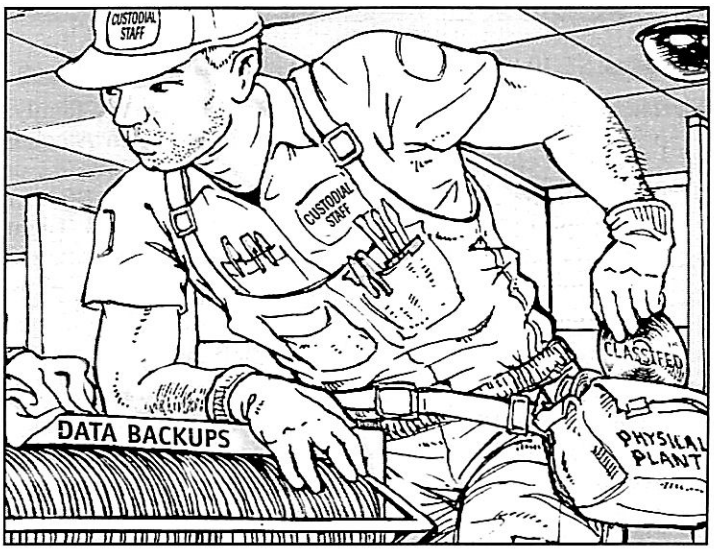
Disadvantages: A total of -25 points in Curious [-5 to -15]; Delusion ("Enemy agents are after me!") [-5 to -15]; Duty (Agency, 9 or less) [-5]; Enemy (Enemy agents, 6 or less) [-15]; Insomniac [-10 or -15]; Light Sleeper [-5]; Loner [-5]; Mistaken Identity [-5]; Nightmares [-5]; Overconfidence [-10]; Paranoia [-10]; Secret [-5 to -20]; and Sense of Duty (Nation) [-10].

Primary Skills: Area Knowledge (any) (M/E) IQ [1]-13; Language (any) (M/A) IQ [2]-13; and two skills from each of these three lists (or just spend a net 12 points on them):

I. Savoir-Faire (M/E) IQ+1 [2]-14; Acting, Fast-Talk, or Interrogation, all (M/A) IQ [2]-13; Sex Appeal (M/A; HT) HT [2]-10; Detect Lies (M/H) IQ-1 [2]-12; or Carousing (P/A; HT) HT [2]-10.

II. Demolition, Electronics Operation (Security systems), Lockpicking, or Traps, all (M/A) IQ [2]-13; Climbing or Stealth, both (P/A) DX [2]-13; or Escape (P/H) DX-1 [2]-12.

III. Electronics Operation (Comm), Electronics Operation (Sensors), Lip Reading, Photography, or Shadowing, all (M/A) IQ [2]-13; or Body Language or Traffic Analysis, both (M/H) IQ-1 [2]-12.



Secondary Skills: Computer Operation (M/E) IQ-1 [½]-12; Disguise (M/A) IQ-1 [1]-12; Holdout (M/A) IQ-1 [1]-12; Intelligence Analysis (M/H) IQ-1 [2]-12; Research (M/A) IQ-1 [1]-12; Speed-Reading (M/A) IQ-1 [1]-12; and one of Beam Weapons (any) or Guns (any), both (P/E) DX+1 [½]-14*.

* Includes +2 for IQ.

Background Skills: One of Driving (any) or Piloting (any), both (P/A) DX-1 [1]-12; and 7 points in Cartography or Heraldry (any), both (M/A); Cryptanalysis, Cryptography, Forensics, Forgery, Poisons, or SIGINT Collection/Jamming, all (M/H); or Computer Hacking (M/VH).

Customization Notes: Primary skills reflect the kind of agent you are. A "social engineer" might have Body Language, Fast-Talk, Lip Reading, Lockpicking, Savoir-Faire, and Stealth. An assassin might have Demolition, Electronics Operation (Sensors), Shadowing, and Traps, and skip List I to add points to combat skills. The best agents have a good mix of skills, though.

Wealthy Traveler (Remittance Man) — 85 points

This template represents someone, usually a non-heir, who is paid by his family to stay away from home. The reasons are many and varied, and are left up to the imaginations of the player and GM. There are certain limitations (the need to check in with a bank from time to time, for one), but the character is largely free to do what he wants (except go within a parsec of home or gain too much notoriety).



Attributes: ST 10 [0], DX 10 [0], IQ 10 [0], HT 10 [0].

Advantages: Either Filthy Rich [50] or Patron (Wealthy family, provides cash, 12 or less) [50]; plus 25 points in Alcohol Tolerance [5]; Ally Group (2-5 75-point bodyguards, 12 or less) [20]; Appearance [5 to 25]; Claim to Hospitality (Other rich people) [5 to 10]; Fashion Sense [5]; Heir [5]; Light Hangover or No Hangover [2 or 5]; Luck [15]; Reputation (Celebrity) [varies]; Status 1-5* [5/level]; and +1 or +2 to any attribute [10 or 20].

* Filthy Rich provides +1 Status; see p. B18.

Disadvantages: A total of -30 points in Addiction [varies]; Alcoholism [-15]; Chummy [-5]; Compulsive Carousing [-5]; Compulsive Gambling [-5 to -15]; Compulsive Spending [-5 to -15]; Delusion ("Everyone thinks I'm great!") [-5]; Extravagance [-10]; Greed [-15]; Impulsiveness [-10]; Incompetence (Administration) [-1]; Intolerance (Poor people, lower classes, etc.) [-5]; Laziness [-10]; Lecherousness [-15]; Overconfidence [-10]; Selfish or Self-Centered [-5 or -10]; and Short Attention Span [-10].

Primary Skills: Savoir-Faire (M/E) IQ+4 [8]-14.

Secondary & Background Skills: Any two of Chess or Games (any), both (M/E) IQ+8 [16]-18; Falconry or Gambling, both (M/A) IQ+7 [16]-17; Sex Appeal (M/A; HT) HT+7 [16]-17; Appreciate Beauty (M/VH) IQ+2 [16]-12; Dancing, Driving (any), Fencing, Piloting (any), Riding (any), or Sports (any), all (P/A) DX+3 [16]-13; or Carousing (P/A; HT) HT+3 [16]-13.

Customization Notes: A character like this is mainly useful for his money, but his skills can be chosen to give him an edge in adventuring situations. Be sure that they reflect your character's background. The scion of a powerful military family might know Chess and Fencing, while the daughter of a rock star is more likely to have Carousing and Sex Appeal.

Army (Enlisted) — 90 points

Soldiers are trained to follow orders and kill people for a living, which is occasionally useful in their subsequent careers. This template represents a former soldier in a land army, whether local (planetary), Imperial, or extra-Imperial.

Attributes: ST 11 [10], DX 13 [30], IQ 11 [10], HT 11[10].

Advantages: A total of 20 points in Combat Reflexes [15]; Courtesy Rank 0-2 [1/level]; Fearlessness [2/level]; Fit or Very Fit [5 or 15]; Hard to Kill 1-2 [5 or 10]; High Pain Threshold [10]; Reputation (Decorated) [varies]; and Toughness (DR 1) [10].

Disadvantages: A total of -20 points in Bloodlust [-10]; Callous [-6]; Chummy [-5]; Code of Honor (Soldier's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Flashbacks [-5 to -20]; Intolerance (Enemy race or culture) [-5]; Nightmares [-5]; Overconfidence [-10]; Post-Combat Shakes [-5]; and Sense of Duty (Comrades in arms) [-5].

Primary Skills: Either Beam Weapons (any) or Guns (any), both (P/E) DX+2 [2]-15*; plus Gunner (any) (P/A) DX+1 [2]-14*; NBC Warfare (M/A) IQ+1 [4]-12; and Savoir-Faire (Military) (M/E) IQ+1 [2]-12.

Secondary Skills: Armoury (Small Arms) (M/A) IQ [2]-11; Camouflage (M/E) IQ [1]-11; Electronics Operation (Comm) (M/A) IQ-1 [1]-10; First Aid (M/E) IQ [1]-11; Hiking (P/A; HT) HT-1 [1]-10; Orienteering (M/A) IQ-1 [1]-10; Stealth (P/A) DX-1 [1]-12; Survival (any) (M/A) IQ-1 [1]-10; and Tactics (M/H) IQ-1 [2]-10; plus a total of 3 points in Brawling (P/E), Judo (P/H), Knife (P/E), Spear (P/A), and Throwing (P/H).

Background Skills: A total of 6 points in Scrounging (M/E); Administration, Demolition, Forward Observer, Leadership, Mechanic (any), or No-Landing Extraction, all (M/A); Engineer (Combat), Explosive Ordnance Disposal, SIGINT Collection/Jamming, or Traffic Analysis, all (M/H); Beam Weapons (other), Guns (other), or Parachuting, all (P/E); and Battlesuit, Driving (any), or Gunner (any), all (P/A).

Customization Notes: Choose Courtesy Rank that reflects your former service grade: A private is Rank 0 [0], a sergeant is Rank 1 [1], and a senior sergeant (or specialist) is Rank 2 [2]. This becomes Military Rank [5/level] if reactivated!



Choose background skills appropriate to unit and MOS; e.g., *Airborne*, No-Landing Extraction-12 [4], Parachuting-14 [2]; *Artillery*, Forward Observer-12 [4], Gunner (Cannon)-14* [2]; *Engineer Corps*, Demolition-11 [2], Engineer (Combat)-11 [4]; *Mechanized Infantry*, Driving (Tracked)-13 [2], Mechanic (Gasoline Engine)-12 [4]; *Supply*, Administration-12 [4], Scrounging-12 [2]; etc.

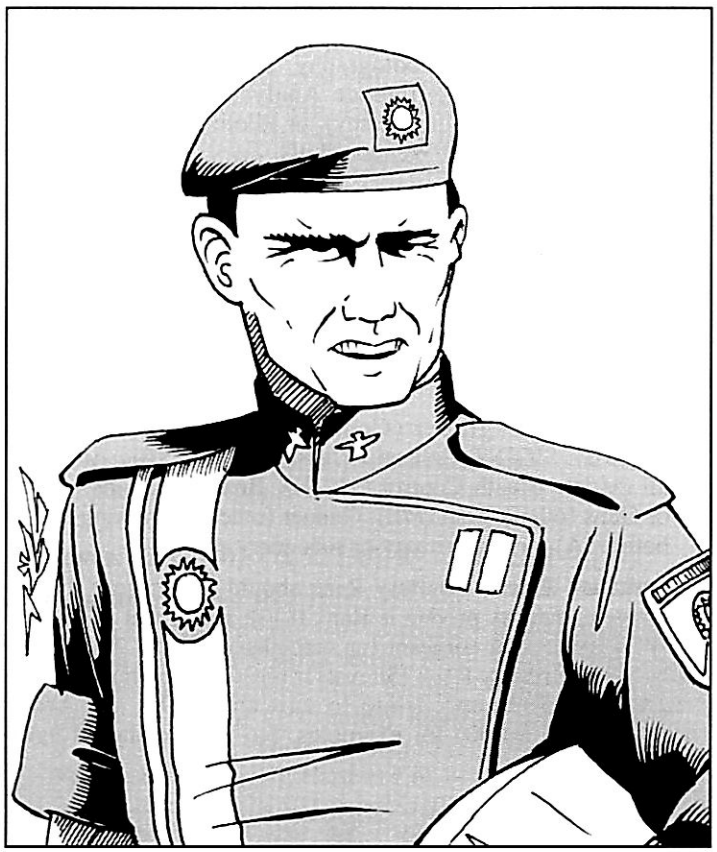
* Includes +1 for IQ.

Army (Officer) — 90 points

A former officer in one of the forces described under *Army (Enlisted)*, p. 100.

Attributes: ST 11 [10], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points in Charisma [5/level]; Combat Reflexes [15]; Courtesy Rank 3+ [1/level]; Reputation (Decorated) [varies]; Status 1 [5]; Strong Will [4/level]; and Voice [10].



Disadvantages: A total of -20 points in Callous [-6]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Honesty [-10]; Intolerance (Enemy race or culture) [-5]; Jealousy [-10]; Odious Personal Habit ("By the book") [-5]; Overconfidence [-10]; Sense of Duty (His command) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Administration (M/A) IQ [2]-13; Leadership (M/A) IQ [2]-13; and Tactics (M/H) IQ [4]-13; plus 2 more points in one of those three skills; and Savoir-Faire (Military) (M/E) IQ [1]-13.

Secondary Skills: Either Beam Weapons (any) or Guns (any) (P/E), both DX+2 [1]-14*; plus Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Gunner (any) (P/A) DX+1 [1]-13*; NBC Warfare (M/A) IQ-1 [1]-12; and Orienteering (M/A) IQ-1 [1]-12.

* Includes +2 for IQ.

Background Skills: A net 4 points in Forward Observer, Heraldry (Military Insignia), Interrogation, or Survival (any), all (M/A); Cryptography, Engineer (Combat), Intelligence Analysis, Psychology, or Strategy, all (M/H); Parachuting (P/E); and Battlesuit, Driving (any), or Stealth, all (P/A).

Customization Notes: Courtesy Rank should reflect your former service grade: A lieutenant is Rank 3 [3]; a captain or major is Rank 4 [4]; a lieutenant colonel is Rank 5 [5]; a colonel is Rank 6 [6]; a brigadier is Rank 7 [7]; and a full general is Rank 8 [8]. This becomes Military Rank [5/level] if reactivated!

Choose background skills appropriate to unit and MOS (military occupational speciality); e.g., *Armor*, Driving (Tracked)-13 [4]; *CIC*, Strategy-13 [4]; *Intelligence*, Intelligence Analysis-12 [2]; Interrogation-13 [2]; *Psych Warfare*, Psychology-13 [4]; etc.

Army Aviation (Enlisted) — 90 points

Army aviation flies aircraft (helicopters, vertols, grav vehicles, and light jets) in support of land operations by the army. Since all Imperial aviation assets are assigned to the Imperial Navy, this template represents a veteran of a local (planetary) or extra-Imperial force.

Attributes: ST 10 [0], DX 12 [20], IQ 12 [20], HT 11 [10].

Advantages: A total of 25 points in Absolute Direction or 3D Spatial Sense [5 or 10]; Acceleration Tolerance [10]; Acute Vision [2/level]; Combat Reflexes [15]; Courtesy Rank 1-2 [1/level]; Danger Sense [15]; and Reputation (Decorated) [varies].

Disadvantages: A total of -20 points in Bad Temper [-10]; Callous [-6]; Code of Honor (Soldier's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Intolerance (Enemy race or culture) [-5]; Overconfidence or Glory Hound [-10 or -15]; and Sense of Duty (Comrades in arms) [-5].

Primary Skills: Gunner (any) (P/A) DX+2 [2]-14*; Gunner (any other) (P/A) DX+2 [2]-14*; and Piloting (any military aircraft) (P/A) DX+2 [8]-14.

* Includes +2 for IQ.

Secondary Skills: Aviation (M/A) IQ [2]-12; Electronics Operation (Comm) (M/A) IQ [2]-12; Electronics Operation (Sensors) (M/A) IQ [2]-12; Navigation (M/H) IQ [4]-12; NBC Warfare (M/A) IQ [2]-12; Parachuting (P/E) DX [1]-12; Savoir-Faire (Military) (M/E) IQ [1]-12; and Tactics (M/H) IQ [4]-12.

Background Skills: A net 5 points in Forward Observer, Leadership, Mechanic (any), No-Landing Extraction, Photography, Survival (any), or Vacc Suit, all (M/A); Free Fall, Gunner (any), or Piloting (any), all (P/A); and personal Combat/Weapon skills.

Customization Notes: Choose Courtesy Rank that reflects your former service grade; aviators are always at least sergeants (Rank 1 [1]), if not senior sergeants (Rank 2 [2]). This becomes Military Rank [5/level] if reactivated!

Choose your basic Gunner and Piloting skills to reflect your unit type; e.g., *Air Cav*, Gunner (Machine Gun) and (Rocket Launcher), Piloting (Helicopter); *CAS*, Gunner (Bombs) and (Machine Gun), Piloting (Heavy Airplane), etc. Choose background skills to reflect special training in things like extraction, reconnaissance, or SERE.

Note that aviators should never have Acceleration Weakness, Acrophobia, Confused, or Motion Sickness!

Army Aviation (Officer) — 90 points

A former officer in one of the forces described under *Army Aviation (Enlisted)*, above.

Attributes: ST 10 [0], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 25 points in Absolute Direction or 3D Spatial Sense [5 or 10]; Acceleration Tolerance [10]; Acute Vision [2/level]; Charisma [5/level]; Combat Reflexes [15]; Courtesy Rank 3+ [1/level]; Danger Sense [15]; Reputation (Decorated) [varies]; and Status 1 [5].

Disadvantages: A total of -25 points in Callous [-6]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Honesty [-10]; Intolerance (Enemy race or culture) [-5]; Jealousy [-10]; Overconfidence or Glory Hound [-10 or -15]; and Sense of Duty (His command) [-10].

Primary Skills: Gunner (any) (P/A) DX+2 [2]-14*; Gunner (any other) (P/A) DX+2 [2]-14*; Leadership (M/A) IQ-1 [1]-12; Piloting (any military aircraft) (P/A) DX+2 [8]-14; Savoir-Faire (Military) (M/E) IQ [1]-13; and Tactics (M/H) IQ [4]-13.

* Includes +2 for IQ.

Secondary Skills: Administration (M/A) IQ-1 [1]-12; Aviation (M/A) IQ-1 [1]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Electronics Operation (Sensors) (M/A) IQ-1 [1]-12; Navigation (M/H) IQ-1 [2]-12; NBC Warfare (M/A) IQ-1 [1]-12; and Parachuting (P/E) DX [1]-12.

Background Skills: A total of 4 points in Forward Observer, No-Landing Extraction, Photography, Survival (any), or Vacc Suit, all (M/A); Intelligence Analysis or Strategy, both (M/H); Free Fall, Gunner (any), or Piloting (any), all (P/A); and personal Combat/Weapon skills.

Customization Notes: Choose Courtesy Rank that reflects your former service grade; if they fly, aviation officers are usually lieutenants (Rank 3 [3]), captains (Rank 4 [4]), or colonels (Rank 5 [5] or 6 [6]). This becomes Military Rank [5/level] if reactivated! See Army Aviation (Enlisted) (p. 101) for other recommendations.

Marine (Enlisted) — 90 points

Inside the Imperium, this represents a veteran of the Imperial Marines. Powers outside the Imperium sometimes have marine forces, while planetary forces within the Imperium have army units that serve the same function, but without the title. The Imperial Marines, after all, are unique.

Attributes: ST 11 [10], DX 12 [20], IQ 12 [20], HT 11 [10].

Advantages: G-Experience [10]; and 20 points chosen from 3D Spatial Sense [10]; Acceleration Tolerance [10]; Breath-Holding 1-2 [2 or 4]; Combat Reflexes [15]; Courtesy Rank 0-2 [1/level]; Fearlessness [2/level]; Fit or Very Fit [5 or 15]; Hard to Kill 1-2 [5 or 10]; High Pain Threshold [10]; Improved G-Tolerance [10]; Reputation (Decorated) [varies]; and Toughness (DR 1) [10].

Disadvantages: A total of -25 points in Bloodlust [-10]; Callous [-6]; Chummy or Gregarious [-5 or -10]; Code of Honor (Soldier's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Intolerance (Enemy race or culture) [-5]; Overconfidence or Glory Hound [-10 or -15]; and Sense of Duty (Comrades in arms) [-5].

Primary Skills: Either Beam Weapons (any) or Guns (any), both (P/E) DX+3 [2]-15*; plus Free Fall (P/A) DX [2]-12; Gunner (any) (P/A) DX+2 [2]-14*; Savoir-Faire (Military) (M/E) IQ [1]-12; and Vacc Suit (M/A) IQ [2]-12.

* Includes +2 for IQ.

Secondary Skills: Armoury (Small Arms) (M/A) IQ-1 [1]-11; Computer Operation (M/E) IQ-1 [½]-11; Electronics Operation (Comm) (M/A) IQ-2 [½]-10; First Aid (M/E) IQ-1 [½]-11; Stealth (P/A) DX [2]-12; Tactics (M/H) IQ-1 [2]-11; one of Battlesuit or Exoskeleton, both (P/A) DX-1 [1]-11; one of Gesture (M/E) IQ-1 [½]-11 or Lip Reading (M/A) IQ-2 [½]-10; and a total of 3 points in Brawling or Knife, both (P/E); Shortsword (P/A); or Judo or Throwing, both (P/H).

Background Skills: A total of 5 points in Scrounging (M/E); Administration, Demolition, Leadership, or Mechanic (any), all (M/A); Engineer (Combat), Explosive Ordnance Disposal, SIGINT Collection/Jamming, or Traffic Analysis, all (M/H); Breath Control (M/VH); Beam Weapons (other) or Guns (other), both (P/E); Gunner (other) or Piloting (any), both (P/A); or any primary or secondary skill.

Customization Notes: Courtesy Rank should reflect your former service grade: A private is Rank 0 [0]; a sergeant is Rank 1 [1], and a senior sergeant (or specialist) is Rank 2 [2]. This becomes Military Rank [5/level] if reactivated. Choose background skills appropriate to unit and MOS; see Army (Enlisted) (p. 100) for examples. No marine should have Space Sickness!



Marine (Officer) 90 points

A former officer in the Imperial Marines.

Attributes: ST 11 [10], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 25 points in 3D Spatial Sense [10]; Acceleration Tolerance [10]; Charisma [5/level]; Combat Reflexes [15]; Courtesy Rank 3+ [1/level]; G-Experience [10]; Improved G-Tolerance [10]; Reputa-tion (Decorated) [varies]; Status 1 [5]; Strong Will [4/level]; and Voice [10].

Disadvantages: A total of -25 points in Callous [-6]; Chummy [-5]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Honesty [-10]; Intolerance (Enemy race or culture) [-5]; Jealousy [-10]; Odious Personal Habit ("By the book") [-5]; Overconfidence or Glory Hound [-10 or -15]; Sense of Duty (His command) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Administration (M/A) IQ [2]-13; Free Fall (P/A) DX [2]-12; Leadership (M/A) IQ [2]-13; Savoir-Faire (Military) (M/E) IQ-1 [½]-12; Tactics (M/H) IQ [4]-13; and Vacc Suit (M/A) IQ-1 [1]-12.

Secondary Skills: Either Beam Weapons (any) or Guns (any) (P/E), both DX+2 [1]-14*; plus Computer Operation (M/E) IQ-1 [½]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Gunner (any) (P/A) DX+1 [1]-13*; and one of Battlesuit or Exoskeleton, both (P/A) DX-1 [1]-11.

* Includes +2 for IQ.

Background Skills: A total of 4 points in Astrogation, Electronics Operation (other), or Interrogation, all (M/A); Engineer (Combat), Intelligence Analysis, Psychology, or Strategy, all (M/H); and Piloting (any) (P/A).

Customization Notes: Courtesy Rank should reflect your former service grade; see Army (Officer) (p. 101) for ranks. This becomes Military Rank [5/level] if reactivated. As with other military careers, choose background skills appropriate to unit and MOS. Marine officers shouldn't have Space Sickness, but some paper-pushers have never been space-side . . .

Marine Commando 130 points (Enlisted)

A veteran of an Imperial marine commando unit. The genuine article is fairly rare.

Attributes: ST 11 [10], DX 13 [30], IQ 13 [30], HT 11[10].

Advantages: Combat Reflexes [15]; Fit [5]; G-Experience [10]; and 10 points chosen from 3D Spatial Sense [10]; Acceleration Tolerance [10]; Breath-Holding 1-2 [2 or 4]; Courtesy Rank 0-2 [1/level]; Daredevil [15]; Fearlessness [2/level]; Hard to Kill 1-2 [5 or 10]; High Pain Threshold [10]; Improved G-Tolerance [10]; Reputation (Decorated) [varies]; Toughness (DR 1) [10]; and Very Fit [10] (adds to cost of Fit).

Disadvantages: Fanaticism (Patriotism) [-15]; plus -15 points in Bloodlust [-10]; Callous [-6]; Chummy or Gregarious [-5 or -10]; Code of Honor (Soldier's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Intolerance (Enemy race or culture) [-5]; Overconfidence or Glory Hound [-10 or -15]; and Sense of Duty (Comrades in arms) [-5].



Primary Skills: Two Beam Weapons or Guns skills, each (P/E) DX+3 [2]-16*; plus Free Fall (P/A) DX+1 [4]-14; Gunner (any) (P/A) DX+2 [2]-15*; Savoir-Faire (Military) (M/E) IQ [1]-13; Tactics (M/H) IQ [4]-13; and Vacc Suit (M/A) IQ [2]-13.

Secondary Skills: Another Beam Weapons or Guns skill, (P/E) DX+2 [1]-15*; plus Armoury (Small arms) (M/A) IQ-1 [1]-12; Battlesuit (P/A) DX-1 [1]-12; Brawling (P/E) DX [1]-13; Computer Operation (M/E) IQ-1 [½]-12; Demolition (M/A) IQ-1 [1]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Engineer (Combat) (M/H) IQ-1 [2]-12; Explosive Ordnance Disposal (M/H) IQ-1 [2]-12; First Aid (M/E) IQ-1 [½]-12; Gesture (M/E) IQ-1 [½]-12; Judo (P/H) DX-1 [2]-12; Knife (P/E) DX-1 [½]-12; Piloting (Spaceship) (P/A) DX-1 [1]-12; Scrounging (M/E) IQ-1 [½]-12; Shortsword (P/A) DX-1 [1]-12; Stealth (P/A) DX [2]-13; and Traps (M/A) IQ-1 [1]-12.

* Includes +2 for IQ.

Background Skills: Administration (M/A) IQ-2 [½]-11; Leadership (M/A) IQ-2 [½]-11; Mechanic (any space-related) (M/A) IQ-2 [½]-11; SIGINT Collection/Jamming (M/H) IQ-2 [1]-11; and Traffic Analysis (M/H) IQ-2 [1]-11.

Customization Notes: Courtesy Rank reflects your former service grade; see Marine (Enlisted) (p. 102). This becomes Military Rank [5/level] if reactivated. There is no choice in background skills here. Elite units have standardized training; the only choices are "qualify" or "wash out." Commandos should have no physical disadvantages (a retired soldier could, if he was wounded in action).

Marine Commando (Officer) 145 points

A former officer in one of the Imperial Marines' commando units . . . even rarer than his enlisted counterpart!

Attributes: ST 11 [10], DX 13 [30], IQ 13 [30], HT 11 [10].

Advantages: Combat Reflexes [15]; Fit [5]; G-Experience [10]; and 15 points chosen from 3D Spatial Sense [10]; Acceleration Tolerance [10]; Breath-Holding 1-2 [2 or 4]; Charisma [5/level]; Courtesy Rank 3-5 [1/level]; Fearlessness [2/level]; Hard to Kill 1-2 [5 or 10]; High Pain Threshold [10]; Improved G-Tolerance [10]; Reputation (Decorated) [varies]; Status 1 [5]; Strong Will [4/level]; Toughness (DR 1) [10]; Very Fit [10] (adds to cost of Fit); and Voice [10].

Disadvantages: Fanaticism (Patriotism) [-15]; plus -15 points in Bloodlust [-10]; Callous [-6]; Chummy [-5]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Honesty [-10]; Intolerance (Enemy race or culture) [-5]; Overconfidence or Glory Hound [-10 or -15]; Sense of Duty (His command) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Two Beam Weapons or Guns skills, each (P/E) DX+3 [2]-16*; plus Electronics Operation (Comm) (M/A) IQ [2]-13; Free Fall (P/A) DX+1 [4]-14; Gunner (any) (P/A) DX+2 [2]-15*; Leadership (M/A) IQ+1 [4]-14; Savoir-Faire (Military) (M/E) IQ [1]-13; Tactics (M/H) IQ+1 [6]-14; and Vacc Suit (M/A) IQ [2]-13.

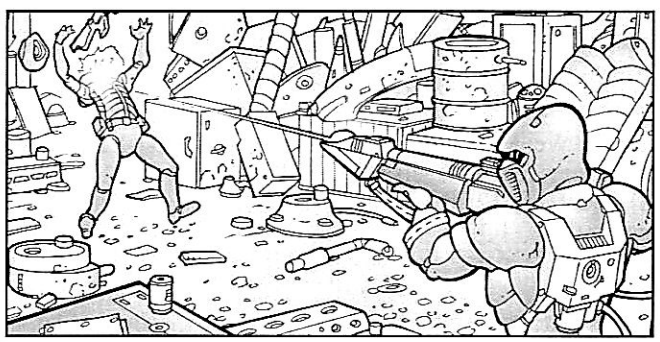
Secondary Skills: Another Beam Weapons or Guns skill, (P/E) DX+2 [1]-15*; plus Administration (M/A) IQ-1 [1]-12; Armoury (Small arms) (M/A) IQ-1 [1]-12; Battlesuit (P/A) DX-1 [1]-12; Brawling (P/E) DX [1]-13; Computer Operation (M/E) IQ-1 [½]-12; Demolition (M/A) IQ-1 [1]-12; Engineer (Combat) (M/H) IQ-1 [2]-12; Explosive Ordnance Disposal (M/H) IQ-1 [2]-12; First Aid (M/E) IQ-1 [½]-12; Gesture (M/E) IQ-1 [½]-12; Interrogation (M/A) IQ-1 [1]-12; Intelligence Analysis (M/H) IQ-1 [2]-12; Judo (P/H) DX-1 [2]-12; Knife (P/E) DX-1 [½]-12; Piloting (Spaceship) (P/A) DX-1 [1]-12; Scrounging (M/E) IQ-1 [½]-12; Shortsword (P/A) DX-1 [1]-12; Stealth (P/A) DX [2]-13; and Traps (M/A) IQ-1 [1]-12.

* Includes +2 for IQ.

Background Skills: Mechanic (any space-related) (M/A) IQ-2 [½]-11; SIGINT Collection/Jamming (M/H) IQ-2 [1]-11; and Traffic Analysis (M/H) IQ-2 [1]-11.

Customization Notes: Commando officers lead from the front, and are just as tough as their men. Since commando units are company- or battalion-sized, these "fighting officers" are limited to Military Rank 5; therefore, commando officers are often passed over for promotion, and may even have to accept a demotion to join the unit. Courtesy Rank should reflect this, and is limited to lieutenant (Rank 3 [3]), captain (Rank 4 [4]), or colonel (Rank 5 [5]). This becomes Military Rank [5/level] if reactivated.

See *Marine Commando (Enlisted)* (p.103) for other notes.



Navy (Enlisted) 90 points

This template can represent a former member of the Imperial Navy or a local planetary navy, either inside or outside the Imperium. Local navies within the Imperium tend to be mislabeled customs and anti-piracy patrols.

Attributes: ST 10 [0], DX 12 [20], IQ 12 [20], HT 11 [10].

Advantages: G-Experience [10]; and a total of 20 points in 3D Spatial Sense [10]; Acceleration Tolerance [10]; Combat Reflexes [15]; Courtesy Rank 0-2 [1/level]; Fit [5]; Improved G-Tolerance [10]; and Reputation (Decorated) [varies].

Disadvantages: A total of -20 points chosen from Chummy or Gregarious [-5 or -10]; Code of Honor (Soldier's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Intolerance (Enemy race or culture, Pirates, etc.) [-5]; Overconfidence or Glory Hound [-10 or -15]; and Sense of Duty (Comrades in arms) [-5].

Primary Skills: Free Fall (P/A) DX+1 [4]-13; Savoir-Faire (Military) (M/E) IQ+1 [2]-13; Vacc Suit (M/A) IQ+1 [4]-13; and one of these 6 options:

1. Area Knowledge (System or sector) (M/E) IQ+1 [2]-13; Astrogation (M/A) IQ+1 [4]-13; and Piloting (Spaceship) (P/A) DX+2 [8]-14.
2. Armoury (any) (M/A) IQ+2 [6]-14 and Gunner (any ship-mounted) (P/A) DX+4 [8]-16*.
3. Cartography (M/A) IQ+1 [4]-13; Electronics Operation (Sensors) (M/A) IQ+1 [4]-13; and SIGINT Collection/Jamming (M/H) IQ+1 [6]-13.
4. Electronics Operation (Comm) (M/A) IQ+2 [6]-14 and Traffic Analysis (M/H) IQ+2 [8]-14.
5. Engineer (Vehicles) (M/H) IQ [4]-12; Shipbuilding (Starship) (M/A) IQ [2]-12; and two of Mechanic (J-Drive), (M-Drive), or (Power Reactor), each (M/A) IQ+1 [4]-13.
6. Leadership (M/A) IQ+2 [6]-14 and Tactics (Space) (M/H) IQ+2 [8]-14.

Secondary Skills: Computer Operation (M/E) IQ [1]-12; Shortsword (P/A) DX [2]-12; and either Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-14*.

* Includes +2 for IQ.

Background Skills: A total of 2 points in any of Scrounging (M/E); Administration or Heraldry (Ship's Markings), both (M/A); Brawling (P/E); or Carousing (P/A; HT).

Customization Notes: Courtesy Rank should reflect your former service grade: An ordinary space hand is Rank 0 [0], a chief is Rank 1 [1], and a master chief (or specialist) is Rank 2 [2]. This becomes Military Rank [5/level] if reactivated! Also choose primary skills that reflect your duty: (1) helmsman or pilot, (2) gunner or gunner's mate, (3) sensor operator, (4) radioman, (5) engineer, and (6) chief or master chief (which require Courtesy Rank 1 or 2, respectively).

Navy (Officer) — 90 points

A former officer in one of the forces described under *Navy (Enlisted)*, p. 104.

Attributes: ST 10 [0], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points in 3D Spatial Sense [10]; Acceleration Tolerance [10]; Charisma [5/level]; Combat Reflexes [15]; Courtesy Rank 3+ [1/level]; G-Experience [10]; Improved G-Tolerance [10]; Reputation (Decorated) [varies]; Status 1 [5]; Strong Will [4/level]; and Voice [10].

Disadvantages: A total of -20 points in Chummy [-5]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Honesty [-10]; Intolerance (Enemy race or culture, Pirates, etc.) [-5]; Jealousy [-10]; Odious Personal Habit ("By the book") [-5]; Overconfidence or Glory Hound [-10 or -15]; Sense of Duty (His command) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Leadership (M/A) IQ+1 [4]-14; Savoir-Faire (Military) (M/E) IQ [1]-13; Tactics (Space) (M/H) IQ+1 [6]-14; and one of these options:

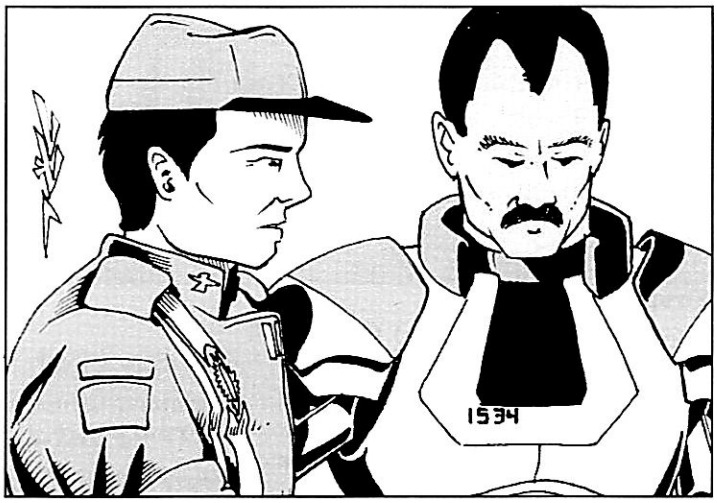
1. Armoury (any) (M/A) IQ+2 [6]-15 and Gunner (any ship-mounted) (P/A) DX+3 [4]-15*.
2. Astrogation (M/A) IQ [2]-13 and Piloting (Starship) (P/A) DX+2 [8]-14.
3. Cartography (M/A) IQ [2]-13; Electronics Operation (Comm) (M/A) IQ [2]-13; Electronics Operation (Sensors) (M/A) IQ [2]-13; SIGINT Collection/Jamming (M/H) IQ-1 [2]-12; and Traffic Analysis (M/H) IQ-1 [2]-12.
4. Engineer (Vehicles) (M/H) IQ+1 [6]-14; Shipbuilding (Starship) (M/A) IQ-1 [1]-12; and all three of Mechanic (J-Drive), (M-Drive), and (Power Reactor), each (M/A) IQ-1 [1]-12.

Secondary Skills: Administration (M/A) IQ-1 [1]-12; Computer Operation (M/E) IQ-1 [½]-12; Free Fall (P/A) DX [2]-12; Vacc Suit (M/A) IQ-1 [1]-12; and either Beam Weapons (any) or Guns (any), both (P/E) DX+1 [½]-13*.

* Includes +2 for IQ.

Background Skills: A total of 4 points in Heraldry (Ship's Markings) or Planetology (any), both (M/A); or Astronomy, Intelligence Analysis, or Strategy (Space), all (M/H).

Customization Notes: Courtesy Rank should reflect former service grade: ensign or junior lieutenant (Rank 3 [3]), lieutenant or lieutenant commander (Rank 4 [4]), commander (Rank 5 [5]), captain (Rank 6 [6]), commodore or rear admiral (Rank 7 [7]), or admiral (Rank 8 [8]). This becomes Military Rank [5/level] if reactivated! Primary skills represent practical experience on board ship: (1) weapons, (2) command, (3) systems, and (4) engineering. The GM may wish to allow those 10 points to be spent in other areas (e.g., on Administration for a logistics man). The Navy also plays a prominent role in Imperial military espionage, with an intelligence network to rival any dedicated agency's. Some former officers will combine naval and spy skills depending on how long they spent in each role.



Navy Aviation (Officer) — 90 points

A former naval officer (see *Navy (Officer)*, left), but trained to handle small craft (aerospace shuttles, fighters, etc.) as opposed to starships. Local navies within the Imperium rarely have "aviation assets" like this except for customs and anti-piracy duties.

Attributes: ST 10 [0], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: One of 3D Spatial Sense [10] or Acceleration Tolerance [10]; plus 15 points Acute Vision [2/level]; Charisma [5/level]; Combat Reflexes [15]; Courtesy Rank 3+ [1/level]; Danger Sense [15]; Daredevil [15]; G-Experience [10]; Improved G-Tolerance [10]; Reputation (Decorated) [varies]; Status 1 [5]; and Strong Will [4/level].

Disadvantages: A total of -25 points in Callous [-6]; Code of Honor (Officer's) [-5]; Duty (Reactivation, 6 or less) [-2] or (9 or less) [-5]; Fanaticism (Patriotism) [-15]; Impulsiveness [-10]; Intolerance (Enemy race or culture, Pirates, etc.) [-5]; Jealousy [-10]; Overconfidence or Glory Hound [-10 or -15]; Sense of Duty (His command) [-10]; Stubbornness [-5]; and Workaholic [-5].

Primary Skills: Gunner (any) (P/A) DX+2 [2]-14*; Gunner (any other) (P/A) DX+2 [2]-14*; Leadership (M/A) IQ-1 [1]-12; Piloting (Starship) (P/A) DX+2 [8]-14; Savoir-Faire (Military) (M/E) IQ [1]-13; and Tactics (Space) (M/H) IQ [4]-13.

Secondary Skills: Administration (M/A) IQ-1 [1]-12; Astrogation (M/A) IQ-1 [1]-12; Aviation (M/A) IQ-1 [1]-12; Computer Operation (M/E) IQ-1 [½]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Electronics Operation (Sensors) (M/A) IQ-1 [1]-12; Free Fall (P/A) DX [2]-12; and Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Navigation (M/H) IQ-2 [1]-11; Parachuting (P/E) DX-1 [½]-11; and a total of 2 points in Photography or Survival (any) (M/A); Beam Weapons (any) or Guns (any), both (P/E); or Carousing (P/A; HT).

* Includes +2 for IQ.

Customization Notes: Courtesy Rank should reflect your former service grade. Navy aviation officers either use the naval ranks listed for Navy (Officer) (above) or the following: flight lieutenant (Rank 3 [3]), squadron leader (Rank 4 [4]), wing commander (Rank 5 [5]), and group captain (Rank 6 [6]). The higher ranks don't get to fly (at least not as often as they would like, and never in combat). This becomes Military Rank [5/level] if reactivated.

Job Table

Job (requirements), Monthly Income	*Success Roll*	*Critical Failure*
Poor Jobs		
Bouncer at Low Dive (ST 10+), Cr400	ST	LJ, 4d/8d
Starport Panhandler* (Panhandling), Cr300	PR	1d/4d
Street Entertainer* (any one of Bard, Dancing, Musical Instrument, or Singing 10+), Cr50 × Skill	PR	-1i
Struggling Jobs		
Actor/Actress* (Acting 10+), Cr50 × Skill	PR	-1i/LJ, 1d
Bouncer at Better-Quality Dive (ST10+, Intimidation), Cr650	Best PR	LJ, 4d/8d
General Laborer (ST 10+), Cr550	PR	LJ/5d
Journalist* (Research 12+, Bard, or Photography 12+), Cr70 × Best PR *plus* Cr500 × Reputation	Best PR	-2i/LJ, 2d
Mechanic/Technician (any Mechanic skill at 12+), Cr120 × skill	PR	-1i/-1i, LJ, 2d
Roadie (ST 10+), Cr650	PR	-1i/LJ
Sales Clerk (Merchant 10+), Cr600	PR + Reaction	LJ
Security Guard (any combat skill at 10+, ST 10+), Cr600	PR	-1i, LJ/LJ, 4d
Translator (two additional languages at 12+), Cr100 × skill	Best PR-2	-2i/-3i, LJ
Average Jobs		
Bodyguard (ST 11+, one combat skill at 12+), Cr90 × IQ	ST	-1i, LJ/-1i, LJ, 4d
Lab Assistant/Tech Worker (Computer Operation 10+, Research 11+, any Science skill 10+), Cr100 × worst PR-6	Worst PR	-2i/LJ, 2d
Local Law Enforcement: Patrol (Law Enforcement, Streetwise, and Criminology 12+), Cr75 × best PR	Worst PR	-3i, 2d/LJ, 4d
Low-level Spy (Fast-Talk, Research, and Stealth), Cr100 × Worst PR	Worst PR	4d, LJ/Jailed
Mercenary Trooper (any two combat skills 10+), Cr100 × Best PR	Best PR-2	-2i, 4d/8d, LJ
Private Detective (Law Enforcement, Research, and Streetwise 12+), Cr75 × best PR	Worst PR	-3i, 2d/LJ, 4d
Prospector/Belter* (Prospecting 10+), Cr100 × Skill	Prospecting	-3i, 1d/LJ, 3d
Starship Crew (Status 0+, appropriate shipboard skill 10+), Cr80 × best appropriate skill *plus* Cr200 × (Rank or Status)	Specific job's PR	LJ, 2d/LJ, 8d
Studio Musician (any Musical Instrument 10+), Cr100 × PR	PR	LJ
Comfortable Jobs		
Back-up Musician (any Musical Instrument 12+), Cr100 × PR	PR	LJ
Black Marketeer* (Streetwise 12+, Merchant 10+), Cr300 × Worst PR	Streetwise	-3i/-5i, arrested
Doctor (Physician 13+, Status 0+), Cr350 × PR	PR	-3i/-10i, lose license
Engineer (any Engineer skill at 12+), Cr200 × PR	PR	-2i/-4i, LJ
Lawyer (Law 12+, Status 1+), Cr300 × PR	PR	-2i/-2i, LJ, 2d
Local Law Enforcement: Detective (Status 0+, Law Enforcement, Streetwise, and Criminology 12+), Cr75 × best PR *plus* Cr10 × (Status)	Worst PR	-3i, 2d/LJ, 4d
Mid-Level Spy (Diplomacy, Intelligence Analysis, and Research), Cr375	Worst PR	-6i/LJ
Mercenary Officer (Rank 1+, any one combat skill, Leadership, and Tactics 10+) Cr100 × Skill *plus* Cr10 × (Rank or Status)	Best PR-2	-2i, 4d/8d, LJ
Scientist (Computer Operation 12+, Research 13+, any Science skill 14+), Cr300 × best Science skill	Worst PR	-2i/LJ, 2d
Starship Officer (Rank 1+, Leadership 10+, appropriate shipboard skill 10+), Cr100 × best appropriate skill *plus* Cr200 × (Rank or Status)	Specific job's PR	LJ, 2d/LJ, 8d
Wealthy Jobs		
Major Corporate Stockholder (Very Wealthy+), Cr50,000	10	-2i/-5i, -1 level of Wealth, 2d
Remittance Man/Woman* (Status 2+), Cr12,000 × Status	IQ + Status	LJ**
Rock Star* (Status 2+, Performance 12+), Cr1,500 × Status	PR	LJ†

Key to Table

PR: Prerequisite; LJ: Lose Job; "d": dice of damage suffered (the GM may opt to play this out); "i": months of income lost.

* Freelance jobs. ** Family loses fortune and the supply of funds is cut off.

† Musical tastes change or band breaks up over artistic differences.

CHAPTER TWO

Characters

CHARACTER TEMPLATES

The following templates describe *former* members of the IISS, or those on detached duty. Any of them can be converted to a template for active-duty scouts, however. To do this, remove Claim to Hospitality (Former scouts) [10], replace Duty (Reactivation, 9 or less) [-5] with Duty (Scout Service, 15 or less) [-15] and replace Courtesy Rank [1/level] with Administrative Rank [5/level]. If a template does not have Courtesy Rank [1/level] already, add it (limited to Rank 5 or less). The net effect reduces the template's cost by 10 points.

BASE CREWMAN — 60 POINTS

You're a citizen of the Imperium from a backwater planet. Before you began your adventuring life, you worked at the local scout base on your home world. That gave you an itch to see other worlds, under other suns. Your time in service also gave you some of the skills you would need to make it out among the stars.

Attributes: ST 10 [0], DX 11 [10], IQ 12 [20], HT 11 [10].

Advantages: A total of 15 points chosen from Claim to Hospitality (Former scouts) [10], Common Sense [10], Courtesy Rank 1-5 [1/level], Fit [5], Intuition [15], Luck [15], Mathematical Ability [10], Sanctity [5], Single-Minded [5], Strong Will [4/level] and Versatile [5].

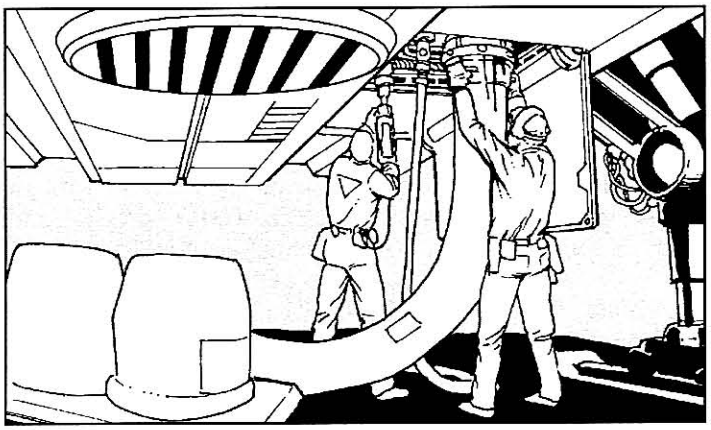
Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -15 points chosen from Code of Honor (Scouts) [-5], Curious [-5 to -15], Honesty [-10], Impulsiveness [-10], Overconfidence [-10], Poverty (Struggling) [-10], Primitive [-5/level], Shyness [-5 to -15], Truthfulness [-5], Uneducated [-5], Workaholic [-5] and Xenophilia [-5 or -15].

Primary Skills: Mechanic (any) (M/A) IQ+2 [6]-14 and *one* of Computer Operation (M/E) IQ+2 [4]-14 or Electronics Operation (any) (M/A) IQ+1 [4]-13.

Secondary Skills: Administration (M/A) IQ [2]-12, Free Fall (P/A) DX+1 [4]-12, Scrounging (M/E) IQ [1]-12 and Vacc Suit (M/A) IQ [2]-12.

Background Skills: A total of 6 points in Electronics (any) or Engineer (any), both (M/H), Armoury (any), Electronics Operation (any), Mechanic (any), Shipbuilding (Starship), Streetwise or Survival (any), all (M/A), Driving (any) or Piloting (any non-starship), both (P/A), or Beam Weapons (any) or Guns (any), both (P/E).

Customization Notes: This is a relatively cheap template. At least some leftover points should be spent on skills from the character's home-planet background. Someone from an agricultural world might have Agronomy, low-tech Craft skills, or extra Survival. Someone from a more urbanized environment might have extra Social or Thief/Spy skills. Growing up in the local educational system, a base crewman might have scientific or technical skills based on a lower Tech Level than the Imperial norm.



COURIER — 80 POINTS

You're a member of the Imperial Courier Service. You know your way around small, fast starships. Within five minutes of planetfall, you're always ready to investigate the local culture (or at least the local nightlife). You tend to tell tall stories about your time in the Service, since "I delivered the mail" isn't a good brag line in starport bars . . .

Attributes: ST 10 [0], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points chosen from 3D Spatial Sense [10], Claim to Hospitality (Former scouts) [10], Combat Reflexes [15], Common Sense [10], Danger Sense [15], Daredevil [15], Fashion Sense [5], Fit [5], G-Experience [10], Improved G-Tolerance [10], Jack-of-All-Trades [10/level], Luck [15] and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Compulsive Carousing [-5], Curious [-5 to -15], Extravagance [-10], Impulsiveness [-10], Overconfidence or Glory Hound [-10 or -15], Workaholic [-5] and Xenophilia [-5 or -15].

Primary Skills: Astrogation (M/A) IQ [2]-13, Electronics Operation (Communications) (M/A) IQ [2]-13, Electronics Operation (Sensors) (M/A) IQ [2]-13 and Piloting (small starships) (P/A) DX+1 [4]-13.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Computer Operation (M/E) IQ-1 [½]-12, Free Fall (P/A) DX [2]-12, Mechanic (J-Drive) (M/A) IQ-1 [1]-12, Mechanic (M-Drive) (M/A) IQ-1 [1]-12, Survival (any) (M/A) IQ-1 [1]-12 and Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Astronomy (M/H) IQ-2 [1]-11, Carousing (P/A) HT [2]-11, Streetwise (M/A) IQ-2 [½]-11, plus a total of 3 points in Area Knowledge (any) (M/E), Beam Weapons (any) (P/E), Gambling (M/A), Gunner (any ship-mounted) (P/A), Guns (any) (P/E) or Tactics (M/H).

Customization Notes: Active-duty Couriers involved in high-level diplomatic work may have the Diplomatic Immunity [20] advantage. Couriers tend to be competent while on duty but flamboyant in private, so many Social or Thief/Spy skills may be appropriate.

Deep-Cover Observer — 100 points

You were a deep-cover agent, working for Contact & Liaison or Intelligence Branch, on an interdicted world or beyond the borders of the Imperium. You were an "observer," not a "spy," since you were not after military or political intelligence. Your job was to blend in to local society, improving the Service's understanding of your adopted culture through long-term immersion. It was fascinating work, if stressful, and it left you with a taste for wandering the starlanes.

Attributes: ST 10 [0], DX 13 [30], IQ 13 [30], HT 10 [0].

Advantages: A total of 25 points chosen from Alertness [5/level], Alternate Identity [15], Charisma [5/level], Claim to Hospitality (Former scouts) [10], Collected or Imperturbable [5 or 10], Combat Reflexes [15], Common Sense [10], Cultural Adaptability [25], Danger Sense [15], Intuition [15], Jack-of-All-Trades [10/level], Language Talent [2/level], Luck [15], Panimmunity [10], Sanctity [5], Strong Will [4/level] and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Curious [-5 to -15], Insomniac [-10 or -15], Light Sleeper [-5], Loner or Reclusive [-5 or -10], Overconfidence [-10], Paranoia [-10], Secret [-5 to -20], Shyness [-5 to -15], Workaholic [-5] or Xenophilia [-5 to -15].

Primary Skills: Acting (M/A) IQ+2 [6]-15, Area Knowledge (target society) (M/E) IQ+1 [2]-14, Fast-Talk (M/A) IQ+2 [6]-15, Language (target society) (M/A) IQ [2]-13, Savoir-Faire (M/E) IQ [1]-13, plus Beam Weapons (any) *or* Guns (any), both (P/E) DX+2 [1]-15.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Computer Operation (M/E) IQ-1 [½]-12, Diplomacy (M/H) IQ-1 [2]-12, Disguise (M/A) IQ-1 [1]-12, Electronics Operation (Communications) (M/A) IQ-1 [1]-12, Electronics Operation (Sensors) (M/A) IQ-1 [1]-12, Holdout (M/A) IQ-1 [1]-12, Intelligence Analysis (M/H) IQ-1 [2]-12, Psychology (M/H) IQ-1 [2]-12, Research (M/A) IQ-1 [1]-12 and Stealth (P/A) DX-1 [1]-12.

Background Skills: Anthropology (M/H) IQ-2 [1]-11, Xenology (M/H) IQ-2 [1]-11, *one* of Streetwise or Survival (any), both (M/A) IQ-2 [½]-11, plus 5 points in Economics, History, Law, Literature, Philosophy or Theology, all (M/H), or Merchant or Politics, both (M/A).

Customization Notes: Active-duty observers may have Security Clearance [5/level], probably at level 3. The template largely covers the *social* skills that allow a deep-cover operative to blend in and live within his target culture. That society will have common technical skills, however, which the observer will have to be familiar with. These will likely be from the Combat/Weapon, Professional, or Vehicle skill classes.

* Includes +2 for IQ.



Exploration Scout — 90 points

You were an archetypal scout, working alone or in a small team, confronting the unknown on a regular basis. Even in this settled era, a certain romance clings to you. Drinking companions will demand your stories, the media on your homeworld will want to interview you. Unfortunately, having made yourself at home on a dozen worlds, you may find it hard to give up the walkabout life.

Attributes: ST 11 [10], DX 11 [10], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points chosen from Absolute Direction [5], Alertness [5/level], Animal Empathy [5], Charisma [5/level], Claim to Hospitality (Former scouts) [10], Combat Reflexes [15], Common Sense [10], Danger Sense [15], Daredevil [15], Fit [5], G-Experience [10], Improved G-Tolerance [10], Intuition [10], Jack-of-All-Trades [10/level], Language Talent [2/level], Luck [15], Panimmunity [10], Strong Will [4/level], and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Curious [-5 to -15], Impulsiveness [-10], Overconfidence [-10], Sense of Duty (indigenous cultures) [-10], Workaholic [-5], and Xenophilia [-5 or -15].

Primary Skills: Cartography (M/A) IQ [2]-13, Electronics Operation (Sensors) (M/A) IQ [2]-13, Survival (any) (M/A) IQ [2]-13, *one* of Driving (any) or Piloting (any), both (P/A) DX+2 [8]-13, and *one* of Astrogation (M/A) IQ [2]-13 or Navigation (M/H) IQ-1 [2]-12.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Computer Operation (M/E) IQ-1 [½]-12, Electronics Operation (Communications) (M/A) IQ-1 [1]-12, First Aid (M/E) IQ-1 [½]-12, Free Fall (P/A) DX+1 [4]-12, and Vacc Suit (M/A) IQ-1 [1]-12, plus *one* of the following:

1. Two of Astronomy, Botany, Chemistry, Ecology, Geology, Mathematics, Paleontology or Physics, all (M/H) IQ-1 [2]-12.
2. *Either* two of Anthropology, Archaeology, Economics, History, Mathematics, Philosophy, Psychology, Theology, or Xenology, all (M/H) IQ-1 [2]-12, *or* Linguistics (M/VH) IQ-1 [4]-12.

Background Skills: Intelligence Analysis (M/H) IQ-2 [1]-11, Planetology (any) (M/A) IQ-2 [½]-11, Xenobiology (any) (M/A) IQ-2 [½]-11, plus a total of 4 points in Area Knowledge (any) (M/A), Beam Weapons (any) (P/E), Diplomacy (M/H), Guns (any) (P/E), Language (any) (M/A), Savoir-Faire (M/E), or Tracking (M/A).

Customization Notes: Scouts choosing secondary skills from set 1 are probably members of the Exploration Branch, while those selecting from set 2 are probably from Contact & Liaison. Exploration scouts are always versatile survivor-types, and are often scientific experts as well. Extra points might be spent on higher levels of skill, or on exotica such as Biochemistry, Genetics, Hyperspace Physics, Nuclear Physics, or Physiology.

Intelligence Officer — 95 points

There's a great Game underway, and you were one of the more important pieces. In Intelligence Branch, you coordinated assets, handling the agents who got the information no one else could get. It was dangerous and painstaking work, but it was also fun. Too bad you had to leave. Anyone need an out-of-work spymaster?

Attributes: ST 11 [10], DX 11 [10], IQ 13 [30], HT 11 [10].

Advantages: A total of 25 points chosen from Alertness [5/level], Alternate Identity [15], Claim to Hospitality (Former scouts) [10], Collected or Imperturbable [10 or 15], Combat Reflexes [15], Common Sense [10], Contacts (Any, skill-18, 9 or less, somewhat reliable) [3/contact], Courtesy Rank [1/level], Danger Sense [15], Intuition [15], Language Talent [2/level], Luck [15], Sanctity [5], Strong Will [4/level], Versatile [5] and Zeroed [10].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Curious [-5 to -15], Enemy (enemy agents, 6 or less) [-15], Light Sleeper [-5], Loner [-5], Mistaken Identity [-5], Nightmares [-5], Overconfidence [-10], Paranoia [-10], Secret [-5 to -20] and Sense of Duty (operatives) [-10].

Primary Skills: Administration (M/A) IQ [2]-13, Computer Operation (M/E) IQ [1]-13, Electronics Operation (Communications) (M/A) IQ [2]-13, Intelligence Analysis (M/H) IQ [4]-13 and Interrogation (M/A) IQ [2]-13.

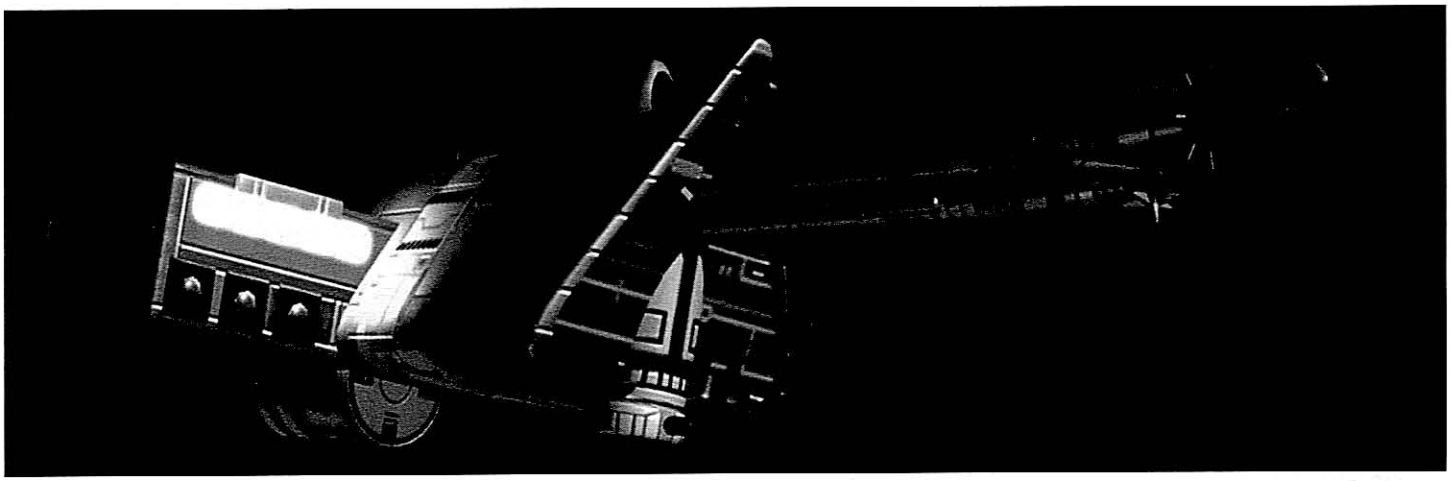
Secondary Skills: Acting (M/A) IQ-1 [1]-12, Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Detect Lies (M/H) IQ-1 [2]-12, Electronics Operation (Sensors) (M/A) IQ-1 [1]-12, Fast-Talk (M/A) IQ-1 [1]-12, Photography (M/A) IQ-1 [1]-12, Research (M/A) IQ-1 [1]-12, Savoir-Faire (M/E) IQ-1 [½]-12, Traffic Analysis (M/H) IQ-1 [2]-12, and *one* of Beam Weapons (any) or Guns (any), both (P/E) DX+1 [½]-14.



Background Skills: Carousing (P/A) HT+1 [4]-11, Psychology (M/H) IQ-2 [1]-11, and a total of 7 points in Cartography (M/A), Computer Programming (M/H), Cryptanalysis (M/H), Cryptology (M/H), Driving (any) (P/A), Forgery (M/H), Heraldry (M/A), Piloting (any) (P/A), or SIGINT Collection/ Jamming (M/H).

Customization Notes: Active-duty Intelligence officers will have Security Clearance [5/level], probably at level 2 or 3. An Intelligence officer often specializes in some subject relevant to the information he has been assigned to help collect. This may imply Area Knowledge, professional skills such as Law or Politics, or technical skills.

* Includes +2 for IQ.



Personnel Officer — 75 points

Okay, so you were a bureaucrat. You still know people better than anyone. You know how to make contacts, motivate colleagues, teach skills, find resources, get things done. Sure, the group has people who know how to drive starships and handle guns. Do they have someone who can form a coherent sentence?

Attributes: ST 10 [0], DX 11 [10], IQ 13 [30], HT 10 [0].

Advantages: A total of 25 points chosen from Charisma [5/level], Claim to Hospitality (Former scouts) [10], Common Sense [10], Contacts (Military, skill-18, 9 or less, usually reliable) [6/contact], Courtesy Rank [1/level], Empathy [15], Imperturbable or Unfazeable [10 or 15], Intuition [15], Sanctity [5], and Strong Will [4/level].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Curious [-5 to -15], Honesty [-10], Impulsiveness [-10], Sense of Duty [-5 to -20], Workaholic [-5] and Xenophilia [-5 or -15].

Primary Skills: Administration (M/A) IQ+1 [4]-14, Computer Operation (M/E) IQ+1 [2]-14, Savoir-Faire (Military) IQ [1]-13, and *either* Diplomacy (M/H) IQ [4]-13 *or* Teaching (M/A) IQ+1 [4]-14.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Electronics Operation (Communications) (M/A) IQ-1 [1]-12, Fast-Talk (M/A) IQ-1 [1]-12, Free Fall (P/A) DX+1 [4]-12, Politics (M/A) IQ-1 [1]-11, Vacc Suit (M/A) IQ-1 [1]-12, and *one* of Driving (any) or Piloting (any non-spacecraft), both (P/A) DX+1 [4]-12.

Background Skills: Carousing (P/A) HT+1 [4]-11, Leadership (M/A) IQ-2 [½]-11, Psychology (M/H) IQ-2 [1]-11, Streetwise (M/A) IQ-2 [½]-11, plus 4 points in Area Knowledge (any) (M/E), Beam Weapons (any) (P/E), Guns (any) (P/E), or Language (any) (M/A).

Customization Notes: Personnel officers who are travelling on their own may need extra skills to give them some combat, ship-handling, or survival ability. Their main focus is on people, however, so some extra points should probably go into Social or Thief/Spy skills.

S-3 Operative — 130 points

You were a member of the Special Security Service. Who needs Marines? You were the fastest, the quietest, the best at blending into the background, the best at winning victories without shedding a drop of blood. You were subtle. Marines are many things, some of them very worthwhile, but they are *not* subtle.

Attributes: ST 11 [10], DX 13 [30], IQ 13 [30], HT 11 [10].

Advantages: Combat Reflexes [15], Fit [5], G-Experience [10] and a total of 10 points chosen from 3D Spatial Sense [10], Alertness [5/level], Claim to Hospitality (Former scouts) [10], Common Sense [10], Courtesy Rank 1-5 [1/level], Fearlessness [2/level], High Pain Threshold [10], Improved G-Tolerance [10], Jack-of-All-Trades [10/level], Strong Will [4/level], Toughness [10], Versatile [5] and Very Fit [10] (adds to cost of Fit).

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Fanaticism (Imperial patriot) [-15], Overconfidence or Glory Hound [-10 or -15], Sense of Duty (fellow Scouts) [-10], Stubbornness [-5] and Workaholic [-5].

Primary Skills: *Two* Beam Weapons or Guns skills, each (P/E) DX+2 [1]-15*, plus Free Fall (P/A) DX+1 [4]-14, Savoir-Faire (Military) (M/E) IQ [1]-13, Tactics (M/H) IQ [4]-13, Vacc Suit (M/A) IQ [2]-13, and *one* of Judo or Karate, both (P/H) DX [4]-13.

Secondary Skills: Armoury (Small arms) (M/A) IQ-1 [1]-12, Battlesuit (P/A) DX-1 [1]-12, Camouflage (M/E) IQ-1 [½]-12, Computer Operation (M/E) IQ-1 [½]-12, Electronics Operation (Communications) (M/A) IQ-1 [1]-12, Electronics Operation (Sensors) (M/A) IQ-1 [1]-12, Engineer (Combat) (M/H) IQ-1 [2]-12, First Aid (M/E) IQ-1 [½]-12, Gesture (M/E) IQ-1 [½]-12, Knife (P/E) DX-1 [½]-12, Scrounging (M/E) IQ-1 [½]-12, Traps (M/A) IQ-1 [1]-12, *one* of Broadsword, Shortsword or Spear, all (P/A) DX-1 [1]-12, and *one* of Driving (any) or Piloting (any), both (P/A) DX-1 [1]-12.

Background Skills: Administration (M/A) IQ-2 [½]-11, Leadership (M/A) IQ-2 [½]-11, Planetology (any) (M/A) IQ-2 [½]-11, Psychology (M/H) IQ-2 [1]-11, Stealth (M/A) DX-2 [½]-11, Xenology (M/H) IQ-2

[1]-11, and 2 points in Languages (any) or Survival (any), both (M/A).

Customization Notes: There is very little choice in background skills here. S-3 operatives should have no physical disadvantages, unless they acquired them by being wounded in the line of duty.

* Includes +2 for IQ.

Security Officer — 90 points

You were in Security Branch, not one of those S-3 hotshots, just a policeman on the beat. You weren't trained for combat, exactly, although on the frontier the people you arrested weren't always willing to come along peacefully.

Attributes: ST 11 [10], DX 12 [20], IQ 12 [20], HT 10 [0].

Advantages: A total of 20 points chosen from Alertness [5/level], Claim to Hospitality (Former scouts) [10], Courtesy Rank [1/level], Combat Reflexes [15], Contacts (Military, skill-18, 9 or less, usually reliable) [6/contact], Fearlessness [2/level], Fit [5], Danger Sense [15], Intuition [15], Legal Enforcement Powers [5], Strong Will [4/level], and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Cannot Harm Innocents [-10], Curious [-5 to -15], Enemy (criminal interests, 6 or less) [-15], Honesty [-10], Intolerance (criminals) [-5], Impulsiveness [-10], Overconfidence [-10], Sense of Duty [-5 to -20], and Workaholic [-5].

Primary Skills: Judo (P/H) DX+1 [8]-13, Law Enforcement (M/A) IQ+2 [6]-14, and *one* of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-14.

Secondary Skills: Administration (M/A) IQ [2]-12, Computer Operation (M/E) IQ [1]-12, Criminology (M/A) IQ [2]-12, Electronics Operation (Communications) (M/A) IQ [2]-12, Electronics Operation (Sensors) (M/A) IQ [2]-12, Free Fall (P/A) DX [2]-12, Research (M/A) IQ [2]-12, Savoir-Faire (Military) (M/E) IQ [1]-12, Vacc Suit (M/A) IQ [2]-12, and *one* of Driving (any) or Piloting (any), both (P/A) DX [2]-12.

Background Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-11, Interrogation (M/A) IQ-1 [1]-11, Intimidation (M/A) IQ-1 [1]-11, Psychology (M/H) IQ-1 [2]-11, Streetwise (M/A) IQ-1 [1]-11, plus a total of 5 points in Area Knowledge (any) (M/A), Armoury (any) (M/A), Gunnery (any) (P/A), Intelligence Analysis (M/H), Language (any) (M/A), Law (M/H), Leadership (M/A), or Tactics (M/H).

Customization Notes: The Legal Enforcement Powers for a former member of Security Branch is equivalent to an Imperial weapons permit, allowing the ex-scout to carry a concealed weapon in certain areas when others legally can't. An active-duty Security officer would automatically have 10 points of Legal Enforcement Powers (see p. 7). IISS Security officers don't tend to be combat monsters, instead thinking their way through difficult situations. Extra points are as likely to be spent on Social, Thief/Spy, or even Science skills as on combat.

Survey Scout — 80 points

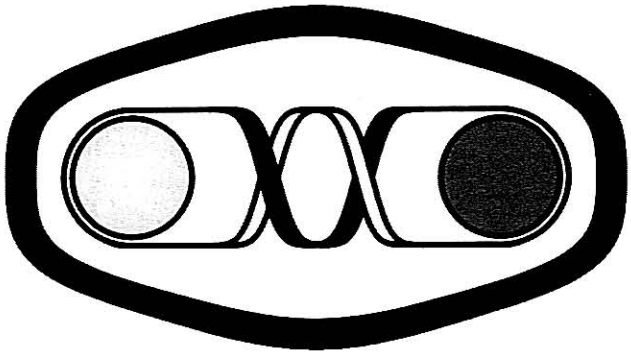
You were a member of the Imperial Grand Survey. You know your way around ships and sensors better than anyone else in space, and you're not shy about the fact. You get along well with people, as long as no one makes that joke about "counting rocks."

Attributes: ST 10 [0], DX 11 [10], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points chosen from 3D Spatial Sense [10], Claim to Hospitality (Former scouts) [10], Collected or Imperturbable [5 or 10], G-Experience [10], Improved G-Tolerance [10], Single-Minded [5], Strong Will [4/level] and Versatile [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Curious [-5 to -15], Loner or Reclusive [-5 or -10], Shyness [-5 to -15], Stubbornness [-5] and Workaholic [-5].

Primary Skills: Cartography (M/A) IQ+2 [6]-15, Electronics Operation (Sensors) (M/A) IQ+1 [4]-14, and Surveying (M/A) IQ [2]-13.



Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1 [2]-12, Astrogation (M/A) IQ-1 [1]-12, Computer Operation (M/E) IQ-1 [½]-12, Electronics Operation (Communications) (M/A) IQ-1 [1]-12, Free Fall (P/A) DX+1 [4]-12, Photography (M/A) IQ-1 [1]-12, Piloting (small starship) (P/A) DX+1 [4]-12, Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Astronomy (M/H) IQ-2 [1]-11, First Aid (M/E) IQ-1 [½]-12, Intelligence Analysis (M/H) IQ-2 [1]-11, Navigation (M/H) IQ-2 [1]-11, Planetology (any) (M/A) IQ-2 [½]-11, Survival (any) (M/A) IQ-2 [½]-11, plus a total of 4 points in Area Knowledge (any) (M/E), Beam Weapons (any) (P/E), Guns (any) (P/E), Gunnery (any ship-mounted) (P/A), Mechanic (J-Drive or M-Drive) (M/A).

Customization Notes: The requirements of the Imperial Grand Survey are fairly constant, but its members probably travel around more than almost any other scouts. Use extra Area Knowledge, Planetology and Survival skills to reflect the places your scout has been. Survey scouts also have a habit of heavy carousing when they get shore leave, so additional Social or Thief/Spy skills may come in handy.

* Includes +2 for IQ.

XBOAT PILOT — 80 POINTS

You are a graduate of the Express Boat Service. As such, you've got skills that are in demand. You've also got a reputation for being a little off the deep end, but there are plenty of employers who don't care about that as long as you get the job done.

Attributes: ST 10 [0], DX 12 [20], IQ 13 [30], HT 11 [10].

Advantages: A total of 20 points chosen from 3D Spatial Sense [10], Claim to Hospitality (Former scouts) [10], Collected or Imperturbable [5 or 10], G-Experience [10], Improved G-Tolerance [10], Strong Will [4/level] and Single-Minded [5].

Disadvantages: Duty (Reactivation, 9 or less) [-5] and a total of -20 points chosen from Code of Honor (Scouts) [-5], Loner or Reclusive [-5 or -10], No Sense of Humor [-10], Reputation (Eccentric) [-5/level], Shyness [-5 to -15], Stubbornness [-5] and Workaholic [-5].

Primary Skills: Astrogation (M/A) IQ+2 [6]-15, Computer Operation (M/E) IQ [1]-13, Electronics Operation (Communications) (M/A) IQ [2]-13, Electronics Operation (Sensors) (M/A) IQ [2]-13, and Mechanic (J-Drive) (M/A) IQ [2]-13.

Secondary Skills: Area Knowledge (Galaxy) (M/H) IQ-1.

Disadvantages:[2]-12, Free Fall (P/A) DX [2]-12, Guns (any) (P/E) DX+2 [1]-14, Piloting (small starship) (P/A) DX [2]-12 and Vacc Suit (M/A) IQ-1 [1]-12.

Background Skills: Astronomy (M/H) IQ-2 [1]-11 and a total of 3 points in Area Knowledge (any) (M/E), Artist (M/H), Beam Weapons (any) (M/E), Meditation (M/H), Musical Composition (M/H), Musical Instrument (any) (M/H), Poetry (M/A), Sculpting (P/A), or Writing (M/A).

Customization Notes: By itself, the template includes adequate (but rather one-sided) shipboard skills. Extra points might be spent to round those out, or emphasis might be put on the background skills which represent what the pilot did during his off-duty hours.

* Includes +2 for IQ.

ADVANTAGES

Administrative Rank — *see p. CI19*

The IISS is not a military organization, so none of its members hold Military Rank. Members of the Bureaucracy, however, can hold Administrative Rank reflecting their level of authority and responsibility. See *Ranks and Pay Grades* below for a detailed description of the Service's rank structure. Rank in the IISS does not entitle one to military honors, but it does bring informal respect and deference from others in the Imperial service.



Claim to Hospitality — *see p. CI21*

Retired and detached-duty scouts may be granted official lodging privileges at IISS facilities throughout the Imperium. The scout may stay in guest quarters and use recreational facilities on-base for free, as long as space is available. The Service also encourages an informal hospitality network. Thus, even if space is not available at the nearest IISS base, an ex-scout with this advantage may be able to get a list of others living in the area, who will be able to house him for a short time. This service isn't coercive. An ex-scout doesn't have to make himself available for the network, although he must do so if he expects to be able to take advantage of it himself.

Courtesy Rank — *see p. CI23*

Field scouts on *active duty* will hold Courtesy Rank in accordance with their expertise and authority. When the Field scout is operating as part of a team including members of the Bureaucracy, the Courtesy Rank acts as a "place-holder" to indicate his current position in the chain of command. It holds no other function and does not entitle the scout to military honors. Field scouts never hold Courtesy Rank higher than level 6.

Meanwhile, retired and detached-duty scouts may hold Courtesy Rank if they held some level of Administrative Rank while on active duty in the Bureaucracy (see above).

Legal Enforcement Powers — *see p. B21*

Active-duty members of the Security Office often have this advantage because of their duty to enforce the interdiction laws. Such officers have full Imperial authority and can override or demand the cooperation of local authorities. They also have broad powers to engage in covert investigations. This level of Legal Enforcement Powers is worth 10 points.

Reputation *see p. B17*

The culture of the Field places a lot of emphasis on individual excellence. Field scouts can easily earn a Reputation within the IISS, on the basis of technical expertise or missions accomplished. As scattered as the Service is, of course, it would be very unusual for anyone to be recognized more often than "sometimes" (10 or less).

Security Clearance *see p. CI29*

For the purposes of character design, assume that the IISS recognizes three levels of security clearance. Level 1 is "Confidential" clearance, access to information which is classified but not particularly sensitive. Level 2 is "Secret" clearance, access to information which would do substantial harm to Imperial interests if revealed. Level 3 is "Most Secret" clearance, access to information which would do severe harm to Imperial interests if revealed. Most Secret clearance is probably required for deep-cover spies, important analysts, and policy-makers. Minor functionaries in the Intelligence apparatus can do with lower levels of clearance.

Ship Patron *see p. GT84*

Detached-duty scouts who have served at least 12 years on active duty may be assigned a surplus *Suleiman*-class scout/courier vessel. This can be considered an extension of the Claim to Hospitality (see above) for scouts who are considered more important by the Detached Duty Office. See sidebar, p. 10 for details of the obligation assumed by a scout with such a Ship Patron.

Status *see p. B18*

Although the Imperial nobility certainly recognizes the Scout Service as an important institution, few scions of the noble houses enlist in it. One reason for this may be the internal culture of the IISS, which discourages class consciousness in favor of an egalitarian atmosphere of teamwork. Whatever the reason, even members of the Bureaucracy do not automatically earn Social Status with higher rank. Many scouts have been knighted, but few have ever been granted entry into the peerage in exchange for their service.

Disadvantages

Code of Honor (Scouts) *see p. B31*

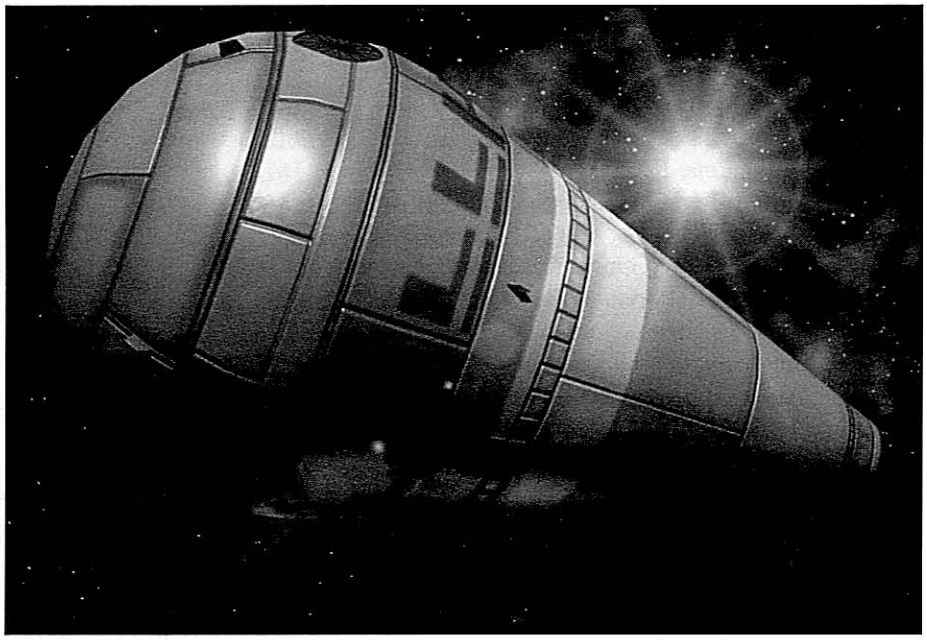
Aside from the usual requirements of Imperial service, the IISS instills a certain personal code of conduct into its recruits. An ideal Scout never gives any mission less than his full effort once he has accepted it. He is expected to exercise initiative, and operate without orders when necessary. He is also expected to accept the consequences of his decisions, whether good or bad, without flinching. Not all Scouts subscribe to this Code of Honor, but almost all Field scouts do. This specific Code is worth -5 points.

Duty (Reactivation) *see p. B39*

Almost all detached-duty scouts have this disadvantage at a 5-point level, implying that the Duty will appear on a 9 or less in any given session. This does not necessarily mean a major commitment of time, such as might keep the character out of the current adventure. Most often, the IISS will call the scout in for a *short* return to active duty. Perhaps he is reporting to an Intelligence Branch officer on what he's seen over the last few months. Or maybe he is needed to brief other scouts on a world he visited years before. Or he has technical skills that are needed in the short term by an IISS team on the same world. In any case, the GM can use the Duty as a way to provide background information to his players . . . or as a plot hook!

Social Stigma (Robot) *see p. B27*

The IISS often makes use of robots in the course of its mission, and in fact Scout robots are often the most intelligent and self-directed to be found in Imperial service. It is possible for a Scouts campaign to use robots as *characters* (using the appropriate rules from ***GURPS Robots***). If so, any robot (whether NPC or PC) must take this Social Stigma as a disadvantage while operating within Imperial society (see p. GT18). It is equivalent to the *valuable property* Social Stigma from the ***Basic Set***, and is worth -10 points.



Skills

Battlesuit *see p. B49*

Battlesuits using gravitic technology can easily be made air-mobile. Use Battlesuit skill for flying battlesuits so long as they are grounded, but use Piloting (Grav Belt) in the air. A scout with Battlesuit skill should also have the Piloting specialty.



Cryptanalysis *see p. B245*

High-tech civilizations all face the problem of encoding words, sounds or images in digital form. The exact codes (or *protocols*) used vary widely, so scout teams which intercept an alien civilization's transmissions often need to strip away a new encoding scheme to get to the meaningful content. Such transmissions are not encrypted in the strict sense, but scouts can use Cryptanalysis to figure out any new digital communications protocol. The GM must determine the difficulty of any such attempt.

Rank and Pay Grades

The IISS Bureaucracy uses a ladder of ranks and pay grades to fill out its hierarchy. These ranks are similar to those of the military services, but they don't carry the same weight of military protocol. Scout characters use Administrative Rank (see p. 24) to represent rank in the IISS. Most scouts in the Bureaucracy use a ladder of titles unique to the Service. The exception is Security Branch, which has a more military tradition and uses traditional military titles up to the rank of Colonel. Higher ranks use the common Bureaucracy titles, although it is rare for someone to reach these ranks while remaining in Security Branch. Security Branch uses the same pay scale as the rest of the Service.

Refer to the *Rank and Pay Grade Table* to see how the various ranks stack up. Monthly salaries are given for each rank. Scouts tend to be relatively well-paid compared to members of the military services. Note that a detached-duty scout who is called up for a short term of active duty will normally be paid according to the rank he held when he went on detached duty. As a courtesy, the scout is paid for a full day even if his term of duty was only a few hours.

Rank and Pay Grade Table

Rank	Title (Security Branch Title)	Salary
0	Recruit (Private)	300
	Apprentice (Lance Corporal)	400
	Journeyman (Corporal)	500
1	Skilled Worker (Lance Sergeant)	600
	Assistant Team Leader (Sergeant)	650
	Team Leader (Gunnery Sergeant)	700
2	Assistant Supervisor (Lead Sergeant)	800
	Supervisor (First Sergeant)	900
	Senior Supervisor (Sergeant Major)	1,200
3	Admin Trainee (Second Lieutenant)	1,200
	Junior Administrator (First Lieutenant)	1,400
4	Administrator (Captain)	1,600
	Group Administrator (Major)	1,800
5	Senior Administrator (Lieutenant Colonel)	2,000
6	Scout Commander (Colonel)	2,400
7	Scout Leader	2,800
	Senior Scout Leader	3,200
8	Sector Scout Leader	4,000

Rank-0 scouts are new recruits into the Bureaucracy, without any prior education that would suit them for serious responsibilities right away. They are in a training phase of their career, up to the rank of Journeyman.

Rank-1 scouts (Skilled Workers and Team Leaders) have been in the Service for several years, and can be given greater responsibilities. They may have a highly technical position or be in charge of the day-to-day operation of a small team. These are roughly equivalent to junior NCOs in the military services.

"I don't know why everybody says the Scouts don't have ranks. Anyone who has ever been inside an express boat cockpit towards the end of a trip can tell you that Scouts can be ***very*** *rank!"*

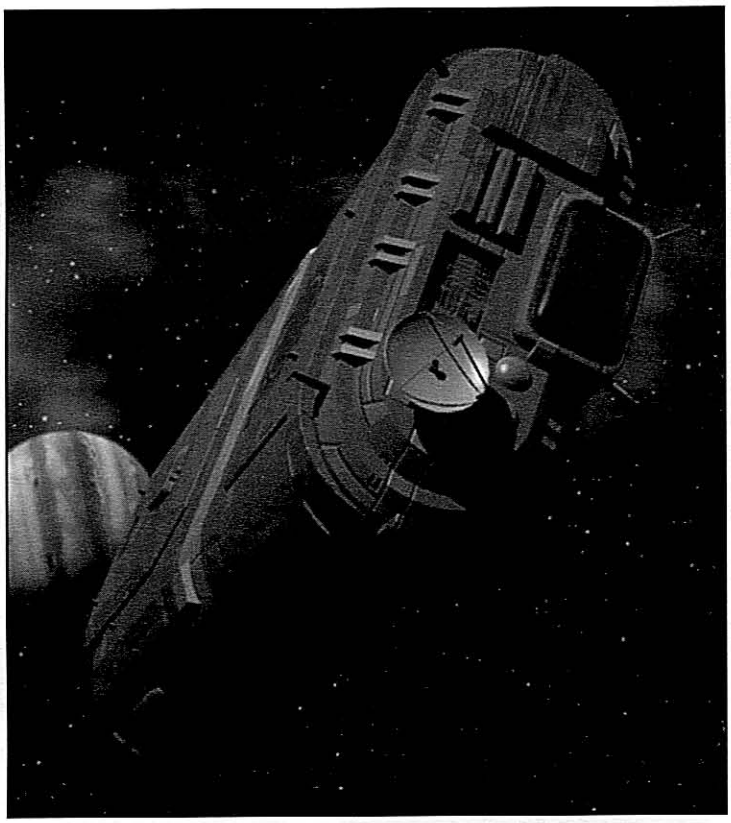
– Comedian Anton Wilson Peale



Rank-2 scouts (Supervisors) are senior members of the Service, with plenty of skills and experience. They are not in the direct chain of command, but they often oversee the routine operations of very large teams.

Rank-3 scouts (Junior Administrators) are the least senior ones actually on the "management track," equivalent to Lieutenants in the military services. They may have a good technical education, but they lack experience and will lean heavily on the Team Leaders and Supervisors in their office.

Rank-4 scouts (Administrators) are the middle-management of the Scout Service. They may be the final authority for relatively large teams of scouts (up to a few dozen), or they may be senior staff at a subsector's most important IISS facility. For many small IISS bases, an Administrator is the seniormost official present.



Rank-5 scouts (Senior Administrators) are in charge of larger facilities, or may be senior staff at IISS sector headquarters.

Rank-6 scouts (Scout Commanders) are the senior-most ones normally seen in the field. They command very large IISS vessels, such as the *Pytheas*-class exploratory cruiser (see p. 37). They can also be placed in charge of large-scale IISS missions, such as the squadron enforcing an interdiction blockade. They may also be in charge of very large IISS bases or way stations.

Rank-7 scouts (Scout Leaders) are placed in command of all IISS operations in a subsector. Scouts at this rank with more experience are assigned to important subsectors, such as potential war zones or regions including "difficult" interdicted worlds.

Rank-8 scouts (Sector Scout Leaders) are in command of IISS operations in an entire sector. They have subtle, but wide-ranging, influence on Imperial policy throughout their jurisdiction. A small group of these scouts forms the nucleus of IISS Headquarters in Core sector.

Scouts in the Field offices do not hold formal rank, although while on active duty they will hold Courtesy Rank to indicate their relative seniority with respect to the Bureaucracy. A Field scout's pay grade is roughly equivalent to that of a ranked scout with equal seniority. For example, a member of the Exploration Office has level 4 Courtesy Rank. He is paid about the same as an Administrator. If he joined a team including members of the Bureaucracy, he could be given a technical position at the same level as an Administrator. He would not be in the chain of command, and would not be treated as the equal of a military or IISS officer in a protocol situation.

EQUIPMENT

WEAPONS

Scouts on duty tend to use the same weapons as a light infantry unit: rifle, ACR, laser carbine or rifle. They rarely carry heavy weapons such as plasma or fusion guns. Instead, they are likely to use nonlethal weapons.

For example, scouts are often faced with the problem of capturing an animal (or a person) without injury. One solution is tranq rounds in standard rifles (see p. GT111).

PERSONAL EQUIPMENT

- **Chronometer (TL8):** A scout's timepiece keeps Imperial standard time, and can also be quickly programmed to keep time in accordance with any planet's rotation and orbital periods. The display can be set to show up to three different time standards at once. Works on an A cell for one year. Cr100, 0.5 pounds.
- **Covert Action Communicator (TL12):** This is a tiny radio communicator, the size of a small coin, which is normally worn next to the user's skin at the base of his throat. It acts as a very short-range communicator with a range of about fifty miles, enough to reach a backup team in hiding or a ship in low orbit. The user may subvocalize into it, communicating without moving his lips. Cr100, weight negligible.
- **Emergency Beacon (TL9):** A specialized communicator and signal transponder. When activated, the beacon waits for transmissions on standard emergency channels, presumably from a search party. When it detects them, it responds with a strong coded distress signal and can then open communication between its user and the rescuing party. The device can operate for up to 1 year on an A cell in passive mode. Cr1,000, 2 pounds.



- **Goodwill Kit (TL10):** Since its earliest days, the IISS has used these kits to gain entry into "primitive" societies (i.e., anything from TL5 down). The kit comes in a secure shoulder case, and includes items such as microchip voice recorders, synthetic gemstones, high-quality steel blades, candy, simple medical drugs, heat-sensitive fabric dyes, and other simple items that are likely to impress members of a pre-industrial culture. Even the canister can be used as a sealed food container or water sack. The highly unofficial term for this item is the "Amaze-the-Natives Kit." Cr200, 20 pounds.
- **Laser Communicator (TL8):** A field laser communicator is often used by scout teams when radio transmissions might be intercepted. The laser device is mounted on a sturdy tripod to make it easy to maintain aim. It has a range of 10 miles at TL8 (100 miles at TL9, 500 miles at TL10+) but is restricted to line-of-sight. Works for 1 hour on an A cell (assuming continuous transmission). Cr650, 5 pounds.
- **Medscanner (TL9):** A compact scanner with a dedicated medical computer, designed to make detailed diagnoses when used by a trained physician on a known species. The medscanner's detachable probe must be placed in contact with the patient's skin, preferably over the chest (or other site near the vital organs). On a successful Electronics Operation (Medical) roll it adds +3 to a Diagnosis roll (+1 per TL over 9). The scanner works for 1 year on an A cell. Cr750, 0.5 pounds.
- **Medscanner Computer (TL9):** A dedicated computer loaded with a medical expert system. The computer can read medscanner output and perform diagnoses even when operated by someone with no medical skill (actually implementing any indicated treatment is another matter). The expert system has Diagnosis skill at 11 (this can be improved by a successful use of the medscanner). Works for 1 year on an A cell. Cr20,000, 1 pound.
- **Translator (TL10):** A small computer dedicated to the task of translating between two languages. The unit can be held in the hand or clipped to a belt or other clothing. The quality of translation is reasonable (effective skill 14 in the two languages), but there are drawbacks since the software is not intelligent. Even when working with similar languages, the unit may miss subtle nuances and will have trouble with highly idiomatic or metaphorical language. IISS policy is to prefer a more complex interpreter robot or a sentient interpreter over this device when possible.

  For spoken languages, the translator has built-in speakers and can deliver translation to its user through an earpiece or headset. It has peripheral ports for connection to various standard accessories for generating unusual communications forms (color shifts, text symbols, ultra- or infrasound, and so on). These accessories vary widely in cost, and a complete set may cost as much as the basic translator unit itself. Translation requires that database chips for the two languages be inserted into the device. Language chips have negligible weight and cost Cr1,000 apiece (more for obscure or very difficult languages). The basic translator unit runs for a year on an A cell. Cr10,000, 1 pound.

Chapter Four

Starport Characters

A starport will have its own unique cast of characters. This chapter introduces some of those personalities.

Character Basics

One of the first questions the players and the GM should ask themselves is whether the characters will work for the Starport Authority. Working for the SPA brings a variety of opportunities and privileges.

It also brings with it a number of substantial responsibilities and drawbacks. SPA personnel do not have quite the freedom to act as do truly independent characters. They have a Duty on 9 or less, but one that isn't life-threatening for most employees. Thus, it usually merits no points as a disadvantage but does interfere with adventuring, freelance work, etc.

If the characters are SPA employees, their department and rank should be determined. Working for the office of the port director will create a very different campaign than working for janitorial services, so some integration of PC assignments may be required to create a workable campaign.

Rank, Position, Pay, and Benefits

All characters employed by the SPA need to consider the following.

SPA Rank

The Imperial Starport Authority uses a system of Administrative Ranks (p. CI19) that correspond to pay grades, just like every other agency in the Imperial bureaucracy. These ranks are typical of the Imperial civil service. The title associated with each rank gives some indication of the level of authority that goes with it; titles will vary considerably depending on exact job duties.

Rank	Title	Salary
0	Clerk	800
1	Team Leader	1,000
2	Manager	1,200
3	Superintendent	1,400
4	Deputy Director	1,800
5	Port Director	2,200
6	Subsector Director	2,800
7	Sector Director	3,400
8	SPA Board Member	5,000

Clerks (Rank 0) usually are new employees with less than two years' experience. They perform the most basic functions, such as filing and sweeping. A team leader (Rank 1) oversees the work of several clerks for the purposes of a given project. Doing well in this role is crucial to being assigned higher Rank that implies permanent supervisory duties.

A manager (Rank 2) oversees the work of several teams. Managers tend to deal with projects that require significant coordination and consultation. A superintendent (Rank 3) is in charge of a department within a given port. Superintendent is a very important rank within a starport.

A deputy director (Rank 4) assists the port director (Rank 5) in the day-to-day operations of a starport. At some ports, a director may delegate much of his authority to his deputies. In such a case, the deputies wield a great deal of power and are essential to its smooth operation. At other ports, the director may use his deputies simply as executors of his orders.

Ranks 6, 7, and 8 represent the highest levels of SPA's bureaucracy. At these levels, there is only one position available for each subsector of a sector and each sector of the Imperium. Similarly, there are only 12 members of the SPA board of directors.

Variant Character Templates

These templates modify some of the templates in ***GURPS Traveller*** to represent some of the character types encountered at starports. Some of them, of course, will be encountered beyond the XT line of a port and so may be used in other contexts. Even if not suitable as PCs, these characters will appear at every starport as NPCs, making them likely to show up in just about any campaign.

Unlike the templates in ***GURPS Traveller***, these are *active-duty* templates, meant to represent characters still employed in the indicated profession.

Those wishing to design former employees from the templates should be able to figure out which advantages and disadvantages may disappear entirely. These include Administrative Rank, Legal Enforcement Powers, Security Clearance, etc. Some may be retained at a reduced level, such as Status. Attributes and skills generally do not change to reflect leaving a particular job.

The GM should be consulted when modifying the character template to reflect an ex-employee.

Attorney see p. GT87

The presence of a starport on a world can lead to all manner of legal wrangling. Consequently, starports usually have a staff of lawyers who are ready to deal with these and other concerns. These attorneys may work within the line office, as a legal attache, or in the legal department, supporting the line office's efforts.

Legal Attache — *60 points*

Legal attaches frequently smooth over differences between the SPA and local legal or governmental authorities. For this reason, they differ somewhat from corporate and other lawyers both in their skills and in their reputations.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: A total of 20 points in Administrative Rank 1-3 [5/level], Charisma [5/level], Security Clearance (SPA) 1-2 [5/level], Status 1 [5], and Versatile [5].

Disadvantages: A total of -20 points in Code of Honor (Professional ethics) [-5], Honesty [-10], Overweight or Skinny [-5], Secret (Dishonest) [-10], Sense of Duty (Starport Authority) [-5], Truthfulness [-5], and Workaholic [-5].

Primary Skills: Diplomacy (M/H) IQ+1 [6]-14, Law (M/H) IQ+3 [10]-16, Research (M/A) IQ+1 [4]-14, and *either* Bard (M/A) IQ+1 [4]-14 *or* Fast-Talk (M/A) IQ+1 [4]-14.

Secondary Skills: Administration (M/A) IQ-1 [1]-12, Area Knowledge (M/E) IQ+1 [2]-14, and Writing (M/A) IQ-1 [1]-12.

Background Skills: A total of 2 points in Criminology, Interrogation, Intimidation, or Politics, all (M/A); Accounting, Detect Lies, or Psychology, all (M/H), and improved levels with any other skills on this template.

Customization Notes

Most legal attaches possess excellent diplomatic skills, as well as decent Area Knowledge of the world on which their port is based. Some legal attaches specialize in areas such as extradition or other kinds of law dealing with the relationship between worlds and the Imperium. Whatever his specialty, a legal attache should possess skills that enable him to carry out his duties in the line office or legal department of the starport.

Bureaucrat see p. GT89

Starports generate a massive amount of data and need for decision-making. For that reason, bureaucrats abound in their corridors. Indeed, most SPA administrators will qualify as bureaucrats, up to and including the port director himself, who may well be the single most powerful bureaucrat on many worlds.

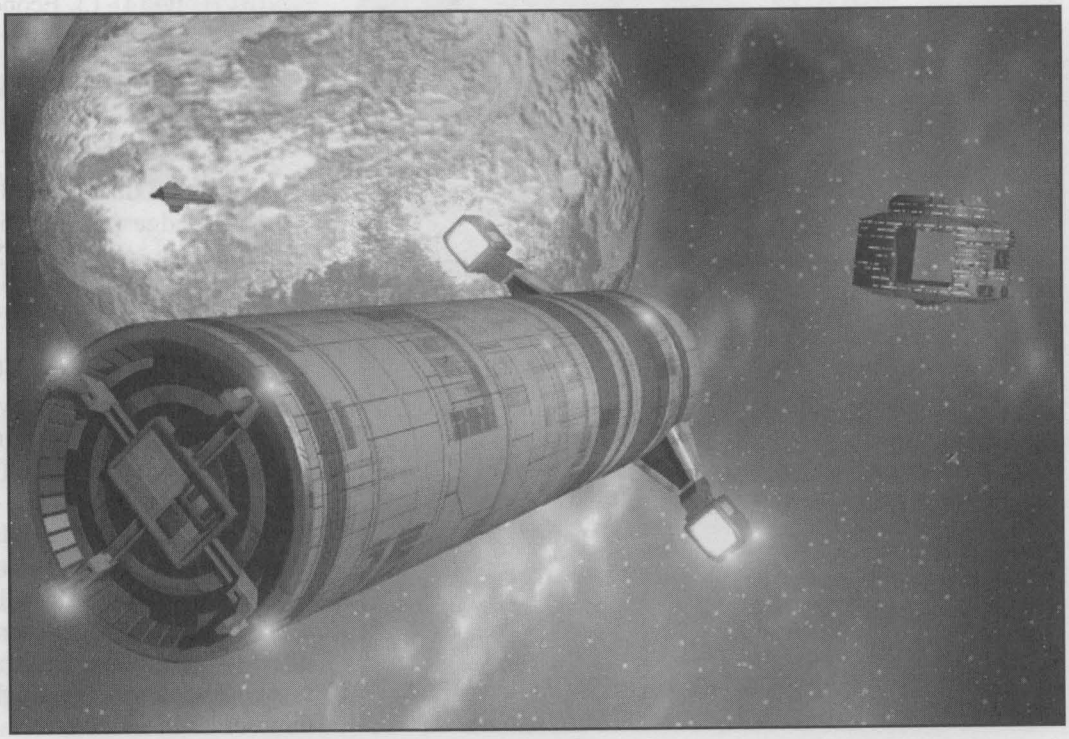
Port Director — *95 points*

Port directors stand in the middle of the tensions between Imperium and host planet, and in many ways lead more exciting lives than naval starship captains! They aren't directly entrusted with shaping Imperial policy, but greatly influence it by how they choose to apply it. They must take the steps necessary to keep their port open and thriving, without stepping on too many local toes. And they must be prepared to deal with the 100 unexpected problems that will inevitably arise at such a nexus of peoples and purposes.

Attributes: ST 10 [0], DX 10 [0], IQ 14 [45], HT 10 [0].

Advantages: Administrative Rank 5 [25], Legal Enforcement Powers (Director's Discretion) [5], and Status 1 [5], *plus* a total of 15 points in Charisma [5/level], Common Sense [10], Imperturbable or Unfazeable [10 or 15], Security Clearance (SPA) 1-3 [5/level], additional Status [5/level], Single-Minded [5], and Wealth [10].

Disadvantages: Duty (12 or less but rarely life-threatening) [-5], plus a total of -20 points chosen from Hidebound [-5], Honesty [-10], Incurious or Obdurate [-5 or -10], No Sense of Humor [-10], Odious Personal Habits ("Imperious," "Meddling," etc.) [-5 to -15], Overweight or Skinny [-5], Sense of Duty [varies], Stubbornness [-5], Unfit [-5], and Workaholic [-5].



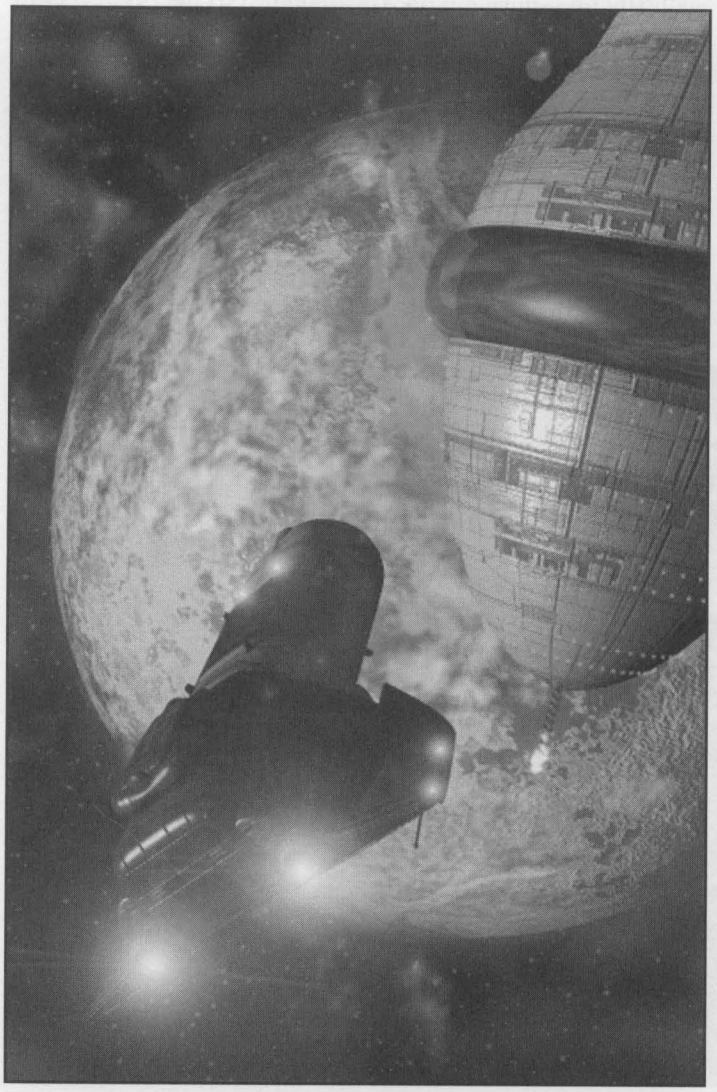
Primary Skills: Administration (M/A) IQ+1 [4]-15, Law (M/H) IQ [4]-14, and Politics (M/A) IQ+1 [4]-15.

Secondary Skills: Computer Operation (M/E) IQ [1]-14, Diplomacy (M/H) IQ [4]-14, Leadership (M/A) IQ [2]-14, Research (M/A) IQ [2]-14, and Writing (M/A) IQ-1 [1]-13.

Background Skills: A total of 3 points in Area Knowledge (Host world) or Savior-Faire (both M/E); Speed Reading (M/A); or Accounting (M/H), or improved levels with any other skill in this template.

Customization Notes

Most port directors will have some level of Security Clearance, often very high, reflecting the wealth of data that passes through their computer terminal and that must be at their disposal to do their job. Successful directors often receive Imperial titles, resulting in higher Status and Wealth. Other starport-related skills – even such things as Engineering – could be taken to reflect the character's SPA experience prior to rising to port director, but most port directors spend their entire career in Administration, so additional skills aren't essential.



Diplomat see p. GT90

A variety of Imperial diplomats can often be found at starports. Many starports house the local consulate or embassy. Even at starports that don't, diplomats often like to conduct their business at the starport. It's seen as "neutral ground" representing both Imperial and local interests. On hostile worlds, the starport is a far more secure meeting place than the offices of the host government . . .

Imperial Consul or Legate *90 points*

Imperial consuls look after the commercial interests of a star system or collection of star systems within the Imperium. Imperial legates combine these functions with those of an ambassador. Both are "blue collar" jobs in comparison to the usual diplomatic functions, dealing more often in tractors than border incidents. This makes them less likely to be under suspicion as spies (therefore more effective if they *are* spies). Both consuls and legates set up office at the SPA starport even more often than other diplomats, since most of their duties revolve around trade.

Attributes: ST 10 [0], DX 10 [0], IQ 13 [30], HT 10 [0].

Advantages: Administrative Rank 2 [10] and Legal Immunity [20], plus a total of 25 points in additional Administrative Rank [5/level], Cultural Adaptability [25], Security Clearance (Imperial) [5/level], Status 1-4 [5/level], and Wealth [10 or 20].

Disadvantages: A total of -20 points chosen from Duties [-2 to -15], Enemy (Rivals, Corporate interests, etc.; 6 or less) [-10], Secret (Spy) [-5 to -20], Sense of Duty (Imperium *or* Host world) [-10], Unfit [-5], and Workaholic [-5].

Primary Skills: Administration (M/A) IQ [2]-13, Diplomacy (M/H) IQ [4]-13, Economics (M/H) IQ+1 [6]-14, Savoir-Faire (M/E) IQ [1]-13, and Law (M/H) at IQ [4]-13.

Secondary Skills: Merchant (M/A) IQ [2]-13, Politics (M/A) IQ-1 [1]-12, Research (M/A) IQ-1 [1]-12, and Writing (M/A) IQ-1 [1]-12.

Background Skills: A total of 3 points in Games or Area Knowledge (world) (both M/E); Bard, Intimidation, or Language (all M/A); Cryptography (M/H); or Carousing (P/A – HT).

Customization Notes

These characters may invest in the espionage skills in the Diplomat template from ***GURPS Traveller***, should they be engaged in such work. (Most won't be.) Many essentially serve as Imperial brokers – ensuring that client or member worlds can obtain the goods they need – so will have considerably more investment in trade-related skills.

A particular consul will more often run afoul of a megacorporation than a government. Since the megacorporations often try to monopolize trade on developing worlds, which rarely best meets the world's interests, consuls often find themselves in an adversarial role.

Law Enforcer see p. GT94

Starports within the Imperium are generally orderly places. This is due in part to the vigilance of several varieties of law enforcers that frequently work within their confines.

Customs Officer — *85 points*

While trade within the Imperium is relatively free, duties, tariffs, and inspections remain an integral part of starport life. The implementation of these duties falls to customs officers and their staffs, who work for the Imperial Revenue Department. Customs officers also work closely with SPA personnel in combating smuggling and other attempts to circumvent Imperial regulations. They sometimes resent the common misimpression that they are not members of an independent agency.

Attributes: ST 10 [0], DX 11 [10], IQ 13 [30], HT 10 [0].

Advantages: Legal Enforcement Powers [10] and a total of 25 points chosen from Acute Senses (any) [2/level], Alertness [5/level], Intuition [15], Sanctity, Strong Will [4/level], +1 DX [10], and +1 IQ [15].

Disadvantages: Duty [-5] and a total of -20 points chosen from Bully [-10], Curious [-5 to -15], Enemy (Smugglers or Pirates, 6 or less) [-15], Honesty [-10], Odious Personal Habit ("Officious") [-5], Overconfidence [-10], Secret (Crooked) [-20], and Workaholic [-5].

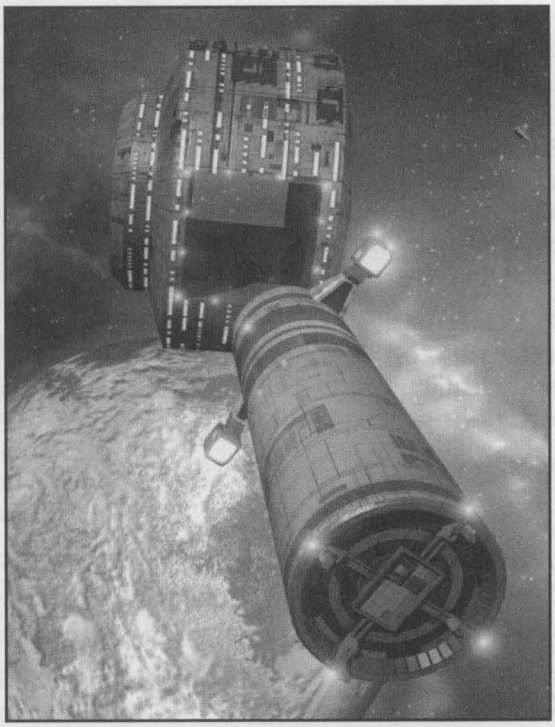
Primary Skills: Administration (M/A) IQ [2]-13, Area Knowledge (Starport) (M/E) IQ+2 [4]-15, and Law (M/H) IQ+1 [6]-14.

Secondary Skills: Computer Operation (M/E) IQ [1]-13, Criminology (M/A) IQ [2]-13, Electronics Operation (Sensors) (M/A) IQ+1 [4]-14, and Research (M/A) IQ [2]-13. Any three of: Interrogation, Intimidation, Streetwise (all (M/A) IQ [2]-13), Detect Lies, Diplomacy, and Psychology (all (M/H) IQ-1 [2]-12). One of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-13.

Background Skills: A total of 7 points in Electronics Operation (any) (M/A); Animal Handling or Forensics, both (M/H), or any primary or secondary skills.

Customization Notes

Imperial customs officers prefer keen observation, psychology, and investigation to physical or combat skills. Their choice of skills should reflect this fact. Local customs officers may start with the same template, but can add disadvantages such as Greed that aren't often seen in their Imperial counterparts.



Starport Security Officer — *85 points*

Major and many minor starports have their own security force. Starport security officers generally deal with minor matters, from rowdy travelers to stolen luggage. From time to time, though, they may be called upon to deal with much more significant disturbances.

Attributes: ST 10 [0], DX 12 [20], IQ 12 [20], HT 10 [0].

Advantages: Administrative Rank 1 [5], Legal Enforcement Powers [5], and a total of 20 points chosen from Administrative Rank 2-3 [5/level], Alertness [5/level], Combat Reflexes [15], Contacts (Floaters or Startown regulars) [varies], Danger Sense [15], Intuition [15], Sanctity [5], Single-Minded [5], Strong Will [4/level], and Versatile [5].

Disadvantages: Duty [-5] and a total of -20 points chosen from Bully [-10], Cannot Harm Innocents [-10], Curious [-5 to -15], Enemy (Criminals, 6 or less) [-15], Honesty [-10], Intolerance (Criminals) [-5], Overconfidence [-10], Secret (Crooked) [-10], Sense of Duty [-5 to -15], Stubbornness [-5], and Workaholic [-5].

Primary Skills: Area Knowledge (Starport) (M/E) IQ+2 [4]-14 and Law Enforcement (M/A) IQ+2 [6]-14; one of Beam Weapons (any) or Guns (any), both (P/E) DX+2 [1]-14; and Judo (P/H) DX [4]-12.

Secondary Skills: Admin-istration (M/A) IQ [2]-12, Computer Operation (M/E) IQ [1]-12, Criminology (M/A) IQ [2]-12, Research (M/A) IQ [2]-12, and Shadowing (M/A) IQ [2]-12. Any three of: Interrogation, Intimidation, Streetwise (all (M/A) IQ+1 [4]-13), Detect Lies, or Psychology (both (M/H) IQ [4]-12).

Background Skills: A total of 4 points in Armoury (any), Electronics Operation (any), or Leadership, all (M/A); Animal Handling, Explosive Ordnance Disposal, Forensics, Law, or Tactics, all (M/H).

Customization Notes

The template above represents a general officer. Naturally, officers with esoteric specialties (bomb-disposal, hostage negotiation, dealing with floaters, etc.) will emphasize skills appropriate to them.

Inspector General — *100 points*

Inspectors general police the Starport Authority itself, rooting about for corruption or criminal practices within the administration and workforce. The inspector general described in this template does not reflect the reality of *all* such operatives – most of them have rather unexciting data-processing jobs without much opportunity for covert investigations. Nevertheless, inspectors general entitled to conduct undercover operations and surveillance do exist, and provide an interesting character option for any starport-based campaign.

Attributes: ST 11 [10], DX 13 [30], IQ 13 [30], HT 10 [0].

Advantages: Administrative Rank 1 [5], Legal Enforcement Powers [10]* and a total of 20 points taken from Administrative Rank 2-5 [5/level], Alertness [5/level], Collected or Imperturbable [5 or 10], Danger Sense [15], Intuition [15], Jack-of-All-Trades [10/level], Language Talent [2/level], Luck [15], Security Clearance (SPA) [5/level], Single-Minded [5], Strong Will [4/level], and Versatile [5].

Disadvantages: Duty [-10] and a total of -25 points chosen from Curious [-5 to -15], Enemy (Criminals, 6 or less) [-15], Honesty [-10], Intolerance (Criminals) [-5], Odious Personal Habit ("Meddler") [-5], Overconfidence or Glory Hound [-10 or -15], Paranoia [-10], Secret (Crooked) [-10], Sense of Duty [-5 to -15], and Workaholic [-5].

Primary Skills: Administration (M/A) IQ [2]-13, Computer Operation (M/E) IQ+1 [2]-14, Criminology (M/A) IQ [2]-13, and Detect Lies (M/H) IQ+1 [6]-14.

Secondary Skills: Beam Weapons or Guns (P/E) DX [1]-13, Research (M/A) IQ [2]-13, and Shadowing (M/A) IQ-1 [1]-12. Any three of: Intimidation, Streetwise (both (M/A) IQ+1 [4]-14), Diplomacy, or Psychology (both (M/H) IQ [4]-13).

Background Skills: A total of 2 points in Savoir-Faire (M/E); Acting, Interrogation, or Language, all (M/A); Cryptanalysis or Cryptology, both (M/H).

Customization Notes

Inspectors general tend to specialize, since they normally work in teams – each inspector in the team has an area of expertise that will prove useful to most of the tasks they face. Still, the SPA is a vast agency, and many inspectors end up "one-man bands" with the well-rounded set of skills necessary for solo operations.

Like most law-enforcement groups operating within starports, inspector teams tend to emphasize social and technological skills over gunplay and brawling. Skills like Body Language, Electronics, Fast-Talk, Lip Reading, and Stealth are far more commonly used than most combat skills. Inspectors general tend to view themselves as the "thinking person's law enforcer," and a PC inspector's peers will more fully respect plans that minimize any chance of violence.

MERCHANT SEE P. GT97

While very few SPA employees make their living selling goods, a great many of them are employed in directly servicing commercial merchant operations.

Dockworker — *65 points*

Also known as a stevedore or longshoreman, these are the starport personnel who get the goods from ship's hold to customer's warehouse. Even on high-tech worlds, there is still a need for individuals trained to move cargo. Though the profession has less to do with stout arms and more to do with vehicle skills as technology improves, even an SPA dockworker has to be ready to manhandle a balky freight container from time to time.

Whether private or Imperial employee, these men and women have a reputation for surliness matched only by their skills in their chosen profession. Merchants and port administrators alike know better than to treat them poorly, lest striking dockworkers cripple the starport.

Attributes: ST 12 [20], DX 10 [0], IQ 10 [0], HT 11 [10].

Advantages: A total of 30 points in Administrative Rank [5/level], Alcohol Tolerance [5], Ally Group (2-5 75-point crewmen, 9 or less) [10], Claim to Hospitality (Trade guilds, etc.) [1 to 10], Common Sense [10], Contacts (Merchant) [varies], Fit [5], Mathematical Ability [10], Strong Will [4/level], Reputation [varies], and +1 ST [10].

Disadvantages: A total of -25 points in Bad Temper [-10], Bully [-10], Chummy or Gregarious [-5 or -10], Code of Honor (Merchant's) [-5], Compulsive Carousing [-5 or -10], Greed [-15], Laziness [-10] or Workaholic [-5], Overweight or Fat [-5 to -20], Reputation [varies], and Stubbornness [-5].

Primary Skills: Freight Handling (M/A) IQ+4 [10]-14 and Merchant (M/A) IQ+2 [6]-12.

Secondary Skills: Carousing (P/A; HT) HT [2]-11.

Background Skills: A total of 12 points in Area Knowledge (Starport or world) (M/E); Hazardous Materials, NBC Warfare, or Streetwise, all (M/A); Animal Handling (M/H); Brawling (P/E); Ax/Mace, Broadsword, Driving (Construction Equipment), Exoskeleton, or Piloting (Contragravity), all (P/A); or any primary or secondary skill.

Customization Notes

Choose background skills that are appropriate to the type and tech level of work that the character does most often. SPA dockworkers generally use wheeled cargo carriers (and Driving skill), but do employ some grav vehicles requiring Piloting skill.

One advantage to this skill set is that employment can be found almost anywhere, so a dockworker may have an impressive set of Area Knowledge skills to reflect an earlier career spent wandering from job to job.



Starport Crew — 60 points

Starports have enormous manpower requirements. This template represents a wide variety of starport occupations, most of them having to do with maintenance of the starport's physical plant. Depending on the local situation, many starport crew members may be native to the world on which the starport is based.

Attributes: ST 10 [0], DX 11 [10], IQ 12 [20], HT 10 [0].

Advantages: A total of 20 points chosen from Administrative Rank [5/level], Common Sense [10], Fit [5], Jack-of-All-Trades [10/level], Mathematical Ability [10], Sanctity [5], Single-Minded [5], and Versatile [5].

Disadvantages: A total of -15 points chosen from Curious [-5 to -15], Honesty [-10], Overconfidence [-10], Primitive [-5/level], Truthfulness [-5], Uneducated [-5], and Workaholic [-5].

Primary Skills: Mechanic (any) (M/A) IQ+2 [6]-14 and one of Computer Operation (M/E) IQ+2 [4]-14, Electronics Operation (any) (M/A) IQ+1 [4]-13, Electronics (M/H) IQ [4]-12, or Engineer (any) (M/H) IQ [4]-12.

Secondary Skills: Administration (M/A) IQ+1 [4]-13 and Scrounging (M/E) IQ [1]-12

Background Skills: A total of 10 points in Electronics (any) or Engineer (any), both (M/H); Armoury (any), Electronics Operation (any), Mechanic (any), all (M/A); and Driving (any) or Piloting (any non-starship), both (P/A).

Customization Notes

Starport crew members fill a variety of niches at the starport. Thus, players should feel free to tailor their skill choices to reflect their chosen field. Since many crew members come from the local population, Area Knowledge and similar skills are also appropriate.

Rogue
see p. GT98

Being centers of travel, starports – and their startowns – attract all sorts of interstellar travelers, including some less than reputable types.

Crime Boss — 90 points

The volume of goods that move through a port is a powerful lure for many criminal elements in the Imperium. The better-organized criminals owe their success to a crime boss behind their operations. Consequently, many startowns possess a powerful kingpin of crime, who directs the "work" of his underlings with skill and finesse.

Attributes: ST 10 [0], DX 13 [30], IQ 13 [30], HT 10 [0].

Advantages: A total of 30 points chosen from Alertness [5/level], Ally Group [varies], Alternate Identity [15 per identity], Contacts (Street) [varies], Danger Sense [15], Luck [15], Wealth [10 to 30], and Zeroed [10].

Disadvantages: A total of -30 points chosen from Callous [-6], Code of Honor (Criminal's) [-5], Compulsive Gambling [-5 to -15], Enemy (Law Enforcement Agency, 6 or less) [-15], Extravagance [-10], Greed [-15], Loner or Reclusive [-5 or -10], Overconfidence [-10], Reputation (Criminal) [varies], Secret (Almost anything!) [-5 to -20], Selfish or Self-Centered [-5 to -10], and Social Stigma (Criminal) [-15].

Primary Skills: Administration (M/A) IQ [2]-13, Area Knowledge (any) (M/E) IQ [1]-13, Leadership (M/A) IQ+1 [4]-14, and Streetwise (M/A) IQ [2]-13.

Secondary Skills: Computer Operation (M/E) IQ [1]-13 and Diplomacy (M/H) IQ-2 [1]-11, and six of the following skills: Acting, Courtesan, Fast-Talk, Gambling, Holdout, Intimidation, Merchant, Research (all (M/A) IQ [2]-13), or Sex Appeal (M/A; HT) HT [2]-10.

Background Skills: A total of 7 points in Disguise or Survival (Urban), both (M/A); Forgery (M/H); Computer Hacking (M/VH); Carousing (P/A; HT); or any primary or secondary skills.

Customization Notes

Crime lords are criminals who made it big and now run vast illegal enterprises. They have a good mix of skills representing their former specialties as well as their current status. However, crime bosses rarely involve themselves directly in the operation of their empire, preferring to leave such matters – and the subsequent direct attention from law enforcement – to their underlings.

The following special considerations apply to the standard ***GURPS*** rules in ***Starports*** campaigns.

ADVANTAGES

Administrative Rank *see p. CI19*

This advantage is discussed in detail under *SPA Rank* (p. 48). SPA-employed player characters holding any authority will have to invest in the appropriate amount. Depending on the type of campaign, the Game Master may want to waive the normal restriction of Administrative Rank 3 or less for beginning player characters.

Allies *see p. B23*

Given the geographically static nature of a starport campaign – in which most of the action occurs within the same locale – advantages such as Allies can come into play much more often. A port director might have an "under the table" agreement with the local crime lord, in which they look out for each other's interests. An SPA stevedore might be the brother-in-law of a local political authority. Webs of relationships such as these can enhance a campaign set in a fixed locale, and the GM should consider allowing inventive relationships.

Contacts *see p. CI22*

As with Allies, SPA and related personnel often have an extensive network of Contacts – in fact, Contacts probably will be more common than Allies for most characters. These also need not be obvious relationships – a janitor might spend five minutes of each evening shift chatting with the security watch commander, effectively earning a police Contact that, on paper, has nothing to do with his job.

Favor *see p. CI25*

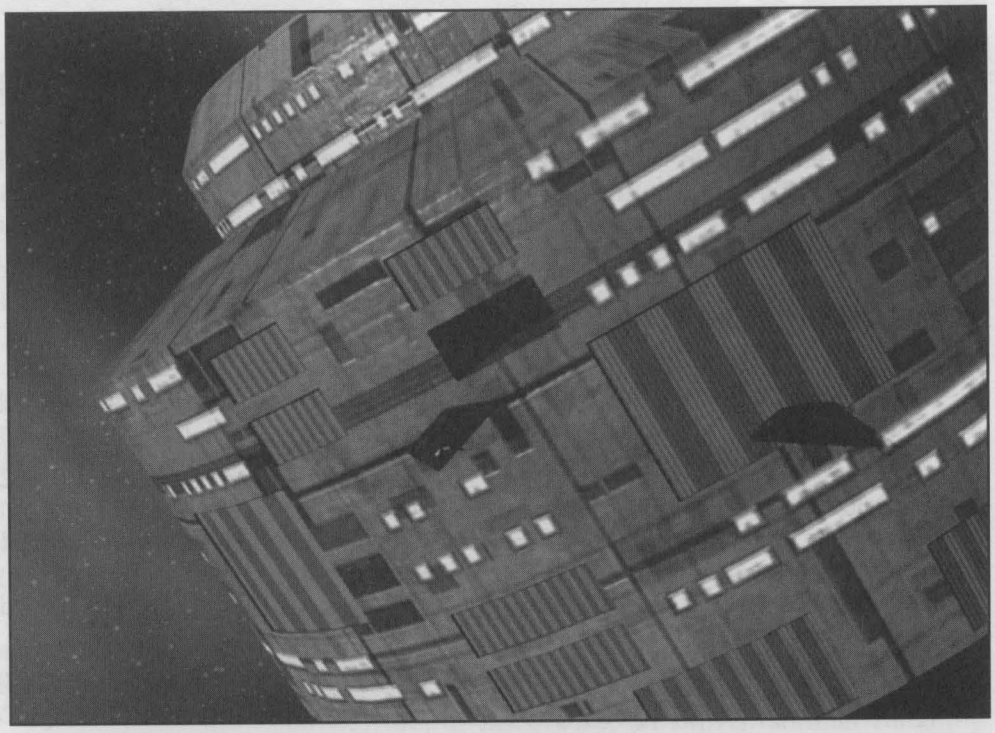
Another social advantage that can come into play frequently in a starports campaign, Favors can be handed out in lieu of (or as a bonus to) experience points to reward role-playing as appropriate. Note that an NPC who routinely grants the PC favors should be purchased as an Ally, instead.

Patrons *see p. B24*

The Starport Authority is organized as a civil service. Civil services are designed to objectively promote and retain personnel, replacing the patronage system in which each boss has full fire-and-hire rights and a new boss can sweep his department clean and fill it with his favorites. This does not mean that patronage does not endure in the Starport Authority. PCs should be allowed to take higher-level SPA authorities as Patrons, but the GM should keep in mind that the civil-service mechanics limit how much a Patron can do to aid his clients.

Reputation *see p. B17*

SPA personnel can have personal reputations – or a reputation based upon their starport's relationship with its host world. For instance, all SPA personnel in a star system with strong Imperial ties might enjoy a +1 Reputation. The frequency of the reputation would depend on how much of the character's time is spent among locals. A line officer might take the reputation all of the time; a mechanic who never deals with anyone but other SPA employees would not take it at all.



Claim to Hospitality *see p. CI21*

Retired and off-duty SPA employees who know how to "work the system" can talk their way into lodging privileges at SPA facilities throughout the Imperium. These privileges are available only when circumstances permit. That is, a port director is under no obligation to provide lodging for a former SPA employee when there is no space available (but *some* sort of lodging will be found for certain types of characters, such as old buddies). Characters planning to use this privilege must purchase Claim to Hospitality to represent it; the GM may require further investment in Fast-Talk, Allies, or some other trait sufficient to explain how the character manages to obtain free room and board.

Courtesy Rank *see p. CI23*

SPA employees may hold a Courtesy Rank after their retirement. Similar to Claim to Hospitality, Courtesy Rank may open a few doors with SPA and its employees, although there is no guarantee. In addition, many current SPA employees are former scouts, who may hold a Courtesy Rank from their time in that service.

Legal Enforcement Powers *see p. B21*

Active-duty members of both Starport Security and the Customs Service have this advantage because of their duties. Customs officers have full Imperial authority and can demand the cooperation of local customs officials in the pursuance of their own duties. Starport security has much more limited powers that are restricted to the grounds of the starport itself. Outside of the XT line, starport security has only whatever authority is granted them by the local government.

Status *see p. B18*

The Starport Authority is not one of the Imperial services toward which the Imperial nobility gravitates. The vast majority of SPA personnel are Status 0. The average port director at a minor port will be effectively Status 1 because of the authority he wields, though his Administrative Rank will give him much higher "effective" status with his employees. The average port director at a major port will be Status 2, or 3 on a high-population world.

Disadvantages

Enemies and Reputation *see pp. B17, B39*

Everything stated under *Allies* and *Reputation* (p. 54) also holds for Enemies and bad Reputation. Bad Reputations based on host world-Imperial ties might be more common than good ones for SPA personnel.

Skills

Area Knowledge *see pp. B62-63, CI118*

In a starport campaign, use the following area classes: Port, Port City, Planet, Subsector, and Sector. Area Knowledge of a Domain or even the Imperium as a whole is possible, but not particularly useful. Some knowledge of *all* the ports or port cities in a subsector – such as Area Knowledge (District 268 ports) – is also fairly common. Distance penalties are assessed at each level along the shortest trade route, as follows (examples refer to the map on p. GT122):

Neighboring (e.g., Hefre from Regina): -4.

One removed (e.g., Forboldn from Regina): -7.

Two removed (e.g., Knorbes from Regina): -12.

Law *see p. B58*

Starport authorities deal with many matters of law. Their "specific area" of law will be the interface between local and Imperial jurisdictions; many SPA lawyers also will specialize in their particular field, such as contract law, tax law, astronautical regulations, etc. SPA lawyers are considered unfamiliar with their jurisdiction if they have not practiced there for a period equal to (60 months/CR). Familiarity previously held can be regained through 8 hours of studying precedent and legislation.

Imperial law takes precedence over planetary law *where it addresses an issue.* Many potential crimes – such as public nuisances – are ignored by Imperial law and can only be local infractions. Most crimes – including homicide – are considered Imperial affairs only if they take place on Imperial property. A few – such as treason against the Imperium – are Imperial crimes regardless of where they take place.

Questions of jurisdiction usually will be tried under Imperial law first, then turned over to the local authorities if unsuccessful.

NBC Warfare *see p. CI151*

This skill covers more than just the military applications of protective equipment and decontamination; it also includes using protective gear around hazardous materials (HAZMAT) and preventing the spread of HAZMAT contamination. Note that someone in a vacc suit or sealed combat armor is fully protected from the effects of (most) HAZMAT as long as he remains in his suit. If he ever wants to take it off, though, he will need this skill to decontaminate the suit exterior first, or he may suffer the ill effects.

Shipbuilding (Starship)/TL *see. p. CI137*

Starship crews routinely learn this skill as part of their damage-control training. Shipbuilding is also useful for smugglers (and customs agents!), as it covers knowledge of where small items can be hidden aboard ship and how to construct secret compartments.

New Skills

Professional Skill (Hazardous Materials/TL) (Mental/Average) *Defaults to IQ-5*

The professional skill of shipping, moving, loading, and storing hazardous materials (HAZMAT). It includes preparing the forms and records that must accompany HAZMAT shipments, applying and identifying warning labels and markings, and knowledge of the countermeasures, antidotes, and decontamination and containment procedures. When dealing with HAZMAT in any capacity, roll against the *lower* of the applicable skill (Diagnosis, Freight Handling, etc.) or Professional Skill (Hazardous Materials) skill. The operation of *personal* protection gear is covered by NBC Warfare skill (see above).

The IQ default represents any layman's knowledge of hazardous household chemicals and their effects. Some aspects of this skill (most notably HAZMAT markings) are deliberately kept obscure by HAZMAT professionals to avoid alarming the general public; no default roll is permitted when dealing with such things.

Characters

The new recruits shivered in the cold, many of them sneaking glances at Assinibola looming overhead. The corporals had managed to herd them into something resembling straight lines and even formations.

"Attention on deck!" About half the newbies straightened up, at least trying to look alert. "Good morning! I am Sergeant-Instructor Jens Harald Rydholm. You will address me as Sergeant-Instructor, Sir. Do you understand me?" There was a ragged chorus of mumbled affirmations. "I asked you all a question. When I ask a question. I expect to hear a strong response from all of you. ***Do you understand?!****" The response was louder this time, and more of the recruits looked awake – some of them were getting worried. Sgt. Instructor Rydholm touched his pointer to the brim of his white kepi. "The kepi is the mark of an instructor. You will address all Marine instructors by their rank then the word instructor, followed by an enthusiastic sir!*

"You have all had the nerve to attempt to join my Marines! Perhaps you bragged to your friends and family when you received your enlistment. They are not here now. Clear all doubts from your minds. You are not Marines! You are forbidden to even speak the name of my beloved Marines! Do you understand?" They answered, pretty loud, and some even remembered to say, "Sergeant-Instructor, Sir."

"Very well. You are not Marines. But we will ***make*** *you Marines. Sergeant-instructors, take charge of your sections. Begin the Grinder."*

In the Regular Army-O

Troops serving in the Army and Marines perform an amazing variety of jobs and functions. Any occupation or skill needed to support large populations will be found in the services.

Sergeants Run the Army

Armed forces trust a great deal of their day-to-day operations to the senior NCOs. They are responsible for execution of orders passed down from their officers, and, while technically lower in rank, tend to have more direct power in the organization. The authority and influence of senior NCOs in certain matters may come to supersede that of junior commissioned officers.

Any good officer will listen to the advice of his NCOs. They quite often have more experience in organizing and running military operations and usually have many more years of military experience than junior officers. Their advice and opinions are to be valued. A good NCO will see teaching young officers as an important part of his job, and more than one lieutenant has learned his job because of the polite "suggestions" of his platoon sergeant.



Campaign Types

When thinking of military roleplaying, the image that comes to mind is grizzled commandos bristling with armaments pulling off dramatic missions. This is the image popularized in books and films.

What those fictional accounts don't show is the endless training, rehearsals, and nights spent on fire watch. For combat soldiers, life during wartime consists of long periods of boredom, either moving toward the enemy or preparing for the enemy to come to you. While combat is an important part of the game, an endless series of combat sessions quickly devolves into nothing more than a wargame.

Armies are hugely complex organizations, with many, many facets beyond the actual fighters. There are many interesting campaigns in the non-combatant branches.

Medical

Made famous by such television shows as *M*A*S*H* and *China Beach*, the action around a military hospital is filled with possibilities for adventure. The players can be doctors fighting the Army system, intrepid combat medics, or they can be involved in cleaning up a biological "hot zone."

In this type of campaign, medical skills will of course be important. But medics need drivers, supply staff, and protection from enemy troops who may not understand the concept of "noncombatant."

Medics also have the advantage of more freedom of movement than most troops, being free to wander between rear areas and combat zones with impunity.

Engineers

The Imperial Army's engineering battalions are often called in to help out member worlds with large-scale projects. With their heavy equipment and discipline, the engineers have an enviable reputation.

A campaign might take engineers to strange locations to help build (or rebuild) massive constructs. In the post-Fifth Frontier War era, there are many worlds needing such help. This sort of game would appeal to players who like to engage in planning and like to leave a mark on the campaign.

Inspectors General

Good for those who enjoy intrigue and mysteries, gaming out the adventures of the Army Inspector General's office has many possibilities.

When faced with an IG inquisition, soldiers have a code of silence that is almost unbreakable. Breaking that wall and finding the truth is the IG's job. Investigations run from complex crime investigations to deep corruption cases.

For the more Illuminated, a campaign can start as a normal investigation, and then take a very sinister turn . . .

Point Totals

The first question that needs to be answered when putting together a Marine or Army campaign is . . . how many points will the troops be built with?

Realistic Troops

The campaign is designed around fairly normal soldiers. The suggested point total for this sort of game is 100 points. Obviously, more experienced troops will have higher point totals. This type of campaign works best for groups of fairly normal "grunts."

Hardened Veterans

The ***GURPS Traveller*** standard of 150 starting points works well to represent veteran troops within regular units or relative newcomers in elite units.

Cinematic Heroes

A good level for special-operations troops, or for playing in campaigns based on action films or novels. These troops are walking war machines, and they should start at the 200-point level. Soldiers of this nature can easily be built with 300 points or more, most of them invested in a wide variety of skills. Their campaigns should concern one of the Imperium's special warfare units, such as the Sylean Rangers or the Marine Commandos.

Advantages

A number of advantages are either required by, or useful for, troopers.

Required Advantages

Everyone serving in the Imperial Armed Forces must have these two advantages:

Fit (p. CI25) [5] reflects the constant physical training done by the troops. This includes a great deal of running and other endurance-building exercises.

Panimmunity (p. CI29) [5] is provided to all Imperial soldiers via regular broad-spectrum vaccinations. This helps prevent diseases from wiping out entire units. The soldiers have +8 HT when resisting infections.

The templates later in this chapter all include these advantages.

Desirable Advantages

Many of the advantages found in ***GURPS*** are very useful to the soldier. Each of the templates includes some points to be spent on the advantages in the following list.

Acceleration Tolerance (p. CI19) [10]; Alertness (p. B19) [5/level]; Cool (p. CI23) [1]; Combat Reflexes (p. B20) [15]; Danger Sense (p. B20) [15]; Extra Fatigue 1-4 (p. CI24) [3/level]; Extra Hit Points 1-4 (p. CI24) [5/level]; Fearlessness (p. CI25) [2/level]; G-Experience (p. CI24) [10]; Hard to Kill 1-2 (p. CI25) [5/level]; High Pain Threshold (p. B20) [10]; Improved G-Tolerance (p. CI26) [5/level]; Less Sleep 1-5 (p. CI27) [3/level]; Night Vision (p. B22) [10]; Peripheral Vision (p. B22) [15]; Strong Will (p. B23) [4/level]; Toughness (p. B23) [10 or 25]; Collected (p. CI22) [5] or Composed (p. CI22) [5]; Imperturbable (p. CI26) [10].

Military Rank

Soldiers operate in a strictly defined social order. That order is the rank and grade system. Service members are divided into three broad categories: *enlisted, non-commissioned officers*, and *commissioned officers.*

Enlisted (Rank 0) troops are the bottom of the pecking order. These are the privates and Marines who do the actual heavy work. Enlisted personnel spend their time either following orders or trying to dodge their leaders. Rank 0 troops have very little personal freedom of action. The service controls their every move.

Non-commissioned officers (NCO) (Ranks 1-2) are the sergeants. They have the legal authority to give orders to any troops placed under their control. In combat units, the NCOs are the ones who will do the majority of the leading in combat. Sergeants run the military; generals may order, captains may shout, but it takes the NCOs to actually get everything moving. Rank 1 troops have a little more freedom of action, while Rank 2 sergeants are actually quite powerful.

Commissioned officers (Ranks 3-8) are the commanders and leaders. They hold a commission from the Emperor, a duke, or a planetary leader allowing them to issue orders and lead forces. Some joke that Imperial officers are "people who needed a message from the Emperor to get a job." There is of course a great deal of difference between a Rank 3 2nd lieutenant and a Rank 8 general. As he rises in the ranks, the soldier's power increases, but so does his accountability. That lieutenant only has to answer to his company commander, whereas the general has to answer to the commanders of the Army and local nobility.

The Imperial Army and Marines use slightly different ranks:

IMPERIAL ARMY

Level	Rank	*GURPS* Rank	Level	Rank	*GURPS* Rank
E1	Private	0	O1	2nd Lieutenant	3
E2	Private 1st Class	0	O2	1st Lieutenant	3
E3	Lance Corporal	0	O3	Captain	4
E4	Corporal	0	O4	Major	4
E5	Sergeant	1	O5	Lt. Colonel	5
E6	Staff Sergeant	1	O6	Colonel	6
E7	Leading Sergeant	2	O7	Brigadier	7
E8	First Sergeant	2	O8	Major General	7
E9	Sergeant Major	2	O9	Lt. General	8
			O10	General	8

IMPERIAL MARINES

Level	Rank	*GURPS* Rank	Level	Rank	*GURPS* Rank
E1	Recruit	0	O1	Force Ensign	3
E2	Marine	0	O2	Force Lieutenant	3
E3	Marine 1st Class	0	O3	Force Captain	4
E4	Corporal	0	O4	Force Commander	4
E5	Sergeant	1	O5	Lt. Colonel	5
E6	Gunnery Sergeant	1	O6	Colonel	6
E7	Section Sergeant	2	O7	Brigadier	7
E8	Ship Sergeant	2	O8	Marshal*	7
E9	Fleet Sergeant	2			

* The Marines have no equivalents to the Army's two highest ranks, and currently do not use the rank of marshal; see p. 47.

The "Level" entry is based on current U.S. usage. It is used in this book only to clarify the relationships among different Army and Marine ranks. The Imperium does not actually use this terminology!

Rank costs 5/level. The rank of the troopers must be appropriate to the campaign theme. While playing a dashing Marine brigadier might be fun, it will be a little out of place if the game is about a single squad. In the Third Imperium, those with Military Rank (p. B22) receive a free level of Status for every three levels of Rank purchased, rounded to the nearest Status.

Character Clichés

Over the years, military fiction has developed a dependable set of character types. At least a few of these clichéd stereotypes seem to show up in every film or book. And the fact is these types exist in the real armed forces.

The Opie

Opies are guys from rural areas, low population planets, or backward areas. They enter the service wide-eyed and innocent, and can get badly shocked by what they see. Conversely, Opies are sometimes the best equipped to handle the rigors of military service, having grown up under tough circumstances.

When creating an Opie, disadvantages like Easy to Read (p. CI89), Gullibility (p. B33), Oblivious (p. CI92), Shyness (p. B37), and Truthfulness (p. B37) help set the persona of a fairly unsophisticated farm kid.

On the other hand, Opies will probably be very true to their friends, and bring with them some very useful field skills. Advantages such as Common Sense (p. B20), Luck (p. B21), and occasionally Unfazeable (p. CI31) are characteristic.

The best example of an Opie in popular culture is the title character of the *Gomer Pyle, U.S.M.C.* TV series.

The Get-Over Artist

The get-over artist is the trooper who will always find the way of doing the task at hand with the least possible amount of effort. This soldier is not shirking the work, but just fails to see why it should not be as easy as possible. Get-over artists often cannot see the necessity of certain tasks, much to their sergeant's frustration.

The prime characteristic for a get-over artist should be Laziness (p. B34). Get-over artists might want to consider some points in Fast-Talk (p. B63) and a few levels in Charisma (p. B19) to charm their leaders into giving them the easy jobs.

The Casanova

This type believes the service exists to provide him or her with opportunities for romance. Casanovas will probably be able to locate companionship on PR 1 worlds.

Casanovas should take Sex Appeal (p. B64) and Charisma (p. B19). A few points to raise the trooper's Appearance (p. B15) and Fashion Sense (p. CI24) round out a real lady-killer.

The ultimate military Casanova in modern fiction was Capt. James T. Kirk of *Star Trek* fame.

Continued on next page . . .

Character Clichés

[Continued]

A variant is the anti-Casanova. This soldier has Delusion (I am irresistible and attractive) (p. B32). Give this person an Odious Personal Habit (p. B26) to explain why he keeps striking out. Anti-Casanovas never really understand that they are being dumped, so Clueless (p. CI87) may be a good disadvantage as well.

The Flag-Waver

Flag-wavers are those soldiers who are so patriotic that they are almost blinded by their devotion. They will speak of the "honor" and "privilege" of serving while scrubbing floors.

Fanaticism (p. B33) is a must for a flag-waver. Intolerance (Anybody who disagrees with me) (p. B34) and Delusion (We are the greatest thing in all history) are also common.

The Businessman

Businessmen are in the service to make a quick credit. Doesn't matter how, they will do it. A large number of businessmen are found in supply rooms and in the Army Transportation and Material Corps.

Most businessmen will try to stick to legal means of making their cash, stooping only to accept small bribes to do small favors. Others will go completely over the edge into blatantly illegal activities. There is always a market for standard-issue equipment, and soldiers on deployment never have enough comfort items.

The businessman PC will of course have Merchant skill (p. B64), and should also possess skills that allow him to negotiate. Fast-Talk or Diplomacy (p. B63) are best for this. Most businessmen will be Greedy (p. B33) and may even suffer from Miserliness (p. B34). Those operating on the wrong side of the law will have a Secret (p. CI78) likely to put them in jail.

The Scrounger

Scroungers are the troops the colonel comes to when he needs to secure a piece of equipment and the regular supply channels are not helping. Scroungers are the company clerks and supply sergeants. A wise officer never asks *how* they work their magic, they are just thankful to have the soldier around.

There are three main requirements for a scrounger; Scrounging and Diplomacy skills, and Contacts (p. B234). Eidetic Memory (p. B20) is useful for the scrounger trying to remember who has what the unit needs, where that person's unit is, and what they might want in return.

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Awards and Decorations

Compared to some cultures, the Imperium is fairly stingy about giving medals out. The Imperium only has a few awards for heroism, and a mere handful of non-combat decorations.



Being awarded medals can significantly enhance a soldier's Reputation with his fellow troops. Troops who have won the Starburst for Extreme Heroism should at least take a +2 Reputation (Large group, sometimes) [3].

Most awards are issued in grades, depending on how many times the particular award has been received by a particular soldier. The first through fifth receipts are awarded in the third grade, signified by a blue ribbon. The sixth through 10th are awarded in the second grade, with a red ribbon. The 11th and further receipts are awarded in the first grade, with a red and black ribbon.

Meritorious Conduct Under Fire

The lowest level of valor award, the MCUF is given for risk-taking slightly above the norm seen in combat. Most combat troops will collect more than a few of these during their careers. The medal itself is an eight-sided piece, 1.25" across, engraved with a soldier motioning others to follow him. Around the edge of the engraving are the words *With Great Merit and Dedication to the Service.*

Medal for Conspicuous Gallantry

Considerably harder to win than the MCUF, the MCG is given for outstanding acts of bravery on the battlefield. To win the MCG, a trooper needs to do something outstanding. Rallying one's side to victory against difficult odds; single-handedly winning a small engagement; overcoming one's wounds to finish the mission . . . these are the things that win the MCG.

The medal is hexagonal, similar in size to the MCUF with a gold tint. On the medal's face is a depiction of Diirdi Khirashkur, a legendary Vilani folk hero who defeated an army by means of skill and trickery. Arcing over the depiction are the words *For Gallantry.*

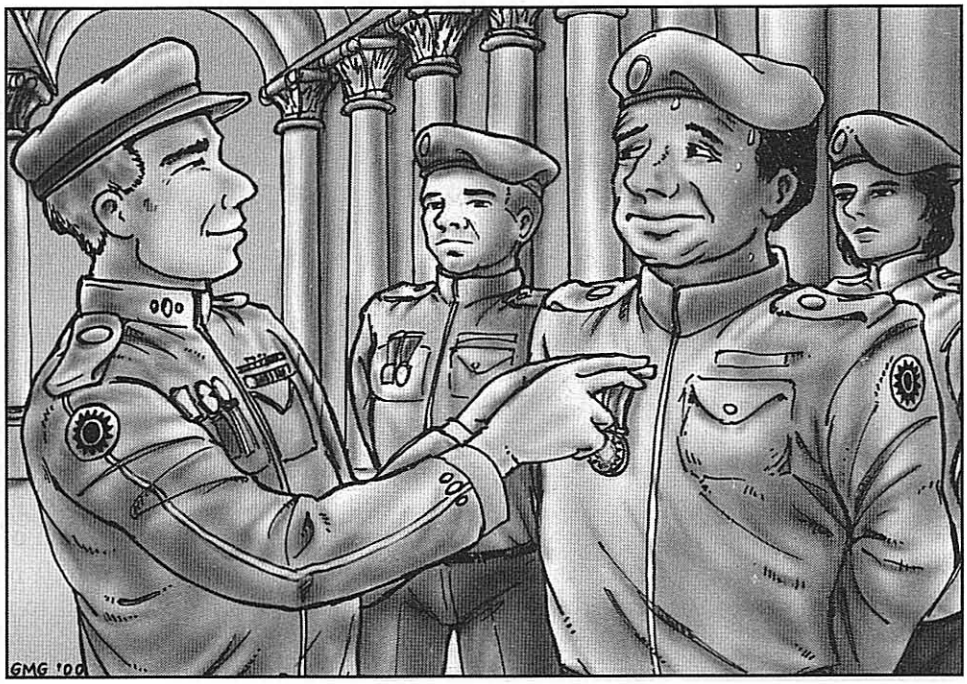


The Starburst for Extreme Heroism

The highest award for courage the Imperium awards, this medal is an exception to the rules concerning the different classes of award presented above. No matter how many SEHs you win, each one is a distinct award.

The Starburst is given only for the most extreme acts in the service of the Imperium. The act has to be without any regard for personal safety or survival, and against overwhelming odds. The list of winners of the Starburst is full of soldiers who died earning the honor.

The Starburst is worn on a 1"-wide cloth ribbon around the neck. The medal is a 3" stylized Imperial Sunburst carved in precious stones of the correct branch color set in iridium. Engraved on the rear of the medal is *With the Gratitude of the Emperor and Imperium, Our Thanks to (soldier's name) of (soldier's homeworld) for (His/Her) Actions on (place where medal was won) on (date of action).* The medal will be signed by an authorized Imperial official, usually a duke or archduke.



Gikhikese (Wound Award)

Literally translated as "blooded fighter," the Gikhikese (*GEE-kee-KAY-zee*) is awarded to those wounded in combat. This award uses a modified version of the award grade system. The first five awards are bronze, the sixth through 10th are silver, and 11 or more awards are issued in gold. Soldiers call the gold Gikhikese the "expert pop-up target award."

The Gikhikese is an oval badge worn on the uniform jacket, about 1.5" across. It depicts a winged figure holding a body in combat gear. The medal is finished in the correct color for the grade of award.

Combat Service Ribbon

Soldiers receive a CSR when they participate in a recognized campaign. The Sector Command is responsible for making the decision on what constitutes a campaign. As an example, the entire Fifth Frontier War was boiled down to three separate campaigns. Campaign ribbons will hold bars naming any notable or famous battles the soldier participated in during the campaign. A soldier who fought in the Abyss Campaign of the Fifth Frontier War might wear bars for the Relief of Lanth and a bar that simply reads "Gram." Officers who were in a command position during the majority of the campaign receive a slightly different award, called the Combat Command Ribbon.

Patrons, Contacts, Allies, and Enemies

The Army and Marines are huge but closely knit organizations. Soldiers will gain friends and rivals, and with enough service may be able to call upon a wide variety of old buddies for help or information.

Character Clichés

[Continued]

Scroungers differ from businessmen in that the businessmen are doing deals for personal profit, while the scrounger does it for the good of his unit. Radar from *M*A*S*H* is an excellent example of a scrounger, as is James Garner's character in *The Great Escape.*

The Old Sarge

This trooper has been in too long and seen too much. He might be a legend, or just another face in the crowd. What he always is is a skilled professional. Old sarges should be treated as masters of their craft.

Old sarges, having seen the horrors of war, generally feel a Sense of Duty (p. B39) to the soldiers under their command. They often drink, and may have an alcohol-related quirk (p. CI79). They may have a Guilt Complex (p. CI90) or even Flashbacks (p. CI90) from past battles.

On the positive side, an old sarge can be expected to have several levels of Strong Will (p. B23).

Lee Marvin's anonymous sergeant from the 1980 film *The Big Red One* and John Wayne's portrayal of Striker in *Sands of Iwo Jima* are prototypes for the classic old sarge.

The Lucky Guy

As the name suggests, the trooper is just plain lucky. His paperwork seems to move faster, his weapons never malfunction, the cleaners never lose his dress uniforms the day before a command inspection, and he never seems to be in sight when the first sergeant needs people for an awful task.

Luck (p. B21) is the primary advantage of the lucky guy. Serendipity (p. CI30) is a good alternative. In more cinematic or silly campaigns, Ridiculous Luck (p. CI29) might be allowed.

Remember that luck can sometimes be deceptive; if the lucky soldier breaks his leg the week before his entire squad is wiped out, that leg injury would be considered pretty lucky!

The Bookworm

You can recognize this soldier by the top of his head. He is constantly reading *something* wherever he goes. The bookworm takes books to the field, to meals, and will even have one hidden somewhere during formations.

Continued on next page . . .

Character Clichés

[Continued]

Bookworms will have Compulsive Behavior (Has to read) (p. B32). In peacetime, this will be a -5 point Disadvantage. Being a bookworm in combat can be much more dangerous. Since they do read so much, bookworms are good candidates for a number of obscure knowledge skills like Area Knowledge (p. B62), History (p. B61), or other Scientific skills. These should be bought at the 1/2-point level.

Because they are so solitary, bookworms can suffer from Shyness or be Loners (p. CI61). Their solitary habits could even reach the point of being an Odious Personal Habit (Ignores everyone).

The Party Animal

This trooper knows the location of every club, bar, and dance hall within a day's travel. He thinks nothing of going out seven nights a week for fun. Somehow, he never seems to get tripped up by this behavior. Marine party animals on long patrol will probably set up a still and wire battledress to play dance music.

Party animals should have Compulsive Carousing (p. CI87) along with a fairly high level in Carousing (p. B63). To help deal with all the parties and still operate as a soldier, No Hangover (p. CI28) is recommended. Many party animals will have Odious Personal Habits, or one of the alcohol-related Quirks (p. CI79).

Casanovas and party animals are natural companions, and are often found operating together, both in the field and in town.

The Hand of God

This individual is convinced that his service is a religious duty, and that he has been given his skills by his particular deity. Hands are often found in solitary combat roles, such as fighter pilots or as snipers.

Hands should have Fanaticism (p. B33), as well as Delusion (I am God's instrument of death). Odious Personal Habit (Extremely devout) is also a common earmark of this type of soldier.

Advantages may include Cool (p. CI23), Fearlessness (p. CI25), Strong Will (p. B23), Collected (p. CI22), Composed (p. CI22), Imperturbable (p. CI26), and Knowledge of a particular religion or religious text.

The sniper Jackson in *Saving Private Ryan* illustrates this character type well.

Patrons (see p. B24) do exist inside the military structure. Senior service members will often look after and guide the careers of promising underlings, either out of altruistic feelings or to curry support for past favors done.

The power of a Patron will be limited by military law and etiquette. Yes, a corporal may have the Marshal of Lanth as his patron, but even he will not be able to have the charges of high treason casually dismissed. A well-conceived Patron can be a great asset to a military campaign.

Contacts (see p. CI22) are an excellent advantage when building long-service NCOs. A good sergeant will have any number of friends from his earlier days in the service, and these friends may be in all sorts of interesting and helpful positions.

These Contacts are not the soldier's closest friends; they are past acquaintances from old assignments. They may ask for favors in return for their aid.

Allies (see p. B23) are your good friends in the service, the guys you can really count on. Allies should be built on the same point level as the PCs, if they are in the same type of unit. If a Sylean Ranger has a 98-lb. finance clerk as his Ally, that clerk probably will not be built on the same 300 points as the Ranger. These Allies are also in the military, and will be forced to attend to their own duties much of the time. Their chance of randomly appearing, or being available to aid the troopers, should be kept low.

Enemies (see p. B39) in a military game are not likely to be the ones who will try to kill you on sight. They might set you up to die, but are more likely to try and destroy your career, ruin your family name, and have the satisfaction of attending your court-martial. Enemies of this nature work especially well in officer-based games, sergeants being usually willing to take the Enemy off to a secluded spot to "have it out" one on one.

Another interesting Enemy for a soldier is the powerful civilian with a grudge against the military or the soldier in particular. Fending off the attacks of someone whom the trooper is sworn to defend makes for an interesting dilemma.

Disadvantages

Several disadvantages are either prohibited or not very likely to be seen in a professional soldier. Others that would be considered disadvantages in the civilian world are just the sort of thing that make good soldiers.

Required Disadvantages

Duty (p. B39) [-15] is required of all soldiers on active service. The military is not known for allowing its members to go off on a whim and without leaving any information on where they are going. Troopers in campaigns that involve frequent combat or who are in special warfare units should take Extremely Hazardous Duty (p. CI78) [-20], instead.

Desirable Disadvantages

Some disadvantages are very common among soldiers, and actively fostered by the Imperial military culture.

Code of Honor (p. B31) is common among soldiers, either the Enlisted Man's version (Take care of your buddies; do your duty; pull more than your share; obey orders; treat honorable enemies with respect and civilians kindly; wear the uniform with pride) for -10 points, or the Officer's version (Bring honor to your unit, service, and the Imperium; lead from the front and by example; look out for the welfare of your troops in every aspect; wear the uniform with pride), also -10 points.

Fanaticism (p. B33) [-15] is common. Elite troops in particular tend to hold strong sentiment about their unit, homeworld, or arm of service. Fanaticism would not be out of place for any soldier, and a non-fanatic in an elite outfit might be considered a "misfit."

Acceptable Disadvantages

These disadvantages are allowable for active-duty troops. The *Desirable Disadvantages* from p. 54 should also be considered part of this list.

Acceleration Weakness (p. CI79) [-5] is not a very likely choice for Marines, but Army troops might well have this problem.

Bad Sight (p. B27) [-10] can be had only at the correctable level. This will be unusual in the Imperium. The player should be ready to explain why his character hasn't had his eyes fixed.

Bloodlust (p. B31) [-10] is not uncommon among troops who have been in a bad campaign. The urge to see your enemy dead can be overwhelming.

Callous (p. CI86) [-6] is common among very long-service troops. It is a good way to portray a soldier who has seen too much.

Chummy (p. CI87) [-5] is a good disadvantage for members of the artillery or vehicle crewmembers.

Compulsive Behavior (p. B32) [-5 to -15] is common; any number of possible behaviors, from carousing to gambling, are tolerated by the service as long as the soldier is able to perform his duties.

Dependents (p. B38) [varies] are not unheard of, despite the old saying that, "If the Army wanted you to have kids, they'd issue them to you." It would be a rare thing for a trooper's children to suddenly be in a war zone, but worries about family members would be a factor in any soldier's mind.

G-Intolerance (p. CI81) [-10/-20] is tough on troopers – the soldier is going to be *miserable* when deployed to worlds other than his home. G-Intolerance is not appropriate for Imperial Marines.

Gluttony (p. B33) [-5] is fairly common among soldiers. Many young soldiers can't seem to ever eat their fill. Many old veterans of hard campaigns will always have food hidden away somewhere.

Greed (p. B33) [-15] will be fairly uncommon, but can be very interesting if coupled with Compulsive Behavior (Gambling).

Gullibility (p. B33) [-10] is appropriate, since most soldiers are quite young and have little experience in the ways of the world. They are natural targets for all manners of con men and thieves.

Impulsiveness (p. B33) [-10] is another characteristic of younger, less-experienced troops.

Intolerance (p. B34) [varies] can be aimed at any number of groups by soldiers. Common targets are civilians, rival services, nobles, or non-combat troops.

Laziness (p. B34) [-10] defines the "get-over artist" (see p. 51).

Lecherousness (p. B34) [-15] is a hallowed tradition among some units, though it can cause all sorts of trouble.

Obsession (p. CI93) [-5 to -15] can have a wide variety of effects in a military setting, from the fairly harmless or beneficial (make it into the Sylean Rangers, make brigadier) to the extremely dangerous.

Odious Personal Habits (p. B26) [-5 to -15] are commonplace. Troopers do any number of obnoxious things: swearing, spitting, using the family pet for target practice. This also would cover annoying superstitions.

Overconfidence (p. B34) [-10] is very common among military units, especially those that have a claim to being elite.

Post-Combat Shakes (p. CI93) [-5] is found in all branches and all ranks. It is not an indication of cowardice, but a bad reaction to the stress of combat.

Space Sickness (p. CI84) [-10] cannot be taken by Marines. While the majority of spacecraft and orbital stations in the Imperium have artificial gravity, troops will be exposed to zero gee from time to time.

Stubbornness (p. B37) [-5] is often seen in senior officers and NCOs. This can greatly enhance a soldier's image with his troops, if roleplayed well.

From Civilian to Soldier

The following describes how civilian recruits are transformed into untried but trained soldiers during basic and advanced training. It can be used to help design a campaign in which the PCs start out as recruits, beginning basic, or serve as drill instructors.

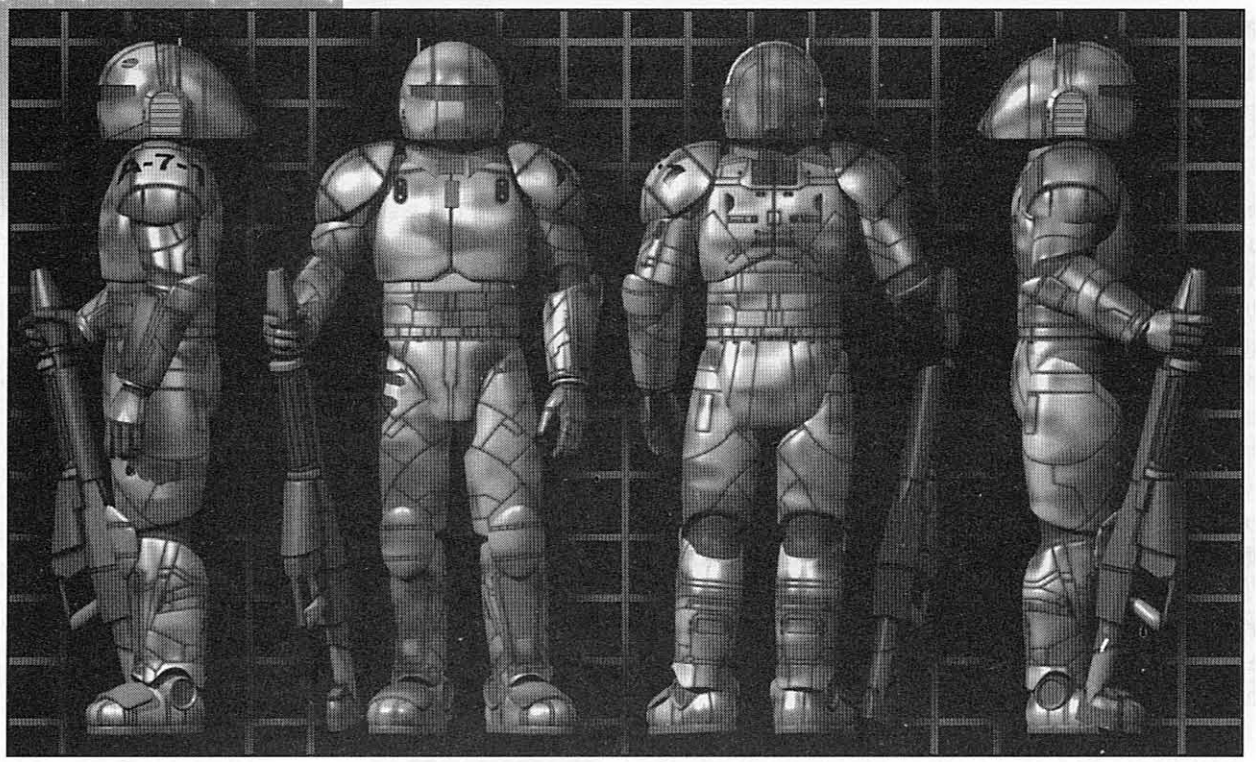
The new recruit obtains his Panimmunity via TL12 medicine upon enlisting. The other required advantage – Fit – isn't so easily obtained. Army basic training and Marine Phase I training take 12 seven-day weeks, consisting of *at least* 12-hour days. (A 12-hour day is a vacation in the Grinder.) At the end of this time, the recruits will possess the Fit advantage. (In essence, they've trained for 1,008+ hours to purchase it at ***GURPS***' usual 1 point per 200 hours invested. Advantages normally cost double to purchase after character creation, but the GM should waive this rule in this instance.)

Marines average more like 1,500 hours spent training in Phase I, which means that a fast-talking player might convince the GM to let him take 1 or 2 points in some appropriate advantage (Temperature Tolerance and Fearlessness are two good examples) as additional Phase I benefits.

This same period also can be considered *Quick Learning Under Pressure* time (pp. CI114-116) for Savoir-Faire (Military). Only the most incredibly dense recruit will not have a half-point in this skill by the end of basic.

Army advanced training and Marine Phase II training also are *Quick Learning Under Pressure* periods. This training usually takes six six-day weeks, but in the Army can vary considerably by subsector and specialty. This means that, for every primary skill *with a default*, the recruit can roll vs. IQ 18 times if Easy, 9 times if Average, four times if Hard, and twice if Very Hard. Per the *Quick Learning* rules, each success increases the recruit's default by 1, until three successes give him a half-point investment in the skill.

The 20-week Marine Phase III training (and the latter stages of many Army advanced-training courses) is handled as *Intensive Training* per pp. CI116-117. This training phase generally employs one instructor per 10 recruits, regardless of the skill being taught. Therefore, mental skills will require considerable instruction periods, while physical skills will improve much more quickly. The average Phase III/advanced training instructor can be considered to have Teaching-13 and a skill level of 18 in Gunner, Guns, or Beam Weapons, or 16 in other topics. A few will be *much* more skilled.



Discouraged Disadvantages

There are some disadvantages that are completely incompatible with the military life. Players can choose to build soldiers with these disadvantages, but they will cause problems far beyond those found in civilian life:

Addiction (to an illegal substance), Alcoholism, Amnesia, Bad Back, Berserk*, Blindness, Cannot Learn, Chronic Depression, Color Blindness, Combat Paralysis, Confused, Cowardice, Deafness, Delicate Metabolism, Delusions, Dependency, Dwarfism, Dyslexia, Epilepsy, Fat, Flashbacks, Gigantism, Glory Hound, Hard of Hearing**, Hemophilia, Hunchback, Kleptomania, Lame, Lunacy, Manic-Depressive, Megalomania, Mute, Night Blindness, No Depth Perception, One Arm***, One Eye***, One Hand***, Pacifism, Paranoia, Phobias, Pyromania, Quadriplegic, Reclusive, Split Personality, Terminally Ill, Trickster, Unfit, Very Unfit, Voices.

* In some cultures, this trait would be prized for special suicide-squads.

** This might be found in very long-service personnel working desk jobs.

*** With Imperial technology, these disadvantages can be countered with mechanical replacements. There is a strong anti-bionic sentiment in the Imperium that will affect troops who have prosthetic limbs. See p. GT109.

Modified Disadvantages

Combat Paralysis (Battledress) [-10] is a limited version of Combat Paralysis (p. B32). You have spent most of your fighting career in battledress, enjoying the protection of the armor and having advanced sensors pinpoint your targets for you. The shock of being on a battlefield without your armor causes you to freeze up. This only applies in mortal combat; the trooper can handle fistfights and brawls.

"Wars may be fought with weapons, but they are won by men. It is the spirit of the men who follow and of the man who leads that gains the victory."
– Gen. George S. Patton, Jr.

Service Academies

Potential Army officers may choose to attend one of the Imperial Service Academies. There is at least one Academy in almost every subsector.

Those who attended an Academy as part of their background will receive the following skills package: Diplomacy (M/H) IQ-2 [1]; Engineer (any) IQ [4]; History IQ-3 [1/2]; and Law (M/H) IQ-3 [1/2]. If the officer's character template already contains any of these skills, simply make the officer invest additional points sufficient to raise Diplomacy, History, or Law by 1, or Engineer by 2. Optionally, the officer could invest in different specializations of all these skills save Diplomacy.

Graduates also receive 8 points in additional Scientific skills, of which at least 4 points must be in a single skill.

Academy graduates tend to watch out for each other, so Contacts would not be inappropriate, nor would Ally or Patron (superior Academy graduate).

Character Templates

The following templates represent *active* service in the Unified Armies or Imperial Marines. They vary considerably from the templates on pp. GT100-105, which are meant to represent Army and Marine veterans who have mustered out. See p. 62 for more information on integrating previous military templates in a ***Ground Forces*** campaign.

Military Schools

A soldier's military career may be additionally fleshed out by selecting from the schools and enhancements listed here. All of them are optional. Some schools will not mesh well with certain templates, because both school and template invest points in the same skill.

In such cases, the player should add the point investments from school and template. If this investment doesn't fall precisely on the amount needed for a skill level, he should then add however many more points are needed to do so.

Protected Forces Training (+3 points). Add Vacc Suit (M/A) IQ-1 [1]; Free Fall (P/A) DX [2].

Specialist School (varies). Choose one of the following:

Medical: Increase First Aid to 13 [1½]; add Diagnosis (M/H) IQ-3 [½]-9.

Commo: Raise Electronics Operation (Commo) to 13 [varies].

Admin: Add Administration (M/A) IQ [2]-12.

Forward Observer: Raise Forward Observer to 13 [varies].

Cross-training (+4 points): Select a template other than the soldier's own (exception: players cannot choose Sylean Ranger). Take 4 points of skills from that template's Primary Skills. This represents time spent learning another branch's job.

Raider Training (+8 points): Add Demolition (M/A) IQ [2]-12; Engineer (Combat) (M/H) IQ-1 [2]-11; Explosive Ordnance Disposal (M/H) IQ-1 [2]-11; Traps (M/A) IQ [2]-12.

Rank Packages

NCO: Rank 1 [5] or Rank 2 [10]; minimums of Administration-12, Leadership-11.

Commissioned Officer: Minimums of Rank 3 [15+]; Administration-12; Leadership-12.

Imperial Army

The soldiers of the Unified Armies are a diverse lot, drawn from 11,000 worlds. Despite their differences, they all receive much the same basic training.

Infantry — 85 points

You are the guy who does the hard jobs. The tankers look flashy, and the missile jocks can flatten miles of terrain, but only the grunts on the ground can go in and clear out the enemy the old-fashioned way, face to face.

Attributes: ST 11 [10]; DX 11 [10]; IQ 12 [20]; HT 11 [10].

Advantages: Fit [5]; Panimmunity [5]; and 20 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* (p. 55).

Primary Skills: Armoury (Small arms) (M/A) IQ-1 [1]-11; Brawling (P/E) DX [1]-11; Camouflage (M/E) IQ-1 [½]-11; Climbing (P/A) DX-1 [1]-10; Electronics Operation (Comm) (M/A) IQ-2 [½]-10; First Aid (M/E) IQ-1 [½]-11; Forward Observer (M/A) IQ-2 [½]-10; Gunner (Gauss) (P/A) DX+1 [1]-12*; Guns (Light auto) (P/E) DX+4 [4]-15*; Guns (RAM grenade) (P/E) DX+1 [½]-12*; Hiking (P/A) HT [2]-11; Knife (P/E) DX-1 [½]-10; NBC Warfare (M/A) IQ-1 [1]-11; Orienteering (M/A) IQ [2]-12; Piloting (Grav) (P/A) DX-2 [½]-9; Savoir-Faire (Military) (M/E) IQ-1 [½]-11; Survival (two types) (M/A) IQ [2 each]-12; Tactics (M/H) IQ-1 [2]-11; Throwing (P/H) DX-1 [2]-10.

Secondary Skills: Administration (M/A) IQ-1 [1]-11; Area Knowledge (Duty station) (M/E) IQ [1]-12; Demolition (M/A) IQ [2]-12; Electronics Operation (Sensors) (M/A) IQ [2]-12; Fast-Draw (Magazine) (P/E) DX [1]-11; Gunner (Guided missiles) (P/A) DX+1 [1]-12*; Guns (Pistol) (P/E) DX+2 [1]-13*; Mechanic (type) (M/A) IQ [2]-12; Scrounging (M/E) IQ [1]-12; Survival (type) (M/A) IQ-1 [1]-11; Traps (M/A) IQ [2]-12.



Skill Packages:

Rapid Interface Infantry (+7 points): Add Battlesuit (P/A) DX+1 [4]-12; Beam Weapon (Plasma or laser) (P/E) DX+2 [1]-13*; Parachuting (P/E) DX+1 [2]-12.

Cavalry — 65 points

The cavalry has always been the arm of decision, slashing across the battlefield in dashing attacks. Today, you ride in 100 tons of whispering death, armed with weapons that run hotter than some stars. If you are very lucky, you'll survive your first fight.



Attributes: ST 10 [0]; DX 11 [10]; IQ 12 [20]; HT 11 [10].

Advantages: Fit [5]; Panimmunity [5]; and 20 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Armoury (Vehicular weapons) (M/A) IQ-2 [1/2]-10; Brawling (P/E) DX-1 [1/2]-10; Electronics Operation (Commo) (M/A) IQ-1 [1]-11; Electronics Operation (Sensors) (M/A) IQ-1 [1]-11; Engineer (Combat) (M/H) IQ-2 [1]-10; First Aid (M/E) IQ-1 [1/2]-11; Forward Observer (M/A) IQ-1 [1]-11; Gunner (Beam) (P/A) DX+2 [2]-13*; Guns (Pistol) (P/E) DX+2 [1]-13*; Mechanic (AFV) (M/A) IQ-1 [1]-11; NBC Warfare (M/A) IQ-1 [1]-11; Piloting (Grav) (P/A) DX+1 [4]-12; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11; Survival (type) (M/A) IQ-1 [1]-11; Tactics (M/H) IQ [4]-12.

Secondary Skills: Administration (M/A) IQ-1 [1]-11; Area Knowledge (Duty station) (M/E) IQ [1]-12; Camouflage (M/E) IQ [1]-12; Demolition (M/A) IQ [2]-12; Gunner (Gauss) (P/A) DX+1 [1]-12*; Knife (P/E) DX [1]-11; Leadership (M/A) IQ-1 [1]-11; Scrounging (M/E) IQ [1]-12; Survival (type) (M/A) IQ-1 [1]-11.

* Includes +2 for IQ.

Artillery — 65 points

Since the invention of gunpowder, the artillery has been the King of Battle. You control enough firepower to devastate hundreds of square miles, and can strike at foes across entire continents. Let the other troops call you a gun bunny or missile monkey; you know that when they need help, they'll call on you.

Attributes: ST 11 [10]; DX 11 [10]; IQ 12 [20]; HT 10 [0].

Advantages: Fit [5]; Panimmunity [5]; and 20 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Armoury (Vehicular weapon) (M/A) IQ [2]-12; Brawling (P/E) DX [1]-11; Engineer (Combat) (M/H) IQ-1 [2]-11; Forward Observer (M/A) IQ [2]-12; First Aid (M/E) IQ-1 [1/2]-11; Gunner (Beam and Guided missile) (P/A) DX+3 [4 each]-14*; Guns (Light auto) (P/E) DX+2 [1]-13*; Mechanic (AFV) (M/A) IQ-1 [1]-11; NBC Warfare (M/A) IQ-1 [1]-11; Piloting (Grav) (P/A) DX-1 [1]-10; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11.

Secondary Skills: Administration (M/A) IQ-1 [1]-11; Area Knowledge (Duty station) (M/E) IQ [1]-12; Camouflage (M/E) IQ [1]-12; Demolition (M/A) IQ [2]-12; Gunner (Gauss) (P/A) DX+1 [1]-12*; Guns (Pistol) (P/E) DX+1 [1/2]-12*; Knife (P/E) DX-1 [1/2]-10; Leadership (M/A) IQ-1 [1]-11; Scrounging (M/E) IQ [1]-12; Survival (type) (M/A) IQ-1 [1]-11.

* Includes +2 for IQ.

Support Personnel — 30 points + specialty cost

The combat troops either laugh at you or hold you in contempt. But you, and the generals, know the truth: Without you and your skills the Army wouldn't last five days. You may be an MP, an engineer, or even a cook, but you are part of the Black Sun Brotherhood just the same.

Attributes: ST 10 [0]; DX 11 [10]; IQ 12 [20]; HT 10 [10].

Advantages: Fit [5]; Panimmunity [5]; and 20 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Electronics Operation (Comm) (M/A) IQ-2 [1/2]-10; First Aid (M/E) IQ-1 [1/2]-11; Guns (Light auto) (P/E) DX+1 [1/2]-12*; Knife (P/E) DX-1 [1/2]-10; NBC Warfare (M/A) IQ [2]-12; Piloting (Grav) (P/A) DX-2 [1/2]-9; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11.

MOS Skills:

Communications (+15 points): A battalion can be spread over a hundred square miles, dodging around mountains and doing a dozen different things. The key to maintaining control is

communications. Your job is to ensure that the lines stay open. Take Computer Operation (M/E) IQ [1]-12; Electronics Operation (Comm) (M/A) IQ+1 [4]-13; Electronics Operation (Sensors) (M/A) IQ+1 [4]-13; Electronics Operation (Security) (M/A) IQ [2]-12; Electronics (any) (M/H) IQ [4]-12.

Engineer (+20 points): The combat engineer is responsible for building it up and then tearing it down. Your duties include preparing fortified positions, setting minefields and clearing the same, constructing temporary shelters, and disposing of unexploded ordnance. At any time, you will drop your tools and pick up your rifle to defend your work. Take Armoury (any) (M/A) IQ-1 [1]-11; Carpentry (M/E) IQ [1]-12; Computer Operation (M/E) IQ [1]-12; Demolition (M/A) IQ+1 [4]-13; Engineer (Combat) (M/H) IQ+1 [6]-13; Explosive Ordnance Disposal (M/H) IQ [4]-12; Gunner (Beam) (P/A) DX+1 [1]-12*; Mechanic (any) (M/A) IQ [2]-12.

Cook (+2 points): Not the most adventuresome life in the service, but you get to travel, and *everybody* wants to be friends with the guy who has the key to the food lockers. Take Cooking (M/E) IQ [1]-12 and Scrounging (M/E) IQ [1]-12. Many food-services personnel develop a secret skill in Distilling (M/A).

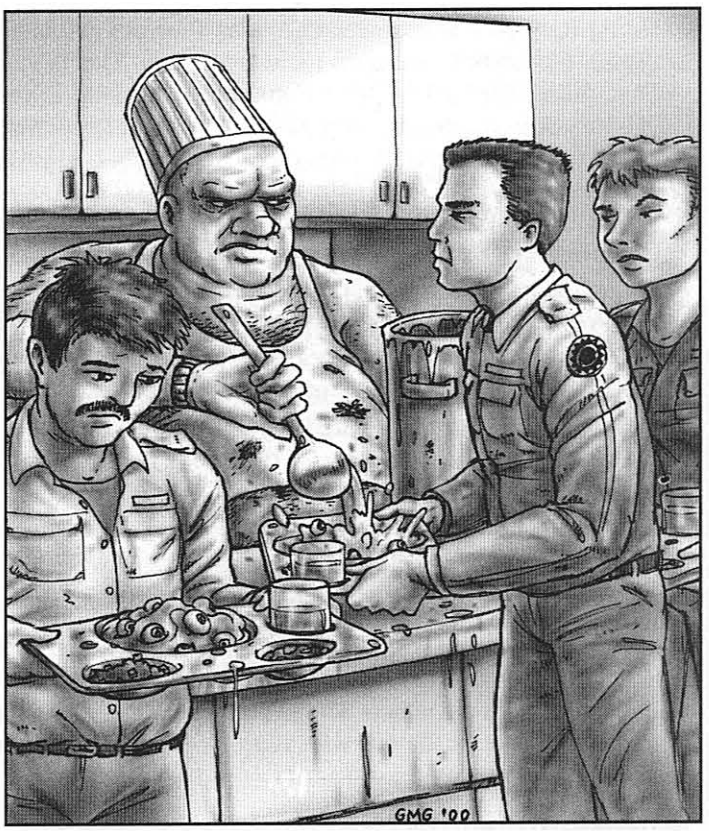
Logistics (+15 points): Your view of the Army is of an abyss that swallows material faster than it can be brought in. The front-line units are always short on something, and it is your job to make sure it gets where it needs to be, and that it gets there in a timely manner. Take Administration (M/A) IQ+2 [6]-14; Electronics Operation (Comm) (M/A) IQ [2]-12; Freight Handling (M/A) IQ+1 [4]-13; Merchant (M/A) IQ-1 [1]-11; Scrounging (M/E) IQ [1]-12; Piloting (Grav) (P/A) DX-1 [1]-10.

Mechanic (+15 points): Ever seen a colonel fixing his own tank? Never happen. So they turn to the mechanics in the vehicle pool. This may not be the most exciting job the Army has to offer, but it is one of the most useful. Take Armoury (any) (M/A) IQ+1 [4]-13; Electronics (any) (M/H) IQ [4]-12; Gunner (Gauss) (P/A) DX+2 [2]-13*; Mechanic (any) (M/A) IQ+1 [4]-13; Scrounging (M/E) IQ [1]-12.

Medic (+13 points): Hearing the panicked cry of "Medic!" means that it is your turn to do your job. Unarmed, it is your responsibility to see that the wounded are treated and safely returned to a hospital unit where they can be saved. Despite being non-combatants, Army medics win many medals for heroism. Raise First Aid to IQ+3 [5½]-15. Take Administration (M/A) IQ-1 [1]-11; Diagnosis (M/H) IQ-2 [1]-10; Electronics Operation (Medical) (M/A) IQ+1 [4]-13; Physician (M/H) IQ-2 [1]-10; Surgery (M/VH) IQ-4 [½]-8.

Military Doctor (+39 points): Once the medics get them back, you have to get them stabilized and ready to move, no matter how many missiles are falling around you. Take Administration (M/A) IQ [2]-12; Diagnosis (M/H) IQ+1 [6]-13; Physician (M/H) IQ+2 [8]-14; Surgery (M/VH) IQ [8]-12. Minimum of Military Rank 3 [15].

Military Police (+30 points): Law and order. Even in the controlled chaos of the average Army brigade, there is a need for police officers to enforce the rules and keep the streets safe. In combat, you protect rear areas and handle prisoners. Take Legal Enforcement Powers [5]; Administration (M/A) IQ [2]-12; *one of* Beam Weapons (Laser) *or* Guns (Pistol) both (P/E) DX+2 [1]-13*; Computer Operation (M/E) IQ [1]-12; Criminology (M/A) IQ+1 [4]-13; Detect Lies (M/H) IQ-2 [1]-10; Fast-Draw (Pistol) (P/E) DX [1]-11; Forensics (M/H) IQ-1 [2]-11; Holdout (M/A) IQ+1 [4]-13; Interrogation (M/A) IQ [2]-12; Intimidation (M/A) IQ [2]-12; Judo (P/H) DX [4]-11; Law (M/H) IQ-2 [1]-10.



Intelligence (+32 points): Your job is simple. Take a jumble of partial reports, out-of-date information, and wild guesses and turn it into a coherent report on the complete local picture for your commanding officer. You have five minutes. Intelligence support troops do the grunt work of listening to enemy transmissions and collating data. Some enlist with the idea that they will be doing something akin to spy work; these troops tend to be very disappointed. Take Administration (M/A) IQ-1 [1]-11; Area Knowledge (Local assignment area) (M/E) IQ+1 [2]-13; Camouflage (M/E) IQ [1]-12; Computer Operation (M/E) IQ [1]-12; Cryptanalysis (M/H) IQ-1 [2]-11; Electronics Operation (Sensors) (M/A) IQ+1 [4]-13; Intelligence Analysis (M/H) IQ [4]-12; Interrogation (M/A) IQ+1 [4]-13; Research (M/A) IQ-1 [1]-11; SIGINT Collection/Jamming (M/H) IQ [4]-12; Traffic Analysis (M/H) IQ [4]-12; and 4 points in languages.

* Includes +2 for IQ.

Speeder Pilot — 90 points

Twenty feet above the trees, doing 2,500 mph, dodging sensors that *really* want to lock you up. This is living! Sure, one solid hit and you become part of the bedrock, but everybody has to die sometime. You'll just have lived a bit more.

Attributes: ST 10 [0]; DX 13 [30]; IQ 12 [20]; HT 11 [10].

Advantages: Fit [5]; Panimmunity [5]; Military Rank 3 [15]; and 10 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Administration (M/A) IQ-1 [1]-11; Aviation (M/A) IQ [2]-12; Electronics Operation (Comm) (M/A) IQ [2]-12; Electronics Operation (Sensors) (M/A) IQ-1 [1]-11; First Aid (M/E) IQ-1 [1/2]-11; Gunner (Beam) (P/A) DX+3 [4]-16*; Guns (Light auto) (P/E) DX+1 [1/2]-14*; Leadership (M/A) IQ [2]-12; NBC Warfare (M/A) IQ-1 [1]-11; Navigation (M/H) IQ-2 [1]-10; Piloting (Grav) (P/A) DX+1 [4]-14; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11; Survival (type) (M/A) IQ-2 [1/2]-10.

Secondary Skills: Area Knowledge (Duty station) (M/E) IQ [1]-12; Brawling (P/E) DX [1]-13; Camouflage (M/E) IQ [1]-12; Guns (Pistol) (P/E) DX+2 [1]-15*; Knife (P/E) DX [1]-13; Orienteering (M/A) IQ [2]-12; Parachuting (P/E) DX [1]-13; Scrounging (M/E) IQ [1]-12; Survival (type) (M/A) IQ-1 [1]-11.

* Includes +2 for IQ.

Speeder Weapons/ Sensors Officer — 85 points

The best advice you got in training was "never look up." Not only does it take your eyes off the job, but you honestly don't want to know what the pilot is doing. You may not be flying the lawn dart, but you are the one with your hands on the weapons controls. That makes all the difference.

Attributes: ST 10 [0]; DX 12 [20]; IQ 12 [20]; HT 11 [10].

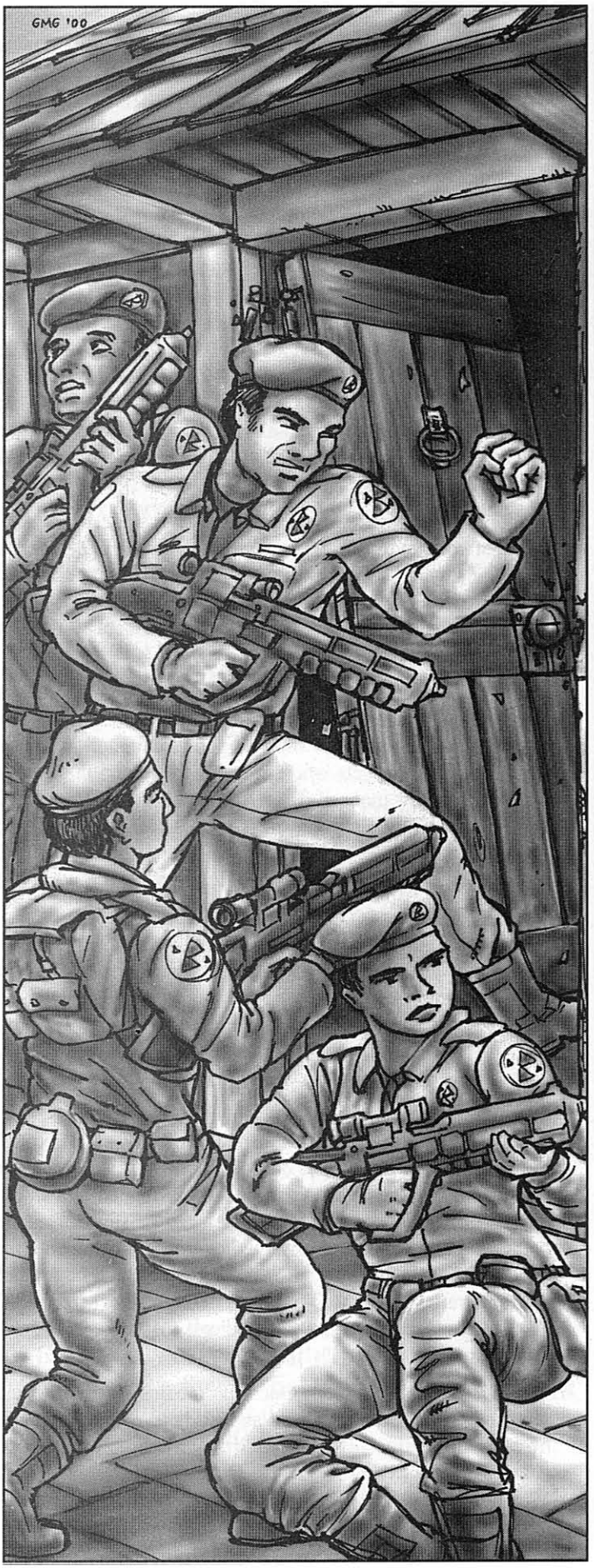
Advantages: Fit [5]; Panimmunity [5]; Military Rank 3 [15]; and 10 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Administration (M/A) IQ [2]-12; Aviation (M/A) IQ-1 [1]-11; Electronics Operation (Comm) (M/A) IQ+2 [6]-14; Electronics Operation (Sensors) (M/A) IQ+2 [6]-14; First Aid (M/E) IQ-1 [1/2]-11; Gunner (Guided missiles) (P/A) DX+3 [4]-15*; Guns (Light auto) (P/E) DX+1 [1/2]-13*; Leadership (M/A) IQ [2]-12; NBC Warfare (M/A) IQ-1 [1]-11; Piloting (Grav) (P/A) DX-1 [1]-11; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11; Survival (type) (M/A) IQ-2 [1/2]-10.

Secondary Skills: Area Knowledge (Duty station) (M/E) IQ [1]-12; Brawling (P/E) DX [1]-12; Camouflage (M/E) IQ [1]-12; Guns (Pistol) (P/E) DX+2 [1]-14*; Knife (P/E) DX [1]-11; Orienteering (M/A) IQ [2]-12; Parachuting (P/E) DX [1]-12; Scrounging (M/E) IQ [1]-12; Survival (type) (M/A) IQ-1 [1]-11.

* Includes +2 for IQ.



Sylean Ranger — 150 points

You've made it to the peak. After all that work and suffering you are a Ranger. Now the hard part begins . . . now you *earn* the beret.

As a Sylean Ranger, you are part of one of the best military organizations in known space, and your missions reflect that. Also, as a Ranger you'll be exposed to the darker side of the Imperium. Can you keep your idealism after seeing the truth about the state you serve?

Attributes: ST 12 [20]; DX 13 [30]; IQ 13 [30]; HT 12 [20].

Advantages: Fit [5]; Military Rank 1 [5]; Panimmunity [5]; and 15 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Extremely Hazardous Duty [-20] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Administration (M/A) IQ-2 [1/2]-11; Armoury (Small arms) (M/A) IQ [2]-13; Battlesuit (P/A) DX [2]-13; Beam Weapon (Lasers) (P/E) DX+2 [1]-15*; Beam Weapon (Plasma) (P/E) DX+2 [1]-15*; Camouflage (M/E) IQ [1]-13; Climbing (P/A) DX-1 [1]-12; Demolition (M/A) IQ+1 [4]-14; Electronics Operation (Commo) (M/A) IQ [2]-13; Engineer (Combat) (M/H) IQ-3 [1/2]-10; Explosive Ordnance Disposal (M/A) IQ-1 [1]-12; First Aid (M/E) IQ [1]-13; Forward Observer (M/A) IQ-1 [1]-12; Gunner (Guided missiles) (P/A) DX+1 [1]-14*; Guns (Light auto) (P/E) DX+3 [2]-16*; Guns (Pistol) (P/E) DX+1 [1/2]-14*; Guns (RAM grenades) (P/E) DX+1 [1/2]-14*; Hiking (P/A) HT [2]-12; Intelligence Analysis (M/H) IQ-2 [1]-11; Interrogation (M/A) IQ-2 [1/2]-11; Judo (P/H) DX-1 [2]-12; Knife (P/E) DX [1]-13; Mechanic (any) (M/A) IQ-1 [1]-12; NBC Warfare (M/A) IQ-2 [1/2]-11; Orienteering (M/A) IQ+1 [4]-14; Parachuting (P/E) DX-1 [1/2]-12; Piloting (Grav) (P/A) DX [2]-13; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-12; Scrounging (M/E) IQ-1 [1/2]-12; Stealth (P/A) DX [2]-13; Survival (two types) (M/A) IQ [2 each]-13; Swimming (P/E) DX-1 [1/2]-12; Tactics (M/H) IQ+1 [6]-14; Teaching (M/A) IQ-1 [1]-12; Throwing (P/H) DX-1 [2]-12; Tracking (M/A) IQ-1 [1]-12; Traps (M/A) IQ-1 [1]-12.

* Includes +2 for IQ.

Secondary Skills: Spend 5 points on languages and Area Knowledges.

IG Agent — 85 points

You've read your history. States like the Imperium don't fall to invaders; they rot from the inside. There's never been a race contacted that couldn't be corrupted. Your job is to try to keep the Army as clean as possible. The troops you deal with may not like you very much, but you aren't there to be liked. You are there to do your job, just like them.

Attributes: ST 10 [0]; DX 11 [10]; IQ 13 [30]; HT 11 [10].

Advantages: Fit [5]; Legal Enforcement Powers [10]; Panimmunity [5]; and 10 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Administration (M/A) IQ [2]-13; Computer Operation (M/E) IQ+1 [2]-14; Criminology (M/A) IQ+2 [6]-15; Detect Lies (M/H) IQ [4]-13; Fast-Draw (Pistol) (P/E) DX-1 [1/2]-10; First Aid (M/E) IQ-1 [1/2]-12; Forensics (M/H) IQ-2 [1]-11; Guns (Light auto) (P/E) DX+1 [1/2]-12*; Guns (Pistol) (P/E) DX+3 [2]-14*; Holdout (M/A) IQ [2]-13; Interrogation (M/A) IQ+2 [6]-15; Intimidation (M/A) IQ [2]-13; Judo (P/H) DX [4]-11; Knife (P/E) DX-1 [1/2]-10; Law (M/H) IQ+1 [6]-14; Piloting (Grav) (P/A) DX-2 [1/2]-9; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-12.

* Includes +2 for IQ.

Imperial Marines

Marines have access to the same schools as Army troopers (p. 57).

Line Marine — 85 points

As a Marine you are a very special kind of warrior. Outsiders always talk about the individual power of the cans, but they miss the point. Sure, you control an advanced fighting machine, but it is your training that makes you what you are, one of the best. The Zhodani use robots, and they aren't that great at actual fighting.

It isn't the suit. It's the Marine inside it.

Attributes: ST 11 [10]; DX 12 [20]; IQ 12 [20]; HT 11 [10].

Advantages: Fit [5]; G-Experience [10]; Panimmunity [5]; and 10 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Duty [-15] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Armoury (Battlesuit) (M/A) IQ-1 [1]-11; Battlesuit (P/A) DX [2]-12; Beam Weapon (Fusion) (P/E) DX+2 [1]-14*; Demolition (M/A) IQ [2]-12; Electronics Operation (Comm) (M/A) IQ-1 [1]-11; Electronics Operation (Sensors) (M/A) IQ-1 [1]-11; First Aid (M/E) IQ-1 [1/2]-11; Gunner (Guided missile) (P/A) DX [1/2]-12*; Guns (Light auto) (P/E) DX+2 [1]-14*; Free Fall (P/A) DX [2]-12; NBC Warfare (M/A) IQ-1 [1]-11; Parachuting (P/E) DX [1]-12; Piloting (Grav) (P/A) DX-1 [1]-11; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-11; Shortsword (P/A) DX-2 [1/2]-10; Survival (type) (M/A) IQ-1 [1]-11; Tactics (M/H) IQ-1 [2]-11; Throwing (P/H) DX-1 [2]-11.

Secondary Skills: Administration (M/A) IQ-1 [1]-11; Area Knowledge (Naval base or large warship) (M/E) IQ [1]-12; Brawling (P/E) DX [1]-12; Gunner (Beam) (P/A) DX+1 [1]-13*; Knife (P/E) DX [1]-12; Leadership (M/A) IQ [2]-12; Scrounging (M/E) IQ [1]-12; Traps (M/A) IQ-1 [1]-11.

Skill Packages:

Sniper (+8 points): Increase Guns (Light auto) to DX+4 [3]-16*. Add Stealth (P/A) DX+1 [4]-13; Camouflage (M/E) IQ [1]-12.

* Includes +2 for IQ.

Marine Commando 160 points

Compared to the Sylean Rangers, nobody seems to have heard of your organization. Good. That's just the way you like things.

The Commandos are the whisper to the Line's thunder, the dagger to the cutlass. Odds are nobody will ever know what it is you did, and you'll never get to tell the stories behind your medals.

But that's not why you became a Commando; you became a Commando to be with the best of the best, to take on the toughest assignments, and to provide the Imperium that extra lethal edge it needs to survive in a hostile universe.

Attributes: ST 12 [20]; DX 13 [30]; IQ 13 [30]; HT 12 [20].

Advantages: Fit [5]; G-Experience [10]; Panimmunity [5]; and 10 additional points in *Desirable Advantages* (p. 50).

Disadvantages: Extremely Hazardous Duty [-20] and -20 points from the *Acceptable Disadvantages* list (p. 55).

Primary Skills: Armoury (Small arms) (M/A) IQ-1 [1]-12; Battlesuit (P/A) DX [2]-13; Beam Weapon (Fusion) (P/E) DX+4 [4]-17*; Beam Weapon (Laser) (P/E) DX+3 [2]-16*; Brawling (P/E) DX-1 [1/2]-12; Camouflage (M/E) IQ [1]-13; Climbing (P/A) DX-1 [1]-12; Demolition (M/A) IQ [2]-13; Electronics Operation (Comm) (M/A) IQ-1 [1]-12; Explosive Ordnance Disposal (M/H) IQ [4]-13; First Aid (M/E) IQ [1]-13; Forward Observer (M/A) IQ+1 [4]-14; Guns (Light auto) (P/E) DX+3 [2]-16*; Knife (P/E) DX [1]-13; Judo (P/H) DX [4]-13; Navigation (M/H) IQ-2 [1]-11; NBC Warfare (M/A) IQ-1 [1]-12; Orienteering (M/A) IQ [2]-13; Parachuting (P/E) DX+1 [2]-14; Savoir-Faire (Military) (M/E) IQ-1 [1/2]-12; Scrounging (M/E) IQ [1]-13; Scuba (M/A) IQ-1 [1]-12; Shortsword (P/A) DX-1 [1]-12; Stealth (P/A) DX [2]-13; Survival (three types) (M/A) IQ [2 each]-13; Swimming (P/E) DX [1]-13; Tactics (M/H) IQ-2 [1]-11; Throwing (P/H) DX [4]-13; Traps (M/A) IQ-1 [1]-12.

Secondary Skills: Spend 5 points on languages and Area Knowledges.

Skill Packages:

Sniper (+12 points): Raise Guns (Light auto) to DX+5 [6]-18* and Stealth to DX+2 [6]-15.

* Includes +2 for IQ.



Integrating Previous Character Templates

GURPS Traveller and ***Star Mercs*** also include character templates for Army and Marine personnel. This book includes this third set in order to provide a more thorough portrait of the active-duty Imperial soldier.

This does not make the other two sets obsolete. Since most military training takes place under intensive circumstances (see the *From Civilian to Soldier* sidebar on p. 55), ex-Army and -Marine personnel will lose some of their active-duty skills as well as advantages soon after mustering out. The character templates in ***GURPS Traveller*** still provide an excellent model for the veteran a few years removed from the last time he put on his uniform.

The templates in ***Star Mercs*** are, of course, well-suited to represent the mercenary outfits that Army and Marine units must face from time to time. They also can be used to represent the forces of a planetary army.

Planetary troops will vary *widely* in quality. Most won't meet Imperial standards, but a few will *exceed* them. The GM should feel free to modify whatever template he intends to use however much he sees fit.

Chapter Four
Equipment and Supplies

Most of the existing equipment created for ***GURPS*** can be used in ***GURPS Traveller***. Game Masters interested in the full range of equipment available should acquire ***Ultra-Tech***, ***Ultra-Tech 2***, and perhaps even ***High-Tech*** for TL4-7 adventuring. The Safetech parameters on pp. UTT9-10 should be consulted as the GM determines what's available and at what cost. In addition, the following setting parameters apply:

Gravitic Technology

Artificial gravity appears at TL8 in the ***Traveller*** universe, two TLs early. Contragravity appears four TLs early – thus, TL12 CG units are available at TL8, while TL13 CG units arrive at TL9. Grav belts are available, but "grav guns" and gravity-beam weapons are *not* used in the ***Traveller*** setting. Artificial-gravity units include automatic compensation for transient high-G accelerations (separate "grav compensators" aren't needed) to 3 Gs at TL8-9 or 6 Gs at TL10-12.

Energy Storage Technology

Non-rechargeable power cells are not in standard use. All power cells should be built as rechargeable (having half normal durations/energy storage/shots).

Medical Technology

Braintaping and regeneration rays are unavailable. Low berths (aka cryo-tubes) are often installed on starships for use by low passengers (those who make the trip in suspended animation), and are often used in lifeboats to extend their capacity and range (see sidebar, p. 108).

Beam Weapon Technology

Beam weapons undergo several changes between "standard" ***GURPS*** and ***GURPS Traveller***. See also the setting-specific design notes on p. 111.

Lasers fire pulses of coherent light. At TL10+, X-ray lasers become available. Lasers use backpack power packs; this is a *heavily* ingrained custom dating to the earliest, power-hungry models and their clunky power cells.

Plasma guns fire bolts of high-energy plasma, and are identical to the plasma blaster weapons described on p. UTT58, except that the cost is × 15, not × 1.5, for beams under 6,400 MJ output. *Fusion guns* are more powerful, higher TL plasma blasters. (They aren't ***Ultra-Tech***'s fusion guns.)

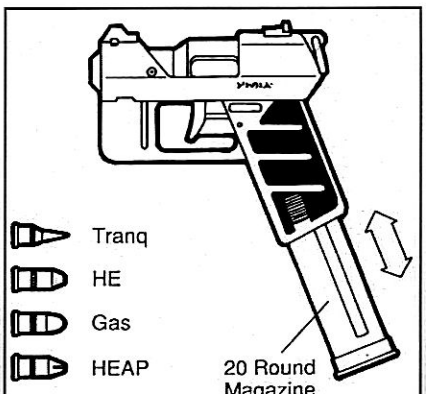
Particle beams are commonly used as spacecraft weaponry, but are not available for use as personal weapons. If designing spacecraft p-beams using ***GURPS Vehicles***, limit designs to neutral particle beams of 100,000 kJ or higher output.

Note: ***GURPS Traveller*** expresses prices in Imperial credits, abbreviated Cr (Cr500, Cr1, etc.). Large amounts are in megacredits (MCr1.23, MCr34.2, etc.) of 1 million credits each. Other ***GURPS*** books use the alternate symbol for credit, which is $.

Tech Levels

Traveller was the first science-fiction roleplaying game to make widespread use of tech levels, a device later used by ***GURPS,*** albeit with modifications. ***GURPS Traveller*** uses the ***GURPS*** tech levels, but since there is considerable possibility for confusion, a table for conversion is provided below. All references to Tech Levels or TLs will be to the ***GURPS*** system. Any reference to *Traveller* tech levels will be clearly labeled as such.

Traveller Tech Level	***GURPS*** Tech Level
0	1-3
1	4
2	5
3	5
4	5
5	6
6	6
7	7
8	8
9	9
10	9
11	9
12	10
13	10
14	11
15	12
16	13



Auto Snub Pistol

Technical Difficulties

In ***Traveller***, all Imperial military forces use top-of-the-line gear. In ***GURPS***, the average marine, with his TL10 background, would be at -10 to use or repair most of his TL12 equipment!

Several solutions exist. The GM can rule that – even though the TL12 units get all the press – the Imperium actually fields units at TLs 10, 11, and 12. (This would make logistics sense, too, vastly multiplying potential "vendor" worlds.) The downsides are introducing multiple TLs of Imperial gear and bending ***Traveller*** canon.

A second option assumes all equipment is TL12, except items that require a Mental skill to use or might need field repair. In those cases, the trooper receives gear of his own TL. This creates even more multi-TL inventory muddle, but tweaks the setting a little bit less.

A third option is to ignore the situation, which would justify slashing the cost of High Technology (see p. 82).

Low Berths

Also called cryo-tubes (or freezers, a vulgarism starship crews never use . . . when passengers can hear). "Low passengers" (see p. 78) spend a star trip in suspended animation. Many lifeboats carry low berths to reduce life-support needs.

Entering: Entering a low berth takes five minutes, 10 without assistance.

Revival: Those outside a low berth can revive an occupant at any time. The berth can trigger revival after a set duration, or a linked computer can when certain preprogrammed conditions are met. Revival takes 15 minutes. Success is automatic if overseen by a person with Physician 10+ or Electronics Operation (Medical) 10+. Otherwise, roll against HT; the occupant dies on a critical failure. One person may only monitor four revivals at once.

Nerve guns are rare; increase their TL by 2 (i.e., they appear at TL12). They cost 10 times listed price. *Stunners* are rare; increase their TL by 3 (i.e., they appear at TL12). They also cost 10 times list.

Disintegrators were used by the Ancients, but their secrets were lost. Any that enter into the game will be one-of-a-kind artifacts, therefore highly valuable and very likely to be confiscated by the Imperial government if discovered.

Several ***GURPS*** beam-weapon types are not used in the ***Traveller*** setting: anti-particle beams ("pulsars"), blasters and electron-beam weapons (as personal weapons), displacers ("tachyon shotguns"), electrolasers, electron pistols/rifles, flamers, gamma-ray lasers ("grasers"), kinetic stunners ("force-beams"), microwave disruptors ("masers"), paralysis guns, screamers, and space/time disruptors. Fusion guns as described in ***Ultra-Tech*** do not exist; use plasma blasters instead.

Meson Technology

Meson guns are designed as neutral-particle beams (p. VE123) except they first appear at TL10 and have a minimum output of 1 billion kJ, divided by 10 at each successive TL. They function like neutral-particle beams, except they ignore target armor PD and DR. Anyone not directly hit will suffer secondary explosive and radiation damage (which does *not* ignore DR and PD) as per antiparticle beams.

Meson communicators are identical in statistics and function to neutrino communicators (see ***Ultra-Tech*** and ***Vehicles***) except weight, volume, and cost are multiplied by 10.

Electronics Technology

Bioscanner, chemscanner, and *multiscanner* devices do not exist. The radscanner *does* exist. *Ultrascanners* do not exist. *Neutrino communicators and receivers* are not available (but see *Meson Communicators*). *Intruder suits* and *intruder chameleon* armor, vehicle, and robot surfaces are unavailable.

Force Field Technology

All deflectors and force screens, and all related force-field technology (force shields, force swords, life-support belts, etc.) are unavailable. Exceptions include nuclear dampers (see p. 51), meson screens (see p. 154), and the ultra-rare "black globe" and "white globe" force fields derived from Ancient artifacts. Gravity ripple communications are not available.



Neural Interface, Implants, and Cybernetics

These are rare in ***Traveller***. With the exception of simple prosthetics, which replace but do not augment missing body parts, bionics are not commercially available in the Imperium. This stems from Imperial distrust for technology that smacks of robotics or mind control ("Zhodani influences!").

On many planets, possession of obvious or known cybernetics is a Social Stigma. Nevertheless, most advanced societies, including the Imperium, have the technology to produce cybernetics and implants, and may do so on a limited basis (outfitting covert operatives, for example).

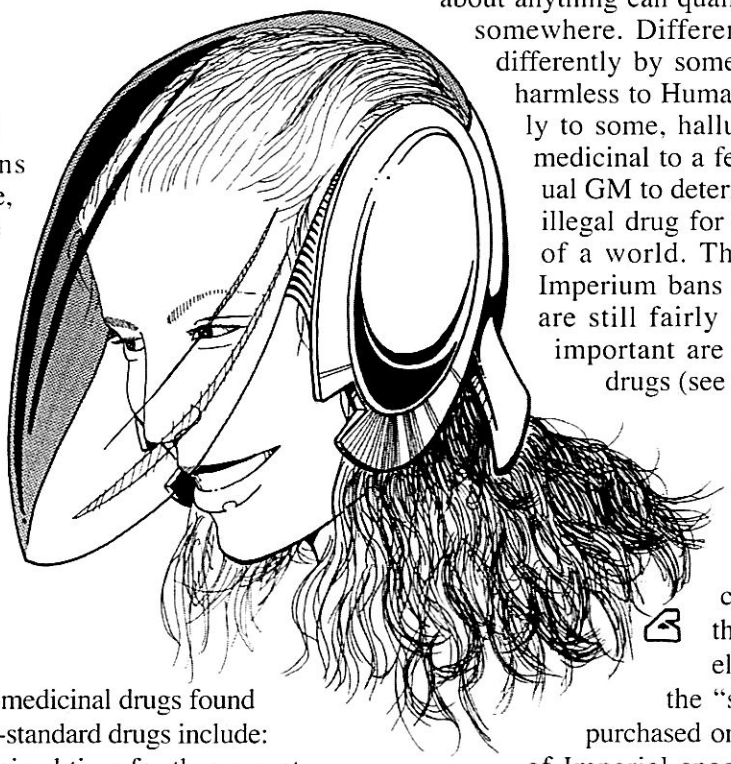
If introducing neural interface technology and cybernetics, GMs should use the TLs from ***GURPS Ultra-Tech***, ***Space***, and ***Ultra-Tech 2*** rather than from ***GURPS Cyberpunk***, and reduce the bonus given by neural interfaces to +1 rather than +4.

Ultra-Tech Melee Weapons

Ultra-Tech melee weapons (vibroblade, monowire, sonic blade, neurolash, force sword, etc.) are rare or non-existent (GM's option) in the ***Traveller*** setting.

Psionic Shields

The technology to block Psi powers exists in the ***Traveller*** setting, and has been incorporated into vehicles, buildings, and personal helmets. The helmets are described on p. 116.



Drugs

Most medicinal and many non-medicinal drugs found in ***GURPS*** are available. Some non-standard drugs include:

Slow (TL10) slows down perceived time for the user, at a rate of 2-to-1. Treat as Altered Time Rate +1 (see p. CI49). A dose takes effect in one minute if taken as a pill, immediately if injected, and lasts 10 minutes. The user suffers 1d damage afterward. Cr2,000 in pill or injectable form.

Fast (TL10) is a powerful improvement of Suspend. A dose lasts 60 days (!), during which the subject requires only a single day's life support. At the end of its use, the user suffers 1d of damage. Fast is primarily used in survival situations, and tablets or injectors are often carried in lifeboat survival kits. Few people take the drug in the presence of those they do not completely trust. One dose costs Cr1,500 in either form. An antidote is available for Cr100.

Combat drug is an improved TL10 Adder (see p. UT97) providing +2 to ST, DX, and HT. Duration and onset are as for Slow drug. Unlike TL8 Adders, no HT roll is required, but users do suffer -2 to ST, DX, and HT for 20 minutes afterward. Cost is Cr200 in pill form or Cr400 as an injectable.

Anagathics (TL12) are the only version of Anti-agathics (p. UT99) available in ***GURPS Traveller***. Anagathics retard the aging process (by about 50-to-1), but cannot reverse it. Each monthly dose slows aging for that month; missing a dose requires making up any skipped aging rolls at one per week till the regimen is re-established or the rolls get caught up. Anagathics are rare and expensive. A monthly dose costs Cr30,000; finding it requires a 5-point Contact (he has 1d-2 doses every month) or a Streetwise roll (roll at -6 once every three months per TL12 world; success finds 1d doses).

Illegal Drugs

Given the size and diversity of the Imperium, just about anything can qualify as an illegal substance somewhere. Different races will be affected differently by some substances, and what is harmless to Humans will no doubt be deadly to some, hallucinogenic to others, and medicinal to a few. It is up to the individual GM to determine what is and is not an illegal drug for a given world, or portion of a world. The substances which the Imperium bans on an empire-wide basis are still fairly numerous, but the most important are the various types of psi drugs (see pp. T:AI140-141).

Weapons

The following sections detail the variety of personal weaponry commonly encountered in the Imperium. These models have informally become the "standards" – they can be purchased or repaired throughout most of Imperial space. For every "standard" model of weapon, at least 100 variants can be encountered on single worlds or in local regions.

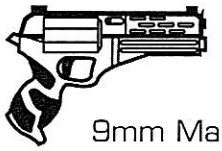
Many weapons don't become "standardized" until one (possibly more) TLs past their introduction. For instance, ACRs can be developed at TL8, but the standard designs incorporated TL9 improvements by the time they filtered throughout the Imperium. Most TL8 militaries with a desire for ACRs simply import the TL9 Imperial standards rather than develop their own TL8 version.

Personal Slug Throwers

Most Imperial slug-throwers are familiar, but not identical to 20th-century fare. Over thousands of years the standard calibers and design parameters have changed. Slight changes in weapon statistics result.



9mm Auto



9mm Mag



Body Pistol

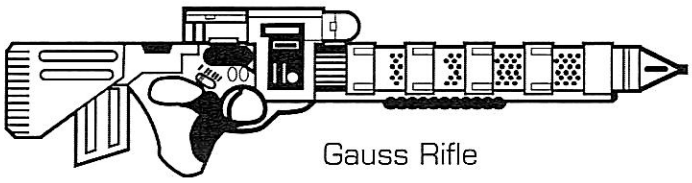
Revolvers commonly fire 5mm, 7mm, or 9mm ammo.

Magnum revolvers fire a more powerful 9mm cartridge than the standard 9mm revolver. Ammo is not interchangeable. Many Imperial nobles carry ceremonial Magnums, in the same way that those of previous ages carried ceremonial swords as part of their formal costume.

Body pistols are small, non-metallic automatic pistols specially constructed to evade detection by all but the most advanced scanning equipment. Covert and criminal uses for the weapon abound, and it is a favorite of spies, smugglers, and others of their ilk.

Auto pistols are usually 7mm or 9mm.

Gauss pistols and *Gauss rifles* fire 4mm darts (sometimes called needles) accelerated by electromagnetic coils in the barrel rather than expanding gasses. They are almost completely silent except for the sharp crack of a supersonic round. (Some weapons can be adjusted to fire rounds at subsonic velocities; this option adds Cr500 to weapon cost and is required for firing tranq rounds. Subsonic rounds do ½ damage but make no more noise than a mosquito.) Standard upgrades to the Gauss rifle include gyrostabilization, laser sights, HUD sights, and a RAM-grenade hardpoint; the listed weapon includes these.



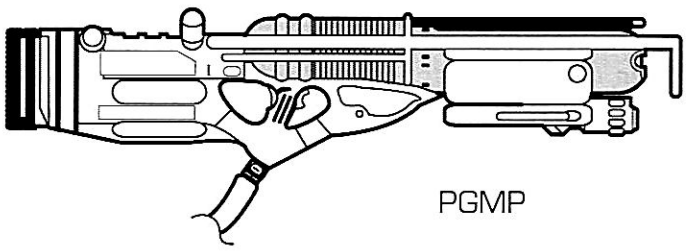
Gauss Rifle

Carbines and *rifles* are normally 7mm (carbines) or 7mm, 9mm, or 13mm (rifles). Their ammo does not interchange with corresponding pistol ammo. The 13mm rifle would have non-military utility on very few worlds.

Assault rifles usually are 5.5mm or 7.5mm. Models seen on Imperial worlds tend to slightly underperform their ancient Terran ancestors, a testimony to how long the Solomani have excelled at weapons-crafting.

Advanced combat rifles fire a variety of caseless ammunition in 7mm or 9mm. The standard models feature gyrostabilization, laser sights, HUD sights, and a RAM-grenade hardpoint.

Snub pistols and *accelerator rifles* fire small rockets, making them recoil-free and well-suited for zero-gravity work. The snub pistol also features very short range, ideal for starship interiors. Both meet the varying demands of shipboard and hullside combat by firing a wide mix of ammo. These weapons could be *much* lighter, but manufacturers find that purchasers want some minimal "heft" to their small arms.



PGMP

SMGs and *shotguns* resemble their Terran ancestors, with small changes in performance over the centuries.

Light assault guns offer a relatively low-tech counter to armored infantry and some utility against unarmored threats.

Energy Weapons

Lasers, plasma guns, and fusion guns all include integral laser and HUD sights (Holographic HUD at TL9+). All have backpack powerpacks with rechargeable power cells; the weight and cost under *AWt* is the backpack. Add both together for total values. The backpack power supply usually attaches to the weapon via a cord; battle dress designed for firing the PGMP-10A or FMMP-11 may incorporate the power cord into the armor.

The PGMP-10A and FGMP-11 are designed to plug into battle-dress electronics to use its HUD; they cannot be fired without a suit.

The PGMP-11 and FGMP-12 use contragravity units in weapons and backpacks that reduce weight to 1% of actual weight; the FGMP-12 can even be used one-handed with the CG unit activated. When turned on, the CG unit drains 1 shot per 5.55 hours (PGMP) or 13.88 hours (FGMP) from the backpack.

Hand Grenades

These are described on pp. UT67-68.

RAM Grenades

Somewhat misnamed, RAM (*r*ocket-*a*ssisted *m*unition) grenades are rockets fired from hardpoints incorporated in the flash suppressors of ACRs or muzzles of Gauss rifles, much like TL7 rifle grenades. They come in anti-personnel and anti-armor versions.

The RAM grenade can only be launched from a rifle hardpoint; this provides minimal "standoff" distance and allows the grenade's firer to use any laser or HUD sights attached to his rifle. Though hardpoint-launched, they may be loaded in combat (takes 6 turns). The rifle cannot function normally while grenade-armed.

Ammunition Notes

Most ***GURPS Traveller*** guns fire conventional ball rounds, but some have multiple ammunition types, listed on the tables on pp. 114-115. These are:

APS is armor-piercing saboted ammunition. DR protects at half value against it, as shown by the (2) after the round's damage, but damage after DR is also halved.

Beehive are flechette rounds described on p. VE189.

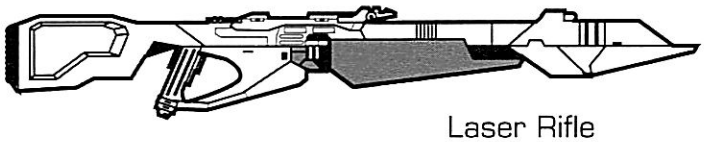
CHEM is a chemical-filled round. A common chemical filler is sleep gas, at Cr5 per dose, but other gasses can be substituted per p. UT70.

Gauss guns fire high-density dart ammunition. Armor DR is halved, but damage is *not* halved after penetrating DR.

HE is a high-explosive round that does damage using the explosion rules in ***GURPS Basic Set*** (p. B121). Fragmentation damage is shown in square brackets.

HEAT is a high-explosive shaped-charge round. The (10) after damage means target armor protects at 1/10 DR against a direct hit. If fired against soft targets the round may not detonate: Roll 3d vs. armor DR+3 (or half armor DR if non-rigid); if it fails, the impact alone does only 1/6 damage and armor protects at full DR.

Tranq rounds are available for all slug-throwers, including Gauss weapons, at TL8+. The slug is a drugged needle imbedded in a special gel. The round normally does no damage, though it will do 1 impaling hit to paper, eyes, and similarly fragile targets. It will penetrate any armor with DR 2 or less vs. impaling, delivering one dose of a drug, usually a Sleep agent. Tranq rounds cost three times as much as normal ammo, plus the cost of one dose of the drug. They have 1/3 the range of normal rounds. See *Needlers* on p. UT50 for more general information and pp. UT70-71 for popular chemical agents.

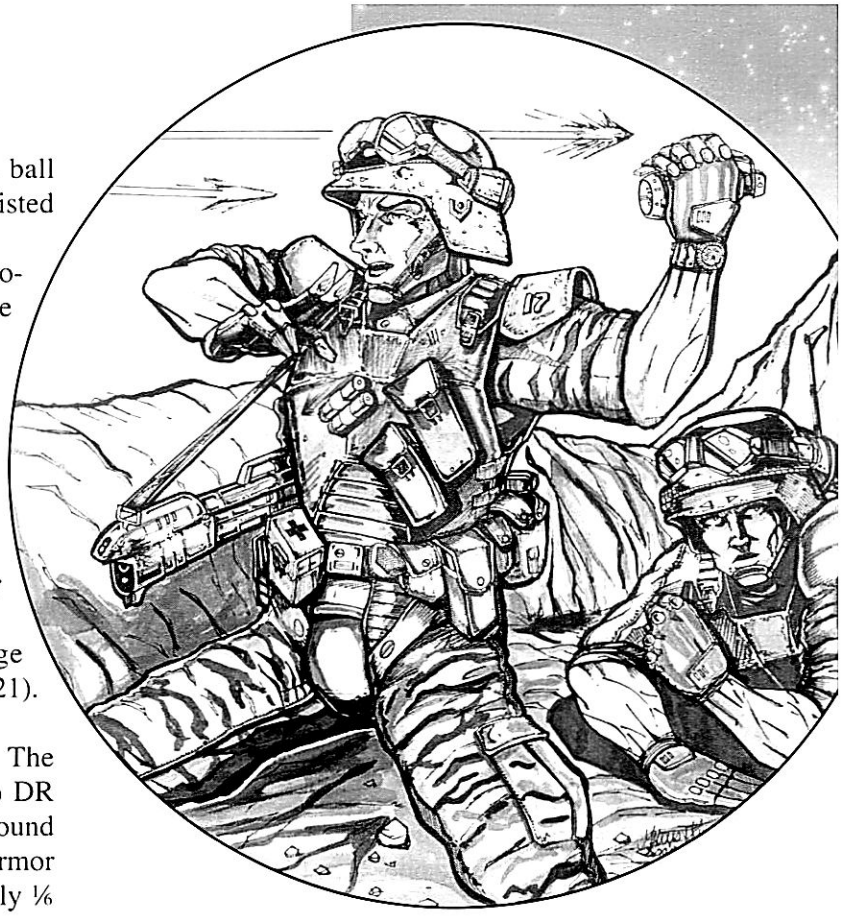


Laser Rifle

Design Your Own!

GURPS Traveller weapons were built using the ***Vehicles*** design rules to approximate the range, armor penetration, and weight of weapons from classic ***Traveller***, ***Striker***, and ***MegaTraveller***.

GMs may wish to design more weaponry for ***Traveller***. As previously mentioned, the weapons in this chapter are simply the most common in the Imperium. Variant models are plentiful. See ***GURPS Vehicles***, ***Ultra-Tech***, and ***Ultra-Tech 2*** for a vast variety of options.



GURPS Traveller Special Rules

When designing new weapons, keep in mind that many types aren't seen in the ***GURPS Traveller*** setting, some weapons cost more, and some have special restrictions; see pp. 107-108. The following special design rules also apply:

Gyrostabilization (TL8): This feature is similar to weapon stabilization for large weapons (see p. VE45), but is available for handheld weapons at TL8. It reduces the penalties for firing while moving (p. B117) by 1.

Weight is 0.05 × empty weight (with stock, etc.) at TL8, negligible at TL9+. Cost is Cr200 × empty weight. Halve cost at TL9 and quarter it at TL10+.

High Energy Recoil: In ***GURPS Traveller***, plasma blasters and fusion guns have a recoil penalty of (square root of KJ output) × M / (Empty weight + 5); M is 0.75 if tripod mount, 1.5 if shoulder stock or stock and bipod, 2.25 if pistol grip. This affects minimum ST.

Gravfield generators (TL8): These can be built into weapons and backpacks to reduce effective weight. Build it as a contragrav-lift unit supporting 90-100% of the weapon's weight (including the unit).

When calculating recoil, use actual empty weight including the weight of the unit; when calculating minimum ST, use the CG-reduced weight.

Full weight applies in all applications when the CG unit is turned off or has no power.

Standard Accessories

These accessories follow the "standard" ***GURPS*** rules. They are noted because they are the options most commonly found on Imperial small arms. ACRs, Gauss rifles, and all energy weapons already incorporate some accessories.

HUD Sights (TL8): These include a cable that plugs into a HUD or Holographic HUD helmet or goggles (see p. 116). The HUD displays a targeting reticle showing exactly where the gun is pointing. This reduces SS by 2 (with HUD) or 5 (with HoloHUD). If a laser sight is used as well, exact range-to-target data will be displayed as well, and snapshooting is even easier: Add half (round up) weapon Acc to unaimed shots. Cr500, negligible weight, powered by display unit.

Laser Sight (TL7): The sight's low-powered beam places a dot where the weapon is pointing. This adds 2 to Acc with aimed shots and reduces Snap Shot penalty to -1 at up to 50 yards or -2 at 51-100 yards. It can also be tuned to infrared. Cr200, weight negligible, 100 shots to a B cell.

RAM Grenade Hardpoint (TL6): This is usually incorporated into the flash suppressor or muzzle brake of a TL8+ firearm. A savvy TL6-7 world could easily design their weapons to fire imported TL8+ RAM grenades, though. There's no reason, other than tradition, that one could not be put on a beam weapon. Cost and weight negligible. Any weapon with a hardpoint may not exceed LC 1.

TL6-7 rifles may incorporate similar rifle-grenade launchers. See ***GURPS High-Tech***, p. 78.

Personal Equipment

Here's a brief list of ultra-tech equipment characters may find useful – see pp. B212-213 for lower-TL gear. Add 50% to any device's operating time on power cells for each TL after it first appeared. Operating durations have already been halved to account for using rechargable power cells.

Halve price and weight one TL after a device first appears; quarter them two TLs later. This doesn't apply to toolkits, air tanks, weapons, or armor.

Survival Gear

Air Mask (TL7): A face mask and air hose. Used on worlds with unbreathable but otherwise harmless atmospheres. If the atmosphere lacks enough oxygen (or has too much) air tanks are also required, while if it has enough oxygen but is contaminated or tainted, a filter (but no tanks) is required. Cr100, 2 lbs.; for another Cr50 has a mini-tank with 10 minutes of air.

Air Tank (TL7): Stores two hour's worth of air; usable with vacc suits, air masks, sealed armor, etc. Multiple tanks can be worn; each is Cr100, 10 lbs. An advanced rebreather (TL8, Cr200, 1 lb.) added to breathing gear multiplies tank duration by 10.

Filter (TL7): Used with air mask or any respirator, allows contaminated air to be breathed without resort to air tanks. The filter media require periodic replacement. Cr200, 1 lb. for CBR-rated filter usable against chemical agents, bioweapons, or radiation fallout; Cr100 for filter only rated for things like pollution, volcano fumes, or pollen. Replacement filter media (every 48 hours): Cr40 for CBR-rated, Cr10 otherwise, ¼ lbs. Note that to protect against contact agents like nerve gas or bioweapons, a sealed suit will also be necessary.

Pressure Tent (TL8): An airtight tent strong enough to be inflated to one atmosphere in a vacuum. Opening it completely evacuates the air; entering or leaving through the one-man lock takes a minute. Cr500 and 15 lbs. for a one-man tent; Cr1,500 and 30 lbs. for a two-man tent; Cr5,000 and 150 lbs. for an eight-man tent.

Respirator (TL9): Makes very thin and thin oxygen atmospheres safely breathable. Lasts two weeks on a B cell. Includes protective goggles and short-range communicator. Cr300, 3 lbs.

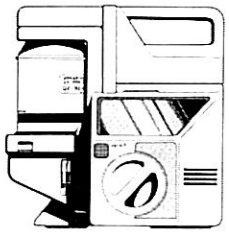
Reducing Respirator (TL9): As above except makes dense or very dense oxygen atmospheres safely breathable. Works for two weeks on a B cell and a chemical recharge (Cr50). Cr500, 5 lbs.

Rescue Ball (TL8): Also called an "enviro-bubble" or a survival bubble, this is a paperback-book sized package that inflates into an air-tight bubble with self-sealing flap. It can be erected in four seconds and holds 15 minutes of air – more if the wearer carries an air tank. It floats and is flexible enough to move in (Move 1). Merchant ships may issue these to passengers instead of vacc suits, since they're well-suited to use by untrained individuals. Cr800, 5 lbs.

Personal Reentry Kit (TL8): A foamed atmospheric ablative heat shield, chemical thruster and parachute allows an individual in a sealed suit (such as a vacc suit or battle dress) to reenter atmosphere on successive Free Fall (to reenter without burning up) and then Parachuting (to land safely) rolls. Cr15,000, 30 lbs.

Sensors

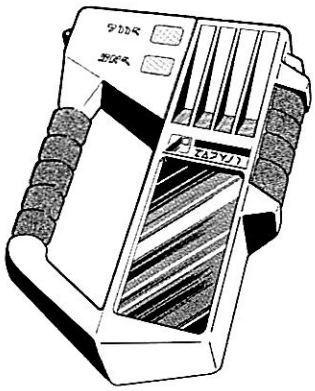
Atmosphere Tester (TL8): A simplified chemsniffer that tests the atmosphere it's in and displays the composition using a digital readout. Also, a light glows red if the atmosphere is unbreathable by Humans, green if breathable. Works for six months on a B cell. Cr400, 1 lb.



Biosniffer (TL10): An advanced chemsniffer that can recognize and categorize evidence of biological organisms. For example, it could determine what type of life-forms had previously occupied an area by picking up characteristic molecules produced by their exhalations, skin flakes, etc., and comparing

them to a database included in the device's computer. It has a range of up to 5 yards. An Electronics Operation (Sensors) roll is required to pick up something, with a -1 penalty per half hour that the trail is cold. Cr2,000, 2 lbs., three months on a B cell.

Chemsniffer (TL8): Analyzes chemical traces in the atmosphere. Range is 5 yards – can be used to determine atmospheric composition or find contaminants, drugs, explosives, etc. on a successful Electronics Operation (Security Systems) roll. Cr700, 2 lbs., works three months on a B cell.



Densitometer (TL11): This gadget uses gravitic-imaging technology to map the interiors of objects. Effective range is 500 yards. A successful Electronics Operation (Sensors) roll is required to make a clear scan, which takes 1 second per 27 cubic feet (18.5 seconds per displacement ton). Failure means the scan must be repeated. When an object has been scanned, it stores the data as a 3-D plan in standard computer media (0.037 gigs per cubic foot/1.85 gigs per displacement ton) that can be accessed via computer for a "cutaway" view of the object. One C cell provides power for five minutes of scanning. Cr15,000, 10 lbs.

Goggles, Anti-Glare (TL8): Darken automatically to protect vs. ultrabright light. Cr150, 0.5 lbs. These or other goggles can add to a suit helmet for the same weight and price.

Goggles, Infrared (TL8): Gives wearer infrared vision (as per Infravision advantage, p. B237). Cr600, 0.5 lbs., three months on an A cell.

Goggles, Light-Intensifier (TL7): These halve all darkness penalties (round in user's favor) except in complete darkness. A laser hit will burn them out. Cr200, 1 lb. At TL-8+, Cr300 buys LI contact lenses with effectively no weight. They work one week on an AA cell.

Goggles, Multiview (TL8): Combines antiglare, infrared, and light-amplification goggles into one system. Works for six weeks on an A cell. Cr1,200, 1.5 lbs. At TL9+, a "sunglasses" version is available at Cr600 and negligible weight, three months on an A cell.

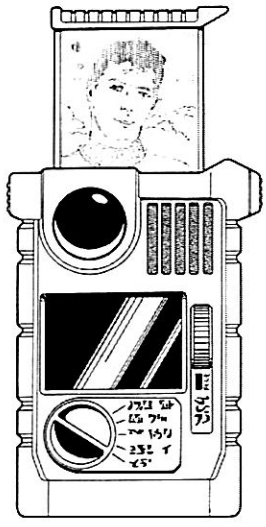
Neural Activity Sensor (TL12): A backpack display and processing unit with one or more handset antennas. It detects the electrical activity of a life form's nervous system at up to 300 yards. The display detects and classifies life-forms as IQ 1, IQ 2 (insect-equivalent level), IQ 3 (reptile-equivalent level), IQ 4-6 (mammal-equivalent level), or IQ 7+ (near-sapient/sapient). Insect-equivalent level lifeforms are generally shown as washes of color on the display representing density of lifeforms, while higher forms may be represented by individual "blips." Electronics Operation (Sensors) allows manipulation of various tools to call up graphs showing exact number of lifeforms and filter out or classify known types according to database information. It's blocked by psi shielding or solid objects. The handset is not attached to the backpack and can be operated out to 100 yards distance, further extending range. The backpack runs on a C cell, handsets on a B cell, for a week. Backpack: Cr15,000, 20 lbs. Handsets: Cr20,000, 0.5 lbs.

Sensor Visor (TL10): As multiview goggles (or helmet visor) but adds image enhancement with 100× magnification; +3 to Vision rolls. Works for two weeks on two B cells. Cr1,500, 2 lbs.

Televiewers (TL8): High-tech electro-optical binoculars with up to 50× magnification and built-in laser rangefinder (+2 to Forward Observer skill, range 5,000 yards). Infrared and light intensification (as per goggles) can be built in for an extra Cr300 each. Works for six weeks on a B cell. Cr950, 2 lbs.

Communication and Information

Communicator, Short-Range (TL8): Tiny two-way radio, often built into helmets. Base range 10 miles, ×10 at TL9 or ×50 at TL10+, increasable up to 100% on a successful Electronics Operation (Communication) roll at -1 per 10% extra range. Lasts six months with an A cell. Cr50, weight negligible. Disguiseable in wristwatch, earring, etc. for +10% cost.



Communicator, Medium-Range (TL8): A palm-sized radio; as above, but base range 100 miles. Lasts six months with a B cell. Video display available at double cost. Cr200, 1 lb.

Communicator, Long-Range (TL8): A book-sized or backpack unit. As above but base range 1,000 miles. A B cell powers it for six weeks of steady use. Cr600, 10 lbs. Add Cr100 for video display at TL8.

Com Scrambler (TL8): Attached to a communicator, scrambles messages so that only another scrambler tuned to the same combination can translate it. Cr500, ¼ lb.

Computer, Personal (TL7): A pocket-sized hand computer, also capable of interfacing with larger systems. Complexity equals TL-6. Cr1,000, 2 lbs., six months on a B cell.

Digital Camera (TL8): Takes full-color still or motion pictures, recording them on a computer disk. Runs for two weeks on a B cell. Cr500, 2 lbs.

PISTOLS – USE GUNS/TL (PISTOL) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
Revolver, 5mm	Crit.	Cr.	1d	9	2	75	1,100	0.7	0.03	3~	6	8	-1	60/0.01	3	+1	6
Revolver, 7mm	Crit.	Cr.	1d+2	10	3	130	1,500	1.4	0.08	3~	6	8	-1	65/0.04	3	0	6
Revolver, 9mm	Crit.	Cr.	2d	10	4	150	1,600	2.3	0.16	3~	6	8	-1	75/0.08	3	-1	6
Magnum Revolver, 9mm	Crit.	Cr.	3d-1	10	4	185	1,800	3	0.2	3~	6	10	-2	390/0.33	3	-2	7
Body Pistol, 5mm	Crit.	Cr.	1+2	9	1	90	1,200	1	0.04	3~	6	8	-1	300/0.06	3	+2	7
Auto Pistol, 7mm	Crit.	Cr.	2d-1	10	2	150	1,600	2.3	0.13	3~	7	9	-1	75/0.05	3	0	6
Auto Pistol, 9mm	Crit.	Cr.	2d+2	10	3	150	1,900	2.6	0.57	3~	15	9	-1	400/0.82	3	-1	7
Gauss Pistol, 4mm	Ver.	Cr.	6d (2)	9	6	500	3,200	1.6	0.03	8	15/A	8	-1	1,300/10.6	2	0	10

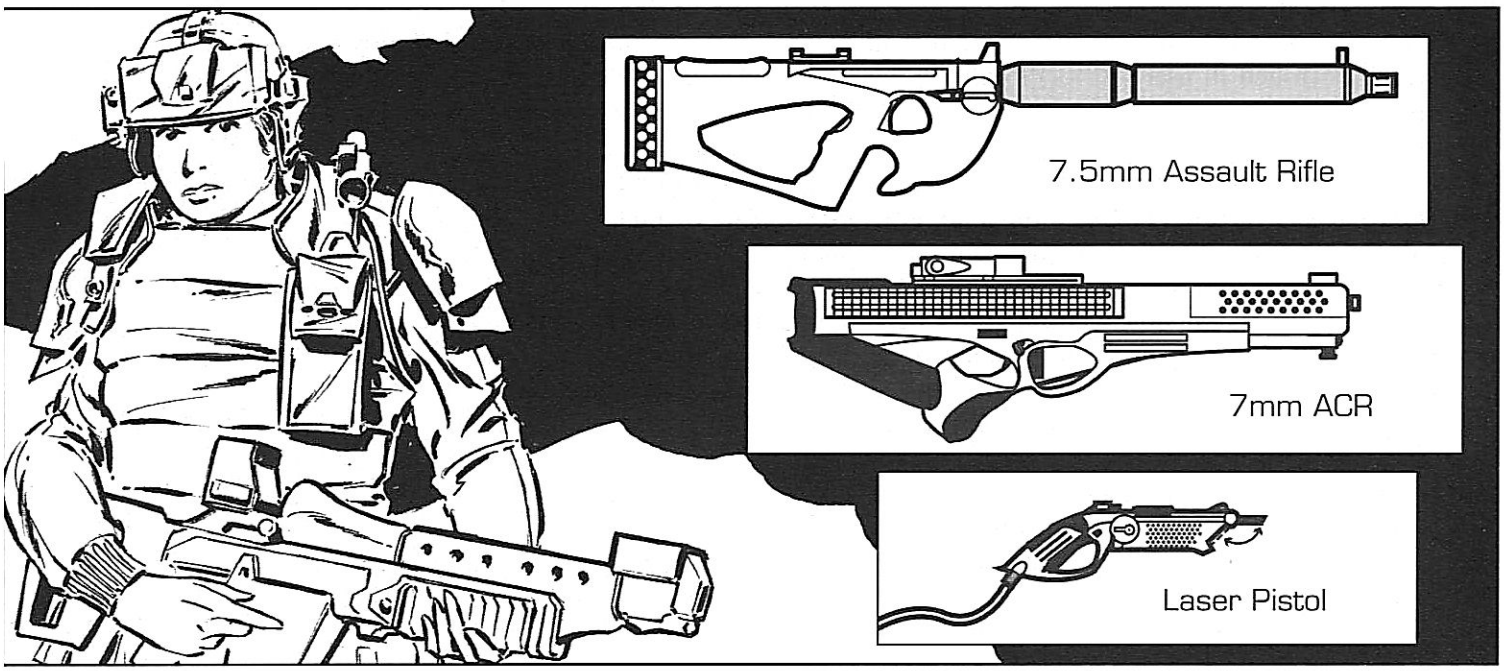
RIFLES AND CARBINES – USE GUNS/TL (RIFLE OR LIGHT AUTO) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
Carbine, 7mm	Crit.	Cr.	5d+1	12	8	400	3,000	9.4	0.6	3~	10	10	-1	140/0.21	4	-5	6
Rifle, 7mm	Crit.	Cr.	6d+1	14	10	700	4,000	10	1.2	3~	20	10	-1	830/1.7	4	-6	7
Rifle, 9mm	Crit.	Cr.	7d-1	14	9	600	3,400	11	1.3	3~	10	11	-2	910/1.8	4	-6	7
Rifle, 13mm	Crit.	Cr.	14d-1	20	11	1,200	5,400	33.1	4.6	1	10	16B	-3	2,140/6.6	1	No	8
Assault Rifle, 5.5mm	Crit.	Cr.	5d	12	8	400	3,000	7.7	0.9	12	30	9	-1	590/1.3	1	-5	7
Assault Rifle, 7.5mm	Crit.	Cr.	7d-1	14	10	800	4,100	11.6	1.5	11	20	11	-2	950/2.1	1	-6	7
ACR, 7mm	Ver.	var.	var.	12	10	Var.	Var.	7.2		10	20	10	-2	1,540	1	-5	9
with Solid		Cr.	6d+1			740	4,000		0.6					0.9			
with APS		Cr.	8d (2)			1,100	6,000		0.4					4.3			
ACR, 9mm	Ver.	var.	var.	12	9	var.	var.	8.6		10	20	11	-2	1,640	1	-6	9
with Solid		Cr.	7d-1			560	3,400		1.3					1.8			
with APS		Cr.	8d+2 (2)			840	5,100		0.9					9.1			
with HEAT		Exp.	3d-1 (10)			560	3,400		0.9					5.5			
Gauss Rifle, 4mm	Ver.	Cr.	8d+1 (2)	12	11	900	4,500	5.9	0.1	20	40/B	9	-1	2,620/32	0	-4	10

ZERO-G WEAPONS – USE GUNS/TL (GYROC) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
Snub Revolver, 10mm	Crit.	var.	var.	9	1	50	50	0.6	0.12	3~	6	–	0	275	2	+1	8
Auto Snub Pistol, 10mm	Crit.	var.	var.	9	0	50	50	1	0.56	3~	20	–	0	275	2	0	8
with Ball	Crit.	Cr.	1d+1											0.2 per round	2		
with HEAT (TL9)	Crit.	Exp.	6d (10)											0.5 per round	0		9
with CHEM	Crit.	Spcl.	Spcl.*						0.3 plus one dose of chem agent per round						2		
Accelerator Rifle, 10mm	Crit.	var.	var.	11	9	500	500	6	2.1	10	15	–	0	450	1	-3	9
with AP	Crit.	Cr.	5d (2)											20	1		
with HEAT	Crit.	Exp.	6d (10)											20	0		
with CHEM	Crit.	Spcl.	Spcl.*						17 plus 15 doses of chem agent per clip						2		

** Creates 2-yard-wide cloud of one dose of chemical agent, usually sleep gas – see pp. UT70-71*



WEAPON TABLES

SUBMACHINEGUNS – USE GUNS/TL (LIGHT AUTO) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
SMG, 9mm	Crit.	Cr.	3d-1	12	6	190	1,800	7.1	1.2	10*	32	9	-1	540/1.8	2	-4	7

SHOTGUNS – USE GUNS/TL (SHOTGUN) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
Shotgun	Crit.	Cr.	4d	12	5	30	165	8.8	0.2	3~	5	10	-2	136/0.23	4	-5	6
Auto-Shotgun	Crit.	Cr.	4d	12	7	30	245	9.8	0.6	10*	10	10	-2	710/1.8	1	-6	8

ENERGY WEAPONS – USE BEAM WEAPONS/TL (LASER OR FUSION) SKILL

Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Costs	LC	Hld	TL
Laser Pistol-9	Ver.	Imp.	2d	10	10	580	1,200	2.8	3	4*	50/5C	7	0	1,300/500	2	-1**	9
Laser Carbine-8	Ver.	Imp.	2d+2	12	18	2,700	5,400	9	6	8*	50/D	7	0	1,900/500	1	-6**	8
Laser Carbine-10	Ver.	Imp.	2d+2 (2)	12	19	4,000	8,000	6	6	8*	50/D	7	0	1,475/500	0	-4**	10
Laser Rifle-9	Ver.	Imp.	4d	12	19	3,300	6,600	10	12	8*	100/2D	8	0	2,100/1,000	0	-6**	9
Laser Rifle-10	Ver.	Imp.	4d (2)	12	20	4,900	9,200	9	12	8*	100/2D	8	0	1,875/1,000	0	-6**	10
Laser Pistol-10	Ver.	Imp.	2d (2)	10	11	870	1,700	1.9	3	4*	50/5C	7	0	1,095/500	0	0**	10
PGMP-10	Ver.	Exp.	6d×8†	12	14	460	920	7.2	6	1	46/D	12	-3	16,675/500	0	No	10
PGMP-10A	Ver.	Exp.	6d×15†	17	15	740	1,500	19	120	1	450/5E	19	-3	36,175/2,500	0	No	10
PGMP-11	Ver.	Exp.	6d×15†	17	15	740	1,500	20	156	1	750/6E	9	-3	72,675/3,500	0	No	11
FGMP-11	Ver.	Exp.	6d×25†	17	16	1,100	3,300	17	192	1	500/8E	22	-4	63,175/3,000	0	No	11
FGMP-12	Ver.	Exp.	8d×20†	15	12	1,100	3,300	22	48	1	80/2E	10	-4	65,475/1,500	0	No	12

** Can be fired at either RoF 3~ (semi-auto with three rolls to hit) or RoF 4 or 8 (full-auto using laser-autofire rules).*

*** Holdout figure is for laser weapon only. Power packs are separate items. A laser pistol power pack is -3 to Holdout; all others are -5.*

† PGMP and FGMPs fire bolts of high-velocity star-hot plasma (treat as crushing; no damage multiplier). The splattering plasma also does ¼ damage to everyone else within 2 yards of the target.

SUPPORT WEAPONS – USE GUNS/TL (RIFLE) SKILL

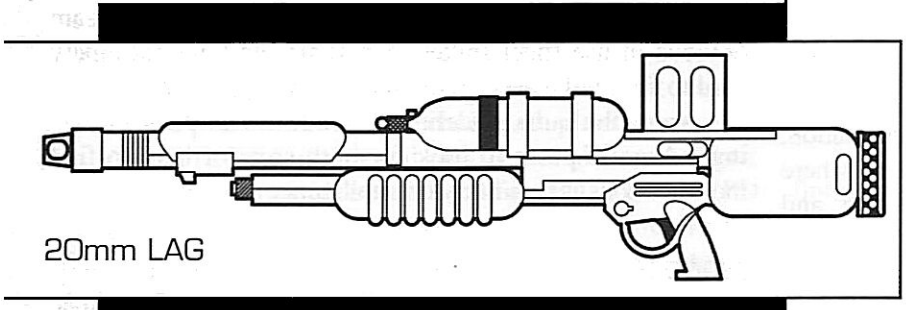
Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	AWt	RoF	Shots	ST	Rcl	Cost	LC	Hld	TL
LAG, 20mm	Crit.	var	var.	17	9	var.	var.	19.2		2~	5	15	-3	1,350	0	No	8
with APDS		Cr.	12d+2 (2)			630	4,300		1.2					12.8			
with HE		Cr.	1d+2 [2d]			420	2,900		1.2					5.1			
with Beehive		Imp.	1d			420	2,900		1.2					10.2			

RAM GRENADES – USE GUNS/TL (RAM GRENADE) SKILL

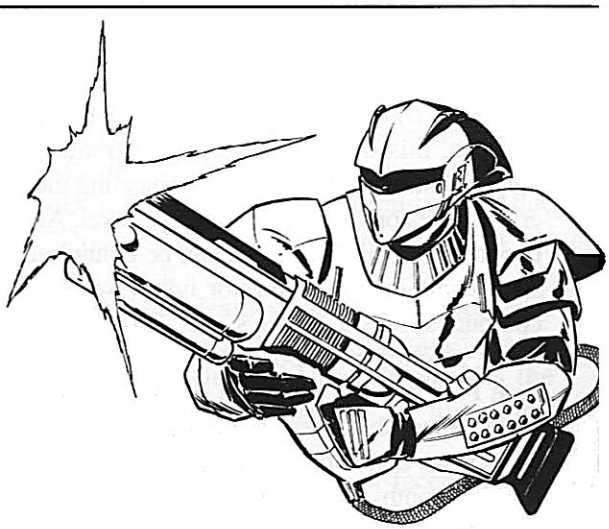
Weapon	Malf	Type	Dam	SS	Acc	½D	Max	Wt	RoF	Shots	ST	Rcl	Cost	LC	Hld	TL
4cm RAM-8 HEAT	Crit.	Exp.	5d×5 (10)	20	11	290	485	0.88	1/6	1	–	0	20	0	-3	8
4cm RAM-8 HE	Crit.	Exp.	6d×2 [4d]	20	11	290	485	0.88	1/6	1	–	0	18	0	-3	8
4cm RAM-9 HEAT	Crit.	Exp.	6d×6 (10)	20	11	370	850	1.1	1/6	1	–	0	17	0	-3	9
4cm RAM-9 HE	Crit.	Exp.	6d×3 [4d]	20	11	370	850	1.1	1/6	1	–	0	14	0	-3	9

** Holdout figure is for the grenade alone. Attaching the grenade to a weapon lowers the weapon's Holdout by -2.*

Note: *Wt* is loaded weight of weapon. *AWt* is weight of one clip or full load of ammo. *Costs* are weapon/(ammo clip or full load). See p. UT124 for explanation of other statistics.



20mm LAG



Miscellaneous Devices

Automedic (TL9): Coffin-like computer-controlled medical bed that automatically treats patients. Has skill 14 in First Aid, and 13 in Diagnosis, Physician, and Surgery (+1 to skill per TL over 9). Cr50,000 at all TLs; weight 600 lbs. at TL9, 500 lbs. at TL10, 400 lbs. at TL11+. Drugpack (refill every 25 uses): Cr5,000, 50 lbs.

Electronic Lockpick (TL8): Gives +3 to Lockpicking or Electronics Operation (Security Systems) to break electronic locks, -2 per TL vs. higher-TL locks. Cr1,500, 3 lbs., three months on an A cell.

Disguise Kit (TL5): Suitcase-sized kit with makeup, wigs, etc. Gives +2 to Disguise skill. Cr300, 10 lbs.



Inertial Compass (TL8): Small device that indicates direction and distance traveled from any preset point on a planet accurate to within 1 yard per 1,000 miles. Must be calibrated for the planet (takes 1 hour and a Navigation or Electronics Operation (Sensors) roll). Works on an A cell for six months. Cr250, 1 lb.

Head-Up Display (HUD) (TL8): Mounted in a helmet or goggles, this displays information readouts from devices plugged into it, organizing and projecting them onto the wearer's goggles or visor at a handy eye-level. Any equipment that uses a visual display screen can be connected to a HUD by a short cable or communicator link – vehicle instrumentation, computers, sensor displays, etc. This adds +1 to skills where quick reaction is important (such as Driving, Piloting, and Free Fall); see HUD Sights on p. 112 for weapon bonuses. Note: Spaceship crew are assumed to be using HUDs, so there is no bonus for using them. A HUD runs off an A cell for six months or uses the same power as other helmet/suit systems. Cr500, ½ lb. At TL9 this becomes Holographic HUD with the same weight, cost, and power usage.

Medical Pouch: A doctor's bag with standard bandages, sedatives, injectors, skin patches, stimulants, and so on, plus a full set of physician's and surgeon's tools for the TL. Cost and weight don't drop at higher TLs – the contents just improve. It's the minimum requirement to use Surgery, Diagnosis, or Physician without penalty, and adds +2 to First Aid skill. A TL8+ physician performs as TL7 without this much gear. Cr700, 15 lbs.

Psi Shield (TL8): Protects wearer vs. telepathy as if it were a Mind Shield used by a telepath with a skill of 3 and a Power of 6 (plus 2 per additional TL). The shield circuits warn the operator when a telepath fails to penetrate the shields, but provide no warning if he succeeds. Works for two weeks on a B cell. Cr5,000, 1 lb. Psi shields can also be added to other headgear.

Tools (TL5+)

Tool Kit, Basic: Available for Engineering, Mechanic, Armoury, and Electronics skills. Anyone attempting repairs without an appropriate kit is at -5 to skill (using the wrong kit will reduce that to -3). An attempt to repair equipment of higher TL than the kit is -2 per TL difference. Mechanic or Engineer kits: Cr800, 300 lbs. Armoury or Electronics kits: Cr1,200, 100 lbs. No price or weight drop as TL increases.

Tool Kit, Portable: As above, but fits into a case or backpack. Major repairs are at -2 to skill; minor repairs at no penalty. Mechanic or Engineer kits: Cr600, 20 lbs. Armory or Electronics kits: Cr900, 10 lbs.

Tool Kit, Mini: A small belt-sized version of the above kit types. Routine repairs can be made at -2 to skill, major repairs at -4. Cr400, 2 lbs.

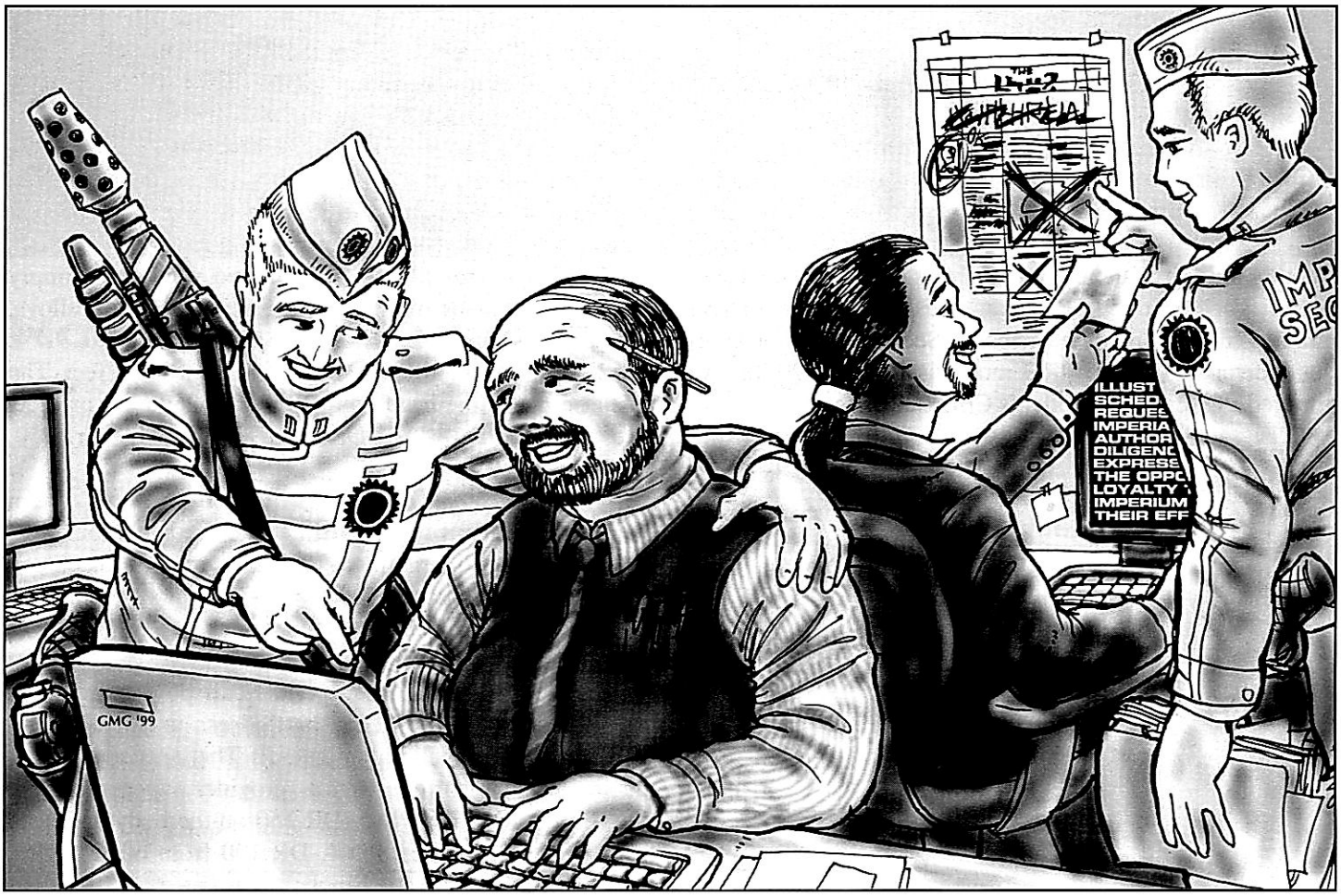
Cyberware and Bioware

Existing prejudices regarding bionics (see *Cybertechnology*, pp. 16-17) influence price and availability. Medical bionics that simply *replace* missing functions are at normal price, though the ⅕-price obviously bionic versions are hard to find. Non-obvious bionics that *enhance* in some fashion are very hard to find, and average twice the price listed in the ***Ultra-Tech*** books. Bionics that enhance *and* are obvious in use (heel spikes, cyberhair, etc.) are extremely hard to find and usually five times list price or more.

Apply the same guidelines to ***GURPS Bio-Tech***'s offerings. A good place to look for both sorts of hard-to-find modifications is a military or intelligence employer.

Robots

Relatively dumb non-combat robots are purchased normally. Robots incorporating weapons or neural nets are very hard to find for sale. Sentient robots are extremely rare, and almost never for sale.



Armor and Protective Gear

Most soldiers wear body armor; wise adventurers do, too. The following entries comprise the armor commonly found in the Imperium. The GM may choose whether to introduce armor from other ***GURPS*** sourcebooks.

Jack, mesh, ablat, reflec, and flak jackets can usually be worn as (or underneath) normal clothing without exciting undue comment. Vacc suits, cloth armor, and CES are tolerated around startowns if no helmet is worn, but outside of lawless worlds and war zones, wearing combat armor or battle dress is illegal.

As with firearms, some of these Imperial-standard pieces of equipment are a tech level later than their introduction.

Jack (TL1): The Imperial nickname for light leather armor. See p. B210 for leather, chainmail, plate armor, etc.

Cloth (TL7): A jacket and pants tailored from ballistic cloth (like Kevlar or Monocrys). It gives PD 2, DR 16 (PD 1, DR 2 vs. impaling attacks) over torso and limbs. Ballistic cloth works by distributing impact force across a wider area, so kinetic energy may cause bruising even when an attack fails to penetrate: Each "6" rolled on cutting or crushing damage dice inflicts *one* additional hit. Cr1,100, 14 lbs. At TL8+, Cr1,500, 12 lbs.

Flak Jacket (TL7): As cloth, but in vest form – it only protects the torso (locations 9-10 and 17-18). Cr425, 6 lbs. At TL8+, Cr600, 5 lbs.

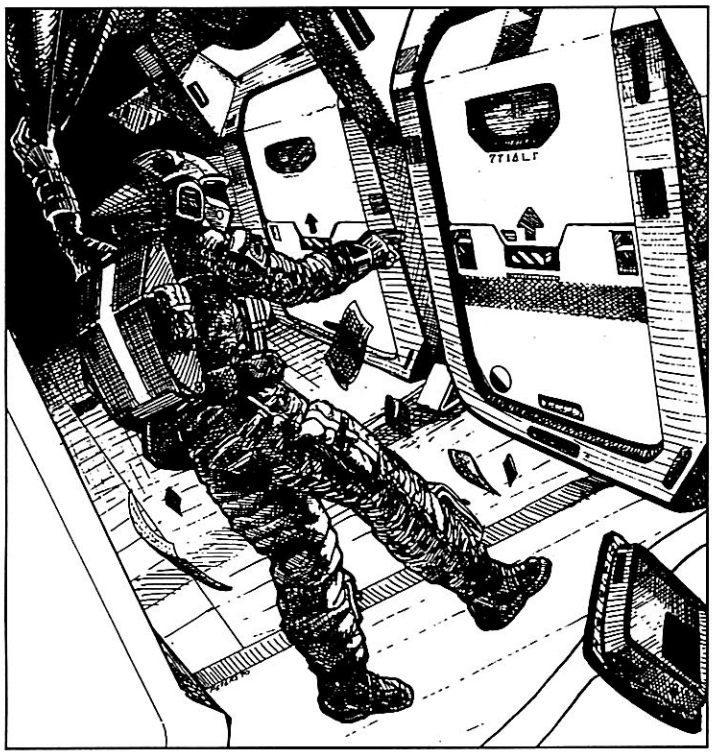
Ablat (TL8): A cheap, bulky vest tailored from material that ablates (vaporizes) when hit by beam fire, carrying away its energy. Ablat is too bulky to wear under clothing, but can pass for winter clothing. It protects the torso only. Against lasers and plasma/fusion guns it has PD 4, DR 12, but every 4 hits stopped on a location drops its DR by 1, and for every 3 DR lost 1 PD is also lost. Against other attacks, it has PD 1, DR 2 (even if beam protection ablated away). A vest is Cr100, 15 lbs.; full suits that also cover the limbs are available (Cr300, 40 lbs.) but rarely worn due to their weight. Double DR at TL9, with 1 PD lost for every 6 DR ablated.

Mesh (TL7): Synthetic leather jacket reinforced with fine alloy mesh. Very light, mainly effective against blades and shell fragments rather than gun fire. It protects the torso and arms with PD 2, DR 4 (halved vs. impaling). Cr150, 1.5 lbs.

Light Infantry Helmet (TL8): An open-faced helmet, often worn with ablat, cloth, or mesh armor. It protects the brain (locations 3-4) with PD 4, DR 15 (+5 per DR over TL8). Cr30, 1.5 lbs.

Combat Infantry Helmet (TL8): A full helmet equipped with CBR filters, airtight with visor down. PD 4, DR 18 except visor, which is PD 2, DR 10. Add +10 DR at each higher TL. Cr240, 8 lbs.

Vacc Suit (TL8): A vacuum suit protects the wearer from vacuum, hazardous atmospheres, and low-level radiation. Getting in or out takes a minute (five seconds to put on the gloves, another five to put on the helmet, if already wearing the suit without either). Times are halved on a successful Vacc Suit roll. The suit holds enough air for five minutes till air tanks are attached. See p. UT25 for additional details. A PD 2, DR 3 model is Cr1,500, 20 lbs. An armored PD 4, DR 30 model is Cr4,000, 80 lbs.



Reflec (TL9): This armor (developed a TL later than listed in ***Ultra-Tech***) is tailored from reflective material designed to deflect laser fire. It can be worn over other armor or clothing. It gives PD 6, DR 2 vs. lasers, PD 3, DR 0 vs. other energy weapons, and no protection otherwise. Full suit: Cr300, 2 lbs. Jacket (torso and arms): Cr150, 1 lb.

Combat Environment Suit (TL9): A neck-to-toe flexible form-fitting body suit of advanced closed-weave synthetic materials. Usually worn open at the neck and wrists, the suit can be sealed by donning gauntlets and a transparent hood and respirator or sealed combat helmet (it still is *not* vacuum-resistant). Its tight molecular mesh protects fully vs. impaling attacks (unlike cloth armor) but heat build-up is a problem. The suit uses a solid-state cooling system woven into the garment, but this gives it a pronounced infrared signature (+2 to spot with infrared sensors). A backpack coolant unit using a chemical chill can nullifies this problem, but after two hours the can is exhausted (spares are Cr20, 1 lb.). CES gives PD 2, DR 24 protecting all locations except the head and hands. As with cloth armor, non-penetrating hits do 1 hit on every damage-die roll of "6." CES is Cr4,000, 12 lbs., or 14 lbs. if coolant system worn. *Note*: Treat this as a TL9 improvement of monocrys (p. UT74), with twice the cost and 75% of the weight. In addition to the heat problem, it can't be concealed by or disguised as ordinary clothing.

Combat Armor (TL9): An armored vacc suit (simply add air tanks) made of articulated plastic, advanced alloys, and carbon composites. It has PD 6, DR 38 on torso; PD 4, DR 28 on limbs; and PD 4, DR 20 on hands and feet. The helmet protects the head with PD 4, DR 26; visor protects face at PD 2, DR 18. Add DR 8 per TL over TL9. Cr2,250, 38.5 lbs.

IR Chameleon (TL9): This infrared-cloaking system blends the wearer's heat signature into the background (-3 to IR spotting and targeting; -10 to IR-homing projectiles). It can be added to combat armor or CES suits. A suit must be sealed for IR chameleon to work. Cr1,500, 5 lbs., works 12 hours on a pair of A cells.

Battle Dress (TL10): Imperials call powered combat armor "battle dress." (The "battledress uniform" on p. UTT73 is simply called "fatigues.") This armor enhances the wearer's strength as well as provides superior protection. Battle dress has PD 5, DR 150 on the body and head from the front or sides, PD 4, DR 100 from other angles, and PD 4, DR 75 on the limbs. Its laminate armor halves the armor divisor of shaped-charge explosive (HEAT-type) rounds; i.e., a RAM-8 round would do 5d×5 (5) rather than 5d×5 (10). Battle dress gives the wearer ST 25 and moves at Speed 5.5, Move 5.

Battle dress is air-tight and self-sealing. Its NBC filter removes nuclear, biological, or chemical contamination allowing unlimited operations in tainted or polluted atmospheres. It has a six-hour air supply (backpack tanks can extend this). Other features: IR chameleon; radar/laser detector; helmet HUD; medium-range scrambled communicator; global positioning system; passive imaging sensors giving choice of telescopic magnification, light-amplified night vision, or IR thermal imaging (2-mile range).

Battle dress runs off a rechargeable E cell for 88 hours, 53 minutes. A suit costs Cr58,050, stands 7′ tall, and weighs 275 lbs. (empty). The weight does not count as encumbrance.

Improved Battle Dress (TL11): As above, but better armored. It has PD 5, DR 240 on the body and head from front or sides, PD 4, DR 160 from other angles, and PD 4, DR 120 on limbs. The armor incorporates a superconductor layer that doubles DR vs. beam weapons such as lasers and PGMP/FGMPs. Other systems are as TL10 battle dress except sensors have a 4-mile range and the suit's E cell powers it for 111 hours, 6 minutes. Improved battle dress costs Cr63,050. It weighs 261 lbs. (empty).

The Army and Marines make use of hundreds of different weapons. Those listed here are the standard issue seen throughout the Imperium.

Gauss Pistol 4mm High Capacity (TL10)

The standard Marine officer's sidearm, the HC Gauss uses the same magazines of 40 AP rounds as the GSMG and Army-standard KG56A3 rifle, below. The weapon has good firepower for its size; battledressed troops often carry one as a last-ditch backup.

Gauss SMG 4mm High Power (TL10)

An SMG built using the same principles as the HP pistol. The GSMG is very useful in ship-boarding actions where the opposing forces are known to be lightly armored. The GSMG has found its way into the hands of various special-operations groups such as the Sylean Rangers. The Gauss SMG is gyro-stabilized and incorporates HUD and laser sights.

KG56A3 Gauss Rifle 4mm (TL10)

The standard rifle for Imperial infantrymen for more than a century, the KG56A3 is beginning to show its age. The A3 model comes with HUD and laser sights, RAM-grenade hard-point, gyrostabilization, and rarely used bayonet lug.

KH301 Gauss LSW 4mm (TL11)

A long, four-barreled Gatling version of the standard Gauss rifle with a 3,600-round-per-minute rate of fire, the GLSW is the support weapon for infantry teams in most of the Army. The 600-round ammo cassettes are distributed among the team members. Most of the time the newest troops find themselves carrying more than their share of the load. To improve performance, the GLSW is often issued along with a gyrostabilized weapon harness (see p. 105). Despite the weapon's weight, GLSW gunners are very proud of their status as "hogmen."

Electromagnetic Battle Rifle 20mm (TL10)

For use by troops wearing battledress, the LEMB-20 is a 20mm electromagnetic cannon sharing the surface features of the Fusion Battle Rifle. (Each *magazine* also shares those features; new rounds for an old magazine only cost Cr260 and weigh 0.7 lbs.!) The weapon includes integral HUD and laser sights. This is the regulation weapon for Marine sniper teams. The weapon actually penetrates armor better than the standard Fusion Rifle.

MPAT-17 Man Portable Anti-Tank Weapon System (TL11)

This team-portable Gauss breech-loader fires a potent HESH anti-tank round. It comes equipped with HUD and laser sights. The integral rD cell fires 36 rounds. The system breaks down to the 34-lb. tube and the 19.4-lb tripod for handling. Usually the weapon is assigned to a four-man team, which can carry it and 12 rounds in four loads of 34 lbs. or just under. Dedicated targeting computers are often attached to increase first-round hits.

Battle Rifle, Fusion (TL12)

The companion armament for *Redding* battledress (see p. 85), this weapon is a standard 3,000-kJ fusion weapon (stats as per FGMP-12, but no grav compensation), with DR 100 armor, integral HUD and laser sights, and all surface features indicated for the battledress. Volume is 0.44 cf.

T-100 Personal Defense Laser (TL12)

Also known as the "laser SMG," this is a weapon typically issued to vehicle crews and rear-area soldiers. The weapon is a short, boxy design, with attachment points for sighting devices.

T-45 X-Ray Laser Rifle (TL12)

The latest entry in the Imperium's search for a replacement for the venerable KG56A3, the T-45 has found favor among Army snipers. The weapon's slightly higher weight per shot, and the difficulty of training troops to use it, has slowed deployment.

Fusion Gun, Rapid Pulse, XP (TL12)

An experimental weapon being issued on a trial basis to select Marine units, the FGRP-X is intended to be the next generation squad-support weapon for Marines facing lightly armored opposition.

HER-21 Starfire (TL11)

The HER-21 Starfire is a bipod-mounted plasma gun intended to be used as a squad-support weapon for units not equipped with battledress. The Starfire, unlike the FGMP/PGMP, is not equipped with contra-grav support or a backpack powercell package. The single rE powercell is attached as part of the gun stock. The targeting system utilizes an advanced PESA array, and attached HUD with pupil tracking and targeting computer.

The HER-21B Starfire is a TL12 version of the original Starfire. Slightly more powerful and longer-ranged than the original, most troops consider it too heavy to carry, but rapid interface troops like the increased firepower.

DTM-130 Tac Missile (TL10)

A disposable antitank missile issued to infantry, the DTM-130 is stealthy with an optical homing system and a powerful HESH warhead capable of destroying light armor and damaging even an *Intrepid*. The gunner can select between low-speed mode (stats as given in the table, p. 103) or high-speed mode, which reduces range but improves survivability (Spd 2,000, End 1, Max 2,000). They are best used in large numbers, or coordinated with other weapons if they are to penetrate point-defense systems. A 0.001-kiloton micronuke version is also available (Dam 6d×4,000, Cr26,700), the DTM-130N.

MANPAT-60 (TL11)

The 60mm man-portable anti-tank missile is a lightweight, disposable, single-shot missile intended to give unaugmented infantry a small chance of hurting an armored vehicle at close range. Sometimes supplied as a military-assistance item to friendly low-tech governments, it fires a stealthy, high-speed missile.

WEAPON TABLES

Gauss Weapons

Name	Type	Damage	SS	Acc	1/2D	Max	Wt	aWt	RoF	Shots	ST	Rcl	Cost	LC	Hld	TL
HC Gauss	Cr.	6d (2)	9	6	500	3,200	1.7	0.1	8*	40/rB	8	-1	1,320/32	1	0	10
GSMG	Cr.	7d (2)	12	10	750	4,000	3	0.1	16*	40/rB	8	-1	1,875/32	0	-2	10
KG56A3	Cr.	8d+1 (2)	12	11	900	4,500	5.9	0.1	20*	40/rB	9	-1	2,620/32	0	-4	10
GLSW	Cr.	9d+2 (2)	14	12	1,200	5,400	15.7	1.8	60*	600/rC	10	-1	5,025/125	0	-6	10
LEMB-20	Cr.	6d×6 (5)	14	12	1,300	5,500	27.1	4	1	18/rB	13	-3	7,400/1,120	0	No	12
MPAT-17	Exp.	6d×62	20	14	1,100	5,000	53.4	6.7	1/4	1	49T	-5	15,200/400	0	No	11

Energy Weapons

Name	Type	Damage	SS	Acc	1/2D	Max	Wt	aWt	RoF	Shots	ST	Rcl	Cost (Cr)	LC	Hld	TL
Battle Rifle	Exp.	8d×20†	15	12	1,100	3,300	46.5	48	1	80/2rE	10	-4	72,000/–	0	No	12
T-100	Imp.	5d (2)	10	14	650	1,300	3	2	4~	48/rC	8	0	1,990/500	0	-3	12
T-45 Rifle	Imp.	7d (2)	12	20	1,600	3,100	6.7	12	8~	135/2rD	8	0	3,000/1,000	0	-6	12
FGRP-X	Exp.	6d×8†	12	17	1,800	3,600	10	12	4*	100/2rD	11	-2	46,000/1,000	0	No	12
HER-21	Exp.	8d×8†	17	15	1,000	3,000	55	24	1	133/rE	14/17	-1	195,892	0	No	11
HER-21b	Exp.	6d×15†	20	15	1,300	3,900	61.3	24	1	133/rE	15/18	-1	119,661	0	No	12

† Splattering plasma does one-quarter damage to everyone else within 2 yards of target.

Tac Missiles

Weapon	Malf	Guidance	Damage	Max	Spd	End	Wt	RoF	Shots	Cost	TL
DTM-130	Crit	OH/21	6d×200	2,600	1,300	2	45	1NR	1	17,900	10
DTM-130N	Crit	OH/21	6d×4,000	2,600	1,300	2	45	1NR	1	26,700	10
MANPAT-60	Crit	IRH/22	6d×27 (10)	2,000	2,000	1	12	1NR	1	4,940	11

All weapon malfunctions are Ver.

Vehicular Armaments Table and related tables are on pp. 124-125.

PERSONAL ISSUE

The Army and Marines keep a bewildering variety of equipment on hand, some of which the troops never use or understand. This section lists some of the more common items issued in the services. Additional equipment can be found on pp. GT112-116 and in ***GURPS Ultra-Tech*** and ***Ultra-Tech 2***.

Technology Levels

All of the following items are shown at their tech level of introduction. Planetary forces will use equipment available at their planet's TL or lower, with the likely addition of some crucial higher-TL imports. Imperial forces will be issued equipment at TL10 or the tech level of introduction, whichever is higher.

Note that most of these goods become one-half price and weight one TL past introduction, and one-quarter price and weight two TLs past introduction. Goods that use power cells also see a 50% improvement in operating time or number of uses at each TL past introduction, assuming power cells of the higher TL are used. See p. UT10 for more information.

Note that this means that most Imperial gear will be cheaper, lighter, and longer-lasting than indicated in this table.

Items marked with a "*" are part of every soldier's standard kit. Items marked with a "†" do not receive the standard price and weight improvements with TL increases.

General Equipment

Artificial Gill (TL9): Extracts oxygen from water, allowing user to breathe underwater. Lasts 12 hours on a single rC Cell. KCr2, 20 lbs.

Autograpnel (TL8): Fires a grappling hook up to 50 yards, and can lift 400 lbs. at 5 yards per second. One rC cell powers 50 ascents or descents. Cr400, 6 lbs.

Backpack* (TL6): Basic medium pack, holds up to 100 lbs. or 3 cf. Cr100, 10 lbs.

Bag, Waterproof* (TL7): Used inside backpacks or other luggage. Can be used as an emergency flotation device. Can carry up to 25 lbs. without rupturing. Cr20, neg.

Baton, Police† (TL7): Collapsible police baton (Reach 1, Sw Cr, Th Cr, Holdout +1). Cr50, 1/2 lb.

Blanket* (TL1): Thick, warm sleeping blanket made from wool or a local equivalent. Cr15, 4 lbs.

Camouflage Face Paint (TL6): Compact with mirror has four colors, with varying patterns available for different environments. Cr5, neg.

Canteen, Basic (TL5): A simple 1-quart canteen with cover, holds 2 lbs. of water. Cr10, 3 lbs. when full.

Canteen Drinking Tube (TL7): Replaces canteen cap with a long drinking tube so canteen does not have to be removed from its storage place. Cr10, neg.

Chemlights (TL7): Plastic tubes that give off a soft light when bent sharply. They come in 1/2-, 1-, 8-, or 24-hour types, and a multitude of colors. Cr5, 1/4 lb. per tube per hour's operation.

Chemsticks, IR (TL8): As above, but these chemlights give off heat, aiding IR vision. Triple normal cost.

Chemsticks, Ultra-Bright (TL8): As above, but lasting only 5 minutes and giving off intense light, sufficient to light a 50-foot radius. Mostly used in situations where marking flares would be inappropriate. Cr5, 1/4 lb. per tube per five minutes' operation.

Datacloth, Large (TL8): This is a flexible combination of interface device (essentially, an ultratech keyboard) and monitor. Can be attached to a computer on site, or linked to a remote computer through a communicator. Solar powered, it stores enough energy to run about an hour in a darkened area. KCr1.8, 9 square feet, 1 lb.

Datacloth, Small (TL8): As above, but only 1 square foot. Infantry leaders often use these to brief troops, since the screen can be rolled up and put away. Cr200, neg.

Duct Tape, 200' (TL7): A 200-ft. roll of "100 MPH" tape, so named for the wind shear it is supposed to withstand. Very useful stuff, will stick to almost anything. Cr5, 2½ lbs.

Emergency Blanket (TL7): Aluminized survival blanket designed to allow the wearer to maintain body heat in cold situations, or deflect heat in overly warm ones, giving +3 to HT to resist extreme temperatures. Cr5, ¼ lb.

Entrenching Tool* (TL6): A folding shovel, and the most treasured tool in any infantryman's kit. If used in combat, use Axe skill-2, and does Sw-1 cutting. Cr15, 6 lbs.

Envirobag* (TL8): An insulated and heated sleeping bag, which can be sealed and make use of air/tanks. The standard issue sleeping bag for the Imperial Army, and prized by serious outdoorsmen. Insulation gives +10 to resist cold *and* can increase effective temperature. Requires one rC cell to operate for 24 hours if effective temperature is raised 10°, 12 hours if +20°, etc. Cr125, 7 lbs.

Filtration Canteen* (TL8): Purifies 1 quart of water in 30 minutes. The filters are good for 100 quarts, less if using badly contaminated water. Replacement filters cost Cr25. Cr175, 3 lbs. when full.

Flare, Rocket (TL6): A small, shoulder-fired flare. The 30mm rocket shoots up to 100' before bursting, lighting the area with light equal to a heavily overcast day. A variant type shoots a bright, colored signaling cluster. Cr10, 1 lb.

Grapnel, Basic (TL7): Three-pronged hook used to assist climbing. Requires Throwing roll to set properly. Supports about 300 lbs. Cr20, 2 lbs.

Grapnel, Advanced (TL7): Supports about 1,000 lbs., sound dampening (-3 to hearing to hear the grapple "clink" when it is used against stone or metal). Cr200, 2 lbs.

Heat Suit (TL8): Heated, multi-layered suit for surviving extreme cold weather, +10 to HT rolls and can increase effective temperature as per the Envirobag, above. The thick bulk of the suit gives DR 1 to the wearer. Powered by one rC cell. Cr150, 5 lbs.

Inertial Navigation System (TL7): More accurate than the Inertial Compass (see p. GT116), adds TL-2 to Navigation skill. Uses one rC cell per week. KCr50, 40 lbs.

Vermin Bar (TL5): Fine netting for hanging over a sleeping bag, cot, or hammock. Cr60, 4 lbs.

Lantern, Small (TL6): Provides a 5' radius of light. Powered by a rC cell for six months. Cr30, 2 lbs.

Lantern, Large (TL6): Provides a 15' radius of light. One C cell provides power for six weeks. Cr60, 4 lbs.

Machete† (TL5): A heavy blade used to clear thick brush. Only a mediocre weapon (Sw+1 cut, Reach 1, Min ST 10). Cr50, 3 lbs.

Mess kit, Group (TL5): A field mess kit, with frying pan, bowl, and pot. Cr50, 20 lbs.

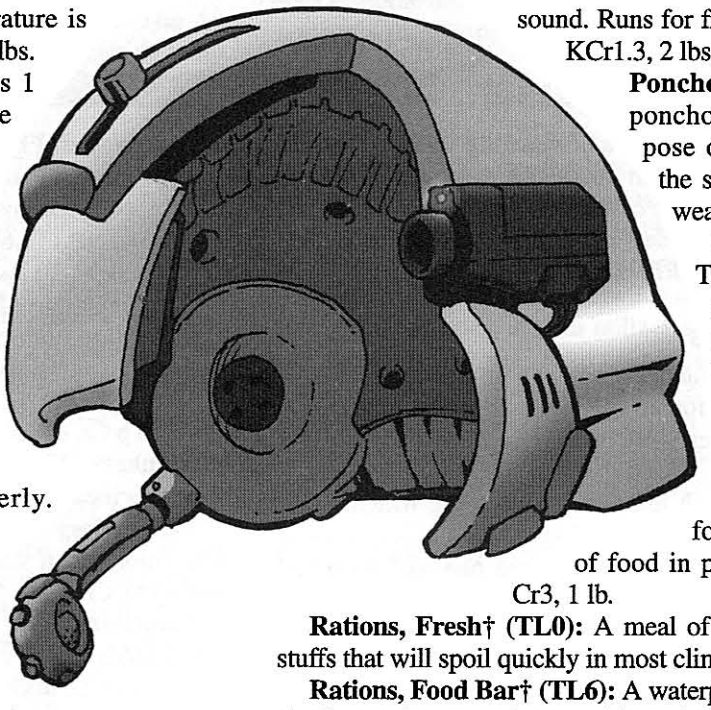
Mess kit, Personal* (TL5): Small cooking kit for one person with can opener, fork, knife, cup, and spoon. Cr15, 2 lbs.

Mirror (TL5): Used for hygiene or signaling passing aircraft, comes with a cloth cover. Cr5, neg.

Nav-Comp (TL7): Global Positioning System with map display, gives +TL-2 to Orienteering and Navigation skills as long as the satellite or orbiting spaceship network can be contacted. Uses one rC cell per week. Cr200, 1 lb.

Netting, Camouflage (TL6): Loose weave net that is placed over stationary vehicles and encampments to decrease the chances of being spotted from above. Along with the visual distraction, at higher TLs the netting contains IR scattering elements that interfere with thermographic and PESA sensors. The net gives a penalty of TL-7 to IR detection and TL-4 to visual detection. Each 10'×10' section costs Cr40, and weighs 24 lbs.

Pestguard (TL9): World-specific devices that repel small vermin within 6 yards with ultrasonic sound. Runs for five days on one rC cell. KCr1.3, 2 lbs.



Poncho* (TL6): Issue nylon poncho. The theoretical purpose of this item is to keep the soldier dry in inclement weather. Cr60, 4 lbs.

Poncho Liner* (TL7): Thermal lining for poncho, can be used as a replacement sleeping bag in warm climates. Cr100, 8 lbs.

Ration, Container (TL6): A DR 4 screw-top container for storing 1 cf (20 lbs.) of food in poor or wet conditions. Cr3, 1 lb.

Rations, Fresh† (TL0): A meal of ready-to-prepare foodstuffs that will spoil quickly in most climates. Cr2, 2 lbs.

Rations, Food Bar† (TL6): A waterproof, sealed package of six flavored squares that provides minimum nutrition for three days. The manufacturer claims that the squares come in three flavors; amused soldiers can spend hours coming up with fantastic guesses on what those flavors actually are. Cr18, 4.5 lbs.

Rations, Tube† (TL7): Seven tubes of concentrated rations for one week, bland and tasteless. Also known as Meat-Whiz. Cr50, 2 lbs.

Rations, Combat† (TL6): A meal of dehydrated military rations with gum, dessert, matches, etc. Cr2, ¾ lbs.

Rations, Tablets† (TL8): A 15-day supply of chewable tablets that provide minimal nutrition, often used in battledress. Cr100, 4 lbs.

Rations, Self-Heat† (TL7): A tasty self-heating meal. Cr2.5, 1 lb.

Rations, Preserved† (TL5): Three meals of canned or packaged foods, shelf-life is usually a couple of years. Cr6, 2 lb.s

Shelter-Foam (TL9): A DR 4 tent-in-a-can used to build two-person shelters. The shelters are formed with two 6'-diameter balloons, and the foam takes about 30 minutes to harden. Cr20, 3 lbs.

Sleeping Pad, Inflatable* (TL7): A self-inflating sleeping pad with insulation and padding for extra comfort. Cr15, 1 lb.

Sleeping Bag, Light (TL7): A very simple, thin sleeping bag. Not suitable for anything but the most benign weather. Cr15, 2 lbs.

Sleeping Bag, Heavy (TL7): A sturdy cold-weather bag, which gives +3 to HT rolls caused by cold weather. Cr100, 15 lbs.

Sleeping Bag, Standard (TL7): Basic sleeping bag, much like the civilian models found all over the Imperium. Cr25, 7 lbs.

Sleeping Bag, Modular (TL7): Includes both Heavy and Standard bags. When zipped together, they give a +5 to HT rolls caused by cold conditions. Cr125, 22 lbs.

Survival Knife† (TL7): Large, good-quality knife. The handle is hollow, and contains fishing line, hooks, a fire-starter, a compass and a wire-saw. The knife does damage as a Large Knife (p. B206). Cr40, 1 1/2 lbs.

Survival Straw (TL8): Filter-in-a-straw, used when the soldier has no other method of distilling potable water from the local sources. The straw is good for 5,000 gallons, although the quality of the filter is questionable. Cr25, neg.

Tent, One-Person (TL6): Simple, low-to-the-ground shelter. Cr150, 5 lbs.

Tent, Two-Person (TL6): Usually a dome tent at TL8+. Cr160, 10 lbs.

Tent, Four-Person (TL6): Usually a dome tent at TL8+. Cr300, 24 lbs.

Tent, Eight-Person (TL6): Usually a dome tent at TL8+. Almost a portable house, this tent has a 10'×12' floor area. KCr1.2, 120 lbs.

Trench Knife† (TL6): A large knife with knuckle-guard forming a set of brass knuckles (+2 to punch damage). Cr60, 1 1/2 lbs.

Vapor Canteen (Camp) (TL8): Creates 1 quart of water every 5 minutes, assuming Earthlike levels of water vapor in the atmosphere. Runs on one rE cell for two weeks. KCr3, 300 lbs.

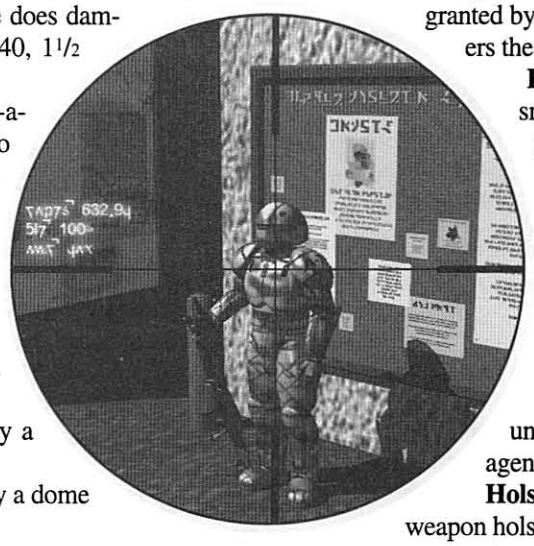
Vapor Canteen (TL8): Takes four hours to distill one quart of clean water, assuming Earthlike levels of water vapor in the air. The canteen holds 1 quart of water. After distilling 50 quarts, the canteen's rB cell needs to be recharged. Cr450, 4 lbs. when full.

Watchdog (TL8): A passive infrared sensor. It will give a warning, either audibly or to a remote unit, if intruders of a specified size and heat enter the sensor's range. The Watchdog runs on a rB cell for three months. Cr 600, 3 lbs.

Water Purification Tablets (TL7): Each of the 50 tablets will purify 1 quart of water and remove any trace of flavor. Cr10, neg.

Combat Accessories

Articulated Weapon Harness (TL8): Reduces the required ST of the weapon it is attached to by 3. Cr600, 5 lbs.



Battle Vest (TL7): A vest designed to hold up to 20 lbs. of gear. Finding a particular item takes 1d seconds unless an IQ (or Fast-Draw where appropriate) roll is made. Cr100, 2 lbs.

D-Tag (TL8): This is a small homing beacon built into the butt of a weapon that allows it to be tracked. Cr20, neg.

Flashlight, Gun-Mount (TL7): Small flashlight mounted on the barrel of a weapon. The light projects a tightly focused 50' beam, centered on the impact point of rounds fired by the weapon. Reduces the SS penalty by 1 in poorly lit areas. Powered by a B cell for two weeks. Cr20, 1/2 lb.

Gun Cleaning Kit, Large (TL7): For use with any chemical-propellant firearm up to 20mm bore size. Cr30, 3 lbs.

Gun Cleaning Kit, Standard (TL6): For use with any broad category of chemical-propellant firearm (pistols, rifles, MGs, etc.). Cr40, 2 lbs.

Gun Cleaning Kit, Small* (TL7): For use with one specific firearm. Cr20, 1/2 lb.

Gyrostabilized Weapon Harness (TL8): An advanced version of the Articulated Weapon Harness that cancels the penalties for walking or running while firing, in addition to the benefits granted by the Articulated Weapon Harness. A C cell powers the harness for 500 hours. KCr2, 10 lbs.

Holster, Tactical (TL7): A holster for pistols or small automatic weapons. Strapped to the thigh, it grants a +2 to Fast-Draw skill with that particular weapon if using the advanced rules on pp. CII97-89. Cr100, 1/2 lb.

Holster, Military (TL5): A standard-issue holster for pistols, with a flap to both protect the weapon and guard against accidental losses, -2 to Fast-Draw due to flap, -1 to Holdout. Cr50, 1/2 lb.

Holster, Undercover, Custom (TL7): A fine undercover holster, +2 to Holdout. A favorite of IG agents. Cr200, 1/2 lb.

Holster, Undercover (TL7): The basic concealed-weapon holster. Gives a +1 to Holdout. Cr100, 1/2 lb.

Laser Designator (TL8): Illuminates targets for laser-homing projectiles. Each rC cell lasts 300 seconds. Cr500, 2 lbs.

Personal Transponder* (TL9): A short-range Identify Friend or Foe system. The Army uses weapons lock-outs on all of its weapons to prevent soldiers from firing on people wearing the correct transponder. Commanders from platoon level on up may turn off this safety feature, should an opponent exploit it . . . An rA cell powers the device for a year. Cr100, neg.

Recognition Pad (TL9): This is a palm-print analyzer built into the gun's handgrip. This prevents anyone but the registered user from firing the weapon. If the weapon has no other power source, an rA cell is required. Cr250, 1/2 lb. Per p. UTT12, these might be available as early as late TL7.

Recoil Reduction† (TL7): Modification that costs +50% of base weapon cost. The weapon's Rcl is reduced by 1 (to a minimum of -1) and the required ST is divided by 1.2

Scope, 2× (TL5): +1 to Acc for aimed shots. Cr200, 2 lbs.

Scope, 4× (TL5): +2 to Acc for aimed shots. Cr400, 3 lbs.

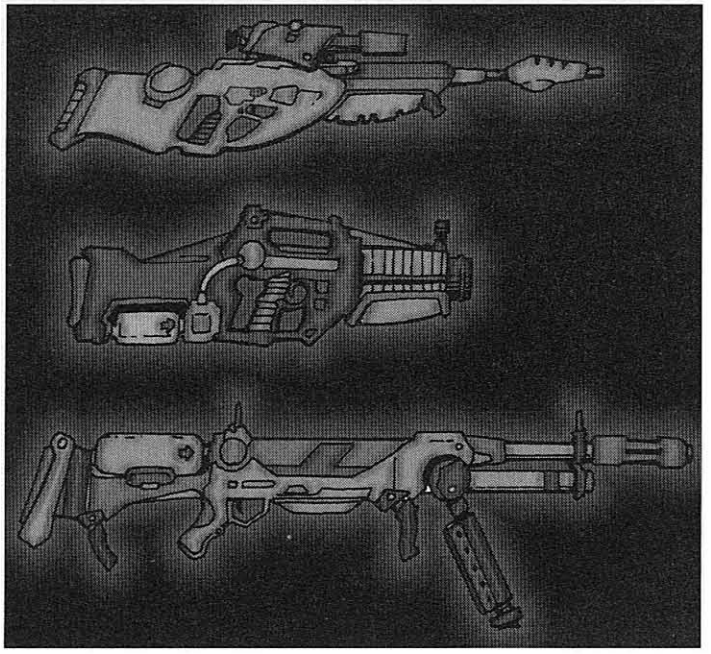
Scope, 8× (TL5): +3 to Acc for aimed shots. Cr800, 4 lbs.

Tripod, Standard† (TL5): Unless otherwise specified, a tripod has the same weight as the weapon for which it is designed, and costs Cr10 per pound.

Tripod, Light† (TL7): A light tripod has half the weight of the weapon for which it is designed, and costs Cr30 per pound.

Tripod Motor (TL8): Tripods are often built with electric motors to improve reaction speed. The motors reduce SS by 2. Two rB cells power the motor for one week. KCr1, 4 lbs.

Vacuum-Proofing (TL7): Allows TL7 guns to work in vacuum with no Malf penalty. Cr400, neg.



Demolitions

Backpack Mini-Nuke† (TL8): One-kiloton nuclear device, does 6d×4 million. KCr40, 25 lbs.

Breaching Charge Frame (TL7): An adhesive, adjustable frame for blowing doors or walls. Used mostly by police and anti-terrorist teams. No explosives are installed. Cr50, 3 lbs.

Contact Wire, 50 ft. (TL5): Used with plunger and detonator caps, or electronic control unit. Cr25, 3 lbs.

Control Unit, Radio (TL7): Detonates remote triggers, can be traced or jammed, 3-mile range. Cr50, 1/2 lb.

Control Unit, Electronic (TL7): Detonates remote triggers, plugs into fiber-optic cable. Cr50, 1/2 lb.

Det-Cord, 30 ft. (TL6): Does 6d×2 damage per 30' if used as explosive, or burns at 4,000' per second. Cr100, 1 lb.

Detonator, Plunger (TL5): Safe and secure detonation device, familiar to anyone who has ever seen a cartoon. Requires contact wire and detonator caps. Cr100, 1 lb.

Detonator Caps, Pack of 50 (TL5): These do 1d-3 damage each, and are used to detonate explosives. They must have an electrical current to function. Cr50, 2 lbs.

Fuze, Military, 100' (TL6): A slow fuse that burns at 30 seconds per foot. Cr20, 1/2 lb.

Explosives, Demo-Brick (TL7): Standard plastic explosive. Does 6d×14 at TL7, 6d×42 at TL8, and 6d×63 at TL9+. Can be broken into smaller charges and shaped, though *not* turned into a true HEAT charge in the field. Cr100, 5 lbs.

Explosives, Demo-Brick, TDX (TL9): As above, but explosion radiates perpendicular to gravity, doing twice the damage of normal charge to objects crossing the plane of detonation, with a burst radius 1.5× normal. Quadruple normal cost.

Satchel Charge (TL7): A knapsack with 5 lbs. of explosives (see above), and an electronic timer. Cr160, 6 lbs.

Trigger, Pressure (TL6): Can be set for different weights. Cr10, 1/2 lb.

Medical

Anti-toxin kit (TL7): Useful against one specific toxin, 10-100 doses depending on toxin. Cr25, 1/2 lb.

Drug Patch (TL8): Self-sticking patch soaked in a pre-measured dose of a specific drug. The most common are painkillers and antibiotics. Cr10+, neg.

Medkit, Emergency† (TL7): +1 to First Aid. Cr30, 2 lbs.

Medkit, Squad† (TL7): as for Medical Pouch, p. GT116.

Tools

Chainsaw (TL): Designed for the quick, efficient cutting of wood. Other uses have surfaced from time to time. Reach 1, 4d cutting, ST 12, 1 turn to ready. Runs on a C cell for two hours. Cr150, 15 lbs.

Crowbar, Titanium (TL7): Non-sparking, non-magnetic, corrosion-resistant basic prying tool. Cr50, 1/2 lb.

Laser Torch (TL8): Cuts through materials at 4d per second. Runs on a rC cell for 30 seconds. Cr250, 5 lbs.

Non-Sparking Tools (TL8): Most tool kits (see p. GT116) can be made of non-sparking, non-magnetic alloys for ×10 cost.

Plasma Torch, Light (TL9): Cuts at 7d per second; 10 points of damage from the torch reduces the target's DR by 1. Powered by an rC cell for 30 seconds. Cr750, 4 lbs.

Plasma Torch, Heavy (TL9): Cuts at 20d per second; 10 points of damage from the torch reduces the target's DR by 1. Powered by an rE cell for 100 seconds. KCr3, 40 lbs.

Six-in-One Axe (TL7): This handy tool combines the functions of an axe/pick (ST 12), hydrant wrench, spanner, wrench, pry bar, and gas-shutoff tool. Cr200, 4 1/2 lbs.

Sensors and Electronics

Binoculars, 8× (TL7): +3 to vision. Cr400, 3 lbs.

Binoculars, Military 10× (TL7): +3 to vision, with light-intensification, Cr600, 4 lbs.

Binoculars, Military 45× (TL8): +5 with light-intensification. Run off an rB cell for three months. KCr1.1, 6 lbs.

Near Miss Indicator (TL8): Gives a +2 to vision to spot enemy projectile fire. An A cell powers the device for a month. KCr1, neg.

Radiation Counter (TL8): Digital radiation counter, can be built into a helmet or goggles. Cr100, 1/4 lb.

Tactical Sensor Array (TL8): An optical imager, sonic-motion detector, thermograph, and parabolic mike in a backpack with a turretlike probe sticking over the user's shoulder. Uses two B cells every week. KCr20, 6 lbs.

Life Support

Air Tank, 24-Hour† (TL7): Heavy space-suit or pressure-tent tank. Cr400, 73 lbs.

Life Support Pack (TL8): Can be added to any sealed body armor to allow operations in vacuum or hostile environments. Requires a B cell for its own operation, beyond whatever power drains are caused by excessive life-support needs. Cr750, 2 1/2 lbs.

Chapter Five
Travel, Trade, and Commerce

How to Get There

Reactionless thrusters are used to fly between worlds and jump drives between stars; any other technology is *very* rare.

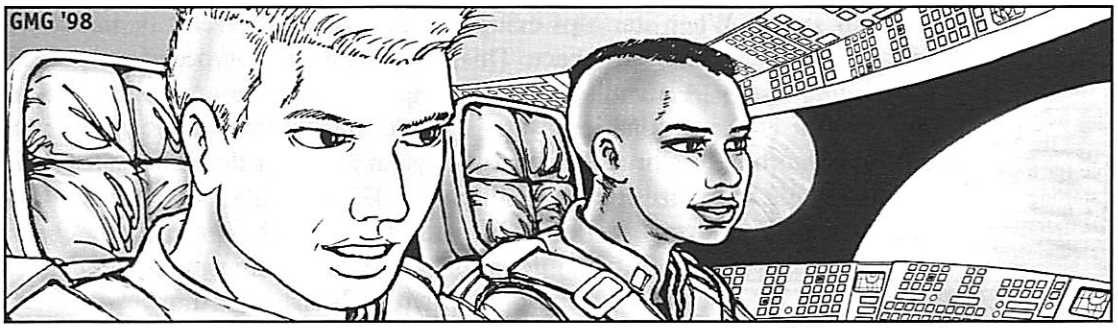
Non-starships (anything under 100 tons or with no jump drive) require Piloting (Spaceship) skill. Starships are flown with Piloting (Starship).

Piloting (Spaceship) equates to Piloting (High-performance spacecraft) on p. V144. To emulate classic ***Traveller***, have Piloting (Spaceship) default to Piloting (Starship)-2. GMs might also allow Piloting (Contragravity) to default to Piloting (Spaceship)-4.

Interplanetary Travel

Interplanetary travel requires success rolls vs. two skills: Piloting (Starship or Spaceship) and Astrogation. One crew member may fill both roles, but at -4 on any vehicle 200 tons or larger.

Ships *can* jump wholly within a star system – see *Micro-Jumps*, p. 121.



Travel Times

This chart assumes constant acceleration to the halfway point, then constant deceleration to the destination (you could accelerate the whole distance, but this will make it harder to stop upon arrival).

	Time					
Distance	*1 G*	*2 G*	*3 G*	*4 G*	*5 G*	*6 G*
0.2 AU	31 hrs	22 hrs	18 hrs	15 hrs	14 hrs	13 hrs
0.5 AU	2 days	34 hrs	28 hrs	24 hrs	22 hrs	20 hrs
1 AU	2.8 days	2 days	40 hrs	34 hrs	31 hrs	28 hrs
2 AU	4.1 days	2.8 days	2.3 days	2 days	43 hrs	40 hrs
5 AU	6.3 days	4.5 days	3.7 days	3.2 days	2.9 days	2.6 days
10 AU	9 days	6.3 days	5.2 days	4.5 days	4 days	3.7 days
50 AU	2.9 wks	2 wks	11.7 days	10 days	9 days	8.3 days
100 AU	4 wks	2.9 wks	2.4 wks	2 wks	12.8 days	11.7 days

Abbreviations: *wks:* weeks, *hrs:* hours.

Planetfalls

Streamlined spaceships (see pp. 150-151) can safely land on and leave planet surfaces, and skim gas-giant atmospheres. Unstreamlined ships avoid all three; their avionics aren't designed for the intricacies of atmosphere nor their hulls for landing.

Reaching Earth orbit requires an orbital velocity of 17,800 mph. For another planet, multiply 17,800 by the square root of (its mass in Earth masses divided by its diameter in Earth diameters). If mass is unknown, simply divide the planet's diameter by Earth's diameter (8,000 miles), then multiply by 17,800. Escape velocity is 1.414 times orbital velocity.

Divide orbital (or escape) velocity by (21.8 × ship's Accel) to find out how many seconds it takes a *streamlined* ship to reach (or escape) orbit from the surface. If a planet has no atmosphere, subtract local gravity from the ship's Accel first. Unstreamlined ships always subtract local gravity from Accel.

Arrivals take as much time as departures, plus 30 seconds of carefully setting down. In either case, vacuum worlds or an unstreamlined hull requires Accel to exceed local gravity.

For gas-giant skimming, figure an average escape velocity of 75,000 mph and local gravity of 1.25 G. Divide entry and exit times by 10; the ship's not even getting close to the surface.

For aerobraking streamlined ships without power, see p. VE164.

Skill Rolls

Safe planetfalls are routine, but not automatic. Make a Piloting roll for each arrival and departure. Skimming a gas giant is +0, landing in atmosphere +3, and landing in vacuum +4. Departures are +2. Weather and other circumstances can subtract -1 to -10. Pilots of skill 15+ can reroll mishaps per p. B69.

Unstreamlined ships can attempt any of these manuevers, at an additional -5. (Except in emergencies, this is *illegal* under Imperial law.) Even the best landing will likely cause some minor hull damage.

Gas Giants

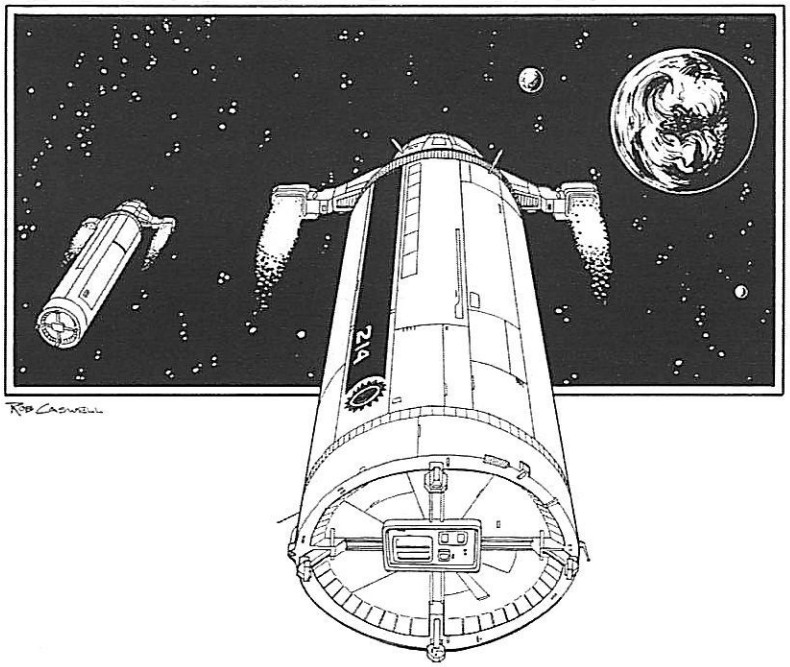
Given their importance, gas giants were noted in ***Traveller***'s star-system statistics. Unfortunately, ***GURPS*** stats don't normally mention whether a system has gas giants. ***GURPS Traveller First In*** provides a system for generating gas giants. For a quick reference in an unknown system, roll 2d. On a 9 or less, a gas giant is present.

Misdirected Jump Table

Roll	Deviation	Distance
2	0°	1d/2
3	30° starboard	1d
4	30° port	1d
5	30° starboard	2d
6	30° port	2d
7	60° starboard	3d
8	180°	3d
9	60° port	4d
10	60° port	4d
11	30° starboard	5d
12	60° starboard	5d

Roll 2d twice (once for each column).

This table allows the referee to place the ship at a random spot on a subsector (or sector) map. The deviation is away from the intended direction of the jump. The distance is the number of dice the GM rolls to determine how many hexes in the new direction the ship misjumps, starting at the departure hex. Note that it is possible for a ship to deviate 30 parsecs from its starting point during a misjump, the only time more than 6 parsecs per jump may be traveled.



Interstellar Travel

Only one form of faster-than-light drive is available, the jump drive. Slower-than-light interstellar travel isn't unknown, but uncommon.

Jump

Jump drives allow a ship to travel faster than the speed of light by entering jumpspace. Ships in jumpspace are completely out of communication with the normal universe, and with other ships in jumpspace. A ship's jump drives determine how far it can jump. The drives are rated in terms of their jump number, which can range from 1 to 6. (The number equals their maximum range in parsecs.) A ship can make a jump equal to or less than its jump number, but fuel requirements round up to the next even parsec (see below). All jumps take about a week (168 hours +/- 10%). Time spent in jump has no relation to the distance traveled; a 6-parsec jump and a 3-AU micro-jump both take about a week.

Each jump requires a quantity of liquid hydrogen. A portion is converted to energy in the ship's reactor to open the "hole" into jumpspace and to maintain the "bubble" around the ship once it enters, a portion is used as jump-drive coolant, and a portion is vented into jumpspace as part of the process of creating the jump "bubble" which separates and insulates the ship from jumpspace. For convenience though technically inaccurate, all of this is referred to as "fuel." Jump fuel is consumed at the rate of 10% of the ship's *displacement* tonnage per parsec jumped. In-system microjumps count as 1 parsec for consumption of fuel.

Ships may attach cargo pods, other ships, and such, then use their jump drives for the volume of the entire "assembly" as long as a ship's jump drives and fuel are sufficient for the increased volume. For instance, a normally jump-2 ship could carry another ship of its own volume through a jump-1.

Jump Types: When starships exit jump, they retain the velocity and direction they had on entering jumpspace. This leads to two basic types of jump:

Standing Jump: A standing jump attempts to give the emerging ship an orbital vector at the destination system. (Note that this will almost certainly require a non-orbital vector at the departure sytem.) Usually this is the safest type of jump, since it minimizes the possibility of colliding with a random asteroid or such. (Accidents still happen, which is why most starships have some armor.)

Running Jump: A running jump attempts to position the ship such that it need merely decelerate to approach the destination world. If poorly calculated, the ship will be off course and can waste considerable time maneuvering to the world.

The 100-Diameter Limit: Jump uses a straight line (called a jump line) in calculating courses. If that straight line intersects a 100-diameter sphere around an object larger than the ship, the ship is "precipitated out" of jump space. It is an astrogator's job to plot a course which avoids these pitfalls. Notice that this prevents a ship from emerging from jump within another object.

Jump Masking: A star's 100-diameter limit often blocks ("masks") the direct jump line from origin to destination world. Roll 8 or less on 3d for *both* origin and destination; success means that the jump point is unmasked. Masked jumps add about two days (44 hours) to normal travel time.

Micro-Jumps: It is possible to jump within a star system. The jump takes the standard time. A jump may be more efficient than using maneuver drives to travel from one world to another.

See p. T:FT59 for more detail on travel times.

Mishaps

A successful jump requires three separate success rolls: Piloting (Starship), Astrogation, and Mechanic (J-Drive). A simple failure means the operation was unsuccessful, but may be attempted again (at a -1 penalty per subsequent attempt). A critical failure (or a simple failure, if the crew is rushed or fatigued) on any roll means that a potential mishap exists; roll again, with any success indicating that the mishap has been avoided, but the failure still counts. A second critical failure results in *disaster*. Mishaps can take several forms:

Attempting a jump using unrefined fuel is -2 to all rolls. Attempting a jump from within 100 diameters of another object is -4, within 50 diameters -8, within 10 diameters -12.

No Jump: A Piloting mishap results in no jump (the jump drive fails to operate – the Game Master may provide suitable sound effects if desired).

Misexit: An Astrogation mishap causes a misexit from jumpspace. Roll 1d. On a 1, the ship has exited near a solitary world, comet, or odd chunk of rock in deep space between major systems; on 2-3, the ship exits near a world or gas giant in the destination star system; on 4-6, the ship exits at a random point at the destination star's 100-diameter limit.

Misjump: A misjump occurs when the drive fails during the initial jump process (Mechanic mishap), or when a jump is failed because of penalties for being too close to another object. A misjump can take the form of no jump, a failed jump (the ship enters jumpspace, but emerges after about a week in the same place it started), or a misdirected jump, where the ship emerges from jumpspace in an unintended location, usually far in distance and location from the intended exit point (this result is different from a misexit). A failed jump and a misdirected jump are indistinguishable before the ship exits jumpspace. For the latter, consult the *Misdirected Jump Table* on p. 120.

Disaster: The ship experiences a high level of damage (or is completely destroyed, at the Game Master's option).

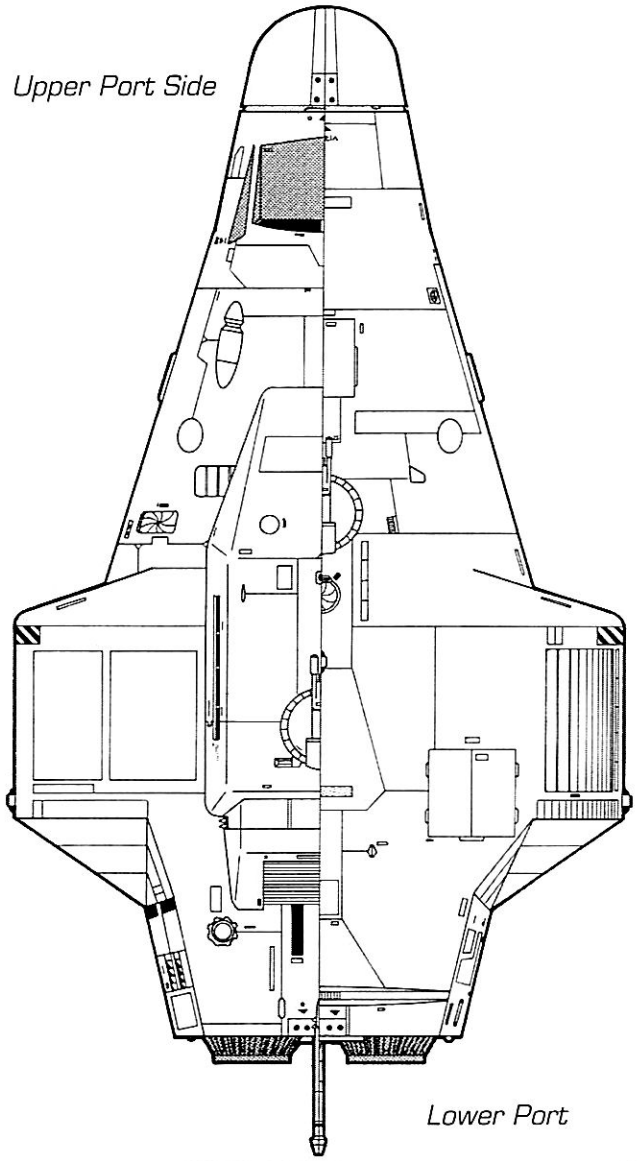
Detection of Jump

Jumps emit short bursts of energy. A previously undetected ship entering jump likely will reveal itself at the moment of jump, just as it disappears from sensor screens. Treat as +60 minus jumping ship's TL to radscanner readings, per p. 173, but don't also count the jumping ship's active transponder, radio, or active sensors unless they give a better bonus. A jump also give PESAs +25 minus twice TL. On a good sensors roll, the burst reveals the approximate size of the ship, and the time it left the system, if the scan is made in the same space-combat round as the jump. The direction of the jump (but not its distance) can be determined as well.

A ship *leaving* jump also emits a pulse of energy, which can reveal the approximate size of the ship and the time it entered the system. Halve the bonuses above for radscanners and PESAs for scans made in the same space-combat round.

A ship in jump cannot be detected in any fashion.

Beowulf-Class Free Trader



Refined and Unrefined Fuel

Starports sell refined fuel (pure liquid hydrogen) for Cr350 per fuel module. Unrefined fuel has impurities and costs Cr50. Class I and II starports sometimes only have unrefined fuel available, whereas Class Vs rarely offer to sell it. Out-of-the-way locales may also offer only unrefined fuel, and the price can fluctuate with supply.

Any ship with fuel processors can create refined fuel from various compounds containing hydrogen, such as water, methane, or unrefined fuel.

Streamlined starships can skim unrefined fuel from a gas giant's atmosphere. Water from a planet's oceans can be converted with a fuel processor; some worlds prohibit this.

Merchant Ship Revenues

Item	Gross Income
High Passage (each)	Cr3,500
Middle Passage (each)	1,750
Low Passage (each)	175
Freight (per ton)	650
Mail (if fitted)	10,000
Speculative Cargo	(see text)

Trade and Commerce

Carrying cargo and passengers between worlds is the foundation of interstellar commerce. More detailed rules for such commerce are given in ***GURPS Traveller: Far Trader***. GMs may override any of the following die rolls at their discretion (to declare no high passengers will be found in the outback of an underdeveloped colony world, for example).

Locate Passengers and Cargo: Passengers (see p. 78) and cargo may normally be found only at starports (they may be found elsewhere at the GM's discretion). Any character with Merchant skill may make one attempt to find each type of passenger and one attempt to find each type of cargo (mail, freight, and speculative cargo) once per day.

Locating passengers is a test of Merchant skill. For each successful roll, determine the number of each type available as follows:

High Passage: Roll 1d/2 for the number of passengers.

Middle Passage: Roll 1d for the number of passengers.

Low Passage: Roll 2d-3 for the number of passengers. See p. 108.

For each successful Merchant roll, determine the tonnage of each type available as follows:

Mail: If the ship is fitted with weaponry and carries a gunner, and the starport is Class II or worse, 1 ton of mail is available.

Freight: Roll 1d to find the number of lots of freight available.

For each lot, roll 4d-4 to find its size in tons. The ship must accept or reject each lot in its entirety. Carrying just part of a lot is not allowed.

Speculative Cargo: Determine the number of tons of speculative cargo in the same way as freight.

Revenue

Merchant ships earn money according to the *Merchant Ship Revenues* table (see sidebar), except for speculative cargo. Speculative cargoes may involve either a profit or loss for the ship, as determined below.

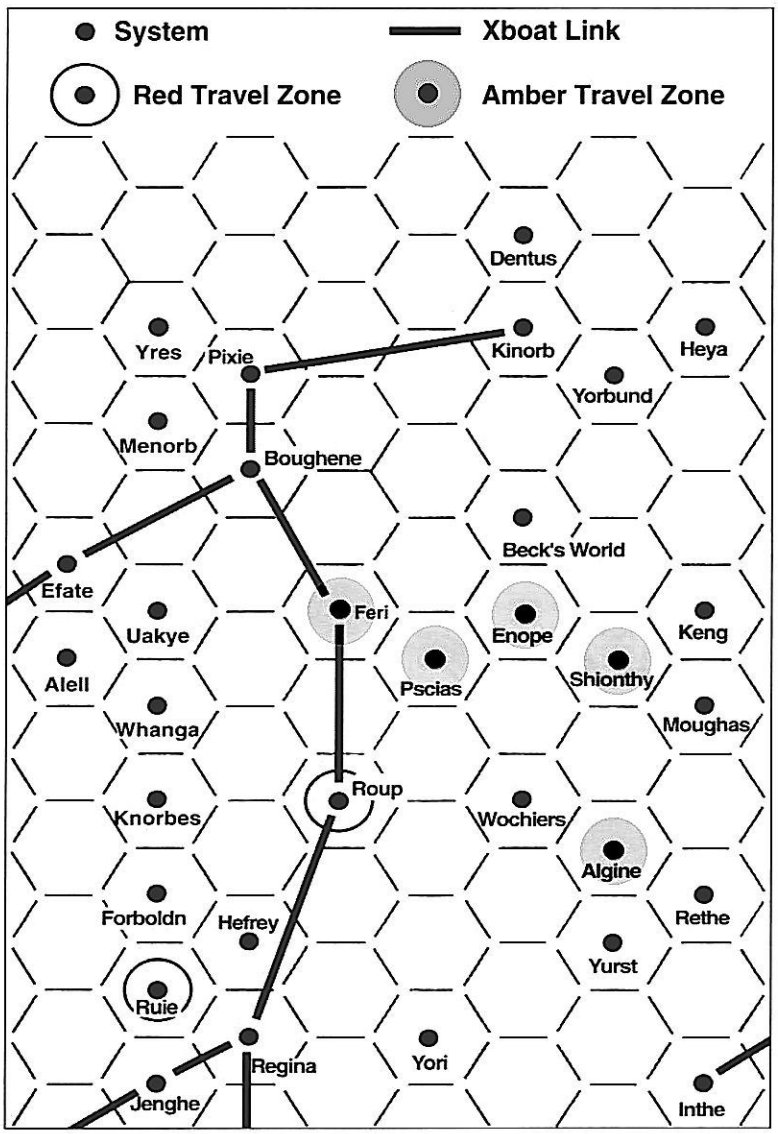
For the speculative cargo as a whole, determine the profit/loss as a test of Merchant skill. Roll once per lot of speculative cargo. On a success, the cargo was sold at a profit; on a failure the cargo was sold at a loss. Profit and loss are both determined by rolling 1d/2 × Cr1,000 per ton of speculative cargo.

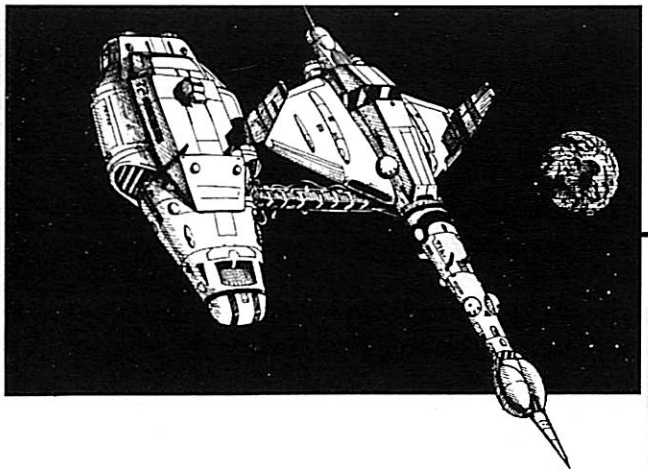
Interstellar Mapping

Normal space is three-dimensional, but jumpspace maps in ***Traveller*** are two-dimensional for simplicity. Game Masters who wish to represent space as three-dimensional in their campaigns are free to do so in any way they see fit.

This map shows the Regina subsector, one of 16 subsectors in the Spinward Marches sector. Regina is the sector capital, and the region is a hub for trade with the Vargr to coreward and the Zhodani to spinward.

Planetary Locations: The Imperium refers to planets and systems by the name of the main or inhabited world, followed by sector and subsector. For instance, the world Dentus on the map below is formally Dentus (Spinward Marches/Regina).





Planets

Thousands of world descriptions have been created for *Traveller* and hundreds for *GURPS Space.* These tables convert the two systems. For more detail about exotic and poisonous atmospheres, strange and unusual governments, the physics of star systems, and so on, see *GURPS Traveller: First In.*

Planetary Size Equivalents

The *Traveller* UPP (Universal Planetary Profile) code corresponds exactly with its diameter in thousands of miles, with "A" indicating 10,000 miles and "0" an asteroid belt. Planetary diameter may be used to generate values for gravity if density is known. *Traveller* usually assumes Earth-like densities (5.5 Earth, 5.2 Venus, 4 Mars, 3.3 Luna). Very low densities (under 2) are most likely in huge gas giants like Jupiter, Saturn, Uranus, and Neptune.

To get gravity, use the formula: Diameter (in miles) × Density × 0.0000229 = gravity, where 1 = Earth gravity. Rules for gravity effects are found on pp. S71-73 and CII133-135, 140-144.

Atmosphere Equivalents

Traveller UPP Code		*GURPS Space*
0	No atmosphere	None, vacuum
1	Trace	Trace oxygen-nitrogen
2	Very thin, tainted	Very thin oxygen-nitrogen, polluted
3	Very thin	Very thin oxygen-nitrogen
4	Thin, tainted	Thin oxygen-nitrogen, polluted
5	Thin	Thin oxygen-nitrogen
6	Standard	Standard oxygen-nitrogen
7	Standard, tainted	Standard oxygen-nitrogen, polluted
8	Dense	Dense oxygen-nitrogen
9	Dense, tainted	Dense oxygen-nitrogen, polluted
A	Exotic	Thin, standard, or dense reducing or exotic
B	Corrosive	Thin, standard, or dense corrosive
C	Insidious	As above, but highly corrosive gasses such as fluorine

See pp. S108-109. *GURPS* rules for handling alien atmosphere types are found on pp. S74-75 and pp. CII136-137.

Hydrographic Percentage

The *Traveller* UPP rates surface water in 10% increments. This corresponds exactly to the surface water percentages used in *GURPS Space* (p. S110).

Population Equivalents

Traveller UPPs record population exponentially: 0 is none, 1 is tens, 2 is hundreds, 3 is thousands, 9 is billions, A (10) is tens of billions, etc. *GURPS* uses the same system (see p. S117).

Starport Equivalents

Traveller	*GURPS Space*	*Traveller*	*GURPS Space*
A	Class V	D	Class II
B	Class IV	E	Class I
C	Class III	X	Class 0

See p. S122 for descriptions.

Government Equivalents

Traveller UPP government codes correspond with the following *GURPS* government descriptions:

	Traveller	*GURPS*
0	No government/family	Anarchy or Clan/Tribal
1	Company/corporation	Corporate state
2	Participatory democracy	Athenian democracy
3	Self-perpetuating oligarchy	Oligarchy, caste, or meritocracy
4	Representative democracy	Representative democracy
5	Feudal technocracy	Technocracy or cybercracy
6	Captive government	Colony, subjugated, or military government
7	Balkanization	Multiple societies
8	Civil-service bureaucracy	Bureaucracy
9	Impersonal bureaucracy	Bureaucracy
A	Charismatic dictator	Dictatorship
B	Non-charismatic dictator	Dictatorship
C	Charismatic oligarchy	Oligarchy
D	Religious dictatorship	Theocracy

See pp. CII185-186 for descriptions of *GURPS* governments.

Law Level Equivalents

Traveller UPPs rate government restrictions on personal freedoms, especially the right to carry weapons, on a scale of 0 (none) to 9+ (very heavy). In *GURPS* this corresponds with Control Ratings as follows:

Traveller Law Level	*GURPS* Control Rating
0	0 (anarchy)
1	1 (very free)
2	1 (very free)
3	2 (free)
4	2 (free)
5	3 (moderated)
6	4 (controlled)
7	4 (controlled)
8	5 (repressive)
9 and up	6 (total control)

Tech Level Equivalents

See sidebar on p. 107.

CHAPTER SIX

Character Conversions

Intelligence Vs. Education

Traveller drew a distinction between intelligence, which was a raw talent, and education, which represented formal schooling or training. This reflected the notion of the original designers that intelligence and education are not necessarily linked; it is possible for a person to be highly educated, but not very intelligent, and vice versa. The *GURPS* IQ attribute is a composite attribute that represents many things, including a certain amount of education (see p. CI7 for details).

Traveller had four main versions: ***Classic Traveller, MegaTraveller, Traveller: the New Era,*** and ***Traveller (4th Edition).*** This chapter converts characters from all four. All four versions of *Traveller* featured semi-random character generation, which means that a typical group of characters converted to *GURPS* will end up with vastly different point totals. Game Masters may ignore this, or may allow the "shortchanged" players to make arguments for *GURPS* advantages that weren't part of their character's *Traveller* stats.

As in all conversions, GMs should bend the rules to retain character concept or playability. These are rough guidelines, to be fine-tuned as needed.

STATISTICS

All four *Traveller* versions generated six personal characteristics. ***Classic Traveller*** **(CT),** ***MegaTraveller (MT),*** and ***Traveller 4th Edition (T4)*** used Strength, Dexterity, Endurance, Intelligence, Education, and Social Standing. ***Traveller: the New Era (TNE)*** used Strength, Agility, Constitution, Intelligence, Education, and Charisma. TNE retained Social Standing, but as a secondary attribute.



These convert to *GURPS* as follows:

***GURPS* Attribute**	**based upon this *Traveller* Characteristic**
ST	Strength*
DX	Dexterity or ***TNE***'s Agility*
IQ	(Intelligence + Education)/2*
HT	Endurance or ***TNE***'s Constitution*
Charisma	Charisma*
Status	Social Standing

** If **TNE** character, add +1 to Characteristic or result of IQ formula.*

For ST, DX, IQ, and HT, use the following conversion table:

Trav	*GURPS*	*Trav*	*GURPS*	*Trav*	*GURPS*	*Trav*	*GURPS*
1	6	5	9	9	12	D	15
2	7	6	9	A	13	E	16
3	8	7	10	B	13	F	17*
4	8	8	11	C	14		

** For NPCs, **Traveller**'s F represents an attribute anywhere from 17 to **GURPS**' mundane ceiling of 20. For PCs, the minimal 17 should be reward enough.*

For Charisma or Status, use:

Trav	*GURPS*	*Trav*	*GURPS*	*Trav*	*GURPS*	*Trav*	*GURPS*
1	-4*	5	-1*	9	1	D	4
2	-3*	6	0	A	1	E	5
3	-2*	7	0	B	2	F	6
4	-1*	8	0	C	3		

** A **TNE** character who converts to **GURPS** with "negative" Charisma should take Odious Personal Habits, negative Appearance, and similar disadvantages that sum to the reaction penalty indicated by the table.*

Skills

Converting skills from the ***Traveller*** systems to ***GURPS*** involves more interpretation than calculation.

The ***Traveller*** systems varied among themselves – and with ***GURPS*** – in how skill levels were applied to game mechanics. More importantly, ***Traveller*** skill systems were usually less "detailed" than ***GURPS***. A commando-trained mercenary in ***Traveller*** might list 10 skills. An equivalent template in ***GURPS Traveller*** requires roughly 30. Background knowledge, familiarities, and secondary skills that were assumed in ***Traveller*** are spelled out in ***GURPS***.

Traveller skill levels were single digits generally ranging from 0 (familiarity) to 5 (expertise). To convert a ***Traveller*** skill level to a ***GURPS*** skill, give 1 character point for level 0, 2 for level 1, 4 for level 2, and 8 for level 3. For each subsequent level, add 8 more points to a *physical* skill or two more to a *mental* skill. These points must be applied to the equivalent ***GURPS*** skill or skills.

For each skill converted, give the character an *equal* number of character points to be spent on "secondary" skills appropriate to his background or that skill! Up to 8 of these points could be spent to increase the original skill if the controlling attribute is less than 12. In some cases, these points can be spent on advantages, martial-arts maneuvers, etc.

Example: *The player of an Army veteran first determines his DX is 9 and IQ 11. He then converts the character's Combat Rifleman-2 into 4 points of Guns (Light automatic), or a skill of 12. He has 4 more points for complementary skills. At DX 9, he could use the points to increase to Guns (Light automatic)-13, but decides against it. He also thinks about boosting his Guns (Rifle) default a little, since Combat Rifleman included single-shot firing, but decides he can live with the less-than-exact conversion. Instead, he puts 2 points in Armoury (Small arms) and 2 in Savoir-Faire (Military).*



Jack-of-All-Trades

Traveller has a special skill called Jack-of-all-Trades, giving low proficiency in skills the character *doesn't* have. To convert it, use this advantage:

Jack-of-All-Trades 10 points/level

This advantage reflects an unusual breadth of talent and versatility. Each level grants +1 to all skill defaults from attributes (but not other skills), to a maximum of +3 for 30 points. It has no effect on skills without a default, and modified default level may never equal or exceed the level that ½ point would purchase. Jack-of-All-Trades does not make *learned* skills any cheaper.

Default skill usage remains restricted as per the sidebar on p. B44.

Skill Comparison Tables

The following tables convert ***Traveller*** skill names to equivalent ***GURPS*** skill names. Some ***Traveller*** skills convert to one of several ***GURPS*** skills. Some convert to a mix of several ***GURPS*** skills. The player may choose how he allocates points in these cases.

Traveller	***GURPS***
Acrobatics (TNE)	Acrobatics
Act/Bluff (TNE)	Acting
Acting (T4)	Acting
Admin (MT)	Administration
Admin/Legal (TNE)	Administration and/or Law
Administration (CT)	Administration
Advanced Combat Rifle (MT)	Guns/TL (Light automatic)
Air/Raft (CT)	Piloting (Contragravity)
Animal Handling (MT)	Animal Handling
Archaic Artillery (TNE)	Gunner/TL (type)
Archaic Weapons (MT)	Black Powder Weapons/TL (type)
Archeology (T4)	Archeology
Archery (TNE)	Bow
Armed Martial Arts (TNE)	
Club	Broadsword or Axe/Mace
Large Blade	Broadsword
Polearm	Polearm
Small Blade	Knife

Traveller	***GURPS***
Armory (T4)	Armoury/TL (type)
Art (T4)	Artist or other (Sculpting, etc.)
Artillery (T4)	Gunner/TL (type)
Artisan (MT)	Artist or other (Sculpting, etc.)
Assault Rifle (MT)	Guns/TL (Light automatic)
Astrogation (TNE, T4)	Astrogation/TL
Athletics (T4)	Running, with aspects of Sport (type)
ATV (CT)	Driving (Heavy wheeled)
ATV, Tracked (MT)	Driving (Tracked)
ATV, Wheeled (MT)	Driving (Heavy wheeled)
Autocannon (MT)	Gunner/TL (Machine gun)
Autogun (TNE)	Gunner/TL (Cannon, possibly machine gun)
Automatic Pistol (CT)	Guns/TL (Pistol)
Automatic Rifle (CT)	Guns/TL (Light automatic)
Autorifle (MT)	Guns/TL (Light automatic)
Axe (MT)	Axe/Mace
Axe, Battle (MT)	Axe/Mace

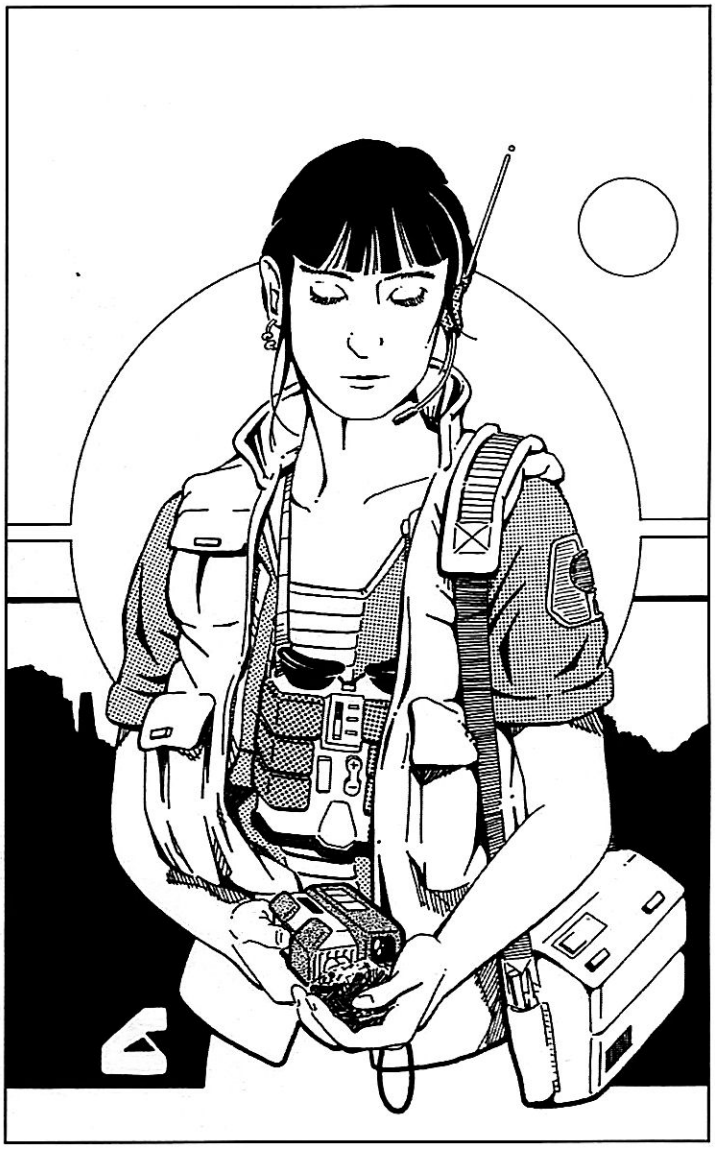


Traveller	*GURPS*
Axe, Hand (MT)	Axe/Mace
Bargain (TNE)	Merchant
Battle Dress (MT, T4)	Battlesuit/TL
Bayonet (CT, MT)	Spear
Biology (MT, TNE, T4)	Botany/TL, Zoology/TL, etc.
Blade (CT, MT)	Shortsword
Blade, Long (T4)	Broadsword
Blade, Large (MT)	Broadsword
Blade, Short (T4)	Shortsword
Blade, Small (MT)	Shortsword
Blowgun (MT)	Blowpipe
Body Pistol (CT, MT)	Guns/TL (Pistol)
Bola (MT)	Bolas
Boomerang (MT)	Throwing Stick
Bow Combat (CT, T4)	Bow or Crossbow
Brawling (CT, MT, T4)	Brawling
Bribery (CT, MT, TNE, T4)	Streetwise or Fast-Talk
Broadsword (CT, MT)	Two-Handed Sword
Broker (MT, T4)	Merchant
Camouflage (T4)	Camouflage

Traveller	*GURPS*
Carbine (CT, MT)	Guns/TL (Rifle)
Carousing (MT, TNE, T4)	Carousing
Carpenter (TNE)	Carpentry
Chemistry (MT, TNE, T4)	Chemistry/TL
Climbing (TNE)	Climbing
Combat Engineer (TNE)	Engineer/TL (Combat)
Combat Engineering (MT)	Engineer/TL (Combat)
Combat Rifleman (MT)	Guns/TL (Light automatic)
Communications (MT, T4, TNE)	Electronics Operations/TL (Communications)
Computer (CT, MT, T4)	Computer Operation/TL and Computer Programming/TL
Computer Tech (TNE)	Computer Operation/TL and Computer Programming/TL
Construction (TNE)	Engineer/TL (Civil)
Craftsman (T4)	Woodworking, Sculpture, etc., as appropriate
Criminology (T4)	Criminology/TL
Crossbow (MT)	Crossbow
Cudgel (CT, MT)	Broadsword
Cutlass (CT, MT)	Broadsword
Dagger (CT, MT)	Knife
Dance (TNE, T4)	Dancing
Demolition (MT, T4)	Demolition/TL
Diplomacy (T4)	Diplomacy
Disguise (MT, T4, TNE)	Disguise
Early Firearms (MT, TNE)	Black Powder Weapons/TL (type)
Electronics (CT, MT, T4)	Electronics/TL (type)
Electronics Tech (TNE)	Electronics/TL (type)
Energy Artillery (TNE)	Gunner/TL (type)
Energy Weapon (Pistol) (TNE)	Beam Weapons/TL (type)
Energy Weapon (Rifle) (TNE)	Beam Weapons/TL (type)
Energy Weapons (MT)	Beam Weapons/TL (type)
Engineering (CT, MT, T4)	Engineer/TL (Vehicles)
Environment Combat (T4)	Free Fall/TL
Environment Suit (TNE)	Vacc Suit/TL
Equestrian (MT, T4)	Riding (type)
Excavation (TNE)	Engineer/TL (Mining or Civil)
FA Gunnery (MT)	Gunner/TL (type)
Farming (TNE)	Agronomy/TL
Fast Talk (T4)	Fast-Talk
Fencing (T4)	Fencing
First Aid (T4)	First Aid/TL
Fleet Tactics (MT)	Strategy (Space)
Foil (CT, MT)	Fencing
Forensic (MT, T4)	Forensics/TL
Forgery (CT, MT, TNE, T4)	Forgery/TL
Forward Observer (CT, MT, TNE, T4)	Forward Observer /TL
Fusion Gun (MT)	Beam Weapons/TL (Plasma blaster)
Gambling (CT, MT, TNE, T4)	Gambling
Gauss Rifle (MT)	Guns/TL (Light automatic)
Genetics (MT, TNE)	Genetics/TL
Geology (TNE, T4)	Geology/TL

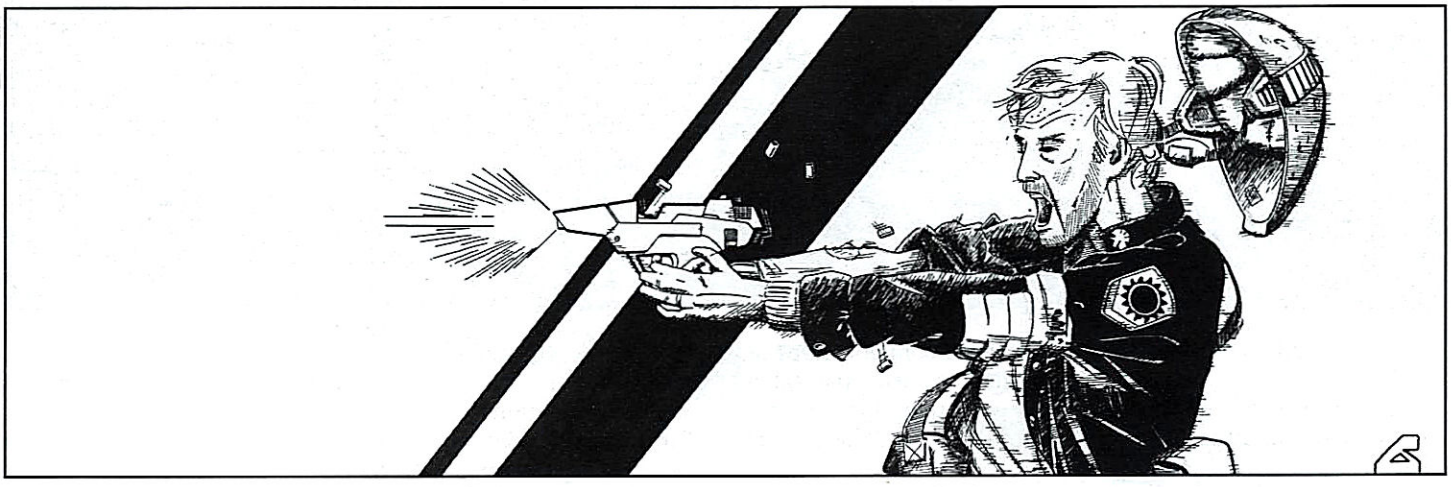
Traveller	*GURPS*
Grav Belt (MT, TNE)	Piloting (Contragravity)
Grav Craft (T4)	Piloting (Contragravity)
Grav Vehicle (CT, MT)	Piloting (Contragravity)
Gravitics (MT, TNE, T4)	Electronics/TL (Contragravity)
Grenade Launcher (MT, TNE)	Guns/TL (Grenade launcher)
Ground Craft (T4)	Driving (type)
Ground Vehicle Tracked (TNE)	Driving (Tracked)
Ground Vehicle Wheeled (TNE)	Driving (type)
Guard/Hunting Beasts (MT, TNE)	Animal Handling
Gunnery (CT, T4)	Gunner/TL (type)
Gunnery, Missiles (TNE)	Gunner/TL (Missiles)
Gunnery, Energy Weapon (TNE)	Gunner/TL (type)
Gunnery, Grav Weapon (TNE)	Gunner/TL (Gravitic)
Halberd (CT, MT)	Polearm
Handgun (MT)	Guns/TL (Pistol)
Heavy Artillery (TNE)	Gunner/TL (type)
Heavy Guns (TNE)	Gunner/TL (type)
Heavy Weapons (T4)	Gunner/TL (type)
Helicopter (CT, MT, T4)	Piloting (Helicopter)
Herding (MT)	Agronomy/TL
High Energy Weapons (MT)	Beam Weapons/TL (type)
High-G Environment (MT, TNE)	Improved G-Tolerance
History (MT, TNE, T4)	History
Hovercraft (CT, MT, TNE)	Driving (Hovercraft)
Hunting (MT)	Tracking
Instruction (MT, TNE, T4)	Teaching
Interrogation (MT, TNE, T4)	Interrogation
Interview (MT, TNE)	Interrogation
Intimidation (T4)	Intimidation
Intrusion (MT, TNE, T4)	Lockpicking/TL
Investigation (T4, TNE)	Criminology/TL
Jet Aircraft (CT), Jet Plane (T4)	Piloting (High-performance airplane)
Jet-propelled aircraft (MT)	Piloting (High-performance airplane)
Jeweler (TNE)	Jeweler/TL
Language (TNE, T4)	Language (type)
Large Watercraft (CT)	Powerboat or Seamanship
Laser Carbine (CT, MT)	Beam Weapons/TL (Lasers)
Laser Pistol (MT)	Beam Weapons/TL (Lasers)
Laser Rifle (CT, MT)	Beam Weapons/TL (Lasers)
Laser Weapons (MT)	Beam Weapons/TL (Lasers)
Law (T4)	Law
Leader (CT, MT)	Leadership
Leadership (TNE, T4)	Leadership
Legal (MT)	Law
Liaison (MT, TNE)	Savoir-Faire
Light Assault Gun (MT)	Guns/TL (Light automatic)
Lighter-than-air Craft (MT)	Pilot (type)
Linguistics (MT, T4)	Linguistics
Machinegun (MT)	Guns/TL (Machine gun)
Machinist (TNE)	Blacksmith/TL
Map (TNE)	Cartography
Marketing (TNE)	Merchant
Mason (TNE)	Masonry
Mass Drivers (MT)	Gunner/TL (Electromag)
Mechanic (TNE)	Mechanic/TL (type)

Traveller	*GURPS*
Mechanical (CT, MT)	Mechanic/TL (type)
Mechanics (T4)	Mechanic/TL (type)
Medical (CT, T4)	Physician/TL, Diagnosis/TL, and Surgery/TL
Medical, Diagnosis (TNE)	Diagnosis/TL
Medical, Surgery (TNE)	Surgery/TL
Medical, Trauma Aid (TNE)	First Aid/TL
Melee Combat (T4)	Brawling
Meson Guns (MT)	Gunner/TL (Meson)
Metallurgy (TNE)	Metallurgy/TL
Meteorology (TNE)	Meteorology/TL
Mortars & Howitzers (MT)	Gunner/TL (Mortar and/or Cannon)
Muscle Transport, Skates (TNE)	Skating
Muscle Transport, Skis (TNE)	Skiing
Muscle Transport, Wheels (TNE)	Teamster or Bicycling
Music (T4)	Singing and/or Musical Composition
Musical Instrument (TNE)	Musical Instrument (type)
Music, Composition (TNE)	Musical Composition



Traveller	*GURPS*
Music, Keyboard (TNE)	Musical Instrument (type)
Music, Other (TNE)	Musical Instrument (type)
Music, Percussion (TNE)	Musical Instrument (type)
Music, Strings (TNE)	Musical Instrument (type)
Music, Wind (TNE)	Musical Instrument (type)
Naval Architect (MT)	Shipbuilding/TL (Starship)
Navigation (MT, TNE, T4)	Navigation/TL
Navigator (CT)	Navigation/TL
Neural Pistol (MT)	Beam Weapons/TL (Neural)
Neural Rifle (MT)	Beam Weapons/TL (Neural)
Observation (TNE)	Tracking
Painting (TNE)	Painting
Parachute (TNE)	Parachuting
Persuasion (MT, TNE)	Fast-Talk
Philosophy (T4)	Philosophy (type)
Physics (MT, TNE, T4)	Physics/TL
Pickpocket (TNE)	Pickpocket
Pike (CT, MT)	Polearm
Pilot (CT, MT, T4)	Piloting (Starship)
Pilot, Airship (TNE)	Piloting (Lighter-than-air)
Pilot, Fixed Wing (TNE)	Piloting (Heavy, high-performance, or light airplane)
Pilot, Glider (TNE)	Piloting (Glider)
Pilot, Interface/Grav (TNE)	Piloting (Contragravity)
Pilot, Rotary Wing (TNE)	Piloting (Helicopter)
Pistol (MT, T4)	Guns/TL (Pistol)
Plasma Gun (MT)	Beam Weapons/TL (Plasma blaster)
Polearm (MT)	Polearm
Prop Plane (T4)	Piloting (Light airplane, possibly ultralight)
Propeller Aircraft (CT, MT)	Piloting (Light airplane, possibly heavy airplane)
Prospecting (MT)	Prospecting
Psionicology (T4)	Psionics/TL
Psychology (TNE, T4)	Psychology/TL (race)
RCV Operations (TNE)	Piloting (type)
Recon (MT, T4)	Tracking and/or Stealth
Recruiting (MT, TNE)	Fast-Talk
Research (T4, TNE)	Research
Revolver (CT, MT)	Guns/TL (Pistol)
Riding (TNE)	Riding (type)
Rifle (MT, T4)	Guns/TL (Rifle)
Rifleman (MT)	Guns/TL (Light automatic)
Robot Ops (MT)	Artificial Intelligence/TL and Mechanic/TL (Robotics)
Robotics (MT, TNE, T4)	Artificial Intelligence/TL and Mechanic/TL (Robotics)
Science (MT)	GM and player's choice(s)





Traveller	*GURPS*
Screens (MT)	Electronics Operations/TL (Force shields)
Screens, Black Globe (TNE)	Electronics Operations/TL (Force shields)
Screens, Meson Screens (TNE)	Electronics Operations/TL (Force shields)
Screens, Nuclear Dampers (TNE)	Electronics Operations/TL (Force shields)
Screens, Sandcaster (TNE)	Gunner/TL (Sandcaster)
Sculpture (TNE)	Sculpting
Sensor Ops (MT), Sensors (TNE, T4)	Electronics Operations/TL (Sensors)
Service (TNE)	Savoir-Faire (Servant)
Ship Tactics (MT)	Tactics
Ship's Boat (CT, MT, T4)	Piloting (Spaceship)
Ship's Engineering (TNE)	Engineer/TL (Vehicles)
Shotgun (CT, T4)	Guns/TL (Shotgun)
Sling (MT)	Sling
Slug Weapon, Pistol (TNE)	Guns/TL (Pistol)
Slug Weapon, Rifle (TNE)	Guns/TL (Rifle)
Small Watercraft (CT)	Boating
Snub Pistol (MT)	Guns/TL (Pistol)
Song (TNE)	Singing
Spear (CT, MT)	Spear
Spinal Weapons (MT)	Gunner/TL (Particle beam)
Starship Architecture (TNE)	Shipbuilding/TL (Starship)
Stealth (MT, TNE, T4)	Stealth
Steward (CT, MT)	Savoir-Faire (Servant)
Streetwise (CT, MT, TNE, T4)	Streetwise
Submachinegun (CT, MT, T4)	Guns/TL (Light automatic)
Submersible (CT)	Seamanship
Survey (MT, TNE, T4)	Astrography
Survival (MT, TNE, T4)	Survival (type)
Swimming (TNE)	Swimming
Sword (CT, MT)	Broadsword
Tac Missile (TNE)	Gunner/TL (Missile)
Tactics (CT, T4)	Tactics
Tactics, Fleet (TNE)	Strategy (Space)
Tactics, Ground (TNE)	Tactics
Tactics, Ship (TNE)	Tactics
Throwing (T4)	Throwing or Thrown Weapon
Thrown Weapon (TNE)	Throwing or Thrown Weapon
Tracked Vehicle (CT)	Driving (Tracked)
Tracking (TNE)	Tracking
Trader (MT, T4)	Merchant
Turret Weapons (MT)	Gunner/TL (type)
Unarmed Martial Arts (TNE)	Karate or Judo, etc.
Vacc Suit (CT, MT, T4)	Vacc Suit/TL
Vehicle (MT)	Driving (type)
VRF Gauss Gun (MT)	Gunner/TL (Machine gun)
Watercraft (T4)	Boating, Seamanship/TL, or Powerboat/TL
Watercraft, Large (MT, TNE)	Seamanship/TL
Watercraft, Small (MT, TNE)	Powerboat/TL
Wheeled Vehicle (CT)	Driving (type)
Writing (T4)	Writing
Xenobiology (TNE)	Xenobiology
Zero-G Combat (CT)	Free Fall/TL
Zero-G Environment (MT, TNE)	Free Fall/TL
Zero-G Ops (MT)	Free Fall/TL
Zero-G Weapons (CT)	Guns/TL (Gyroc)

Advantages, Disadvantages, and Quirks

These three features of ***GURPS*** character creation have little direct correspondence in ***Traveller.*** Status can be determined from ***Traveller*** stats, of course, and Wealth judged based on the character's Status and fiscal position at conversion. Controlling interest in a ship is handled with the Ship Patron rules on pp. 84-85 or Ship Owner on p. T:FT101. The ***TNE*** system covered Charisma, Contacts, and Patrons, but for other ***Traveller*** systems these will have to be estimated.

Other advantages, disadvantages, and quirks can be given based on the character's concept. Certainly an experienced Marine could have Combat Reflexes. GMs might allow more advantages for low-attribute, low-skill conversions than those with high attributes and/or skills.

Appendix A

Starships

This appendix describes some of the most common ships in the Imperium. Each class is rated in displacement tons (also called dtons), but with masses given in standard tons. Displacement tons measure *size* (500 cf per dton). The masses listed measure *weight* (2,000 pounds per ton).

See *Modular Starship Design*, pp. 149-162, for an explanation of ship statistics. See *Crew Requirements*, pp. 149-150, for the skills required at each crew position.

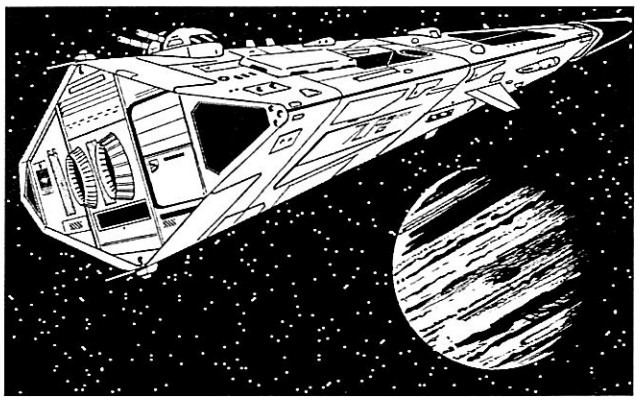
Prices are given with any weaponry listed in the writeup, but without any ship's vehicles, ammo, fuel, or computer programs.

The EMass (empty mass) listed assumes only fuel is carried. The LMass (loaded mass) assumes standard ship's vehicles, 5 tons per cargo space, and fuel.

Listed Accel is based on LMass. To calculate different Accels: divide LMass by (EMass plus cargo, extra weapons, and vehicles carried), then multiply by the listed Accel.

Sulieman-Class 100-ton Scout/Courier (TL10)

Commonly used for survey, reconnaissance, courier, and liaison duties, the *Sulieman* class is one of the most commonly encountered vessels in interstellar space. Selected retirees from the Imperial Interstellar Scout Service (IISS) are granted the long-term use of a Scout/Courier (see *Ship Patrons*, pp. 84-85).



The ex-scout may use the vessel for any legal purpose, and many engage in small-scale speculative trade. The ship really isn't suited for passenger service, but it's not unkown.

The large number of such vessels in existence has given rise to a number of rumors: The most common of these is that Scouts are often used for espionage. The large number of sheep means that a goat or two might be concealed among them, the thinking goes.

The spacedock usually houses an air/raft.

- **Crew:** Pilot, co-pilot, and engineer are the most common arrangement. An exceptional person might fill all slots and operate the vessel alone, but few people have all the requisite skills (see *Crew Requirements*, pp. 149-150).
- **Design:** 100-ton SL Hull, DR 200, Basic Stealth, Basic Emissions Cloaking, Heavy Compartmentalization. *Modules:* 1 Basic Bridge, 1 Engineering, 20 Maneuver, 3 Jump, 20 Fuel, 1 Space Dock, 4 Staterooms, 1 Utility, 2 Fuel Processors, 1 Turret, 12.5 Cargo (+3 in Turret).
- **Statistics:** EMass 268, LMass 346, Cost MCr26.4, HP 15,000. Size Modifier: +8.
- **Performance:** Accel 2.3 Gs, Jump 2, Air Speed 2,357.

Sulieman II-Class 100-ton Seeker (TL 10)

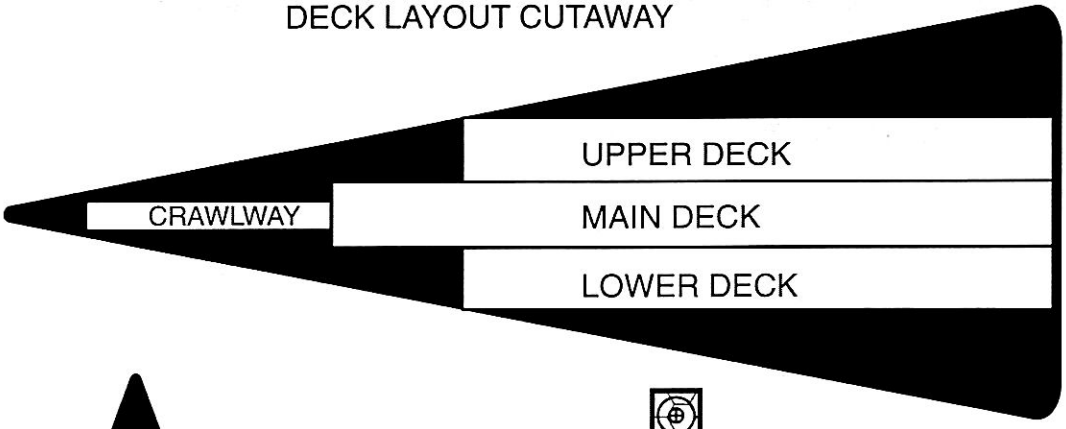
The *Sulieman II*-class seeker is a common IISS modification of the *Sulieman,* used for mineral surveys and similar duties. Crew requirements are the same.

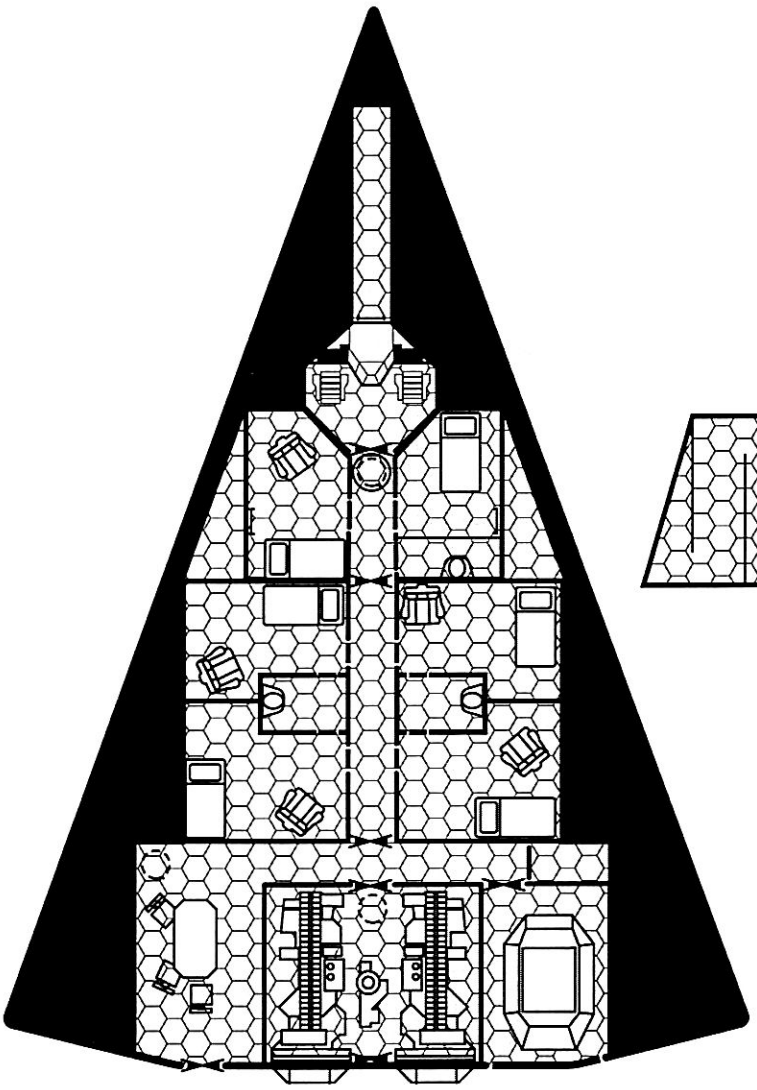
The spacedock usually houses an air/raft.

- **Design:** 100-ton SL Hull, DR 200, Basic Stealth, Basic Emissions Cloaking, Heavy Compartmentalization. *Modules:* 1 Basic Bridge, 1 Engineering, 20 Maneuver, 3 Jump, 20 Fuel, 1 SpaceDock, 2 Staterooms, 1 Utility, 2 Fuel Processors, 1 Turret, 20.5 Cargo (+3 in Turret).
- **Statistics:** EMass 263, LMass 382, Cost MCr26.4, HP: 15,000. Size Modifier: +8.
- **Performance:** Accel 2.1 Gs, Jump 2, Air Speed 2,357.

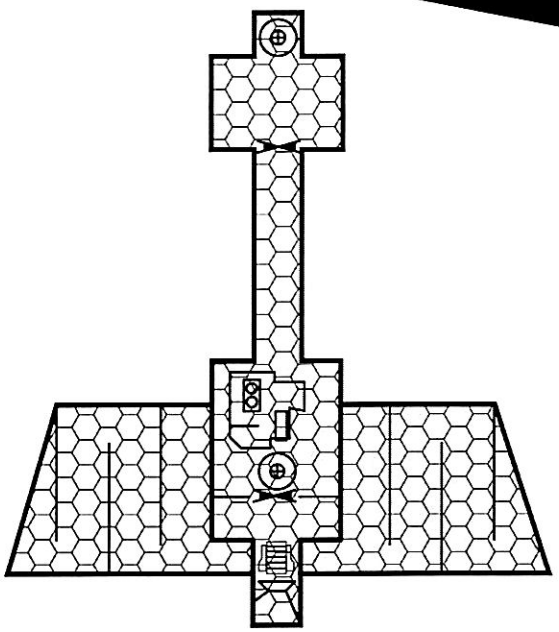
100-ton *Sulieman*-Class Scout/Courier

DECK LAYOUT CUTAWAY

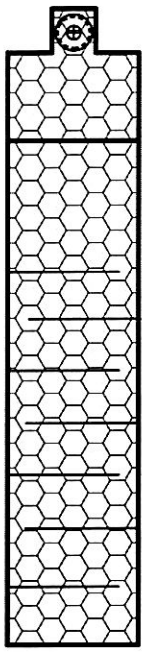




MAIN DECK

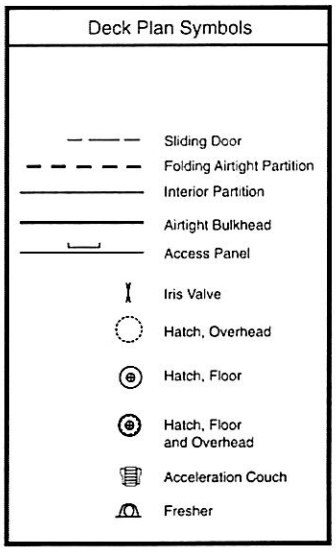


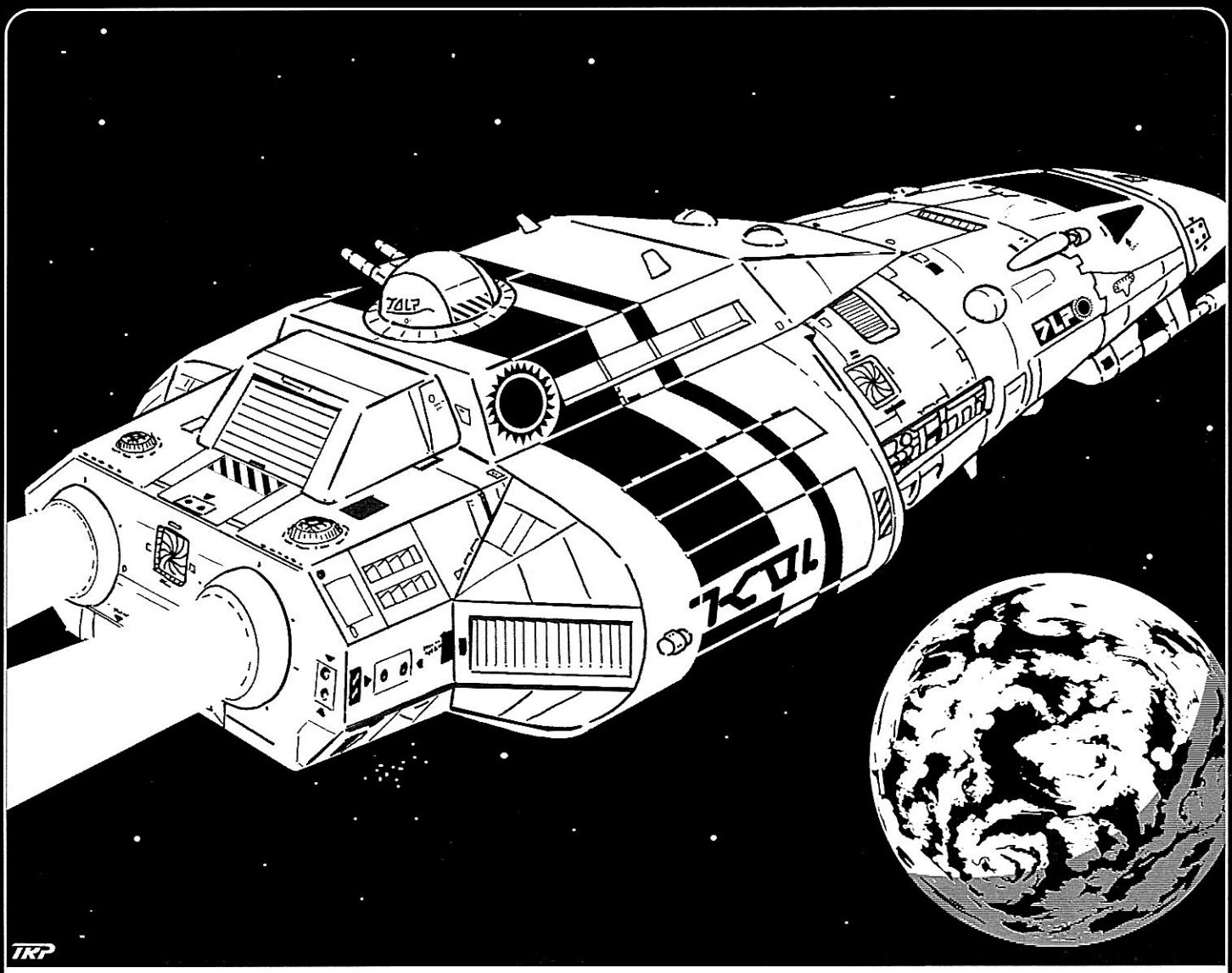
UPPER DECK



SCALE IN YARDS

3 6 9





Beowulf-Class 200-ton Free Trader (TL10)

The *Beowulf* class is the most common design of Free Trader, at least in the frontier regions of the Imperium and the surrounding client states. Huge megacorporate transports dominate mercantile service in the Imperial core regions. These little freighters fill the irregular and small-lot needs of the less habitated fringes, while keeping overhead and crew administration needs to a minimum.

Numerous formal variants, and a myriad of individual modifications, mean that the deck plan layout presented is subject to considerable change.

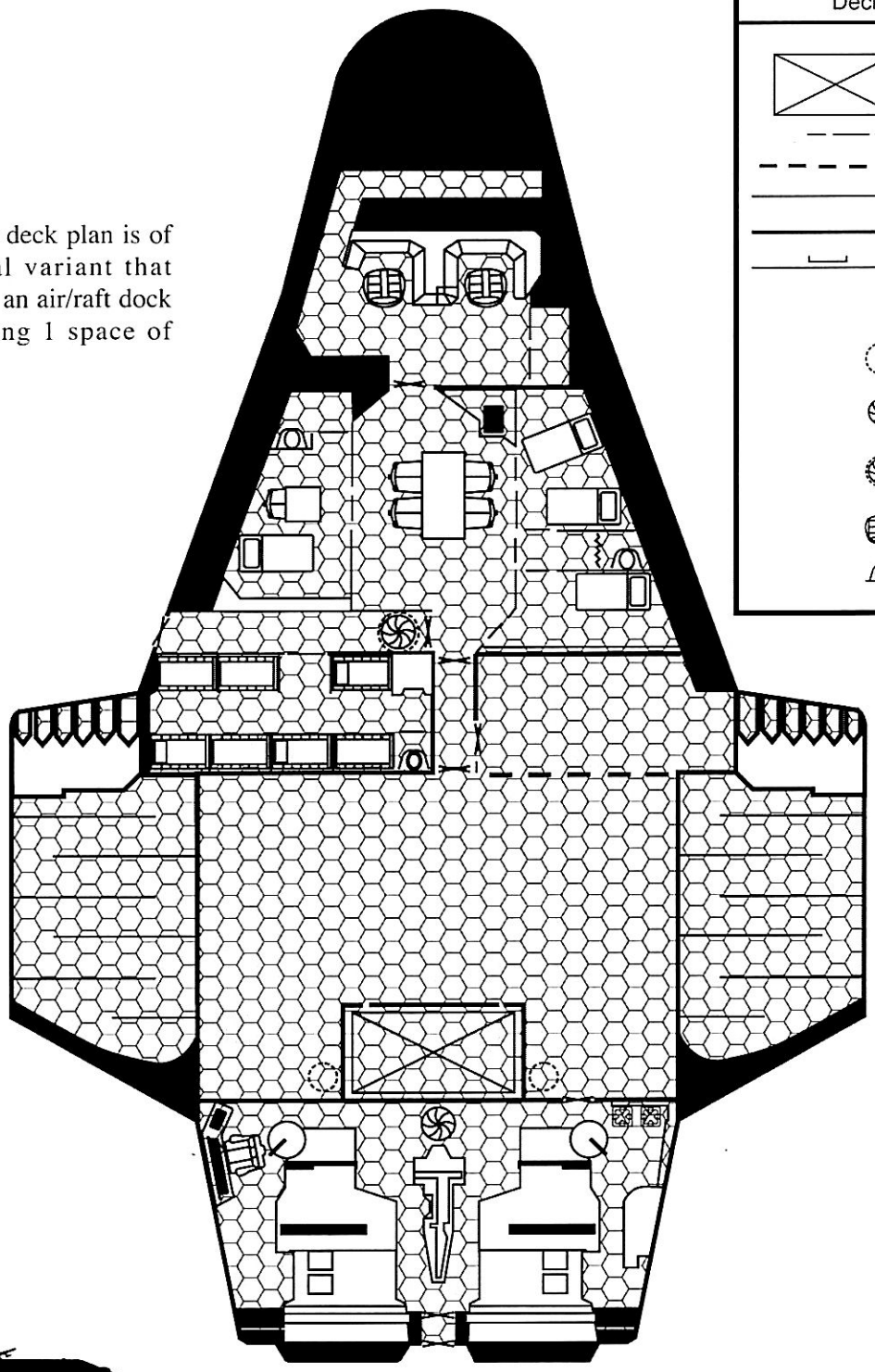
The *Beowulf's* most serious limitation is that it is only capable of jump-1, meaning that it is restricted to the "mains," as the stretches of J-1 linked star systems are called.

Captains often omit the air/raft and use the spacedock for additional cargo.

- **Crew:** Captain/pilot, navigator, sensor/commo operator, steward, and two engineers. One of the crew will serve double duty as a pilot for the enclosed air/raft if carried aboard.
- **Design:** 200-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 16 Maneuver, 4 Jump, 20 Fuel, 5 Low Berths (capacity 20), 10 Staterooms, 1 Spacedock (up to 250 cf air/raft), 1 Utility, 2 Fuel Processors, 2 Turrets, 68 Cargo (+6 in Turrets).
- **Statistics:** EMass 257, LMass 598, Cost MCr28.9, HP: 22,500. Size Modifier: +8.
- **Performance:** Accel 1.1 Gs, Jump 1, Air Speed 1,700.

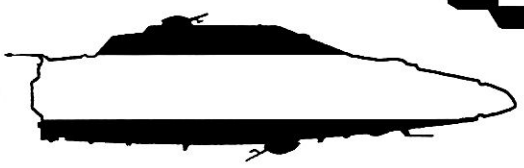
200-ton *Beowulf*-Class Free Trader

This deck plan is of a formal variant that includes an air/raft dock (replacing 1 space of cargo).



Deck Plan Symbols

- Cargo Elevator
- Sliding Door
- Folding Airtight Partition
- Interior Partition
- Airtight Bulkhead
- Access Panel
- Iris Valve
- Iris Valve, Overhead
- Iris Valve, Floor
- Iris Valve, Floor and Overhead
- Acceleration Couch
- Fresher



Deck 2

SCALE IN YARDS

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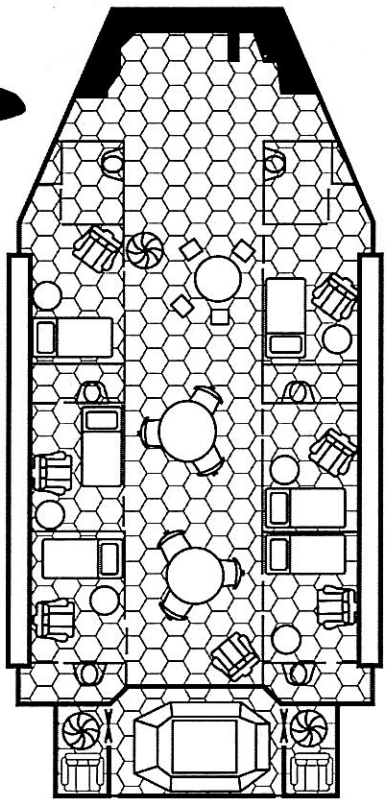
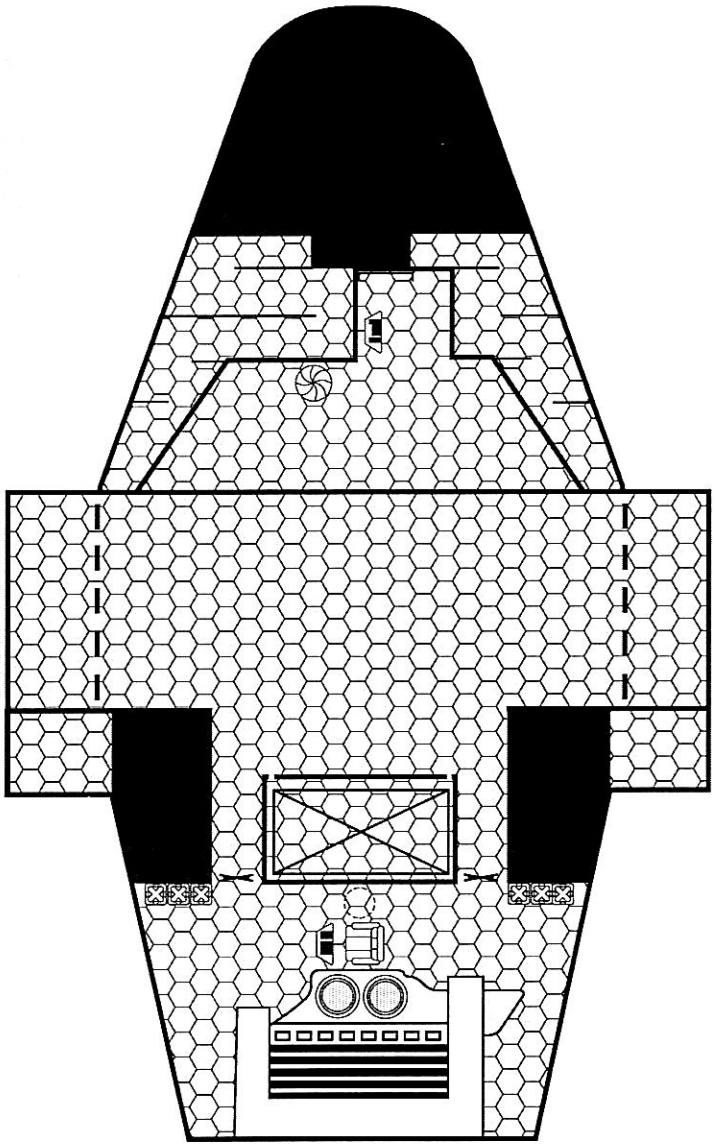
Beowulf-Class 200-Ton Free Trader

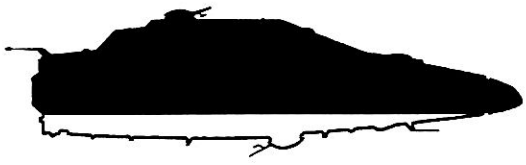
MAIN DECK ON P. 133



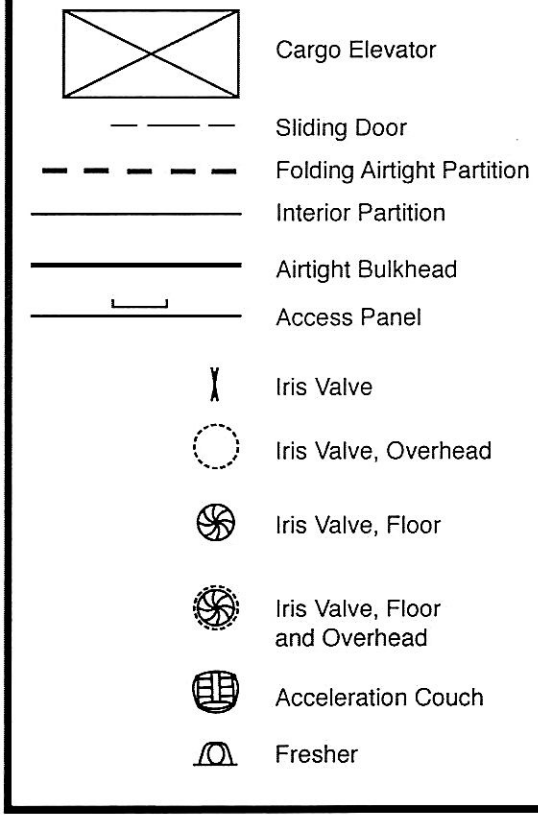
Deck 1

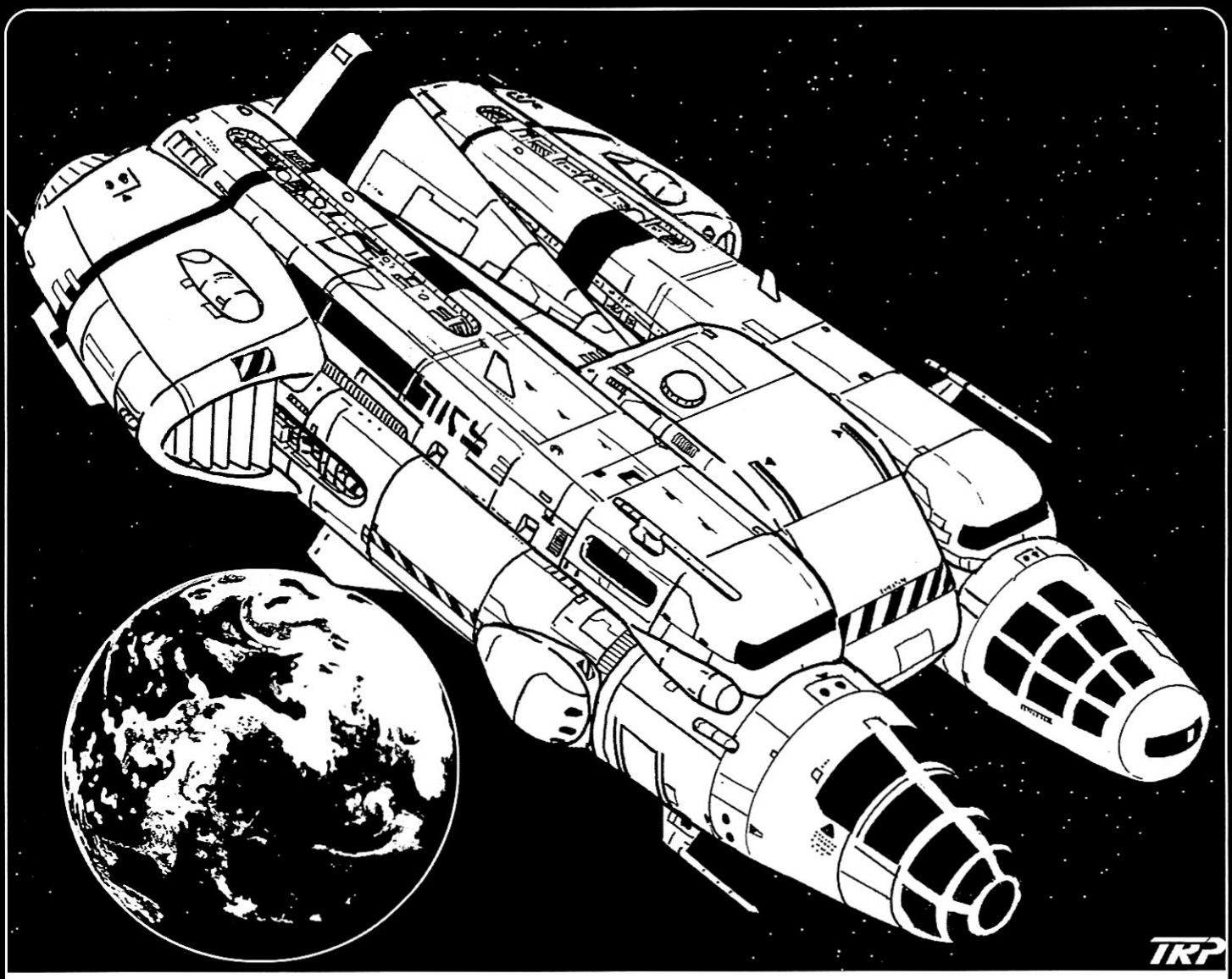


Deck 3



Deck Plan Symbols





Empress Marava-Class 200-ton Far Trader (TL10)

Far Traders earn their name with their jump-2 capability. With "longer legs" than the somewhat more common Free Trader, the Far Traders can service routes their brethren can't reach.

The increased jump and fuel requirements mean that cargo capacity and stateroom numbers must suffer, but in some areas no other vessel will do the job as well. A common practice is to hire a steward with some medical training in place of installing a sickbay, and to help ensure the survival of low-berth passengers. As with the Free Trader, custom refittings are common.

The 48-point Ship Patron cost cited on p. T:FT100 assumes an air/raft is carried, one turret is armed, and the ship profit/upkeep arrangement evens out to 0 points.

- **Crew:** Captain/pilot, navigator, sensor/commo operator, steward, and two engineers. One of the crew doubles as air/raft pilot. The steward should have Electronics Operation (Medical)-10+ if low passengers carried.
- **Design:** 200-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 15 Maneuver, 6 Jump, 40 Fuel, 3 Low Berths (capacity 12), 1 SpaceDock (holds up to 250 cf air/raft), 10 Staterooms, 1 Utility, 2 Turrets, 1 Fuel Processor, 49 cargo (+6 in Turrets).
- **Statistics:** EMass 283, LMass 559, Cost MCr36.8, HP: 22,500. Size Modifier: +8.
- **Performance:** Accel 1.1 Gs, Jump 2, Air Speed 1,646.

Vanderbilt-Class 200-ton Yacht (TL10)

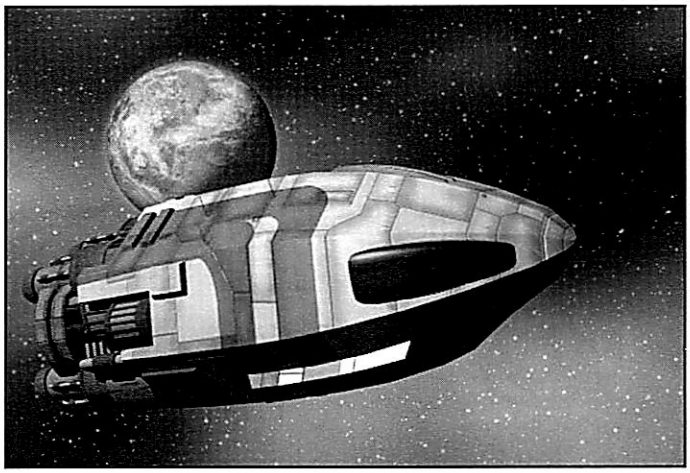
This particular class represents a typical yacht used by planetary nobles, corporate officials, and interstellar diplomats. Externally, however, this design and the *Lady of Shallot* class (below) are nearly identical.

Two of the staterooms are merged to form a suite for the owner. Two more are merged to form a lounge area. Six are for guests, and five house the crew (four at double occupancy, plus a single-occupancy berth for the captain). The five tons of cargo space allow the owner to travel as light as the wealthy usually travel.

The two stewards double as small-craft crew, flying the ship's boat or air/raft carried aboard. If the yacht is armed, one or more of the crew double as gunners during emergencies. Bodyguards, assistants, and assorted other members of an owner's retinue are carried as passengers, often doubling up on staterooms and thereby increasing overall occupancy.

As luxury items, yachts often are embellished with expensive decor and trappings, substantially increasing their cost with features that aren't reflected in the ship's performance. These same fittings sometimes get ripped out and sold by less savory second owners, who find the vessel's harmless appearance and jump-3 capability useful for disguising illicit functions and getting away afterward respectively.

- **Crew:** Captain/pilot), navigator, sensor/commo operator, two stewards, two medics, and two engineers.
- **Design:** 200-ton USL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 12 Maneuver, 8 Jump, 60 Fuel, 15 Spacedock, 15 Staterooms, 1 Sickbay, 1 Utility, 1 Vehicle Bay (30-ton Ship's Boat), 2 Turrets, 1 Fuel Processor, 5 Cargo (+6 in Turrets).
- **Statistics:** EMass 313, LMass 439, Cost MCr44.1, HP: 22,500. Size Modifier: +8.
- **Performance:** Accel 1.1 Gs, Jump 3.



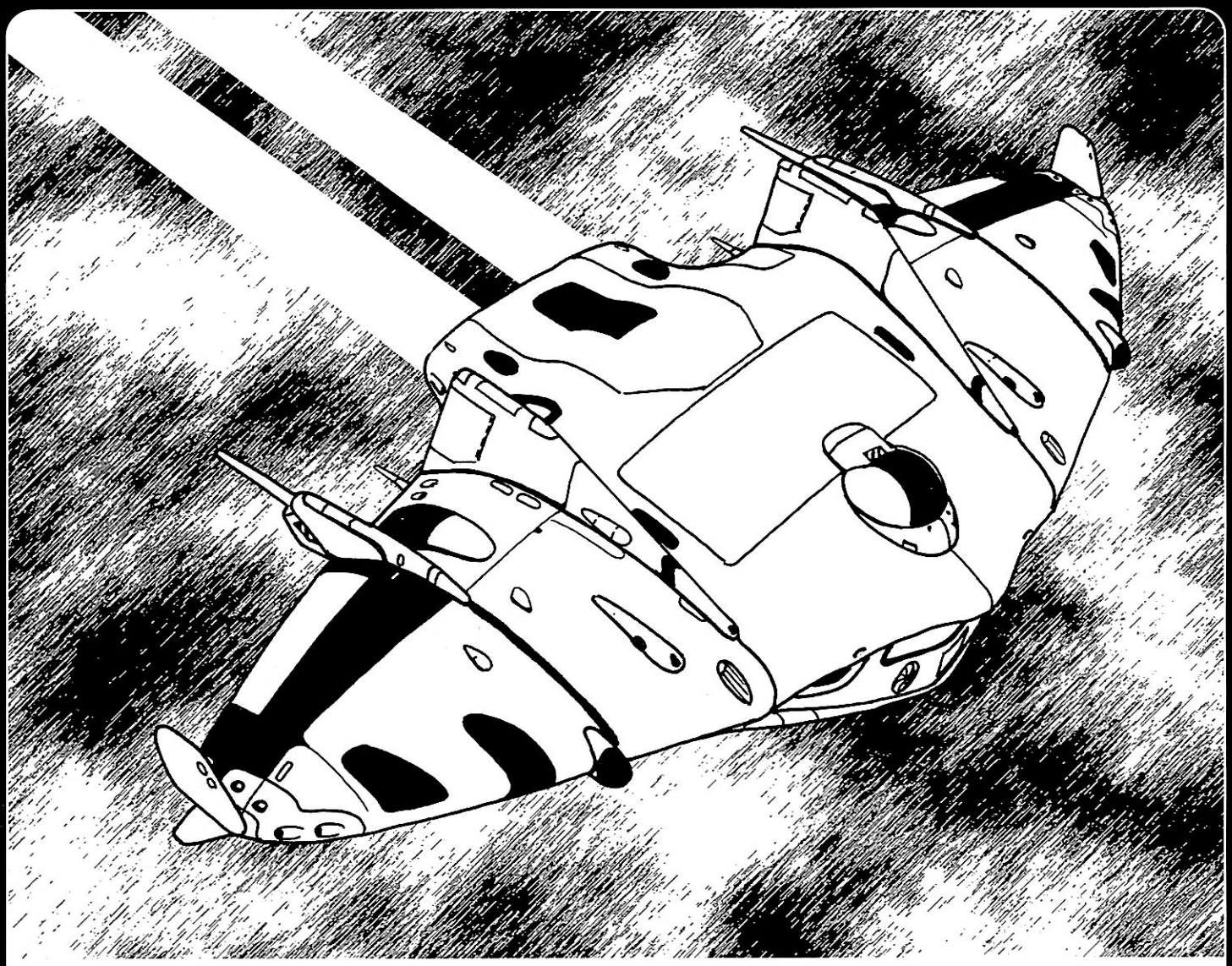
Lady of Shallot-Class 200-ton Yacht (TL12)

This represents a higher-tech and more-expensive yacht used by Imperial nobles, extremely high-level corporate officials, and upper-level Imperial diplomats. *Ladies of Shallot* are not so commonly encountered as the other starships detailed in this section. For that reason – and given the nature of their average occupant – the arrival of one of these yachts in a star system never fails to draw attention.

The *Lady of Shallot* class actually houses fewer people than the *Vanderbilt* class, but uses the space for a slightly larger manuever drive that – given its higher TL – more than triples performance. Similar to the *Vanderbilt*, two staterooms are merged to form a suite for the owner. Two more are merged to form a lounge. Five are for guests, and five house the crew (four at double-occupancy plus one single-occupancy berth for the captain). The two stewards double as small-craft crew, and one or more of the crew double as gunners if weapons are installed. (One mildly unhinged Imperial noble had the turrets on his yacht loaded with specially modified sandcasters that discharged 10-mile-long party streamers . . .) The owner's entourage usually must still double-occupy staterooms; even though the boss has more Status, the help doesn't.

Wildly expensive custom trappings are even more common on *Ladies of Shallot*, with some examples having cost their owners 10 times the list price. Unlike the *Vanderbilt*, these yachts rarely see more secretive duties; they're simply too conspicious and attract too much interest.

- **Crew:** Captain/pilot, navigator, sensor/commo operator, two stewards, two medics, and two engineers.
- **Design:** 200-ton USL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 15 Maneuver, 8 Jump, 60 Fuel, 15 Spacedock, 14 Staterooms, 1 Sickbay, 1 Utility, 1 Vehicle Bay (30-ton Ship's Boat), 2 Turrets, 1 Fuel Processor, 6 Cargo (+6 in Turrets).
- **Statistics:** EMass 266, LMass 397, Cost MCr49.9, HP: 22,500. Size Modifier: +8.
- **Performance:** Accel 3.8 Gs, Jump 3.

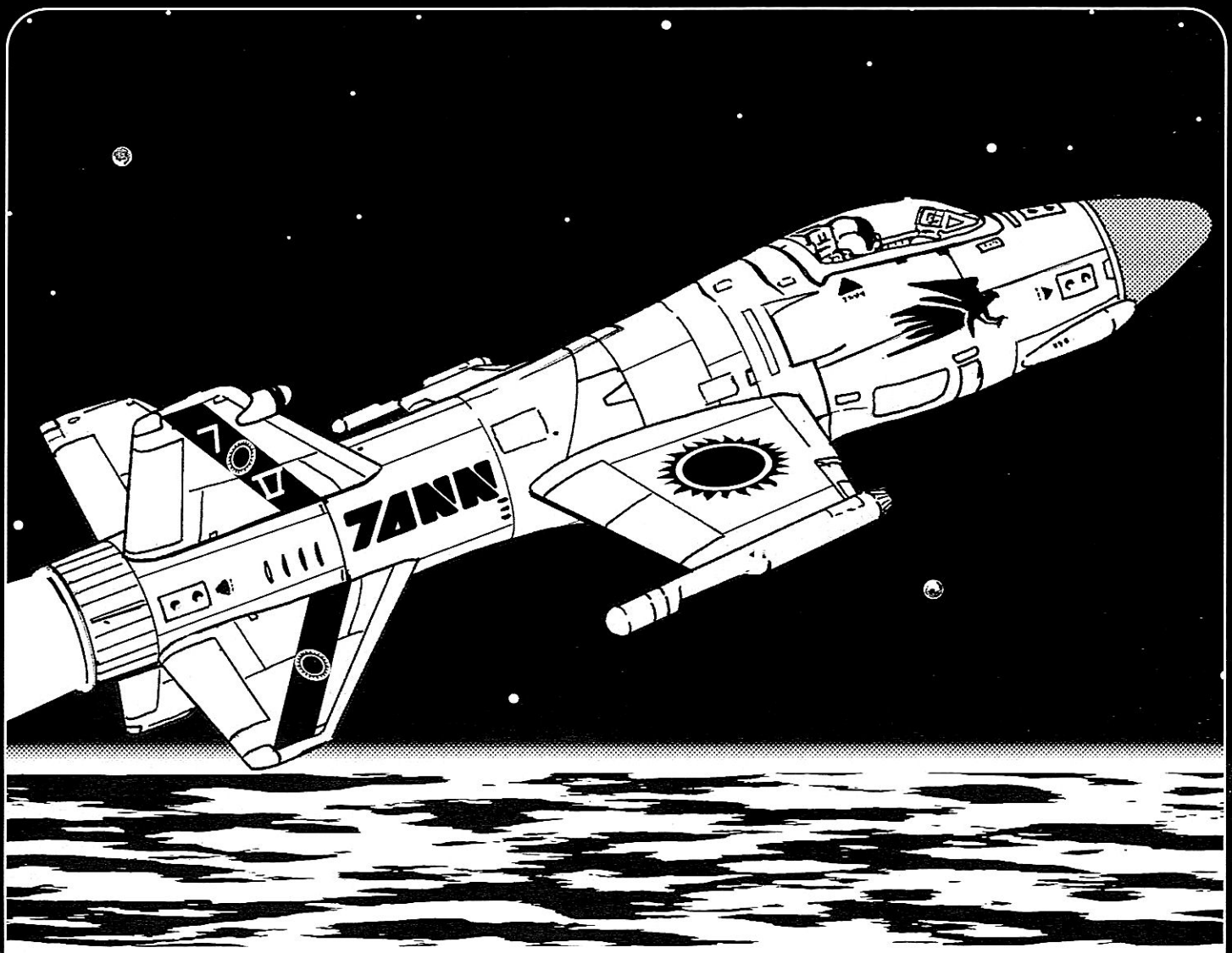


Animal-Class 200-ton Safari Ship (TL10)

Safari ships are used for hunting or photographic expeditions, depending on the predilections of the owner and the laws of the local world.

The main distinguishing feature of this vessel is the presence of a trophy room/lounge, looking out through a large viewing window (protected by a sliding shutter) onto whatever planetary vista presents itself. Of the 11 staterooms, two are merged to form a suite for the owner, and two more are merged to form the trophy room/lounge. Three are set aside for guests of the owner, and four for the crew (at double occupancy). An air/raft is carried to convey the hunting/photographic party. The steward usually serves as its operator.

- **Crew:** Captain/pilot, navigator, sensor/commo operator, two medics, two engineers, and a steward.
- **Design:** 200-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 11 Maneuver, 6 Jump, 40 Fuel, 15 Spacedock, 11 Staterooms, 1 Sickbay, 1 Utility, 1 Vehicle Bay (30-ton Ship's Boat), 1 Turret, 1 Fuel Processor, 5 Cargo (+3 in Turret).
- **Statistics:** EMass 262, LMass 373, Cost MCr35.5, HP: 22,500. Size Modifier: +8.
- **Performance:** Accel 1.2 Gs, Jump 2, Air Speed 1,445.



Rampart-Class Fighter (TL12)

The *Rampart*-class fighter series (introduced during the Fifth Frontier War) is the most recent fighter design adopted by the Imperial Navy, and can operate either from a planetary surface or from a larger vessel in space. A number of variants are produced, but almost all are in service only with the Imperial military or megacorporations – very few have made it to private mercenary organizations.

Note that a single-purpose fighter will attract official interest where a similarly armed freighter would not.

- **Crew:** Pilot.
- **Design:** 10-ton SL Hull, DR 1,175, Radical Stealth Cloaking, Radical Emissions Cloaking, 2 hull-mounted Lasers. *Modules:* 1 hardened Cockpit Bridge, 5 Maneuver.
- **Statistics:** EMass 90, LMass 90, Cost: MCr10.8, HP: 3,000. Size Modifier: +6.
- **Performance:** Accel 5.5 Gs, Air Speed: 4,330.

Iramda-Class Fighter (TL10)

This aging warhorse is now almost completely replaced in front-line service by the *Rampart*-class. It is now relegated to secondary duties, such as rear-area planetary defense, scouting, customs patrol, and piracy suppression.

The *Iramda*-class is the fighter most commonly encountered in mercenary organizations.

As with the *Rampart*, non-megacorporate or bonded-mercenary private owners may face official inquiry as to why they need a boat with no non-combat utility.

- **Crew:** Pilot.
- **Design:** 10-ton SL Hull, DR 200, Basic Stealth Cloaking, Basic Emissions Cloaking, 1 hull-mounted Laser. *Modules:* 1 Cockpit Bridge, 6 Maneuver.
- **Statistics:** EMass 57, LMass 57, Cost: MCr5.1, HP: 3,000. Size Modifier: +6.
- **Performance:** Accel 4.2 Gs, Air Speed: 3,000.

10-ton Launch (TL10)

The 10-ton Launch is the smallest surface-interface craft commonly encountered, and is used where small loads or a few passengers need to be transferred from one ship to another or to/from a planetary surface.

While this configuration offers a mix of passenger and cargo service, many Launches simply cater to one or the other payload, with a maximum of 72 passengers or 3,000 cubic feet of cargo. Generally, 24 long-term passengers require 1 cargo space to shuttle their luggage.

Outwardly, the 10-ton Launch and 10-ton Lifeboat appear very similar.

- **Crew:** Pilot, engineer, and steward if passengers are carried.
- **Design:** 10-ton SL Hull, DR 100. *Modules:* 1 Cockpit Bridge, 1 Maneuver, 3 Passenger Couches (occupancy 36), 3 Cargo.
- **Statistics:** EMass 22, LMass 37, Cost: MCr3.3, HP: 3,000. Size Modifier: +6.
- **Performance:** Accel 1.1 Gs. Air Speed 1,225.

10-ton Lifeboat (TL10)

Smaller vessels rely on rescue balls or conventional small craft in emergencies, but larger starships are equipped with some form of long-term lifeboat. This example can carry up to 12 individuals in its passenger couches and a further 40 in low berths. With the low berths full, couches empty, and power consumption set to minimum (a distress beacon broadcasting on a timer; minimal power to the low berths and computer; no life support), lifeboats can and do keep passengers alive for centuries. This design has no airlock, so cannot take on more passengers while in vacuum or harmful atmospheric conditions unless everyone already aboard is inside rescue balls, vacc suits, or low berths.

- **Crew:** Pilot; autopilot only if life-support lacking.
- **Design:** 10-ton SL Hull, DR 100. *Modules:* 1 Cockpit Bridge, 1 Maneuver, 10 Low Berths (capacity 40), 1 Passenger Couch (capacity 12).
- **Statistics:** EMass 41, LMass 41, Cost: MCr5.3, HP: 3,000. Size Modifier: +6.
- **Performance:** Accel 1 G. Air Speed 1,225.

800-ton *Broadsword*-Class Mercenary Cruiser (TL10)

The *Broadsword*-class mercenary cruiser can be encountered throughout the Imperial fringes. It is easily the most common transport for small, independent military units.

The starship's jump-3 allows it to reach the fringe worlds where trouble most often flares, while the impressive Accel allows the owner to fill its cargo hold with superheavy AFVs (should he enjoy the luxury of affording that sort of equipment) and still manage decent transit times.

Broadswords generally carry a crew of nine, with the owner-aboard serving as captain, and a troop contingent of 31. The ship features a double stateroom for the owner-captain. The leader of the mercenary troop – who traditionally holds the rank of (army or marine) captain – enjoys single occupancy. Everyone else double-bunks. In the event that a separate owner and captain are aboard, requiring that another single-occupant berth be created, some unlucky troopers will be triple-bunking.

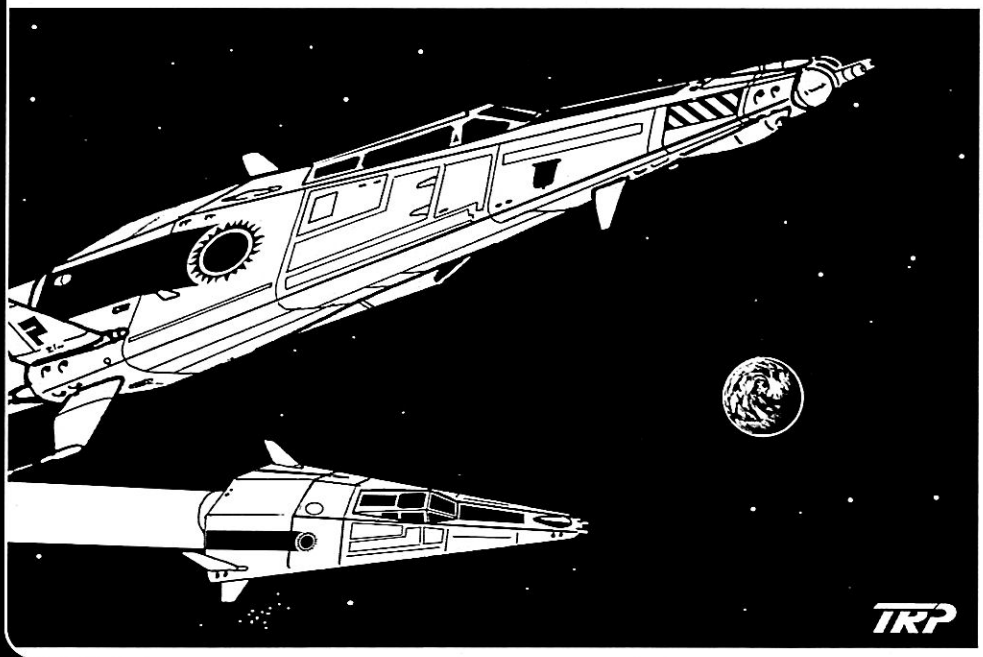
The design is not streamlined, relying upon a standard air/raft and two modular cutters (p. 142) for orbit-to-ground transport. Two stubby silos attached to the spherical hull house a module-fitted cutter each and a spare module each. The fit is tight; switching modules requires the cutter to leave the cruiser, offload its module in space, re-enter the cruiser, and attach the new module. The process generally takes 37 minutes.

The spacedock usually holds an air/raft.

- **Crew:** Captain, pilot, navigator, sensor/commo operator, two medics, three engineers, and eight gunners. The gunnery needs are almost invariably supplied by the ship's troop contingent, reducing ship's crew to nine.
- **Design:** 800-ton USL Hull, DR 100, 4 Turrets with 3 Lasers each, 2 Turrets with 3 Missile Racks each, 2 Turrets with 3 Sandcasters each. *Modules:* 1 Basic Bridge, 1 Engineering, 175 Maneuver, 32 Jump, 240 Fuel, 1 Spacedock, 22 Staterooms, 1 Sickbay, 2 Utilities, 2 Vehicle Bays (1 50-ton Modular Cutter (p. 142) and 1 spare 30-ton Module each), 1 Fuel Processor, 80.5 Cargo.
- **Statistics:** EMass 1,613, LMass 2,280, Cost MCr188.8, HP: 60,000. Size Modifier: +10.
- **Performance:** Accel 3 Gs, Jump 3.



20-ton Gig (TL10)



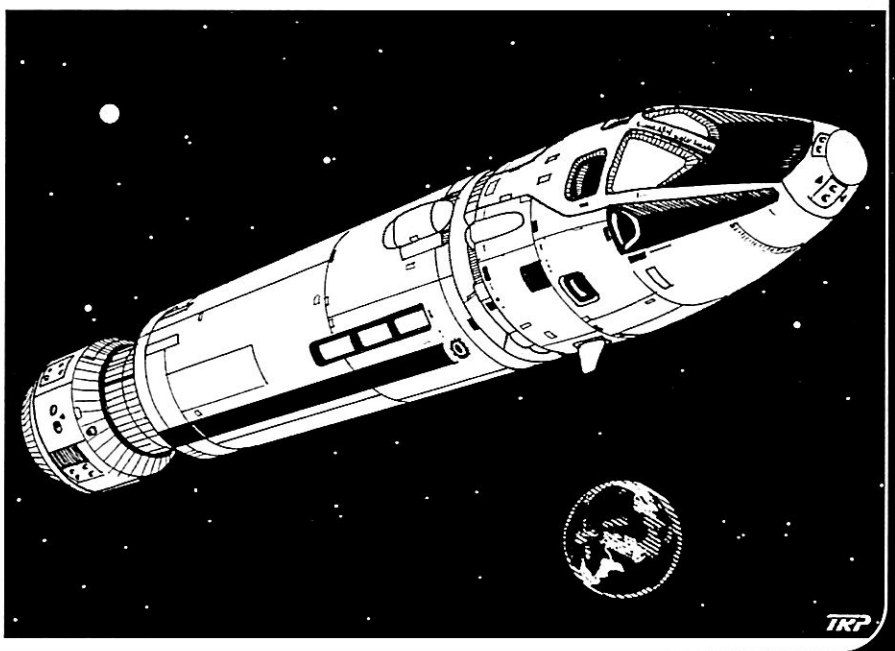
The Gig is primarily designed for cargo, but can carry up to 24 passengers for a duration of 24 hours or less.

- **Crew:** Pilot, engineer, and steward if passengers are carried.
- **Design:** 20-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 4 Maneuver, 2 Passenger Couches (capacity 24), 6.5 Cargo.
- **Statistics:** EMass 45, LMass 78, Cost: MCr5.7, HP: 4,500. Size Modifier: +6.
- **Performance:** Accel 2.1 Gs, Air Speed 2,000.

30-ton Ship's Boat (TL10)

The Ship's Boat is a smaller, more affordable surface-interface craft. Up to 96 passengers can be carried for durations of up to 24 hours. Passenger payload can be doubled if couches are fitted into the cargo space.

- **Crew:** Pilot, engineer, and steward.
- **Design:** 30-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 4 Manuever, 8 Passenger Couches (capacity 96), 8.5 Cargo.
- **Statistics:** EMass 55, LMass 97, Cost: MCr6.3, HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 1.7 Gs, Air Speed 1,732.



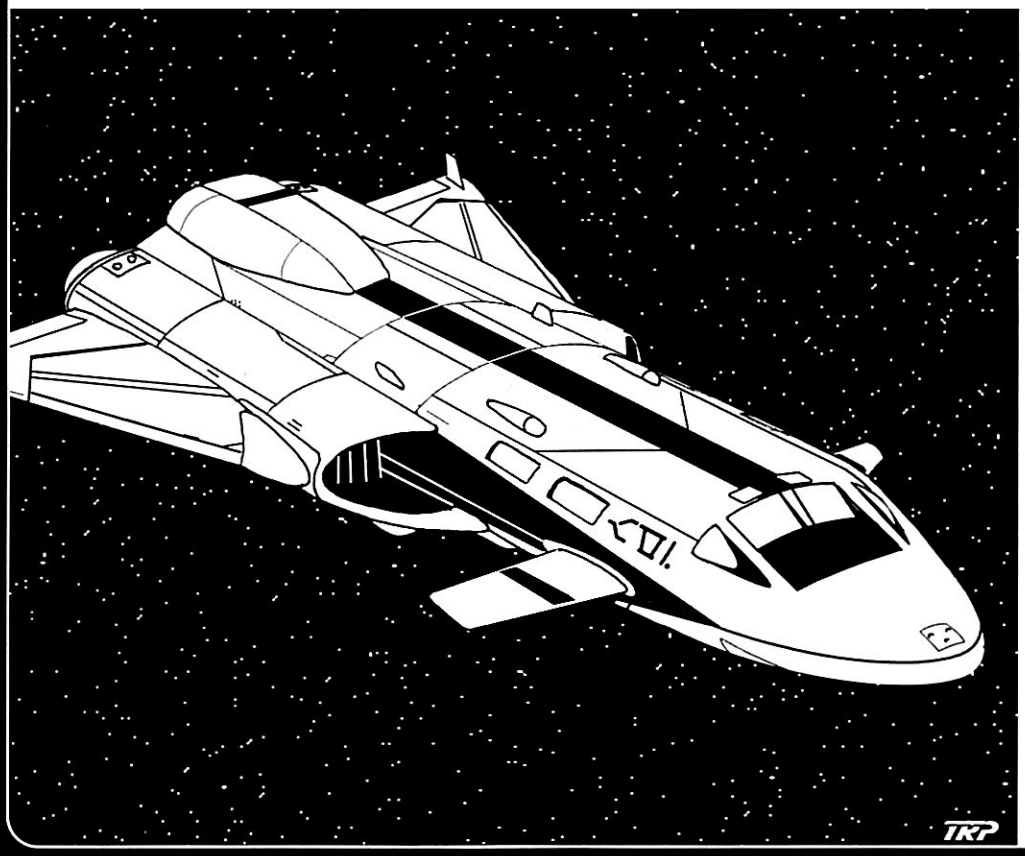
40-ton Fuel Skimmer (TL10)

This vessel was designed to skim and process jump fuel for large unstreamlined starships, military fleets, or deep-space installations.

In appearance, it differs from the 40-ton Pinnace only in minor details.

- **Crew:** Pilot and engineer.
- **Design:** 40-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 11 Maneuver, 2 Fuel Processors, 15 Fuel, 0.5 Cargo.
- **Statistics:** EMass 102, LMass 104, Cost: MCr11.1, HP: 7,500. Size Modifier: +7.
- **Performance:** Accel 4.2 Gs, Air Speed 2,569.

40-ton Pinnace (TL10)



This particular design emphasizes speed over some other considerations, and is used for planetary interface work by large unstreamlined vessels. Up to 96 passengers can be carried for durations up to 24 hours.

- **Crew:** Pilot, engineer, and two stewards.
- **Design:** 40-ton SL Hull, DR 100. *Modules:* 1 Basic Bridge, 1 Engineering, 16 Maneuver, 8 Passenger Couches (capacity 96), 1 Utility, 3.5 Cargo.
- **Statistics:** EMass 113, LMass 130, Cost: MCr8.7, HP: 7,500. Size Modifier: +7.
- **Performance:** Accel 4.9 Gs, Air Speed 3,098.

100-ton Shuttle (TL10)

This shuttle is designed for orbital work or interplanetary voyages taking less than 24 hours. Up to 240 passengers are carried, but life support does not permit lengthy trips.

More than half of the available hull tonnage in these boats is taken up by cargo space and passenger couches that can be stripped out, leaving a large amount of room for custom needs. For that reason, these vessels often are encountered in one-of-a-kind configurations. Belters often strip out the passenger couches and haul ore with them.

- **Crew:** Pilot, co-pilot, engineer, and five stewards.
- **Design:** 100-ton SL Hull, DR 200. *Modules:* 1 Basic Bridge, 1 Engineering, 30 Maneuver, 20 Passenger Couches (capacity 240), 1 Utility, 25.5 Cargo.
- **Statistics:** EMass 247, LMass 375, Cost: MCr13.4, HP: 15,000. Size Modifier: +8.
- **Performance:** Accel 3.2 Gs, Air Speed 3,000.

100-ton Interplanetary Shuttle (TL10)

This shuttle is used for in-system travel and is fitted out to carry 12 passengers and four crew for trips lasting days or weeks. Armed versions are also manufactured, equipped with one triple turret and adding an additional crewmember with Gunner skill.

Not as customizable as its cousin, the Interplanetary mostly sees modification by local militaries. More than one fleet has stripped the staterooms out and used the vessel as a fast fuel transport in a crisis. The shuttle also can serve admirably in rapidly deploying troops from orbit.

- **Crew:** Pilot, co-pilot, engineer, and Steward.
- **Design:** 100-ton SL Hull, DR 200. *Modules:* 1 Basic Bridge, 1 Engineering, 17 Maneuver, 14 Staterooms, 1 Utility, 2.5Cargo.
- **Statistics:** EMass 226, LMass 238, Cost: MCr10, HP: 15,000. Size Modifier: +8.
- **Performance:** Accel 2.9 Gs, Air Speed 2,258.

50-ton Modular Cutter (TL 10)

This vessel was developed for use during the Third Frontier War, but design was not completed before the end of that conflict. The 50-ton modular cutter was designed originally by Ling-Standard Products, but proved to be such a useful design that the firm discovered it could not produce enough to satisfy demand, and licensed production to other companies. Such was its penetration in the market that today the word "cutter" is hardly ever used to refer to anything but this particular design of small craft, and often "modular cutter" is assumed.

Originally intended as a utility vessel for support of military operations, the cutter is designed in two parts, a 20-ton hull section and a 30-ton module section. The modules are readily switched out, either in space or inside a hangar. This takes an average of 15 minutes under normal conditions.

The modules themselves are available separately, and separate prices are given below. Some modules were designed to be used only in conjunction with the hull section; others were intended to be operated either joined with or separated from the hull.

All modules can be linked to each other, and are often deployed in deep space or on a planetary surface as components of bases or stations. The variety of modules designed and constructed over the years is large, and only a few will be described here.

Performance statistics are given for the cutter with various modules fitted, and for the hull section alone (since it will often be maneuvered by itself after it has dropped off a module).

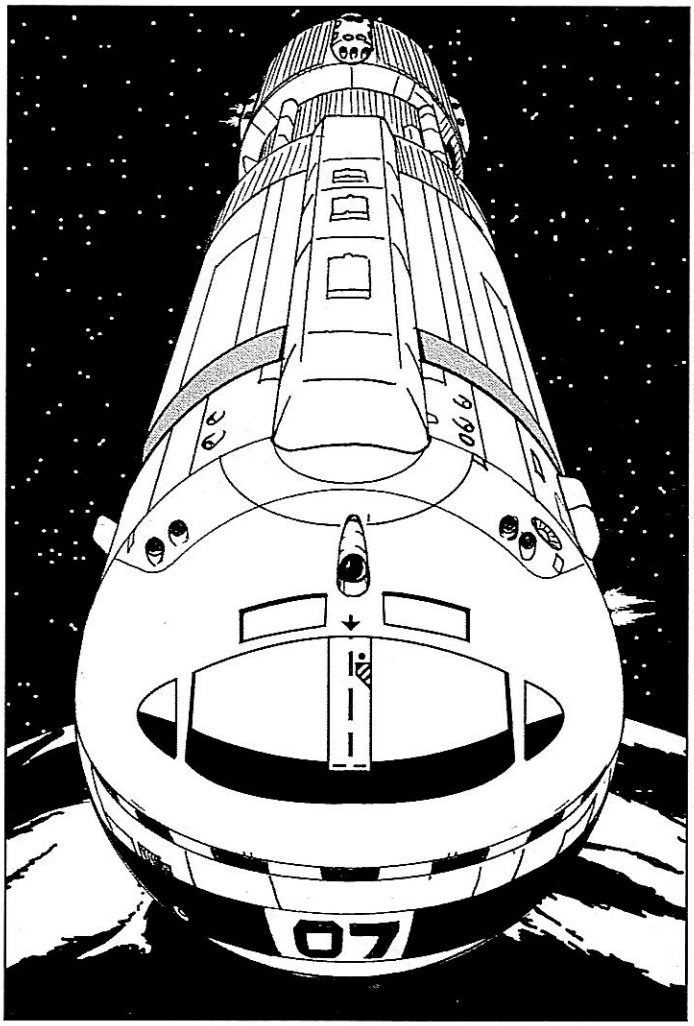
50-ton Modular Cutter, Hull Section without Module

- **Crew:** Pilot, co-pilot, and engineer.
- **Design:** 20-ton SL hull, DR 100. *Modules*: 1 Basic Bridge, 1 Engineering, 12 Maneuver, 0.5 Cargo.
- **Statistics:** EMass 72, LMass 74, Cost MCr6.8, HP: 4,500. Size Modifier: +6.
- **Performance:** Accel 2 Gs, Air Speed 1,200. Without a module, the cutter hull is limited to 2 Gs acceleration, because the frame is not able to withstand the strain of further acceleration without the bracing effect of a module. In an atmosphere, it is limited to 1,200 mph top speed.

50-ton Modular Cutter with Passenger Module: This module is not intended for use separately from the hull, as it provides life support for trips of 24 hours or less duration. The main purpose of this module is the transfer of passengers and cargo from ship to ship, ship to world surface, or the reverse.

Both hull and module sections have airlocks.

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Engineering, 4 Passenger Couches (capacity 48), 19.5 Cargo.
- **Crew:** Standard for cutter, plus steward for module.
- **Statistics:** *(Cutter and Module):* EMass 102 (*Module alone:* 30), LMass 199 (*Module alone:* 125), Cost MCr8.2 (*Module alone:* MCr1.4), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 2.4 Gs, Air Speed 2,353.



50-ton Modular Cutter with Fuel Skimmer: With this module, the cutter becomes a fuel skimmer for a larger craft. The two fuel-processing modules can refine a total of 16 jump-fuel modules per hour, or the entire load in 1 hour, 22.5 minutes.

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 2 Fuel Processors, 22 Fuel.
- **Crew:** As hull section.
- **Statistics:** EMass 126 (*Module alone:* 55), LMass 129 (*Module alone:* 55.), Cost: MCr12.8 (*Module alone:* MCr6), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 3.7 Gs, Air Speed 2,353.

50-ton Modular Cutter with ATV Cradle: This module allows the cutter to transport a single ATV (either wheeled or tracked) to or from a world's surface as needed. No airlock is provided, and no provision is made for moving in and out of the ATV while in flight. If the ATV is not sealed, any passengers carried in it must wear vacc suits. Passengers are seldom carried in ATVs while in transit because few have artificial gravity or G-compensators.

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 14 Spacedock, 10 Cargo.
- **Crew:** As hull section.
- **Statistics:** EMass 97 (*Module alone:* 25). LMass with wheeled ATV 180 (*Module alone:*106), with tracked ATV 169 (*Module alone:* 95). Cost : MCr7.6 (*Module alone:* Cr765,000). HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 2.9 Gs with tracked ATV, 2.7 Gs with wheeled ATV, Air Speed 2,353.

50-ton Modular Cutter with Weapons Pod: The module was intended to provide a defensive weapon for an orbital or deep-space installation, although it has been used as a fighter and a close-support ground-attack vessel as well (note that its lack of significant armor means that it is not well suited to the latter two uses). The turret is a standard model and can be fitted with lasers, missile racks, or sandcasters as desired (a mixture is common).

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Cockpit Bridge, 1 Turret with 3 Lasers, 22 Cargo.
- **Crew:** As hull section, plus Gunner. Substituting missiles or sandcasters for lasers will change the mass and cost. Cargo space is provided for extra missiles or sand canisters, as desired. An airlock is provided in both hull and module sections.
- **Statistics:** EMass 141 (*Module alone:* 70), LMass 254 (*Module alone:* 180), Cost: MCr13.3 (*Module alone:* MCr6.5), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 1.9 Gs (but 3.4 Gs if cargo spaces emptied in preparation for a fight!), Air Speed 2,353.

50-ton Modular Cutter with Quarters Module: This module is designed to provide shelter for a surface or deep-space station or base, as well as other purposes. At double occupancy, the module can support 10 inhabitants for an indefinite period of time (provided food and other perishables are occasionally replenished). Used with a cutter hull, it can provide long-duration sublight transport. An airlock is provided in both the hull and module sections.

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Engineering, 5 Staterooms, 1 Utility, 2 Cargo.
- **Crew:** As hull section.
- **Statistics:** EMass 123 (*Module alone:* 52), LMass 136 (*Module alone:* 62), Cost: MCr8.3 (*Module alone:* MCr1.4), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 3.5 Gs, Air Speed 2,353.

50-ton Modular Cutter with Lab Module: This module provides lab facilities for a station or base, and can be deployed on a world's surface or in deep space. An airlock is provided in both the hull and module sections. Three staterooms for the lab technicians are included (six can be accommodated with double occupancy).

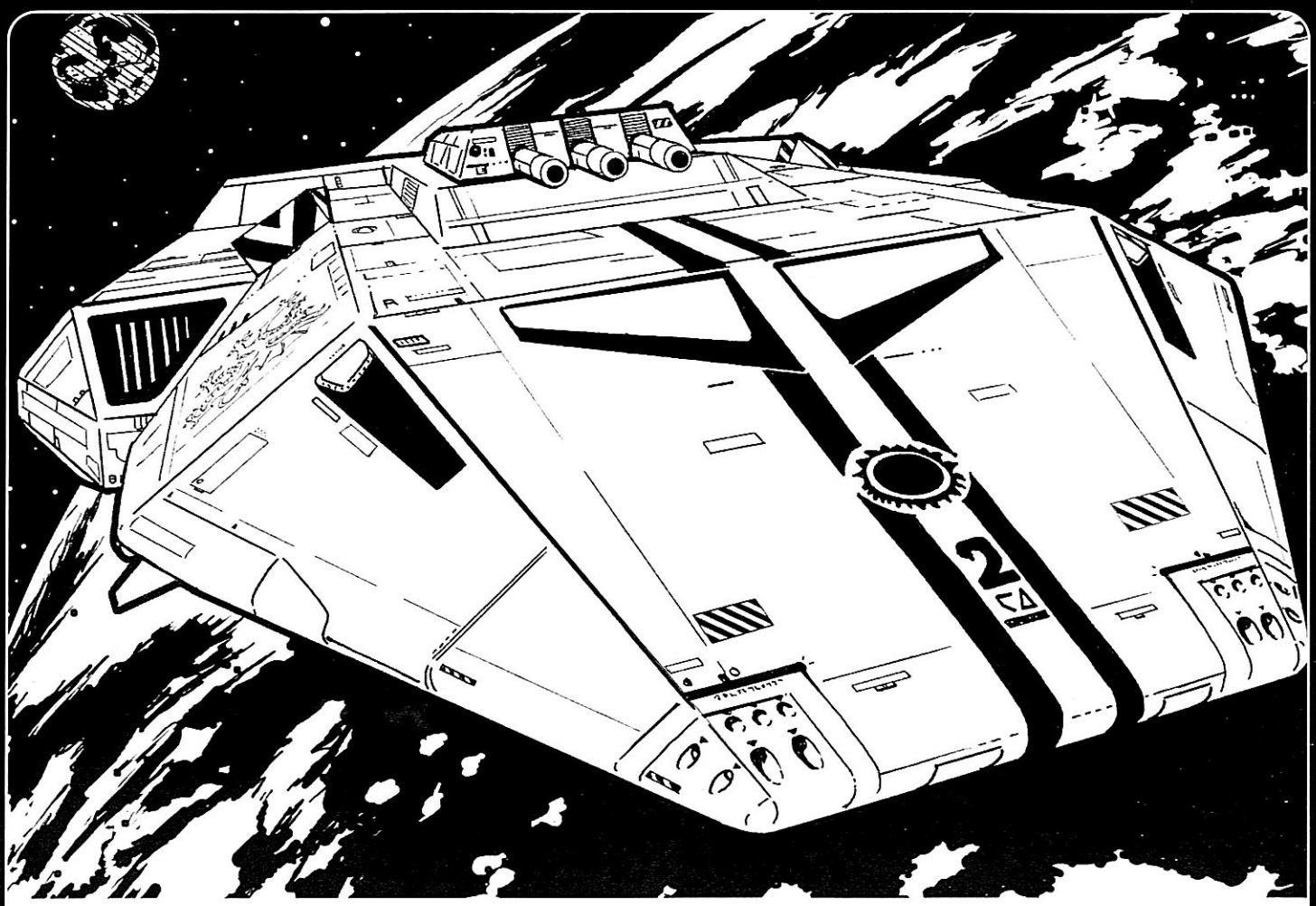
- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Engineering, 2 Laboratories, 3 Staterooms, 1 Utility, 6 Cargo.
- **Crew:** As hull section, plus three to six laboratory personnel.
- **Statistics:** EMass 138 (*Module alone:* 67), LMass 171 (*Module alone:* 97), Cost: MCr10.2 (*Module alone:* MCr3.4), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 2.8 Gs, Air Speed 2,353.

50-ton Modular Cutter with Medical/Surgical Module: This module provides medical facilities for a station or base, and can be deployed on a world's surface or in deep space. It can also be used as a portable emergency hospital for disaster relief, rescue operations, and so on. An airlock is provided in both the hull and module sections. Quarters exist for three, six with double occupancy.

- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Engineering, 3 Staterooms, 2 Sickbays, 1 Utility, 8 Cargo.
- **Crew:** As hull section, plus three medical personnel.
- **Statistics:** EMass 120 (*Module alone:* 48), LMass 162 (*Module alone:* 88), Cost: MCr8.5 (*Module alone:* MCr1.7), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 3 Gs, Air Speed 2,353.

50-ton Modular Cutter with Fighter Module: This pod was designed to be joined with other cutter modules as part of a base facility, but can also be used in conjunction with the cutter hull. The module provides a vehicle bay for a single 10-ton fighter (in this case, a TL10 *Iramda*-class, but others can be used) and quarters for the crew, for the defense of the station or base to which it is attached. Used with a cutter hull, it provides a deep-space "rest stop" for fighter crews, extending their operational duration.

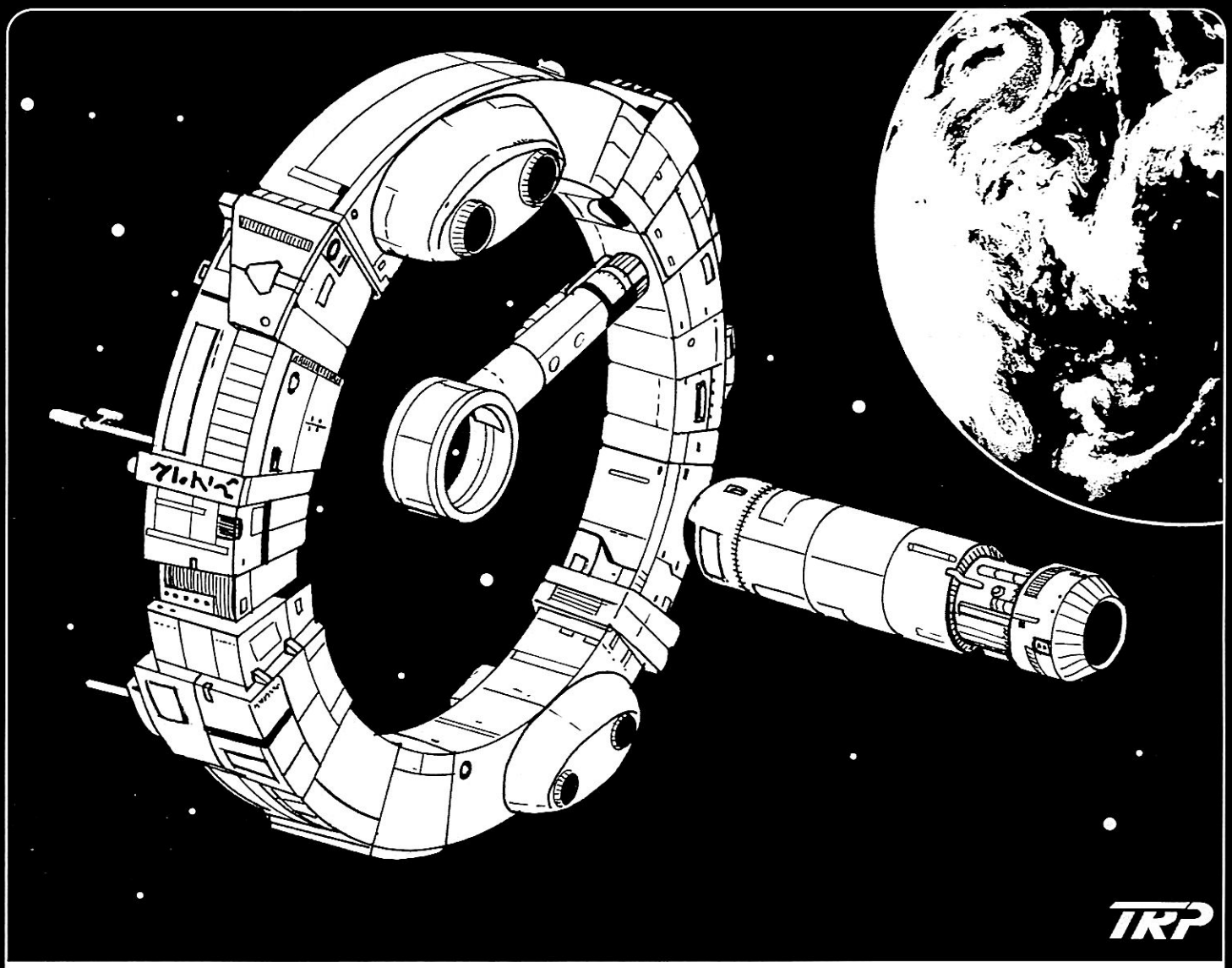
- **Design:** 30-ton SL Hull, DR 100. *Modules*: 1 Engineering, 2 Staterooms, 1 Utility, 1 Vehicle Bay (for 10-ton Fighter), 3.5 Cargo.
- **Crew:** As hull section. Quarters for two.
- **Statistics:** EMass 116 (*Module alone:* 45), LMass 196 (*Module alone:* 122), Cost: MCr8.2 (*Module alone:* MCr1.4), HP: 6,000. Size Modifier: +7.
- **Performance:** Accel 2.4 Gs, Air Speed 2,353.



Dragon-Class 400-ton System Defense Boat (TL10)

The *Dragon*-class SDB is found in local defense squadrons throughout the Imperium. These vessels are used for customs inspections, piracy suppression, system defense, and whatever else a local government might need done. A few are still found in the Imperial Navy, but they have largely been replaced by more modern craft. *Dragon*-class boats have a variety of armament configurations, but the most common is two laser turrets (each housing triple 360-MJ lasers) and two missile turrets (each with triple launchers). Sandcasters are sometimes fitted in place of one or more missile racks or lasers. Note that there are only six staterooms for use by 12 crewmembers, necessitating a procedure called hot-bunking, where several crew use the same bed at different times, meaning that the bed is always occupied (except during general quarters) and water must be strictly rationed. Because of this, and the lack of other crew amenities, the *Dragon*-class SDBs are given the nickname "Pig Boat" in many services.

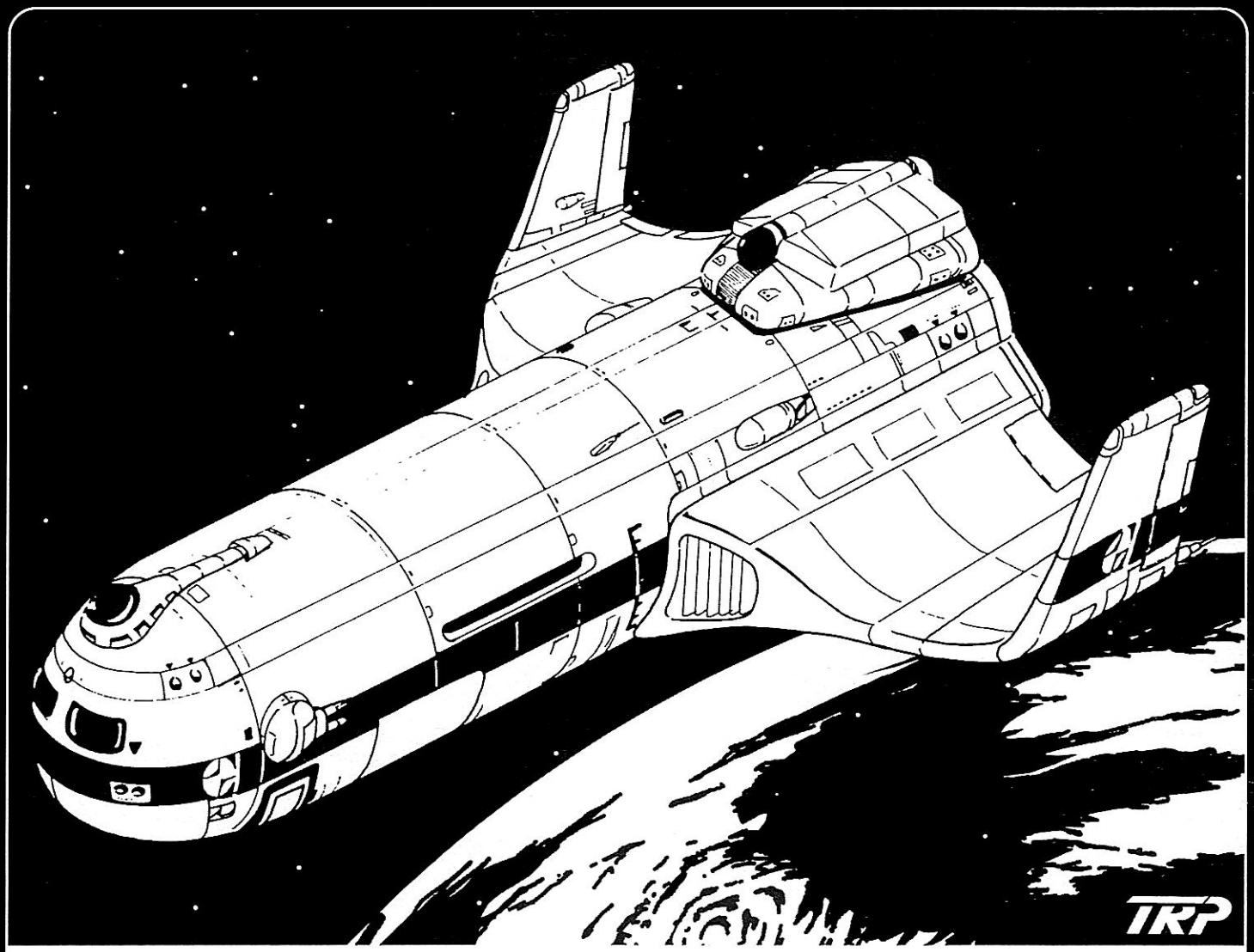
- **Crew:** Captain (pilot and navigator), second officer (sensors and commo), five engineers, and four gunners.
- **Design:** 400-ton SL Hull, DR 1,011, 2 Turrets with 3 Lasers each, 2 Turrets with 3 Missile Racks each, Radical Stealth, Radical Emission Cloaking, Heavy Compartmentalization. *Modules*: 1 hardened Basic Bridge, 1 Engineering, 284 Maneuver, 6 Staterooms, 1 Utility, 3.5 Cargo.
- **Statistics:** EMass 2,639, LMass 2,657, Cost: MCr120.1, HP: 37,500. Size Modifier: +9.
- **Performance:** Accel 4.3 Gs, Air Speed 5,497.



Kugashin-Class 400-ton Lab Ship (TL10)

This vessel is used by government (both Imperial and others) and private-research organizations. The equipment in the labs varies with the mission of the vessel. Laboratory ships are not normally armed unless they expect to be operating in dangerous areas, in which case one or more of the crew will have gunner training in addition to their other skills. The fuel skimmer is used to obtain fuel in frontier areas, and the skimmer crew often pilots the two air/rafts with which the ship is normally equipped (other small craft may be assigned depending on the vessel's mission).

- **Crew:** Captain, pilot, navigator, sensors operator, commo operator, two medics, two engineers, 10 scientists/lab techs, small-craft pilot, and small-craft engineer.
- **Design:** 400-ton USL Hull, DR 100. *Modules*: 1 Basic Bridge, 1 Engineering, 28 Maneuver, 12 Jump, 80 Fuel, 1 LowBerth, 100 SpaceDock (capacity 50 tons), 20 Staterooms, 1 Sickbay, 1 Utility, 1 Vehicle Bay (40-ton Fuel Skimmer), 10 Lab, 1 Turret, 31 Cargo (+3 inTurret).
- **Statistics:** EMass 578, LMass 944, Cost: MCr72.8, HP: 37,500. Size Modifier: +9.
- **Performance:** Accel 1.2 Gs, Jump 2.



Akkigish-Class 400-ton Subsidized Merchant (TL10)

Subsidized Merchants are usually found operating a set route where part of the operating expenses are met by an outside party in return for some guarantee (usually a courier contract or a regular shipment/passenger contract of some kind).

Usually a part of the hold or one or more passenger cabins will be reserved for the use of the subsidizer, and the ship required to service a set and scheduled route.

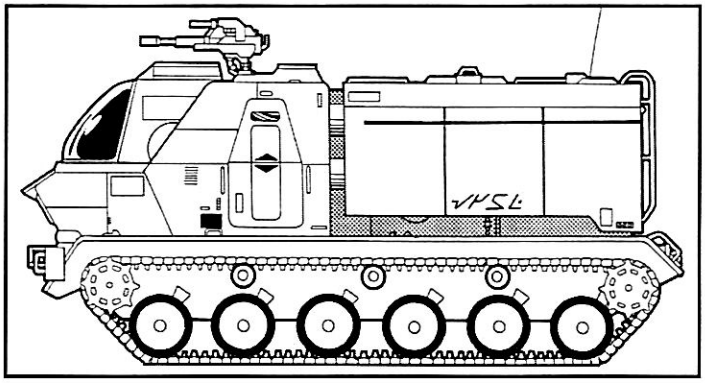
A 10-ton Lifeboat may be substituted for the launch if desired. Members of the crew will be cross-trained as small-craft crew for operating the Launch or Lifeboat.

The 72-point Ship Patron cost on p. T:FT100 assumes an unarmed ship carrying its Launch, with -5 points for owner profit-taking/upkeep.

- **Crew:** Captain, pilot, navigator, sensors operator, communications operator, steward, two medics, and two engineers.
- **Design:** 400-ton SL Hull, DR 100. *Modules*: 1 Basic Bridge, 1 Engineering, 34 Maneuver, 8 Jump, 40 Fuel, 2 Low Berths (capacity 8), 13 Staterooms, 1 Sickbay, 1 Utility, 1 Vehicle Bay (10-ton Launch), 4 Turrets, 165 Cargo (+12 in Turrets).
- **Statistics:** EMass 430, LMass 1,277, Cost: MCr47.4, HP: 37,500. Size Modifier: +9.
- **Performance:** Accel 1.1 Gs, Jump 1, Air Speed 1,902.

ATV, Tracked (TL7)

Scouts on low-tech worlds, mercenaries skirting Imperial intervention, and others often avoid conspicious grav vehicles. This vehicle fills the bill. Its huge cargo capacity makes it ideal to carry supplies for a base camp. With 400 cf of empty space, there is plenty of room for customization. On some worlds these are armed against the fauna, and on others they are fitted with turrets (or pop turrets) and used as APCs.



- **Subassemblies:** Tracks.
- **Body Features:** None.
- **Propulsion:** 500-kW tracked drivetrain (HP 72).
- **Instruments and Electronics:** Very-long-range radio (3000 mi., HP 15, 0.1 kW); sensitive receive-only RDF (10× range, HP 1, 0.001 kW); passive infrared (2 mi., Scan 13, HP 3, neg. power); navigation instruments (3 HP, neg. power); GPS (1 HP, neg. power).
- **Miscellaneous:** Full fire suppresion (HP 15); environmental control for six (HP 4, 1.5 kW).
- **Controls:** Mechanical. Crew stations: Roomy. "Driver" operates manuever controls.
- **Accommodations:** Five roomy crew stations. One bunk.
- **Power System:** 520-kW gas turbine (HP 47, 31.2 gph); 1,000-gallon standard tank (HP 169, 32 hrs.); 10,000kJ advanced battery (HP 4).
- **Access, Cargo, and Empty Space:** 63.2 cf access space. 1,200 cf cargo space (12 tons). 401.172 cf empty space.
- **Volume:** Body 2,187.5 cf. Tracks 1,312.5 cf.
- **Surface Area:** Body 1,011 sf. Tracks 719 sf.
- **Structure:** Standard heavy.
- **Hit Points:** Body 3,033. Tracks 1,079 each.
- **Armor:** Body PD 4, DR 100 expensive composite. Tracks PD 4, DR 20 standard composite.
- **Surface Features:** Waterproof.
- **Vision:** Vision slits only.
- **Statistics:** Empty weight 39,041 lbs. Usual internal payload 31,200 lbs. Loaded weight 70,241 lbs. (35.12 tons). Volume 3,500 cf. Size modifier +6. Price Cr481,245. Structural HT 12.
- **Ground Performance:** Top speed 45. gAccel 3 mph/s. gDecel 20 mph/s. gMR 0.125. gSR 6. Off-road speed 36. Very low ground pressure.
- **Water Performance:** Top speed 4. wAccel 0.3. wMR 0.1. wSR 5. wDecel 10. Draft 2.7 feet.

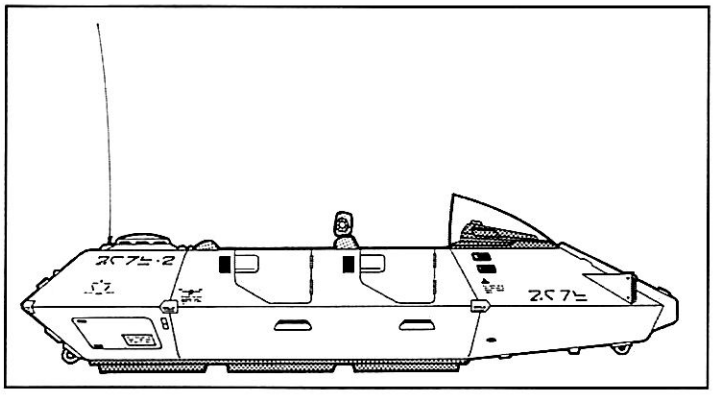
Passenger Option:

Add: 25 roomy seats.

Change: 31-person environmental control (HP 13, 7.75 kW). Cargo 200 cf and 4,000 lbs. Empty space 398.6 cf. Empty weight 40,166 lbs. Internal payload 16,000 lbs. Loaded weight 56,166 lbs. Top ground speed 51 mph. gAccel 4.5. Off-road speed 41. Top water speed 5 mph. Draft 2.5 feet.

Air/Raft, Open Topped (TL12)

This is a sturdy, high-tech grav vehicle, using contragravity for lift and thrusters for propulsion. It has an open top and cargo bed. It can carry four people and up to four tons of cargo. Its nuclear power unit runs it for 10 years. This vehicle (and its close-topped cousin) is one of the most commonly produced TL12 vehicles within the Imperium, and innumerable variants are produced.



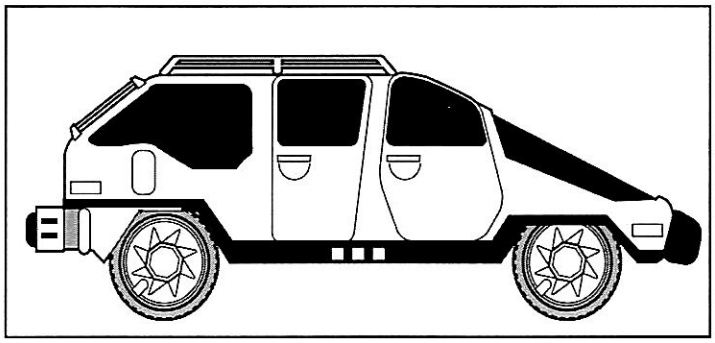
- **Subassemblies:** None.
- **Body Features:** None.
- **Propulsion:** Reactionless thruster (TL11), 800 lbs. thrust (40 lbs., 0.8 cf, Cr800, 40 kW).
- **Aerostatic Lift:** Four CG units each rated at 4,000 lbs. (48 lbs., 0.96 cf, 16 kW, Cr2,080).
- **Instruments and Electronics:** Long-range radio communicator (50,000 mi., 2.5 lbs., 0.05 cf, Cr150, 0.04 kW); low-res imaging radar (20 mi., no targeting, 5 lbs., 0.1 cf, Cr6,250, 5 kW); PESA (5 mi., 2.5 lbs., 0.05 cf, Cr10,000); terrain-following radar (1.25 lbs., 0.025 cf, Cr500, 0.25 kW); small computer (0.5 lbs., 0.01 cf, Cr250, Complexity 6).
- **Controls:** Computerized (Cr1,000). Crew stations: One roomy exposed. "Pilot" operates manuever controls.
- **Accommodations:** One roomy exposed crew station (40 lbs., 20 cf, Cr100). Three roomy exposed seats (120 lbs., 60 cf, Cr300). Short occupancy.
- **Power Systems:** 61.29 kW nuclear power unit (21.4 lbs., 0.214 cf, Cr20,000).
- **Access, Cargo, and Empty Space:** 1.014 cf access space. 160 cf open cargo space. 1.777 cf empty space.
- **Volume:** 165 cf.
- **Surface Area:** 200 sf.
- **Structure:** Heavy frame, cheap materials (600 lbs., Cr10,000).
- **Hit Points:** 600.
- **Armor:** PD 4, DR 28 cheap metal overall (560 lbs., Cr560) protects body (but not exposed seats or cargo from all angles).
- **Surface Features:** None.
- **Vision:** Good.
- **Statistics:** Weight 1,441.15 lbs. Usual payload 8,800 lbs. Loaded weight 10,241.15 lbs. (5.1 tons). Volume 165 cf. Size modifier +3. Price Cr51,960. Structural HT 12.
- **Air Performance:** Aerial motive thrust 800 lbs. Aerodynamic drag 140. Aerial top speed 160 mph. aAccel 2 mph/s. aMR 5. aSR 4. aDecel 20 mph/s.
- **Space Performance:** sAccel 0.08 Gs. Most air/rafts *can* reach orbit (this one would require vacc suits be worn), but are rarely used for such.

Ground Car (TL6)

The ground car is a typical passenger motor vehicle suitable for road travel on low-tech worlds. This particular design is typical of a wide variety of variations produced on countless worlds. Luxury, sports, utility, exploratory, scientific, commercial, paramilitary, and military versions are manufactured. The version here is for use in standard atmospheres; special fixtures may be needed for non-standard atmospheres.

Obviously, the basic performance, cost, and features available on the typical ground car on a given world can vary immensely with tech level. The TL6 version shown here, while found in many places around the Imperial frontiers, likely will be non-existent on a TL12 world.

- **Subassemblies:** Standard wheels (four).
- **Body Features:** None.
- **Propulsion:** 100-kW wheeled drivetrain (240 lbs., 4.8 cf, Cr960).
- **Instruments and Electronics:** Headlights.
- **Miscellaneous:** None.
- **Controls:** Mechanical. Crew stations: roomy. "Driver" operates maneuver controls.
- **Accommodations:** One roomy crew station (40 lbs., 40 cf, Cr100), four normal seats (120 lbs., 120 cf, Cr400).
- **Power Systems:** 100-kW standard gasoline engine (630 lbs., 12.6 cf, Cr1,260, 4.5 gph); 18-gallon standard fuel tank (27 lbs., 2.7 cf, Cr36) filled with gasoline (108 lbs., Fire 12).
- **Access, Cargo, and Empty Space:** 17.4 cf access space. 40 cf cargo space. No empty space.
- **Volumes:** Body 280 cf. Wheels 28 cf.
- **Surface Area:** Body 300 sf. Wheels 60 sf.
- **Structure:** Light frame, cheap materials (2,160 lbs., Cr900).
- **Hit Points:** Body 225. Each wheel 23.
- **Armor:** PD 3, DR 5 cheap metal overall (1,260 lbs., Cr1,260).
- **Vision:** Good.
- **Statistics:** Empty weight 4,625 lbs. Usual internal payload 2,000 lbs. Loaded weight 6,625 lbs. (3.31 tons). Volume 308 cf. Size modifier +4. Cost Cr5,016. Structural HT 12.
- **Ground Performance:** Top speed 90 mph. gAccel 4 mph/s. gDecel 10 mph/s. gMR 0.75. gSR 4. Off-road speed 15. High ground pressure.



ATV, Wheeled (TL8)

This eight-wheeled transport is suitable for use on the most hostile of worlds. It is capable of extended operations in nearly any environment. Three variants are standard and commonly found almost everywhere.

- **Subassemblies:** Off-road wheels (8).
- **Body Features:** Sealed body.
- **Propulsion:** 500-kW all-wheel drivetrain (HP 36).
- **Instruments and Electronics:** Very-long-range radio (10,000 mi., HP 10, 0.1 kW); very sensitive receive-only radio direction finder (100 × reception, HP 3, 0.0005kW); thermograph (2 mi., Scan 13, HP 1, neg. power); navigation instruments (HP 3, neg. power); global positioning system (HP 1, neg. power); active/passive sonar (2 mi., no-targeting, Scan 13/15, HP 7, neg. power); 4 AESAs (2 mi. each, no targeting, Scan 13, HP 1 each, neg. power); minicomputer (Complexity 3, HP 5, neg. power); 5 × terminals (HP 28 each, neg. power).
- **Miscellaneous:** Full fire-suppression system (HP 15); two-man airlock (HP 129).
- **Controls:** Computerized. Crew stations: five roomy. "Driver" operates manuever controls. "Radio operator" operates communications equipment. Two "radar operators" operate sensors. "Computer operator" operates computer.
- **Accommodations:** Long term, 5 roomy crew stations, 5 bunks, TL8 full life system for 10 persons (HP 254, 100 kW), 500 man-days provisions, 10 crashwebs.
- **Power System:** 600-kW nuclear power unit (HP 81); 2.16-million kJ rechargeable energy bank (HP 11, will run life support for six hours).
- **Access, Cargo, and Empty Space:** 130 cf access space. 1,600 cf cargo space. 0.1607 cf empty space.
- **Volume:** Body 2,916.7 cf. Wheels 583.3 cf.
- **Surface Area:** Body 1,500 sf. Wheels 500 sf.
- **Structure:** Heavy standard frame.
- **Hit Points:** Body 4,500. Each wheel 375.
- **Armor:** Body PD 4, DR 50 expensive metal. Wheels PD 4, DR 25 expensive metal.
- **Surface Features:** Sealed.
- **Vision:** Viewports only.
- **Statistics:** Empty weight 61,382 lbs. Usual internal payload 33,000 lbs. Loaded weight 94,382 lbs. (47.191 tons). Volume 3,500 cf. Size modifier +6. Cost MCr1.456. Structural HT 12.
- **Ground Performance:** Top speed 52. gAccel2.8. gDecel 20. gMR 0.75. gSR 5. Off-road speed 13 mph. Ground pressure high.
- **Water Performance:** Floats. Drag 2,073. Top speed 5. wAccel 0.2. wMR 0.25. wSR 6. wDecel 10. Draft 3 ft.

Science Lab Option:

Adds: Science lab (HP 600, 3 kW)
Changes: Cargo 600 cf. Empty weight 81,382 lbs. Payload 13,000 lbs. Cost MCr2.456.

Passenger Option:

Add: 15 roomy seats.
Change: Cargo 505 cf. 750-kW nuclear power unit (HP 436). Full life support for 25 (HP 450, 250 kW). Empty weight 70,682 lbs. Payload 14,100 lbs. Loaded weight 84,782 lbs.
Ground Performance: Top speed 55 mph. Off-road speed 14 mph.
Water Performance: Drag 1.930.

Appendix B
Modular Starship Design

Spacecraft are built and sold at shipyards across known space. ***GURPS Vehicles*** offers a complete design system suitable for all types of vehicles (including starships), but it is also time-consuming and complex. To make ***GURPS Traveller*** more accessible, this section is a modular design system enabling ships to be assembled from standard-sized hulls and components.

These hulls and modules were all created using ***GURPS Vehicles***, so experienced GMs may use that book to design their own modules or to create custom-built designs.

Terminology

Vessel: Any spacecraft.

Hull Class: The Imperium customarily rates vessels in "displacement tons," each representing the volume occupied by a ton of liquid hydrogen. This can cause confusion – since tonnage references to all non-hull components indicate mass or weight, not volume – but is entrenched in tradition. To avoid confusing these terms, these rules usually will call displacement tons "spaces." A "space" is assumed to be 500 cubic feet (this is an approximation that simplifies design).

Ship: A vessel of 100 tons or larger.

Small Craft: A vessel of fewer than 100 tons.

Starship: Any ship with a jump drive.

Non-starship: A vessel lacking a jump drive.

Ton: For vessels and vessel hulls, 500 cubic feet of volume. For all else, 2,000 pounds.

cf: ***GURPS*** abbreviation for "cubic foot."

kW: A kilowatt; kJ is kilojoule or kilowatt-second (kWS); a thousand kW is a megawatt (MW); a thousand kilojoules is a megajoule (MJ) also known as a megawatt-second (MWS).

Tech Levels

This simplified design system allows vessels to be built at two distinct tech levels, TL10 and TL12.

TL10 vessels are often used by merchant lines, independent traders, and planetary and subsector navies. Many TL7-9 worlds also use TL10 designs, ordering them (and spare parts and service) from shipyards elsewhere in their sector, just like Third World nations today order ships from Europe, Russia, or the United States.

TL12 vessels represent the cutting edge of naval architecture. The Imperial Navy is equipped at TL12, with TL10-11 vessels in service in backwater areas. Shipping lines and corporations use TL12 vessels as fast couriers or liners.

When designing the vessel, do not install components higher than the vessel's TL without good reason (e.g., a TL10 hull that was upgraded with TL12 electronics and weapons).

Crew Requirements

The *Module Table* (p. 155) lists starship crew needs. Here's an explanation:

Cockpit: A pilot and sometimes a co-pilot. Pilot should have Piloting (Spaceship), Electronics Operation (Sensors, and Communications would be wise), and Gunner for any weapons he plans to use. On military vessels he should have Tactics as well. The co-pilot needs the same skills, or to provide any the pilot lacks.

Basic Bridge: Standard crew includes a captain, pilot, navigator, sensors officer/operator, and commo officer/operator.

The captain requires Leadership, and Tactics is essential on a military vessel and wise on any ship. The pilot needs Piloting (Starship), the navigator Astrogation, the sensors operator Electronics Operation (Sensors), and the commo operator Electronics Operation (Communications).

Bridge crews are often smaller, with one person handling multiple tasks.

Command Bridge: As above, often augmented by one to three extra commo/sensor operators, a computer officer with Computer Operations and Computer Programming, and a screens officer with Electronics Operation (Force shields) if a meson screen or damper is installed.

Sickbay: One or two medics with Diagnosis, Physician, and Surgery. The first module requires two medics; additional sickbays may have fewer as long as there is at least one per module.

Engineering, M-drive, and J-drive: Fractional requirements are listed for M-drive and J-drive modules; e.g., 1/60 means one engineer per 60 modules. Total up these requirements to determine the number needed. Round fractions down, but vessels of 200+ tons generally have a minimum of one engineer!

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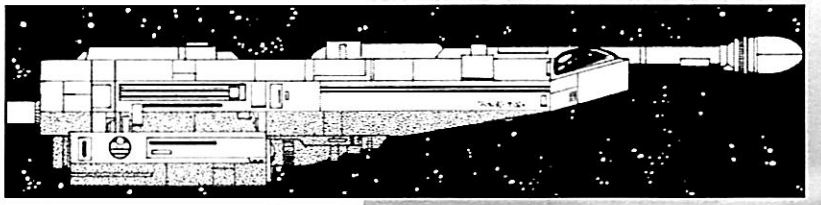


Crew Requirements

[Continued]

Engineers need Engineering (Vehicles) and Mechanic (M-drive, J-drive, and Power Reactor). Large crews of engineers can split up the Mechanic specializations.

Small crafts' engineers are usually carried aboard the mother vessel or base.

Labs: 1-2 scientists per lab module.

Ship's Vehicles: Air/rafts and small craft require Piloting (Contragravity) and (Spaceship) respectively.

Weapons: One gunner for each turret, with Gunner (Laser, Missile, and/or Sandcaster) as appropriate. One or two per bay with Gunner (Missile, P-Beam, or Meson). A gunner or pilot on the bridge operates any hull-mounted weapons.

Cargo: Large merchants may have a cargo master with Freight Handling and Merchant. On small vessels, the captain handles purchases.

Staterooms: Paying passengers require a steward with Savoir-Faire (Servant), plus at least one additional per full 50 middle or 20 high passengers carried.

Stewards should have First-Aid on ships without sickbays, and Electronics Operation (Medical)-10+ if overseeing low berths.

Passenger Couches: A steward with Savoir-Faire (Servant) is required for each 48 passengers carried in couches, unless the trip duration is under 2 hours.

Design Sequence

The next several pages provide a step-by-step spacecraft design process. Calculations are simple and can be easily done on scrap paper. A calculator is useful but not absolutely essential.

Step 1: Design the hull and record its characteristics.
Step 2: Designate turrets and/or bays.
Step 3: Select armor tonnage. Calculate its cost, DR, and PD.
Step 4: Seal hull and consider adding sensor-masking features.
Step 5: Fill all internal spaces with component modules.
Step 6: Add turret and bay weapons (optional).
Step 7: Calculate basic statistics.
Step 8: Calculate performance.
Step 9: Finalize design.

As design choices are made, keep a running total of the vessel's mass (in tons) and cost (in millions of credits, or megacredits). All masses are in tons, all costs in megacredits (MCr).

Step 1 - Hull Design

Decide whether the vessel is streamlined or unstreamlined. *Streamlined* vessels are sleek lifting bodies (often needle, wedge, or disk shaped) and may fly within a planetary atmosphere. *Unstreamlined* vessels cannot enter atmosphere. Cylindrical, spherical, and "patchwork" hulls usually fall in this category.

Select a standard hull tonnage from those listed on the following table:



HULL TABLE

Hull Tonnage	Volume (cf)	Hull Area	TL10 Mass	TL12 Mass	Hull Cost (in MCr)	Size Modifier
10	5,000	2,000	2	1	0.1/0.24	+6
20	10,000	3,000	3	1.5	0.15/0.36	+6
30	15,000	4,000	4	2	0.2/0.48	+7
40	20,000	5,000	5	2.5	0.25/0.6	+7
50	25,000	6,500	6.5	3.25	0.325/0.78	+7
80	40,000	8,000	8	4	0.4/0.96	+8
100	50,000	10,000	10	5	0.5/1.2	+8
200	100,000	15,000	15	7.5	0.75/1.8	+8
400	200,000	25,000	25	12.5	1.25/3.0	+9
600	300,000	30,000	30	15	1.5/3.6	+9
800	400,000	40,000	40	20	2.0/4.8	+10
1,200	600,000	50,000	50	25	2.5/6.0	+10
2,000	1,000,000	60,000	60	30	3.0/7.2	+10
3,000	1,500,000	80,000	80	40	4.0/9.6	+11
4,000	2,000,000	90,000	90	45	4.5/10.8	+11
5,000	2,500,000	110,000	110	55	5.5/13.2	+11
10,000	5,000,000	170,000	170	85	8.5/20.4	+12
15,000	7,500,000	230,000	230	115	11.5/27.6	+12
20,000	10,000,000	280,000	280	140	14/33.6	+12
30,000	15,000,000	360,000	360	180	18/43.2	+14
50,000	25,000,000	510,000	510	255	25.5/61.2	+14
100,000	50,000,000	810,000	810	405	40.5/97.2	+15

Record hull mass (varies by TL), hull cost (the costs given are for non-streamlined/streamlined vessels), and size modifier (see p. B201). Hull areas and volume are for reference and will figure in later calculations.

Calculate the vessel's *internal spaces.* An unstreamlined vessel has spaces equal to its hull tonnage. A streamlined vessel has spaces equal to 0.8 × hull tonnage. Internal spaces will be used up by equipment and other options. Keep a running total of how many remain; when they are all gone, nothing else can be installed in the vessel.

Step 2 – Turrets and Bays

Turrets are standard mounts for shipboard weapons. A ship can have one turret per 100 tons, or it can have fewer or none at all. A small craft may have one or no turret.

Bays are large weapon mounts. A ship can install one bay for every 10 turrets *not* installed. For example, a 10,000-ton ship may have up to 100 turrets, but could instead have installed 80 turrets and two bays.

Decide how many turrets and/or bays the vessel has. Their mass and cost are shown below. As with the hull, mass varies by TL and cost varies depending on whether the hull was streamlined or not.

TURRET AND BAY TABLE

Type	Mass TL10	Mass TL12	Cost (MCr)	Internal Spaces
Bay	6.5	3.25	0.325/0.78	10
Turret	0.825	0.425	0.0406/0.0966	1

Interior Facilities

Vessel interiors generally have these details in common:

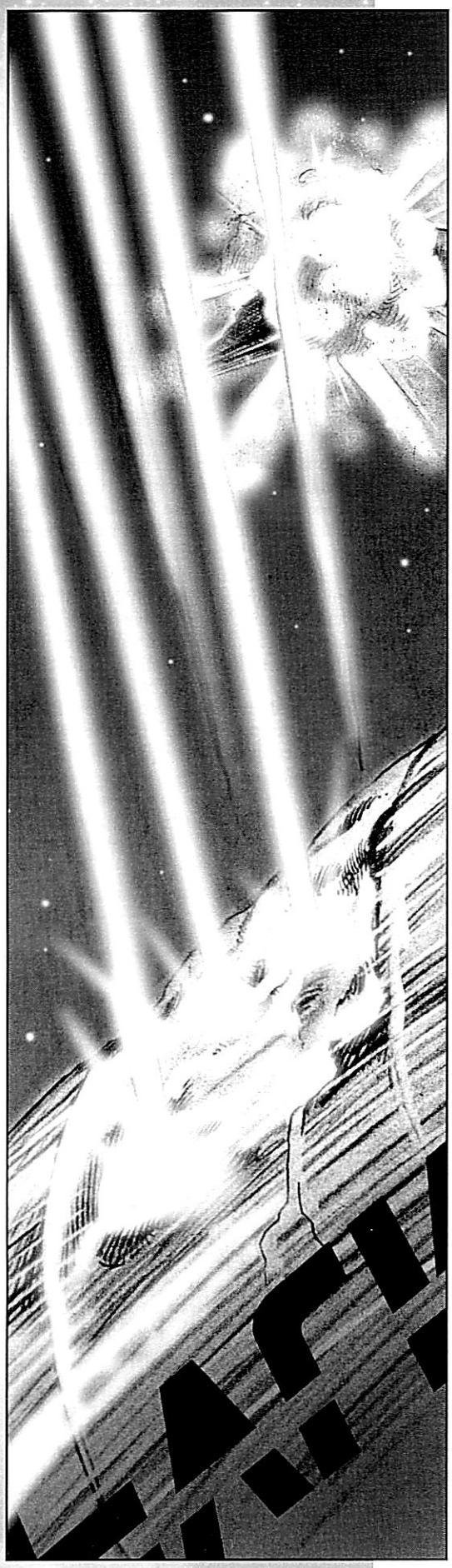
Partitions are light wall panels used to separate facilities such as individual staterooms, galleys, and offices. They aren't airtight. DR 8 and 40 hit points. *Bulkheads* are armored walls used to separate major airtight compartments. An internal bulkhead has DR 50 and 250 hit points; an external bulkhead has the vessel's armor DR.

Doors are sliding panels set in partition walls. They are not airtight, and open or close at the touch of a stud (takes one second if power is on). Stateroom doors come with electronic locks in various styles (voiceprint, keypad, card, etc.), but these are for privacy only – use Lockpicking skill (or a crowbar) to break in; locks can also be overridden or changed from the bridge. A door has DR 4 and 10 hit points. A locked door can also be forced open by brute strength. Make a ST-4 roll; repeated attempts cost 1 fatigue each.

Iris valves are powered portals set in bulkheads, at either end of airlocks and in vertical shafts. An iris valve resembles the aperture of a camera: a series of metal plates that slide into place to block an opening. It is opened or closed by depressing a stud next to the valve, provided the vessel has power. Any iris valve can also be locked from the bridge. A closed valve is airtight; as long as a vessel has power, iris valves will shut automatically when interior pressure nearby drops, preventing a single hull leak from decompressing the vessel. It takes iris valves one second to shut – an object like a metal bar that is jammed in a valve as it closes will prevent closure, allowing it to be reopened with ease. Otherwise, once fully shut they are difficult to force open: Roll as with doors, but against ST-6. Iris valves are tough: DR 50 and 100 hit points.

Hatches are hinged, pressure-tight metal doors that are placed at some locations secured by pins operated by a handwheel on the door. They take five seconds to open and are not powered or controlled by the ship's bridge. Hatches are intended as damage-control devices to restrict atmosphere loss in the case of a hull breach. Thus, there is normally no provision for locking hatches, but a crowbar inserted into the handwheel will jam one shut from that side requiring the destruction of the hatch to open it. Nothing prevents a character from installing locks on any given hatch, but these cost extra. Hatches can be found in floors, decks, or bulkheads, often in engineering or spacedock areas. They are typically used to provide alternative routes for damage-control teams in the event of power loss that seals iris valves. Hatches are DR 50 and 250 hit points.

See p. B125 for rules on breaking down walls and similar inanimate objects.



Turrets and bays take up internal space. Each turret uses up one internal space. Each bay uses up 10 internal spaces.

Turrets come with a roomy built-in crew station (seat and console) with computer terminal and a Heads-Up Display/Weapon Aiming Computer (HUDWAC). Bays don't – but these crew stations are built into the actual weapons that are installed in the bay.

Step 3 – Armor

Vessels are armored to protect against cosmic rays, micrometeors, and enemy weapons.

Surface Area: Calculate the vessel's total surface area. This is the number shown in the "area" column on the *Hull Table* (p. 151) plus the surface area of all turrets and bays. Each turret has an area of 800. Each bay has an area of 6,500.

Armor Mass: Decide how many tons of armor the vessel will carry. Most civilian vessels have 0.5 to two tons of armor times their hull tonnage. Warships usually have 0.5 to five tons times their hull tonnage. The more mass a vessel has, the slower it accelerates.

Armor Cost: Multiply armor mass by MCr0.012 to get cost.

Armor Damage Resistance: Calculate armor DR:

If TL10 armor, DR = (armor mass × 20,000) / surface area.

If TL12 armor, DR = (armor mass × 50,000) / surface area.

Optionally, rather than assigning armor mass and calculating DR from it, choose a DR first, then calculate mass. To do so, multiply the DR by 0.00005 at TL10 or 0.00002 at TL12 and then by hull area. This gives the armor's mass; calculate cost as above.

Optionally, armor for the turrets/bays may be calculated separately from hull armor. Turrets and bays are often designed with lighter armor than the hull itself. For a fast way to design this, just add *half* the turret or bay's area to the vessel's area, and then afterward it can be assumed to have half the DR the hull has.

Passive Defense (PD): Armor PD depends on DR, as follows: 1 if DR 1, 2 if DR 2-4, 3 if DR 5-15, 4 if DR 16+. Almost all vessels have PD 4.

Step 4 – Other Surface Features

Sealed: Vessels must be sealed. Multiply total surface area by MCr0.00001 to get the price of sealing the hull against vacuum.

Sensor Masking: Usually only warships use sensor-masking. A vessel may optionally be given *stealth* making it harder to detect by active sensors (like radar) and/or *emission cloaking* to mask it from passive sensors (like infrared). Each type comes in two levels, "basic" and "radical."

Sensor Masking Feature	Mass (tons)	Cost (MCr)
Basic Stealth or Emission Cloaking	0.00025	0.000075
Radical Stealth or Emission Cloaking	0.0005	0.00075

Mass and cost are each equal to the vessel's total surface area times the number shown on the table above. A vessel may not have both basic and radical versions of the same feature.

Basic emission cloaking subtracts (TL-4) from rolls to determine the success of passive sensor scans, while basic stealth subtracts from active sensor scans. Radical cloaking or radical stealth will double this penalty; i.e., -2 × (TL-4).

Step 5 – Component Modules

A component module is a set of spacecraft components that are grouped together, such as a bridge or maneuver drive.

All modules are rated for the internal space they take up in the vessel (spaces), their mass (tons) and cost (MCr). Select precisely the number of modules that fills the vessel's internal space.

Bridge: The vessel's control, navigation, sensor, and communication systems. All ships require one bridge module, and larger vessels sometimes have a second auxiliary bridge. Two types of bridge module are available. A "basic bridge" is typical of ordinary ships. Some ships (especially those with tonnage over 1,000) will install a larger and better-equipped "command bridge." See *Bridge Systems* (pp. 160-162) for each type's capabilities.

Engineering: All ships require a single engineering module. It has a fusion reactor core (the base "startup" weight, cost, and volume for a fusion reactor), full fire-suppression system, and a six-person airlock. Included with the airlock is an inflatable 100′-long passage tube (armored to DR 20) that can be deployed in 30 minutes to connect two airlocks for passenger boarding.

Cockpit/Systems: A cockpit/systems module is used on small craft instead of the bridge and engineering modules. It provides control, navigation, avionics, and fusion-power startup, plus a one-person airlock and two man-days limited life support.

Hold: Each hold module has space for 500 cubic feet (18.5 cubic yards) of cargo. Multiple hold modules may represent a single large hold or a number of smaller holds. Holds in ½-space increments (250 cf) may also be installed.

Jump Drive: A ship requires a jump drive if it's to make interstellar jumps. Each module includes the jump-drive machinery and fusion-power components to power it. Decide on the ship's jump-drive number to a maximum of jump-3 at TL10 or jump-6 at TL12. The number of J-drive modules required is then:

number of j-drive modules = 0.01 × hull tons × (jump number+1)

Jump Fuel: These modules consist of an ultralight self-sealing tank that stores the liquid hydrogen fuel used by the jump drive. A ship with j-drive requires a number of fuel modules equal to:

number of jump-fuel modules = 0.1 × hull tons × jump number

Low Berth: A low-berth module contains four cryonic freeze capsules, each capable of holding one person in suspended animation ("low passage") plus fusion-power components. See p. 108, and pp. UT103, S66, or BT115 for detailed rules.

Maneuver Drive: An M-drive is a reactionless thruster that produces thrust without fuel or reaction mass. Each module has a reactionless thruster that produces 40 tons of thrust at TL10 or 100 tons at TL12 and a slice of fusion-reactor power to run it. Install as many M-drive modules as desired. A vessel's acceleration (in gravities) equals thrust divided by its total mass. As a result, it can be desirable to install the M-drive last so that you can estimate the total mass of the vessel (or make use of a computer spreadsheet to recalculate the thrust and Gs for each different configuration).

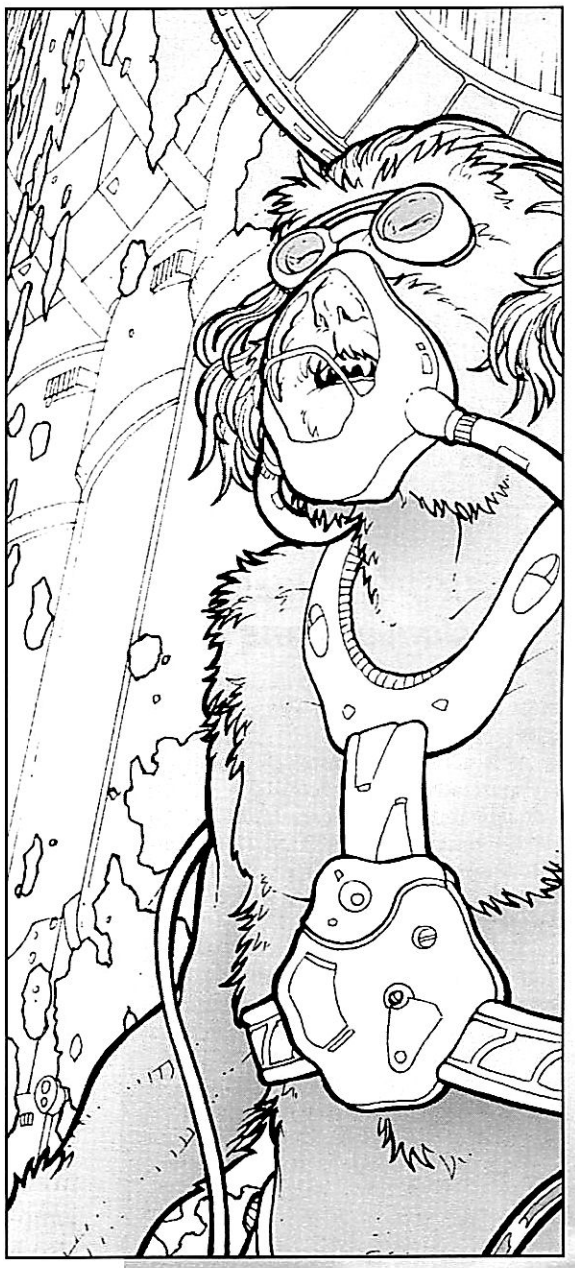
Passenger Couch: This module is only available for small craft. It incorporates 12 roomy seats and limited life support (lasts 12 man-days) plus the necessary fusion-power components to operate the life-support system.

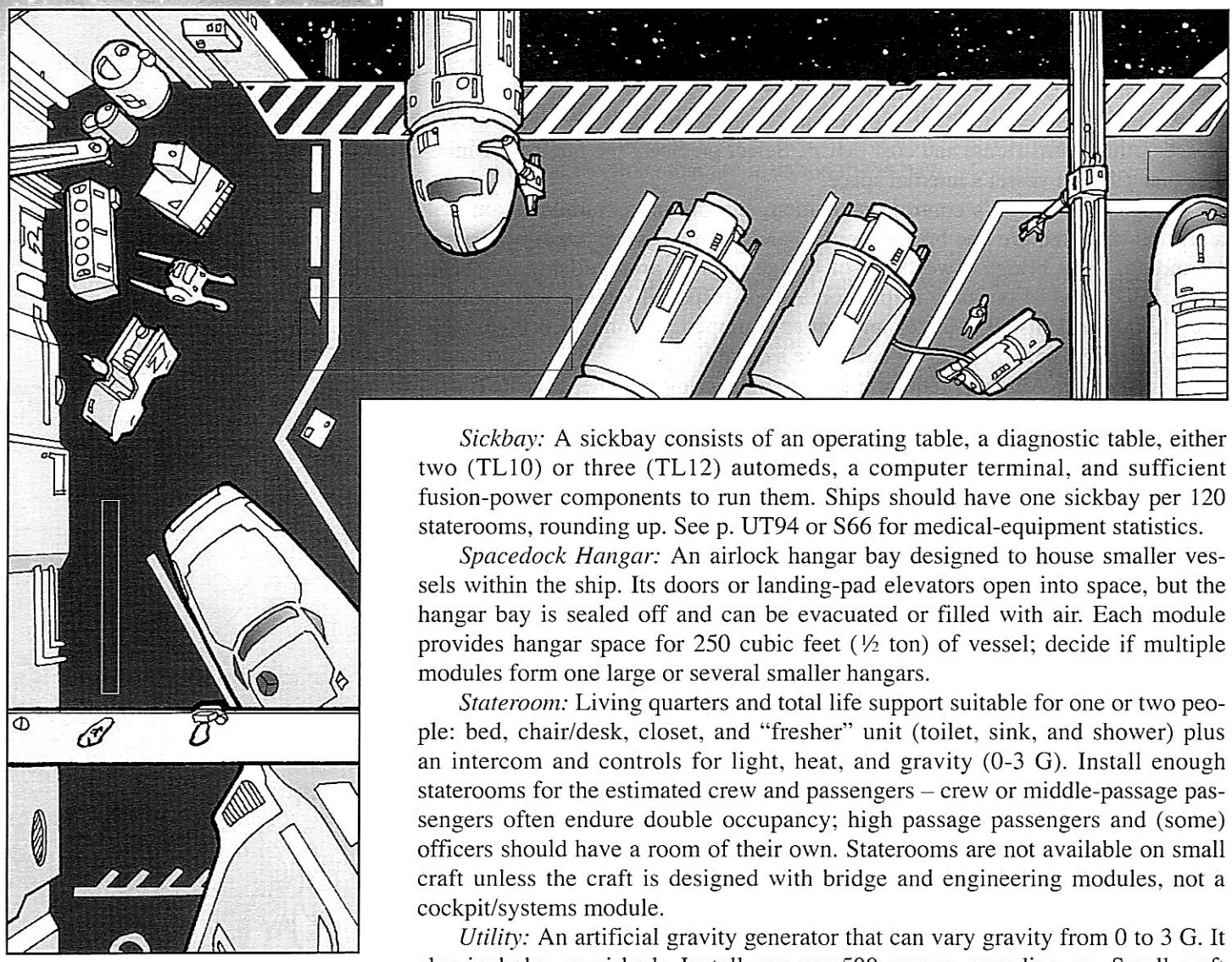
Creating Deckplans

Ship designs can be used to create deck plans to facilitate boarding actions, hijackings, and other adventures.

Hexgrid Deck Plans: ***GURPS*** uses a 1-yard hexagonal grid for maps. Assuming headroom of about 8-9 feet and some room under the decks, a "space" in a module can be represented by six squares or four hexes (GM's option). If a square grid is used, GMs will have to improvise movement: multiply diagonal movement costs/distances by 1.5.

Existing Deck Plans: Original ***Traveller*** ship plans use a 1.5m (5′) or 2m (6′) square grid. GMs using them should multiply movement costs and ranges by 1.5 (2 to move/shoot diagonally).





Sickbay: A sickbay consists of an operating table, a diagnostic table, either two (TL10) or three (TL12) automeds, a computer terminal, and sufficient fusion-power components to run them. Ships should have one sickbay per 120 staterooms, rounding up. See p. UT94 or S66 for medical-equipment statistics.

Spacedock Hangar: An airlock hangar bay designed to house smaller vessels within the ship. Its doors or landing-pad elevators open into space, but the hangar bay is sealed off and can be evacuated or filled with air. Each module provides hangar space for 250 cubic feet (½ ton) of vessel; decide if multiple modules form one large or several smaller hangars.

Stateroom: Living quarters and total life support suitable for one or two people: bed, chair/desk, closet, and "fresher" unit (toilet, sink, and shower) plus an intercom and controls for light, heat, and gravity (0-3 G). Install enough staterooms for the estimated crew and passengers – crew or middle-passage passengers often endure double occupancy; high passage passengers and (some) officers should have a room of their own. Staterooms are not available on small craft unless the craft is designed with bridge and engineering modules, not a cockpit/systems module.

Utility: An artificial gravity generator that can vary gravity from 0 to 3 G. It also includes an airlock. Install one per 500 spaces, rounding up. Small craft normally omit utility modules.

Meson Screen (TL12): A meson screen disrupts incoming high-energy mesons. The module includes a screen generator and fusion-power components. The vessel's DR *vs. meson guns only* is 20.8 *million* times the number of meson screen modules divided by its total surface area.

Nuclear Damper (TL12): A nuclear damper focuses a field that subtly interferes with the strong nuclear force causing nuclear warheads to fail to detonate. A spacecraft damper field protects a 10-mile radius, increased by +5 miles each time the number of modules installed is doubled.

Vehicle Bay: A vehicle bay is custom-designed to snugly hold a single, specific small craft (e.g., "30-ton ship's boat"). It is not usable for other sorts of vehicle. It takes up 21 spaces per 20 tons of vessel stowed.

Lab Module: A laboratory dedicated to one scientific skill (e.g., Geology) as well as room for one or two scientists to work. For larger teams, multiple labs are a necessity! It gives +2 to skill in situations where the lab equipment would be beneficial; the GM can also rule a lab is required for a task – it gives no bonus but work would be impossible without it.

Fuel Processor: Purifies raw fuel (skimmed from a gas-giant atmosphere or from another source), turning it into refined fuel. Each module can process eight jump-fuel modules full of raw gas-giant atmosphere every hour. The module also includes necessary fusion-power components.

GURPS Vehicles Conversions

All structures and components were built using the ***GURPS Vehicles*** rules, with these exceptions:

1) Reactionless thruster technology is far more advanced. Accordingly, TL10 standard thrusters appear at TL8, TL10 super thrusters appear at TL9, TL11 standard thrusters appear at TL10. TL11 super thrusters are unchanged, while TL13 "mega thrusters" remain TL13.

2) The jump drive. It works differently than existing ***GURPS*** jump engines, because its performance is based on transporting a specific *volume* rather than mass and because it consumes hydrogen.

3) Final weight in pounds and cost in dollars were converted to tons and millions of credits (rounding off). Outputs listed are given in megawatts (1,000 kW), megawatt-seconds, and megajoules (1,000 kJ) to save space.

MODULE TABLE

Type of Module	Spaces	Mass	Cost (MCr)	Crew
Cockpit Bridge				
TL10	1	4.9	2.5	1-2
TL12	1	4.7	2.3	1-2
Basic Bridge				
TL10	2.5	8.6	4.0	1-5
TL12	2.5	7.3	3.1	1-5
Command Bridge				
TL10	5	20.9	9.6	1-10
TL12	5	19.2	8.8	1-10
Engineering				
TL10	1	4	0.32	0-1
TL12	1	3.6	0.16	0-1
Hold	1	0	0	0
Maneuver Drive				
TL10	1	3.4	0.16	1/60
TL12	1	4	0.65	1/100
Jump Drive				
TL10	1	4	3.1	1/25
TL12	1	4	3.05	1/100
Jump Fuel	1	1.3	0.16	0
Low-Berth (4 tubes)	0.5	2	0.22	0
Passenger (12 seats)				
TL10	1	0.54	0.075	0
TL12	1	0.54	0.073	0
Spacedock	1	1*	0.005*	–
Stateroom (1-2 occupants)				
TL10	4	2.4	0.012	0
TL12	4	2.0	0.012	0
Sickbay				
TL10	1	0.75	0.16	1
TL12	1	0.85	0.21	1
Utility				
TL10	1	11.5	0.30	0
TL12	1	11.5	0.25	0
Meson Screen (TL12)	1	5	2.258	0
Nuclear Damper (TL12)	1	10	4	0
Fuel Processor	1	1.1	0.85	0
Lab	2	10	1	1-2
Vehicle Bay	1.05**	0.5*	.003*	0

* Mass and cost are paid only once, regardless of the number of modules making up the spacedock hangar or vehicle bay – it mainly represents the mass and cost of the hangar doors and air pump.

** Multiplied by hull tonnage of vessel carried.

Notes: When estimating performance, spacedock mass should include the vessels that normally dock there, while cargo mass should assume five tons of mass per cargo module as an average load.

All bridge/cockpit computers can be "hardened" (fiber-optic backup) to resist radiation for an additional 0.15 tons and MCr0.04 (cockpit), 0.375 tons and MCr0.6 (in basic bridge), or 3 tons and MCr6 (command bridge).

Crew is the suggested number of crew per module. See *Crew Requirements* sidebar on pp. 149-150 for details of crew requirements.

Creating Non-Standard Hulls

You can use ***GURPS Vehicles*** to extend the hull table to include non-standard hull designs. Standardized hulls were built as vehicle bodies in multiples of 500 cubic feet using TL10 and TL12 medium frames and standard materials. Streamlined hulls used the lifting body and "very good" streamlining features.

Armor: The armor formula assumes "expensive metal" armor, and converts numbers to tons and MCr. Other armor types are possible, as described in ***Vehicles.***

Subassemblies: Turrets and bays are both turret subassemblies using medium frames and standard materials. Bays are limited rotation, turrets are full rotation.

Basic landing legs for soft vertical takeoffs/landings are subsumed in streamlining. To keep things simple, we've omitted proper wheels/skids, since all ships are vectored-thrust designs.



Design Your Own Modules!

Modules were built in multiples of 500 cubic feet with extra "empty space" being added to round them out as necessary. Weights were calculated in pounds, then rounded to the nearest 0.1 ton.

All modules are collections of components assembled from those in ***GURPS Vehicles***. This book can be used to design new modules or modify existing ones.

To design a new module, decide on its TL and then select which components (see p. VE12) are built into it. Make sure that the total volume of all components is a multiple of 500 cf. If it doesn't match, add extra empty space to it.

If any of the components in the module require power, make sure that one of the components includes the necessary power systems. Use either rechargeable power cells or fusion reactors (or at TL13+, antimatter reactors). When installing fusion or antimatter power systems, only include the weight, volume, and cost per kilowatt, plus the volume of "long-term" access space. The base weight, volume, and cost, and the reactor-core cost, is included in the engineering module that every vessel requires.

The same rule applies to TL9-10 life support. Add any incremental requirements, but the base costs have already been tallied.

Component modules do not have any structural weight or cost – they should not be thought of as actual homogenous systems (like the modular sockets on p. VE72), but rather as sets of components some of which might be scattered throughout a vessel. Component modules simply bundle related features for ease in accounting during vehicle design. (Power plant slices actually within turrets and bays represent the necessary power conduit connections.)

Turrets are semi-recessed in hull (hence the restriction on volume); thus, even in craft with Very Good streamlining weapons take up volume/50 cf rather than volume/20 cf.

Step 6 – Bay and Turret Armament

Each turret a vessel possesses has room for up to three turret weapons to be plugged into it. Each bay has room for a single bay weapon. Armament need not be specified when a vessel is designed, as shipyards can leave turrets or bays empty for the owner to later customize. Merchant ships in safe subsectors or on a tight budget may have empty turrets or mount only one or two rather than the full three weapons. (Crew often find creative uses for the unused 500-1,000 cf, such as illicit liquor stills.)

Fixed-Mount Weapons: Instead of a turret or bay, weapons can be built directly into the hull. A hull-mounted weapon takes up space just as if it were a component module. If a turret-sized weapon, it is fired from the bridge/cockpit crew stations (often by the pilot). Hull-mounted weapons are assumed to be installed in casemate swivel-mounts that enable them to fire directly forward and 45 degrees to either side. The spaces occupied by fixed mount weapons count against the number of turrets that can be included: up to three spaces of fixed-mount weapons are allowed for every turret not installed.

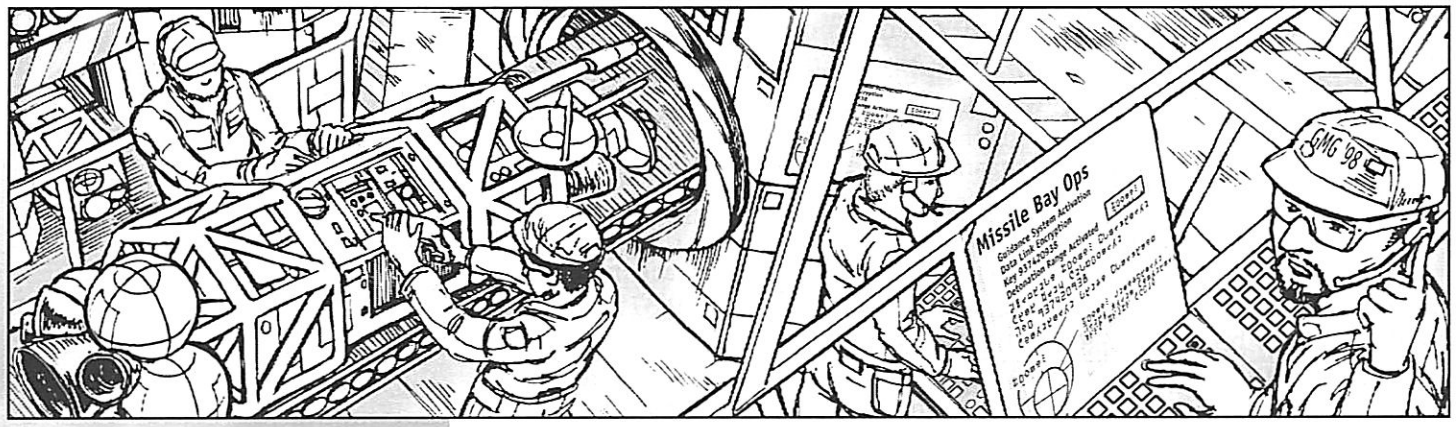
Spinal Mounts: Spinal mounts are huge weapons built into the centerline of the vessel. A ship can only have one spinal mount. They are hull mounted, but are limited to firing directly forward, and are aimed by pointing the ship.

If weapons are to be fitted, select from these standardized designs:

ARMAMENT TABLE

Weapon	Spaces	Mass	Cost
Turret Weapons			
Missile Rack	1	13	0.0175
Turret Laser (TL10)	1	8.3	0.82
Turret Laser (TL12)	1	7.8	0.68
Sandcaster	1	5	0.25
Bay Weapons			
Missile Bay	10	618.8	0.85
Particle Beam Bay (TL10)	10	467	23.21
Meson Gun Bay (TL12)	10	467	21.04
Spinal Mount			
Spinal P-Beam (TL10)	1,513	15,126	1,035
Spinal Meson Gun (TL12)	1,512	15,119	939

Add each weapon's mass and cost to the running total of vessel mass and cost. Turret weapons may occupy a turret space (three to a turret) or take up space in the hull. Bay weapons may occupy an entire bay or take up space in the hull. Spinal mounts always take up hull space. Note that the same missile launchers and sandcasters are used at both TL10 and TL12.



Turret Weapons

Missile Rack: A launch tube rated to fire 250mm 300-pound (0.15 ton) missiles. The system also includes a 50,000-mile-range laser communicator used to control operator-guided missiles. Magazine space sufficient for 77 standard 0.15-ton space-interceptor missiles is included.

Sandcaster: A unique defensive weapon that launches clouds of ablative crystals (nicknamed "sand") into the projected paths of enemy laser fire. Unlike prismatic aerosols used in ground combat, sand clouds are thick enough to ablate X-ray laser beams. Space for 200 120-lb. sand canisters is included.

Turret Laser, 250-MJ (TL10): This system consists of an X-ray laser (250-MJ output, cyclic rate ½, extreme range), a power cell that stores enough energy (667 MW) to fire one shot, and fusion-reactor components that generate the 11.1 MW required to fully recharge that power cell every 60 seconds. The X-ray laser is fully stabilized and installed in a universal mount (if in a turret) or casemate (if in hull). Turrets can fire in all directions, the casemate forward.

Turret Laser, 405-MJ (TL12): The previous weapon's replacement at TL12, cheaper but more powerful. The system is an X-ray laser (405-MJ output, cyclic rate ½, compact, extreme range), a 1,080-MWS power cell and fusion-reactor components generating 18 MW to permit one shot every 60 seconds. The X-ray laser is fully stabilized and installed in a universal mount (if in a turret) or casemate (if in hull). Turrets can fire in all directions, the casemate forward.

Bay Weapons

Bay weapons available are listed below. Besides the weapon, power supply and any ammunition, each also includes a pair of roomy crew stations for two gunners (though the weapon can be fired by only one person), a computer terminal, and a HUDWAC.

Missile Bay: A weapons bay housing 50 launch tubes and laser coms (each the same as the missile rack's), plus space for 3,800 standard 0.15-ton missiles.

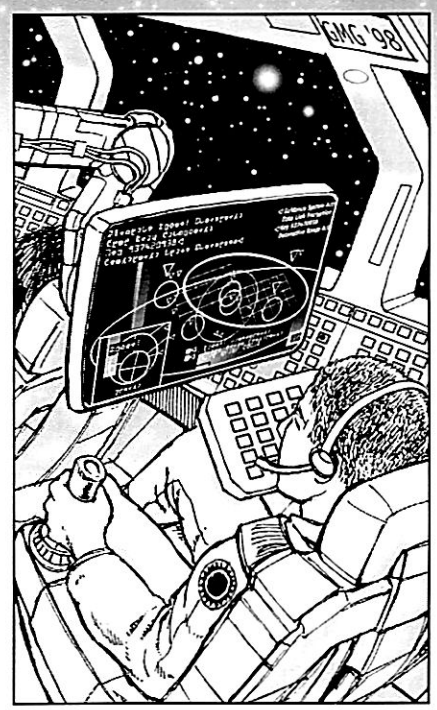
Particle Beam Bay (TL10): This weapon accelerates hydrogen nuclei to relativistic velocities, strips them of their charge and fires them. P-beams are shorter ranged but more powerful than turret lasers, and sandcasters don't affect them. The bay houses a 12,810-MJ neutral particle beam (cyclic rate ½, extreme range option), a power cell storing 25,620 MWS (enough for one shot), and fusion-reactor components generating 427 MW (recharging the power cell every 60 seconds).

Meson Gun Bay (TL12): Meson guns use nuclear dampers and particle-beam technology to generate and aim a beam of high-energy mesons (subatomic particles that carry nuclear force). Mesons pass harmlessly through normal matter, but soon decay explosively in a storm of other energetic particles – but with precise calculation a meson beam may be created and aimed so this explosion occurs inside an enemy vessel. The bay includes a 12,810-MJ meson gun (extreme-range option), a power cell storing 25,620 MWS energy (one shot), and sufficient fusion-reactor components to generate 427 MW, recharging it every 60 seconds.

Spinal Weapons

Particle Beam (TL10): This is a 569,500 MJ neutral particle accelerator (cyclic rate ½, extreme range option) installed in a fully stabilized mount, powered by a 1.139 million MWS rechargeable energy bank and 18,983.3 MW fusion reactor.

Spinal Meson Gun (TL12): A meson gun of similar characteristics to the spinal particle beam.



Jump Drives in GURPS Vehicles

If building a ship using the modular system, just plug in the requisite number of jump drive modules. However, if you want to install a ***Traveller*** jump drive in a ship built entirely with ***GURPS Vehicles***, here's how to do it.

First, decide on the intended jump number – how many parsecs the ship can jump. This cannot exceed a maximum of jump-2 at TL9, jump-3 at TL10, jump-4 at TL11, or jump-6 at TL12+.

Then assign the drive a "jump capacity" normally equal to the desired (jump number+1) × anticipated volume of the vessel.

Weight is jump capacity × 0.12 lbs.

Volume is jump drive weight/50 cf. As ships spend a week in jump, add "long term" access space equal to 2 × volume.

Cost is jump drive's weight × Cr500.

Power required is jump capacity × 0.2 kW, which must be provided continuously throughout the week in jump or the ship is lost (either dropping out of jump space or destroyed).

As well as using energy, a jump consumes gallons of hydrogen equal to displacement tons (which is body volume in cf/500) × 333.3 × the length of the jump in parsecs (round up to nearest parsec). Fuel tanks are usually ultralight and self-sealing.

To function, the jump capacity must be at least twice the volume of the ship. Once the ship's volume is known, its actual jump number can be calculated as: Jump number = (jump capacity/volume) - 1, limited by the TL maximums above. Jump capacities larger than a ship's jump number are useful for towing non-starships.

The ship must be at least 100 displacement tons.

BEAM WEAPONS COMBAT TABLE

Name	Type	Acc	SS	Damage	1/2D Range	Max Range	RoF	FP
Laser, 250-MJ	Imp.	32	30	5d×50 (2)	17,045*	51,135*	1/60	3
Laser, 405-MJ	Imp.	33	30	5d×100 (2)	26,022*	78,068*	1/60	7
P-Beam bay	Imp.	33	30	6d×1,000	14,630*	43,890*	1/60	63
Meson Gun bay	Exp.	30	30	6d×1,000 (!)	14,630*	43,890*	1/60	63 (!)
Spinal P-Beam	Imp.	36	30	7d×3,000	97,600*	292,800*	1/60	424
Spinal Meson Gun	Exp.	36	30	7d×3,000 (!)	97,600*	292,800*	1/60	424 (!)

(2) after damage means DR protects at half normal.
(!) after damage means that armor DR is ignored. In the ***GURPS Space*** system, meson guns ignore armor DF.
*Range is in *miles*. In a planetary atmosphere divide laser ranges by 100 and particle beam ranges by 50.
FP = firepower, used for ***GURPS Space*** abstract combat.

Sandcaster rules are found in the Space Combat appendix. If using ***GURPS Space*** rules, each adds +1 DF vs. lasers or missiles; each time the number of sandcasters doubles, add another +1.

SIM-10 Missile (TL10)

A standard TL10 space-interceptor missile.

Features: Very good streamlining.

Propulsion: 1,800 lbs. vectored thrust (135 lbs., 2.7 cf, 90 kW, Cr2,700).

Armament: 250mm "small" HEAT warhead self-destruct device (15.625 lbs., 0.3125 cf, Cr468.75).

Communications: Laser communicator, receive-only, very long range (1 million mi., 50 lbs., 1 cf, Cr625, 0.16 kW).

Sensors and navigation: None – guided by controlling ship.

Computer: Hardened robot brain small computer (1.5 lbs., 0.03 cf, Cr1,250, Complexity 4).

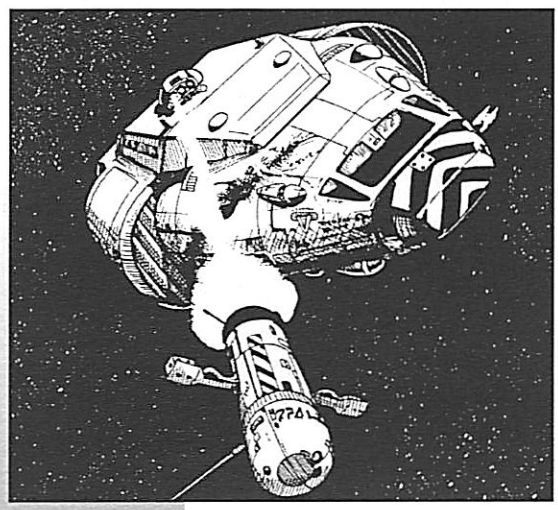
Power: Rechargeable power cell stores 324,576 kWS (18.17 lbs., 0.1817 cf, Cr1,817), good for one hour of operation.

Body: 6 cf (including 0.4875 cf empty space). Area: 20 sf. Medium frame, very expensive materials, very good streamlining, robotic (20 lbs., Cr20,000, 30 hit points).

Armor: PD 4, DR 40 advanced metal (50 lbs., Cr1,000).

Surface Features: Basic Stealth and Emission Cloaking (20 lbs., Cr3,000.)

Statistics: Volume 6 cf. Weight: 310.295 lbs. (0.15 tons). Price: Cr30,860.75. HT: 12 (30 hit points). Size Modifier: +0. Space acceleration: 6 Gs (for one hour).



Standard Missiles

If using the ***Vehicles*** space combat system, standard missiles maneuver like spacecraft under the direction of the firing gunner. In a 20-minute combat round a missile rack can fire and control one missile or a missile bay as many as 50.

The standard missile has basic emission and stealth cloaking and 6-G acceleration (TL10) or 10 G (TL12) for 60 minutes (three space combat rounds). When a missile ends its turn in a target vessel's hex, it may detonate, typically an explosive shaped charge doing 6d×60 (10) at TL10 or 6d×80 (10) at TL12. Missiles have Size Modifier +0, DR 40 (TL10) or DR 120 (TL12), and 30 HPs. (If using the ***GURPS Space*** combat system, treat as "medium explosive missile" with FP 3 at TL10 or 5 at TL12.) See sidebar for missile costs and exact statistics.

Step 7 – Statistics

Total Empty Mass: Total the mass of hull, turrets/bays, armor, surface features, chosen modules, and weapons. This is the vessel's empty mass.

Total Loaded Mass: This is equal to empty mass plus these additions:

- The weight of cargo carried. Assume 5 tons per space of cargo hold (i.e., about 20 lbs./cf) unless you desire to recalculate every time these vary.
- The mass of vessels carried in spacedocks.

Total Cost: Add together hull, turret/bay, streamlining, armor, surface features, module, and weapon costs to get the vessel's cost. This does not include the cost of carried vehicles.

Hit Points: Record hit points for the hull and each bay or turret. A hull, bay, or turret's hit points are its area × 1.5. Standard turrets have 1,200 HP. Standard bays have 9,750 HP.

Step 8 – Performance

Space Acceleration is measured in gravities (G) and determines how rapidly the vessel can accelerate or decelerate. To find space acceleration, add up the thrust in tons: This is 40 per TL10 M-drive or 100 per TL12 M-drive. Divide by the ship's *weight* in tons (*not* displacement tons). The result is the ship's space acceleration (sAccel) in G. Accelerations in the 1 G to 6 G range are typi-

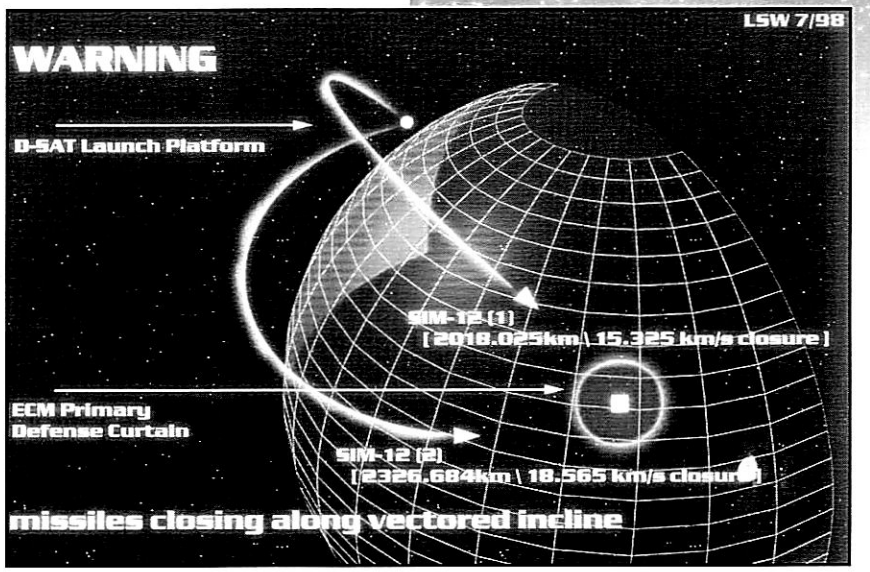
cal of ***Traveller*** vessels – at least 1 G is a good idea, to enable liftoff from a standard planetary surface without atmosphere. Designers may wish to tweak their designs (often by carefully manipulating armor mass) to give results that yield "round" numbers.

Jump Number: This is the distance a starship can jump measured in parsecs. See the description of the J-drive and jump-fuel modules for the requirements needed to jump.

Air Speed: This is the top speed in mph a streamlined vessel can fly at and still maneuver while within a planetary atmosphere. (Vessels going to and from orbit may reach higher straight-line speeds in the upper atmosphere.) To calculate it, first determine its drag: total surface area/5. Then divide thrust by drag. Multiply that by 15 million, and find the square root of the product to get air speed. Thus:

mph = square root [(thrust/drag) × 15 million]

Calculate other useful aerial-performance statistics with ***GURPS Vehicles***.



SIM-12 Missile (TL12)

A TL12 space-interceptor missile.

Features: Very good streamlining.

Propulsion: 3,000 lbs. vectored thrust (90 lbs., 1.8 cf, 150 kW, Cr9,000).

Armament: 250mm "modest" HEAT warhead self-destruct device (31.25 lbs., 0.625 cf, Cr937.5).

Communications: Laser communicator, receive-only, very long range (1 million mi., 50 lbs., 1 cf, Cr625, 0.16 kW).

Sensors and navigation: None – guided by controlling ship.

Computer: Hardened robot brain small computer (1.5 lbs., 0.03 cf, Cr1,250, Complexity 6).

Power: Rechargeable power cell stores 540,576 kWS (20 lbs., 0.2 cf, Cr2,000), good for one hour of operation.

Body: 6 cf (including 0.93 cf empty space). Area: 20 sf. Medium frame, standard materials, robotic, very good streamlining (20 lbs., Cr4,000, 30 hit points).

Armor: PD 4, DR 120 advanced metal (60 lbs., Cr1,200).

Surface Features: Basic Stealth and Emission Cloaking (20 lbs., Cr3,000).

Statistics: Volume 6 cf, Weight: 292.75 lbs. (0.15 ton). Price: Cr22,012.5. HT: 12 (30 hit points). Size Modifier: +0. Space acceleration: 10 Gs (for one hour).

Step 9 – Finalization

The vessel design is now complete. A new class of vessel is assigned a descriptive name like "mercenary cruiser" or "fast merchant" that abbreviates to a letter code (see *Ship Codes,* p. 160). Ship designs are usually also given a *class name* for the first vessel of its type to fly. Later vessels generally follow the same theme; e.g., all mercenary cruisers in the *Broadsword* class are named after archaic hand weapons.

Fitting Out: Vessels may require these additional expenditures not included in their cost:

- Computer programs (p. 161).
- Missiles (standard missile costs Cr31,955 at TL10, Cr22,050 at TL12).
- Sand canisters (replacesment cost Cr400).
- Fuel (refined hydrogen at Cr350 per fuel-tank module).
- Spares and maintenance: assumed at 0.1% of total cost of vessel per year.
- Berthing costs: To land or dock at a ground port or orbital facility, plus berthing for up to six days, costs Cr100 per displacement ton. It costs the same to stay docked for each additional week or fraction thereof.

Advanced Design Options

Compartmentalization: Vessels are already divided into airtight compartments with interior walls and pressure doors. For extra weight and cost, vehicles can have "heavy" compartmentalization (masses 10% of hull mass) or "total" compartmentalization (masses 20% of hull mass). Either type costs MCr0.01 per ton of weight added.

Variable-Mass Performance: GMs may wish to calculate multiple sets of performance figures for ships whose mass can change dramatically; e.g., for example with near-empty vs. full cargo holds, tanks, or hangar decks, or with/without drop tanks.

This can make flight operations more complex; e.g., a Free Trader might take off from a planet with empty fuel tanks to save mass, refuelling at a gas giant, ice asteroid, or space station.

After-Market Mods

Traveller has a healthy tradition of user modifications to an existing ship. ***GURPS Vehicles*** purists will note that adding components with increased power needs effectively makes the core power system larger after it's been built! Instead, consider the power "slice" of an after-market module to be a more robust cooling system or somesuch for the existing reactor. Just as a TL7 car enthusiast might have his existing engine bored out, a TL10 ex-scout will find a way to power a laser or three in that once-empty turret of his . . .

Ship Codes

The Imperium assigns one- or two-letter codes to ship designs for their intended function, either a single primary letter or a primary followed by a qualifier. Some examples:

Primary		Qualifier
A	Merchant	Armored
B	Battle	Battle, Boat
C	Cruiser or Carrier	Cruiser or Close
D	Destroyer	Destroyer
E	Escort	Escort
F	Frigate or Fighter	Fast or Fleet
G	Gig, Refinery	Gunner
H	–	Heavy
I, J	Intruder	–
K	Pinnace	–
L	Corvette, Lab	Leader, Light
M	Merchant	Missile
N	–	Non-standard
P	Planetoid	Provincial
Q	Auxiliary	Decoy
R	Liner	Raider
S	Scout, Station	Strike
T	Tanker, Tender	Troop, Transport
U	–	Unpowered
V	–	Vehicle
W	Barge	–
X	Express	–
Y	Yacht	Shuttle, Cutter
Z	–	Experimental



Starship Operations

This section explains the operation and care of a ***GURPS Traveller*** starship.

Bridge Systems

The heart of a bridge is its crew stations. A cockpit has one or two crew stations, a basic bridge has five such stations, while a command bridge has 10. Each is a seat facing a console with a computer terminal and various multi-function displays that can be reconfigured to enable any station to perform any bridge crew function – pilot, navigator, communications officer, gunner, sensor operator, and so on.

Communications

As well as seats and consoles, a cockpit or bridge has various "avionic" systems, such as communicators.

Radio: A basic multi-frequency broadcast communicator capable of sending and receiving radio signals over great distances. Transmissions may be scrambled (encrypted), but if continuous will be received by all radios within range. A cockpit has one radio, a basic bridge two, a command bridge 10.

Lasercom: A tight-beam directional communicator using a modulated laser beam. Only another lasercom can receive its signal and only if directly in the path of the pencil-thin beam. This makes transmissions secure, but it can only talk to one vessel at a time, and it must be focused on the recipient: no broadband "Free Trader *Beowulf*, Calling Anyone" SOS . . . Laser signals are blocked by solid objects, smoke or prism clouds. and sandcasters. A cockpit or basic bridge has one, a command bridge four.

Meson Communicator: This system uses a modulated beam of mesons for communication. It functions like a lasercom, but is not blocked by solid objects, smoke or prism clouds, etc. Only another meson communicator can receive its signal. Basic bridges at TL12 and both TL10 and TL12 command bridges have meson communicators.

IFF-Transponder: This sends out an automatic identification code (via communicator). Civilian systems are factory-sealed – they can be turned on or off, but the signal can't be altered; military systems can be reprogrammed to give false identities. Of course, a ship that claimed to be a 100-ton scout but appears on radar as a 50,000-ton vessel would attract suspicion, but if it claimed to be a bulk transport . . . Cockpits/system have one IFF, bridges include two to provide one backup.

COMMUNICATION RANGE TABLE

	— Communication Ranges —		
Module	Radio	Laser	Meson
TL10			
Cockpit/Systems	0.5 mil.	1 mil.	none
Basic Bridge	5 mil.	10 mil.	none
Command Bridge	5 mil.	10 mil.	0.1 mil.
TL12			
Cockpit/Systems	0.5 mil.	1 mil.	none
Basic Bridge	5 mil.	10 mil.	0.02 mil.
Command Bridge	5 mil.	10 mil.	0.2 mil.

Communicator ranges are in *millions* of miles.

Sensors

Bridge and cockpit/system module avionics generally consist of four standard sensor types: PESA, AESA, radscanner, and radar/laser detector.

Passive Electromagnetic Sensor Array (PESA): This is an array of infrared thermal imaging and low-light telescopic sensors. A PESA gives the bridge crew a visual picture of objects within its sensor range. The PESA is mounted in a small pop turret that can extend out to scan a 360-degree arc.

Radscanner: This is a multi-function energy scanner that can detect and scan for various types of radiation, such as radio, neutrino, or radar emissions. It can detect the neutrinos emitted by fusion-power plants – this is a good way to tell a scoutship from a dreadnought . . . It is capable of detecting radiation from all directions simultaneously.

Active Electromagnetic Sensor Array (AESA): A multi-mode sensor that works as a radar, imaging radar, and ladar. In radar mode it detects objects within its range, although they only appear as "blips" with inexact size and shape. In imaging radar or ladar mode, it has only half its range but better resolution: Objects appear as actual silhouettes permitting identification of known vessels and exact determination of size.

SENSOR RANGE TABLE

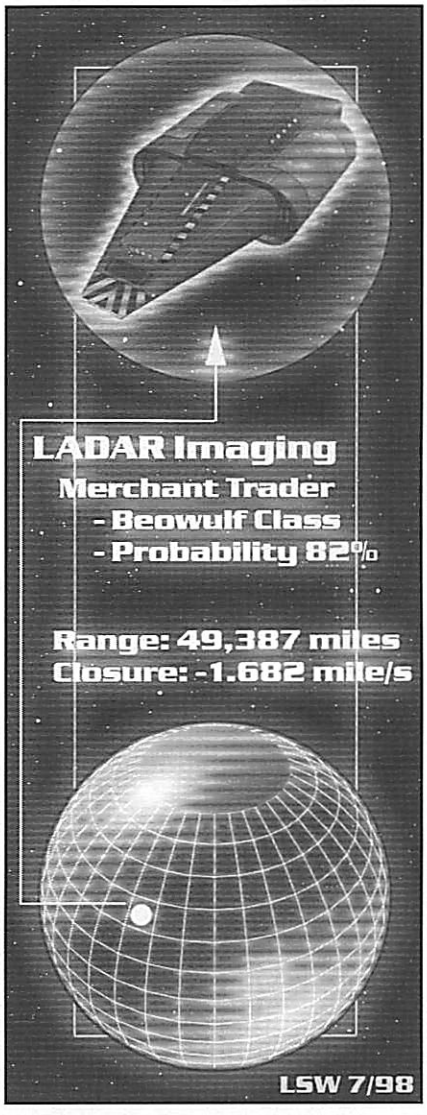
	— Sensor Range in Miles —		
Module	**PESA**	**AESA**	**Radscanner**
TL10			
Cockpit	10,000	50,000	1,000
Basic	20,000	100,000	2,000
Command	50,000	150,000	4,000
TL12			
Cockpit	20,000	70,000	2,000
Basic	30,000	150,000	10,000
Command	100,000	200,000	30,000

Sensor ranges quoted above are averages for detecting a man-sized object, such as a person in a vacc suit or a missile. Big ships can typically be detected at 5-20 × these ranges, but actual ranges may vary greatly in various situations – see the *Space Combat* table of modifers on p. 173.

In atmosphere, PESA and AESA sensors (but not radscanners) have one-tenth this range.

In any mode it will also function as a rangefinder, feeding targeting data to weapons consoles and giving +2 to hit detected objects. It's mounted in the same pop turret as the PESA.

Advanced Radar/Laser Detector: This sensor can detect and locate any operating radar or ladar sensor (such as an AESA) within twice that sensor's range. For this reason any vessel wanting to avoid detection will often turn off their active sensors and rely solely on their passive PESA sensor arrays. All bridges include two of these for redundancy.



Computers

Each bridge or cockpit system incorporates *three* computers: a trio of microframes in the cockpit, mainframes in the basic bridge, and macroframe "super computers" in the command bridge. The computer's Complexity is shown at right.

COMPUTER TABLE

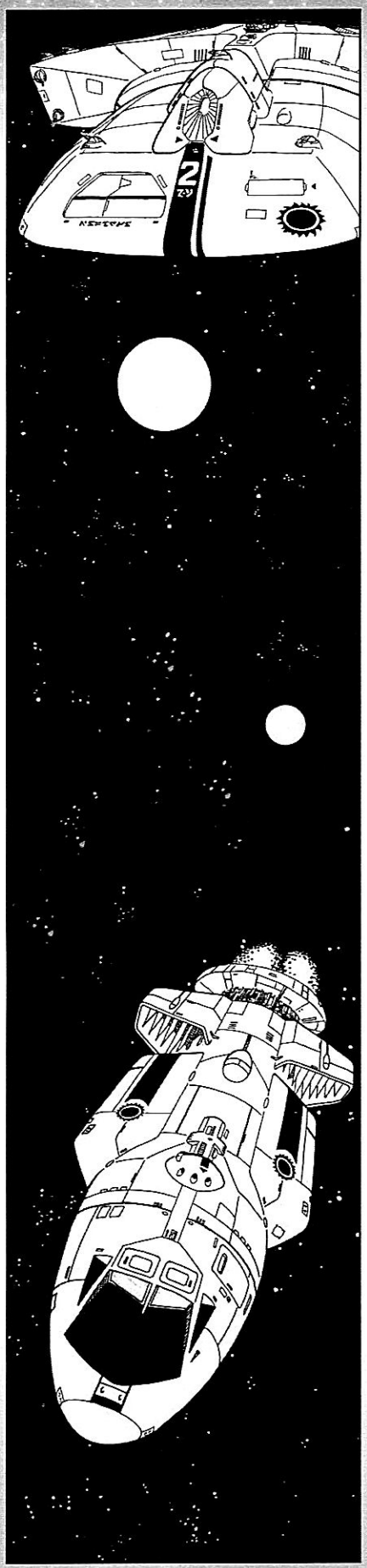
	Complexity	
Module	**TL10**	**TL12**
Cockpit	6	8
Basic	7	9
Command	8	10

Any cockpit, bridge, sickbay, turret, or bay incorporates computer terminals that can access the computers.

Using Computers

Every computer has a Complexity rating which governs the software it can run and how fast it will run. Each +1 Complexity represents an order-of-magnitude performance increase.

A computer needs programs, which also have Complexity ratings. A computer of a given TL and Complexity can't run higher-TL or higher-Complexity programs. The number of programs that can run concurrently is based on computer Complexity: two programs of its own Complexity, 20 of Complexity-1, 200 of Complexity-2, etc. They can be mixed; e.g., one at Complexity, nine more at Complexity-1, and 100 more at Complexity-3. Switching a program takes only a few seconds. Programs vital for space operations include:



Astrogation: Needed to make an interstellar jump. Complexity equals jump distance+1. Costs Cr10,000 × jump number.

Datalink: Used to share realtime data with other computers, sensors, missiles, etc. Complexity 1, Cr400.

Damage Control: Monitors systems status, +2 to rolls to repair ship damage. Complexity 2, Cr2,000. Also requires ship blueprints (1 gigabyte and Cr1,000 per ship).

Gunner: In conjunction with a Targeting program, it lets the computer act as a gunner with skill-12. Complexity 4, Cr45,000, double cost and +1 Complexity per +1 added to skill. The bonus to skill is not cumulative with a Targeting program – use the *lower* of the Targeting or Gunner program bonus.

Library Data: An encyclopedia program containing detailed non-classified information on the Imperium. Not always up-to-date for all worlds, but licensed owners can often download supplementary data at local starports. 100 gigs, Cr100,000.

Targeting: Predicts target positions and helps aim weaponry adding a bonus to a gunner's skill equal to its Complexity+1. Costs Cr1,000 for Complexity 1 program, doubling per +1 Complexity increase. One needed per human or computer gunner. Due to the long ranges at which spacecraft engage their opponents, a targeting program giving a +7 to +10 bonus is *strongly* recommended for all armed spacecraft!

More programs can be found on pp. UT33 and VE63.



Power Plant

The standard shipboard power plant at TL9-12 is a fusion reactor. Its supply of internal hydrogen fuel is sufficient to operate it for 200 years without refuelling under ideal conditions, but without annual checkups in a major shipyard it can cease functioning – a ship that misjumps ending up years away from home (by sublight speeds) may have trouble returning.

Fusion reactors are fairly safe: If an operating reactor was destroyed, steam and high-energy plasma might wreck and irradiate the engine room, and this might cause a steam explosion, but there wouldn't be a nuclear blast.

Other Ship Systems

Navigation Electronics: Bridge and cockpit modules each include precision navigation and inertial-navigation systems (one in a cockpit, a pair on basic and command bridges).

Flight Recorder: All cockpit and bridge modules include a tough "black box" flight recorder (like those on modern aircraft) that records voice transmissions and instrument readouts. One is in a cockpit/systems module or basic bridge, a pair in a command bridge.

Fire Suppression System: Vessels are normally fitted with automatic fire and explosion extinguishers that use non-toxic inert gas to smother fires within microseconds. One fire-suppression system is in each bridge, cockpit/systems, and engineering module.



This system resolves space actions on a hexagonal grid using counters or miniatures, much like the *Advanced Combat System* does personal combat. It's intended for vessels created with the ***GURPS Traveller*** modular system, but is also usable with other ***Vehicles***-built spacecraft. It is derived from the system in ***GURPS Vehicles*** but makes several changes in scale and modifiers to better reflect the high-gee, long-ranged space battles of ***Traveller.*** GMs should feel free to use it in non-***Traveller*** campaigns where ships have multi-G thrusts and weapons have ranges in the tens of thousands of miles.

Blank hexgrids may be photocopied from the ***GURPS Basic Set***. GMs will have to devise their own counters.

Scale and Definitions

Space battles are fought in 20-minute combat rounds. One map hex is about 10,000 miles. Each spacecraft counter represents a single vessel or a salvo of missiles. A velocity of one hex per round is a speed of about 30,000 mph. "Acceleration" is measured in Gravities (G). For tactical combat purposes (not long-distance travel) round accelerations over 1 G to the nearest full Gravity.

Any unqualified use of the term "spacecraft" can be assumed to encompass ships, small craft, and missiles.

Preparation

In addition to a hexagonal grid map, each spacecraft requires two counters: a "spacecraft counter" (or miniature) representing the vessel's location and a "vector counter" marking its future position. Both should be distinct, but marked with the same ID.

Just like characters, spacecraft and vector counters must be placed on the map so they are fully inside a hex. Spacecraft must always face a particular hex side (although facing can be ignored if the ship has no fixed weapons). Facing of vector counters is unimportant.

The GM should prepare statistics of the spacecraft involved and their most important crew (captain, pilot, gunners, engineers, sensor and commo operators). As gunnery skills are subject to large modifiers due to the systems or weapons used, the GM can save time by calculating an "adjusted gunner skill" for each gunner, human, or computer controlling beam weapons:

Adjusted Gunner Skill is Gunner base skill modified as follows:

+ Weapon's Accuracy (up to Gunner skill level). As all standard-design weapons have Acc 30+, this means the bonus is generally limited to an effective doubling of gunner skill.

+ Weapon's RoF bonus. This is +7 for standard weapons, which are all RoF 1/60. For ***Vehicles***-built weapons that have different RoFs, refer to the *RoF Bonus Table,* p. 174.

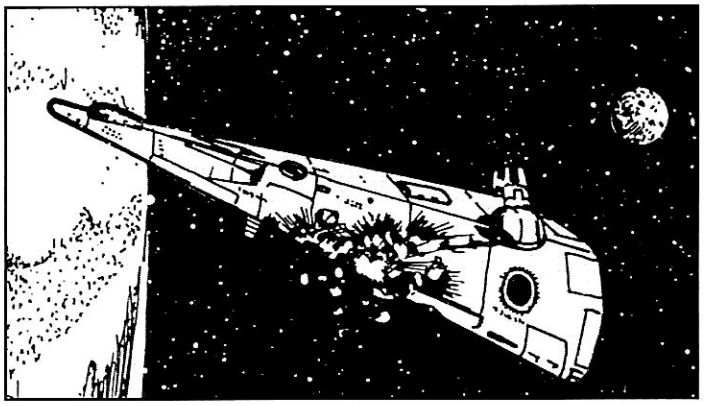
+ Targeting program's Complexity+1. (Do not add this bonus if the weapon already has a computer Gunnery program.)

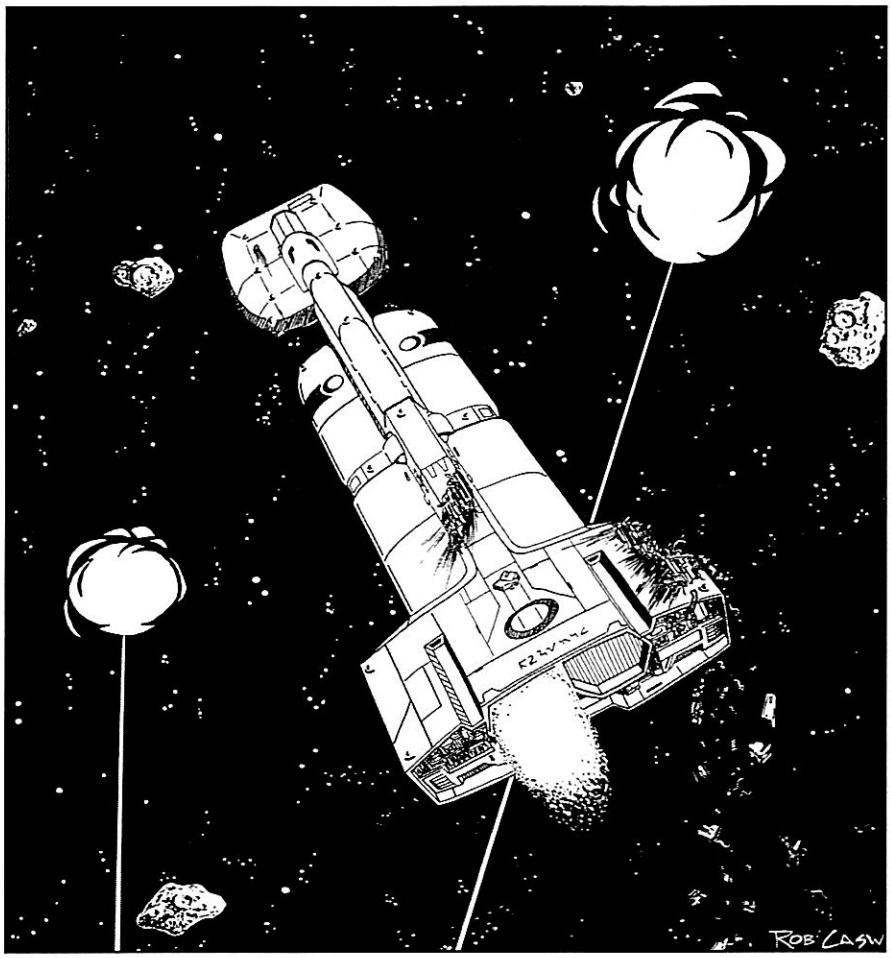
Thus, for standard weapons, adjusted gunner skill simplifies as: (Gunner skill × 2) + 7 + Targeting program bonus.

Setting Up

The GM should only set up a map and counters if space actions are a possibility (or he wants players to think they are). While deep-space encounters are possible, most action occurs within 100 planetary diameters of a world, as ships head to and from the world and the safe jump distance. For example, if the world was 8,000 miles in diameter, encounters might occur anywhere from orbit to 800,000 miles out: 1 to 80 hexes away.

If space action seems imminent, the GM should first place any planets, moons, or other large bodies on the map (see *Celestial Bodies,* p. 170). Different planets will be tens of thousands of hexes apart, but a planet/moon system may fit on the map – e.g., Luna's average distance from Earth is 24 hexes.





The GM secretly decides on the location and course of NPC spacecraft, then, before revealing the location of any vessels, asks players to provide him with the same information for their vessels. Based on this, the GM should place friendly, neutral, and hostile spacecraft (except any carried aboard ships) on the map. (The GM may sometimes wish to keep some unspotted craft "off the map" to surprise players, especially stationary vessels hidden on or behind worlds.) In a duel between players, they should secretly record their general formation ("ship #1 in the lead, ship #2 two hexes to the right . . .") and vector length (in hexes).

Place each spacecraft's counter where the spacecraft is, and its vector counter where the spacecraft will be next round if it does not maneuver. The position of the vector counter is its course, while the distance from the spacecraft to its vector counter is its velocity. Thus, a stationary spacecraft has its vector counter in the same hex it occupies, one moving at one hex per round (30,000 mph) toward a planet would have a vector counter in the adjacent hex closest to the planet, and so on. Relatively low velocities (1-5 hexes/round) are most playable, as vessels that move too fast will take a long time to turn about.

How far apart should spacecraft begin on the map? That depends on the situation. In a system with a busy starport (V to III), there's usually a fair bit of traffic passing by, and captains won't start getting antsy until a vessel passes within a half-light second or so (7-9 hexes). Likewise, if players are planning nefarious activity of their own, an enemy won't usually pay much attention to them until they get within that distance. In an actual war zone, or in frontier systems, any contact might be suspicious. The GM may wish to start checking for detection within a light second or two (e.g., 18-37 hexes range). On the other hand, if an enemy vessel was hiding behind a planet, asteroid, or moon, the combat could begin at only a few hexes range as it suddenly appeared within line of sight.

If it's a set-piece battle or a random encounter, the GM should take care to place ships with converging vectors, while if it's a chase, place the quarry in the middle of the map and the pursuers at one end, bearing in mind that the pursuer will be unable to catch up unless he possesses a faster ship or missiles. Care should also be taken when placing things that can't maneuver (or can't maneuver much) in the context of the game; i.e., stations, satellites, or low-acceleration ships.

Sequence of Action

Play proceeds through this sequence each round. There are no individual turns per se: Detection is checked for all spacecraft, then maneuvers are made for all spacecraft, and so on.

1. *Detection and Communication.*
2. *Maneuver.*
3. *Movement.*
4. *Direct Fire.*
5. *Collision and Point Defense.*
6. *Launch/Docking.*
7. *Damage Control.*

If one spacecraft has yet to spot another, the unaware crew may not take previously unplanned actions until events such as hostile fire or detection alert them. The GM should go through the Sequence of Action each round, checking to see if unaware vessels have detected opponents (phase 2) and moving the spacecraft (phase 3). Once a crew becomes aware of a potential threat (or target!) it can begin to maneuver, fire, etc. Until then, though, a ship should continue on its pre-planned course. Eventually, all spacecraft will either spot one another, reach their destinations, or drift apart and go their separate ways.

1. Detection and Communication

Each space combat round, check to see if spacecraft detect previously unnoticed objects. Large objects like planets, stars, or moons are automatically spotted. GMs may require sensor rolls to find smaller bodies like asteroids, if they aren't on charts.

At the start of this phase, the GM should secretly decide whether NPC spacecraft are using active sensors (such as AESAs) or sending out radio broadcasts, then ask players to reveal if their own spacecraft are "going active" or broadcasting. If using an AESA, specify whether using it as a radar or ladar.

After these decisions are made, the GM should check for detection – there are several ways in which another object can be detected or deliberately announce its presence. Detection depends on picking up communicator or transponder transmissions, enemy fire, or active sensor emissions with radscanners – or upon use of PESA or AESA sensors to locate other craft.

All three types of sensor can be used in a single round. If a ship has multiple sensors of the same type (e.g., extra bridges) only check detection for the sensor with the highest combined operator skill and scan rating in that category.

If a single sensor operator tries to use more than one sensor type in a round, he rolls at -2 per extra sensor he's using.

While successful detection with any sensor type alerts a vessel to an opponent's presence, beam-weapon fire is only allowed against vessels detected with targeting sensors. AESA or PESA are targeting sensors; radscanners are not. (Missiles can still be maneuvered to attack targets detected only by radscanners.) Detecting a vessel with one sensor type doesn't mean detection with the others, but gives a bonus to do so on *later* rounds (see *Sensor Modifier Tables,* pp. 172-173).

Radscanners

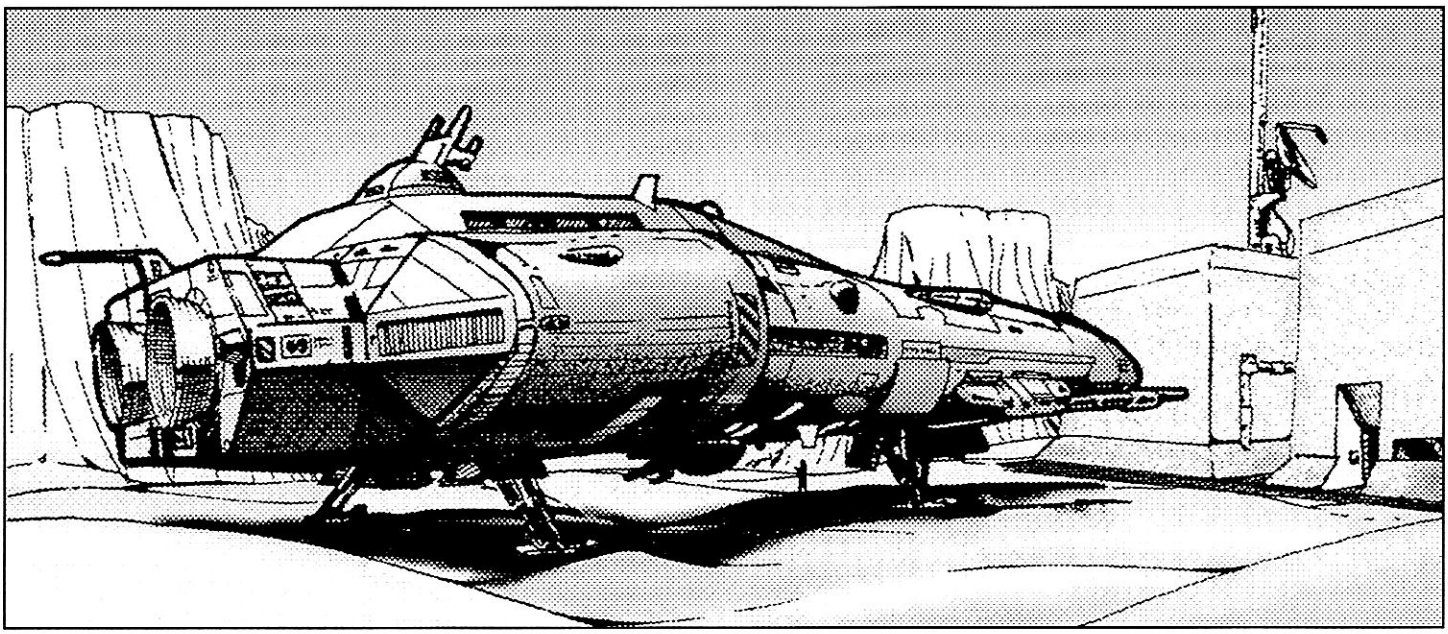
Cockpit and bridge modules include radscanners. They are normally used in space as radar/radio/laser/particle detectors. If the ship was hit by laser or particle-beam weapons fire on the previous turn, its radscanners automatically detect the firer's position. Otherwise, a radscanner can check for detection if an undetected object is broadcasting on radio, using transponders, or has "gone active" with an AESA or other active sensor.

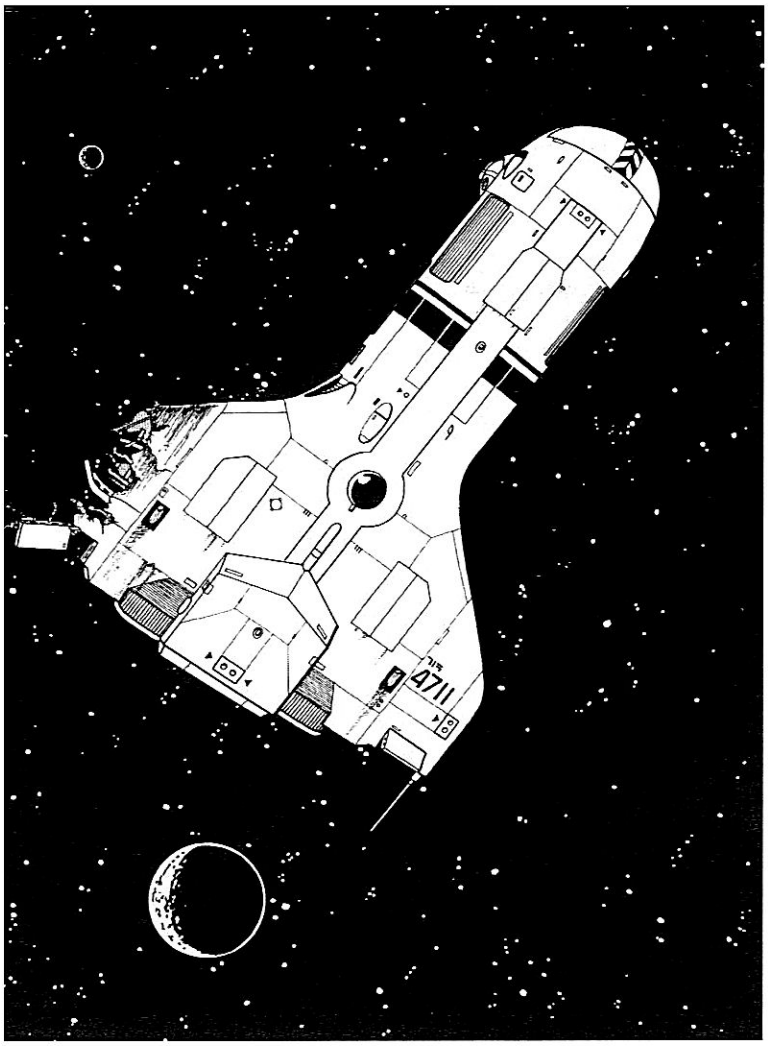
To determine if a transponder, radio broadcast, or active sensor use has been detected, roll vs. the sensor operator's Electronics Operation (Sensors) skill, adding appropriate modifiers from the *Sensor Modifiers Table* (pp. 172-173). Failure means the object's emissions went unnoticed (or were overlooked against the general radio noise in a system).

Success means the emitting object is detected: Its location is known, along with information on the type and strength of emission it was broadcasting (radio, active sensor, transponder, etc.). The detecting ship is now alerted.

If a detected object has a broadcasting transponder, that signal also provides the vessel's name, registry, and traffic-control information (ship class, identity number, origin, and destination); e.g., "Type-R merchant *Gyro Zorina,* ID #17960327DY5, Rhylanor registry, inbound Hefry to Regina."

At very close (0 hex) range, radscanners can also provide information on whether target power plants are functioning, etc.





Passive Electromagnetic Sensor Arrays (PESA)

All standard-design spacecraft incorporate an array of thermal-imaging, passive-radiation, and visual-detection systems, collectively called a PESA. If an undetected object is within sensor range (and not hidden behind a celestial body), the GM should make detection rolls to see if the PESA has detected it.

Roll against the sensor operator's Electronics Operation (Sensors) skill, adding appropriate modifiers from the *Sensor Modifiers Table* (pp. 172-173). Failure means the object is not detected, but another try may be made next round.

Success by 0-2 means *detection.* The object's existence has been discovered, alerting the spacecraft to its location and course.

Success by 3-4 means *detection and recognition.* The object is detected, and its general shape resolves as a fuzzy image.

Success by 5+ means *detection and identification.* The object appears "on screen" as an actual image.

Once detection is achieved, it is retained unless something occurs that would interrupt a direct line of sight between the vessels, such as a ship moving behind a planet. If only detection or recognition was achieved, on later rounds further attempts at detection may be made to "improve the picture." If so, ignore any results that would lower the degree of detection achieved.

Any objects that a spacecraft launches after it has been detected are spotted automatically. Thus, if a spacecraft that has been identified fires missiles, they are identified as they launch.

Active Electromagnetic Sensor Arrays (AESA)

Ships with a standard-design cockpit or bridge module incorporate an array of radar and ladar sensors known as AESA. An AESA provides precise ranging information, but its use emits electromagnetic radiation that will usually give away the vessel's position, so wary vessels often leave it turned off.

An AESA can only be used if the decision was made to "go active" at the start of this phase. An AESA also improves the chance of hitting targets with direct fire; even if an enemy has already been detected, this is an advantage to "going active."

Use the same procedure as for PESA systems, but use the AESA scan ratings and skill modifiers instead (see *Sensor Modifier Table,* p. 172-173). Also, if using an active sensor as search radar rather than ladar, treat "detection and identification" as merely "detection and recognition."

2. Maneuver Phase

In this phase, all spacecraft with working M-drives may maneuver. Spacecraft maneuver in order of lowest to highest acceleration (in gravities); spacecraft of equal acceleration maneuver in order of highest to lowest Size Modifier. Break ties with a quick contest of Tactics skill between the respective captains. The spacecraft's pilot (or controlling gunner, for a missile) decides how the spacecraft will maneuver.

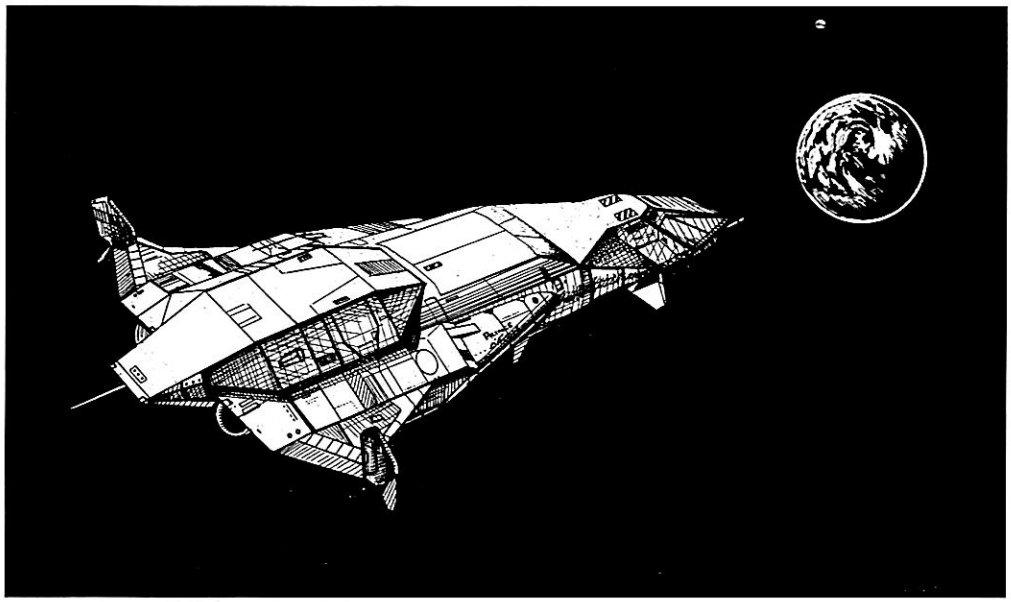
On its turn to maneuver, a spacecraft may change facing and/or accelerate. A spacecraft may change facing so it faces any hex-side. Acceleration is performed by moving its *vector counter* a number of hexes *in any direction* to a maximum of the spacecraft's acceleration. Round acceleration to the nearest G for this purpose.

Slow Acceleration: If a spacecraft has an acceleration substantially under one G, it will not accelerate every round. It requires (1/G) rounds to make a one-hex vector change (round down). For example, a spacecraft capable of 0.3 G accelerates every 1/0.3 = 3.33 rounds, rounded off to every three rounds.

Endurance and Missiles: A spacecraft with a fusion power plant and reactionless thruster M-drive has no fuel restrictions. However, the power cells that energize standard missiles store energy for only three rounds; GMs may wish to use a die next to missile counters to keep track of their remaining power. Other craft built with

GURPS Vehicles may be limited in the number of rounds of operation and/or acceleration before running out of fuel or energy.

Control of Missiles: Standard shipboard missiles are drones remotely piloted by their gunner. The missile can only maneuver if in sensor *and* communicator range of its launcher. A single gunner (one per turret, two per bay) can control one missile per communicator dedicated to this purpose. Standard missiles use laser communicators. One laser communicator is built into each missile rack and 50 into each missile bay. If a gunner has to drop a missile because he can't control all the ones he has, he may "reacquire" it on a later round. Missiles can be (and often are) pre-programmed to self-destruct after a certain number of rounds uncontrolled.



3. Movement Phase

Spacecraft can move in any order – it doesn't matter. For each spacecraft, the GM or a player should do the following:

1. Put a marker (e.g., a small coin or die) in the spacecraft's hex as a placeholder.

2. Move the spacecraft into the same hex as its vector counter.

3. Visualize a line between the placeholder and the spacecraft's current hex and move the vector counter a number of hexes along that line equal to the distance from the placeholder's hex to the spacecraft's hex.

(In other words, the spacecraft moves into the same place as its vector counter, and the vector counter is moved to a new location along the same projected course. In this way, a spacecraft that does not otherwise accelerate will continue to move each round in the same direction. Facing has no effect on movement – all that matters is the vector counter's location.)

4. If a spacecraft passes close to a world, it may be affected by gravity. The hexes adjacent to worlds are gravity hexes – see *Celestial Bodies* (p. 170). Imagine a line from the placeholder's hex to the spacecraft's hex – this is the spacecraft's course. For each gravity hex that this line passes through, visualize an arrow from that gravity hex pointing to the planet and move the *vector counter* one hex in that arrow's direction.

5. After gravity effects, if any, are resolved, remove the placeholder marker and go on to the next spaceship's movement.

Some other special factors may influence movement.

Collisions: If a spacecraft's course intersects a planet-sized celestial body, the spacecraft may either crash into it or land – see *Celestial Bodies* on p. 170. However, any number of spacecraft may safely occupy or pass through the same hex containing small bodies like asteroids or other spacecraft.

Vector Adjustment: Spacecraft moving at very high velocities may move off the map. If this seems likely, the GM should simply move all spacecraft, planet, and vector counters a fixed number of hexes in an appropriate direction. (If necessary, record locations of planets or ships that "disappear" off map.) Another possibility, of course, is to lay down a second mapsheet.

Ramming: After *all* spacecraft have completed their movement, a spacecraft that has other spacecraft (or other things) in its hex may attempt to ram. This is the way standard missiles attack. Ramming must be declared at the end of the movement phase by the craft's pilot (or missile's gunner); the target of a ram may cooperate or attempt to evade the ram, or even announce that it is ramming a different vessel. The actual results of ramming are resolved in the *collision* phase, but the decision must be made now, as a vessel closing to ram becomes easier to hit. A spacecraft may only try to ram a single target each round.

See *Celestial Bodies* (p. 170) for more on landing and takeoff.

4. Direct Fire Phase

Direct fire is fire performed using beam or gun weapons such as lasers. Spacecraft perform direct fire one at a time. All fire is considered simultaneous – resolve attacks sequentially, but actual damage should not be applied until the end of the phase.



When it's a spacecraft's turn to fire, resolve fire one gunner at a time – that character decides whether to shoot and whom to shoot at. Also in this phase, a gunner controlling sandcasters should indicate the spacecraft the 'caster will be protecting against – this protection continues until the gunner's turn to act on the *next* round. (See *Using Sandcasters* on p. 172 for more information.)

A single gunner can fire the weapons in his turret or bay; the gunner must be in the crew station in his turret or bay to control its weapons. Other hull-mounted weapons can be fired by a single gunner from a bridge crew station. A Gunner program running on the spacecraft's computer can replace a single gunner. A single gunner can only fire at one target per round.

Each weapon may only attack once (regardless of its actual rate of fire) – in a space combat round, weapons are firing multiple carefully aimed tracking shots over the 20-minute period. Thus, while a standard weapon has a RoF of 1/60 (one shot per minute), for playability only one attack is allowed per weapon, to prevent the game degenerating into dozens of rolls. Higher RoF weapons get a bonus to hit, rather than multiple attacks.

Use this procedure for each weapon that is being fired:

First, the gunner chooses the target. Missiles *can* be targeted in this phase. A weapon can fire on any target the gunner's spacecraft has detected with a targeting sensor that is within his weapon's maximum range and arc of fire. Ranges in hexes are shown on the *Space Weapons Table.* Weapons in bays/turrets may fire in any direction. Weapons in hull mounts can fire at any targets in front of the spacecraft – use the normal "arc of vision" (p. B115). Weapons in spinal mounts can fire at targets in the spacecraft's hex and in a row of three hexes wide extending from its three front hexes straight forward out to maximum range.

Second, determine the modified Gunner skill of the firing character (or program) using the *Gunner Skill Modifiers Table* (p. 173), then roll against modified skill to determine if the hit occurred. In the 20-minute combat rounds, an attack roll scores a number of hits on its target equal to half the margin of success (minimum one hit). Thus, success by 0-3 scores one hit, success by 4-5 scores two hits, and so on.

Third, spacecraft with at least 0.1 G thrust can Dodge: roll vs. (Piloting skill + thrust in G - ship Size Modifier)/2, rounded down. Modifiers: +1 if pilot has Combat Reflexes; + ship PD (4 usually, 0 vs. meson gun). Ramming craft cannot Dodge point-defense fire.

For each hit not dodged, determine hit location. If the target spacecraft lacks bays or turrets, the attack hits the hull. Otherwise, roll 1d: On a 1-2, it hit a turret or bay of the attacker's choice. On a 3-6, the attack hits the hull.

For each hit, roll the weapon's damage dice (see *Space Weapons Table* on p. 173). Damage is halved beyond the ½D range. Subtract target DR (modified by armor divisor). Sandcasters offer extra DR against lasers (see *Using Sandcasters,* p. 172). Meson screens (p. 154) sometimes give DR against meson guns (see *Meson Guns and Meson Screens,* p. 171). If damage penetrates armor and screens, subtract it from the hit points of the hull, turret, or bay location that was struck. On a critical hit, the attacker may choose to do double damage or have defenses protect at one-tenth DR.

Damage Effects

Damage effects are calculated immediately but do not "take effect" until the end of the direct fire phase – thus, everyone has a chance to fire before being killed or crippled.

A hull ("body"), turret, or bay reduced to 0 or fewer hits is "disabled." One reduced to -5 × its original hit points is "destroyed." The effects are described below:

Hull Disabled: The spacecraft is crippled, out of power, and leaking any air. A crippled vessel continues to move, but cannot maneuver, jump, or use shipboard systems like sensors, computers, communicators, or weapons. Piloted spacecraft (such as lifeboats or fighters) can still be launched.

Hull Destroyed: The spacecraft loses structural integrity. At the GM's discretion it may break up or even explode. Occupants may be killed, trapped in wreckage, or escape depending on the situation. GMs may require a successful Vacc Suit roll to survive.

Turret or Bay Disabled: Weapons and other systems built into that turret or bay no longer function.

Turret or Bay Destroyed: As above, but no repairs possible; systems must be replaced at full cost. Crew members take 5d damage each (personal DR does not protect).

More specific damage effects, such as disabled drives, may occur. Each time cumulative damage to a ship or smallcraft hull reaches a multiple of 10% of the spacecraft's original hit points, roll 3d on the *Major Damage Table* (see p. 174) and apply the result on the table to the spacecraft. This simplifies the ***GURPS Vehicles*** advanced-damage system, but gives more flavorful results with ***GURPS Traveller***-designed vessels.

5. Collision and Point Defense Phase

If a spacecraft attempted to ram its target and was not destroyed by enemy fire, resolve the ram attempt as described here. If multiple spacecraft are ramming each other in the same hex resolve them in order of highest to lowest acceleration, then lowest to highest Size Modifier, breaking ties with a Quick Contest of Tactics.

After a ram is announced, the target spacecraft may attempt to use point-defense fire as a "last chance." Fire is allowed even if the weapon fired during the direct fire phase. Point-defense fire is resolved exactly like normal direct fire against a target at 0 hex range, except that weapons receive a bonus to hit due to the closing range and much simpler target solution.

Each beam weapon can only fire *once* in the point-defense phase. If its gunner scores multiple hits (see p. 168) he may divide those hits among different targets (for example, several incoming missiles) rather than hitting the same target more than once, as long as these other targets are craft that are no harder to hit than his first target. This means a single beam may, on average, stop two or three missiles. Sandcasters may be fired as point-defense weapons: Treat them as TL10 turret lasers for this purpose against missiles. A hit destroys a single missile, but has no effect on larger vessels.

If both spacecraft cooperate in ramming each other, the attempt succeeds automatically. Otherwise it is a Quick Contest of Piloting skill between rammer and the evading target. Missiles use their controlling Gunner's skill, with a -1 per 3 hexes range from *controlling spacecraft* to the target. Add the target Size Modifier to rammer skill; a craft with a higher acceleration adds half the difference in G to skill (round down).

If the rammer loses or ties, it fails to hit the target. If this occurs, nothing happens: it remains in the current hex. If the rammer wins, both spacecraft collide.

A collision inflicts crushing damage on both spacecraft equal to the relative velocity times the lower of the two craft's hull hit points times 20d (5) – that is, armor protecting at ⅕ DR. As both craft will be in the same hex, relative velocity is the distance between their respective vector counters. For a standard missile with 30 hit points, this simplifies to 6d×100 (5) × relative velocity. A missile's gunner may choose to detonate the warhead's shaped-charge warhead *instead* of doing impact damage. This is more effective if relative velocity is 0-1. Standard missiles use shaped-charge warheads doing 6d×60 (10) damage at TL10 or 6d×80 (10) at TL12 – the (10) means armor protects at one-tenth DR.

Ramming an asteroid, planet, or moon won't do damage on a planetary scale, but can devastate an area – aside from warhead effects, assume anything nearby takes explosive concussion damage from the impact based on one-tenth the collision damage.

6. Launch/Docking Phase

In this phase spacecraft may launch missiles and other craft in order of lowest to highest captain initiative.

A missile rack can launch one missile and a missile bay can launch up to 50 (subject to remaining ammunition). A spacedock or vehicle bay can launch any number of vessels carried in it or initiate docking and recovery operations with any number of vessels per bay, but not both at once.

Newly launched spacecraft are placed in the launching vessel's hex; place their vector counter in the same hex as the launching spacecraft's vector counter. The launch mechanism of missile bays or racks may impart an additional 1-G acceleration as it launches – if desired, place the missile's vector counter in any adjacent hex.

Docking: A spacecraft can dock with another (link airlocks using passage tubes) if both have matched courses. One of the docking spacecraft must be capable of maneuver; the other must either cooperate, or be crippled and unable to maneuver. Safe docking requires precise maneuvering and takes a complete round. Neither craft may maneuver in the *next* space combat round's maneuver phase, and the docking maneuver is not completed until the beginning of the next round's docking phase. Docked spacecraft can maneuver while docked provided that they continue to match courses and don't exceed 1 G acceleration. Undocking is faster: It takes a single phase and does not restrict maneuver.

Recovery: A spacecraft can recover smaller craft into a spacedock or vehicle bay if it meets the above docking requirements and the smaller craft can fit aboard. The smaller spacecraft is taken aboard at the beginning of the next round's launch/docking phase.

Matching Courses: Two spacecraft have matched courses if both occupy the same hex *and* both their vector counters also occupy a single hex.

Emergency Docking and Recovery: A docking or recovery operation can be performed more quickly. The maneuvering craft makes a Piloting skill roll. If the roll succeeds, the docking or recovery occurs in a single round – there's no restriction on maneuver next round. If it fails, the two craft collide, each taking dice of damage equal to 1/10 the smaller spacecraft's hit points (this is equivalent to a collision at about 20 mph).

7. Damage Control Phase

In this phase, engineers can attempt to repair damage to their spacecraft.

An engineer can repair either hull damage, damage to a specific subassembly (a turret or bay), or a single major system (such as the M-drive) that was damaged or knocked out by a roll on the *Major Damage Table.* Spacecraft with multiple engineers can divide them into teams working on the same or different areas. Assigning them is usually the responsibility of the chief engineer.

Disabled hulls or subassemblies can be repaired, but destroyed ones can't – they must be replaced in a shipyard.

To determine the success of repair attempts, roll against the engineer's Mechanic or Engineering skill. Modifiers: -2 if working on a disabled hull or subassembly. If a team is working under a chief engineer's direction, all may add +1 to skill if the chief engineer makes a successful Leadership roll.

If a single engineer is making repairs, a number of hit points of damage are regained equal to the margin of success. For a team, use their average skill but multiply the margin of success by the number of engineers to get hit points repaired.

If repairing a hull or subassembly, reduce its accumulated damage by the hit points repaired. If disabled it begins to function again after being raised above 0 hit points. When repairing a system knocked out by Major Damage rolls, assume that getting it working requires accumulating hit points' worth of repairs equal to 10% of the hull's original hit points.

A critical success doubles the hit points repaired. On a critical failure, roll 1d: On a 1-3, there is an accident; a plasma or hydrogen leak, a fire, or a collapsing weakened structure does 5d damage to an engineer. On a 4-6, there is a setback (someone cut the wrong cable or turned on a circuit breaker before it was ready) and the area being repaired suffers 1d damage multiplied by the number of engineers in that team.

Rushed Repairs: Engineers can rush ahead on repairs, ignoring safety procedures, performing dangerous jury-rigs, and so on. Multiply the number of HPs repaired by 5, but any failure is a critical failure, and on a critical failure roll three times for effects.

Celestial Bodies

While most of space is empty, the valuable parts aren't. Many engagements will take place around planets and other strategic objectives.

Worlds

These are planets and moons whose diameter is 1,000 miles or greater. Typical inhabited world sizes are 10,000 miles or less and so comfortably fit in a single hex (Earth is 8,000 miles across). Worlds should be represented on the map either by drawing a circle or placing an appropriate counter in a hex.

Line of Sight: A world blocks line of sight past it: A spacecraft may use PESA and AESA sensors, laser communications and direct fire (except with meson guns) into but not through a world hex.

Gravity: The six hexes adjacent to a world with a surface gravity of 0.25 G or more are its "gravity hexes." They affect spacecraft passing through them, as described in the *Movement* rules. The world's hex itself is *not* a gravity hex. If the world's surface gravity is over 0.5 G, gravity effects are mandatory. Otherwise, the pilot may decide whether to pass close enough to the world for them to take effect. (If he passes through more than one of a world's gravity hexes, then if one takes effect, all must take effect.)

High Orbit: A spacecraft which moves one hex in the movement phase directly from a gravity hex to an adjacent gravity hex is in orbit. The spacecraft's movement should carry it around the planet without any further acceleration being required.

Low Orbit: A stationary spacecraft in a world's hex is assumed to be in low orbit.

Takeoff: A spacecraft on a world's surface may leave that world by accelerating into an adjacent hex, and on future rounds, leave the planet's gravity hexes or enter orbit.

Landing: A streamlined spacecraft can land on a world by moving onto it at one hex speed; it can also land if it occupies the hex and is at zero speed. Entering a world hex at higher speeds destroys the spacecraft. Attempting a landing also destroys the spacecraft if the world has more than a trace atmosphere and the craft is unstreamlined.

Large Bodies

Large bodies such as stars and gas giants will take up multiple hexes. Represent such bodies as a circle of (diameter/10,000) hexes across. A large body's gravity hexes are represented by a larger circle with a diameter four times the square root of the planet's mass (in Earth masses).

Don't worry about aligning a big planet on the hex grid; it won't fit. Just draw a circle for the given diameter, and if the 1-G gravity well is larger, a second circle for it.

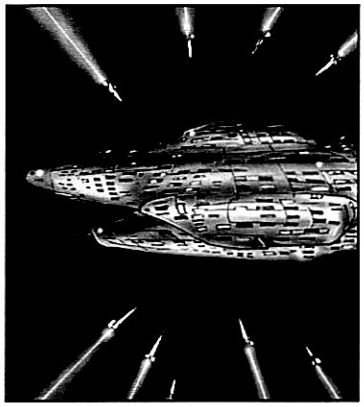
Large bodies will also block line of sight as per worlds. Realistic gravity and orbital mechanics for large bodies are beyond the scope of this system. GMs can apply gravity effects as per the ordinary world rules, except that the gravity zone may be a number of hexes deep, rather than just the six adjacent hexes.

Landing on a gas giant is fatal, but vessels with DR 100+ armor can enter or move through a gas-giant hex if it keeps its velocity below one hex/round. The vessel is assumed to be flying through or hovering in its upper atmosphere.

Moving into a star will destroy any spacecraft.

Small Bodies

This includes asteroids (a few yards to several miles across) and small moons or planets up to 1,000 miles in diameter. In the 10,000-mile-hex scale, such bodies do not affect detection or fire unless a ship is in the hex and deliberately keeping the asteroid between it and another spacecraft.



Ships may freely pass through hexes containing small bodies. Even an asteroid belt is fairly thinly spread: In a dense asteroid belt there would only be one small asteroid every hex.

Miscellaneous Situations

The following rules elaborate on various aspects of space combat.

Anti-Missile Fire

Standard missiles have DR 40 (TL10) or DR 120 (TL12) and can withstand 30 hits each. A single standard laser or particle beam hit is enough to destroy a missile, so feel free not to bother rolling damage if using ordinary turret or bay weapons.

Communications

Radio communications must be declared in the detection phase; otherwise, spacecraft can communicate freely back and forth with radio, laser, and meson communications as described in the *Starship Operations* rules. These give communication range in millions of miles; one million miles = 100 hexes. Note that communications are limited by lightspeed. Light travels 18.6 hexes per second or 22,320 hexes per combat turn.

Friendly ships in communication using datalink programs can share sensor data, giving a bonus to their friend's detection chances.

Standard missiles must remain within communication range to be controlled. In most cases, this is not a problem, but a missile behind a planet (for example) cannot maneuver or attack.

Broadcast communications may be picked up by anyone in range, but the *content* of scrambled transmissions will not be understood unless decoded (see Cryptanalysis skill, p. B245).

Crew Positions and Skill Rolls

Smaller vessels often have the same crewman performing multiple roles. If a crew member is filling multiple positions during a particular space combat round, he will suffer a -2 penalty on all skill rolls for each extra task he is performing.

Actions counted as tasks are: piloting; fire of one weapon or set of linked identical weapons (except sandcasters) at the same target; controlling one missile or a salvo; acting as a sensor operator; damage control; complex communications (GM's option, e.g., coordinating a squadron or tracking a signal); meson screen operation. A ship with more than two crew engaged in the above tasks should also have one captain who does nothing but give orders – if not, the GM can apply an extra -1 penalty to everyone's skill rolls!

Jump

A starship with an operating jump drive and enough fuel may prep for a jump in the Maneuver Phase. The ship may not maneuver while jumping. It will then jump at the start of its next round's maneuver phase. A safe jump (entry or exit) requires a distance from a body of at least hundred diameters. Thus, starships may jump in or out safely from (planetary diameter in miles/100) hexes. See p. 121 for the skill rolls needed to perform a safe and accurate jump. Ships jumping *in* appear during the maneuver phase. They retain whatever vector they had when they went into jump.

Meson Guns and Meson Screens

Meson gun hits ignore the target's damage resistance, unless the target has a meson screen. *Meson screens* must be carefully focused to deflect meson gun fire. Whenever a spacecraft is hit by a meson gun, the screen operator must make an Electronics Operation (Force Field) roll.

A critical success means the screen provides its full DR against the attack. Success by 4 or more means it provides half DR. Success by 0-3 means it provides 10% DR. Failure means it provides no DR. Critical failure means it malfunctions and cannot be used next round. To get it back on line requires a successful Electronics Operation (Force shields) roll, one try per round.

Missile Salvos

Big ships sometimes fire many missiles at a time. It can be convenient to represent these by single counters each representing multiple missiles from a single bay or turret – just record that a given set of missile and vector counter represents *n* number of missiles, and reduce *n* if the missiles take hits.

If a very large salvo of missiles attempts to ram the same spacecraft, GMs may wish to make contests of skills for *groups* of 3, 5, 10, or more missiles rather than rolling individually for each attack.

Likewise, GMs can simplify damage by rolling once per group and multiplying both damage and DR by the number of missiles.



Planetary Defense Fire

TL8+ planets with large populations and/or good starports often have planetary defenses. Ground-based lasers and particle beams cannot penetrate a planetary atmosphere and still carry enough energy to hit high orbital targets, so static planetary defenses generally take one of two forms: ground-based missile launchers, or a number of armed "orbital platforms" (built as ships with no drives), or meson guns buried deep underground. Such "deep meson guns" are immune to most attacks except other meson guns, sabotage, or destruction of their orbital or surface sensors.

GMs can assume that surface starport installations have sensors at least as capable as those of a command bridge (type V-IV starport) or basic bridge (type III or II starport).

Using Sandcasters

In the Direct Fire Phase, a turret's sandcasters can be targeted vs. a single enemy vessel (or a group of vessels in *very* tight formation). A sandcaster adds DR 400 to its ship's armor DR vs. all laser fire originating from the targeted vessel. Multiple sandcasters can combine to protect against laser fire from a single vessel, but each extra 'caster only adds an additional +50 DR. X-ray laser fire halves sandcaster DR just like ordinary armor, so against standard shipboard lasers it's DR 200 + DR 25 per extra sandcaster.

Selective, Pinpoint, and Battery Fire

A gunner can choose to selectively target individual turrets or bay subassemblies. A standard turret has a Size Modifier of +5, a bay has +7 – use these modifiers instead of the spacecraft's Size Modifier when firing. A successful hit means that hit location is not rolled for – instead, that turret or bay is hit.

A gunner using a direct-fire weapon can attempt to use "pinpoint marksmanship" vs. a weak spot (e.g., hatches, weapon tubes, turret rings, etc.) in the target's armor. This is extremely difficult: Roll to hit at -6 *and do not add the Size Modifier to the roll.* DR protects at half normal, cumulative with other armor divisors.

To simplify big-ship battles, GMs can require identical laser-equipped turrets be grouped into fairly even "batteries" of up to 30 lasers each. Each battery fires as one weapon (roll to hit only once). Calculate "adjusted battery skill" just as you would adjusted Gunner skill, except use the average of individual Gunner skills, and find RoF bonus by adding all RoFs together and using the RoF Bonus table (p. 174) to find the new bonus. E.g., if five turrets each with three RoF 1/60 lasers fired as a 15-laser battery, they would be treated as one RoF (15 × 1/60) = RoF 15/60 = RoF 1/4 weapon; while it would only fire once rather than 15 times, the usual +4 RoF bonus would become a +8.

Transponders

Civilian ships are legally required to activate transponders broadcasting their location and identity. Transponders can be unplugged, but naval patrols reserve the right to fire on ships detected that are not operating transponders. (Usual peacetime procedure is to order it to cut its velocity and stand to for boarding, but in troubled regions or in sensitive areas such as around restricted naval depots, patrols may not be that patient.)



It may take weeks to check registry, while origin and destination information are only as accurate as the navigator who entered them.

SPACE WEAPONS TABLE

Weapon	RoF	1/2 D	Max	Acc	Damage
360-MJ Laser	1/60	2	6	32	5d×50 (2)
405-MJ Laser	1/60	3	8	33	5d×100 (2)
Particle Beam Bay	1/60	1	4	30	6d×1,000
Meson Gun Bay	1/60	1	4	30	6d×1,000 (!)
Spinal P-Beam	1/60	5	15	36	7d×3,000
Spinal Meson Gun	1/60	5	15	36	7d×3,000 (!)

Ranges are in 10,000-mile hexes. (2) means armor DR is halved; (!) means armor DR but not meson-screen DR is ignored.

SPACE RANGE TABLE

Hexes	Modifier	Hexes	Modifier
0	-39	11-15	-48
1	-41	16-20	-49
2	-43	21-30	-50
3	-44	31-45	-51
4	-45	46-70	-52
5-7	-46	71-100	-53
8-10	-47	etc.	etc.

SENSOR MODIFIERS

Scan Values Table

Type	—PESA—		—AESA—		—Radscan—	
	TL10	TL12	TL10	TL12	TL10	TL12
Cockpit/System	35	37	39	40	29	31
Basic bridge	37	38	41	42	31	35
Command bridge	39	41	42	43	32	38

Scan Modifiers

Sensor: Add value from *Scan Values Table*, above.

Skill: Add Electronics Operations (Sensors) skill level.

Range: Count the range in hexes from the sensing spacecraft to its target. Look this number up on the *Space Range Table*, above, and subtract the corresponding modifier.

Prior Detection: Object detected on prior round by other sensor type or by ally sharing information through datalink: +4.

AESA only:

- Object's Size Modifier.
- Object has basic stealth: -(TL-4).
- Object has radical stealth: -2 × (TL-4).
- Object in same hex or adjacent to planet or moon: -4.
- Object or sensor within planetary atmosphere (more than Trace): -6.
- AESA used as ladar: -2.

PESA only:

- Object's Size Modifier.
- Object in same hex or adjacent to planet or moon: -2.
- Object silhouetted against a star: -4.
- Object or sensor within planetary atmosphere (more than Trace): -6.
- Object has basic emission cloaking: -(TL-4)/2, round down.*
- Object has radical emission cloaking: -(TL-4).*

* Emission Cloaking doubles (to the same effectiveness as stealth) if the object is in a planetary atmosphere, including a gas giant. In space, emission cloaking is less effective, as the vehicle is always going to be "hotter" than surrounding space.

Radscanner only:

- Object using active sensors: + the Scan value of the active sensor (e.g., AESA) that the object is using (see *Scan Values Table*, above) but *minus* the TL of that active sensor. If the active sensor is used as a ladar, use the Scan value - (TL+2).
- Object is using transponder or broadcasting wideband radio signals: +40. Note – if the object is also using active sensors, use the higher of the two modifiers; don't add them together.

GUNNERY MODIFIERS

Use augmented Gunner skill (the sum of Gunner skill, Acc bonus up to a limit of base Gunner skill, RoF bonus, and targeting program) with these additional modifiers:

Target Size: Add the Size Modifier of the target. (Standard missiles are +0). If using pinpoint marksmanship (p. 172) use a -6 penalty instead of Size Modifier.

Range Modifier: Add the range in hexes from the firing spacecraft to its target, counting the firing hex. The result is linear Range in hexes. Look this up in the "Hexes" column on the *Space Range Table*, above. Read the number to the right ("Modifier" column) to get the range modifier applied to the gunner's skill.

Active Sensors: +2 if target is within sensor range and detected with active sensors.

Point Defense Fire: +10.

Firing beyond ½D range does not reduce Accuracy to 0; as ships are firing over a 20-minute round using fully stabilized beam weapons in the vacuum of space, there is no sudden Acc loss.

Note there is no modifier for target velocity: Over space combat ranges, gross course changes are predictable enough that speed itself isn't a major factor, while relative velocity is factored into engagement times, as ships with high velocities will flash past each other for only a few rounds of firing.

MAJOR DAMAGE TABLE

3 – Fuel tank shattered; half of fuel capacity lost.
4 – 1d passengers injured; 5d damage each, ignore DR.*
5 – J-drive knocked out.
6 – Cargo damaged; a quarter of all cargo carried is lost.
7 – One computer knocked out (standard bridges have three).
8 – 1d crew are injured; 5d damage each, ignore DR.*
9 – Power loss; halve Gs and jump number.
10 – Weapon: one turret, bay or other weapon disabled.
11 – No special effect unless damage caused by particle beam or meson gun; then one non-hardened computer is knocked out.
12 – Fuel tank shattered; half of fuel capacity lost.
13 – 1d passengers injured; 5d damage each, ignore DR.*
14 – M-drive acceleration halved (round down).
15 – Cargo damaged (see above).
16 – Bridge (or cockpit) knocked out.
17 – 1d crew are injured; 5d damage each, ignore DR.*
18 – Power plant knocked out; ship crippled.

* Add an extra 1d casualties *per full 50 people* aboard; e.g., if 50-99 passengers were left, 2d would be hit. The GM chooses or rolls to see who is hit. Rather than roll damage for NPCs, GMs can assume each hit disables or kills. Add +1 per die of damage (or use explosive decompression rules) for anyone not suited up!

GURPS VEHICLES-DESIGNED SPACECRAFT

These rules are designed for use with spacecraft built using the ***GURPS Traveller*** design system. Ships constructed with ***Vehicles*** may have additional systems or design choices – if so, just add the appropriate rules from ***Vehicles.*** Here are a few guidelines on issues not addressed in ***Vehicles:***

Partial or Unstabilized Mounts: If a vessel is given partially stabilized weapons,Acc halves (round down) at ½D range; if unstabilized weapons, Acc goes to zero past ½D range.

Ships Without Vectored Thrust Engines: These can only accelerate (move their vector counter) in the direction they are facing, and may not add a G-bonus to Dodge. They may still change facing at the start of the maneuver phase, before accelerating.

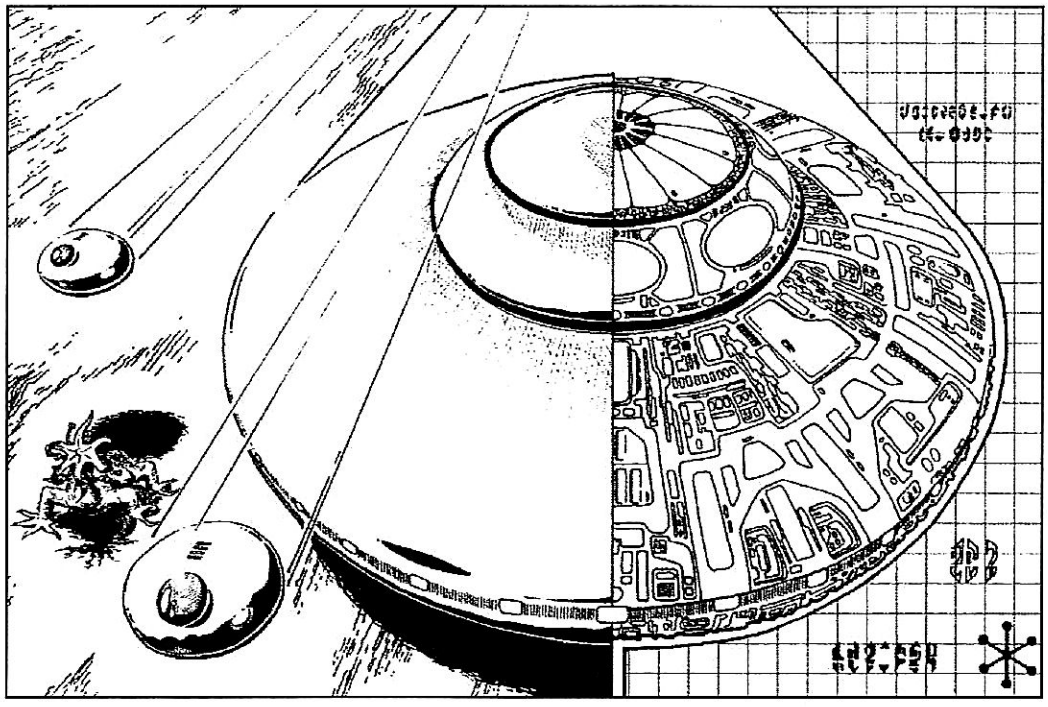
Higher or Lower RoF: In a space-combat round, weapons are assumed to be firing multiple carefully aimed tracking shots over the 20-minute period, and taking time to aim between each shot. All standard turret and bay weapons fire with an effective RoF 1/60 (including time to recharge power cells), giving a bonus of +4. In the 20-minute scale, higher or lower RoF provides a modifier to adjusted skill as follows:

ROF BONUS TABLE

RoF and Bonus	RoF and Bonus	RoF and Bonus
1/600.....+4	1/8 .....+10	8 .....+16
1/300 ..... +5	1/4 .....+11	15 .....+17
1/150.....+6	1/2.....+12	30 .....+18
1/60 .....+7	1 .....+13	and so on . . .
1/30 .....+8	2 .....+14	
1/15 .....+9	4 .....+15	

Values that fall between these numbers use the lower bonus. When calculating RoF for ***GURPS Vehicles*** weapon that use power cells, base it on sustained RoF over a 20-minute period. If a weapon can fire four shots, but then takes a minute to recharge its power cells, its sustained RoF would be 1/15 rather than 4.

Guns: On a 10,000-mile scale, guns, including railguns, will only be able to hit maneuvering targets within a 0-hex range. Against stationary targets (e.g., derelicts, planets), they have unlimited ranges, but suffer normal range modifiers to hit.



Chapter Four

Stars

Resources

Everything in this chapter (and in much of Chapter 5) is in the domain of *astrophysics.* A good undergraduate-level text on the subject will be useful for anyone who wants to understand the background to these rules. We suggest *An Introduction to Modern Astrophysics,* by Bradley W. Carroll and Dale A. Ostlie.

Short of a rigorous study of astrophysics, there are many good books on astronomy for the layman. The best is probably the three-volume *Burnham's Celestial Handbook,* by Robert Burnham, Jr. The *Handbook* is a comprehensive introduction to deep-sky astronomy. It's slightly dated, but even so it provides an extensive introduction to astronomical concepts, and is very rich in detail.

Another good source is *The Guide to the Galaxy,* by Nigel Henbest and Heather Couper. This book includes a review of the history of galactic astronomy, explaining all the major concepts, and including visually stunning maps of the Galaxy at several levels of detail.

Finally, the best source intended for science fiction writers (and GMs) is *Worldbuilding,* by Stephen L. Gillett. Gillett covers most of the concepts useful to a world-builder, without too much mathematical detail. His book was a major starting point for the rules systems here.

"The use of robots has considerably reduced the casualty rate in first contact situations, especially with unexpectedly xenophobic cultures – except, of course, among the contact robots."

– Twenty Years in the IISS, Janos Projaska

In ***Traveller,*** world-building begins on a grand scale. The Third Imperium (or your own ***Traveller*** universe) exists within the context of the whole Galaxy, a stage wide enough for almost any roleplaying game!

Mapping the Galaxy

Following ***Traveller*** and ***GURPS Space,*** we use the *parsec* as a standard unit of measurement for interstellar distances. One parsec is equal to about 3.26 light-years or 19 trillion miles.

Space is three-dimensional, but ***Traveller*** simplifies star-mapping by projecting the Galaxy onto a two-dimensional plane. Star maps are thus oriented with the *coreward* direction at the top, toward the center of the Galaxy. The opposite direction is *rimward.* The direction of galactic rotation is toward the left edge of a standard map, designating the *spinward* direction. To the right edge of a standard map is the *trailing* direction.

The map of Charted Space (see p. GT6) covers a region of the Local Arm, about 512 parsecs "wide" (spinward-to-trailing) and 320 parsecs "deep" (coreward-to-rimward). Charted Space is centered on the territory of the Third Imperium. This space is divided by Imperial astrographers into *sectors,* rectangular regions which are exactly 32 parsecs wide and 40 deep. Each sector contains roughly 400 to 500 stars. Each sector is divided further into 16 *subsectors,* which are 8 parsecs wide and 10 deep.

Mapping a Subsector

In the ***Traveller*** setting, space is mapped on a hexagonal grid, with each "hex" being one parsec across. Hence a sector is 32 by 40 hexes, a subsector 8 hexes by 10. Each subsector has a *system density,* indicating how likely it is for a star system to appear in each hex (see the System Presence Table). Most subsectors will be of Scattered or Standard density. For example, the entire Spinward Marches are of Scattered density. Very Dense subsectors do not occur, that density class only appearing inside very rich galactic clusters (see sidebar).

When mapping a subsector for the first time, choose a system density, then roll dice as indicated in the table for each hex in the subsector map. Place a star system in the hex if the target number or greater is rolled. Alternatively, the GM may simply place an appropriate number of star systems as he pleases (typical ranges of star system counts are given in the table).

System Presence Table

Subsector Density	Throw per Hex	Typical Number
Rift	12+ on 2d	2-3
Sparse	6+ on 1d	11-16
Scattered	5+ on 1d	21-32
Standard	4+ on 1d	32-48
Dense	3+ on 1d	43-64
Very Dense	2+ on 1d	53-80

Generating Stars

Here we begin an extended world design sequence, which will help ***GURPS Traveller*** GMs (and those running other science fiction campaigns) to design realistic worlds. The steps in this chapter will allow the GM to design star systems, determining what star(s) and planets each contains and determining their general properties. Using Chapter 5, the GM will be able to determine the specific characteristics of single worlds, and generate animal encounters. Using Chapter 6, the GM will be able to construct detailed descriptions for societies of sentient beings.

At many points in this process, a die-roll procedure will be presented to allow random selection among options. These procedures can be used to do fairly realistic world-building at random. Always remember that the rules should be considered *guidelines,* an indication of which options are more likely than others according to current scientific theory. No die roll should be allowed to dictate the course of the GM's campaign.

The design sequence here is based on the one from ***GURPS Space,*** although it is more detailed (and in some cases, more realistic). If these rules are used as written, they will sometimes yield results different from those in earlier versions of ***Traveller.*** In such cases we will describe the differences, and suggest ways to adjust the rules to better fit published ***Traveller*** material. As always, it's up to the GM to decide how to apply the rules to his personal game.

Step 1: Number of Stars

Many stars have companions. Two or more stars may travel together through space, bound together gravitationally so that each orbits the center of mass of the system. In such systems, the component stars are generally named using letters of the alphabet, with the brightest component tagged A, the next brightest B, and so on. The A-component is also called the *primary* of the system, while the other components are *companions.*

Procedure

Roll on the Multiple Stars Table to determine how many stars are in the system. Modifiers: +3 if the system is a member of a true galactic cluster (see sidebar).

Multiple Stars Table

Roll (3d)	Number of Stars
3-10	1
11-15	2
16 or more	3

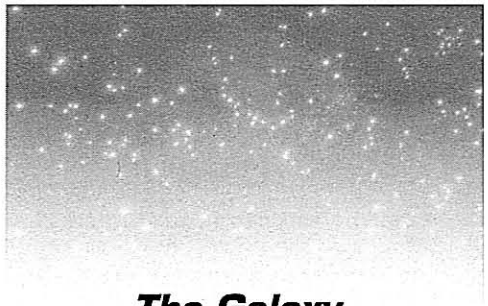


Multiple star systems with more than three members are possible but very rare. This possibility is taken into account in step 4.

Example

To demonstrate the world-building system in this book, we will use it to generate a star system for a ***GURPS Traveller*** campaign. The star system in question is somewhere in the trailing fringes of the Imperium, in a region for which little "official" information has been published. The GM wants there to be at least one more-or-less Earthlike planet in the system, but is willing to accept what the dice give him. He has a name in mind already for the planet: *Haven.*

He begins by rolling a 13 on 3d and consulting the Multiple Stars Table, finding that the Haven system contains two stars.



The Galaxy

Our galaxy is an "island universe" of stars, a little over 30,000 parsecs in diameter. It's a very typical spiral galaxy, in shape, size, and structure.

The Galaxy's most prominent feature is the *galactic disk,* a structure composed of gas, dust and bright young stars. This disk is about 600 parsecs thick, becoming thicker toward the galactic core. Its mass is not smoothly distributed. Most of the disk's matter falls in the *spiral arms.* These are not the smooth curves that most people imagine, sweeping out from the core to the fringes in a regular pattern. The densest parts of the arms fall into a series of short, discontinuous arcs, which piece together to form an overall spiral shape.

The disk is embedded in the *galactic halo,* a spherical structure that takes up most of the Galaxy's space. There is very little gas or dust in the halo, and only a few percent of the Galaxy's stars. The stars of the halo are old and dim, orbiting the core at wide angles to the plane of the disk. Strangely, it seems that the halo contains the majority of the Galaxy's mass, which must be in some "dark" form that isn't easily detectable.

The halo is densest toward the center of the Galaxy, where it shades into the *galactic core.* This is a flattened bulge, about 1,800 parsecs thick. Astronomers long believed that the galactic core had a roughly circular cross-section in the plane of the disk, but recent observations suggest that the core is actually somewhat elongated, making our Galaxy a moderate example of a "barred" spiral. The best current model of the Galactic bar makes it about 1,800 parsecs wide and 4,500 parsecs long, with its long axis forming a small angle with the line from Terra to the Galactic center.

Current observations indicate that Terra is near the plane of the galactic disk, about 7,700 parsecs from the center of the Galaxy. Published ***Traveller*** materials have established a longer distance, placing Terra at a little over 10,000 parsecs from the center. GMs may assume that Solomani astronomers mismeasured galactic distances in the last century before starflight . . .

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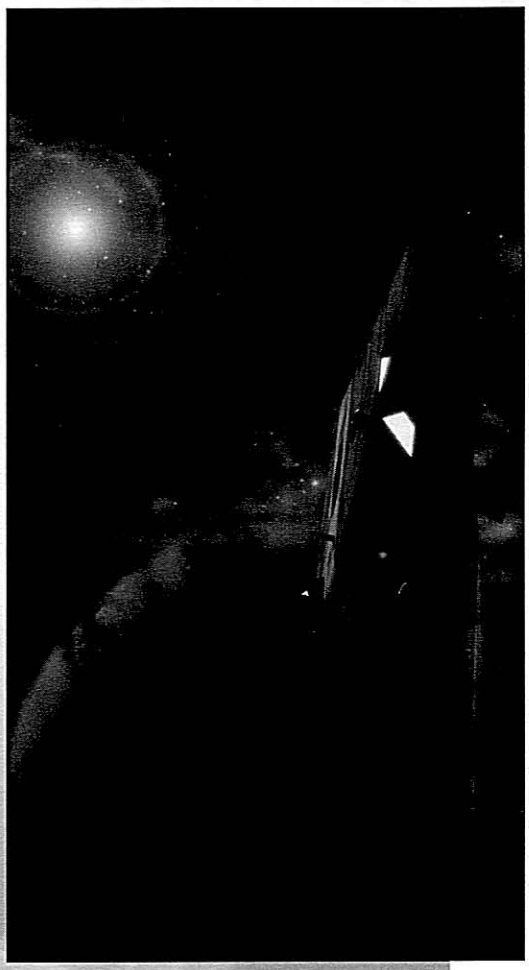
The Galaxy
[Continued]

Sol is embedded in what Imperial astronomers call the Local Arm. This arm is about 1,800 parsecs across, and winds about halfway around the galaxy. The axis of the Local Arm passes about 100 parsecs rimward of Sol, so Terra is fairly close to the heart of the arm.

One major feature of the Local Arm is the Orion region, a territory rich with bright, young stars. This region is rimward of Sol, most of its bright stars at a distance of about 100 to 300 parsecs from Terra. The region is named after the constellation Orion, familiar to Terrans, since some of its brightest stars form the outlines of that constellation. Since these stars are actually very close together in galactic terms, Orion is one of the few star patterns which is visible and recognizable from much of Imperial space.

Opposite the Orion region is the Scorpius-Centaurus region, another area of rapid star formation containing many bright giant stars. This region is at the coreward fringe of Charted Space, although a few bright stars associated with it are actually in Imperial territory (notably Antares).



Step 2: Primary Star Type

A star's most important properties are its mass, composition, age, and *luminosity* or brightness. With four important parameters, one might expect stars to vary widely, but in fact they fall into a few very well-defined groups. Astronomers classify stars using their *spectral class,* which can be thought of as a way to sort stars by color and size.

The first component of the spectral class is the star's *spectral type* or "color," denoted by a single letter. The major spectral types are O, B, A, F, G, K, and M. This sequence also defines the relative surface temperature and luminosity of stars. O and B stars are hot and very bright, while K and M stars are cool and dim. We will sometimes refer to spectral types as "early" (toward the bright, hot end of the range) or "late" (toward the dim, cool end). This nomenclature comes from the early days of stellar astronomy, when it was widely believed that all stars began their lives as O or B class and slowly moved down to K and M class before dying. This theory of stellar evolution has long since been discredited, but the "early late" jargon persists.

The spectral type can be further specified by a decimal classification, using the digits 0 through 9. 0 indicates a "standard" star of that spectral type, while 1 through 9 indicate progressively cooler, dimmer stars. Sol, for example, is spectral type G2, and can be considered two-tenths of the way between a standard G-class and a standard K-class star.

The second component of spectral class is the star's *luminosity class* or "size," which is denoted by a Roman numeral. Luminosity and size are related; two stars with the same spectral type (i.e., the same surface temperature) will be of different brightness if one is larger and has more surface to radiate energy with. The luminosity classes are I (for supergiant stars), II and III (for giant stars), IV (for subgiants), V (for average-sized "dwarf" stars) and VI (for a rare class of "subdwarf" stars). The rules that follow simplify by referring only to classes I, III and V, which should suffice for the vast majority of stars.

Most stars are class V, existing on the "main sequence" of star types. Members of the main sequence are mature and stable, shining by means of hydrogen fusion. The most massive main sequence stars (O through A class) are rare. Running through their nuclear fuel quickly, they burn out long before planetary systems or life-bearing worlds can form. Medium stars (in the range F through K) are much more common. They are stable long enough for planets to form and life to evolve. Finally, the M-class "red dwarf" stars are so common that over half of all stars belong to their class. Red dwarf stars are so stingy with their fuel that some of them may still be burning a trillion years from now.

One set of stars does not fall into this classification scheme: the *white dwarf stars.* In one sense, these are not stars at all. A white dwarf is the remnant of a star which has finished its stable lifespan on the main sequence, passed through a period as a giant star, and finally found itself unable to continue fusion burning. Stars which die in this fashion lose much of their mass, in processes that may be more or less violent. The most common remnant of such a star-death is a white dwarf, a small but extremely dense body which shines dimly due to the retained heat of its final collapse. White dwarf stars may have planets but are too dim to foster any kind of life on them. We use luminosity class D without spectral type for all white dwarf stars, simplifying the standard classification scheme for them. Other kinds of stellar remnants exist (see sidebar, p. 49).

Procedure

To generate the primary star, roll first on the Luminosity Class Table. If the star is known or intended to have an Earthlike world present, don't bother rolling. In this case, the star will automatically be of type V, on the main sequence.

Luminosity Class Table

Roll (3d)	Class
3	III (Giant)
4-14	V (Main Sequence)
15-18	D (White Dwarf)

The table does not allow for the random appearance of type I supergiant stars. These are so rare that the GM must deliberately choose to place them (no more than one per sector, and normally none).

With the luminosity class established, roll 3d on the Spectral Type Table (unless the star is a white dwarf). If the star is of class V and is known or intended to have an Earthlike world present, roll 1d+5 instead. This table does not allow for the random appearance of type O or B stars. Again, these stars are very rare and should be placed sparingly by the GM.

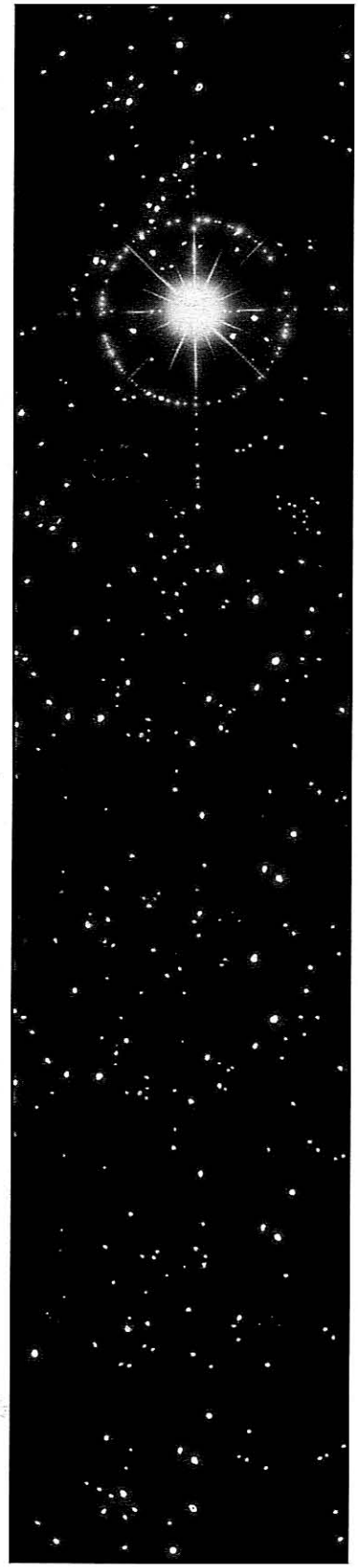
Spectral Type Table

Roll (3d)	Spectral Type
3-4	A (White)
5-6	F (Yellow-White)
7-8	G (Yellow)
9-10	K (Orange)
11-18	M (Red)

Finally, roll 1d to determine the star's spectral subtype. On a 1-3, the star is subtype 0, on a 4-6 it is of subtype 5. If you want a more detailed approach that uses the full range of spectral subtypes, see the sidebar on p. 53. Ignore or re-roll any result that might yield a star of type O4 or earlier, or any type O star of class III.

Example

The roll on the Luminosity Class Table is a 10, so the Haven system's primary star is a class V main sequence star. This isn't surprising, but it does mean that an Earthlike planet is still possible. The GM then rolls an 10 on the Spectral Type Table, finding that the primary is of type K. He rolls 1d for a 2 and then (using the Detailed Star Generation sidebar) 1d-1 for a 2, so the star's final spectral class is K2 V.



Three-Dimensional Mapping

The ***Traveller*** system simplifies star mapping by placing every star in a two-dimensional plane. Three-dimensional mapping is more complicated, but can add flavor. The following suggestions can be applied in campaigns outside the Third Imperium setting.

As suggested in ***GURPS Space,*** the best way to produce a 3-D star map is to use grid paper, with a scale of one parsec to the grid square. The plane of the paper represents the plane of the galactic disk. When a star is placed on the paper, a "height" coordinate is noted for it. A positive height represents distance above the galactic plane, while a negative height represents distance below the plane. As in ***Traveller,*** the top edge of the map points toward the galactic core, while the left edge of the map points in the spinward direction. The direction of positive height (up from the plane of the map) is normally called Galactic North, while Galactic South is in the direction of negative height. This convention is consistent with standard astronomical practice, but is different from the one found in ***GURPS Space***.

In the region of Sol, there is about one star system per 20 cubic parsecs. This can be matched by rolling 3d for each grid point and distinct altitude on the map, placing a star system on a 6 or less. Or we can divide the volume of the space being mapped by the system density, and place about that many stars at random. In this case, the height coordinates for star systems should also be determined randomly, using any convenient method.

Three-dimensional geometry will have a number of implications which can drastically affect a campaign. One result is that starships with longer range can reach many more possible destinations. In two-dimensional space, the average number of stars that can be reached in one jump goes up as the *square* of the jump range. In three-dimensional space, the number of stars goes up as the *cube* of the range. No matter what the task, faster ships will have a greater advantage than they do in standard ***Traveller.*** Another effect is that interstellar empires will be more "compact." Distances from core to frontiers will be shorter, so those frontiers will be easier to control. The frontiers may be *harder* to defend, however, since the empire will have to guard the entire surface of a sphere.

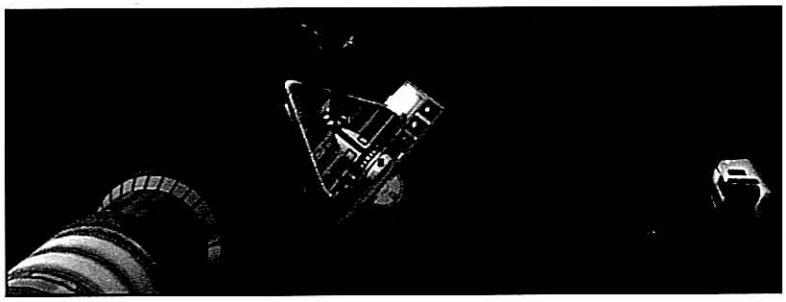
In any case, the GM will need to consider the effect of these changes very carefully when designing his campaign. Any campaign using the idea will have a different "feel" than the standard Third Imperium setting.

Galactic Clusters

Stars are not normally born alone. They form in great families, dozens or even hundreds of stars coalescing at about the same time in one of the Galaxy's dark nebulae. Sometimes these groups remain bound by mutual gravitational attraction, continuing to travel together long after they leave the region where they formed. Such *galactic clusters* or *open clusters* are fairly common. There are several in the immediate neighborhood of Sol itself.

GMs may place galactic clusters in their own star maps for ***Traveller.*** Simply choose a single hex for the center of the cluster, and assume that the cluster includes one or two hex rings around this center hex. Within this area, the system density will be one or two classes higher than in the rest of the subsector. When generating stars within the galactic cluster, the GM should make sure that every star is the same age (see p. 52).

Galactic clusters are likely places to find thriving interstellar communities. Since all the stars formed in the same protostellar nebula, they are likely to have the same composition and have similar planetary systems.



Some clusters are very rich in Earthlike planets or certain valuable resources, for example. Also, since the stars are packed so close together, travel and trade between them is easy.

In many regions of space, stars appear to congregate by pure coincidence. In the Third Imperium, the IISS calls such regions *system clusters,* shortened to *clusters* in popular usage. While the close proximity of such stars makes travel between them convenient, the members of such a "false cluster" are not the same age and may have very different composition.

Step 3: Companion Star Types

By definition, the primary star is the brightest one in the system. Any companion stars must be of the same or lower luminosity class, and if of the same class must be of the same or lower spectral type. It seems common, however, for stars in a multiple system to be of about the same mass, and therefore of similar spectral type.

Procedure

If the primary star is of luminosity class D, its companions are automatically of class D as well. Otherwise, for each companion star in the system, begin by rolling 1d. On a 1-4 the companion is of the same luminosity class as the primary. On a 5 the companion is one class lower, and on a 6 it is two lower. For this purpose, the hierarchy of luminosity classes, highest to lowest, is I-III-V. If a companion "falls off the end" of this scale, roll 1d again. On a 1-4 the star is a class V main-sequence star, automatically of type M. On a 5-6 the star is a white dwarf of type D.

If the companion is of the *same* luminosity class as the primary star, then roll 1d. On a 1-3 the companion is of the same spectral type as the primary. On a 4 the companion is one type later, on a 5 it is two later, on a 6 it is three later. For this purpose, the hierarchy of spectral types, earliest to latest, is O-B-A-F-G-K-M. If a companion "falls off the end" of this scale, it is automatically of type M. Generate a subtype for the companion as in Step 2 (possibly with the sidebar). Ignore and reroll any result that would make the companion of a the same spectral type as the primary *and* a higher subtype.

If the companion is of a *lower* luminosity class other than D, and hasn't already been assigned to spectral type M, then generate a spectral type as in Step 2, accepting any result.

Example

The GM now needs to determine the spectral type of the companion star in the Haven system. He rolls 1d for a 5, indicating that the companion is one luminosity class lower than the primary, falling off the end of the scale. The GM rolls 1d again for a 3. The companion star is a main-sequence red dwarf of type M. The GM rolls 1d for a 5 and 1d-1 for a 0, fixing the full spectral type at M5 V.

Step 4: Companion Star Orbits

Stars in a multiple system follow orbital paths that circle the center of mass of the system. We simplify by assuming that companions follow circular or elliptical paths centered around their primary stars.

We measure distances within star systems in *astronomical units* (abbreviated AU). One astronomical unit is equal to the average distance between Terra and Sol, about 93 million miles. The relevant parameters of an orbital path are its average radius and its *eccentricity.* This last is a measure of the amount by which the orbit deviates from a perfect circle, and takes values between 0 and 1. An value of 0 indicates a perfectly circular orbit, while values approaching 1 indicate elliptical paths that are more and more elongated.

Members of a multiple star system can fall at a variety of distances from each other. At one extreme are "contact binaries," stars whose outer atmospheres actually mingle as they whirl about each other in hours or days. At the opposite extreme are very wide pairs, which may take thousands of years to complete an orbit. Stars tend to have orbital paths of moderate eccentricity.

Procedure

Roll 3d on the Orbital Separation Table for each companion. Modifiers: +6 for the second companion in a trinary system.

Orbital Separation Table

Roll (3d)	Separation	Orbital Radius Multiplier
6 or less	Very Close	0.05 AU
7-9	Close	0.5 AU
10-11	Moderate	2 AU
12-14	Wide	10 AU
15 or more	Distant	50 AU

The initial result from the table gives a general idea of how widely separated the primary is from its companion. Roll 2d and multiply by the indicated Orbital Radius Multiplier to get a value for the average radius of the orbit for that companion. The GM may accept this value or choose a precise value close to it.

A Distant companion may have a companion of its own, on a roll of 11 or more on 3d. If so, the companion is treated in all respects as the primary for its own companion. Generate a spectral class for the "subcompanion" as in Step 3, and generate an average radius for the subcompanion's orbit around its primary, applying a -6 modifier to the 3d roll.

Once the average orbital radius for each primary-companion pair is determined, roll on the Orbital Eccentricity Table for each. Modifiers: -6 if the two stars are Very Close, -4 if they are Close, and -2 if they have Moderate separation.

Orbital Eccentricity Table

Roll (3d)	Eccentricity
3 or less	0.05
4	0.1
5	0.2
6	0.3
7-8	0.4
9-11	0.5
12-13	0.6
14-15	0.7
16	0.8
17	0.9
18 or more	0.95



For each primary-companion pair, compute and record the *minimum separation* and the *maximum separation* of the two stars.

Min. separation = (1 - E) × R **Max. separation = (1 + E) × R**

E is the eccentricity of the companion's orbit, and **R** is the average orbital radius for the companion in AU. The minimum and maximum separations will be in AU.

Example

The GM now turns to the Orbital Separation Table, rolling 3d for an 11. The two stars in the Haven system have Moderate separation. He rolls 2d for an 7, finding that the two stars have an average separation of 14 AU. He then rolls 3d-2 on the Orbital Eccentricity Table, getting a 14. The orbit has a rather unusual eccentricity of 0.7. The minimum separation of the two stars is 4.2 AU, the maximum separation is 23.8 AU.

Stellar Remnants

Some of the most interesting objects to be found in deep space are the remains of dead stars. This interstellar bestiary includes some very exotic objects.

White dwarf stars are only a few thousand miles across. They shine because of the internal heat generated during their final collapse, retained over billions of years. The surface temperature of a white dwarf star can be very high, but their small radiating surface makes them dim. Most white dwarf stars are composed of ionized carbon and oxygen nuclei, existing in a *degenerate* state of very high density.

If the planetary system of a white dwarf star is to be generated, ignore its effective temperature. Unless the white dwarf formed very recently in cosmic terms, its luminosity will be less than 0.001 solar units. Its mass will be 0.14 + (3d × 0.04) solar units. A few white dwarf stars are more massive, although the maximum mass for such a stellar remnant is 1.44 solar units.

Planetary nebulae are associated with very "young" white dwarf stars. During the last period of a giant star's life, it loses mass from its outer layers. At the climax of this process, a significant portion of the star may simply stream off in all directions. This creates a planetary nebula, so-called because (seen from a distance in a small telescope) it looks very much like the disk of a planet. The nebula consists of a shell of hot gas, which glows due to radiation from the new white dwarf star at the center. Planetary nebulae can be up to about a parsec in radius. They normally only last about 50,000 years, after which the expanding shell of gas dissipates into interstellar space.

Planetary nebulae are uncommon, since they only exist very early in a white dwarf star's lifespan. There are perhaps 1-3 such nebulae in Charted Space. The GM may wish to place them around a few white dwarf stars already on sector maps, for local flavor. The white dwarf star associated with a planetary nebula will be unusually luminous, since it still retains almost all of its heat of collapse. Assume that such a white dwarf has mass as described above, but has luminosity of 3d × 0.01 solar units.

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Stellar Remnants
[Continued]

Neutron stars form during the violent death of more massive stars. Stars with more than about 8 solar masses can't simply shed their outer layers and settle into a white dwarf state. Instead, they experience a *supernova explosion.* For a very short time, the dying star outshines the rest of the Galaxy put together. The core of the star is too massive to stabilize as a white dwarf, instead collapsing into an incredibly dense sphere only a few miles across.

Many neutron stars rotate very quickly and have extremely powerful magnetic fields. They act as great particle accelerators, spewing out beams of energetic radiation that sweep the sky as the neutron star rotates. Such an object is called a *pulsar,* since if the observer is properly located to see the energy beams, the star seems to "pulse" in a very rapid and regular cycle.

A neutron star would be a dangerous (but interesting) object to visit. Since neutron stars are hard to detect, it's difficult to estimate how many there might be in our region of the Galaxy. The GM may assume that any white dwarf star on a sector map is actually a neutron star on a 3d roll of natural 18. Or he may simply place neutron stars on his sector maps, no more than one per 5-6 sectors. Assume that a neutron star has negligible luminosity and a mass of 1.5 + (1d × 0.25) solar units.

Black holes are the ultimate in exotic astronomical phenomena. The core of a very massive star may not be able to stabilize as a neutron star. In this case, no force known to science can halt the process of collapse. As the core becomes increasingly dense, its gravitational field becomes more and more intense, until even light can no longer escape it. The mass of the stellar remnant has essentially dropped out of our Universe entirely, leaving behind a gravitational hole in space. The full properties of such an object are beyond the scope of this book, but GMs who are familiar with astrophysics may be interested in using black holes in their campaigns. GMs who are *not* comfortable with the physics should ignore the possibility. There are many misconceptions about black holes in the popular media and even in science fiction.

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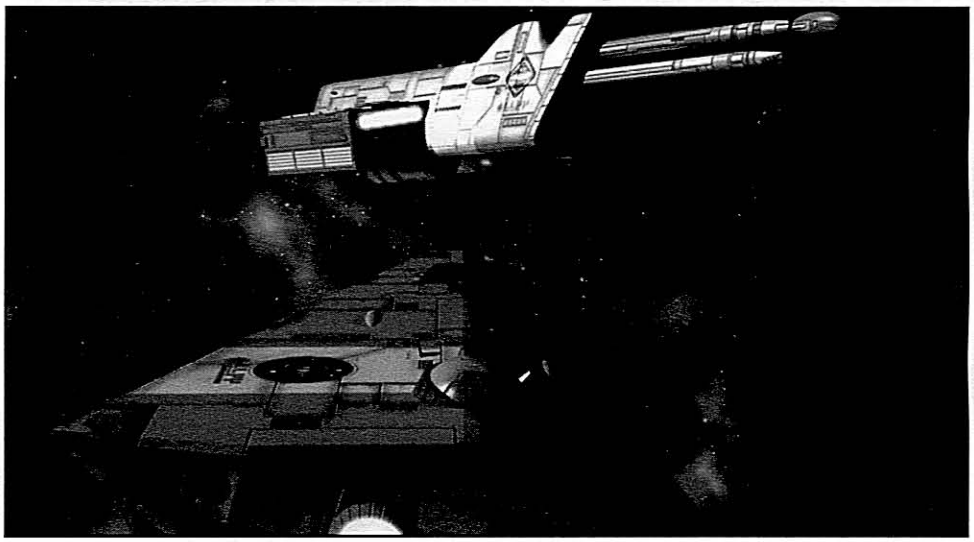
Step 5: Stellar Characteristics

The following tables show what characteristics a typical star of any given spectral class and type will have. The discussion of each item will suggest how the GM should use the tables to determine the exact properties of any given star.

Star Characteristics: Main Sequence (Class V)

Type	Temperature	Luminosity	Mass	Radius	Lifespan
O5	45,000	790,000	30	0.14	0.0
B5	15,000	830	5.4	0.040	0.1
A0	9,500	54	2.7	0.025	0.5
A5	8,200	14	1.9	0.017	1.4
F0	7,200	6.5	1.6	0.015	2.5
F5	6,400	2.9	1.3	0.013	4.5
G0	6,000	1.5	1.1	0.011	7.3
G5	5,800	0.79	0.94	0.0082	12
K0	5,300	0.42	0.81	0.0071	19
K5	4,400	0.15	0.62	0.0062	41
M0	3,900	0.063	0.50	0.0051	79
M5	3,200	0.011	0.21	0.0032	190
M8	2,600	0.001	0.063	0.0014	630



Star Characteristics: Giants (Class III)

Type	Temperature	Luminosity	Mass	Radius	Age
B5	15,000	1,800	7.0	0.058	0.0
A0	9,500	106	4.0	0.035	0.2
A5	8,200	43	2.5	0.030	0.6
F0	7200	20	1.5	0.027	3.0
F5	6,400	17	1.0	0.031	10
G0	6,000	34	1.0	0.050	10
G5	5,800	43	1.1	0.060	7.5
K0	5,300	60	1.1	0.085	7.5
K5	4,400	220	1.2	0.24	5.8
M0	3,900	330	1.2	0.37	5.8
M5	3,200	930	1.4	0.92	3.6
M8	2,600	1,100	1.6	1.5	2.4

Star Characteristics: Supergiants (Class I)

Type	Temperature	Luminosity	Mass	Radius	Age
O5	45,000	1,100,000	70	0.16	0.0
B5	15,000	52,000	20	0.31	0.0
A0	9,500	35,000	16	0.64	0.0
A5	8,200	35,000	13	0.86	0.0
F0	7,200	32,000	12	1.1	0.0
F5	6,400	32,000	10	1.3	0.0
G0	6,000	30,000	10	1.5	0.0
G5	5,800	29,000	12	1.6	0.0
K0	5,300	29,000	13	1.9	0.0
K5	4,400	38,000	13	3.1	0.0
M0	3,900	41,000	13	4.1	0.0
M5	3,200	300,000	19	17	0.0
M8	2,600	500,000	24	32	0.0

Effective Temperature

The *effective temperature* of a star is the temperature of the star's visible surface, measured in *kelvin*. It is the primary factor determining the "color" of the star's light (more precisely, the distribution of the star's radiant energy across the electromagnetic spectrum). Spectral type mostly depends on effective temperature, although the material composition of a star is also a factor.

Luminosity

The *luminosity* of a star is a measure of its total energy output. We will measure luminosity in "solar units," so that a star with luminosity 1 radiates exactly as much energy as the Sun. Note that not all of a star's radiant energy will be in the form of visible light. In fact, at the extremes of the range of spectral types, most of a star's output may be outside the visible range.

Luminosity depends on the entire spectral class of the star. The GM should refer to the Luminosity Table to get a base value. Real stars can vary somewhat from these standard values.

Once a star's effective temperature and luminosity have both been determined, its physical size can be computed. The tables give typical stellar radii in AU. This figure is of interest for ***Traveller*** because jump drives don't function reliably within 100 diameters of any large object. To get the 100-diameter distance for a star, multiply its radius from the table by 200.

Mass

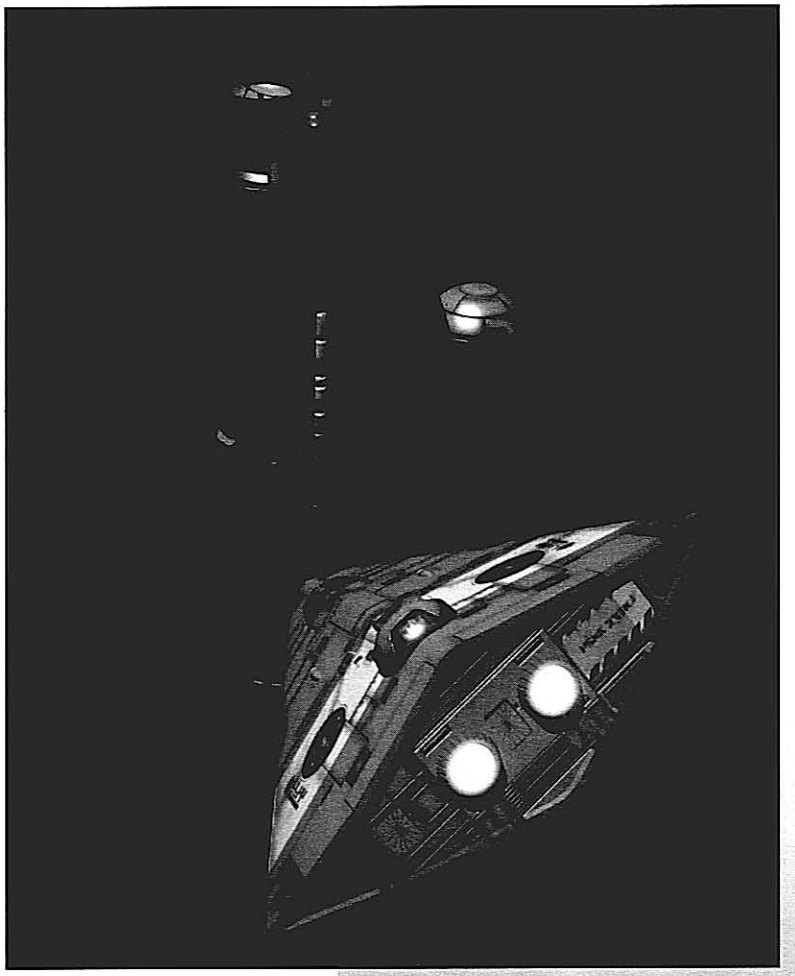
The mass of a star is also measured here in solar units, so that Sol has mass 1. For main-sequence stars, there is a close mathematical relationship between luminosity and mass, which we can use to compute the approximate mass from the luminosity. The similar relationship for giant or supergiant stars is too complex to compute from scratch. The tables give typical values for stellar mass.

Stellar Remnants

[Continued]

Black holes are even harder to detect than neutron stars, but they must be vanishingly rare. No ***Traveller*** campaign should include more than one. A black hole has negligible luminosity and a mass of 2.5 + (1d × 0.5) solar units.

It's known that stellar remnants can have planets. When generating such bizarre planetary systems, GMs should feel free to modify the procedures in this book as they see fit. A few rules of thumb: the original main-sequence star probably had about 5 times the mass of the stellar remnant. Planets close in to the star were likely destroyed during its giant phase. A supernova explosion might destroy all planets, although this would leave behind debris which might form a new planetary system *after* the explosion. Such a system would not contain any gas giant planets.



Flare Stars

Not all stars shine steadily. Due to a variety of physical processes, some stars change in size and brightness, sometimes on a strongly regular schedule.

Flare stars are the variables most likely to be encountered by adventurers. They are red main-sequence stars, most of them of type M3 and later. At irregular intervals they experience a sudden rise in luminosity. These events are the result of flares on the surface of the star, very similar to those experienced by Terra's sun, but much larger in proportion to the small, cool red dwarf.

Flare stars seem to experience some flare activity almost constantly, since most of the known examples are subject to very frequent fluctuations of up to 50% in brightness. However, every few hours or days a *big* flare comes along, increasing the star's luminosity by as much as 100 times. These events are always very short, usually lasting only a few minutes.

An inhabited planet circling such a star would probably experience a "heat pulse" after such a monster flare, raising local temperatures by a noticeable amount. Also, since the flares are much hotter than the star's normal surface, they light they give off is relatively rich in ultraviolet. Creatures living on a planet of a flare star would normally get very little UV, but would have to adapt to sudden massive doses at irregular intervals. Plant life might actually *use* the flares to kick into photosynthetic high gear, taking advantage of the short flood of useful light. Unfortunately, a flare would also dump charged particles into the planet's atmosphere, raising the level of ionization, disrupting radio traffic and possibly causing spectacular aurorae.

Most flare stars are very obvious about their status, but it's possible that all red dwarf stars have some potential for big flares. An M-class star that is *believed* to be calm and well-behaved might present adventurers with an interesting challenge if it suddenly decides to flare . . .

"One of the perils of lecturing in astrography is that during the lecture on the age of stars, some joker is almost certain to ask if some research station is working on stellar anagathics. While I appreciate a sense of humor in cadets, I prefer that they leave actual comedy to professionals."

– Twenty Years in the IISS, Janos Projaska

Age

If a star is on the main sequence, its luminosity and mass yield its *stable lifespan.* This is the length of time that it can be expected to stay on the main sequence after its formation (barring outside influences). For main-sequence stars, the "Lifespan" column of the table gives the stable lifespan in billions of years.

To determine the age of a main-sequence star, the GM may arbitrarily choose an age that is less than the star's stable lifespan. If the stable lifespan is greater than 12 billion years, the GM should choose an age less than that figure. Very few stars in the galactic disk are older than 12 billion years, and those few are probably stars of the galactic halo that just happen to be passing through the disk. The GM should *never* choose an age greater than about 16 billion years, since that's a good estimate for the beginning of star formation in the embryonic Galaxy.

Alternatively, the GM may roll 3d on the Age Table to determine what *population* the star belongs to. Population II stars are the oldest, leftovers from the formation of the Galaxy. Population I stars were formed in the galactic disk and can be much younger. Once the population is determined, roll 1d-1, multiply the result by 0.5 billion years, and add the result to the base age as indicated on the table. The result will be an approximate value for the star's age (the GM should feel free to vary this slightly if he wishes). Ignore and reroll any result that gives an age greater than the star's stable lifespan.

Age Table

Roll (3d)	Population	Base Age
3-6	Intermediate Population I	0 billion years
7-10	Old Population I	3 billion years
11-14	Disk Population	6 billion years
15-17	Intermediate Population II	9 billion years
18	Halo Population II	12 billion years

The age of stars of luminosity classes I or III is determined differently. Once stars leave the main sequence, they tend to proceed through their time as a giant or supergiant star very quickly. Their age is therefore slightly more than the stable lifespan of a main sequence star of about the same mass. The tables for giant and supergiant stars give typical values for age. Notice that many of these stars have an Age of 0.0 billion years. These stars can be no more than a few million years old.

Multiple star systems are composed of stars which formed together and are therefore of the same age. The GM should determine the age of the system by working with the component whose range of possible ages is most restricted. For example, if a giant star is present, its range of possible ages is narrowest and its age should determine the age of the system. If all the stars in the system are on the main sequence, then the star with highest spectral type (and thus, shortest stable lifespan) should be used to determine the system's age.

It's possible that a randomly generated set of primary and companion stars has no possible age in common. In this case, the GM can simply fix a reasonable age for the system, ignoring the anomaly. Stars in multiple systems *do* often evolve differently from those without companions. Or the GM can simply alter the contents of the system until a consistent age can be assigned.

Note that current theories of planetary formation hold that it takes a fairly long time for the process to run to completion. Stars which are less than 500 million years old probably do not have actual planets as yet, only a disk of dust and planetoids, with perhaps a few growing proto-planets in the mix. We assume that main sequence stars of type earlier than A0 will not normally have planets.

Stars that are very *old* may not have planetary systems either, if they formed in nebulae that had not yet been enriched in heavy elements by earlier generations of stars. Any planets that are associated with such stars are likely to be gas giants. We will suggest no rule for generating such planetary systems, but the GM is free to adjust the procedures given here for stars which are (say) more than 10 billion years old.

Example

The GM decides to ignore the Haven system's red-dwarf companion and concentrate on developing the K2 V primary star. He refers to the Star Characteristics Table for class V and uses interpolation to get a value of 4900 K for the effective temperature. Interpolation for luminosity yields a value of 0.31 solar units.

The rest of the star's characteristics have to be computed by hand, since the GM used interpolation for effective temperature and luminosity. He refers to the Detailed Star Generation sidebar and applies the formulae there. The star's radius turns out to be 0.0072 AU, its mass 0.75 solar units. The star's stable lifespan is about 24 billion years. The GM decides to roll on the Age Table, getting an 11, which indicates an Old Population I star. He rolls 1d to get a 2, so the age is about 4 billion years. This age is consistent with the stable lifespan for both the primary and companion stars, so the GM accepts it.

Generating Planetary Systems

Once a star's characteristics have been determined, the GM can sketch out the contents of the attached system of planets. We assume here that the GM is working with a single star. If a multiple star system is being created, these steps should be repeated for each member of the system.

Step 6: Locate Orbital Zones

Every system of planets has a specific structure, determined by the physical processes that occurred during the system's formation. Normally, small rocky planets form close in to the primary star, while gas giants take shape at greater distances. We will compute several orbital distances that are important when determining what planets will be in which positions.

The presence of a companion star complicates these calculations. As a general rule, if a pair of stars has Very Close separation, simply add their masses together, add their luminosities together, and treat them as a single star with the resulting mass and luminosity for the purpose of these computations. This will require that the detailed star generation rules be used (see sidebar). If the stars are separated more widely, treat them as separate stars (but see *Forbidden Zones* below).

Detailed Star Generation

GMs who wish to incorporate a bit more realism into star generation may use the following procedures.

First, the GM can use the full range of spectral subtypes. Once the spectral class has been determined as far as the subtype (0 or 5) using the rules in the main text, roll 1d-1, rerolling any result of 5. Add the die roll result to the spectral subtype. This procedure will yield the full range of subtypes, from 0 to 9. Stars of type M9 do not seem to exist, so reroll any such result.

When using complete spectral subtypes, a star's effective temperature and luminosity can be derived from the appropriate tables through a process of *interpolation.* When a spectral type falls between two values on the tables, divide the difference between the two values by the number of steps, to get the difference per step. Multiply this difference by the number of steps the desired value is away from the lower of the two, and add the result to the lower value. The result is the value for the exact spectral type.

For example, the GM wants to determine the effective temperature for an F8 V star. F8 falls between F5 and G0, which have temperatures of 6400 and 6000 K. There are five steps in this range, so the difference per step is (6400 - 6000)/5 = 80. F8 is two steps above the lower value, so the effective temperature for the F8 star is 6000 + (2 × 80) = 6160 K.

Another way to add detail is to introduce some variance to a star's characteristics. Luminosity, in particular, varies significantly even for stars of the same spectral class. The GM may multiply the value from the table by 0.79 + (3d × 0.02) to get a precise value for the luminosity. This yields a maximum variation of about 30%, which is actually conservative for most of the main sequence.

Once effective temperature and luminosity are known, the star's radius can be computed. Use the following formula:

D = 309,000 × Square root of L / T^2

Here, **D** is the star's diameter in astronomical units. **L** is the star's luminosity, and **T** is its effective temperature in kelvin. Carry this computation to two significant figures. Almost all main-sequence stars will be a small fraction of an AU in diameter, while giant stars may be *much* larger.

Continued on next page . . .

Detailed Star Generation

[Continued]

For main-sequence stars, the mass can also be estimated from the luminosity. For stars of class O5 V through K9 V, use:

M = Fourth root of L

For red dwarf stars of spectral types M0 V through M8 V, use:

M = 2 × Square root of L

In both cases, **M** is the star's mass in solar units, and **L** is its luminosity in solar units. If you choose your own value for a main sequence star's luminosity, you may wish to use these formulae to get a precise value for the star's mass. Since a similar simple relationship doesn't hold for stars of class I or III, the GM may use interpolation to get the mass for them.

A main sequence star's stable lifespan follows from its mass and luminosity:

S = (10 × M) / L

Here, **S** is the stable lifespan in billions of years, **M** is the star's mass in solar units and **L** is its luminosity in solar units. Use the tables in the main text to determine the approximate age of a giant or supergiant star, interpolating if necessary.

When generating stars using the detailed method, the various zone distances will have to be computed from scratch. For all of the following formulae, **R** is the distance being computed, **M** is the star's mass in solar units, and **L** is the star's luminosity in solar units. The inner limit distance can fall at one of two values:

R = 0.2 × M

R = 0.0088 × Square root of L

Compute both possible distances and take the larger of the two. The second formula normally only "wins" if the star is *extremely* luminous, as for O-class main sequence stars and some giants. For almost all main sequence stars, it's enough to compute the inner limit radius using the first formula.

The inner and outer edges of the life zone are at:

Inner edge: R = 0.95 × Square root of L

Outer edge: R = 1.30 × Square root of L

Meanwhile, the snow line is found using:

R = 5.00 × Square root of L

Finally, to compute the outer limit distance:

R = 40 × M

We assume that the outer limit distance is no less than 10 AU. This minimum usually only affects the planetary systems of red dwarf stars.

Zone Distances

For main sequence stars which are likely to have planets, refer to the Orbital Zones Table. If developing a star system not in this set, use the detailed star generation rules.

Orbital Zones Table

Type	Inner Limit	Life Zone	Snow Line	Outer Limit
A0	0.54	7.0-9.6	37	110
A5	0.38	3.6-4.9	19	76
F0	0.32	2.4-3.3	13	64
F5	0.26	1.6-2.2	8.5	52
G0	0.22	1.2-1.6	6.1	44
G5	0.19	0.84-1.2	4.4	38
K0	0.16	0.62-0.84	3.2	32
K5	0.12	0.37-0.50	1.9	25
M0	0.10	0.24-0.33	1.3	20
M5	0.042	0.10-0.14	0.52	10
M8	0.013	0.03-0.04	0.16	10

The *inner limit distance* is the radius of the smallest possible planetary orbit for the primary star. Closer than that, planets will not form, either because a stable planetary orbit is too unlikely or because the star's heat is so great as to vaporize rock.

The *life zone* is the range of orbits in which a planet can maintain Earthlike temperatures, allowing liquid-water oceans to exist for long periods of time.

The *snow line* is the orbital radius at which water ice was able to stay frozen during the formation of the planetary system. With ice available, protoplanets are more likely to enter a runaway growth process that ends in the formation of a gas giant planet.

The *outer limit distance* is the radius of the largest possible planetary orbit for the primary star. Further out than that, the material for planetary formation is too thinly spread to allow planets of significant size to form. There will be a great deal of "junk" at and beyond this orbital radius, of course (see sidebar).

Forbidden Zones

If the star is a member of a multiple star system, planets will not form at certain distances. The presence of a companion star makes a stable planetary orbit impossible in these zones.

The inner edge of the band of forbidden orbits is at one-third of the minimum separation between the star and its companion (computed in Step 4). The inner edge of the forbidden zone may be closer than the inner limit distance computed above, in which case there will be no planets between the primary and its companion. Alternatively, the inner edge of the forbidden band may be beyond the outer limit distance, in which case the companion will have no significant effect on the planetary system.

The outer edge of the forbidden zone is at three times the maximum separation of the star and its companion. If this outer edge is closer than the outer limit distance, planets may form circling the pair as a whole. This can happen even when the stars are at fairly wide separations, although in this case the outer edge of the forbidden zone is likely to be beyond the outer limit distance.

The placement of forbidden zones may become very complicated in a system with three or more stars. In most cases, the GM should be able to take the stars singly or in pairs, and assume that any other members of the system are too far away to affect things.

Orbital Zones

Several times in the following steps, we will refer to the *orbital zone* a given planet falls into. A planet is in the *inner zone* if it is closer to the primary star than the inner edge of the life zone. The definition of the *life zone* should already be clear. The *middle zone* extends between the outer edge of the life zone and the snow line, while the *outer zone* runs from the snow line to the fringes of the star system.

Example

The GM now places orbital zones for the Haven system's primary star, again referring to the Detailed Star Generation sidebar. The inner limit distance for the star falls at 0.15 AU. The star's life zone runs from 0.53 to 0.72 AU, the snow line is at 2.8 AU, and the outer limit distance is at 30 AU. Haven's companion sometimes comes as close as 4.2 AU, so a forbidden zone exists in the system, its inner edge at 1.4 AU. The maximum separation is 23.8 AU, so the forbidden zone's outer edge is at 71.4 AU, well beyond the outer limit distance. All of the primary's planets, then, will be closer than the forbidden zone.

Step 7: Place Planetary Orbits

Planets tend to be spaced evenly on a logarithmic scale. That is, the ratio between one planet's orbital radius and the next is usually about the same throughout the system. To generate a set of planetary orbits, we will generate a Bode sequence (see p. S104).

Procedure

Roll 1d+1 and divide the result by 2, retaining fractions. Multiply that result by the inner limit distance. That product is the base orbital radius (D). Now roll 1d. On a 1-2 the Bode constant (B) is 0.3, on a 3-4 it is 0.35, on a 5-6 it is 0.4.

The innermost orbit will be at D AU, the second at (D + B) AU, the third at (D + 2B) AU. The rest of the orbital radii will be (D + 4B), (D + 8B), (D + 16B) and so on, doubling the B component each time. Continue generating this sequence until a radius falls outside the outer limit distance. When generating orbital radii, round the results of each computation to the nearest hundredth of an AU. Feel free to vary any orbital radius somewhat. A variation of up to 5% is reasonable, or more for the outermost orbits in a system.

In the case of a pair of stars at Very Close separation, again treat the stars as one when placing orbits. At wider separations, some orbits will probably fall into a forbidden zone. If so, continue to place orbits only for the primary star, and only if the forbidden zone does not extend all the way to the primary's outer limit distance. In Step 8, no object will be placed in an orbit within a forbidden zone.



Example

The GM rolls 1d+1 for a 3, divides by 2 to get 1.5, and multiplies this by the inner limit distance to get 0.23 AU. This is the radius of the system's innermost orbit (D). Rolling 1d again, the GM gets a 4, so the Bode constant B is 0.35. The Bode sequence can now be generated: 0.23 AU, 0.58 AU, 0.93 AU. The next term in the sequence would be in the forbidden zone, so the GM stops. The Haven system will have three planetary orbits: one in the inner zone, one in the life zone, and one in the middle zone.

Using Real Stars

GMs running campaigns for ***Traveller*** outside the Third Imperium setting may want to experiment with using real astrography. This is best done in conjunction with the "three-dimensional mapping" option described above.

When researching a real star, you may find that all of its important parameters are available. Some catalogues, however, will only give a star's spectral type and its *magnitude,* a measure of its visual brightness in the sky. Even so, from these two items the rest can be computed.

There are several possible magnitude measurements that might be found in a star list. The *apparent magnitude* is a measurement based on the star's apparent visual brightness in the sky. The *absolute magnitude* is similar, but has been corrected to allow for the star's distance. The *bolometric magnitude* has been further corrected to account for all of the star's radiation, including those portions outside the visual range. Each of these works on a *logarithmic* scale, so that the same difference in magnitude always means the same ratio in brightness.

To get luminosity from bolometric magnitude **B**, compute

$$A = 1.86 - (0.4 \times B)$$

Then raise 10 to the power of **A**. The result will be the star's luminosity. If your source doesn't list the star's bolometric magnitude, it will probably list the absolute magnitude. In this case, refer to the Bolometric Correction Table and find the *bolometric correction* for the star's spectral type. Add this quantity to the listed absolute magnitude, then proceed as above.

Bolometric Correction Table

Type	Correction
O5	-4.4
B0	-3.2
B5	-1.5
A0	-0.30
A5	-0.15
F0	-0.09
F5	-0.14
G0	-0.18
G5	-0.21
K0	-0.31
K5	-0.72
M0	-1.4
M5	-2.7
M8	-4.1

The mass of a star will probably be available only if it is a member of a multiple star system (since that's the only time astronomers can measure star mass directly). If not, then the mass-luminosity relationship given in the main text can be used to get the star's mass, as long as it is a main-sequence star. Continue with the rules in the main text to generate the star's planetary system.

Rhylanor (I)

We will use Rhylanor (Spinward Marches 2716) as an example of how the rules in this book can be used to flesh out the details of a world from published ***Traveller*** material. As we shall see, building Rhylanor from scratch is a challenge, but it can add depth to the world in one GM's personal ***Traveller*** universe.

Referring to published materials from an earlier version of ***Traveller,*** the GM learns that Rhylanor orbits a singleton star of spectral class M2 VI. In its star system there is one planetoid belt and *no* gas giants.

The rules here don't allow for class VI "subdwarf" stars, but the GM decides to break with the published material as little as possible and declares that Rhylanor's primary is an M2 V main-sequence star. He uses the rules from the Detailed Star Generation sidebar to generate the primary's characteristics. Its effective temperature is about 3600 kelvin, its luminosity 0.042 solar units, its mass 0.41 solar units. It radius is 0.0049 AU, and its 100-diameter radius is about 0.98 AU. Its stable lifespan is 98 billion years. The GM rolls 3d on the Age Table and get a 10, indicating an Old Population I star, then rolls 1d-1 for a 0. The star is 3 billion years old.

Generating the star's orbital zones, he finds that the inner limit distance is at 0.082 AU, the life zone is between 0.19 AU and 0.27 AU, the snow line is at 1.0 AU, and the outer limit distance is at 16 AU. Since there is no companion star, there are no forbidden zones.

The GM refers to ***Behind the Claw*** and finds that Rhylanor is listed as having "Normal" climate. This implies that it must orbit somewhere near the inner edge of the life zone, just as Terra does around Sol. Given the ratio between the life zone distances and the inner limit distance, it's obvious that Rhylanor must occupy the innermost orbit of the system. The GM therefore decides not to roll randomly for this innermost orbit's radius, and sets it at 0.21 AU. He rolls randomly for the Bode constant and gets a 0.4. The Rhylanor system will have orbits at 0.21 AU, 0.61 AU, 1.0 AU, 1.8 AU, 3.4 AU, 6.6 AU and 13 AU. The innermost will be in the life zone, the second in the middle zone, the third on the border between middle and outer zones, and the rest will be in the outer zone.

Step 8: Fill Planetary Orbits

Each orbit placed in Step 7 will be occupied by some object, unless it falls in a forbidden zone as the result of the presence of a companion star. In this step, we will place objects in three classes.

A *gas giant* is a massive planet, composed mostly of hydrogen and helium. Because of a gas giant's powerful gravity, it is likely to have many moons and will affect the formation of other planets in nearby orbits. Gas giants are most likely to form outside the snow line of a system, but can appear in the inner system as well. Examples in the Terran system include Jupiter, Saturn, Uranus, and Neptune.

A *terrestrial planet* is a small, stony body with little or no atmosphere. Terrestrial planets are most likely to be found in the inner system, inside the snow line. They are unlikely to have many moons, or large ones. Examples in the Terran system are Mercury, Venus, Terra, and Mars.

A *planetoid belt* is an orbital region occupied by many very small, stony objects. None of the planetoids are more than a few hundred miles in diameter, and most of them are much smaller. Planetoids are the remains of stillborn planets, remnants from the formation of the star system. Planetoid belts are normally formed when a gas giant or companion star disturbs the early mass of planetoids, pulling them out of the stable orbits that would have allowed them to coalesce into a planet. The few planetoids that survive this winnowing process make up a stable system. The Terran system has one major planetoid belt.

Every star system has a great deal of debris in it: scattered planetoids outside the main belts, comets and tiny rogue planets in the dark outer fringes. We will not generate these objects in detail (but see the sidebar).

Procedure

Begin by placing gas giants in their orbits. For each available orbit, roll 3d against the appropriate target number from the Gas Giant Placement Table. If the roll succeeds, a gas giant will occupy the orbit.



Gas Giant Placement Table

Orbit Zone	Target Number
Inner zone	3 or less
Life zone	4 or less
Middle zone	7 or less
Outer zone	14 or less

Next, place planetoid belts. Any orbit not already occupied by a gas giant may contain a planetoid belt. If the next orbit out from the primary star already contains a gas giant, there will be a planetoid belt on a roll of 15 or less on 3d. If there is a companion star, the outermost orbit before the forbidden zone will be occupied by a planetoid belt on a roll of 12 or less on 3d. An orbit not meeting either of these conditions will contain a planetoid belt on a roll of 6 or less on 3d.

Any orbit not occupied by either a gas giant or a planetoid belt will contain a terrestrial planet.

You may already have information about the "mainworld" of the system, as when developing system information based on published ***Traveller*** material. An inhabited "asteroid belt" can be placed in any slot occupied by a planetoid belt. A world with an Earthlike atmosphere must be placed in the life zone. If a gas giant is already in the life zone, the Earthlike world can still be placed, as a moon of the gas giant. If the life zone is occupied by a planetoid belt, it should be removed and replaced with the Earthlike world.

Example

Referring to the Gas Giant Placement Table, the GM decides to work from the innermost orbit outward, and rolls 3d three times. He gets 12, 11 and 14. There will be no gas giants in the system. When placing planetoid belts, he again works from the star outward, rolling 4, 9 and 13. There will be one planetoid belt, in the innermost orbit. The other two orbits will be occupied by terrestrial planets. The planet at 0.58 AU appears to be a good candidate for Earthlike conditions.

Step 9: Planet Size

In this step, we will determine the diameter, density, mass and surface gravity of the planets in the star system under development.

Diameter

For each planet, roll 2d. Modifiers: -4 for the innermost orbit, -2 for any other orbit inside the snow line, +6 for the first orbit outside the snow line, and +4 for the second orbit outside the snow line. -1 for a main sequence star of type M0 through M4, -2 for a main sequence star of type M5 through M8. Multiply the result by 1,000 miles (for a terrestrial planet) or 5,000 miles (for a gas giant) to get the diameter of the planet. For a terrestrial planet the minimum diameter is 1,000 miles, for a gas giant it is 25,000 miles.

The GM may wish to vary these diameters slightly. If so, roll 2d-7 and multiply by 100 miles (for a terrestrial planet) or 500 miles (for a gas giant). Add the result to the diameter obtained above to get a more precise value.

Density

A planet's density depends on its diameter and composition, but the details of computing it are too complex for gaming purposes. As a rule of thumb, terrestrial planets will be denser if they are larger, since rock compresses slightly under gravity. They will also be denser if they are *younger,* since later generations of stars formed in nebulae that were enriched in heavy elements. Gas giants will also be denser if they are larger, but they vary less in composition. We can get reasonable values as follows.

Terrestrial planets: Roll 3d. Modifier: -1 for every full 500 million years of the star system's age (the final result can be negative). Divide the result by 10, retaining fractions, and add the appropriate value from the Terrestrial Planet Density Table. The minimum possible result is 1.3. The result is the planet's average density in grams per cubic centimeter (divide by 5.5 to get density relative to that of Earth).

Terrestrial Planet Density Table

Diameter	Inside Snow Line	Outside Snow Line
<3,000 miles	3.2	2.3
3,000 - 5,999 miles	4.4	1.6
6,000 - 8,999 miles	5.3	1.8
≥ 9,000 miles	5.9	1.9

Terrestrial planets can be classified by their density, as in ***GURPS Space.*** A planet with density of 1.3 to 3.0 is a *silicate* world, with density 3.1 to 4.5 it is a *low-iron* world, with density 4.6 to 6.0 it is a *medium-iron* world, with density 6.1 to 7.0 it is a *high-iron* world, and with density 7.1 and up it is a *metallic* world.

"Hot Jupiters"

Science fiction games often include systems for star system generation, based on the current wisdom among astronomers. For a long time, this has meant a "default model" for planetary systems: small rocky planets close to the star, gas giants out in the cold fringes, all of the planets following fairly circular orbits.

Recently, astronomers have developed the first indirect methods for detecting Jupiter-sized planets around other stars. Very few of these planets have been seen directly, but in each case the planet's presence affects the movement of its primary star. Very precise instruments can measure these effects, allowing us to estimate the mass and orbital characteristics of each planet. Planets orbiting other Sunlike stars were first discovered in 1995, and by this writing there are about twice as many planets known outside the Solar system as inside!

To the astronomical community's surprise, very few of the new planets have followed the expected pattern. Many of them circle surprisingly close to their primary stars, well inside the life zone. Also, many of the new planets follow eccentric orbits, unlike any major planet in the Solar system.

At this writing, theory is scrambling to explain these strange findings. The most popular hypothesis is that a Jupiter-sized planet in the process of formation tends to lose angular momentum through interaction with surrounding matter. It therefore spirals inward quickly, until something aborts the process or it is absorbed by the primary star. This theory is promising, but it fails to explain how Jupiter and the other gas giants of our own Solar system survived.

One implication is that Earthlike planets may be fairly rare in the Galaxy. A Jupiter-sized planet orbiting close to its primary would tend to disrupt the formation of terrestrial planets in the life zone. Even worse, a gas giant in the process of spiraling into its primary might simply *destroy* any planets forming closer in. At present there is no way to even guess the likelihood of such events.

Of course, the detection methods that enable us to locate these planets are biased. These strange cases are much more likely to be detected than a "normal" distant gas giant. The team which has found the most of these extrasolar planets has estimated that perhaps one or two percent of Sunlike stars have close-in gas giants. For the moment, it remains possible to believe in a Galaxy with many Earthlike worlds, a congenial setting for space opera roleplaying.

Space Junk

A normal solar system will contain many minor objects that don't fit the scheme we use here. These objects may be important in a ***Traveller*** campaign.

Not every star system will have planetoid "belts" as such. On the other hand, almost every star system will contain planetoids that wander freely, taking up whatever stable orbits are available. In our own Solar system, there are thousands of planetoids outside the "main belt" between the orbits of Mars and Jupiter.

One important group of planetoids will be associated with the gas giant planets. There are two positions on the orbital path of a gas giant around its primary, sixty degrees (or one-sixth of the circle) ahead and behind. These "Trojan points" are dynamically stable, due to the combined gravitation of the gas giant and its primary star. Planetoids which drift into these positions will tend to stay near them for long periods. This might make a gas giant's Trojan points a convenient place for space industries or refueling stations.

Comets will also appear in almost every star system. Comets are planetoid-sized objects, composed mostly of ices rather than stone. Comets might make a good source of water for space habitats or for starship refueling.

Most of a system's comets exist in the "Oort cloud," a region stretching thousands of AU away from the primary star in all directions. There are *trillions* of comets in the Oort cloud, but they are so widely scattered that finding even one would be a difficult task. A more useful group may exist in a system's "Kuiper belt," which lies in the star system's plane at about the outer limit distance. Some comets fall into the inner star system due to random perturbations, and become the spectacular, regularly appearing objects we're familiar with.

Along with the comets, any star system may have some number of icy bodies, the size of large moons, at or beyond the outer limit distance of the system. Pluto and its moon Charon are examples of this class of object in the Terran system. These might present another opportunity for refueling, for a starship that is out of other options.

The presence of all these objects means that very few star systems will be *completely* without hydrogen-bearing volatiles. Even if there is no gas giant present and the main world of the system is a desert, local civilization can always snag a comet and have enough water to refuel armadas of starships. Or a lone starship, stranded, can search for an ice-bearing object in the outer fringes of the system.

Note that this procedure yields a fairly limited range of densities for a terrestrial planet of a given size. The occasional world may be considerably heavier or lighter, indicating that strange events occurred during planetary formation. Perhaps chemical fractionation somehow took place in the protoplanetary cloud, leading to an unusually light world. Or perhaps a monstrous collision occurred, leaving only an iron-rich core behind. In any case, the GM should (as always) feel free to exercise creativity rather than relying on a roll of the dice.

If the GM wishes to fix a world's density based on its diameter and a desired value for surface gravity, he should use the following:

$$K = (43.9 \times G) / D$$

Here, **K** is the density of the world in grams per cubic centimeter, **G** is the desired value for surface gravity, and **D** is the world's diameter in thousands of miles. Once this formula is applied, the world's mass and surface gravity will work out to be approximately correct.

Gas Giants: Simply refer to the Gas Giant Density Table to get a value for the average density of the planet in grams per cubic centimeter.



Gas Giant Density Table

Diameter	Density
<40,000 miles	1.4
40,000 - 59,999 miles	1.0
60,000 - 79,999 miles	0.7
80,000 - 84,999 miles	1.0
≥85,000 miles	1.4

Mass

Once a world's diameter and density are known, we can compute its mass and surface gravity. To get a world's mass, use the following:

$$M = (K \times D^3) / 2750$$

M is the world's mass in units of Earth's mass. **K** is the world's density in grams per cubic centimeter, as computed above. **D** is the world's diameter in thousands of miles.

Surface Gravity

To compute a world's surface gravity, use either of the following (they give roughly equivalent results):

$$G = (62.9 \times M) / (D^2) \qquad G = 0.0228 \times K \times D$$

G is the world's surface gravity in units of Earth's surface gravity (Gs). **K** is the world's density in grams per cubic centimeter, **M** is the world's mass in Earth masses, and **D** is the world's diameter in thousands of miles.

Example

The terrestrial planet in the Haven system's second orbit looks like the best candidate for an Earthlike world. The GM names that planet "Haven" and decides to detail it before fleshing out any details for the rest of the system. The second orbit is inside the snow line but it isn't the innermost in the system, so he rolls 2d-2 for a 6. This would yield a diameter of 6,000 miles, which the GM decides to vary. He rolls 2d-7 for a 3, yielding a final diameter of 6,300 miles.

For density the roll is 3d-8. The result is a 0, so the planet's density is 5.3 grams per cubic centimeter. This makes Haven a medium-iron world with density about 96% that of Earth. The planet's mass is 0.48 Earth masses and its surface gravity is 0.76 G.

"One of the first things they teach you in training is that no matter how strange it seems, somebody has probably seen it before. They tell you that everything has been seen, labeled, cross-indexed and classified a thousand times over. This is merely to lull you into a false sense of security."

– Twenty Years in the IISS, Janos Projaska

Step 10: Place Moons

For our purposes, we will classify satellites as *small moons* and *large moons*. Small moons are planetoid-sized, no more than 100 miles in diameter. Large moons, on the other hand, may be up to 5,000 miles in diameter. The orbital distances of moons will be given in *planetary radii*. For example, the surface of the planet is at one planetary radius from its center (by definition). A satellite at two planetary radii is twice as far from the center of the planet, a satellite at ten planetary radii is ten times as far, and so on. Planetary radii can be converted to miles by multiplying by half the planet's diameter.

Terrestrial planets and gas giants can each have satellites, but the two classes are very different in the *kind* of moons they are likely to have.

The moons of a terrestrial planet must orbit close in, since the planet's mass is low and would have difficulty maintaining its gravitational hold on a distant satellite. This is especially true for planets that are close to the overwhelming gravitational pull of the primary star.

For terrestrial planets, large moons are an exception. They form close to the planet, but they don't remain there, as tidal effects quickly force them out to a wider orbit. For example, current theory claims that Terra's large moon formed at about 4 planetary radii, but only a million years later had moved halfway out to its current orbit at 60 planetary radii. This partially explains why terrestrial planets are very unlikely to have more than one large moon. With orbits changing so quickly, it's very difficult for multiple large moons to fall into a stable configuration. Instead, they will tend to collide with each other or with the planet.

Gas giants, on the other hand, have extensive systems of satellites. A gas giant's powerful gravity allows it to compete more effectively with its primary star, especially since it probably orbits further out in any case.

One feature which is probably unique to gas giants is the *ring system*. Almost all gas giants have rings, composed of billions of small particles orbiting in a flat disc at about 2 planetary radii. The rings are composed of particles thrown off the gas giant's inner moons due to meteoroid collisions. A large number of inner moons means more particles feeding the ring. It also increases the chance that some of the moons will be in position to act as "shepherds," maintaining the ring particles in their orbits. Normally a gas giant's rings are fairly thin and wispy, but a few ring systems may be as spectacular as Saturn's, in the Terran system.

Science fiction has sometimes used the notion of an Earthlike world with a ring system. In fact, the Third Imperium includes such a world in the Spinward Marches sector (Trin). This situation may be unlikely, but it's not impossible. A moon might spiral too close to the planet and shatter, or a major impact on a moon might scatter enough debris to form a ring. The problem is that such a system would be unstable. The particles would fall to the planet or escape to space, within a few million years at most. These rules don't not allow the random generation of terrestrial planets with rings, but the GM is free to set up such a system as a rare case.

Wayward Planets

The main text rules should suffice for generating stable, long-lived systems of planets. It's possible, however, for any given star system to capture free-wandering planets from outside. It seems unlikely that such a wayward planet would remain in place for very long. It would occupy an unusual orbit at first, highly eccentric or inclined to the plane that the other planets orbit in. In the long term, gravitational perturbations from other planets in the system would tend to regularize its orbit, or eject it to interstellar space once again. Large gas giants are particularly effective in "policing" a star system. The presence of Jupiter may be one reason why Sol system has no wayward planets.

To determine if any wayward planets are present, roll 3d. Modifiers: +2 if any gas giants are present in the system. On a 7 or less there will be 1d-3 wayward planets (minimum 1). For simplicity, assume that any wayward planets orbit the primary star in a multiple star system.

Wayward planets may appear in almost any part of a star system, including outside the outer limit distance. To determine the orbital parameters of a wayward planet, roll on the Orbital Separation Table and Orbital Eccentricity Table as if generating parameters for a companion star. Determine the planet's minimum and maximum separation from its primary as usual, then check to see that the planet does not cross into any forbidden zones. If it does, then the planet's orbit is unstable and must be re-generated.

We have no information on what kind of "rogue" planets exist in interstellar space, or even if they exist at all. Assume that any wayward planet is a terrestrial world without moons. Determine its properties normally using the rules in the main text. Note that a captured planet is almost certainly not the same age as the rest of the star system, and can be much older or younger. The GM should determine an age for the planet using any convenient means. In Chapter 5, determining a planet type (see Step 12) will be difficult if a wayward planet's orbit crosses between orbital zones. The GM should set a planet type based on his own common sense and the needs of his campaign.

Incidentally, the capture of wayward planets is one of the few ways that a very early type star (O or B type) might have a planetary system. A ***Traveller*** GM should feel free to use such a situation if it fits his campaign.

Planetoid Belts

A planetoid "belt" is actually an orbital zone, in which many small chunks of stone or ice circle their primary star. Planetoid belts often possess valuable resources, and can be inhabited "worlds" in their own right.

Planetoids tend to be stony objects, but they can vary dramatically in the details of their composition. *S-type* planetoids have plenty of metal-rich silicates containing iron, magnesium or nickel. *M-type* planetoids are even richer in metals, and may be mostly composed of metallic nickel-iron. *C-type* planetoids are poor in metals, but contain carbon and may also contain volatiles such as water ice. *P-type* planetoids also have carbon and volatiles, and may have complex organic compounds on their surfaces. Any planetoid belt can be mined for metals. Even more to the point, a civilization living in the belt can mine the volatiles-carrying planetoids for organics and water, the basis of any deep-space habitat environment.

If a planetoid belt is to be developed as a world, ignore most of the world-design sequence. Most of the planetoids in the belt will have nearly circular orbits, with radius close to the radius assigned to the belt. Oddly enough, some planetoids have "moons" in orbit around them, but these are too small and close to be generated using the rules in the main text. The rotation period of any given planetoid can be generated using the main text rules. Planetoids are almost always of the Tiny size class, and will be of Rockball or Icy Rockball type depending on their location in the star system.

Planetoid belts can vary dramatically in economic value. When determining the Resource Value of a planetoid belt, roll 3d on the following table. Modifiers: -3 in the inner zone, -1 in the life zone, -3 in the outer zone.

Planetoid Belt Value Table

Roll (3d)	Overall Value	Modifier
3	Worthless	-5
4	Very Poor	-4
5	Poor	-3
6-7	Very Scant	-2
8-9	Scant	-1
10-11	Average	+0
12-13	Abundant	+1
14-15	Very Abundant	+2
16	Rich	+3
17	Very Rich	+4
18	Motherlode	+5

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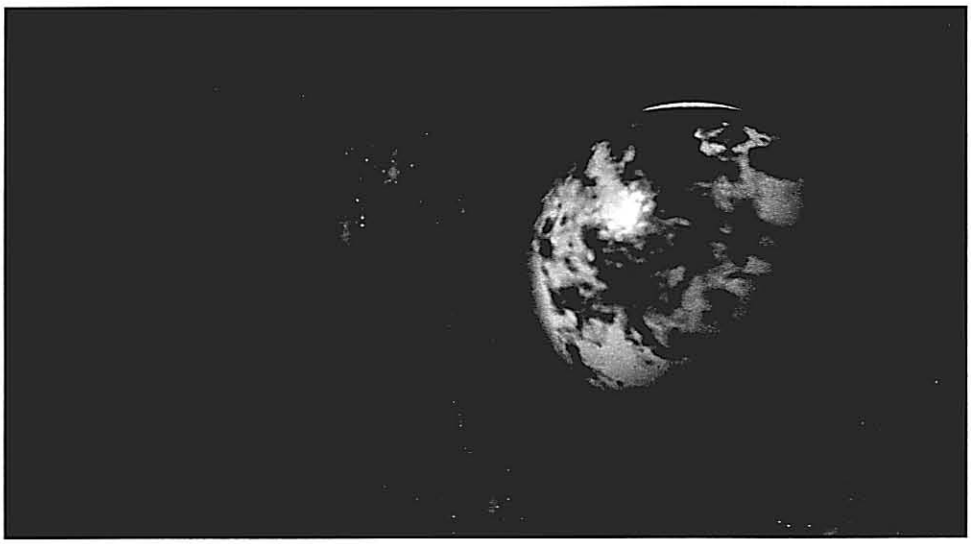


Procedure

Terrestrial planets: Roll 1d-4 to determine the number of large moons for a terrestrial planet. If the planet has *no* large moons, it will have 1d-2 small moons. Modifiers (for both of these rolls): -3 for a planet within 0.75 AU of the primary star, -1 for a planet between 0.75 AU and 1.5 AU away from the primary star, +1 if the planet is more than 9,000 miles in diameter, -1 if the planet is between 2,000 and 3,999 miles in diameter, -2 if it is less than 2,000 miles in diameter. Do not roll for moons for a planet within 0.5 AU of its primary star.

A terrestrial planet's small moons orbit close to the planet, between 2 and 7 planetary radii. Roll 1d+1 for each small moon to determine this value. If two moons orbit at the same radius, re-roll for both.

Large moons will be found between 10 and 80 planetary radii. Before determining the orbital radius of a large moon, determine its size as described below. Then roll 2d. Modifiers: +1 if the moon is 500-999 miles in diameter, +2 if it is 1,000-1,999 miles in diameter, +3 if it is 2,000-3,999 miles in diameter, +4 if it is 4,000 miles or more in diameter. Multiply the result by 5 to get the radius of the moon's orbit in planetary radii. Large moons of terrestrial planets *may not* orbit close to each other. If two orbits are within 10 planetary radii of each other, re-roll or assign new values.

Gas giants: The satellite systems of gas giants are always very complex. We will simplify and assume that gas giants normally have three distinct families of moons.

The first family is a cluster of small moons orbiting at between 2 and 5 planetary radii. These moons orbit very close together, sometimes even sharing orbits in a "resonant" pattern that prevents their collision. Roll 2d to determine the number of small moons in this family. Record their number, but don't bother to generate specific orbital information or sizes for them until one of them becomes important to an adventure.

The size of this family will also determine the level of ring system the planet has. If a gas giant planet has at least 6 moons in this family, its ring system will be visible from anywhere in the star system, at least in moderately powerful telescopes. If there are 10 or more moons in this family, the ring system will be comparable to Saturn's, easily visible in even small telescopes from a distance of several AU.

The second family is a group of large moons, orbiting between 6 and 30 planetary radii. Roll 1d to determine the number of moons in this family. Modifiers: -5 for a planet within 0.5 AU of the primary star, -3 for a planet

within 0.75 AU, -1 for a planet within 1.5 AU. Roll 3d+3 to determine the orbital radius of each moon. If any result is 15 or more, add another roll of 2d. If any two orbits are within 2 planetary radii of each other, re-roll or assign new values.

The last family is a group of small moons, orbiting at 40 to several hundred planetary radii. These moons are normally captured planetoids, and often have highly eccentric, inclined or even retrograde orbits. Roll 1d to determine the number of these moons. Modifiers: -5 for a planet within 0.5 AU of the primary star, -3 for a planet within 0.75 AU, -1 for a planet within 1.5 AU, +4 if there is a planetoid belt within 3 AU. Again, don't bother to generate specific information for these moons.

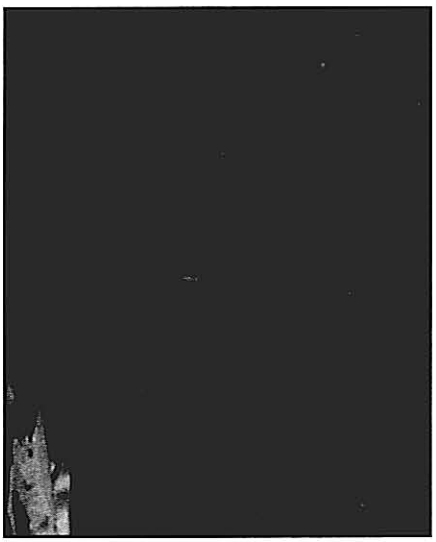
Moon Size

To determine the diameter of a small moon, roll 2d-5. If the result is greater than 0, it will give a diameter in tens of miles. If the result is 0 or less, assign the moon a diameter less than 10 miles. A very small moon is likely to be irregular (the moon's self-gravitation isn't strong enough to force a spherical shape).

To determine the diameter of a large moon, roll 2d-7 and add a modifier from the Large Moon Size Table.

Large Moon Size Table

Planet Diameter	Modifier
60,000 miles or more	+2
40,000-59,999 miles	+1
8,000-9,999 miles	-1
6,000-7,999 miles	-2
4,000-5,999 miles	-3
2,000-3,999 miles	-4
Less than 2,000 miles	-5



If the result is greater than 0, it will give a diameter in thousands of miles. The GM may vary the diameter by up to 500 miles, using the same procedure as for planetary diameters. If the result is 0 or less, assign the moon a diameter between 100 and 500 miles. This procedure sometimes generates moons for gas giants that are larger than theory considers likely, but big (and habitable!) gas giant moons have made good adventure sites in science fiction too often for us to rule out the possibility here.

If a terrestrial planet is going to be developed in full detail, the GM should determine the density and mass for at least the planet's large moons. This can be done using the same procedures as in Step 9. No other properties of a moon will have significant effect on the planet, so they can be left ungenerated unless the moon itself is going to be an adventure location.

Example

Haven orbits at 0.58 AU and is between 4,000 miles and 9,000 miles in diameter. The modified roll for large moons is 1d-7, so the GM doesn't bother rolling. Haven has no large moons. The modified roll for small moons is 1d-5. The GM rolls and gets a result of 1, so Haven will beat the odds and have one small moon. He rolls 1d+1 and gets a 7, so the moon will orbit at 7 planetary radii. For diameter, the GM rolls 2d-5 and gets a 1, so the small moon will be about 10 miles in diameter. Since the moon is small, the GM decides not to determine its density and mass for now.

Planetoid Belts

[Continued]

Poor belts either contain relatively few objects, or contain few of the metal-bearing or volatiles-bearing objects that are of use. A "worthless" belt contains nothing but a scattering of stony gravel, impossible to mine or live in. On the other hand, a rich belt contains many metallic or volatiles-bearing objects, spaced relatively close together for ease of use.

When developing the population and local tech level of a planetoid belt in Chapter 6, treat it as if it were a planet with diameter less than 4,000 miles, with no atmosphere or hydrographic coverage. Its MSPR will be 0, but it may have a PR of up to 10 like any other world.

Rhylanor (II)

The GM is now ready to place planets in the Rhylanor system. He has already established that Rhylanor itself occupies the innermost orbit, at 0.21 AU. Published material claims that the system contains no gas giants. This is unlikely under the current rules, since there are several orbits outside the snow line. Nevertheless, the GM skips over gas giant placement and goes on to place planetoid belts. Without gas giants, there is no obvious place to put the one planetoid belt listed in canon material, so the GM arbitrarily chooses the orbit at 3.4 AU. The other five orbits all contain terrestrial planets, which the GM will develop later if he needs to.

It's finally time to develop Rhylanor, the mainworld of the system, in detail. Referring to ***Behind the Claw,*** the GM finds that Rhylanor's diameter is (rounded to three significant figures) 3,980 miles. This is about Mars-sized, a trifle small for a world that has seas and an oxygen-nitrogen atmosphere (even if that atmosphere *is* listed as being Very Thin). The GM therefore decides to make the planet's density higher than average for its size and age. The usual roll for density would be 3d-6 with an average of 4.5, yielding a density of about 4.9 grams per cubic centimeter. The GM chooses a density of 5.5 grams per cubic centimeter instead, making Rhylanor about as dense as Terra despite its small size. He decides that its nickel-iron core is unusually large, and its overall metal content high. The chosen density yields a planetary mass of 0.126 Earth masses, and a surface gravity of almost exactly 0.5 G.

Rhylanor is so close to its primary star that it will not have moons on a random roll. The GM decides not to place any arbitrarily, and moves on to the next step.

Chapter Five

Worlds

We will sometimes use the generic term *world* to refer to any astronomical body that characters are likely to visit. This can be a planet, a moon, or even a single planetoid. This chapter includes rules and guidelines for developing single worlds as sites for adventure.

Physical Details

In this section, we'll detail the physical characteristics of our world.

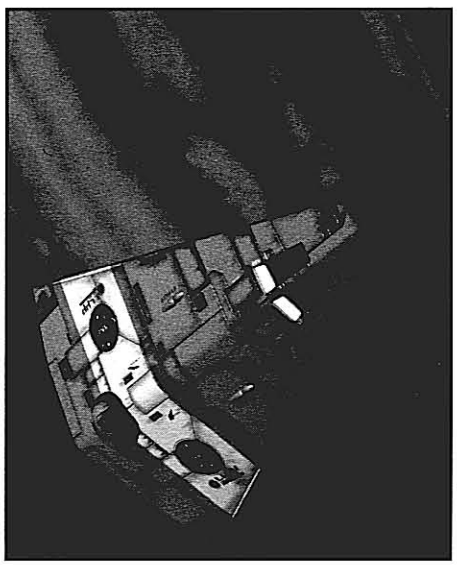
Step 11: Dynamic Parameters

Most planetary orbits are eccentric, but they don't deviate as far from a circular path as the orbits of stars in a multiple system. Highly eccentric orbits are not stable. Any planet in such an orbit will tend to fall into the primary star or be ejected from the system in a relatively short time.

In this step, we will compute the orbital and rotational periods for the planet and any of its moons. In effect, this will give us the length of the local "day," "month," and "year."

Orbital Eccentricity

Roll 3d on the Planetary Orbit Eccentricity Table and record the resulting value.



Planetary Orbit Eccentricity Table

Roll (3d)	Eccentricity
3-4	0.00
5-6	0.01
7-8	0.02
9-12	0.05
13-14	0.08
15	0.10
16	0.15
17	0.20
18	0.25 or more (assign value)

The minimum and maximum separation between the planet and its primary can be computed as for stars:

Minimum separation = (1 - E) × R
Maximum separation = (1 + E) × R

E is the eccentricity of the planet's orbit, and **R** is the orbital radius (which can be considered the *average* separation). It's possible for eccentric planetary orbits to overlap. If this happens, assume that the orbits are in sufficiently different planes so that the two planets never come dangerously close to one another.

Tide-Locked Worlds

Many habitable worlds are tide-locked. One situation is the habitable moon of a gas giant planet, which will almost certainly be tide-locked to the planet. "Double planets," where a terrestrial planet and its moon are of comparable size, may lead to the two worlds being locked to each other. Another case is that of a planet in the life zone of a small type-M star. Since such stars are very common, explorers will often encounter such worlds in the course of their travels.

When a planet is tide-locked with respect to its primary star, the situation has a number of implications. There will probably not be much axial tilt. The "day face" will be unusually warm. The "night face" may be warmed by air circulation, but this process will be inefficient and most of the face will be very cold. If a tide-locked world doesn't retain enough atmosphere, air circulation will fail, and *all* of the planet's volatiles will freeze out on the night face.

Step 11: Apply a -10 modifier to the roll on the Axial Tilt Table. Tide-locked worlds will not rotate in the retrograde direction.

Step 12: When determining world type, compute the size parameter as usual, then divide it by 2. The world will (effectively) be of the size class indicated by the reduced size parameter. A world which becomes of Desert or Rockball type due to this process will have extensive caps of frozen volatiles on its night face.

Step 13: If the world is still of a type that has a substantial atmosphere after the correction to Step 12 is applied, then compute its atmospheric pressure as usual.

Step 14: When rolling to determine hydrographic coverage for the planet, apply a -4 modifier. Any oceans will tend to be in or near the "twilight zone" between the day and night faces.

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Orbital Period

The orbital period of a planet is computed as follows.

$$P = \text{Square root of } (R^3 / M)$$

P is the orbital period in standard years, **R** is the orbital radius in AU, and **M** is the mass of the primary star in solar units. Multiply **P** by 365.26 to get the period in standard days.

The orbital period of a moon can be computed using a similar formula.

$$P = 0.0074 \times \text{Square root of } (R^3 / M)$$

Here, **P** is the orbital period in standard days, **R** is the orbital radius in thousands of miles, and **M** is the *sum* of the masses of the planet and moon. As a rule of thumb, the moon's mass can be ignored if its diameter is no more than 1/5 that of the planet.

Astronomers should notice that the orbital periods computed above are *sidereal* periods. They measure the time it takes for the planet or moon to complete one orbit with respect to distant stars. The apparent length of a month or day on the planet itself is affected by the planet's rotation (see below).

Tidal Effects

A planet orbiting its primary star will not experience that star's gravity uniformly. The star will exert more gravitational force on the near side of the planet than on the far side. Likewise, if the planet has a moon, that moon will also exert a differential force on the near and far sides of the planet. This difference causes something called a *tidal force.* It tends to pull the planet into a slightly elongated shape, producing tidal bulges on the near and far sides. These bulges will be much more noticeable in liquids than in more-rigid rock, causing high and low ocean tides as the planet rotates.

The level of tidal force exerted on the planet has another effect, over long periods of time. If the planet rotates with respect to the body producing a tidal force, the tide will slow that rotation. In extreme cases, the planet may *stop* rotating altogether with respect to the other body, becoming "tide-locked" so that the tidal bulges remain stationary. We will estimate the level of tidal force on any given planet, to get an idea how significant any ocean tides may be, and also to help determine the planet's rotation period.

To estimate the level of tidal force being exerted on a planet by each of its moons, use the following.

$$T = (0.14 \times M \times D) / R^3$$

T is a measure of the tidal force on the planet, in units of the force exerted by Earth's Moon on the Earth. *M* is the mass of the moon in Earth masses, **D** is the diameter of the planet in thousands of miles, and **R** is the radius of the moon's orbit around the planet in *millions* of miles. A planet also exerts tidal forces on its moons. Use the same formula to estimate the strength of these forces, using **M** for the planet's mass and **D** for the moon's diameter.

Tide-Locked Worlds

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Step 17: When computing the average surface temperature, multiply the final result by 1.2. The corrected result will be the average surface temperature *on the day face.*

Some tide-locked worlds will exhibit "resonant tide-locking." If a planet's orbit has eccentricity of at least 0.15, then it's possible for the planet to settle into a stable situation such that its rotational period is exactly 2/3 of its orbital period. Since such a world rotates (slowly) with respect to its star, it should be designed using the standard rules. The GM may use this situation instead of full tide-locking whenever it seems appropriate.



Rhylanor (III)

At this point, the GM takes stock. Without proceeding further, it's obvious that strictly following the world-design sequence will make it very difficult to generate a Rhylanor that matches published material. The planet orbits very close to its red-dwarf star, and will almost certainly be tide-locked to it. This would not be a problem for a larger world, but the rules for tide-locked worlds imply that Rhylanor is too small to retain any atmosphere at all, much less an almost-breathable one (not to mention oceans).

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Rhylanor (III)

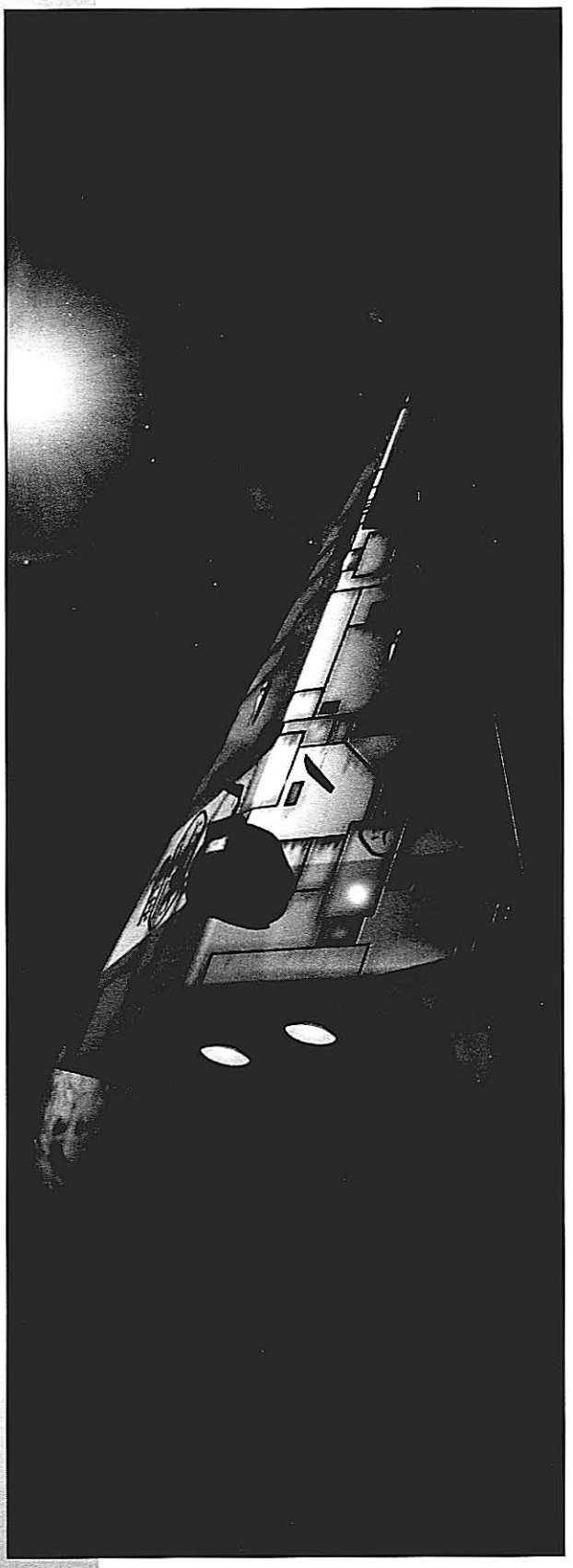
[Continued]

Meanwhile, even if the tide-locking were not a factor, the planet is too small to be an Ocean world. It will be classified as a Desert world at best, meaning that while the seas may not be impossible, they do stretch the bounds of probability. Clearly the world-design rules will have to be bent. The trick will be to bend them as little and as few times as possible.

Bearing all this in mind, the GM proceeds to develop Rhylanor's dynamic parameters. He considers setting the orbit's eccentricity at 0.15 or higher, allowing him to use resonant tide-locking, but he decides against it – he doesn't want to use that trick too often. A roll on the Planetary Orbit Eccentricity Table yields a minimal eccentricity of 0.05. The planet approaches its primary as closely as 0.20 AU, and recedes as far as 0.22 AU. The orbital period is almost exactly 0.15 standard years, or 54.9 standard days.

Rhylanor's primary star exerts a tidal force of close to 10 on the planet, implying a total tidal effect of about 240. The GM decides not to roll randomly for rotation period, knowing that that roll would automatically make the planet tide-locked. Instead, he observes that if he made the roll, it would yield an initial rotation period of about 260 hours, which is close to 1/5 of the orbital period. He decides that Rhylanor is currently in a state where it rotates exactly five times per orbit. Such a state isn't stable in the long term, but the GM finds it plausible that it could last for a few million years. Besides, it makes an interesting local detail. So the rotation period is exactly 10.98 standard days. The GM rolls for retrograde rotation and gets a 15, so Rhylanor rotates retrograde. The apparent day length is 9.15 standard days, and the star appears to rise in the west and set in the east.

Finally, a random roll on the Axial Tilt Table yields an axial tilt of 15 degrees.



The primary star also exerts tidal forces on its planets. To estimate these, use the following.

$$T = (0.057 \times M \times D) / R^3$$

T is again a measure of the tidal force on the planet, in the same units as above. Here, however, **M** is the mass of the primary star in solar units, **D** is the planet's diameter in thousands of miles, and **R** is the planet's orbital radius in AU.

One important factor is the *total tidal effect* on the world.

$$E = (S \times A) / M$$

E is a measure of the total tidal effect, essentially a "fudge factor" for the amount by which the world's rotation has been slowed by the various tidal forces on it. **S** is the sum of all tidal forces on the world, from the primary star or any moons, as computed above. **A** is the star system's age in billions of years, and **M** is the mass of the world in Earth masses. Round **E** to the nearest whole number.

Rotation Period

In general, more massive worlds tend to rotate more quickly, but this is modified by many factors and can depend on sheer accident during the formation of the star system. A nearly random choice of rotation period is as likely to be realistic as any other method.

Roll 3d. Modifiers: Add the total tidal effect, along with the appropriate modifier from the Rotation Period Table. The result is an initial value for the planet's rotation period in standard hours (divide by 24 to get standard days).

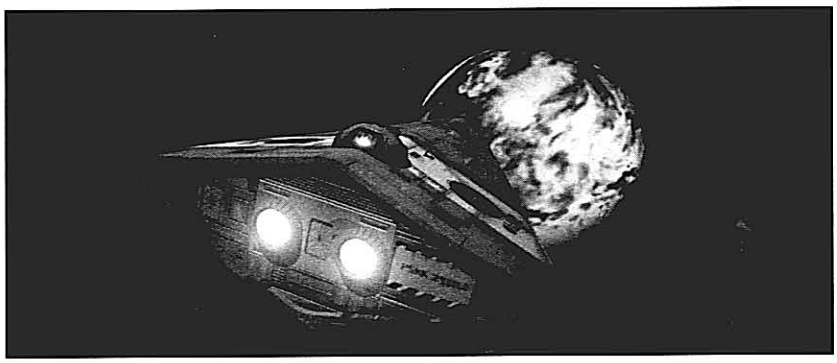
Rotation Period Table

Diameter	Modifier
Less than 3,000 miles	+10
3,000-5,999 miles	+8
6,000-8,999 miles	+6
9,000-25,000 miles	+4
25,000-39,999 miles	+3
40,000-59,999 miles	+2
60,000-79,999 miles	+1
80,000-84,999 miles	+0
More than 85,000 miles	-1

If the result is greater than 36 hours *or* the initial 3d roll was a natural 16 or greater, the planet will have unusually slow rotation. In this case, roll 3d on the Special Rotation Table and use the result from that instead. Modifiers: +1 for every hour that the initial rotation period value was over 36 hours.

Special Rotation Table

Roll (3d)	Rotation Period
6 or less	Use initial value for period
7	1d × 2 standard days
8	1d × 5 standard days
9	1d × 10 standard days
10	1d × 20 standard days
11	1d × 40 standard days
12	1d × 100 standard days
13 or more	Tide-locked



The Special Rotation Table can yield a result of *tide-locked,* indicating that the planet's rotation has stopped with respect to some body exerting tidal forces on it. Also, if the rotation period from the above procedure is longer than the orbital period of the planet's innermost moon or the orbital period of the planet itself, the planet is tide-locked instead. Tide locking has a variety of implications (see sidebar).

If the world is not being acted upon by any significant tidal forces, then tide-locking will not take place. If the total tidal effect is less than 1 but a result of "tide-locked" appears anyway, assume the world's rotation period is 1d × 200 standard days.

The GM may treat the value for rotation period from the tables as approximate, and arbitrarily vary it by part of standard hour, a few standard hours, or a few standard days as appropriate. Rotation periods can also be recorded with precision down to the minute or second, although this is useful mostly for local color.

Again, the rotation period generated here is the sidereal period, the time it takes the planet to complete one rotation with respect to a distant fixed point. The apparent local day length may be different (see below).

By convention, each star system has a "north" direction, defined so that the star rotates eastward (in accordance with the right-hand rule). On each planet, "north" and "east" are also defined by the right-hand rule in accordance with planetary rotation, but in some cases the planet's north pole is actually on the "south" side of its orbital plane with respect to the primary star. In effect, the planet rotates in the opposite direction from the primary star and most of its neighboring planets. This is more common than one might assume. In the Terran system, two out of the eight major planets have such "retrograde" rotation. For each planet, roll 3d. The planet will have retrograde rotation on a 13 or more.

Local Calendar

At this point, the GM can determine the length of various celestial cycles from the point of view of an observer on the planet's surface. The formula to be used for all of these computations is:

$$A = (S \times R) / (S - R)$$

A is the apparent length of the cycle, **S** is the sidereal period associated with the cycle in question, and **R** is the rotation period of the planet. All of these must be expressed in the same units. If the planet rotates retrograde, **R** is *negative.* If **S** and **R** are equal, the above formula is undefined. In this case, assume that the length of the cycle is *infinite,* or that there is no apparent motion.

Detailed World Typing

To get greater accuracy in world typing, we need to correct the size parameter for a given world to account for the amount of energy it receives from its primary star. If a world is closer to its primary, it is warmer and the molecules in its upper atmosphere are more likely to attain escape velocity.

Compute a correction factor as follows:

C = Square root of R / Fourth root of L

Here, **C** is the correction factor, **R** is the average distance of the world from the primary star, and **L** is the star's luminosity. Multiply the size parameter as computed in the main rules by this correction factor, and use the result as the corrected size parameter. Close to the inner edge of the life zone, the correction factor will be about 1 – this is why the uncorrected size parameter is usually close enough in such cases.

For those interested in the science behind these formulae: the corrected size parameter is inversely proportional to the minimum molecular weight of substances that the world can retain over a long period of time. Divide 6.93 by the corrected size parameter, and round the result up to the nearest whole number. Substances with at least this molecular weight will be retained, while lighter substances will tend to escape quickly. For comparison, some of the more important molecular weights are: hydrogen 2, helium 4, methane 16, ammonia 17, water vapor 18, nitrogen 28, oxygen 32.

Local Color

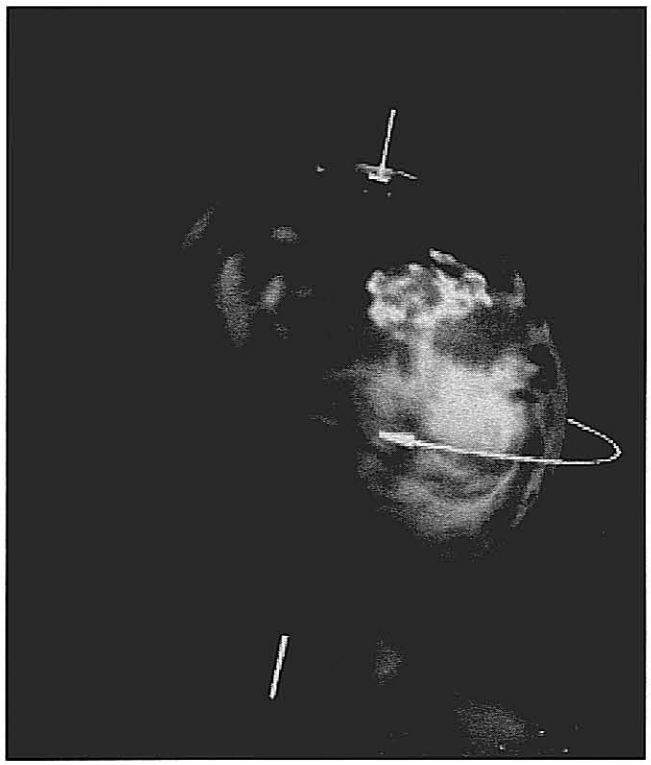
It might be interesting to determine the size of various objects in a world's sky. Use the following formula:

$$S = (57.3 \times D) / R$$

S is the apparent size of the object, in degrees. **D** is the object's diameter, and **R** is the distance to the object (both in the same units). This is a reasonable approximation for apparent sizes up to about 20 degrees. For comparison, from Earth's surface both the Sun and the Moon appear to be about half a degree across, roughly the size of a US dime held six feet from the eye.

The apparent size of an object has several effects. For example, the smaller a star's apparent size in the sky, the sharper the shadows it will throw. For example, an early F-class star will appear very small as seen from a world in its life zone, so its shadows will be sharp and very black. A small red dwarf, on the other hand, will loom very large over a world in its life zone. Shadows there will be blurred and the surroundings will appear to have "indirect" lighting. Also, if a planet's moons appear at least as large as its primary star, then total solar eclipses will be possible.

A star's spectral type will also affect the quality of light more directly. Early A-type or F-type stars will put out harsh white light. Cool M-class dwarf stars will emit softer light. Incidentally, a red dwarf's light will not look obviously "red" from the surface of its planets. It will have a color balance more like that of an incandescent bulb – different from Earthly sunlight, to be sure, but not so much so that the human eye can't adapt. A more radical difference is due to the fact that an M-class star emits most of its radiation in the infrared. The actual amount of visible light reaching a planet in a red dwarf's life zone will be only a few percent of that reaching Earth. The human eye will be able to adapt to this as well, seeing about as well as it does on a cloudy day on Earth. It will be possible to stare directly at the star's disk, picking out starspots and other features (although this will be dangerous, because the high level of IR radiation may cause retinal burns).



The day length (the time between sunrises) is computed by setting **S** equal to the planet's orbital period. For a rapidly rotating planet, the day length will be very close to the actual rotation period for the planet. If day length is *negative,* as often happens when the planet is in retrograde rotation, the primary star will appear to rise in the west and set in the east.

The apparent length of a moon's orbital cycle (the time between moonrises) is computed by setting **S** equal to the moon's sidereal orbital period, as computed above. If the length of the cycle is *negative,* as often happens for very close-in moons, the moon will appear to rise in the west and set in the east. A close-in moon may happen to orbit near the planet's geosynchronous distance, in which case the moon will spend long periods in the sky as seen from any given location, keeping pace with the planet's surface.

Axial Tilt

The angle between a world's rotation axis and a vector perpendicular to the star system's ecliptic plane is what we call the *axial tilt* of the world. The major planets of the Terran system have a wide variety of axial tilt values, and there seems to be no correlation with their other properties.

Roll 3d on the Axial Tilt Table. If necessary, roll 1d on the extended table. In any case, roll 2d as indicated and record the end result.

Axial Tilt Table

Roll (3d)	Axial Tilt
2 or less	0 degrees
3-6	0 + (2d-2) degrees
7-8	10 + (2d-2) degrees
9-10	20 + (2d-2) degrees
11-12	30 + (2d-2) degrees
13-14	40 + (2d-2) degrees
15-18	Roll on extended table

Roll (1d)	Axial Tilt
1-2	50 + (2d-2) degrees
3-4	60 + (2d-2) degrees
5	70 + (2d-2) degrees
6	80 + (2d-2) degrees

Example

The GM now proceeds to determine the orbital and rotational parameters for the planet Haven. He rolls 3d on the Planetary Orbit Eccentricity Table and gets a 6 yielding a minimal eccentricity of 0.01. Haven's minimum separation from its primary star is 0.57 AU, and its maximum separation is 0.59 AU. Haven's orbital period is 0.51 standard years, or 186.3 standard days.

Based on the results from step 10, Haven's moon orbits very close in, about 22,000 miles from the center of the planet. Its orbital period is 1.10 standard days. The tidal force of the primary star on Haven is 1.38, somewhat greater than the Moon's tidal force on the Earth. The total tidal effect on Haven is 12.

The GM rolls 3d+18 (+6 for the planet's size and +12 for the total tidal effect) and gets a total rotational period of 28 hours. He decides to vary this a bit and records the actual period as 27 hours, 50 minutes (about 1.16 standard

days). The apparent day length is almost exactly 28 hours. The moon's apparent orbital period is -21.27 standard days. Haven's moon rises in the west and sets in the east, and appears to move much more slowly than Haven's sun. It spends several local days in the sky at any one time. Finally, the GM rolls on the Axial Tilt Table, getting a 7 on 3d and a 9 on 2d. Haven's axis is tilted by about 19 degrees.

Step 12: World Type

Gas giant planets are all very similar. When you know a gas giant's mass and diameter, you know almost everything you need about it. Terrestrial planets, on the other hand, are much more diverse. The following steps are appropriate for terrestrial planets and moons, especially those in the life zone.

A world's general type depends on what *volatiles* the planet's core can retain over billions of years. Volatiles are chemical compounds with low melting and boiling points, which make up the bulk of a planet's atmosphere. Over billions of years, heavy volatiles will be retained by a world while lighter compounds escape into space. We will use world types to *vastly* simplify the world-building process.

Procedure

In general, larger worlds can retain lighter volatiles. The closer a world is to its primary, however, the faster the loss of volatiles will take place and the more likely it is that light volatiles will escape. Here, we will present a relatively simple approach to determining what volatiles will be retained by a world over the long term. These simple rules will be nearly correct for worlds in a star's life zone, less so elsewhere. See the sidebar for a more detailed and realistic procedure, applicable to worlds anywhere in a star system.

Begin by computing the *size parameter* as follows:

$$P = (7.93 \times M) / D$$

Here, **P** is the size parameter, **M** is the world's mass in Earth-masses, and **D** is the world's diameter in thousands of miles. Round the size parameter off to the nearest hundredth, then refer to the World Size Table.

World Size Table

Size Parameter	Size Class	Typical Diameters
More than 1.74	Large	More than 10,400 miles
0.39-1.73	Standard	4,900-10,400 miles
0.25-0.38	Small	3,900-4,900 miles
0.14-0.24	Very Small	3,000-3,900 miles
Less than 0.13	Tiny	Less than 3,000 miles

Here, the *size class* is defined by what major volatiles will be retained. The "typical diameters" column shows what size worlds will fall into each size class, assuming densities equal to that of Earth. Denser worlds will tend to rise into higher size classes, less dense worlds will fall into lower ones.

A *large* world is one which can retain hydrogen and helium over long periods of time. Such a world will tend to have a thick atmosphere composed mostly of hydrogen compounds. A *standard* world is too small to retain hydrogen, but it can retain water vapor in its atmosphere over long periods. If the world's surface temperature is right, it will have liquid-water oceans on its surface, and has a good chance of being close to Earthlike conditions. A *small* world cannot retain water vapor in its atmosphere. Such worlds tend to be dry, although if they are cold enough they may have large deposits of water ice. They may retain substantial atmospheres of nitrogen and nitrogen compounds, and can also retain

Terraforming

The world-design rules in the main text make a number of unspoken assumptions. One of the most important of these is that worlds evolve *naturally,* with no interference from any advanced civilization. This is a poor assumption to make for any space-opera setting!

Terraforming is the art of modifying planetary environments. Every industrial civilization engages in it, although not always with full knowledge of what it is doing. It's possible that our own civilization is altering Earth's climate, by burning fossil fuels and releasing greenhouse gases into the atmosphere. So far the evidence isn't conclusive – but if we hadn't learned a great deal about planetary climate by exploring the other worlds of the Solar system, we wouldn't even be aware of the possibility.

By TL9, it becomes possible to make *deliberate,* large-scale changes to a planet in the life zone. The climate category can be adjusted by one or two levels, depending on the situation. Any Ocean world can be moved to the Earthlike world type if is isn't already there, using genetically engineered organisms to build a new ecosphere. A Desert world might even be turned into an Earthlike world, using water and air mined from comets. Such changes might take many centuries to complete (less at higher TL). They are also temporary, in the sense that many of them would reverse themselves once the terraforming civilization stopped maintaining them. Of course, in this case "temporary" means that the natural state would return in thousands or even *millions* of years. A planet which was once terraformed, but is now inhabited by a culture which doesn't have the technology or the wealth to maintain the changes, would make an interesting "dying world" setting.

In the Third Imperium setting, it's clear that many worlds have been terraformed. The Imperium itself sponsors some ongoing terraforming projects, and many worlds have been made human-habitable by previous civilizations. The Ancients clearly modified many worlds, using technology capable of making permanent and radical changes to planetary environment.

Local Biochemistry

Science fiction has often included worlds where the local life forms are incompatible with human needs. Humans may simply get no nutritional value out of local life forms (and vice versa). Or the local flora and fauna can actually set off allergic or toxic reactions in humans who are exposed to them. Certainly there's no reason why alien lifeforms have to use the same biochemistry we do. For that matter, even the amino acids that form the basis for Terran biochemistry come in "left-handed" and "right-handed" forms. All Terran life uses the left-handed forms, but a different evolutionary path might use the right-handed forms – leading to two virtually identical biochemistries that could not use each other's proteins.

If the GM wishes to include this factor in worldbuilding, he can roll 3d on the Compatibility Table.

Compatibility Table

Roll (3d)	Level
3-6	Nearly Identical
7-8	Compatible
9-13	Partially Compatible
14-15	Incompatible
16-18	Toxic

Nearly Identical indicates that the two biochemistries are very close. Humans have no problem living off native foods, and native life can eat Terran organisms. In fact, this level might be a drawback because local diseases can "cross over" to Terran organisms fairly easily.

Compatible means that humans can satisfy their dietary needs locally, although it helps if they can supplement their diet with Terran foods. Diseases are not likely to cross over.

Partially Compatible means that humans can eat some native foods, possibly after considerable effort in processing or cooking them. They can't rely wholly on native foods without developing various deficiency diseases. Diseases will not cross over, although the local equivalent of decay bacteria can still deal with dead Terran organisms.

Incompatible means that humans will not be able to get any nutritional value out of local life forms, no matter how much processing is done. Diseases will not cross over, and decay organisms may have difficulty with dead Terran organisms.

Toxic means that humans will find local life forms to be poisonous. Exposure to local proteins will set off allergic reactions. Disease and decay organisms will be unable to attack Terran life. In extreme cases, this situation can be the equivalent of a Polluted atmosphere.

oxygen (although without photosynthetic life there will be very little "free" oxygen in the atmosphere). A *very small* world cannot even retain molecular nitrogen in its atmosphere. There are heavier volatile compounds, but most of them are either chemically unstable or involve relatively rare elements, and so they can't form a substantial atmosphere. Very small worlds tend to not only be dry, but to have very thin atmospheres. Finally, a *tiny* world cannot retain even the heaviest common volatiles, and will have only a trace atmosphere if it has any at all.

Once the size class of a world has been established, cross-reference it with the orbital zone the world falls in on the World Type Table.

World Type Table

Size Class	Inner Zone	Life Zone	Middle Zone	Outer Zone
Large	Hostile (SG)	Hostile (SG)	Hostile (SG)*	Hostile (SG)*
Standard	Greenhouse	Ocean*	Hostile (N)*	Hostile (A)*
Small	Desert	Desert*	Desert*	Hostile (A)*
Very Small	Rockball	Rockball	Rockball	Icy Rockball
Tiny	Rockball	Rockball	Rockball	Icy Rockball

The table gives world types following the system in ***GURPS Space*** (p. S105), with extra detail in some cases. An asterisk indicates that the world is likely to have substantial oceans of some liquid substance (see Step 14).

A result of *Hostile (SG)* indicates that the world is a *subgiant.* A subgiant world is large or cold enough to retain hydrogen in its atmosphere, yet never experienced the runaway accretion process that would have given rise to a gas giant. A subgiant world has a dense atmosphere of hydrogen and hydrogen compounds such as methane or ammonia. Unlike a gas giant, the atmosphere is relatively shallow, and the world has a well-defined surface of rock and ice. A gas subgiant close enough to its primary star may support life. There are no examples of such a world in the Terran system.

Hostile (N) indicates a *nitrogen world.* Molecular nitrogen is a very common atmosphere component for hostile worlds, because it is relatively heavy, has a low freezing point, and is very chemically stable. Many Hostile worlds will therefore have atmospheres dominated by nitrogen. In the Terran system, Saturn's moon Titan is an example of such a world. Terra itself was a nitrogen world early in its history, before the advent of photosynthetic life.

Some nitrogen worlds will have methane and ammonia in their atmospheres, making them a variant of an *ammonia world* (see below). Roll 3d. Modifiers: -3 if the primary star is of type A, -1 if it is of type F, +1 if it is of type K, +3 if it is of type M, +1 if the world is in the outer half of the middle zone. On a 15 or more the world is actually of type *Hostile (A).*

A result of *Hostile (A)* indicates an *ammonia world,* whose atmosphere contains substantial amounts of ammonia, methane, and other compounds. Ammonia and its related volatiles are even more likely than water to photodissasociate when exposed to ultraviolet light, so an ammonia world's primary star must be either of a late spectral type or fairly distant. If an ammonia world is warm enough, it may have oceans of liquid water and ammonia in a so-called "eutectic" mixture. Such a world may support life. There are no clear examples of such a world in the Terran system, although Saturn's moon Titan comes close. Its atmosphere is composed mostly of nitrogen, but it contains significant amounts of methane and other exotic compounds.

A *Greenhouse* world retains a substantial atmosphere, originally including water vapor. However, it is too close to its sun to maintain habitable conditions. Early in its history, its liquid-water oceans boil, putting large amounts of water vapor in the atmosphere and setting off an intense greenhouse effect. As a result,

the world's water vapor is exposed to a process of *photodisassociation.* That is, ultraviolet light from the primary star breaks water down into hydrogen and oxygen, after which the hydrogen is lost to space and the oxygen combines with other elements. Meanwhile, the intense heat "bakes" the world's surface rock, bringing large quantities of carbon dioxide into the atmosphere and making the greenhouse effect self-sustaining. The result is a dense, dry, furnace-hot atmosphere composed of carbon dioxide and sulfur compounds, utterly inhospitable to organic life. An example in the Terran system is Venus.

A few Greenhouse worlds close to the life zone may have different properties. For example, if photodisassociation works fast enough, the world's supply of water may be lost before the greenhouse effect becomes self-sustaining. The planet would then cool off, remaining in a reasonable temperature range and retaining a dry atmosphere of nitrogen compounds. Such a world would be of type *Desert* (see below). Assume that this situation can appear if the world's orbital radius is at least 90% that of the inner edge of the life zone. Roll 3d. Modifiers: +3 if the primary star is of type A, +1 if it is of type F, -1 if it is of type K, and -3 if it is of type M. On a 15 or more, the world is of type Desert rather than Greenhouse.

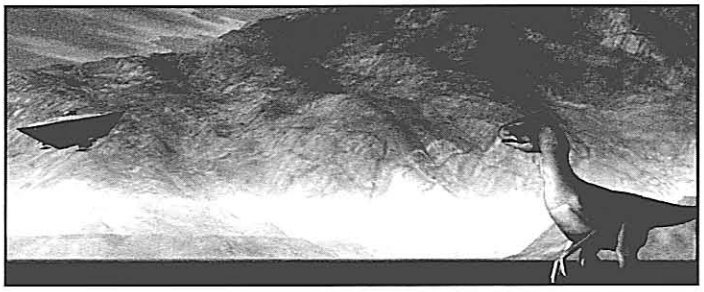
A result of *Ocean* indicates that the world is a good candidate for Earthlike conditions. It has a substantial atmosphere and extensive liquid-water oceans. The exact world type depends on the presence of life, which we will determine in Step 15.

A *Desert* world is too small to retain water vapor in its atmosphere. Thus any surface water that exists early in their history either freezes or is lost to space. Most desert worlds have some volcanic activity early on, but cool off and become geologically dead within a billion years or so. Their atmospheres tend to be thin, composed primarily of carbon dioxide and nitrogen. An example in the Terran system is Mars, although Mars is so small as to almost be a *rockball* world (see below).

A *Rockball* world is too small to retain most volatiles. Rockball worlds have no more than a trace atmosphere, and little or no ice. They may exhibit some volcanic activity early in their existence, but they rapidly cool off and become geologically dead. Examples in the Terran system include Mercury and Luna.

An *Icy Rockball* world is normally too small to retain gaseous volatiles, but cold enough to keep frozen volatiles. Ice worlds have very little atmosphere, but are partially or completely covered with a coat of ice. Water and carbon dioxide ices form close to the primary star, while in the outer reaches of the system there may be plentiful ammonia, methane or nitrogen ice. Examples in the Terran system include Jupiter's moon Callisto or Neptune's moon Triton.

Icy Rockball worlds orbiting gas giants will be heated by tidal effects. Such moons may have extensive liquid-water oceans beneath their surface of ice. They are common places for refueling stations, since the hidden water can be brought to the surface relatively easily. An example in the Terran system is Jupiter's moon Europa. Meanwhile, a few gas giant moons are heated enough to become "sulfur worlds." The tidal heat drives off all of the ices and light volatiles, leaving only the heavy sulfur compounds. A sulfur world is mostly composed of normal rock, but it has extensive volcanic activity which concentrates sulfur compounds on the surface. An example in the Terran system is Jupiter's moon Io. Roll 3d for any ice world orbiting a gas giant within 10 planetary radii. On a 10-13 the moon has subsurface liquid-water oceans. On a 14+ the moon has very little ice but has sulfur volcanoes.



Atmospheric Pollutants

Here are some of the most likely contaminants to be found in a Polluted atmosphere. See ***GURPS Space*** for more details on the effects of these.

Chlorine or Fluorine: In an oxygen-nitrogen atmosphere, chlorine would normally combine with other elements to form nontoxic compounds. It's possible for living things with an odd biochemistry to release a significant amount of chlorine into the atmosphere, however. This might give rise to a biosphere full of plants and animals which use an Earthlike carbon-oxygen cycle, but which are well-adapted to trace amounts of chlorine in the air. Visitors who do not have similar biochemistries would find the unfiltered air to be corrosive and very poisonous. Since chlorine gas is heavier than air, it would tend to pool in caves and depressions in the land, reaching concentrations that might kill even native animal life. Rainfall and standing "water" would actually be a weak hydrochloric acid solution on such a world. Fluorine could conceivably play a role similar to chlorine, but it is much less common.

Sulfur Compounds: Hydrogen sulfide and various sulfur oxides might be a byproduct of massive industrial pollution or heavy volcanic activity. Visitors would find the unfiltered air to be toxic and full of unpleasant odors. Sulfur compounds would also make rainfall and standing water slightly acidic.

Nitrogen Compounds: Certain nitrogen compounds may be in the atmosphere due to industrial pollution (they will not coexist with an oxygen-nitrogen atmosphere under natural circumstances). As with sulfur compounds, the unfiltered air would be toxic and any open water would be made slightly acidic.

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Atmospheric Pollutants

[Continued]

Low Oxygen: The atmosphere might have no significantly toxic elements, and still be hard to breathe due to a relative lack of oxygen. Moderate examples would cause visitors to tire easily and have difficulty with strenuous activities. In more extreme cases, a visitor without his own oxygen supply would simply suffocate. Fortunately, a compressor mask or portable oxygen tank is enough to avoid these effects. At the GM's option, visitors may be able to acclimate themselves to this condition.



Pollutants: The atmosphere may be breathable as far as its gas mix is concerned, yet still have some contaminant in it that makes it dangerous. Examples include pollen, spores, disease microorganisms, complex airborne toxins released by certain plants, airborne dust from industrial or volcanic pollution, or radioactive contamination from nuclear incidents. A filter mask may be enough to avoid the harmful effects of these. The GM must decide the likely effects of exposure, and how easily visitors can acclimate to the local conditions. Some pollutants may have very subtle long-range effects. Others may kill quickly – but only when local conditions concentrate them in the atmosphere. Either case can lead to sudden nasty surprises for explorers . . .

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Example

The GM now proceeds to Step 12, determining Haven's world type. Haven has mass of 0.48 Earth masses and a diameter of 6,300 miles, so its size parameter is about 0.6. Since the planet is in the life zone and the size parameter isn't on a borderline, the GM doesn't bother correcting for the amount of energy received from Haven's sun. The planet is clearly of Standard size. Since it is in the life zone, it will be an Ocean world, its exact world type to be determined later.

Step 13: Atmosphere Pressure

The physics of planetary atmospheres are terribly complex, and we will only approximate them here. First, we determine the atmospheric pressure at a standard elevation. On worlds with liquid oceans, the usual standard elevation is sea level. Without oceans, planetologists define a *datum level* at some convenient elevation, normally near the average elevation of the planet's entire surface. We will describe atmospheric pressures as in ***GURPS Space*** (see p. S108).

Procedure

If a world's size class is Tiny, it will have no significant atmosphere. If the size class is Very Small, then the world will have no more than a *trace* atmosphere. A Greenhouse world will have a *superdense* atmosphere.

For all other worlds, roll 3d, multiply by 0.1, then multiply the result by the planet's surface gravity. The result is the base atmospheric pressure, relative to that of Earth's atmosphere at sea level.

Atmospheres are classified as *very thin* (below 0.5 Earth normal), *thin* (0.5 to 0.8 Earth normal), *standard* (0.8 to 1.2 Earth normal), *dense* (1.2 to 1.5 Earth normal), or *very dense* (above 1.5 Earth normal).

Traveller Note: The world-design system in the original ***Traveller*** rules did take into account that the density of a world's atmosphere is tied to its size. The implied relationship wasn't as strong as theory requires, however, so the system often generated tiny planets with dense atmospheres (or large planets with only a trace of atmosphere). Feel free to place a world with an unexpectedly thin or dense atmosphere, but be aware that this is an unusual circumstance and may require explanation if you are concerned with scientific realism. For consistency, a world's type may have to be redefined as if it were of a larger or smaller Size Class (i.e., a Standard size world with no atmosphere should be re-classified as Tiny for this purpose, making its world type Rockball or Icy Rockball).

Example

The GM is now ready to determine the properties of Haven's atmosphere, hydrosphere, and biosphere (if any). He begins by rolling 3d for a 9, multiplying by 0.1 and by Haven's surface gravity of 0.76. Haven's surface atmospheric pressure will be 0.68 atmospheres, giving it a Thin atmosphere.

Step 14: Hydrographics

Some worlds will have extensive oceans of some liquid substance. Close to the primary star, this liquid will usually be water, possibly with other chemicals or impurities in it. Further out, the oceans may be composed of liquid ammonia or more exotic substances.

Procedure

A world may have hydrographic coverage if it is of Large, Standard or Small size class, has at least a Very Thin atmosphere, does not fall in the inner zone, and is closer to its primary star than three times the snow line distance. To determine the percentage of the surface covered by liquid, roll 2d-2. Modifiers: +2 if the primary star is of type M, +1 if it is of type K, -1 if it is of type F, -2 if it is of type A, -8 if the world is a Desert world in the life zone, -6 if it is a Desert world in the middle zone, -2 if it is a Hostile world of any subtype. The result cannot be less than 0 or greater than 10. Multiply the result by 10% to determine the ocean coverage of the world. The GM may vary this percentage by up to 5% at his discretion.

Example

Turning to Haven's hydrographics, the GM rolls 2d-2. He gets a 7 and concludes that the planet has about 70% ocean coverage. He decides to vary this a little and sets the exact hydrographic coverage at 73%.

Step 15: Native Ecosphere

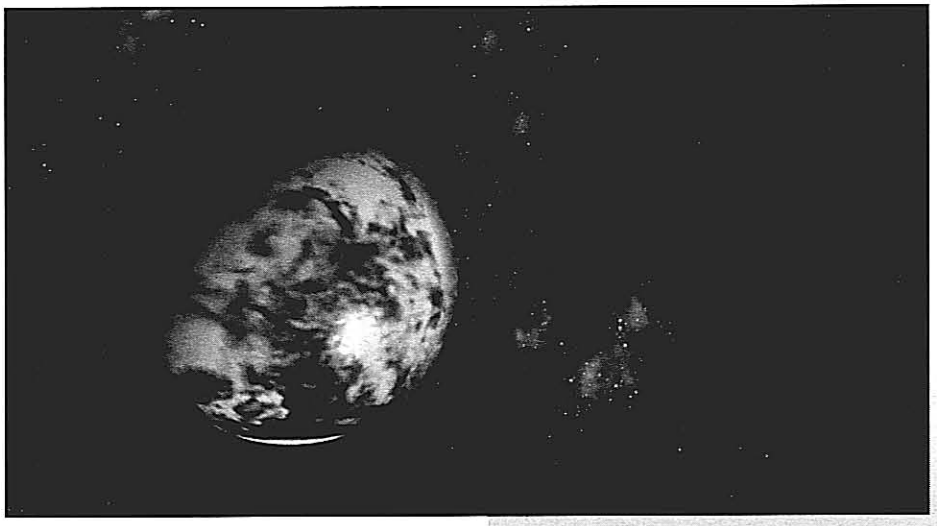
Simple one-celled lifeforms may be very common in the universe, but only certain world types are likely to give rise to complex ecospheres and intelligence. The level of complexity of the local ecosphere is dependent on time and random chance.

Procedure

If a world has hydrographic coverage, or is an Icy Rockball with subsurface liquid oceans, then it may have native life. Roll 2d on the Native Ecosphere Table and record the result. Modifiers: +2 for an Ocean world, add +1 for every 500 million years of the star system's age.

Native Ecosphere Table

Roll (2d)	Ecosphere
13 or less	No Life
14-16	Protozoa
17	Metazoa
18	Simple animals
19 or more	Complex animals



At this point, the exact world type of an Ocean world can be determined. If the world has metazoa, simple animals, or complex animals, then it is *Earthlike.* Otherwise, it is of type *Hostile (N).*

Note that this procedure only determines the level of *native* life. A starfaring civilization which colonizes new worlds will bring along its own plant and animal life. If the native ecosphere has advanced no further than "simple animals," the newcomers may well crowd out the native life.

Atmospheric Pollutants

[Continued]

High Carbon Dioxide: The human metabolism is set to deal with a certain concentration of carbon dioxide in the air. When there is too much, our breathing reflex malfunctions and we tend to hyperventilate and experience a sense of suffocation. This effect can be dealt with as long as sufficient oxygen is present, and visitors may be able to acclimate themselves. Very high levels of carbon dioxide are actually toxic, and cannot be adapted to.

High Oxygen: In moderate cases, an excess of oxygen can be a mild irritant to skin and mucous membranes, and can make it much easier for visitors to hyperventilate when working hard. This can be handled using some kind of reducing respirator, preferably covering the face to avoid irritation of the eyes and air passages. In high concentrations, oxygen can be actively poisonous.

Inert Gases: Nitrogen and other chemically inert compounds can cause "inert gas narcosis" when their partial pressure is high enough. Symptoms include lightheadedness, reduced dexterity, euphoria and impaired judgement. This is normally only a problem in very dense atmospheres, although a new compounds (nitrous oxide or "laughing gas" in particular) can cause these symptoms at relatively low pressures.



Weather

Weather systems (storms and high winds) are driven by a difference in temperature or pressure in adjacent portions of a planet's atmosphere. Where the potential for greater differences exists, the weather can be more violent. We will define the *weather factor* for a world as a simple indicator of how violent and changeable local weather is likely to be there.

Vacuum worlds have no weather (obviously). If the world has at least a Very Thin atmosphere, roll 1d+7. Modifiers: +4 if the world's rotation period is less then 8 hours, +3 if between 8 and 12 hours, +2 if between 12 and 16 hours, +1 if between 16 and 20 hours, -1 if between 32 and 40 hours, -2 if between 40 and 56 hours, -3 if between 56 and 72 hours, -4 if greater than 72 hours. +4 if the axial tilt is greater than 45 degrees, +2 if it is between 30 and 44 degrees, +1 if it is between 20 and 29 degrees, -1 if it is 10 degrees or less. +4 if the world's base climate is Very Hot or Torrid, +3 if it is Hot, +2 if it is Tropical, +1 if it is Warm, -1 if it is Chilly, -2 if it is Cold, -3 if it is Very Cold, -4 if it is Frozen or Frigid. +6 if the world's atmosphere is Very Dense, +2 if it is Dense, -1 if it is Thin, -3 if it is Very Thin. The result (which may be negative) is the weather factor. For comparison, the weather factor of Terra is 10.

Ecosphere Levels

Protozoa are single-celled life forms. Almost all protozoa live as individuals, surviving by exploiting chemical reactions in their environment. Some species cluster together, forming bacterial "mats" that may cover large stretches of shallow water. Protozoa include bacteria, algae, and simple fungi.

Metazoa are multi-celled organisms, composed of cells which have learned the trick of living in symbiotic communities. Metazoa include simple plant and animal forms: lichens, molds, kelp, sponges and jellyfish.

Simple animals have developed differentiated internal structures (bones, muscles, nerves). Terran examples include arthropods, fish and amphibians. Such animals are supported by an array of plant forms, using photosynthesis on Eden worlds, more exotic chemical reactions elsewhere. They may attain IQ scores up to about 3.

Complex animals have developed even further physically, and have added a variety of complex behavior patterns. Terran examples include reptiles, birds, and mammals. Complex animals may develop sentience. Roll 3d to determine how sentient the most advanced animals on the planet are. On a 15 or less, all animals are nonsentient (IQ 5 or less, up to the level of wolves or big cats). On a 16 or 17, near-sentient animals exist (IQ 6-7, equivalent to a chimpanzee, hominid or cetacean). On an 18, native sentience has appeared (IQ 8+).

Traveller Note: The procedure here allows for the possibility of native sentient life, but such life will be rare. This is realistic, since the available evidence seems to indicate that sentient life is an unusual phenomenon. In a fictional setting where there are many starfaring races, however, the GM may want sentient life to be more common. He should feel free to arbitrarily place a sentient species on any life-bearing world, if it fits his campaign plan.

Alternatively, the GM may apply a consistent positive modifier to the roll for determining the highest intelligence on any world bearing complex animals. A modifier of +1 or +2 would be reasonable. In fact, a +2 probably approximates the frequency of sentient life in the Third Imperium setting. Note that in the Third Imperium, even worlds that have no native sentient species may be the homeworld of a minor human race.

Example

Since Haven is an Ocean world which is 4 billion years old, the GM rolls 2d+10 on the Native Ecosphere Table and gets a 20. Haven has an advanced ecosphere, including complex animals, so it is automatically an Earthlike world. The GM rolls 3d again, adding 2 since he's working in the Third Imperium setting. He gets a 16, and records that there is near-sentient animal life in Haven. Since he doesn't care whether a sentient species is present on Haven or not, he accepts this result.

Step 16: Atmosphere Composition

If a world has only a trace or no atmosphere, then its composition is irrelevant. Thicker atmospheres can vary dramatically in their properties, especially their ability to support life. There are four types of atmosphere (these definitions follow p. S108).

Oxygen-Nitrogen: Such an atmosphere is similar to Earth's, breathable for human beings. It is composed primarily of oxygen and nitrogen, with no contaminants sufficient to cause breathing problems. Such an atmosphere requires the presence of life or of strange chemical processes, since free oxygen tends to disappear from the atmosphere (combining with other elements in the atmosphere or in surface rocks) unless replenished.

Polluted: Polluted atmospheres are basically oxygen-nitrogen, but human beings require some degree of artificial help to breathe them. This may indicate a simple problem with the balance of atmospheric gases, or the presence of contaminants (see sidebar).

Exotic: Exotic atmospheres are unbreathable, and cannot easily be made breathable by filtering or processing. Human beings will require a self-contained oxygen supply and possibly protective clothing to survive in an exotic atmosphere. Even without protection, however, a human could survive exposure to an exotic atmosphere for a few minutes.

Corrosive: Corrosive atmospheres are very deadly to human beings, forcing them to use extensive artificial means for survival. Unprotected humans exposed to a corrosive atmosphere will die quickly and painfully.

Procedure

The basic atmosphere type depends on the planet type as determined in Steps 12 and 15.

A world of types Hostile (SG) or Hostile (A) will have an atmosphere composed of compounds which are highly poisonous to human life. Such an atmosphere is always Corrosive.

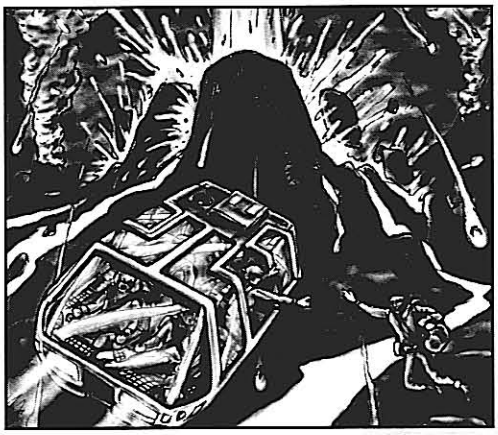
A world of types Hostile (N) or Desert will have an atmosphere composed mostly of nitrogen, with small amounts of carbon oxides, nitrogen oxides, argon or sulfur compounds. The proportions of each depend on the available volatiles and on the surface temperature. Such an atmosphere will normally be Exotic, but roll 3d. On a 13 or more the quantity of nitrogen or sulfur compounds is high enough to make the atmosphere Corrosive.

A Greenhouse world has an atmosphere composed of carbon oxides and sulfur compounds, at very high temperature and pressure. Such an atmosphere is always Corrosive. Note that ***GURPS Space*** allowed for the appearance of "earthlike" Greenhouse worlds. These rules assume that such worlds fall under the Earthlike category, so that all Greenhouse worlds are intensely hostile.

An Earthlike world will (by definition) have an atmosphere composed primarily of oxygen and nitrogen. Such an atmosphere will normally be Oxygen-Nitrogen, but roll 3d. On a 12 or more some atmospheric component will be outside the range of human tolerance, making the atmosphere Polluted. For a Polluted atmosphere, roll 3d on the Atmospheric Contaminants Table or choose a primary contaminant from the sidebar.

Atmospheric Contaminants Table

Roll (3d)	Major Toxic Factor
3-4	Chlorine/Fluorine
5-6	Sulfur Compounds
7-8	Nitrogen Compounds
9-10	Low Oxygen
11-12	Pollutants
13-14	High Carbon Dioxide
15-16	High Oxygen
17-18	Inert Gases



Traveller Note: In the original ***Traveller*** system, planetary atmospheres were rather more likely to be Oxygen-Nitrogen than is indicated here. In particular, it was possible to get a breathable atmosphere on a world with no oceans, or with no advanced life. As always, when placing a world the GM is free to adapt these rules to yield the situation he wants. In this case, the occurrence of prior terraforming may be enough to explain many otherwise-hostile worlds with Earthlike atmospheres.

Gaming Weather

On any world that has a weather factor, the GM can use it to generate local weather as adventurers go about their business.

While adventurers are exploring a planetary surface, check for weather every eight hours. Roll 3d. Modifiers: subtract the planet's weather factor, and apply any modifier based on the last eight-hour period's weather. The GM should also feel free to modify this result to account for local conditions. The final result may be zero or negative. Check the result against the Weather Table.

Weather Table

Roll (3d)	Weather
3 or more	Calm
0 to 2	Windy
-3 to -1	Storm
-6 to -4	Severe Storm
-7 or less	Violent Storm

Calm: There is no appreciable wind. There may be some cloud cover, depending on local climate (moist climates almost always have some cloud cover, dry climates are often very clear). Visibility is good, unless local conditions are likely to cause fog or haze.

Windy: Fairly strong winds are blowing. Depending on local climate, this may lead to sandstorms, a snow white-out, or high waves on bodies of water. Visibility is somewhat reduced. Suggested vehicle control penalties are -1 or -2 for water or air vehicles.

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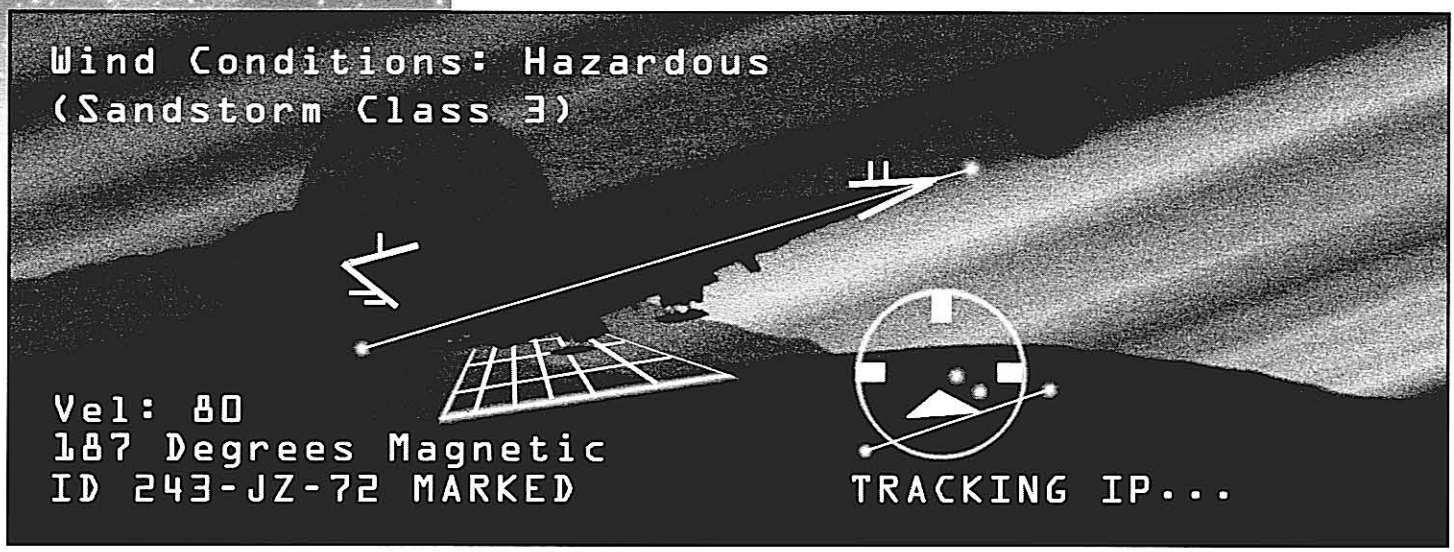


Gaming Weather

[Continued]

Storm: If the local climate allows it precipitation is falling (rain or snow). Visibility is poor. Suggested vehicle control penalties are -1 or -2 for all vehicles. Subtract 1 from the next weather roll.

Severe Storm: Strong winds and rapid precipitation, possibly with frequent lightning. Visibility is very bad. Suggested vehicle control penalties are -1 or -2 for ground vehicles, -3 or -4 for water or air vehicles. Subtract 2 from the next weather roll.

Violent Storm: Very strong winds will destroy flimsy structures and damage exposed vegetation. People or animals caught in the open must make rolls against Dexterity or an appropriate skill to avoid injury. Precipitation is violent and may include hail or driving rain. Visibility is almost zero. Suggested vehicle control penalties are -3 or -4 for ground vehicles, -5 or -6 for water or air vehicles. Subtract 4 from the next weather roll.

Notice that some worlds may have a weather factor as high as 31. Such worlds will be in an almost constant state of violent weather, to the extent that any native life will have to have made very unusual adaptations just to survive. On the other hand, some worlds may have a weather factor as low as -4. These worlds will *never* have violent weather unless the GM deliberately decides to inflict some on the explorers.

Example

Since Haven is Earthlike, it has an oxygen-nitrogen atmosphere which humans may be able to breathe. The GM rolls 3d for 14, yielding a Polluted atmosphere. He decides to choose a contaminant randomly and rolls 3d, getting a 12. Haven's atmosphere has generic pollutants in it. The GM improvises and decides that a common form of plant life fills the air with spores and pollen that attack the human respiratory system.

Step 17: Overall Climate

We now determine the average surface temperature of the planet. Greenhouse worlds are a special case here. Don't bother to determine a specific surface temperature for any greenhouse world (it will be far above the habitable range in any case).

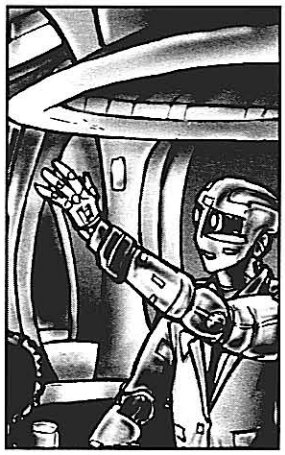
Albedo

A planet's *albedo* is a measure of the amount of stellar energy which is reflected away from the planet's surface (or its upper atmosphere). This quantity ranges from 0 to 1, with 0 indicating a perfectly flat-black surface and 1 indicating a perfectly reflective surface. Energy which is reflected in this fashion doesn't contribute to the planet's heat budget.

Refer to the Planetary Albedo Table to get a base value for albedo. Each planet type has a different base value (for Earthlike worlds, the base value also depends on hydrographic percentage). Then roll 3d and multiply by 0.01, adding the result to the base albedo to get the actual albedo.

Planetary Albedo Table

Planet Type	Base Albedo
Hostile (SG)	0.50
Hostile (N)	0.20
Hostile (A)	0.50
Earthlike (less than 30%)	0.02
Earthlike (30% to 59%)	0.10
Earthlike (60% to 89%)	0.20
Earthlike (90% or more)	0.28
Desert	0.02
Rockball	0.02
Icy Rockball	0.45
Icy Rockball (sulfur volcanoes)	0.80



Greenhouse Factor

Next, we determine the *greenhouse factor* which exists on the planet. This is a measure of the amount of heat that is retained by the planet's atmosphere. Use the following to estimate it.

$$E = B \times (P / G)$$

E is a measure of the planet's greenhouse effect. **B** is the base value for the planet type, taken from the Greenhouse Effect Table. **P** is the surface atmospheric pressure, and **G** is the surface gravity.

"Anyone who thinks an Xboat is cramped has obviously never had to share a fresher with three teenaged siblings."

– Comedian Anton Wilson Peale

Greenhouse Effect Table

Planet Type	Base Greenhouse Factor
Hostile (SG)	0.20
Hostile (N)	0.20
Hostile (A)	0.20
Earthlike	0.15
Desert	0.15
Rockball	0.00
Icy Rockball	0.00
Icy Rockball (sulfur volcanoes)	0.00

Average Surface Temperature

First, determine the *blackbody temperature* of the world:

$$B = (278 \times \text{Fourth root of } L) / \text{Square root of } R$$

B is the blackbody temperature, the average temperature (in kelvin) that a body in the planet's orbit wold have if it had perfect heat-absorbing and heat-radiating properties. **L** is the luminosity of the primary star in solar units, while **R** is the planet's orbital radius in AU.

The average surface temperature of the world is given by:

$$T = B \times [\text{Fourth root of } (1 - A)] \times (1 + G)$$

Here, **T** is the average surface temperature in kelvin, **B** is the blackbody temperature, **A** is the albedo, and **G** is the greenhouse factor. This temperature should only be considered approximate, since there are many other significant factors. For ocean worlds, refer to the Planetary Climate Table to find the world's climate category in terms from ***GURPS Space*** (see p. S109).

"Why did I become a comedian? Look, I was in the Scouts. When you've seen as much of the universe as I have, you realize how absurd it is."

– Comedian Anton Wilson Peale

Planetary Climate Table

Temperature Range	Climate
238 K or less	Uninhabitable (Frigid)
239-249 K	Frozen
250-260 K	Very Cold
261-272 K	Cold
273-283 K	Chilly
284-294 K	Cool
295-302 K	Earth-normal
303-308 K	Warm
309-313 K	Tropical
314-319 K	Hot
320-324 K	Very Hot
325 K or more	Uninhabitable (Torrid)

Rhylanor (IV)

Rhylanor's size parameter is 0.25, so the planet is of size class Small. The GM doesn't bother with the correction. Checking the World Type Table, the GM finds that Rhylanor is of Desert type.

Rolling for the atmospheric pressure, the GM gets an 8 and records a pressure of 0.4 standard atmospheres. This makes the atmosphere Very Thin, which matches the planet's record in ***Behind the Claw.***

Hydrographics are a thornier problem. The modified roll for hydrographic coverage would be 2d-8 (-2, +2 for an M-type primary, -8 for a Desert world in the life zone). The published coverage of 40% is possible, but unlikely (it would require a natural 12 on the dice if rolling randomly). The GM decides that Rhylanor is in an unusually "wet" phase of its evolution at present. The human population is probably using high technology to maintain the planet's seas in their current state.

The GM rolls 2d+6 on the Native Ecosphere Table and gets a 17, indicating that Rhylanor has primitive multi-celled native life. This helps the GM to justify his next violation of the world-design rules. Normally a Desert world would not have an oxygen-nitrogen atmosphere, however thin, but the listing in ***Behind the Claw*** records Rhylanor as having such an atmosphere. The GM decides that the planet's native life maintains some free oxygen in the air, though it's not enough for human beings to breathe without mechanical assistance.

The GM now turns to determine the planet's overall climate, hoping that it will fall into the "Normal" range listed in ***Behind the Claw.*** He rolls randomly for albedo, getting a value of 0.15. The greenhouse factor is 0.12. The blackbody temperature turns out to be 275 kelvin, and the average surface temperature is 295 kelvin or 71°F. This falls (barely) in the Normal climate range, so the GM stops. Had the temperature fallen outside the range, the GM had many ways to adjust it.

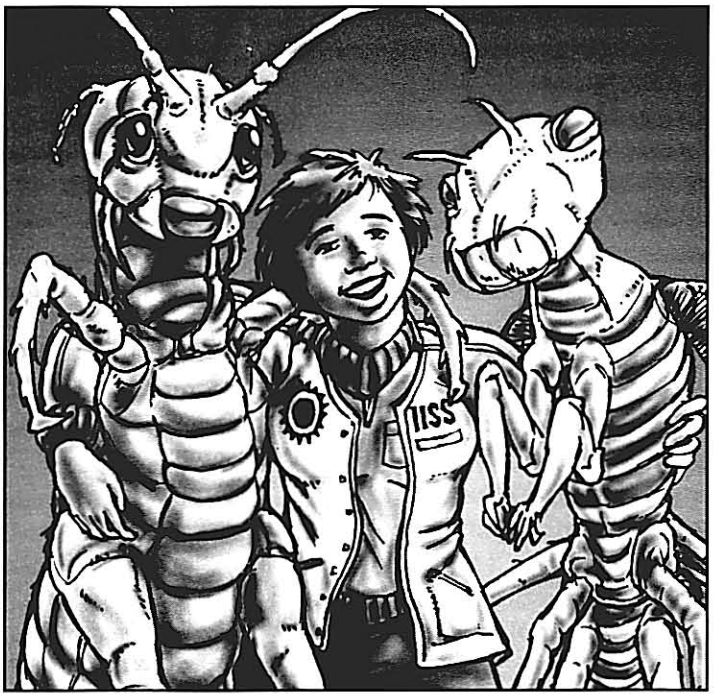
The modified roll for weather factor is 1d (1d+7, -4 for the slow rotation, -3 for the Very Thin atmosphere). The GM rolls a 5 and decides that Rhylanor has fairly placid weather.

Finally, the GM rolls on the Resource Value Table and gets a 13, indicating an Average resource level. This seems strange given the planet's unusual density. Still, the mechanics of crust chemistry are complicated and it's possible that many valuable minerals simply haven't been laid out as accessible ore deposits.

Climate Details

The "average surface temperature" generated in the main rules is just that – an average for the world's surface. Temperature will vary widely by place and time. Here are some guidelines for determining what local temperatures are likely to be on most terrestrial worlds.

These rules refer to the planetary hex map blank found in ***GURPS Space.*** We will refer to *hex rows* on that map, equivalent to latitude parallels, by number. The hex rows immediately adjacent to the equator will be numbered 1. Each row north or south will have one higher row number. For example, the rows at the transition between contiguous and separated map triangles (equivalent to the 30th parallels North and South) are numbered 5. The single hexes at the North and South Poles are the hex "rows" numbered 13.



Latitudinal variations: The climate category for a planet is equivalent to the climate category found in hex rows 4-5. Hex row 1 will average two climate categories warmer, hex rows 2-3 will average one category warmer, hex rows 6-7 will average one category cooler, hex rows 8-9 will average two categories cooler, hex rows 10-11 will average three categories cooler, and hex rows 12-13 will average four categories cooler.

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The average temperature can be converted from kelvin to degrees Fahrenheit by:

$$F° = (1.8 \times K) - 460$$

F is the temperature in degrees Fahrenheit and **K** is the temperature in kelvin.

Example

Haven is an Earthlike world with 73% hydrographic coverage, so the base albedo is 0.20. The GM rolls 3d for 12, so the actual value for the planet's albedo is 0.32. The greenhouse factor is 0.13. The planet's blackbody temperature is 272 K, and its average surface temperature is 279 K, or about 43° Fahrenheit. The GM records the planet's climate category as Chilly. To determine the weather factor, he rolls 1d+5 (+7, -1 for the Chilly climate, -1 for the Thin atmosphere) and gets a 7. Haven's weather is somewhat less "interesting" than that of Terra.

Step 18: Resource Value

GURPS Space includes a system for determining the abundance of specific resources on any given world. The system there depends not only on the physical characteristics of a world, but also on the level to which local resources have been developed. Here, we are concerned only with the richness of the local geology and ecology.

Procedure

Roll 3d and refer to the Resource Value Table. The result will yield a general resource abundance and a Resource Abundance Modifier. The GM may apply this modifier to all rolls for the abundance of specific resources, when using the system from ***GURPS Space*** (see p. S111).

Resource Value Table

Roll (3d)	Overall Value	Modifier
3-4	Very Poor	-2
5-6	Poor	-1
6-14	Average	+0
15-16	Rich	+1
17-18	Very Rich	+2

Example

For natural resources, the GM rolls 3d and gets a 6. Haven is a Poor world with respect to overall resources, and the GM can apply a -1 to any resource-abundance rolls when determining trade parameters.

World Mapping

Designing realistic world maps is an art rather than a science, since there are so many factors involved. We present a few general guidelines for terrestrial worlds here. If you want greater realism, some basic texts in geography and geology might be in order. The Bibliography cites several worthwhile books on the subject.

One good way to map a world is to use the equal-area icosahedral projection suggested in ***GURPS Space.*** There, the planetary surface is mapped on a hex grid so that each hex represents about the same amount of surface area. The scale of the map depends on the size of the planet. Multiply the planet's diameter by 0.07 to get the width of each hex.

Landforms

Land and Ocean

The best way to draw continents and oceans on the planetary map depends on whether land or water is more frequent. If the hydrographic coverage is under 50%, draw the seas, otherwise draw the continents. The planetary map blank used in ***GURPS Space*** has 812 hexes in it, so every percentage point of hydrographic cover implies about 8 hexes of water or land surface.

There will be a hierarchy of bodies of water (or land masses). For example, on Terra the vast majority of the land makes up the six major continents, with one land-mass (Eurasia) representing almost 40% of the entire land surface of the planet. A good rule of thumb is to place about 90% of the minority surface type in a few large bodies (say, 1d of them). Then scatter the rest as small seas or islands, for no more than a few hexes each. This rule can be relaxed if the minority surface type is very rare. For example, a world with less than 5% water coverage may have all of its surface water in the form of scattered lakes, with no major seas at all.

On an Earthlike world with active plate tectonics, islands will tend to occur in definite patterns. "Chains" of islands (like the Hawaiian archipelago) will exist in the midst of the ocean, possibly indicating a partly submerged land mass or a sequence of volcanic islands. "Arcs" of islands (like the Japanese archipelago) tend to parallel the edges of continents, and are associated with volcanic activity at the edges of tectonic plates.

Mountains and Volcanoes

Mountains will also appear in chains or ranges. Mountain-building usually takes place along the edges of tectonic plates.

Sometimes mountain chains occur at the edge of a continent. As a light continental plate slips over an oceanic plate, driving it down into the planet, mountains are built through processes of fault-block lifting and volcanic eruption. Such mountain chains are associated with earthquake activity and vulcanism. On Terra, the Rockies and the Andes are the best examples of such mountains, formed where the two American plates ride over the Pacific plate.

Mountain chains can also appear in the middle of a land mass, where two continental plates are colliding. Where this happens, massive "foldbelt" mountain chains are pushed up. Such mountains can be very high and massive, but are not necessarily associated with earthquakes or volcanos. The best example on Terra is the Himalayas, formed where the Indian subcontinent is colliding with the bulk of the Asian continental plate.

Assuming a level of tectonic activity similar to Terra's, about 10% of the total land area would be a reasonable number of Mountain terrain hexes. Worlds currently in the midst of heavy tectonic activity might have more (and higher) mountains, while worlds in a quiet phase would have fewer. At the GM's discretion, a few hexes can be designated as Volcanic terrain, indicating the presence of geothermal areas, active volcanoes, or upwelling zones.

After mountain-building ends in a region, erosion begins to wear down the peaks and give rise to hilly or rough country. About the same number of hexes as have been designated Mountain terrain should be designated Hills/Rough terrain. These hexes can appear in chains by themselves, to indicate where old mountain chains once existed (the Appalachian Mountains on Terra are an example of this). Alternatively, Hills/Rough hexes can be placed adjacent to Mountain hexes, to indicate foothills and "badlands."

Climate Details

[Continued]

Seasonal variations: Greater axial tilt makes for greater variation in temperature through the seasonal cycle. During local summer, the climate category should rise above the average by about one level for every 18 degrees of axial tilt. During local winter, the climate category should fall below the average by about one level for every 12 degrees of axial tilt.

Seasonal variations will not always be felt everywhere on the planet, so the GM should decide what hex rows receive their full impact. A planet with very little axial tilt would only experience seasons very near the poles (and those variations would be slight in any case). A planet with very high axial tilt (40 degrees or more) would feel at least some seasonal effect all the way down to the equator. For moderate cases (25 degrees) it's reasonable to apply the full seasonal effect to hex rows 7-13.

Daily variations: Naturally, temperatures tend to rise during the day and fall at night. Such variations don't usually go so far as to change a location's climate category in the course of a day, however. Assume that the local climate category will rise above the average by one level during the day, and fall below the average by one level during the night, for every 40 hours of the planet's day length. This effect will not cause the local climate to rise or fall more than five levels.

All of these variations will be much reduced if the location is on or near a large body of water. Oceans act as a "heat reservoir" to damp out short-term fluctuations in temperature. Assume that the presence of nearby ocean will reduce the sum of seasonal and daily variations by up to one climate category.

These three effects are cumulative. For example, take the planet Haven. Its overall climate category is Chilly, it has an axial tilt of 19 degrees, and its day length is about 28 hours. A seacoast settlement in hex row 8 would have an average climate category of Very Cold due to latitudinal effects. It would experience the full range of seasons, rising about one climate category during the summer and falling about one and a half categories during the winter. The daily shifts would be less than one climate band either way, and can be considered as being damped out by the nearby ocean. Bearing all this in mind, the GM decides that the settlement reaches a Cold climate at the height of summer, but will be Uninhabitable (Frigid) during the long winter nights.

Mapping Tide-Locked Worlds

When drawing a planetary map for a world that's tide-locked with respect to its source of heat and light, the usual procedures don't work well. Here's an alternative that takes account of the drastic differences between the day and night faces.

Instead of placing the North Pole of the world at the top of the planetary map grid, place the "hot pole" (the sub-stellar point) there. Then the top half of the map grid, "above the equator," will be the world's day face. The bottom half will be the world's night face, with the "cold pole" at the very bottom. The twilight zone, which is most likely to be habitable, will be near the "equator" of the map grid.



If the world is at all habitable, ignore the usual rules for placing climatic zones. The average surface temperature generated in Step 17 will hold for hex rows 4-5 on the day face. Hex rows 6-7 on the day face will average one climate category warmer, hex rows 8-9 two warmer, hex rows 10-11 three warmer, and 12-13 four warmer. Hex rows 2-3 on the day face will average one climate category cooler, and hex row 1 on both faces will average two categories cooler. On the night face, climate category will fall by one category for *each* hex row away from the "equator," so that the region around the "cold pole" will almost certainly be Uninhabitable (Frigid). Naturally, there will be no daily or seasonal climate variations!

Continued on next page . . .

Climate Zones

Several of the terrain types described below have specific requirements for local climate. The GM should use the sidebar on p. 76 as a guide when deciding how to place these terrain types.

Polar Climates

Ocean worlds may have regions of permanent ice cover near their poles. Ice cap terrain occurs where the local climate is no warmer than Very Cold year-round. If such a region exists and is completely composed of land hexes, then place Icy/Barren hexes to mark the presence of the ice cap. If a potential ice cap extends out into water hexes, however, it's possible for warm currents from the equatorial zone to prevent the formation of permanent ice. The GM should decide whether this happens on any given world.

Any ocean world with ice caps will also have a zone of *tundra.* This is open, marshy terrain where the soil is permanently frozen. The GM should place Tundra hexes on land adjacent to the ice caps.

Desert Climate

Once the landforms and polar zones have been marked off, desert terrain can be placed. Deserts occur for several different reasons.

Mid-latitude deserts appear because of large-scale patterns of air circulation. On most Earthlike worlds, a persistent pattern causes warm, moist air to rise above the equatorial zone, moving away from the equator and releasing its moisture as heavy rain. The cooling air masses, now dry, descend at about 30 degrees north and south latitude, absorbing moisture and causing arid conditions. On Terra, the Sahara Desert is the most prominent example of this phenomenon. A similar pattern occurs closer to the poles, creating the extremely dry conditions there.

On the planetary map, the 30-degree parallels are in the hex rows where the apparent transition from "contiguous" to "separated" map triangles takes place. If the GM can find a group of at least 10 contiguous land hexes anywhere on or near these lines, he should consider placing mid-latitude desert in that region. In this case, the Desert hexes may even be adjacent to ocean hexes.

Rain-shadow deserts occur where moist air crosses over a mountain chain on its way from the ocean into land. As the air is deflected upward, it cools, and the moisture it carries condenses and precipitates out as rain or snow. On the landward side of the mountains, the air no longer holds moisture. Instead, it descends and absorbs moisture from the land, creating desert conditions.

Rain-shadow deserts should be placed adjacent to Mountain hexes, preferably on the landward side of a mountain chain that is itself on the edge of a continent. If the GM can find even two or three hexes that fit these requirements, he should consider placing Desert terrain there. Naturally, rain-shadow desert should not be placed adjacent to ocean.

Continental deserts occur when a land mass is so large that moisture-carrying air is simply unable penetrate to the center. Any land hexes that are four or more hexes away from the ocean are good candidates for continental desert. The GM should avoid placing such deserts too close to the polar regions, however.

Jungle

After placing desert terrain, the GM should see if any part of the planetary map is a good candidate for jungles. Jungle (or more precisely, "tropical rain forest") can appear in any region where the local climate is Warm or Tropical at all times, and where there is plentiful moisture (i.e., within four hexes of ocean, but not adjacent to an already-placed desert). Jungle terrain can appear on large or small islands, if they fall into the right climate zone.

Other Terrain

Any terrain not already assigned a terrain type (i.e., not Mountain, Hills/Rough, Ice Cap, Tundra, Desert or Jungle terrain) is considered "Mixed" terrain. Mixed terrain is probably some mix of forest and prairie or savanna in wilderness areas. On an inhabited world, the local population will cultivate Mixed terrain, and will build most urban centers there as well.

Animal Encounters

Whenever explorers enter a working ecosystem, they will naturally find themselves dealing with the local flora and fauna. Here we will lay out a system that can be used to generate varied and interesting animal encounters on any alien world. GMs who plan to make frequent use of animal encounters should find ***GURPS Bestiary*** a good source for ideas on roleplaying animals.

Encounter Tables

Every living thing has its own natural habitat, the environmental situation that it is best adapted to survive in. Whenever an adventure will involve wilderness travel on a new world, the GM should create one or more encounter tables for the major terrain types the PCs are likely to visit. An encounter table defines a *community* of living organisms, a set of species which live in the same area and interact while they go about the business of living.

Elements of Community

Underlying each community is a set of *producers,* species that do not need to eat other organisms to live. Producers gather nutrients from the nonliving environment, and gather energy from some naturally occurring source. The most typical producers on Earthlike worlds are *plants,* which use inorganic matter from the soil and energy from sunlight to produce their food. Producers are the keystone of every ecosystem. All other organisms are *consumers,* living off the energy that the producers bring into the community.

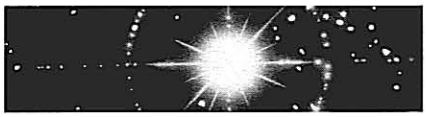
On Earthlike worlds, producers often fall into two classes, according to their survival strategy. *Point producers* are large, robust, long-lived organisms. They compete to grow higher and spread farther than their rivals. Typical Terran point producers are trees. *Area producers,* on the other hand, pursue a strategy of scattering many small organisms into every available growth site. Typical Terran area producers are grasses and other ground-cover plants. Area producers can be found almost anywhere, even under very harsh conditions. Point producers, on the other hand, are most likely to appear where local resources (water and good soil) are plentiful and the only limiting factor on growth is sunlight.

The first consumers to consider are *primary consumers* or *herbivores,* animals which eat only plant material. Most ecosystems include a variety of very small herbivores (such as worms or insects). These form a critical part of the community they live in, but are rarely noticed except by biologists. Larger herbivores can be of more interest to casual observers, as potential game animals (or potential threats, since some herbivorous animals can be very dangerous).

Mapping Tide-Locked Worlds

[Continued]

Place any liquid water in the zone where climate is Cold to Hot. Colder hex rows will have permanent ice cap, while hotter hex rows will be permanent desert. Any hex on the night face which is not ice-capped will be Barren, since there is no light to foster plant growth. The permanent hot zone will tend to pull air dayward across any open water, causing it to rise and drop its moisture on the land. Hexes immediately dayward of open water may be Jungle terrain if they are at least Warm, otherwise they will be Mixed. Hexes which are on the day face, nightward of any open water but not ice-capped, will be Tundra or Desert terrain. The GM should use common sense or his imagination to resolve any situations not covered here.



Food Strategies

Below are some of the many ways an organism may sustain its life.

Filters are herbivores which live by allowing the environment to pass through their bodies. Most filters are aquatic in nature, pulling edible matter out of the water they live in. They are often unable to move, and so are not dangerous unless an adventurer is careless enough to enter their intake. Terran example: barnacles.

Grazers are herbivores which eat low-value food such as grass. They tend to spend most of their time eating. They may be solitary, but are more likely to move in herds for defense. Their primary defense is flight, which can cause dangerous stampedes if observers get in the way. If they are forced to fight, they will defend themselves fiercely. Terran example: antelope or horses.

Browsers are herbivores which eat foods of moderate value, such as leaves or shoots. They spend less of their time eating, and are more likely to be solitary animals. Their usual response to a threat is to hide or "freeze." Terran example: deer or elephants.

Pouncers are carnivores which attack prey by stalking it or attacking from ambush. Since a pouncing attack is difficult to coordinate, pouncers tend to be solitary animals. They will attack if they attain surprise and the target is recognized as potential prey, otherwise they will tend to avoid an encounter. Terran example: leopards or tigers.

Continued on next page . . .

Food Strategies

[Continued]

Trappers operate in similar fashion to pouncers, but instead of tracking or ambushing prey they construct traps and wait for prey to fall in. Any creature falling into the trap is attacked, but those which avoid the trap are usually ignored. Trappers rarely stray far from their prepared position. Terran example: spiders (there are few examples of large trappers on Terra).

Chasers are carnivores which use stalking behavior to locate prey, but run the prey down using a burst of superior speed. Chasers behave somewhat like pouncers, attacking only if they have a clear advantage. Terran example: cheetahs.

Herders are similar to chasers, but they use pack tactics rather than speed to bring down their prey. Herders are often willing to attack much larger animals, or to move in on a larger group to cut one animal off. Terran example: wolves.

Scavengers are carnivores in a sense, but they don't hunt for prey. Instead, they live by eating the remains of other animals, either moving in on the kill of another carnivore, or finding the carcasses of animals which die of natural causes. Scavengers almost never attack other animals, although some scavenger species operate in groups to intimidate other carnivores into abandoning their kills. Terran example: jackals or vultures.

Gatherers are omnivores which tend toward herbivorous behavior. They eat high-level plant material such as fruit or seeds most of the time, but sometimes catch insects or small game. They are similar to browsers in their behavior. Terran example: raccoons or chimpanzees.

Hunters are omnivores which tend toward carnivorous behavior, eating mostly small game. Hunters resemble chasers in their behavior. Terran example: bears or humans.

Eaters are true omnivores, which are willing to eat almost anything they can find. They can be rather dangerous, as they have little fear of any other creature and may attack without apparent provocation. Terran example: army ants (if an entire swarm is considered one animal).

Another class of consumers are *omnivores,* animals which can eat both plants and animals. Omnivores can be solitary or group-living animals, and tend to be of fairly high intelligence. *Carnivores* occupy the highest level on the "food pyramid" in any given community, eating only other animals. They also tend to be of high intelligence, although many carnivores are too strongly specialized to be good candidates for complete sentience.

Designing Encounter Tables

No matter what the environment, the numerical relationships between producers, primary consumers and higher consumers is about the same. Energy is lost at each stage of consumption, so a given mass of plant matter can only support a much smaller mass of primary consumers, which can in turn support an even smaller mass of higher-level consumers. Since carnivores tend to be larger than herbivores, this implies that meat-eaters are *much* less common than their prey. The numbers of each level of consumer are therefore dependent on the richness of the local population of producers, and *almost nothing else.*

We represent a local biological community by way of an encounter table. See the Encounter Table Template below. The "probability of encounter" depends on the richness of the local community. Each slot on the template represents an animal species, which can be designed using the rules that follow.

"Look, kid. Life out here isn't like in the arcology. Yeah, I know you know that. You don't know it in your guts, though. Down deep, you expect your air to be free, your meals on time, your day's work routine and your three-vee program ready to watch in the evening. Well, kid, that's civilization, and you've been taking it for granted all your life. Now you're going out where it hasn't been built yet."

– Ravi Shah, Exploration Office

Encounter Table Template

*Probability of Encounter on **X** or less*

Roll (3d)	Species Type
3	Herbivore
4	Herbivore
5	Herbivore
6	Herbivore
7	Herbivore
8	Herbivore
9	Herbivore
10	Herbivore
11	Omnivore
12	Omnivore
13	Omnivore
14	Carnivore
15	Carnivore
16	Carnivore
17	Carnivore
18	Carnivore

***X** is the Encounter Number from the Biome table on page 81.*

Begin setting up an encounter table by referring to the Biome Table. Each major terrain type has its own *Encounter Number.* A 3d roll is made every four hours and if the result is equal to or less than the Encounter Number, an animal encounter occurs. There is also a *Type Modifier* and a *Size Modifier,* both of which are applied when designing specific animals for the encounter table. Once these items have been recorded, use the rules below to generate enough animal species to fill in the table.

Biome Table

Terrain Type	Encounter	Type	Size
Tropical Forest, Jungle	15	-3	+0
Temperate Forest, Woodland	12	-4	-2
Polar Forest, Taiga	6	-4	-3
Scrub Forest, Chaparral	9	-2	-2
Grassland, Savanna	12	+4	+1
Polar Plains, Tundra	6	+2	-1
Wetlands, Swamp	9	+0	+0
Desert, Dunes	6	+3	-2
Mountain, Alpine	9	+0	-2
Glacier, Ice Cap	6	+0	-1
River, Stream	2	+1	-1
Shoreline, Coast	12	+3	+1
Shallows	15	+2	+2
Deep Ocean	12	-4	+3
Ocean Bottom	9	-2	+1

Social Strategies

Solitary animals spend most of their time fending for themselves, avoiding other members of their species. They can be very territorial, acting aggressively to drive intruders out of their favored grounds. Solitary animals normally meet only during a defined mating season. Terran example: bears.

Pair-Bonding animals behave like solitary animals, but they tend to form mated pairs that cooperate and share territory. Terran example: monogamous birds such as geese.

Small Group animals tend to move in family groups. Sometimes the young remain with their parents for a time even after becoming adults. In other species, siblings travel and hunt or forage together even as adults. Terran example: lions.



Survival Strategies

The level an animal holds in the local "food pyramid" is an important factor in determining its physiology and behavior. Each category, however, can be further divided according to *how* the animals get the food they eat. Species also differ according to how their members behave toward each other.

Procedure

Roll 2d on the Food Strategy Table, checking under the column for the current species' overall type. Modifiers: add the Type Modifier for the local terrain. The result is the exact survival strategy used by the species.

Food Strategy Table

Roll (2d)	Herbivores	Omnivores	Carnivores
0 or less	Filter	Gatherer	Trapper
1	Filter	Gatherer	Pouncer
2	Filter	Eater	Trapper
3	Browser	Gatherer	Pouncer
4	Browser	Eater	Scavenger
5	Browser	Gatherer	Scavenger
6	Browser	Hunter	Pouncer
7	Grazer	Hunter	Herder
8	Grazer	Hunter	Chaser
9	Grazer	Gatherer	Chaser
10	Grazer	Eater	Scavenger
11	Grazer	Hunter	Herder
12	Grazer	Gatherer	Trapper
13 or more	Grazer	Gatherer	Chaser

Large Group animals form packs or troops, in which not all the members are directly related. These groups can exhibit a wide variety of social and communicative behaviors, as they cooperate in foraging, hunting, or defense. Terran example: wolves or humans.

Small Herd and *Large Herd* animals are very social and gregarious. If a herd animal is found alone it is probably physically or emotionally ill, and can be very dangerous. Herd animals are most often herbivores, which use their group tactics to defend against predators. Terran example: elephants or horses.

Hive animals are so gregarious that they have little or no individual behavior, all effort being directed toward the survival of the group as a whole. Terran example: social insects such as ants or bees (a few small mammals exhibit a similar social structure).

Domesticable Animals

Many wild animal species can be captured and tamed. Humans have made pets of a tremendous variety of animal species. True domestication goes deeper than taming, however. A domesticated animal species is selectively bred in captivity, for use by humans (or aliens) who control its food supply and reproduction. Domesticated animals can be raised to serve as pets, but will also serve as supplemental labor or a food source. It turns out that very few animal species are suited for complete domestication.

A domestic animal will almost certainly be an herbivore, or an omnivore that can get by on a vegetarian diet. Domesticated carnivores will be small, and will not be used for food except in very unusual circumstances. Herbivores and vegetarian omnivores are much more efficient than carnivores, requiring less effort to keep fed.

Domestic animals must also be fairly easy to raise. Many animals are unwilling to breed in captivity. Others may not breed often enough, or grow to adulthood quickly enough, to be worth raising.

A domestic animal must also have a relatively calm and unaggressive disposition. Some animals are simply too dangerous to tame. Others bite or strike out at their handlers, too often to be reliable for domestic use. Still others are not dangerous, but have a tendency to panic at the slightest sign of danger, fleeing blindly and even running into obstacles in their haste to escape. An animal with any of these habits will be hard to keep safely confined.

Finally, domestic animals usually come from species which live in troops or herds in the wild. Social animals are easy to tame because human beings can make themselves seen as "part of the herd" or "leaders of the pack." Also, animals that live in large groups are less likely to be aggressive or panicky.

Assume that any animal on an encounter table is a candidate for complete domestication if it is between 100 pounds and 2,000 pounds in mass, is not a carnivore, and lives in a Large Group or a Herd. Such an animal will be domesticable on a 15 or more on 3d. Other animals are probably not domesticable in this sense (although many species can be tamed, and small species are more likely to be useful than large ones).

Then roll 2d on the Social Strategy Table. Modifiers: +4 for grazers, +2 for browsers, -3 for pouncers, -4 for trappers, -2 for chasers, +1 for herders, +2 for gatherers, +1 for hunters, +2 for eaters. The result is the preferred social structure for the species, along with typical numbers for an encounter. The GM should use common sense to modify the encounter numbers given. Species will tend to congregate in larger numbers where food is plentiful, and be more solitary in harsh terrain.

Social Strategy Table

Roll (2d)	Structure	Number Encountered
5 or less	Solitary	1
6-8	Pair-Bonding	1d-3 (minimum 1)
9-10	Small Group	1d-1 (minimum 1)
11-12	Large Group	1d+2
13	Small Herd	3d
14	Large Herd	6d (or more)
15 or more	Hive	8d (or more)



Body Plan

Swimming or flying animals are usually specially adapted to their lifestyle. Aside from these adaptations, an animal's exact physiology is usually not very important to the course of an encounter. In other words, "they look like they look." The GM should feel free to decide how many limbs an alien animal has, what shape its body has, and so on.

Of course, the higher animals on any world are likely to be related (assuming that none of them were "imported" by interstellar visitors). The physiology of even distantly related species will bear some similarities. For example, on Terra almost all the higher animals are members of certain classes of the subphylum *Vertebrata.* These animals are characterized by an internal bony skeleton, a long spinal cord with brain and sensory cluster at the front end, and four limbs (some of which may be undeveloped or *vestigial*). If we found a large, intelligent animal with a significantly different structure – a different arrangement of the nervous system, say, or *six* working limbs – we would be hard-pressed to understand its place in local biology. The GM designing animal encounters for a world may want to consider matching the physiologies for most of the species, representing such major lines of evolutionary heritage.

Procedure

Roll 2d on the Special Features Table. Modifiers: +2 if the planet's diameter is less than 4,500 miles, +1 if it is between 4,500 and 7,499 miles, -1 if it is 8,000 miles or more. -2 if the planet's atmosphere is Very Thin, -1 if it is Thin, +1 if it is Dense, +2 if it is Very Dense.

Special Features Table

Roll (2d)	Wetlands	River	Shore	Ocean	Other
2 or less	S (-6)	S (+1)	S (+1)	S (+2)	–
3	A (+1)	A (+1)	A (+1)	S (+2)	–
4	A (+2)	–	A (+2)	S (+2)	–
5	–	–	–	A (+2)	–
6	–	–	–	A (+0)	–
7	–	–	–	S (+1)	–
8	–	–	–	S (-1)	–
9	–	–	–	T (-7)	–
10	–	–	–	T (-6)	F (-6)
11	F (-6)	F (-6)	F (-6)	F (-6)	F (-5)
12	F (-5)	F (-5)	F (-5)	F (-5)	F (-4)
13	F (-4)	F (-4)	F (-4)	F (-4)	F (-2)
14 or more	F (-2)	F (-2)	F (-2)	F (-2)	F (+0)

The table may yield a letter code, indicating whether the animal has any special features. *A* means that the animal is an *amphibian,* spending most of its time in the water but able to emerge onto land. *F* indicates a *flying* animal, which can use wings, a lighter-than-air gas sac, or some other mechanism to move through the air. *S* means a *swimming* animal, which spends all of its time in the water. *T* signifies a *triphibian* animal, which prefers to live in water but can also walk on land and fly in the air. Note that if an animal has *no* special features, it is automatically a land animal.

The table may also yield a modifier, which should be added to the Size Modifier for the local terrain type. In general, flying animals are smaller and swimming animals larger.

Woods Devils

The GM wishes to design an animal for a woodland environment on the planet Haven. He is trying to fill a carnivore's slot on the appropriate encounter table, and hopes that the animal will prove a challenge to wilderness explorers.

The Type Modifier for the woodland biome is -4, so the GM rolls 2d-4 on the Food Strategy Table for a 5. The animal in question is a scavenger. He rolls 2d on the Social Strategy Table for a 5, finding that the animal has solitary habits. Haven's diameter is 6,300 miles and its atmosphere is of Thin density, so the roll on the Special Features Table is 2d. The GM rolls a 9, so the animal has no special features (in other words, it's a land animal).

The total Size Modifier is -2, from the Biome Table only. The GM rolls a 7, finding that the animal's average mass is 150 pounds (roughly human-sized). He decides that the animal is a trifle stronger than its mass would indicate, and records a ST score of 11. The base number of Hit Points is 10. He rolls 2d on the Animal Build Table for a 10, finding that the species has a Very Robust build. The base HT score is 16, and the final number of Hit Points from the tables is 12. Since this last is between 10 and 20, the GM simply uses the HT score for hit points as well.

The GM then rolls 2d+2 twice on the Animal Weapons Table, getting a 9 and a 12. The animal's main attack mode is a bite with its fangs. Referring to p. B140, the GM determines that the animal's bite does 1d-2 impaling damage. He rolls 3d+1 to determine if the animal has any natural poison or venom, and gets a 12, indicating none. Finally, he rolls 2d+1 on the Animal Armor table, rolling a 12 (but *not* a natural 12, given the modifier). He decides that the animal has Heavy Scales for PD 1, DR 1.

The GM rolls 3d+1 on the Animal IQ table for a 9, and finds that the animal has IQ 4, roughly comparable to a big cat in intelligence. He rolls 3d+1 on the Animal DX table for a 10, so the animal has DX 12. He has already decided that most dominant life-forms on Haven are four-limbed, so the base Speed for the animal is (16 + 12)/3 or about 9. Since the animal is fairly large for its environment, and since scavengers don't need a great deal of speed, the GM decides to reduce this value to 8. The animal's Dodge is therefore governed by its DX score and comes out to 6.

The animal's data block looks like this:

ST: 11 **Spd/Dodge:** 8/6 **Size:** 1 hex
DX: 12 **PD/DR:** 1/1 **Mass:** 150 lbs.
IQ: 4 **Damage:** 1d-2 imp
HT: 16 **Reach:** C

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Woods Devils

[Continued]

After thinking about it and checking through the *GURPS Bestiary,* the GM decides that this scavenger is a little like a hyena. It's about the same size, perhaps a little tougher, but slower and more likely to run alone. No one likes hyenas, so this beast is probably not popular either. He decides that it is called a "woods devil" by the people of Haven. It normally avoids humans, although it has been known to attack sleeping or injured woodsmen. It has repulsive dietary habits, an unpleasant appearance, and an uncanny moaning cry. The people of Haven dislike woods devils intensely, and only local environmental law prevents hunters from exterminating the species whenever its range impinges on human territory.

"The people I pity are the tender crews – they're the ones who have to deal with Xboat pilots as part of their job, whereas the rest of us can simply shoot them if they get too stroppy."

– Comedian Anton Wilson Peale

Evaluation

As always, the captain walked into the survey center without fanfare. Or advance notice. "Report."

Lead Surveyor Robinson managed to contain her irritation. "Computer, system schematic, private scope."

A light-point appeared between them, unfolding in seconds to a view of the system under survey. The primary glowed orange-yellow, an ordinary K3 star. Robinson pointed to a fleck of light near the central star, its motion barely visible. "Number Two is the only planet in the biozone. Unfortunately it doesn't work as a candidate. Diameter about twenty-five hundred miles, too small for an atmosphere. Albedo about one-tenth, consistent with naked rock."

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Animal Size



An animal's size controls or influences many of the factors that are important in an encounter.

Procedure

Roll 2d on the Animal Size Table. Modifiers: add the Size Modifier as given by the Biome Table and Special Features Table. Also add +1 for a grazer or filter, -1 for a gatherer, eater or pouncer. If a natural 12 is rolled, roll again with an additional +6 modifier.

Animal Size Table

Roll (2d)	Mass	ST Score	Hit Points
0 or less	1	1	2
1	3	1	3
2	5	2	3
3	9	2	4
4	18	3	5
5	36	4	6
6	75	6	8
7	150	10	10
8	300	16	13
9	600	25	16
10	1,200	40	20
11	2,400	64	25
12	4,800	100	32
13	9,000	150	40
14	18,000	240	50
15	27,000	320	56
16	36,000	390	62
17	45,000	450	67
18	54,000	510	71
19	63,000	560	75
20 or more	72,000	610	78

The size result gives the mass in pounds for an average adult member of the species. The GM should feel free to adjust this average value by up to 20% in either direction, especially at the higher values. Notice that we are referring to the animal's *mass* rather than its weight, which can be computed by multiplying mass by planetary gravity.

The size result also yields a ST score for an average adult member of the species. The GM should feel free to adjust this as well, to reflect differing body structures. Flying and swimming animals tend to have lower ST than land animals of the same body mass, for example.

The size result also yields a base number of hit points. This number is relatively insensitive to differences in body mass, but can vary widely depending on the body's *structure* and the animal's general resistance to injury.

Roll 2d on the Animal Build Table. Modifiers: +1 for a grazer, +1 for a swimming animal, -1 for a flying animal, +1 if the local terrain is Tundra or Glacier, -1 if the local terrain is Desert.

Animal Build Table

Roll (2d)	Build	HT Score	Hits Modifier
4 or less	Very Flimsy	13	-20%
5	Flimsy	14	-10%
6-8	Average	15	+0%
9	Robust	16	+10%
10 or more	Very Robust	17	+20%

This result measures how sturdy the animal's build is. "Flimsy" animals have light structural elements and a delicate constitution, while "robust" animals are bulky and healthy. The table also yields a figure for the HT score of an average member of the species. The GM should feel free to adjust this by a point or two, to fit his own concept for the species. Carnivores tend to have slightly lower HT for their build, while herbivores are more resistant to disease.

Finally, the table yields an adjustment to the animal's hit points. If a animal's final number of hit points is between 10 and 20, the GM should ignore the results of the tables and use the animal's HT score for both its "body HT" and its available hit points.



Natural Defenses

Two of the most important features of an alien animal are "How sharp are its teeth?" and "How thick is its hide?" Hunting omnivores and carnivores tend to have more natural weaponry, while herbivores tend to have more armor. Some animals have no viable attack form at all, yet have such thick defenses that few predators can threaten them.

Evaluation

[Continued]

"That can't be correct," said the captain. "I've gone over the Umakaar group's results myself. Ruins on six planets in this sector, with glyphs or geometric alignments pointing toward this star. This has to be the home system of the Aion civilization."

Robinson shrugged. "You know more xenoarchaeology than I. We'll study the planet in detail if you order it, but you can have my professional opinion already. That planet does not sustain life, and never could."

A third crewman joined their discussion. "Something new, Lead," he said, glancing nervously at the captain.

"Go ahead, Carson," Robinson prompted.

"It's Number Four. We just finished a detailed workup of its satellite system." He gestured into the schematic, at some distance from the star. "Computer, incorporate data file Alpha-three-five-nine and magnify."

Suddenly, Planet Four was no longer a simple point-glow, but a banded white-brown sphere the size of a fist. New sparks hovered in the air nearby. "Four is just outside the biozone," the specialist reminded them. "A large gas giant, emitting significant radiation of its own, mostly in the far infrared."

"Are any of the moons large enough for an atmosphere?" Robinson asked sharply.

The specialist nodded. "This one," he said, pointing to the brightest light. "Mass about point-six. Quite large, even considering its primary's size. We have no spectral reading yet."

Robinson considered silently, holding the captain's gaze for a long moment. Then she nodded decisively. "Tide-locked to the gas giant, of course. Close enough to the primary to keep the atmosphere from freezing out on the far side. Enough heat from the gas giant to keep the near side habitable. It's not a common situation, but it's possible."

The captain smiled slightly. "All right. Concentrate on the gas giant and its moons. I'll order a slow approach."

As he left, the lead surveyor turned back to her team, fatigue forgotten. They had a lot of work to do.

Landing

The herd moved slowly over its range, nibbling at the foliage. Males ranged around the edges of the herd, keeping half an eye out for predators. Females and young stayed close to the center. That was the pattern. No member of the herd knew any other way to live.

A few of the males, always alert to changes in the environment, glanced upward in time to see a white-silver dart drop from the zenith. It fell coldward, its path leveling off as it approached the horizon. Eventually, it disappeared behind the range of low hills that separated the herd's range from the Ring Ocean.

Out of sight, out of mind. The herd returned to the business of living.

Young Chandra got up from his seat as soon as the cutter touched ground. He was already in his suit. Now he pulled the soft helmet over his head, glanced at the ready light, and reached to touch the airlock control.

"Slow down!" laughed Eshkuri. "Go through your checklist."

Chandra shrugged, irritated at the veteran's caution. "We know the air is almost breathable. Even if the seal isn't perfect, we won't be out there long enough to take any harm."

"Don't you want to live as long as I have, and have the pleasure of ruining your juniors' fun? What about trace elements that didn't show up in the spectrograph? Or dust or seasonal pollens? Or greebles?"

Chandra frowned. "Greebles? What are those?"

"I don't know. But they'll kill you stone dead in five minutes. Go through your checklist."

Chandra didn't like being patronized, even by someone twice his age. He fumed, but he also went through the checklist. Eventually, the outer airlock door opened and the two scouts stepped down onto Carson's World.

The sun stood high overhead in a deep-blue sky. Primary's swollen mass was visible even at noon, hanging immobile over the heatward horizon. A cold wind struck through the fabric of their suits for a moment, until the internal thermostats compensated. Green-black foliage covered the ground, blurring the outline of slopes that ran down to the distant seashore. Chandra sniffed reflexively, but smelled nothing but clean recycled air.

Eshkuri was doing deep knee bends. "Feels good to be under light gees for a change. My last assignment was on a heavy world. Rough on the heart."

"There's the object we spotted from the air," said Chandra, pointing. "Let's go see."

Continued on next page . . .

Weapon Types

Roll 2d *twice* on the Animal Weapons Table to see what weapons are available to the species. Modifiers: -2 if herbivore, +1 if omnivore, +2 if carnivore, +2 if aquatic, -1 if mass is 600 pounds or more.

Animal Weapons Table

Roll(2d)	Weapon Type	Damage
0 or less	Big Horns/Tusks	Thrust/impaling or swing/cutting
1	Spear	Thrust+1/impaling
2	Smashing Tail	Thrust/crushing
3	Butting Horns	Thrust/crushing
4	Horns	Thrust/impaling
5	Blunt Teeth	Crushing bite attack (half ST)
6-9	None	None (Slam attacks only)
10	Sharp Teeth	Cutting bite attack
11	Small Claws	Thrust/crushing
12	Fangs	Impaling bite attack
13	Large Claws	Thrust/impaling or swing/cutting
14	Smashing Tail	Thrust/crushing
15 or more	Spear	Thrust+1/impaling



Each weapon type gives the animal an attack mode, with damage depending on its ST as listed. "Bite attacks" do damage as per the sidebar on p. B140, again depending on the animal's ST (blunt teeth halve ST when making this computation). Animals that have no effective attack modes can still perform

Slam attacks, although weaponless animals tend to avoid combat if at all possible. An animal's attack modes also yield its Reach. Most attack modes work only in close combat (Reach C). Big Horns, Tusks, or a Spear attack will all work at 1 hex range. Note that many of the attack modes match Striker types listed in ***Compendium I*** (see p. CI66).

Some animals are poisonous. Roll 3d. Modifiers: -3 if the animal's average mass is 9 pounds or less, -1 if it is between 10 and 75 pounds or greater than 600 pounds. -1 if the species is herbivorous, +1 if it is carnivorous, +1 if it is an amphibian or swimmer. +2 if the local terrain is Desert. On a 5 or less, the species has *defensive* poison only, delivered by sweat, a short-range spray, or short spines. Such a poison system is ineffective as a weapon and works by discouraging predators from eating the animal. On a 14 or more, the animal has *offensive* venom which can be delivered by fangs, claws, a stinger or a projected spit. Choose an appropriate venom type from ***GURPS Bestiary*** (pp. BE78-79) or ***Compendium II*** (pp. CII147-149).

Some animals have more exotic attack types: a sonic blast, a flash or darkness defense, an electric shock, even a psionic attack. The GM should assign these as he feels appropriate, although very few species should have such weapons.

Armor Types

Roll 2d on the Animal Armor Table. Modifiers: -1 if carnivore (except scavengers), +1 if scavenger carnivore, +2 if herbivore. +1 if the animal's average mass is between 1,200 and 8,999 pounds, +2 if it is between 9,000 and 35,999 pounds, +3 if it is 36,000 pounds or more. -4 if the animal is an amphibian or swimmer, -2 if it is a flyer or triphibian. On a natural 12, reroll with an additional +6 modifier.

Animal Armor Table

Roll (2d)	Armor Type	PD	DR	Special Features
4 or less	Skin with mucous	0	0	Water passage aided
	Oily feathers	0	0	Water passage aided
5-7	Skin	0	0	Can sunburn
	Very thin fur	0	0	
	Downy feathers	0	0	
8-11	Fur	0	1	
	Scales	0	1	
	Feathers	0	1	
12-14	Thick fur	1	1	Best for cold climates
	Spiny fur (Quills)	1	1	Close combat damage
	Heavy scales	1	1	
15-16	Carapace	2	2	
17-18	Armor plates	2	3	
19	Thick armor plates	3	4	
20 or more	Armor shell	3	5	

The table yields the armor type (some of which match types described in ***GURPS Uplift*** or ***Compendium I***). For some die-roll ranges there are several equivalent armor types listed, so the GM should choose one to fit his concept of the animal. The animal's PD and DR follow. Some armor types require special treatment, as noted briefly under Special Features (see ***Compendium I*** for details).

Landing

[Continued]

It was an easy walk in the light gravity, their boots silent on the thick mats of ground cover. They climbed a low hill and stood before it: a four-sided obelisk of some blue-white stone, standing about twice as tall as a man. No markings were visible, but there were signs of weathering around its edges.

"I wonder what it's made of?" said Eshkuri, reaching out to touch it gingerly. It was very hard.

"We could get the densitometer out here," Chandra suggested.

"Later."



The younger man moved slightly, sighting through the obelisk. "One side faces Primary directly."

"So it does." Acting on an obscure hunch, Eshkuri pulled one of his gloves off. "The air's cold. Feels like air, though."

"After that lecture, you're just going to expose yourself like that?" Chandra demanded.

"First learn to be careful, then you can decide what risks are worth taking. Now hush. I'm trying an experiment." The older man pulled his twenty-year service ring from his finger and reached to draw the setting firmly down one side of the obelisk. It left a barely visible mark. "As I thought. My ring's marked too."

Chandra gaped. "Diamond?"

"Probably the whole marker," Eshkuri said, looking up at it thoughtfully. "You know, it takes a pretty advanced technology to grow an artificial diamond this size. I wonder how long it takes for this thin atmosphere to weather one?"

The two men stood silently, letting the age of the place sink into their bones. On the heatward horizon a few herd animals appeared, silhouetted against Primary's bulk, stopping to watch the strange invasion of their world.

Search

Gwen sighed. "Ten thousand years of spaceflight experience and we still can't design a vacc suit that you can scratch in."

"Repeat, Blue Three. Didn't catch that," said the grav-car's communicator.

"Never mind," she growled. "Proceeding to cover grid square thirty-seven by fifteen."

"Roger that, Blue Three."

She took a moment to look away from the instruments as the grav-car followed its automatic survey pattern. A low range of hills passed five hundred feet below.

I owe myself a break, she thought. "I see something," she told the communicator. "Going in for a closer look."

Once the grav-car touched down, Gwen popped the canopy and clambered out. For a moment, it was sheer animal bliss simply to stretch. Two minutes later she had stripped down to compressor mask and undersuit, and was on her way to the water.

A quick scan assured her that nothing dangerous lurked in the water. Then she waded out, shivering at the cold. For a moment she considered diving, but decided that would be excessive. She contented herself with standing waist-deep, splashing hours of sweat away. Eventually, she turned back to the car – and stopped with a gasp. She wasn't alone.

They were slender, six-hooved creatures with rough brown coats, the species that the expedition had tagged "antelope." Three adults watched her warily as they bent down to drink from the lake. They had colts with them, peering out at her from behind their parents.

As she moved toward the shore, Gwen stubbed her toe on an unseen rock and stumbled, raising a splash. The adults flinched back from the water and turned to flee. That gave her a good view of the largest colt.

It stood on its two back pairs of legs, its forepaws off the ground in a stance that its parents could only match with great difficulty. It stood its ground bravely, eyes lively with intelligence as it confronted a hairless, upright, four-limbed alien. Then it bent down, picked up a pebble, and hurled it at Gwen. Too startled to dodge, she took the blow on her left shoulder.

"Ow!"

Then the antelope, adults and offspring alike, were gone.

Gwen rubbed at the bruise. She hadn't been imagining it. The little beastie had hands.

As soon as she was in the air, she called base camp. At first, the dispatcher wanted to shout at her for abandoning her car, going out unarmed and practically naked. She had the right words to silence him, though.

Finishing Details

To round out an animal's description, we need to determine its DX and IQ scores and determine how quickly it can move.

Determining IQ

Roll 3d on the Animal IQ Table. Modifiers: -4 if the animal's average mass is 5 pounds or less, -3 if it is between 6 and 18 pounds, -2 if it is between 19 and 36 pounds, -1 if it is between 37 and 75 pounds, +1 if it is 600 pounds or more. +1 if the animal is Solitary, Pair-Bonding, or lives in a Small or Large Group. -2 if the animal lives in a Hive.



Animal IQ Table

Roll (3d)	Species IQ
5 or less	2
6-8	3
9-12	4
13 or more	5

The result is an average value for the IQ score of an adult member of the species. If the species has IQ 5, it may have higher IQ at the GM's discretion, limited by the results from Step 17 of the world-design sequence. Such animals will not normally have IQ higher than 7, since beings with higher IQ border on sentience.

Determining DX

Roll 3d on the Animal DX Table. Modifiers: +2 if the animal's average mass is 5 pounds or less, +1 if it is between 6 and 18 pounds, -1 if it is between 150 and 299 pounds, -2 if it is between 300 and 599 pounds, -3 if it is between 600 and 1,199 pounds, and -4 if it is 1,200 pounds or more. -2 if the animal has a Carapace or Armor Plates, -4 if it has Thick Armor Plates, -6 if it has an Armor Shell. +1 if the animal is a hunter omnivore, +2 if it is a carnivore.

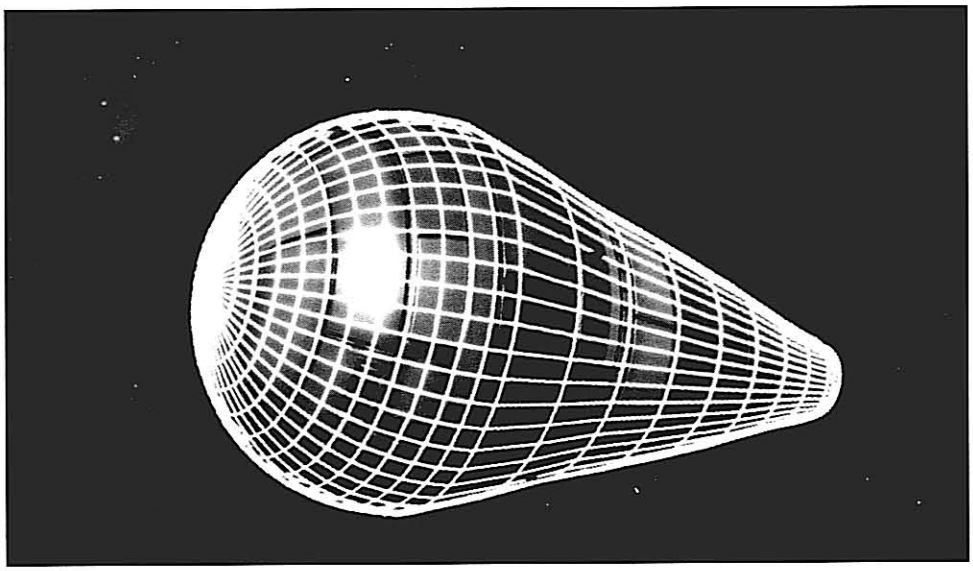
Animal DX Table

Roll (3d)	Species DX
3 or less	8
4	9
5-6	10
7-8	11
9-12	12
13-15	13
16-17	14
18 or more	15

An animal's Speed score when walking on land is related to its DX and HT scores, although the relationship is not as exact as with human characters. Compute a base value for Speed as (DX + HT)/3 for animals with four or more legs, (DX + HT)/4 for animals with two or three legs, or (DX + 4)/8 for animals with no legs (like snakes or snails). Then choose an actual land-movement Speed. Reasonable values are usually within 2 points of the base value. Large and heavily armored animals tend to move slower, while small animals and carnivores will move faster. Chaser carnivores, and herbivores whose main defense is flight, may move *much* faster (up to about twice the base Speed score).

Animals which swim or fly most of the time will have separate Speed scores for those modes of locomotion. Animals which use wings to fly might have flying Speed equal to about 2-3 times their land Speed. Animals which levitate using a flotation gas or other means will be much slower. Animals such as amphibians which use legs to get around on land will usually be very inefficient swimmers, moving at about ¼ their land Speed. Animals which are more optimized for water speed (streamlined body, slimy coat, flippers or flukes rather than legs) will have swimming Speed comparable to the land Speed of a four-legged animal with the same DX and HT.

An animal's Dodge score is equal to half of its most common Speed score or half of its DX, whichever is greater. Some small animals which are well-suited for defense may have an extra point or two of Dodge.



Completing the Design

At this point, we have all of the information necessary to fill in a standard animal data block:

ST: --	**Speed/Dodge:** -/-	**Size:** ----
DX: --	**PD/DR:** -/-	**Mass:** ----
IQ: --	**Damage:** -------	
HT: --	**Reach:** --	

Collect the results of earlier steps and fill in the fields of the block. At this point, consider what kind of behavior the animal will exhibit. How will it react to humans or other sentient creatures? Is it a good candidate for domestication, does it have any value as a game animal? Does it have any unusual features that would make an encounter memorable to players? One idea is to page through ***GURPS Bestiary*** or a naturalist's text to see how similar Terran species fit into their environment.

Report

Chandra shifted nervously as he waited. Finally, four senior scouts entered the conference center and seated themselves silently. Chandra reflexively noted the patterns of deferent body language that centered on an elderly man in a plain IISS uniform.

"Go ahead," said one of the new arrivals.

"Thank you, sir," Chandra said, and coughed. After a moment to get a mental grip on himself, he proceeded. "I've been sent to describe several remarkable developments on Carson's World. Our expedition has recently discovered evidence that the Aion species is not extinct, that indeed the Aion civilization may be on the verge of a resurgence."

A tap at the controls of his lectern, and a holograms of two very similar animals appeared above the conference table. "You're doubtless aware of the accidental discovery of what we call beta-form Carson antelope. The alpha-form or original species is a six-legged grazing herbivore, found in large numbers throughout the temperate zone. It is fairly intelligent, probably due to the need for cooperative defense against predators. The beta-form animal is very similar, but the differences have profound implications. Notice that the foremost pair of limbs has been freed by a reconfiguration of the spine. The three-toed hooves found on the alpha form are now three-fingered hands, with fair manual dexterity. Notice also that the cranium is larger and bulges strongly backward, indicating a considerable increase in brain mass."

From the audience: "They look a little like Centaurs. Any chance that this is a lost K'kree colony?"

Chandra smiled. This question he could answer. "No, sir. The resemblance ends with the gross anatomical structure and diet. The beta-form antelope were first sighted as juveniles, living among herds of alpha-form animals. This inspired us to perform a genetic study of the species. What we found is simply unprecedented. The basic repository of genetic information is a DNA variant with no unusual features. The genome, however, is fantastically long. The Carson antelope have over forty times as many base pairs as do human beings. Further, statistical analysis shows that very little of the genome is taken up by unexpressed DNA. Almost all of it is significant information.

Continued on next page . . .

Report

[Continued]

"We have concluded that the Carson antelope is an artificially engineered species. Our speculation is that the Carson antelope are the Aion. The alpha form is one that can survive in a simple animal existence for very long periods of time. The beta form are the sentient Aion. If this is so, then the extra-long genome may encode cultural information, accessible to the sentient Aion at an instinctive level. A kind of racial memory."

"Why do you suppose the beta-form antelope are appearing just now?" asked one of the seniors.

Chandra shrugged. "We don't know. Although we have mapped the antelope genome, we don't yet understand how most of it is expressed. The beta form may be a natural part of the reproductive cycle, although this seems unlikely since we've only sighted it near the expedition's base. Herds far from our camp show no sign of the beta form. Doctor Nuskaldin, our senior geneticist, speculates that the presence of our expedition has somehow triggered the appearance."

This provoked a stir of muttered comments and head-shaking, until the eldest scout raised a hand for silence. "Enough," he said. "Young man, are you aware that I am under pressure from several powerful interests to declare Carson's World open for development?"

Chandra nodded, swallowing sudden apprehension.

"Your expedition has not only found a biological mystery. It has also found large deposits of platinum and industrial-quality gemstones. Would you have me place these riches off-limits?"

Chandra hesitated for only a moment. "Sir, that's your decision to make, not mine. Thankfully. But our recommendation is that you should forbid development, at least temporarily. There are plenty of sources of precious metals and gemstones. If the antelope really are the Aion, then they represent a treasure unique in the Galaxy. At the very least, we can afford to take a few years and be sure."

Sector Scout Leader Anselm hault-Roderic peered intently into the young scout's eyes for a moment, then nodded. "I find I agree with you, young man. When you return, tell your captain that I will contact the Emperor at once."



Example

The GM wishes to design an animal for a woodland environment on the planet Haven. He is trying to fill a carnivore's slot on the appropriate encounter table, and hopes that the animal will prove a challenge to wilderness explorers.

The Type Modifier for the woodland biome is -4, so the GM rolls 2d-4 on the Food Strategy Table for a 5. The animal in question is a scavenger. He rolls 2d on the Social Strategy Table for a 5, finding that the animal has solitary habits. Haven's diameter is 6,300 miles and its atmosphere is of Thin density, so the roll on the Special Features Table is 2d. The GM rolls a 9, so the animal has no special features (in other words, it's a land animal).

The total Size Modifier is -2, from the Biome Table only. The GM rolls a 7, finding that the animal's average mass is 150 pounds (roughly human-sized). He decides that the animal is a trifle stronger than its mass would indicate, and records a ST score of 11. The base number of Hit Points is 10. He rolls 2d on the Animal Build Table for a 10, finding that the species has a Very Robust build. The base HT score is 16, and the final number of Hit Points from the tables is 12. Since this last is between 10 and 20, the GM simply uses the HT score for hit points as well.

The GM then rolls 2d+2 twice on the Animal Weapons Table, getting a 9 and a 12. The animal's main attack mode is a bite with its fangs. Referring to p. B140, the GM determines that the animal's bite does 1d-2 impaling damage. He rolls 3d+1 to determine if the animal has any natural poison or venom, and gets a 12, indicating none. Finally, he rolls 2d+1 on the Animal Armor table, rolling a 12 (but *not* a natural 12, given the modifier). He decides that the animal has Heavy Scales for PD 1, DR 1.

The GM rolls 3d+1 on the Animal IQ table for a 9, and finds that the animal has IQ 4, roughly comparable to a big cat in intelligence. He rolls 3d+1 on the Animal DX table for a 10, so the animal has DX 12. He has already decided that most dominant life-forms on Haven are four-limbed, so the base Speed for the animal is (16 + 12)/3 or about 9. Since the animal is fairly large for its environment, and since scavengers don't need a great deal of speed, the GM decides to reduce this value to 8. The animal's Dodge is therefore governed by its DX score and comes out to 6.

The animal's data block looks like this:

ST: 11	**Speed/Dodge:** 8/6	**Size:** 1 hex
DX: 12	**PD/DR:** 1/1	**Mass:** 150 lbs.
IQ: 4	**Damage:** 1d-2 imp	
HT: 16	**Reach:** C	

After thinking about it and checking through the ***GURPS Bestiary,*** the GM decides that this scavenger is a little like a hyena. It's about the same size, perhaps a little tougher, but slower and more likely to run alone. No one likes hyenas, so this beast is probably not popular either. He decides that it is called a "woods devil" by the people of Haven. It normally avoids humans, although it has been known to attack sleeping or injured woodsmen. It has repulsive dietary habits, an unpleasant appearance, and an uncanny moaning cry. The people of Haven dislike woods devils intensely, and only local environmental law prevents hunters from exterminating the species whenever its range impinges on human territory.

Chapter Six

Cultures

World Data

In this section, we will complete the world-design sequence by developing general information about a world's sentient population.

Step 19: Population

We will define the *population rating* or PR of a world as the "order of magnitude" of its sentient population. Increasing a world's PR by 1 increases its population by a factor of 10. PR 0 represents a population less than 10, PR 1 represents a population of 10-99, PR 2 a population of 100-999, and so on. We assume that no world may have a PR greater than 10.

The rules in the main text for Steps 20-24 assume that the "mainworld" of the system is being developed. The rules are different for other worlds in the same system (see sidebar). Before going on to the next steps, the mainworld of the system should be designated. This need not require that the entire system be generated in detail. If one world in the system is clearly more hospitable than any others, it can be designated the mainworld.

Procedure

Begin by computing the *maximum sustainable population rating* or MSPR. This represents the number of people the world can sustain without advanced technological support.

If the planet has no atmosphere, an Exotic or Corrosive atmosphere, or an atmosphere at Trace or Very Thin pressure, the MSPR is 0.

Otherwise, the MSPR begins at 9 and is modified if the world is inhospitable for various reasons. Modifiers: -1 for a world of diameter 2,000 - 4,000 miles, -2 for a world of less than 2,000 miles diameter, -1 for hydrograpic coverage of 1% to 30% or over 90%, -2 if there is no hydrographic coverage, -1 for a Thin or Very Dense atmosphere, -1 for a Polluted atmosphere, -1 if the world's climate type is Very Hot, Very Cold or Frozen, -2 if it is Uninhabitable (Torrid or Frigid).

Once the MSPR is known, roll 2d-2 to get the actual PR of the world. Modifiers: Add the Resource Abundance Modifier, -1 for every point the MSPR is *less* than 5. The final PR may be greater than the MSPR.

Traveller Note:The original ***Traveller*** world-design system simply assigned a PR to the mainworld of each star system by rolling 2d-2 with no modifiers for local conditions. If you prefer, use this system to generate PR for your mainworlds, but be aware that it will lead to apparently absurd results (such as unpopulated "garden" planets next door to vacuum worlds with populations in the billions). Of course, the exercise of explaining such odd PR levels may provide the GM with plot hooks. The procedure given in the current rules should be used for secondary worlds of the system.

Expansion From a Center

One possible theme for non-Imperial ***Traveller*** campaigns is an "age of exploration." Such a setting involves a homeworld sending out its first expeditions of interstellar exploration and colonization. Nearby worlds may be well-developed, but farther out is the frontier, and beyond that is uncharted space. To generate worlds for such a setting, modify Step 19 as follows.

When planning the campaign as a whole, the GM should choose an "average jump range." This should be the normal jump capacity for a typical commercial starship, the kind that would try to make a living on speculative trade or carry supplies for a new colony. Jump-2 is reasonable for most ***Traveller*** settings. Then decide on the "radius of development." This is expressed in terms of a number of average jumps, within which every world has been thoroughly explored and is being developed as quickly as possible.

When designing a new star system, count the number of "average jumps" it takes to get from the homeworld to the new system. The route chosen must hop from star system to star system, so that none of the "average jumps" ends in deep space. Use the best route possible (which may be rather indirect).



For every average jump in the route beyond the radius of development, apply a -2 modifier to the roll for PR for every world in the system. If the modified roll for a given world is -3 or less, then the world has yet to be thoroughly explored. If this is true for every major world in a star system, then the system as a whole is *uncharted* and must be surveyed and explored from scratch during the course of the campaign.

Mainworlds

The ***Traveller*** system assumes that every star system has a primary focus of population, a single planet, moon or planetoid belt called the *mainworld.* Any other settlements in the same system are assumed to be dependent on the mainworld for economic support and political control.

Once the population of all worlds has been determined, the mainworld can be designated. The mainworld is always the world with the highest PR. If two worlds have the same PR, the one in the life zone is the mainworld. If none of the candidates are in the life zone (or more than one is) then choose one at random.

The PR for a secondary world must be less than MPSR + (2 × (TL - 7)), where the MPSR is the maximum sustainable PR for the secondary world and the TL is that of the mainworld. The GM may wish to rule out inhabited secondary worlds when the mainworld is at TL6 or less (since interplanetary travel only becomes possible at TL7).

The rules in Steps 20-24 are different for secondary worlds. Once the mainworld of the system has been fully developed, use the following procedures to generate details for any secondary worlds.

Step 20 – Starport Facilities: Port facilities on secondary worlds are generally called *spaceports* to distinguish them from the *starport* on the mainworld. To determine the level of facility available, roll 1d. Modifiers: +2 if the PR is 6 or more, -2 if the PR is 1 or less. The spaceport is Class 0 on a 2 or less, Class I on a 3, Class II on a 4 or 5, and Class III on a 6 or more. A secondary world's spaceport facility may never be better than the mainworld's.

Step 21 – Political Type: If the mainworld of the system has a Captive Government, then so do all secondary worlds. Otherwise, roll 1d. Modifiers: +1 if the mainworld is balkanized. The secondary world's political type is Anarchy on a 1, Corporate State on a 2, Athenian Democracy on a 3, Oligarchy on a 4, or Captive Government on a 5 or more.

Step 22 – Control Rating: Roll 1d. The secondary world's Control Rating is two less than the mainworld's on a 1, one less on a 2, the same on a 3 or 4, one higher on a 5, and two higher on a 6. As always, the minimum CR is 0, the maximum is 6.

Step 23 – Base Technological Level: The secondary world's TL is always one less than the mainworld's.

Step 24 – Unity of Government: For simplicity's sake, we assume that secondary worlds are never balkanized.

Example

Haven's MSPR is 8, with the only applicable modifier being for the Thin atmosphere. The GM rolls 2d-3 (-2, -1 for its Poor resource abundance) and gets 6. Haven has a population in the millions. The GM decides arbitrarily that the exact population is 6 million.

Step 20: Starport Facilities

We will assign starports of Class V-I and 0, as in ***GURPS Space*** (see p. S122).

Procedure

Check for each class of starport in turn, in each case rolling 3d for less than the target number. Place a starport for the first roll that succeeds.

A Class V starport will appear only on a world of PR 6 or greater. Roll 3d for less than (PR + 3).

A Class IV starport will appear only on a world of PR 6 or greater. Roll 3d for less than (PR + 6).

A Class III starport will appear on any world, on a roll of 3d for less than (PR + 9).

A Class II starport will appear on any world, on a roll of 3d for less than (PR + 8).

A Class I starport will appear on any world, on a roll of 3d for less than 15.

If no Class I-V starport is present on a world, the starport will automatically be of Class 0.

At this point, the GM may want to decide whether the world has been declared an Amber or Red Zone. This should be normally be done according to the campaign situation, but if you want a random determination, roll 3d. Modifiers: +4 if the world has a Class 0 starport. On a 13-16 the world is an Amber Zone, on a 17 or more it is a Red Zone.

Traveller Note: The original ***Traveller*** world-design system assigned starports without reference to the population of a world. To mimic this pattern, roll 2d on the Starport Class Table *if* the world being generated is the mainworld of the star system. Otherwise, follow the above procedure, except that no secondary world may have better facilities than the main world. Secondary worlds will only have port facilities on a random die-roll if they are populated (the GM is free to deliberately place a port on an uninhabited world if he has some reason to do so).



Starport Class Table

Roll (2d)	Starport Class
2-4	V
5-6	IV
7-8	III
9	II
10-11	I
12	0

This procedure will cause some high-population worlds to have primitive facilities or none at all, while some frontier worlds have Class V starport facilities. Explaining why such combinations occur is up to the GM. Perhaps the high-population world has deliberately shut itself off from interstellar trade for cultural reasons, or the frontier world has a major port because of its strategic location.

Example

The GM decides to use the main procedure to generate Haven's starport facilities. The planet has PR 6, so the target numbers are 9, 12, 15 and 14. The GM rolls a 12, 13, and 10, so Haven has a class III port or "local facilities."

Step 21: Political Type

The political type of a world indicates the kind of social and political structure that is most prevalent there. It does not necessarily indicate that there is only one local government (see Step 24). We will generate political types to match, as closely as possible, the world government types used in ***Traveller.***

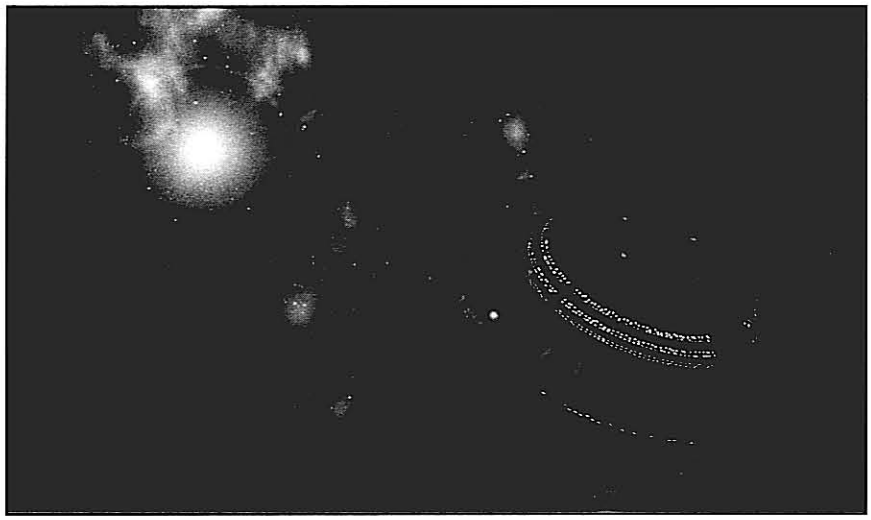
Note that the political types generated here are most appropriate for *human* societies. As always, nonhuman aliens may develop very different approaches.

Procedure

Determine the dominant political type by rolling 2d-7 on the Political Type Table. Modifiers: add the world's PR. Record the final dice roll result as well, for use in Step 22.

Political Type Table

Roll (2d-7)	Political Type
0 or less	Anarchy
1	Corporate State
2	Athenian Democracy
3	Oligarchy
4	Representative Democracy
5	Technocracy
6	Captive Government
7	Balkanized
8	Meritocracy
9	Bureaucracy
10-11	Dictatorship
12	Oligarchy
13 or more	Theocracy



Several results require explanation, or have slightly different meaning here than they do in ***GURPS Space*** (see pp. S119-S122).

True *anarchy* is fairly rare, and usually represents a society in a state of collapse. If an Anarchy is rolled, roll 1d: on a 2-6 the society is Clan/Tribal instead.

An *oligarchy* is a "special condition" under the rules in ***GURPS Space.*** In this case, it indicates that no matter what the nominal form of government, real power is in the hands of a small, self-perpetuating elite. An oligarchy may be based on a hereditary aristocracy of some kind. Roll 1d: on a 4-6 the society is Feudal instead.

A *technocracy* represents what ***Traveller*** calls a "feudal technocracy." This form of government is common in the Third Imperium. In it, government is indeed carried out by technical experts, but these experts are regarded as an aristocracy and given the titles and privileges of nobility.

A *captive government* represents a society which is ruled from elsewhere. This may represent a colony, a military government, or a subjugated society. The GM should decide which is applicable, based on the situation in his campaign.

If a result of *balkanized* comes up, then the world is automatically divided among multiple societies (see Step 24). Re-roll to determine the most common political type on the world, ignoring further results of "captive government" or "balkanized."

Bases

There may be several different facilities present on any mainworld, associated with the local or Imperial government.

Naval Base: The Imperial Navy will maintain a base in the system if the mainworld starport is Class V or IV, on a roll of 2d for 8 or more. At his discretion, the GM may designate a naval base as an Imperial Naval Depot, a major center of military shipbuilding and supply. Depot systems are usually chosen for their strategic location. There is normally only one per sector.

Scout Base: The IISS will maintain a base in the system if the mainworld starport is Class II or better. Roll 2d for 10 or more to place a scout base. Modifiers: +2 if the mainworld starport is Class III, +1 if it is Class IV. Scout bases which fall on the express-boat routes may actually be IISS Way Stations, with extensive facilities for the repair and maintenance of IISS ships. Way stations should appear about one per subsector. IISS bases are never established in the same system as an Imperial Navy depot.

Military Base: A local military base may be present in the system if the mainworld starport is Class III or better. Such a base is associated with a powerful world, a group of worlds, or a subsector. It acts like an Imperial Navy or IISS base, supporting local military forces. Roll 2d for 10 or more to place a military base. Modifiers: +1 if the mainworld's PR is 8 or more, +2 if the mainworld starport is Class III, +1 if it is Class IV, -2 if an Imperial naval or scout base is already present in the system.

Continued on next page . . .

Bases

[Continued]

Imperial Research Station: A research station can be placed on almost any world. Roll 3d for 17 or more to place a research station, or the GM may arbitrarily place them (about one in every other subsector). Research stations are named on a sector basis, using Greek letters (i.e., the first station in a sector is Research Station Alpha, the second Beta, and so on). When a station is closed permanently its letter becomes available again.

A *meritocracy* or a *bureaucracy* is also a "special condition" in ***GURPS Space.*** Again, another government type from the table may nominally be in charge, but real power is wielded by a collection of bureaucratic agencies. A Meritocracy represents what ***Traveller*** calls a "civil-service bureaucracy," in which government agencies hire individuals for their expertise. A Bureaucracy represents an "impersonal bureaucracy," in which the governing agencies are no longer responsive to the people, and in which entry to government service may no longer be purely by competence.

Example

A roll of 2d-1 (-7, +6 for the world's PR) yields a 7. Haven is balkanized. The GM rolls 2d-1 again, getting a 6 but ignoring the "captive government" result. A third roll of 2d-1 gives a 3, so the planet's most common political type is Oligarchy.

Step 22: Control Rating

The local Control Rating represents the level of legal control that visitors to the planet are most likely to see. Police and court mechanisms may work very differently away from the startown, or for natives of the world.



Procedure

Roll 2d-7 on the Control Rating Table. Modifiers: add the modified final dice roll made for Political Type in Step 21.

Control Rating Table

Roll (2d-7)	Control Rating
0 or less	0 (effective anarchy)
1-2	1 (very free)
3-4	2 (free)
5	3 (moderate)
6-7	4 (controlled)
8	5 (repressive)
9 or more	6 (totalitarian)

Example

Turning to the Control Rating Table, the GM rolls 2d-4 (-7, +3 for the final dice roll result from the political type determination). The result is a 4, so Haven's usual Control Rating is 2.

Step 23: Base Tech Level

A world's *base tech level* is the level of technology that the world's population most commonly uses *and* can produce for itself with local skills and resources. A more detailed technological description can be generated using rules later in this chapter.

Procedure

Begin by computing the minimum TL required by the world's environment and population. If the world's PR is less than or equal to its MSPR, then the minimum TL is 0. Otherwise, it is equal to 6 plus half the difference (PR minus MPSR), rounded down.

Determining a UWP

Classic ***Traveller*** used an eight-part code to represent the mainworld of each system: the Universal World Profile or UWP. For those who wish to use the world-design systems in this book in their Classic ***Traveller*** campaign, we offer the following guidelines for converting world descriptions to the UWP.

The first entry in the UWP represented the system's starport facility, and fell in the range A-E (with X for interdicted worlds). Use the mainworld's starport class and the Starport Equivalents table on p. GT123 to get this entry.

Continued on next page . . .

Roll 1d on the Tech Level Table to determine the actual TL. Modifiers: +6 if a Class V starport is present, +4 for a Class IV starport, +2 for a Class III starport, -4 for a Class 0 starport, +1 if the planet is less than 4,000 miles in diameter, +1 if there is no atmosphere, +1 if the atmosphere is Exotic or Corrosive, +1 if the atmosphere is Hospitable or Polluted but has Trace or Very Thin density, +1 if the hydrographic coverage is 85% to 94%, +2 if the hydrographic coverage is 95% or higher, +1 for PR of 1-5, +2 for PR 9, +4 for PR 10, +1 for a political type of Anarchy or Technocracy, -2 for a political type of Theocracy.

Some results require a second roll of 1d on the Low Tech Level Table. The actual TL is the result from the tables or the minimum TL computed above, whichever is greater.

Tech Level Table

Roll (1d)	Tech Level
0 or less	0
1	Roll on Low TL Table
2	4
3-4	5
5-6	6
7	7
8	8
9-11	9
12-13	10
14	11
15	12
16 or more	13+

Low Tech Level Table

Roll (1d)	Tech Level
1-2	1
3-4	2
5-6	3



In the Third Imperium setting only a very few societies have TL higher than 12, and those societies have very limited scope. Results of TL13 or higher should normally be re-rolled. The GM may deliberately choose to have an ultra-tech world present in his campaign, of course. Other settings may have different maximum TL, as defined by the GM.

Traveller Note: The procedure above follows the original ***Traveller*** rules closely. Under that system, however, there was no consideration of minimum TL as such (although inhospitable worlds tended to get higher TL via the die-roll modifiers). If you want to mimic the original system exactly, simply ignore the minimum-TL computation. This may give rise to situations where a world's population can't sustain itself using local technology. This may indicate that the world is dependent on offworld trade or imported technology to sustain its population. Or (if the Area Tech Levels rules below are used) perhaps the local society is more advanced in environmental technology than in other sectors.

Example

Haven's PR is less than its MSPR, so there is no minimum TL. The GM rolls 1d+2 (+2 for the Class III starport) and gets a 4. Haven has a base TL of 5, roughly equivalent to Earth's early industrial period. The GM decides that the inhabitants are members of a "back-to-nature" movement, who have settled the planet to enjoy a low-technological lifestyle. The planet name that he chose at random earlier is now beginning to seem appropriate . . .

Determining a UWP

[Continued]

The second entry represented the size of the mainworld. If the mainworld is a planetoid belt or a world whose diameter is less than 500 miles, then this entry is 0. Otherwise, round the mainworld's diameter to the nearest thousand miles, then divide by 1,000 to get the second entry.

The third entry represented the planet's atmosphere type. If the mainworld has no atmosphere, this code is 0. If it has a Trace atmosphere, the code is 1. If the atmosphere is Exotic, the code is A. If the atmosphere is Corrosive, the code is B (or C for very extreme cases). Otherwise, if the atmospheric pressure is less than 0.43 standard, the code is 3 (if Hospitable) or 2 (if Polluted). If pressure is between 0.43 and 0.7 standard, the code is 5 (if Hospitable) or 4 (if Polluted). If pressure is between 0.71 and 1.49 standard, the code is 6 (if Hospitable) or 7 (if Polluted). If pressure is 1.5 standard or higher, the code is 8 (if Hospitable) or 9 (if Polluted).

The fourth entry represented the mainworld's hydrographic coverage. Round the hydrographic coverage to the nearest 10%, then divide by 10% to get the entry.

The fifth entry represented the mainworld's population. It is exactly equal to the PR as generated in the main rules here.

The sixth entry represented the government type of the mainworld. If the mainworld is balkanized, this code is 7. Otherwise use the Political Type generated here, refer to the Government Equivalents table on p. GT123, and choose a ***Traveller*** government type that fits.

The seventh entry represented the "Law Level" of the mainworld. It was effectively equal to the 2d roll on the Control Rating Table in these rules. Alternatively, take the mainworld's Control Rating, refer to the Law Level Equivalents table on p. GT123, and choose a ***Traveller*** law level that fits.

The eighth entry represented the "Tech Level" of the mainworld. It was essentially equal to the modified 1d roll on the Tech Level Table in these rules. Alternatively, take the mainworld's ***GURPS*** Tech Level, refer to the sidebar on p. GT107, and choose a ***Traveller*** Tech Level that fits.

Resources

The best book on the design of cultures for science fiction is *Aliens and Alien Societies,* by Stanley Schmidt.

Good undergraduate-level texts in anthropology and political science will be helpful when working on the design of local cultures. One anthropologist who has written extensively for the popular market is Marvin Harris. We recommend his book *Our Kind* as a good layman's introduction to the subject. Be aware that some anthropologists disagree with Harris' philosophical biases, and some of his views are controversial.

Certain specialized branches of knowledge will be particularly useful. For example, *ethnography* is a branch of anthropology which deals with the direct observation of a society and its cultural systems. Ethnographic studies are priceless to us as world-builders, because they provide detailed information on societies which are completely human and yet are very different from our own.

Sociobiology is a relatively new field of study, which tries to explain the social behavior of humans and other animals in terms of evolutionary biology. It will be useful to worldbuilders who want to deduce the cultural behavior of *alien* sentient species from their biology. The most important book on the subject is E. O. Wilson's *Sociobiology: The New Synthesis.* Wilson's more recent books *On Human Nature* and *Consilience* are also of interest. Another writer who is more accessible to the layman is Desmond Morris, whose most popular books are *The Naked Ape* and *The Human Animal.*

Meanwhile, many ***Traveller*** GMs will want to develop interesting local customs without delving into the arcana of the social sciences. For them, a superb resource is widely available: travel guides! These often include considerable information about what is considered polite (and what isn't) in various cultures. One good example is the *Customs and Manners* series, by Nancy Braganti and Elizabeth Devine. Naturally, the cultures covered tend to be those of the more developed Terran nations of the late 20th century, but the GM can easily use them as inspiration for cultures of the Third Imperium . . .

Step 24: Unity of Government

A world's political type doesn't always represent a single government over the entire population. Many worlds, especially at low levels of technology, are *balkanized* or divided among a number of governments. In this case, the overall political situation may fall into several categories.



Procedure

Roll 2d on the World Government Table. Modifiers: subtract the planet's PR and add its base TL. If the results of Step 21 require that the world be balkanized, then the maximum result of the dice roll is 7.

World Government Table

Roll (2d)	Political Situation
5 or less	Diffuse
6	Factionalized
7	Coalition
8 or more	World government exists

In a *diffuse* situation, there are dozens or even hundreds of petty tribes, clans, nations or groups. The starport, if it exists, rests in the midst of a number of local governments which may change over time. In this case, the political type generated will be the most common one in force in the area of the starport. The average PR of any one political unit is equal to the world's PR, minus 2.

In a *factionalized* situation, there are perhaps a dozen major governments (roll 3d) which divide control of the world between them. These governments are probably in constant competition, engaging in political scheming and open warfare. The planet's main starport will probably be in the territory of one major government, whose political system will be represented by the generated political type. Other governments may vary widely. The average size of a political unit is equal to the world's PR, minus 1.

A *coalition* system resembles a factionalized situation, but in this case a few of the world's most powerful societies (roll 1d to see how many) dominate affairs and tend to present a united front to outsiders. Competition is kept within limits that are more-or-less clearly defined, so that no outside force or minor nation can upset the balance of power. The starport may again be within the territory of one powerful society, or it may be in a neutral area with security guaranteed by the entire coalition. In this case, the political type generated is the one most common for members of the coalition. The average size of a political unit is equal to the world's PR, minus 1 (in some cases, the largest political units may have PR equal to that of the world).

Traveller Note: The original world-design system for ***Traveller*** did not determine unity of government separately from political type. In that system, a result of "balkanized" for political type was sufficient. The current rule is designed to add nuances to the concept of balkanization. It also reflects the fact that low-technology cultures have more difficulty bringing large populations under a single government. If the GM wishes, he may simply skip Step 24 and allow Step 21 to determine whether a world is balkanized or not.

Example

The GM rolls 2d+1 (-6 for the PR, +5 for the TL) and gets a 7 (which is the maximum allowable result anyway, since the political type roll forced a balkanized result). Haven is ruled by a coalition of several major states.

Population Centers

In our discussion of population centers, we will often refer to the PR of a city. This means the same thing for cities as it does worlds – it indicates the "order of magnitude" for the city's population.

A Brief History of Cities

An urban center requires some amount of agricultural hinterland to keep itself fed. The size of cities, therefore, depends on the available technology. Improved agriculture can lead to greater food yields per acre, improved transportation can make it easier to bring food into the city, improved social institutions can lead to more effective administration of masses of people.

Cities based on a primarily agricultural economy can grow to about PR 5. The occasional city at low-end PR 6 is possible without industry, but it requires massive imports of food from outlying regions. Such cities are almost always the capitals of large states.

Cities of PR 6-7 normally require the mechanized agriculture and improved transportation that come with an industrial economy. The industrial city reaches its height as some individual cities grow to PR 7. Another PR 7 city type is the *megalopolis,* which happens when several smaller cities sprawl far enough to meet each other along highway or rail lines.

Larger urban populations are possible. An *arcology* is a nearly self-contained city housed in a single huge building. Theoretically, arcologies can use fusion power and recycling technology to allow unprecedented population densities, reaching PR 8. Finally, the ultimate in city development comes when gravitic technology allows buildings to ignore the drag of gravity. The soaring spires and floating buildings of gravitic architecture allow individual cities of PR 9, although such incredible crowding is almost never necessary.

Assuming an economic base that is typical for human civilizations, the maximum PR for cities should follow the City Size Table.

City Size Table

Tech Level	Max PR	Examples
0 (late)	3	Jericho, Uruk, Eridu
1	4	Memphis, Babylon, Nineveh
2-4	5	Alexandria, Antioch, Rome, Baghdad
5-6	6	London, New York, Tokyo
7-8	7	Boston-Washington, Mexico City, Shanghai
9-10	8	(Arcology cities)
11 or higher	9	(Grav cities)

Mapping Cities

On most worlds, the largest cities will have PR equal to two less than the world's PR *or* the maximum PR for that Tech Level, whichever is less. There will normally be about 1d+3 of such cities, with the rest of the population living in smaller urban centers and in the countryside. On an Earthlike world, these major cities will almost always appear in Mixed terrain, along important rivers or coastlines.

One variation on this pattern appears when a world is economically undeveloped, or when it has just been colonized. In such cases, there is usually a single dominant or "primate" city, which incorporates almost all commercial and industrial activity. Any other urban centers will be quite small. The GM should consider applying this pattern on any world that he considers to be still in the process of economic development.

Rhylanor (V)

From published material, we know that Rhylanor has a PR of 9 and an actual population of about 8.3 billion. Checking the planet's MSPR, we find that (due to its Very Thin atmosphere) the maximum sustainable PR is 0. This isn't a paradox – it simply means that Rhylanor's population is dependent on some kind of high technology to survive. Presumably the planet's billions live in domed or underground cities.

We already know that Rhylanor has a Class V starport and plays host to Imperial naval and scout bases. We also know that its political type is Oligarchy, and ***Behind the Claw*** states that the government is by a hereditary aristocracy. Perhaps Rhylanor is one of those worlds where the Imperial nobility plays an important or even dominant part in local government. The listed Control Rating for the planet is 3.

Given Rhylanor's MSPR and PR, we can set the minimum TL for the planet at 10. The published TL for the planet is 12, so we can be certain that the local population is able to maintain its environment using local expertise and resources.

Published information about Rhylanor doesn't indicate that the world has divided government. This is reasonable, since the roll on the World Government Table would be 2d+3 (-9 for PR, +12 for TL). Even if we were to determine Rhylanor's unity of government randomly, odds are it would be unified.

This completes the development of a detailed world description for Rhylanor. This should demonstrate how the application of world-building techniques can add considerable new color to existing ***Traveller*** material.

We always knew Rhylanor as the homeworld of Olav hault-Plankwell, first of the Emperors of the Flag. Now we have some insight into the harsh world he grew up on. The looming reddish sun makes its way through the sky very slowly, baking the surface during the long days; lengthy nights freeze the surface. The temperature extremes and thin atmosphere are likely to kill anyone caught without life-support gear on the surface. A few hardy native life-forms exist, analogous to lichen or bacterial mats, clinging to the naked rock or swimming in the shallow seas. The upper classes live in domed cities, while the bulk of the population huddles in vast underground warrens. The world is a prosperous hub of trade and high-tech industry, although it has few unusual natural resources of its own. Millions of visitors come each year to the city once dominated by the Plankwell family, where today a monument to the clan's most famous member stands in the dim noon light . . .

Local Customs

Most people who briefly visit a culture other than their own never reach a deep understanding of all of that culture's customs and rituals. Similarly, ***Traveller*** players will rarely need much detailed information about local customs. The GM can usually develop a few distinctive customs for any given world to be visited, bringing them into play to give his players some "flavor" for the alien society. Of course, developing a few distinctive customs may also give the GM tools to challenge his players. Adventurers who run afoul of cultural "land mines" will soon learn to inquire about local customs ahead of time!

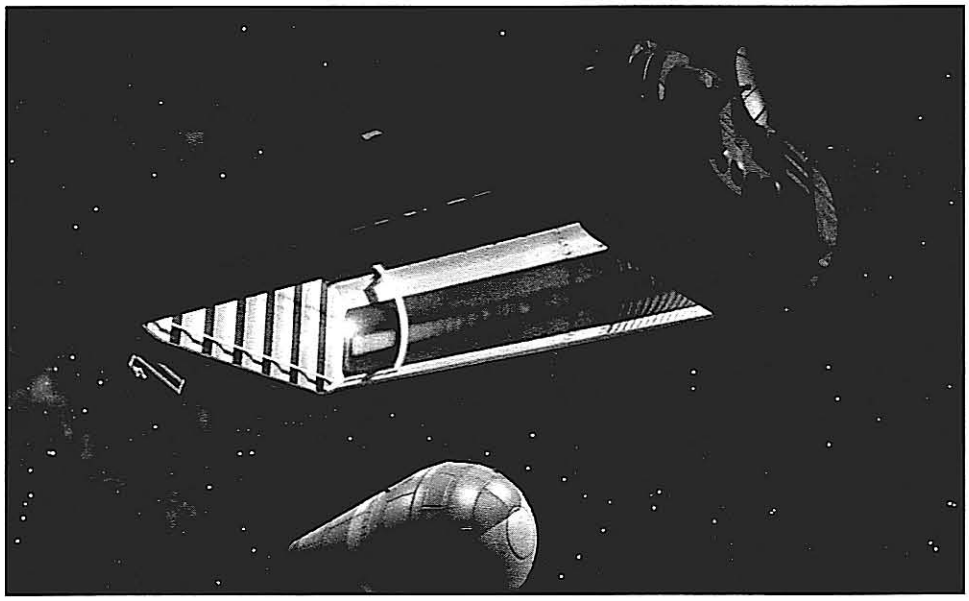
One way to proceed is to consider a few *cultural universals.* Anthropologists have long recognized that every human culture develops some response to each of a number of universal concerns. The details differ from society to society, but *every* culture addresses these issues. The GM can choose a few of these and use his imagination to develop unique local customs that his players will long remember. Specific cultural universals are discussed in sidebars throughout this chapter.

When designing customs for a strange human society, consider investigating known cultures from Earth's history, *as different from your own as possible.* You'll find plenty of inspiration for your own alien cultures, all the more useful since you will know that real people lived under similar customs.

Naturally, the cultural universals are probably only "universal" in *human* cultures. Even so, the GM developing cultural traits for a nonhuman civilization can still use these universals as a point of departure for his own thinking. Suppose the aliens have a different reproductive pattern than humans do? They will still structure their reproductive activity through cultural values and customs. What does the difference in biology imply for sexual taboos, family patterns, rules of inheritance? Even if an alien species simply doesn't have one of the human cultural universals, that fact will suggest something about the aliens' mindset that the GM can use. Besides, perhaps the aliens have cultural universals, rooted in their different biology, which humans don't have and can't easily understand . . .

On high-population Earthlike worlds, the GM may wish to mark some "urban terrain" on the planetary map. This represents regions of the planet that are heavily built-up, with many small urban centers and a population of at least 1,000 people per square mile. Urban terrain should almost always replace Mixed terrain near water, as for the planet's largest individual cities. Assume that there are about 1d-2 Urban hexes (minimum 0) per billion people living on the planet. The world's major cities should be placed in Urban terrain.

One more feature that should appear on almost any planetary map is the world's main starport. This should be placed in Mixed terrain, preferably near the equator and as close to the world's major cities as possible.



Social Parameters

Societies of intelligent beings are the most complex systems in the known universe. This book will present no single set of rules for detailing a society. Instead, there are a number of tools that can *optionally* be used to flesh out alien cultures.

We can describe societies in terms of a eight "social parameters." These represent general tendencies in a society's worldview. Such a description will naturally simplify the true situation drastically, but it should allow GM and players to grasp a culture's general flavor.

Procedure

For each of the eight parameters, roll 3d on the Social Parameters Table. Apply any listed modifiers.

The modifiers will sometimes refer to conditions on a given world. If the society inhabits and controls a single world, use that world's characteristics (its population, assigned political type, Control Rating, and so on). If the society shares the world with others, use the characteristics specifically associated with the society rather than of the entire world. If the society covers multiple worlds, use the characteristics of its homeworld or most important world. The GM should use his discretion when determining parameters for societies that don't seem to fit any of these patterns.

Further, each parameter is tied to one of the sets of "personality traits" that can be used in designing alien racial templates (see ***GURPS Uplift*** or p. CI180). The eight parameters can thus be used to generate cultural profiles for nonhuman societies.

Record the resulting parameter level. Extremes of each parameter will have descriptive adjectives attached, which can be used to portray the society in intuitive terms. Each parameter level will also have an associated Skill/Reaction Modifier. If the GM wishes, he may apply this modifier to certain die rolls when adventurers are interacting with the culture in question.

Social Parameters Table

Roll (3d)	Level	Skill/Reaction Modifier
5 or less	Low	-3
6-7	Low	-2
8-9	Moderate	-1
10-11	Moderate	+0
12-13	Moderate	+1
14-15	High	+2
16 and up	High	+3

"The old Imperial strategy of a "crust defense" has proven unworkable. Instead, the bulk of the Imperial Navy now operates as a strategic reserve, relying on colonial forces to delay the first blow of any attacker. Such a strategy requires advance warning and quick response. IISS intelligence and covert operations have therefore expanded considerably in the last fifty years."

– J. Edward Zowdrani, Intelligence Office

Pluralism

Societies are not always unified. Members of a society may differ in ethnic background, and may have varying notions about moral principles, laws, religious beliefs, political ideologies, scientific theories, even styles in art or architecture. The Pluralism parameter describes how divided the society is with respect to these core ideas.

Modifiers: +2 if the society is in contact with many different other societies (as on a balkanized world). +2 if the society has CR 0, +1 for CR 1, -1 for CR 5, and -2 for CR 6. +2 if the beings making up the society have Reclusive, +1 if they have Loner, -1 if they have Chummy, -2 if they have Gregarious.

High Pluralism (Diverse): The society is fragmented along cultural lines. No set of cultural values can be considered dominant. Internal conflict may be common, or the society may have developed ways of mitigating the clash of cultural values.

Moderate Pluralism: One "majority" subculture may be considered dominant, possibly for historical reasons. Even so, a number of distinct worldviews are present within the society. There is dissension on many issues.

Low Pluralism (Monolithic): The society is dominated by one set of cultural values. Cultural minorities may exist, but they are always under pressure to conform to majority expectations. Individual members of society may be punished if they deviate publicly.

Applications: Apply the Pluralism modifier whenever characters need to deal with dissension and diversity within local society. For example, the GM can add the modifier to any Reaction roll when an adventurer publicly challenges the core values of a local culture. Or the modifier can be added to the effective skill level when PCs are working to locate, contact or even create a dissident group.

Contact

One day, the Aion came down from the hills.

They weren't unexpected. Small bands of Aion had been approaching for some time, finding good vantage points from which to observe human activity. When these Aion crossed the security perimeter and showed no sign of stopping, Administrator Ral Chandra was ready to meet them.

Chandra remembered the day he had been one of the first two men to stand on Carson's World, half a lifetime ago. His career had taken him to a dozen worlds, but he had leaped at the chance for another posting to the Aion homeworld. How better to find out how the story would end?

The Aion cantered directly toward the administration building, which might have been coincidence but might also have revealed something about their grasp of human nature. Chandra and his staff intercepted them, unarmed and empty-handed. One of the Aion carried a wooden staff, others had wide-bladed iron knives, but none made a threatening movement. Human and Aion watched each other calmly, waiting.

The first Aion finally stepped forward, speaking briefly in a deep and gravel-filled voice. For a moment, Chandra caught none of the meaning, but then his training reasserted itself. "What kind are you?" the Aion had asked.

"We are human," Chandra replied, stumbling only slightly over the phonemes of Aion language.

"Human," the Aion mused. "We do not remember you. The stream-of-stars must have changed much while we slept."

Chandra made the hand-gesture that corresponded to a nod.

"How wide is your understanding?" the Aion asked. "Do you know how long it has been, how long we slept, how long we dreamed in animal innocence?"

"Not precisely," Chandra replied. "Your ancestors cleared away signs of their presence with great care. It may have been as long as a million years."

The Aion all made the nod-gesture, unsurprised.

"If I may inquire," said Chandra, "why did your people enter the period of animal existence?"

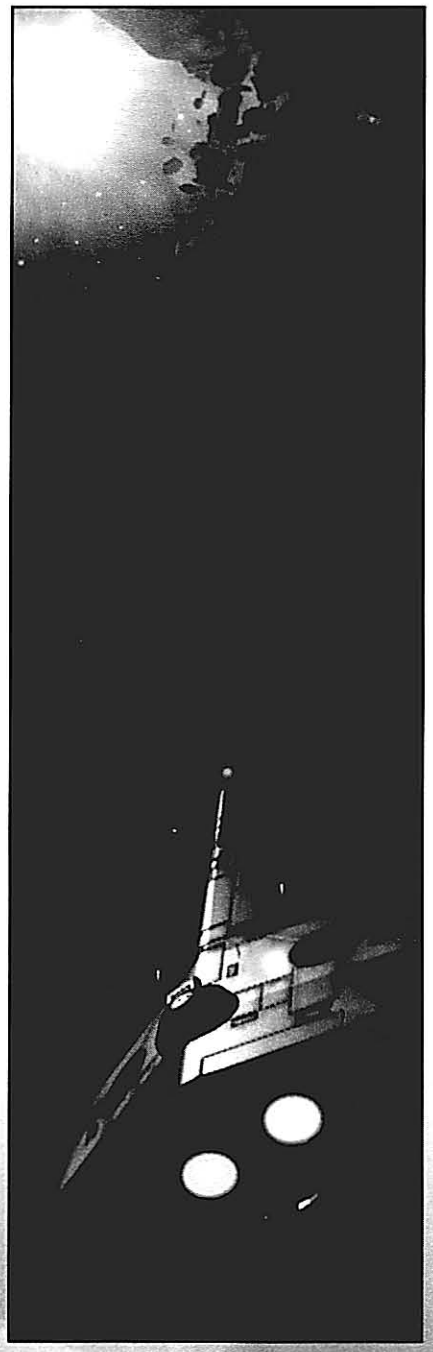
Continued on next page . . .

Contact

[Continued]

"It is not forbidden knowledge," said the leading Aion. It gestured with its staff at the sky, the sun, the round limb of Primary. "When first we moved among the stars, there was no one else. There were only animals who had not yet learned the arts of speech, of fire, of starships. We are not beings who can long tolerate being alone. After a time, we chose to return to the life of our distant ancestors, waiting for the time when someone would come to find us. Now you have."

Chandra nodded gravely. "Now we have, and you are very welcome among us."



Toleration

Societies vary in the degree of tolerance they display toward foreigners and foreign ideas. Some societies prefer to close themselves off from outside influence. Others may welcome exotic ideas. Naturally, a tolerant society is more likely to welcome visitors or immigrants.

Modifiers: +2 if the society is Diverse, -2 if it is Monolithic. +2 if the society's main world has a class V starport and is not interdicted, +1 if class IV and not interdicted, -1 if class I or 0 and not interdicted, -2 if the world is interdicted. +2 if the beings making up the society have Strong Xenophilia, +1 if they have Xenophilia, -1 if they have Racial Intolerance, or -2 if they have Xenophobia.

High Toleration (Cordial): Foreigners and foreign ideas are actively welcomed. Members of the society tend to be curious, willing to hear what foreigners have to say even if they don't agree. In extreme cases, foreigners may find themselves idolized.

Moderate Toleration: Foreigners are accepted to some extent, although they are expected to obey local laws and respect local customs. Members of the society tend to regard their own society as superior to others. Foreign ideas are accepted or rejected on their merits, as long as they are not disruptive.

Low Toleration (Xenophobic): The society fears and distrusts foreigners. Foreign ideas are rejected out of hand as foolish and dangerous. If foreigners visit the society, their movements may be restricted for their own protection.

Applications: The Toleration modifier comes into play whenever a character is clearly foreign to the local culture. Add the modifier to any Reaction roll when a character's foreign origins or customs are obvious. Or add it to effective skill level when a foreigner tries to explain his own culture or motivations to locals.

Solidarity

This parameter measures the relationship that the society expects between the individual and the group. Some cultures put great emphasis on private action and responsibility, while others submerge the individual into his social allegiances.

Modifiers: +2 if the society has over 1 billion members, +1 if it has between 100 million and 1 billion members, -1 if it has between 1 million and 10 million members, -2 if it has less than 1 million members. +2 if the beings making up the society have Hive Mentality, +1 if they have Selfless, -1 if they have Selfish, -2 if they have Self-Centered.

High Solidarity (Collectivistic): Altruism is a strong cultural value. Members of the society routinely try to help others, even at cost to themselves. Social leaders can easily mobilize large numbers of people to work toward collective goals. Economic competition is kept under strict control, either by government action or by social pressure.

Moderate Solidarity: Members of the society exhibit altruistic behavior at specific times (for example, when conditions are difficult). They tend to look out for themselves otherwise. Leaders find it difficult to muster support unless there is a clear need. Economic competition is common and only lightly restricted.

Low Solidarity (Egoistic): Members of the society rarely sacrifice themselves for others. Altruism may be regarded as a foolish or weak attitude. Collective action is very difficult to bring about unless force is applied. Economic competition is very common and can be cut-throat in nature. Lower social classes may be ruthlessly exploited.

Applications: The Solidarity modifier can be added to Reaction rolls involving "requests for help." It can also be added to effective skill when using Leadership or other social skills to call for collective effort.

Tractability

This parameter measures how easily the society is governed, how much effort the society's political leaders must exert to maintain order and control.

Modifiers: +2 if the society is Collectivistic, -2 if it is Egoistic. +2 if the local government type is Caste, Dictatorship, Feudal or Theocracy, +2 if it is Corporate State or Oligarchy, -1 if it is Athenian Democracy, or -2 if it is Anarchy or Clan/Tribal.

High Tractability (Submissive): The society is easily governed. The people obey the laws without much complaint, and work within established channels if they must press for change. The society is very stable.

Moderate Tractability: The society's leaders must sometimes use persuasion or force to keep its members in order, but open rebellion is rare. Complaints about the law reach the level of civil disobedience or personal rebellion.

Low Tractability (Rebellious): Members of the society resent authority, and are likely to rebel as soon as they disagree with established laws or policies. In aggressive societies, armed revolt is always a possibility. The society is unstable.

Applications: Use the Tractability modifier whenever dealing with rebellion against authority. The modifier could be added to Reaction or social skill rolls when appealing to people to "work through channels," or subtracted when trying to encourage defiance of authority figures.

Aggression

This parameter measures the attitude of the society's members toward violence. It also offers insight into how cultural norms are enforced within the society.

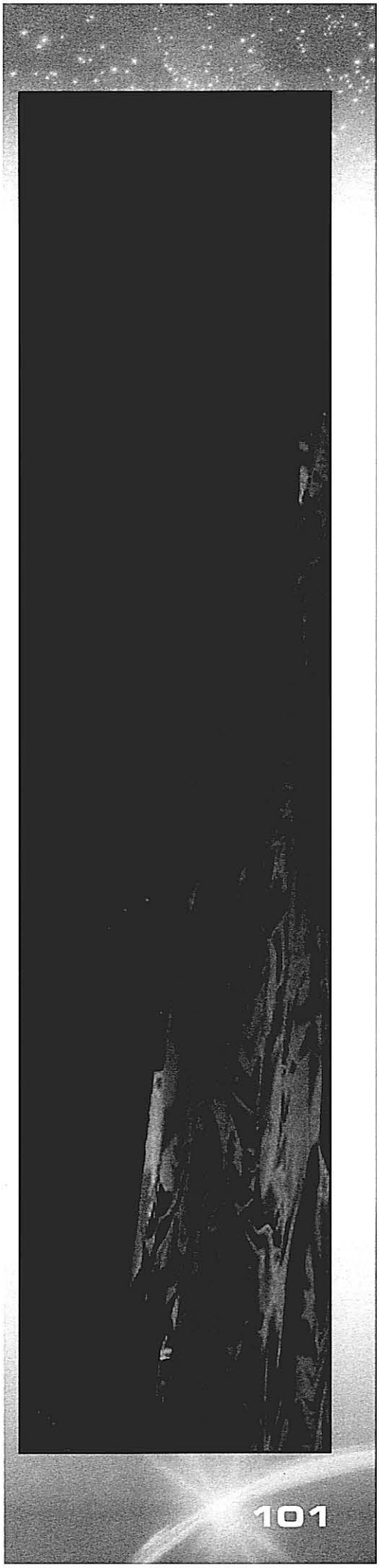
Modifiers: +2 if the society is Rebellious, -2 if it is Submissive. +2 if the local CR is 0, +1 if CR 1, -1 if CR 5, -2 if CR 6. +2 if the beings making up the society have Solipsist, +1 if they have Callous or Oblivious, -1 if they have Sensitive, -2 if they have Charitable.

High Aggression (Violent): Violence is a common method for resolving disputes in the society. In extreme cases, violence may be the preferred response to any problem. Social norms are likely to be imposed by naked force, whether or not they also have the weight of custom.

Moderate Aggression: Social and cultural forces exist to restrain violence. When resolving disputes, members of the society will tend to try diplomatic methods first. The use of force may be reserved to certain institutions or social classes. Social norms are enforced through the rule of custom or law, backed by the threat of violence.

Low Aggression (Pacific): Violence is regarded as an aberration, to be used in the last resort if at all. Members of the society may prefer to leave a dispute unresolved, or accept an unsatisfactory result, rather than use force. Social norms are enforced through the force of custom, possibly with an elaborate code of shame, so that violent force is seldom needed.

Applications: The Aggression modifier can be subtracted from any Reaction roll in a "potential combat situation." It can also be subtracted from die rolls for morale checks. On the other hand, the modifier can be added to Leadership skill when in a combat situation, or to social skills when trying to whip people into a violent response.



Kinship

Every human society develops its own rules of kinship, recognizing what relationships exist between people based on marriage or descent. Some individualistic societies make very little of such relationships, so that people not in the same immediate family will behave almost like strangers. Other cultures, however, place considerable importance on kinship. Such societies form *descent groups,* whose members share resources and support one another out in the society at large.

Humans have evolved a wide range of rules for deciding who is related to whom. Some cultures trace descent only through the male line, a system called *patrilineal descent.* For example, most Americans and Europeans use patrilineal reckoning with their "family name." This name is inherited from the father, while wives take their husband's family name. The complementary system is called *matrilineal descent,* and indicates that descent is traced only through the female line. The third major system is called *cognatic descent,* indicating that kinship can be reckoned through a combination of male or female links, depending on the situation. Some cognatic societies use patrilineal kinship for some social purposes and matrilineal kinship for others. In other cognatic societies, group membership may depend on which set of relatives one lives with, or simply on the choice of the individual.

Another important concept which affects kinship is the question of residence. When a marriage takes place, who do the newlyweds live with? In *patrilocal* societies, the wife moves in with her husband's family, while in *matrilocal* cultures the husband moves to live among his wife's kin. Most other societies allow newlyweds to live where they want to, choosing which set of relatives to live among or setting up a new household elsewhere. A very few cultures use *natolocal* residence, in which husbands and wives remain in their birth households and simply visit one another.

"What amazes me is how the same problem is solved in the same way by so many different cultures..."

– Ravi Shah, Exploration Office

Pragmatism

This parameter describes the methods normally used by members of the society to gain greater understanding of their environment. It indicates whether the society is likely to take an experimental, scientific approach to knowledge, or is more likely to seek understanding through revelation.

Modifiers: +2 if the society's most common Tech Level is 6-8, +1 if it is 5 or 9, -1 if it is 2-3, -2 if it is 0-1. +2 if the beings making up the society have Hidebound, +1 if they have Dull, -1 if they have Imaginative or Versatile, or -2 if they have Dreamer.

High Pragmatism (Empirical): The society puts the most emphasis on observation, experimental evidence and methodical inquiry. Intuition and revelation are not valued as sources of understanding. There may be a rigid framework of knowledge that cannot be easily expanded to include new facts.

Moderate Pragmatism: The society uses empirical methods, but many of its members accept mysticism as a valid approach. The society may be capable of rapid leaps of scientific progress, using imagination to uncover new avenues for empirical research.

Low Pragmatism (Mystical): The society does not value empirical inquiry, preferring to use intuition and revelation to understand the universe. Members of the society may cling to wildly abstract theories, ignoring any empirical evidence to the contrary.

Applications: Add the modifier to Reaction rolls when trying to convince a member of the society to change his views based on logical argument and empirical evidence. Subtract the modifier when appealing to abstract motivations (moral values or religious precepts).

Innovation

This parameter measures how easily local society develops new ideas, and how willing it is to accept social or economic change.

Modifiers: +2 if the society is Empirical, -2 if it is Mystical. +1 if the society is Cordial, -1 if it is Xenophobic. +2 if the beings making up the society have Extremely Curious, +1 if they have Curious, -1 if they have Incurious, -2 if they have Staid.

High Innovation (Progressive): The society embraces change. Its members may be experimenting with new technologies, new political or cultural values, even new artistic conventions. The society may also be interested in territorial or political expansion.

Moderate Innovation: The society tolerates change. There may be a conservative faction which tries to evaluate possible innovations and keep them under control. The society tries to assimilate one set of changes completely before moving on.

Low Innovation (Reactionary): The society is very stable, even stagnant. Little or no cultural change takes place. Members of the society tend to distrust any new idea. The society keeps within its established borders and refuses obvious opportunities to expand.

Applications: Use the Innovation modifier whenever a member of the society is trying to generate or spread a new idea. The modifier can be added to a Reaction roll when seeking financial or political support for new ventures.

Providence

This parameter measures the society's relationship to time. It reflects whether people are aware of their cultural history, how well they plan for the future, and how wisely they husband resources.

Modifiers: +2 if the society is Reactionary, -2 if it is Progressive. +1 if the society is Collectivistic, -1 if it is Egoistic. +2 if the beings making up the society have Single-Minded, +1 if they have Attentive, -1 if they have Distractible, -2 if they have Short Attention Span.

High Providence (Prudent): The society takes a very long view. Members of the society are fully aware of events that occurred decades or centuries ago, and are used to planning for the needs of future generations. The society may encourage a strong sense of connection with one's ancestors and descendants. Resources are carefully hoarded and used as efficiently as possible.

Moderate Providence: The society operates on a time-span of years or decades. The events of a few years or decades ago are still fresh in people's minds. Members and institutions of the society may plan up to a decade or two into the future.



Low Providence (Reckless): The society is capricious, and has little or no institutional sense of time. Events of more than a few months ago are forgotten, events more than a few months away are not yet important. Members of the society rarely bother with long-term planning, and may tend to squander resources. Adaptability is a primary cultural value.

Applications: Use the Providence modifier whenever long-term planning is a factor. Add it to the Reaction roll when trying to convince a member of the society regarding the merits of a long-range strategy. Or *subtract* the modifier from effective skill when trying to convince someone to change plans on short notice.

Gender Roles

Almost all known human societies are, to some extent, male-dominated. The reasons for this are not well-known (and are controversial anyway), but the ethnographic study of many societies provides a few clues. Men have somewhat more physical strength, and they also usually monopolize the use of weapons. Thus if the local economy is heavily dependent on human muscle power, or if warfare between groups is common, then men will probably be in charge and women will have a deeply subordinate role. Where women can make a more equal contribution to economic or military efforts, they will tend to have a higher place, reaching complete social equality when conditions render the physical differences between the sexes irrelevant. Societies dominated by women, in which men are denigrated and devalued, are almost completely unknown among human beings.

A few other factors may tend to affect the relative status of the sexes. Matrilineal cultures will tend to give women higher status, although many such cultures are still male-dominated. Matrilocal cultures are even more likely to be egalitarian. In a matrilocal society, the women of a group will probably be closely related and will have lived together all their lives. They can therefore work together to restrain the men who marry in.

Naturally, the factor most likely to bring about social equality between men and women is *technology*. In most societies, by about TL8 there is no difference between the ability of men and women to perform any economic activity of significance. Military technology becomes gender-neutral at the same level. Beyond this point, gender inequities will only exist through sheer social inertia. Many of the high-population, high-technology worlds of the Imperium (the main drivers of Imperial culture) practice complete gender equality.

Note that gender *equality* doesn't imply gender *identity*. Many societies which allow men and women equal social status do not assign them identical social roles. Perhaps certain occupations are more likely to be undertaken by men, others by women. Both men and women may attain positions of social power, but the positions may be different in nature. For example, men may dominate the military leadership, while women control all important religious posts.

Rhylanor (VI)

As an example of the culture-design rules, we'll use the planet Rhylanor, as if a GM were detailing the world for his own Spinward Marches campaign. The details developed for Rhylanor in earlier sidebars can be used without modification as the basis for these social parameters, since the society being developed is equal to the population of one whole world.

The roll for *Pluralism* is unmodified. The GM rolls 3d for a 15, and finds that Rhylanor has a *diverse* culture. This makes sense, since although the planet is under a single government it is a center of commerce and Imperial administration. People from dozens of worlds have brought their own cultural values to Rhylanor. The Pluralism modifier is +2.

The Toleration roll is 3d+4 (+2 for the Diverse culture, +2 for the planet's Class V starport). The GM rolls a 15, so Rhylanor's culture is Cordial and the Toleration modifier is +2. Again, this makes sense for a major world of the Imperium.

The Solidarity roll is 3d+2 (+2 for the planetary PR of 9). The GM rolls an 11 and gets moderate Solidarity, with no modifier. The people of Rhylanor are not remarkable for their degree of cooperation or competitiveness.

Continued on next page . . .

Political Institutions

Interstellar travelers will often find themselves dealing with local governments (even if only in the course of overthrowing them). Knowing *who* to deal with, who can make decisions, is often of critical importance.

Division of Power

In describing political institutions, we will use the common model which divides governmental authority into *executive, legislative,* and *judicial* sectors.

The legislative power is concerned with *making* law. Legislators write new laws and revise or repeal old ones. Many governments allow the legislative power to set budgets for other institutions and oversee their operation.

The executive power is concerned with *enforcing* the law. The executive is in charge of national administration, normally including the police, the military, and any regulatory bureaucracy. Another role normally held by an executive institution is that of "head of state," covering ceremonial and diplomatic functions where individuals must stand in for the society as a whole.



The judicial power is concerned with *interpreting* the law. Members of the judiciary make sure that other branches of government follow existing laws, and that the whole structure of law is consistent. When citizens are accused of breaking the law, the judiciary is responsible for managing the resulting court cases.

More than one of these powers can be combined in a single institution. A dictator ruling by decree may both make and enforce the laws, for example. Power can also be subdivided, so that a given function is shared among several different institutions.

During a planetary survey, the IISS normally assigns a "political type" to a world or region, as set in Step 21 of the world design process. If the political type isn't obvious, the survey team looks closely at the institution which seems to dominate the local political process. A government deliberately designed under a "separation of powers" philosophy, where the different branches are set up with roughly equal levels of authority, can be very difficult to unravel. In this case, the IISS tries to see which branch seems to gather the most public attention. Unfortunately, some political systems simply don't fit the standard model all that well, in which case the IISS surveyors do the best they can and move on . . .

Generating Institutions

To describe a political institution, the GM needs to determine three basic facts about it: its *leadership structure,* its *principle of succession,* and its *sphere of authority.*

Leadership Structure

The leadership structure defines who is ultimately responsible for making decisions on behalf of the institution.

A *single individual* may make all important decisions. This is a very common leadership structure among human beings, who seem to need a strong leader at the top of every social hierarchy. Single-individual leadership is typical of monarchic or dictatorial systems of government, although many democratic societies place a great deal of power in the hands of a single leader (a President or Prime Minister).

A common variation on this form includes an *advisory council,* whose members help the leader make decisions. A president's cabinet is one example of such a council. In some political forms, the advisory council must approve the decisions made by the leader. One example would be that of a young monarch who has a Regency Council.

A *small council* is a group of 2-7 people who share authority over the institution. The members of the council may act to check each other's authority, requiring that all agree before anything significant can be done. Alternatively, the members of the council may each manage different aspects of their common authority. One member of an executive council might run the military, another the internal police, another the treasury, and so on.

A *large council* is a body of 8 or more people who must all participate in any decisions. Such a large body is often clumsy when it tries to act quickly. A large council may therefore appoint a single leader or a small council from among its own members. The important fact here is that the large council remains in command and can remove or override its appointees at any time. The British House of Commons is an example of such a large council, wielding both legislative and executive authority. The House as a whole makes law, but certain members of the House are named as senior executive officials to manage the government's routine operations.

Multiple councils often appear in governments that are specifically designed to divide authority. In this form, at least two separate councils of variable size exist, and must interact to make decisions. An legislative example of this form is the U.S. Congress, which is composed of two distinct large councils with different structures and roles.

Beyond the multiple-councils structure are those forms which rely on direct participation from the citizens. *Limited direct participation* implies that decisions are made by a limited subset of the whole citizenry. Participation may be limited to members of a specific gender, age group, ethnic group, economic class, religion, political party or some other class. An example of this form was the Assembly of classical Athens, which included all male adult citizens but excluded children, women, resident foreigners and slaves.

Full direct participation means that most or even all citizens may influence decisions made by the institution. Such "direct democracy" is very rare in human history, limited mostly to very small political units. High-tech societies may rely on advanced computer technology to help the citizenry stay informed and make decisions.

Rhylanor (VI)

[Continued]

The Tractability roll is 3d+1, since the world is governed by an Oligarchy. The GM rolls a 13 and gets moderate Tractability, with a modifier of +1. The people of Rhylanor are fairly content with their government, but are not reflexively obedient.

The Aggression roll is 3d, and the GM gets a 10. The populace has moderate Aggression, with no modifier. They have no extreme attitudes toward the use of force.

The roll for Pragmatism is an unmodified 3d. The GM gets a 12, recording moderate Pragmatism with a +1 modifier. The people of Rhylanor are somewhat methodical in approach, but not to an extreme.

The Innovation roll is 3d+1, since the society is Cordial. The GM rolls an 11 and records moderate Innovation with no modifier. Rhylanor is not stagnant, but neither is it the scene of rapid innovation in any field.

The GM rolls 3d unmodified for Providence. The result is a 12, so the society has moderate Providence and a +1 modifier. Members of the society tend to be slightly more prudent than the norm. The GM decides that this attitude is influenced by the need to maintain the complex environmental systems that sustain the world's high population.

Rhylanor's planetary culture is Diverse and Cordial, but has no other remarkable features. This is probably typical of many of the high-population, high-technology worlds which participate fully in Imperial civilization.



Imperial Nobility

The rules in the main text are fine for setting up political institutions for planetary or local government. But if the world is a member of the Imperium, how does the Imperial nobility fit into the system?

The answer, of course, is "it depends." Every world has a slightly different situation. The typical world has a complement of Imperial nobles who hold fiefs there, land or business holdings that give them an interest in local events. Small, unimportant worlds may have only a single baronial family in residence, while high-population worlds may host hundreds of members of the peerage. These nobles don't necessarily have any formal role in local government. Naturally, their wealth, prestige and offworld connections will give them considerable indirect influence.

Of course, nobles who formally represent a given world will have some relationship with local administration. If they spend most of their time in residence, the local government will partially fund their permanent office and staff, and they will occasionally be consulted before important decisions are made. Such nobles often fall into the role of "Imperial ambassador" to their world, even while they represent that world's interests in the Moot.

Resident nobility may sometimes hold office in one or more of the local institutions. They may share executive power, act as head of state, hold guaranteed seats in the legislature, or serve on the highest courts. Normally, only the most radically democratic worlds will refuse to allow *any* formal role for their resident nobility. Of course, there are the so-called "Imperial" worlds which are directly owned or ruled by the nobility. On these worlds, the nobles draw up the local constitution to suit themselves.

Another complicating factor: the Imperium has a habit of ennobling local political leaders, if they demonstrate great ability and loyalty to Imperial interests. Even a democratically elected statesman may suddenly receive a "letter patent" and find himself holding a *hereditary* knighthood or barony. This often means that the local leadership is salted with Imperial nobles, even if the formal constitution allows the nobility little role.

Principle of Succession

Government institutions must be *legitimate* if they are to function well. In this context, "legitimacy" means that the citizens agree that their government has the authority to rule them. Without that agreement, the government can only maintain itself in power by force. Legitimacy usually requires a clear method for choosing government officials, so that the citizens will continue to agree to be ruled by each new office-holder in turn. Each institution therefore has a principle of succession, a rule that defines who is chosen to fill each office when it becomes vacant.

Situations where there is *no rule of succession* usually mean that the institution has no legitimacy. The citizens may regard the *current* office-holder as a worthy leader, but that feeling will not necessarily carry over to anyone who replaces him. Or the citizenry may "agree" to be ruled only because of the threat of force.

Hereditary succession is often used in monarchic or feudal systems of government. In this case, authority is usually held for the life of the office-holder. When he retires or dies, his power is handed on to one of his heirs according to local inheritance customs.

Adoptive succession is rather like hereditary succession. Each office-holder appoints his successor, who may or may not be a family heir according to local custom. Sometimes the office-holder formally adopts his successor into his family (some of the Roman emperors used this system). Another example is the corporate executive who names his own successor upon retirement.

Appointive succession is the next step away from pure hereditary succession. Here, each official is appointed by some other official in the government, possibly from a different institution. Office-holders may retain their positions for life, or for a fixed term. For example, members of the US Supreme Court are appointed by the President as vacancies appear, subject to the approval of Congress.

Limited election means that officials are elected by a limited subset of the whole citizenry. The *franchise* or right to vote can be limited by a variety of methods, just as the right to direct participation can be limited. *Open election,* on the other hand, means that officials are elected by most or all of the citizenry. Election procedures vary widely, with most societies designing the election system to fit local ideas about fairness and the balance of power. Whether elections are limited or open, candidates may be required to meet certain criteria before running for office, and they must usually face re-election after a fixed term in office. The United States has demonstrated both kinds of election system. Early in its history, only white male adult property-owners could vote for certain offices (limited election), but today almost all adults can vote for all offices (open election).

Random selection means that officials are selected from among the citizens using some kind of random procedure. The pool of candidates for a given office may still be required to meet certain qualifications and serve for fixed terms. Random-selection systems are normally designed so that almost every qualified adult can count on serving in the government sometime in his life. They are fairly rare, usually appearing only in "Athenian" democracies where a great deal of public participation in government is normal. In fact, classical Athens used this system for many of its executive and judicial offices.

Direct participation implies that there is no rule for legitimate succession, because there is no individual holding the office. Decisions are made by the citizens themselves.



Procedure

To design a political system for a society or world, begin by deciding how many major institutions there are. If the local political type is Anarchy, then there will be no institutions (and no government). Few governments will have more than three major institutions. The U.S. federal government, for example, is headed by three major institutions: the Presidency, the Congress, and the Supreme Court. The government of the United Kingdom also has three major institutions: the monarchy, the House of Commons, and the House of Lords. Repressive governments and dictatorships tend to concentrate power in fewer major institutions.

While choosing the number of major institutions, decide what functions each institution will carry, and which institution has the most power. Allocate executive, legislative, and judicial functions. If two or more institutions share a given function, decide what role each has. The dominant institution will usually carry executive or legislative powers, or both. Finally, assign the head-of-state function to one institution, usually one with executive powers. If you want to determine the character of the dominant institution randomly, roll 3d on the Division of Powers Table.

Division of Powers Table

Roll (3d)	Dominant Institution	Secondary Institutions
4 or less	Judicial only	Executive and Legislative
5-6	Legislative only	Executive and Judicial
7-8	Executive only	Legislative and Judicial
9-10	Executive-Legislative	Judicial
11	Executive-Judicial	Legislative
12	Legislative-Judicial	Executive
13 or more	Undivided authority	None needed

For each institution, choose an appropriate leadership structure or roll 3d on the Leadership Structure Table. Modifiers: -6 for an institution with only executive powers. Add the modifier from the Institution Structure Modifiers Table for the planet's political type.

Rhylanor (VII)

The GM proceeds to develop a governmental structure for Rhylanor. ***Behind the Claw*** claims that the planetary government is based on a hereditary aristocracy, so the GM keeps that in mind.

The GM begins by rolling on the Division of Powers Table. He gets a 7, which indicates that the dominant institution has executive powers. There will be secondary institutions with legislative and judicial powers as well. He then rolls 3d-8 on the Leadership Structure Table (-4 for Oligarchy, -4 for an executive-only institution). The result is a 1, indicating that executive power is held by a single individual with his advisory council. A roll of 3d-8 on the Principle of Succession Table also yields a 1, indicating hereditary succession.

The GM decides that Rhylanor is ruled by a planetary king, who is the supreme executive authority as well as head of state. The king can't be an absolute monarch, since the planet's political type isn't Dictatorship. He operates within strict constitutional guidelines and must consult with his Privy Council, whose members are drawn from the planet's higher nobility.

Proceeding to the legislative authority, the GM gets an 11 on the Leadership Structure Table and a 1 on the Principle of Succession Table. The legislative authority on Rhylanor is a large council whose members hold office by right of hereditary succession. The GM decides that the planet's entire peerage gathers in a planetary Moot to make law.

For the judicial authority, the GM rolls a 5 for Leadership Structure and a 3 for Principle of Succession. The planet's highest court is a small council whose members inherit their posts. The GM decides that Rhylanor's Supreme Court consists of seven of the highest planetary nobles. These seven Law Lords rule on the most important cases, and also appoint and oversee all lower courts for the planet.

At this point, the GM realizes that he needs to further develop the relationship between Rhylanor's planetary nobility and the Imperial peerage. It would be strange for there to be no connection, since Rhylanor is one of the Imperium's more important worlds. The GM decides that some of the planet's noble families also hold Imperial baronial titles. Such "dual peers" are called by both their planetary and Imperial titles when at home, but by only their Imperial title when off-world. The planetary king of Rhylanor also holds the Imperial title of Marquis of Rhylanor. Meanwhile, there is also a Duke of Rhylanor, the senior Imperial noble in the subsector. He resides on Rhylanor and holds a large fief there, but he is not a member of the planetary peerage and plays no direct role in planetary government.

Interest Groups

A society's dominant political institutions, those which appear in the official constitution, are only part of the story. There are always secondary institutions which have no official role, but which act to *influence* the government to support their own interests. The official institutions may be the mechanism by which law is made, but these interest groups often decide what laws are made using that mechanism.

The details of interest groups are probably important only if a given world is going to be very important to your campaign (or if the campaign involves a lot of political intrigue). In that case, the GM should at least consider what kind of interest groups have the most influence on local government.

Clubs, associations, and secret societies will have considerable importance in any reasonably open form of government. It's natural for people to discuss politics and discover common political opinions during social gatherings. From there it's a short step to deciding to act as a group to pressure the government. Aside from the normal process of voicing opinions, club memberships are an easy source of "shock troops" for political demonstrations. Members of widespread secret societies may help each other to attain political office.

Religious groups are almost always of importance, even in nontheocratic states. Most religions include a well-defined ethical code, which devout people will naturally want written into the laws of the state. Where one religious sect is dominant, the government often finds itself unable to act without at least the tacit support of the church. Religious diversity, on the other hand, can lead to a "secular" state (and possibly a great deal of religion-inspired political conflict).

Families often play a role in political affairs. This is especially true in clan/tribal, monarchic, or feudal societies, but prominent political families can appear even in open democracies. When parents have held public office, it's natural for their children to grow up interested in politics as well, leading to a "dynasty" whose members are all elected to office. Family ties can also play a role in any society where it is acceptable to use public office to promote one's own relatives.

Continued on next page . . .

Institution Structure Modifiers Table

Political Type	Structure	Succession
Anarchy	(No roll)	(No roll)
Clan/Tribal	-8	-8
Corporate State	-4	+0
Athenian Democracy	+8	+8
Oligarchy or Feudal	-4	-8
Representative Democracy	+0	+4
Technocracy	+0	+0
Captive Government	-4	-4
Meritocracy	+2	-2
Bureaucracy	+2	-6
Dictatorship	-8	-8
Theocracy	-8	-4

Leadership Structure Table

Roll (3d)	Leadership Structure
0 or less	Single individual
1 - 4	Single individual with advisory council
5 - 8	Small council
9 - 12	Large council
13 - 16	Multiple councils
17 - 20	Limited direct participation
21 or more	Full direct participation

Now choose a succession principle. If the leadership structure involves limited or full direct participation, the succession principle is also "direct participation." Otherwise a different rule of succession must be chosen. To choose a principle at random, roll 3d on the Principle of Succession Table. Modifiers: add the modifier from the Institution Structure Modifiers Table.

Principle of Succession Table

Roll (3d)	Principle of Succession
0 or less	No rule of succession
1-4	Hereditary succession
5-8	Adoptive succession
9-12	Appointive succession
13-16	Limited election
17-20	Open election
21 or more	Random selection

Technological Profile

The IISS assigns a Technology Level to each world, matching the TL generated in Chapter 5. This TL characterizes the level of technology that is commonly available on the world. However, few cultures follow the exact pattern of technical achievement implied by the standard TL system. The GM may wish to develop a more detailed Technology Profile for any world.

We divide the profile into a number of Area Tech Levels (ATLs), divided into two groups. Each group is headed by an ATL which indicates a level of achievement in theoretical science. This level can easily be different from base TL for the world. A higher level indicates that the local culture has assimilated more theoretical knowledge than it is willing or able to implement in practical

technology. A lower level probably indicates a cultural "block" which prevents progress in that area of science.

Each group also includes several ATLs indicating different aspects of the technology available to local industries. Where these are lower than the world's base TL, it indicates that development has been retarded in that area. This may because of a failure of local research and development. Or the population may simply prefer offworld products in that sector, so that there is no market for local production. If an ATL is *higher* than the base TL for the world, it indicates that there have been recent breakthroughs. Goods using the new technology are locally available, but they are likely to be expensive or unreliable.

Note that the sequences described here indicate the TL at which various developments are likely to be *discovered,* assuming a society must learn each technique from scratch. While this fits the usual concept of "technology levels," it isn't entirely realistic. If a society knows that certain techniques are *possible,* it may be able to develop them (or discover workable substitutes) at a much lower TL than indicated here.

The technological areas are as follows:

Physical Science: Theoretical understanding regarding the physical universe.

Materials: Technology involving material production and processing. This area underlies many others, and directly governs the materials available for armor and hull materials.

Energy: Technology involving energy production and storage. This area governs power systems for vehicles and equipment.

Information: Technology involving communications and information processing. This area governs equipment such as communicators and computers.

Transport: Technology involving methods for moving goods and people. This area governs general designs for vehicles and nonvehicular transport systems.

Weapons: Military technology, governing both personal and heavy weapons as well as defensive systems.

Biological Science: Theoretical understanding regarding the workings of life forms.

Medicine: Technology involving the care and healing of living things. This area governs the effectiveness of available medical and surgical methods.

Environment: Technology involving the maintenance of ecosystems. This area governs the ability of civilizations to avoid damaging the environment, to reconstruct a damaged ecosystem, or to terraform an uninhabitable planet.

Procedure

Begin by determining the Imports TL. This is the highest available TL for the interstellar society the world belongs to. In the Imperium, for example, the Imports TL would be 12, while in the Zhodani Consulate it would be 11. An interdicted world, or any other world with no interstellar contact, has an Imports TL of 0. The GM should use common sense to resolve situations for worlds which have only sporadic outside contact, or which might have substantial imports from an interstellar state of which it is not itself a member.

Each ATL is based on either the world's base TL or another ATL. It is modified based on the local situation, and then the result of a 3d roll on the Tech Level Modifier Table is added. Refer to the descriptions of each area below to determine exactly how to proceed. The minimum for any ATL is 0, the maximum is 12 (unless the GM wishes to deliberately introduce a society to his game with higher than Imperial-maximum technology).

Interest Groups

[Continued]

Political parties are large-scale organizations deliberately designed to influence the government, usually (not always) in a democratic state. Party members do many of the same things that members of nonpolitical clubs do: pay dues, attend meetings, and support party activities. Political parties play an important role in choosing who may serve in government office. They choose certain members to run as candidates, and deliver votes by encouraging their members to follow the party's lead in the ballot box. Powerful political parties can drastically *limit* the choices available to the electorate, by preventing nonparty candidates from having the opportunity to run for office. On the positive side, large political parties can make democratic governments more stable by "aggregating interests," gathering many smaller interest groups together and forging compromises between them.

Note that political parties do not appear in all democracies. Sometimes a democracy is characterized by short-lived alliances that gather around individual statesmen. If a given politician loses his influence, his allies go elsewhere. This kind of political culture is common in relatively small democracies, such as low-tech city-states. Political parties tend to appear when the electorate is so large that political alliances can no longer be personal in nature.

Political parties are not limited to democratic states. Many dictatorships and other totalitarian regimes begin when one political party reaches a dominant position, takes total control of the state, and then outlaws all its political opponents. Such a "one-party state" can be a democracy in name, yet be very repressive in practice.

Advocacy groups are similar to political parties, but smaller in scale. An advocacy group may serve a social function, but its primary role is to pressure the government on a single issues. They will often work to support a large-scale political party, in return for a commitment to pass the "right" legislation once the party is in power.

Media organizations such as newspapers, broadcast stations, and information-net "content providers" play an important role in the political process. They bring information on law and politics to the citizenry, often with subtle (or not-so-subtle) biases toward certain policies.

Continued on next page . . .

Interest Groups

[Continued]

Large businesses are natural secondary institutions, since money can lead to power in almost every form of government. Businesses have a natural interest in influencing economic law so as to give themselves an advantage over their competitors. Small businesses will not have the same ability to influence government on their own, but they may band together to have the same effect.

Guilds and trade unions represent workers, but they have many of the same political goals as large businesses: legal protection and competitive advantage for their members. They are often populist in nature, representing ordinary citizens against the actions of large businesses or established political institutions.



Legal Structure

Law is the tool by which governments act. While ethics and morality are defined by local cultural values, law is set through an explicit *political* process. While law often reflects local moral values, the match is usually imperfect.

Governments implement law by using force. Those who break the law are captured, confined, and punished by designated government agents (police). Indeed, some political theories define government as the sole social institution which may legitimately use force to pursue its aims.

GURPS Traveller measures law using Control Ratings, indicating how local political institutions approach the task of governing the populace. At low Control Ratings, there are few laws and they cover only matters of great importance. Citizens may be required to enforce the laws themselves, and the punishments for lawbreakers are light. At moderate Control Ratings, there are more laws covering a wider variety of subjects. Government will employ official police to enforce the law. At high Control Ratings, there will be many laws covering all aspects of life. Police will be common and intrusive, responding even to trivial violations with force.

The Control Rating generated in Chapter 5 is a good overall indicator of the intrusiveness of local government. The GM may wish to expand the CR into more detail. Political philosophies differ in what aspects of life require the most regulation.

Continued on next page . . .

Tech Level Modifier Table

Roll (3d)	Modifier
5 or less	-4
6	-3
7	-2
8	-1
9-16	+0
17	+1
18 or more	+2



Physical Technologies

Physical Science

The base TL for this theoretical area is the base TL for the world. If the Imports TL is higher than the local base TL, add half the difference (rounded down). Add a result from the Tech Level Modifier Table.

TL0: Animistic explanations for physical processes.

TL1: Engineering and architecture by rule-of-thumb techniques. Astrology appears due to the need to time seasonal activities (planting and harvest, for example).

TL2: Geocentric theory of celestial motions. First empirical rules of mechanics.

TL3: Observational astronomy matures, with very precise naked-eye observations of planetary and stellar motions.

TL4: The telescope leads to a revolution in astronomical observation. Old theories of mechanics and celestial motions are rejected, usually in favor of a heliocentric theory.

TL5: The first synthesis of celestial and local laws of motion, usually along the lines of Newtonian mechanics. Engineering begins to rely on rigorous mathematics and empirical investigation of materials.

TL6: Flaws in the Newtonian synthesis become obvious. New theories involve elements of quantum mechanics and Einsteinian relativity. First approximate measurements of galactic distances.

TL7: High-energy physics elaborates on the basic structure of quantum and relativistic theory. First full classification of elementary particles and forces. Cosmology appears as a viable science.

TL8: Quantum physics and relativity theory are reconciled in some form of unified field theory. One consequence of the new theory is gravity-manipulation technology. A few cultures discover jump space at about this point.

TL9: Empirical observations allow full access to jump space. The exact relationship of jump space to normal space remains a mystery. Gravitic manipulation continues to advance.

TL10: Continued elaboration on unified field theory leads to practical methods for manipulating the strong and weak nuclear forces.

TL11: Advanced control of gravity, including the creation of artificial gravitic fields at a distance.

TL12: Tentative theory unifying the known physics of normal space and the observed physics of jump space.

Materials

The base TL for this applied area is the base TL for the world or the ATL for Physical Science, whichever is less. Add a result from the Tech Level Modifier Table.

TL0: Use of "found" materials in construction (wood, stone, bone and hides).

TL1: Bronze working, hard woods, quarried stone.

TL2: Iron working, fine carving of quarried stone, cement and concrete.

TL3: Improved iron working, soft steels. Reinforced concrete becomes possible, although it is more likely to appear once hard steels are available (at TL4-5).

TL4: Hard steels, advanced masonry techniques.

TL5: Large-scale production of hard steels, allowing their use as structural members.

TL6: Versatile metal alloys, plastics and other synthetic materials.

TL7: Light composite materials, advanced ceramics.

TL8: Composite laminate materials. Earliest experiments with nanotechnology.

TL9: Crystalline iron and other super-strong allotropes of industrial metals.

TL10: Gravitic manipulation allows the creation of superdense materials. Nanotechnology finally becomes practical for industrial applications, although these are very limited. Long-standing predictions of a "nanotech revolution" fail to materialize.

TL11: Techniques for reinforcing the electron bonds in superdense material, increasing its strength further. Industrial nanotechnology spreads into new applications, reducing production costs for many items and producing new materials.

TL12: Incremental improvements in structural materials and nanotechnology.

Energy

The base TL for this applied area is the base TL for the world, the ATL for Physical Science, or the ATL for Materials, whichever is least. Add a result from the Tech Level Modifier Table.

TL0: All work is driven by muscle power, including the energy of domesticated animals and slave labor.

TL1: Early water wheels used for irrigation.

TL2: Advanced water wheels, including complex mechanisms to drive mills or other equipment.

TL3: Windmills.

TL4: Mechanical means for energy storage (clockwork).

TL5: Steam engines, followed by the exploitation of wood and coal for fuel. Electrical energy appears late in the period, transmitted through local power grids and stored using simple chemical batteries.

TL6: Internal combustion engine appears and causes large-scale exploitation of oil and natural gas takes place. Electric power grids cover large urban areas and begin to reach the countryside.

TL7: Fission power plants and radiothermal generators. Electric power grids reach continental scale. Energy storage includes advanced chemical batteries and fuel cells.

TL8: Advanced radiothermal generators (NPUs). Solar power becomes practical, especially in space. Microwave beamed power. Superconducting materials make power transmission much more efficient and lead to the development of advanced power cells.

Legal Structure

[Continued]

Public Safety: Most governments regulate the possession or use of items which can cause injury or death. Perhaps people must prove that they are competent drivers before they may be licensed to operate a vehicle. Weapons can also be regulated for similar reasons. The higher the Control Rating, the more restrictions are placed on weapon ownership and use.

Economic Activity: Most governments also regulate economic activity by the citizens. At low CR, the government may simply enforce contracts or prevent fraud or deception in business affairs. At higher CR, the state may regulate how businesses operate, requiring licenses or permits or even prohibiting certain kinds of trade. At very high CR, the state may effectively run all businesses, deciding for each citizen what work he must do and what pay he can expect for it.

Taxation also comes under the heading of economic law. A low CR here means that taxes are light and fair. As CR increases, the state demands more and more revenue, and may use the tax laws to reward or punish certain kinds of economic activity. At very high CR, taxes are crushingly heavy, to the point where the state is the primary beneficiary of every economic transaction.

Personal Freedom: Every citizen makes choices that don't obviously affect the physical safety of others and don't have a clear economic aspect. Laws regarding personal freedom affect these choices: what opinions to hold and express, what materials to read, what religion to practice, who to associate with, where to travel, what leisure activities to enjoy.

At low CR, the state doesn't regulate these activities, and may instead enforce laws that guarantee the citizen considerable personal privacy. At higher CR, the state takes greater and greater interest in personal liberties, possibly tracking the activities of the citizenry, possibly restricting some of them. At very high CR, the citizen has no rights of privacy against the state, and any kind of activity can be considered criminal.

Civil Law: Most states recognize a wide variety of actions which are not criminal, but which constitute a violation of one citizen's rights by another. One of the government's roles is as an arbiter in such disputes. Civil law details the ground rules under which such conflicts are resolved.

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Legal Structure

[Continued]

At low CR, there may be little concept of civil law at all. The government will only interest itself in criminal actions, and allow citizens to resolve their own disputes in whatever noncriminal manner they wish. As CR rises, the government involves itself more in civil disputes, setting up a code by which those who harm others must make restitution. At some point, the concept of "punitive damages" arises. This allows the plaintiff to demand more than simple restitution would require, so as to punish the defendant for his actions. At high CR, punitive damages can vastly outweigh restitution, and the state may collect part of each settlement for its own purposes.

We assume that the CR generated in Chapter 5 always matches the level of control for Public Safety. The rules for determining what weapons are legal for any given CR are established elsewhere (see p. S54). To generate varying CR for the other three categories, roll 3d for each on the Law Variation Table. Add the resulting modifier to the base CR for the society (minimum 0, maximum 6).

Law Variation Table

Roll (3d)	Modifier
3	-4
4	-3
5-6	-2
7-8	-1
9-12	+0
13-14	+1
15-16	+2
17	+3
18	+4

*"How many Scouts does it take to **find** a light bulb?"*

– Anonymous

Progress

The main text includes rules for determining the *current* state of a world's technological accomplishment. The ***Traveller*** universe isn't static, however. Worlds are always making technological advances, while others lose the technical knowledge they have. What determines the rate at which progress takes place?

Continued on next page . . .

TL9: First fusion power plants. Energy grids have become global in scope.

TL10: Advanced fusion power plants have become the backbone of the planetary energy economy.

TL11: Incremental improvements in fusion power technology.

TL12: First large-scale production of antimatter. The new material has industrial uses, but is very expensive and strictly controlled. Antimatter-based power is not yet practical.

Information

The base TL for this applied area is the base TL for the world, or the ATL for Materials, whichever is less. Add a result from the Tech Level Modifier Table.

TL0: Communication by runner, with memorized messages and oral tradition. Whole-number mathematics.

TL1: Writing is used almost exclusively by social elites for record-keeping. Rational-number arithmetic.

TL2: True literacy appears, as writing is used for many purposes other than simple record-keeping. Incremental improvements in mathematics, often including a systematic study of geometry and formal logic.

TL3: Block printing, too cumbersome to have broad impact. Algebra and trigonometry.

TL4: Movable-type printing, making printed material cheap and commonplace. Long-distance communication supplemented by organized semaphore networks. Development of calculus.

TL5: Mechanized printing devices make printed material ubiquitous. Personal printing devices (typewriters). Mechanical calculating devices. Long-distance communications via electric signals (telegraph and voice telephone).

TL6: Radio telegraph and voice transmission. Massive electrical calculating devices for specialized applications.

TL7: Programmable electronic computers, rapidly becoming small and cheap enough to allow personal use on the desktop. Advanced radio communications include radio telephony, image transmission ("television"), satellite relays, and digital signaling.

TL8: Almost every device has a small, specialized computer in it ("ubiquitous computing"). Computers can be programmed in high-level languages that approach the ease of natural language. Meanwhile, computers can be used (not programmed) in natural language via smooth voice recognition and real-time linguistic transcription. Fiber-optic networks and digital signals are applied to a global information network. Personal image transmission (videophone, flat-screen TV).

TL9: Linguistic interfaces improve, allowing computers to be programmed exclusively in natural language. Computers are capable of reasonable linguistic interpretation. Holographic ("three-V") telephones and media.

TL10: Artificial intelligence makes computers capable of some of the same self-programming capability and flexibility as biological intelligence (self-awareness is not yet possible).

TL11: Real-time linguistic analysis and translation. Small computer brains of roughly human intelligence, allowing the construction of convincing humanoid robots. Experimental meson communications.

TL12: "Pseudo-reality" computers allow the perfect simulation of physical reality and living personalities. First experiments with true machine consciousness. Common meson communications.

Vehicles

The base TL for this applied area is the base TL for the world, the ATL for Materials, or the ATL for Energy, whichever is least. Add a result from the Tech Level Modifier Table.

TL0: All land travel is on foot, possibly with the help of draft animals. Water travel is by raft or canoe.

TL1: The wheel allows draft animals to pull carts or chariots. Small rowed ships and single-masted sailing ships can cross short stretches of open water.

TL2: Road networks and bridges. Large, specialized rowed ships (triremes, galleys) and double-masted sailing ships.

TL3: Incremental improvements in land transport (improved animal harness, animal shoeing, and so on). Sailing vessels now strike out across open ocean, although navigational methods are still rudimentary. Some cultures begin experimenting with rockets and kites.

TL4: Fast long-distance travel by coach. Sailing vessels use complex square-rigging techniques. Dead-reckoning navigation leads to long-distance voyages of discovery. First theoretical designs for simple aircraft.

TL5: Steam power revolutionizes transport. Railroad lines are supplemented by fast stagecoach service in frontier areas. Steam-powered ships replace sailing vessels for short-distance applications. Precise navigation makes planet-wide sea transport routine. Hot-air balloons and experimental propeller aircraft.

TL6: Fast railways and electric trains. Personal automobiles. Tracked vehicles, usually restricted to military applications. Massive steam-powered sea vessels, supplemented by the first practical submersibles. Advanced balloons and dirigibles become practical for slow, long-range applications. Advanced propeller-driven aircraft, supplemented late in the period by jet aircraft. First suborbital rockets.

TL7: Advanced automobiles. Ocean-going vessels and submersibles use nuclear power. Hovercraft and hydrofoils for specialized purposes. Jet aircraft dominate air transport, with some models attaining supersonic speeds. Manned orbital rockets allow exploration of near-planetary space. Some cultures experiment with nuclear-powered spacecraft (the "Orion" concept).

TL8: Electric automobiles. Incremental improvements in water-transport technology, including "triphibian" vehicles. Hypersonic and semi-ballistic aircraft. Lightsails and practical fission and ion drives allow manned interplanetary missions. Some cultures refine the Orion drive to reach the planets *quickly.* New advances in physical science lead to experimental "contragrav" vehicles and reactionless thrusters.

TL9: Ultra-fast rail lines, comparable in speed to hypersonic aircraft but restricted to underground tunnels. Personal grav cars. Fusion rockets become practical, although the new reactionless drives are much faster and more efficient. Cultures using the Orion concept begin to abandon it at this point. If jump-space has been discovered, starships will now be possible with the development of the jump-1 and jump-2 drives.

TL10: Grav vehicles become the basis for all forms of transportation (land, sea, air and space). Personal grav belts. Jump-capable cultures develop jump-3 drive. Others will attain their first interstellar capability using slower-than-light fusion drives.

TL11: Antimatter rockets appear but are almost never used, being more inefficient (and more dangerous) than reactionless drives. Jump-capable cultures develop jump-4 and jump-5 drives.

TL12: Incremental improvements in maneuver drive technology. Appearance of jump-6 drive.

Progress

[Continued]

On Terra, the Solomani had attained TL1 circa -7500, at the beginning of the Bronze Age. It took about 2000 years for the first Solomani societies to reach TL2, about 1500 years after that to attain TL3, and about 1000 years again to achieve TL4. This kind of progression is typical for pre-industrial societies, in which innovation is a very slow and uncertain process. Whole civilizations can rise and fall without making more than superficial changes to the same general set of technologies.

After reaching TL4, the Solomani entered a period of rapid technical progress that is nearly without precedent in human history. This progress centered on the civilization of Western Europe, which had several unusual features. Europe was divided among many competing nations, each of which had its own language and (to some extent) its own culture, incompatible with the others. These national divisions were large enough to develop strong local cultures, but too small for any one of them to dominate the others. This division forced the Europeans to constantly look for advantage over each other, preferably an "edge" that even small nations could exploit against large ones. Such advantages were often technological in nature. Furthermore, the fact that Europe was divided ensured that if progress was stifled by one short-sighted government, it would continue unabated elsewhere. Division also brought about diversity in ideas and viewpoints. Finally, European civilization had recently given rise to the so-called "Enlightenment," a philosophical movement which emphasized rational inquiry and the collection of knowledge. All these factors combined to produce the astonishing Solomani flowering.

Earth went from TL4 to TL9 in the space of only 600 years, with most of that progress taking place in the last 200. At that point, the Solomani encountered the First Imperium. The stress of the Interstellar Wars pushed the Solomani into attaining a slight advantage over the Vilani, reaching TL10 after about 100 years at TL9. Further technical progress slowed drastically once the Interstellar Wars were over. Terra and its nearest colonies had come under a unified government during the wars, and once the question of immediate survival was over the governing elite lost interest in rapid technological change. Meanwhile, the Solomani who settled the former Imperial worlds had too much to do just exploring and administering their new realm. The Rule of Man remained at TL10 until its end.

Continued on next page . . .

Progress

[Continued]

In comparison, the Vilani first reached TL9 about -9300. Vilani ascendancy in the galaxy lasted for over *seven thousand years*, during which time they never advanced beyond late TL9. Admittedly, the Vilani are unusually conservative, but even so such a long period without significant progress demands explanation. Certainly the Vilani enjoyed none of the factors that drove Solomani innovation. They were culturally unified from a very early period, and their civilization put a much higher value on conserving knowledge than on extending it. Some historians speculate that every society has a natural limit to its technical or cultural progress, which will only be exceeded in very unusual circumstances. If this theory is true, then perhaps the pre-contact Solomani civilization simply had a broader natural limit than did Old Vilani culture.

Technologies beyond TL10 appear to be difficult to reach. At the end of the Long Night, the Third Imperium had regained access to TL10 technology. It attained TL11 after the Civil War period, and TL12 about 1000. Most scientists predict that TL13 will not be available for centuries, barring unexpected breakthroughs in several key areas (or contact with a presently unknown civilization with higher technology). In some respects, the Third Imperium is not a terribly innovative civilization. The Vilani influence is doubtless important in keeping change under control. Further, it's difficult for scientists to exchange results when separated by many parsecs – especially when so many of the best are in Imperial or megacorporate employment, unable to share their work freely.

There *is* one example of rapid human technical progress that puts even early Solomani civilization in the shade. The dominant civilization on Darrian had reached early TL5 by about -1500. At that point, a small group of Solomani arrived, fleeing the chaos that followed the collapse of the Rule of Man. The Solomani blended into Darrian society quickly, sharing their advanced technology. As a result, the Darrians zoomed from TL5 to TL13 in less than 600 years. Had the Maghiz not occurred, they would probably have advanced even further.

Continued on next page . . .

"Courier Service members . . . tend to cultivate an image as rakish adventurers, daring any peril to deliver the vital data or packages entrusted to them. In reality, their job is only occasionally dangerous, and is sometimes almost as dull as that of an Xboat pilot."

– Colonel Robert L. Wyssarban, Security Branch

Weapons

The base TL for this applied area is the base TL for the world, the ATL for Materials, or the ATL for Energy, whichever is least. Add a result from the Tech Level Modifier Table.

TL0: Stone knives, stone-pointed spears and arrows.

TL1: Bronze stabbing swords and spear points. The composite bow becomes the primary battlefield weapon, possibly wielded by chariotry. Spring-powered stone-and bolt-throwers.

TL2: Iron replaces bronze, leading to a revolution in military styles as more people can afford weapons. Mass tactics (phalanx and legion) evolve. Torsion-powered catapults.

TL3: Steel weapons. Counterweight-powered engines (trebuchets). A few crude gunpowder cannon (bombards) appear late in the period.

TL4: Black-powder weapons (matchlocks and flintlocks). Mass tactics involve techniques for managing volley fire). Cannons are now standard heavy artillery.

TL5: Percussion-cap weapons, far more accurate and reliable (revolvers, rifles, repeating rifles). Machine guns and heavy cannon. Abandonment of the old volley-fire techniques of mass combat, forcing a more open order and greater reliance on mobility.

TL6: Powerful smokeless-powder weapons, along with full-automatic weapons for small-unit support. Advanced indirect-fire techniques. Self-propelled guns (tanks). Large air-dropped explosives, including (late in the period) fission bombs.

TL7: Small-arms technology continues to advance. Advanced AFVs dominate the battlefield, with air and infantry support. Fusion and enhanced-radiation bombs.

TL8: Caseless ammunition. Energy weapons appear in the heavy-support role (laser and particle cannon). Experimental laser small-arms are produced late in the period.

TL9: The "firearm" attains its full maturity with advanced caseless-ammunition weapons (the ACR). Laser weapons become more common on the small-unit scale. Exoskeletons produce "powered infantry" units. Plasma cannon.

TL10: Laser and gauss rifles become the standard infantry weapon, while plasma rifles (PGMP) enter use for squad support. Advanced (X-ray) lasers. Full-coverage powered armor. Heavy artillery includes fusion guns. Nuclear weapons suddenly go into decline with the appearance of the battlefield nuclear damper.

TL11: Fusion guns (FGMP) appear in the squad-support role. Powered armor continues to improve. Antimatter warheads replace the near-obsolete fission or fusion bombs.

TL12: Incremental improvement in all weapons systems. Experimental neural weapons and stunners, not generally used in military applications. Black-globe technology is sometimes applied in deep-space combat.

Biological Technologies

Biological Science

The base TL for this theoretical area is the base TL for the world. If the Imports TL is higher than the local base TL, add half the difference (rounded down). Add a result from the Tech Level Modifier Table.

TL0: Useful animals and plants are domesticated. Basic principles of animal husbandry and/or agriculture.

TL1: Selective breeding of domesticated species for desired characteristics, probably with uncontrolled side effects.

TL2: Basic understanding of anatomy, possibly more detailed for animal than for sentient species. First formal description of the art of medical diagnosis.

TL3: Incremental improvements in anatomy and physiology. Crude sciences of chemistry (alchemy) and pharmacology.

TL4: Further incremental advances in biological understanding. Discovery of microorganisms, and of the cellular structure of living tissue.

TL5: Theories of heredity and evolution put biology on a rigorous footing. Early cell biology. Germ theory of infectious disease.

TL6: Biochemistry. Discovery of viruses. Growing awareness of the nature of ecosystems.

TL7: Discovery of DNA (or the local equivalent), allowing crude genome mapping. Experimental genetic engineering.

TL8: Genome mapping extends even to complex organisms. Complex genetic therapies, experimental germ-line engineering. Systems ecology (detailed understanding of specific ecosystems).

TL9: Full theory of genetic morphology allows radical modification of species. First integration of mechanical implants with peripheral or sensory nerves. Experimental nanosurgery.

TL10: Practical nanosurgery. First brain implants. Partial theory of aging.

TL11: Theory of memory. Full understanding of the brain's mechanisms.

TL12: Full understanding of the body's immune systems and aging process.



Progress

[Continued]

The Darrian case is of extreme interest to historians, who point out that many of the cultural factors present in Western Europe a few centuries earlier were also present on Darrian. Darrian culture was inherently rational, interested in extending the boundaries of knowledge. The arrival of the Solomani, with all of their diverse cultural background, brought a flood of new ideas and inspiration. Finally, the Darrians were intensely competitive in their intellectual pursuits. Indeed, the fact that they normally avoided destructive warfare meant that this competition may have been even more effective in promoting technical innovation. After all, Darrian scientists and engineers didn't have to worry about fleeing from a war or an outbreak of totalitarian government.



Economic Customs

Every human society engages in economic activity of some kind, using the available natural resources to provide basic needs and luxuries. Customs exist to help members of the society to cooperate on work projects. Other customs deal with the division of labor – men may do one kind of work, women another, children or the elderly may have other roles, and so on. How goods are distributed also comes under local custom. Most societies have some concept of property rights, defining who owns (or who controls) what things. Residence rules lay out who may live where, and how elaborate a dwelling they may have.

Exchange of goods or services involves its own system of customs, determining what things may be traded and what may not, as well as how negotiations are carried out. Most cultures also have a set of gift-exchange conventions. Customs involving the exchange of resources are often highly charged, since they tie in to questions of survival. In any culture, it can be very easy to insult someone by implying that they don't follow local notions of generosity or fairness.

Continued on next page . . .

Economic Customs

[Continued]

Kinship customs often control how property is handled within a family or descent group. In some cultures, property is not held by individuals. The current leader of a descent group may control property, but it is owned by the group as a whole. In other societies, property can be inherited along lines of descent. When this happens, the question arises of how to divide an inheritance. Some societies divide property equally between all possible heirs, possibly by contributing resources to the children as they marry and form their own households. Others apply a principle of *primogeniture*, in which the first-born heir always receives the best share of family property. Another inheritance system is that of *ultimogeniture*, in which the *youngest* heir receives the best share. This system is often tied to a notion that the youngest child should be the one to stay in the household and care for aged parents, receiving the core of the inheritance in exchange.



Medical Technology

The base TL for this applied area is the base TL for the world or the ATL for Biological Science, whichever is less. Add a result from the Tech Level Modifier Table.

TL0: Shamanistic medicine, herbalism.

TL1: Advanced herbalism, crude surgery.

TL2: First formal description of medical diagnosis. Medical knowledge is recorded and expanded through empirical observation.

TL3: Incremental improvements in medical diagnosis and treatment.

TL4: Further incremental advances in medicine.

TL5: Experimental vaccination techniques. Reliable anesthetics and antiseptics make radical surgery practical for the first time.

TL6: Mass vaccination techniques. Development of antibiotics lead to the first reliable cures for disease. Rapid development of surgical techniques. Workable prosthetic limbs.

TL7: Advanced antibiotics. Eradication of specific infectious diseases through universal vaccination. Invasive surgery reaches its highest level of development. Major organ transplants, surgical reattachment of limbs. Experimental genetic therapies.

TL8: Lasers and microprobes make surgery minimally invasive, allowing greater efficiency and very rapid recovery. Full genetic screening and complex genetic therapies. Previously unknown infectious diseases can be analyzed and cured quickly.

TL9: Experimental nanosurgical techniques. Mechanical implants can be integrated with peripheral or sensory nerves, allowing a variety of bionic replacement organs. Clone transplants are available.

TL10: Practical nanosurgery (still too expensive for widespread use). Partial panimmunity. Neural implants can interface directly with the brain, treating certain kinds of mental dysfunction. Cheap, reliable clone transplants.

TL11: Brain implants can augment natural brain functions or modify an existing personality. Memories can be erased, implanted or modified. Crude antiagathic treatments.

TL12: Total panimmunity, reliable antiagathic treatments.

Environment

The base TL for this applied area is the base TL for the world, the ATL for Biological Science, or the ATL for Materials, whichever is least. Add a result from the Tech Level Modifier Table.

TL0: Hunting cultures may overhunt certain game animals to extinction. Primitive agriculture. Villages and towns (PR 3).

TL1: Cities (PR 4) and large-scale irrigation projects.

TL2: Large cities (PR 5), aqueducts and canals. Deliberate deforestation and swamp drainage to increase agricultural land.

TL3: Advanced agricultural techniques (crop rotation, crude fertilization).

TL4: Incremental improvements in agriculture and city planning.

TL5: Improved sanitation allows very large cities (PR 6).

TL6: Skyscrapers. Crude weather prediction. Conservationist ethic.

TL7: Megalopolitan areas appear, as mass transit allows rapid expansion of suburbs. First space stations. Advanced weather prediction. Environmentalism.

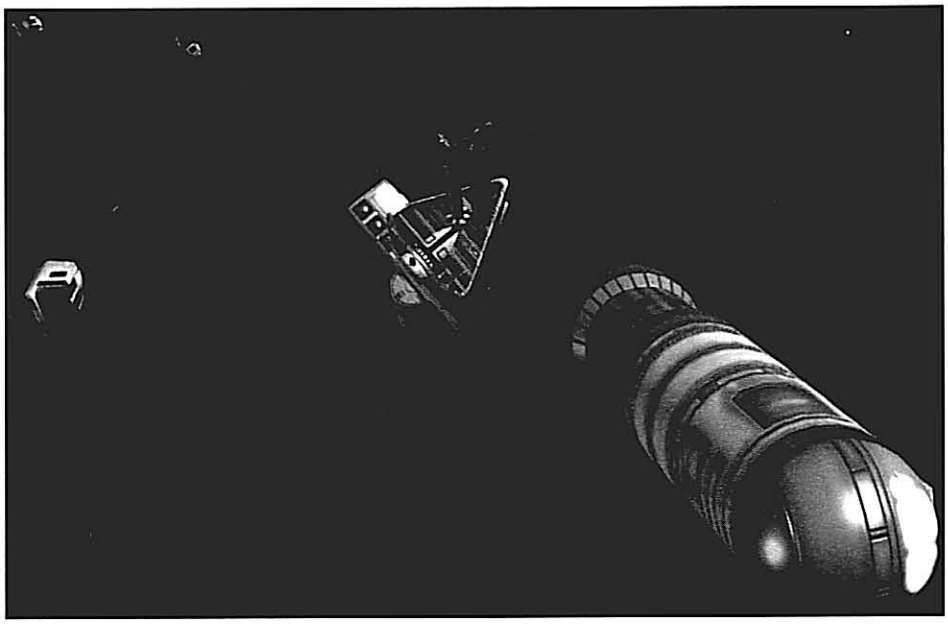
TL8: Arcologies. Large orbital settlements, with near-complete recycling efficiency. Crude weather control, long-term climate prediction. Experiments in reconstructing damaged ecosystems.

TL9: Orbital and deep-space settlements with complete recycling efficiency (microworlds). Similar techniques make arcologies common in crowded planetary urban centers. Practical weather control. Terraforming can cause gradual change in planetary environments.

TL10: Gravitic support of large buildings. Grav technology allows stationary "floating cities" late in the period. Advanced weather control. Incremental advances in terraforming techniques, advanced ecosystem reconstruction.

TL11: Advances in grav technology allow mobile "floating cities." Further incremental advances in terraforming. Whole ecosystems can now be created from scratch ("ecopoiesis").

TL12: Terraforming can produce radical and (relatively) fast change in planetary environments.



World History

Any world which is going to be of importance to the campaign is likely to need a "back story," explaining how the planet was settled and what events have taken place during its history. This back story can help the GM to come up with adventure seeds for the planet, and can help him roleplay natives convincingly.

Naturally, the history of any world depends on the history of the overall campaign. Here we will give a procedure to sketch out the history of worlds in the standard setting for ***GURPS Traveller*** (i.e., the Third Imperium, about Year 1120). These tables will be most applicable to worlds which were part of the Vilani Empire and the Rule of Man, as well as the Third Imperium. GMs should feel free to use this as a guide for developing similar procedures for their own campaigns, or for other parts of the Third Imperium setting.

Original Settlement

Previous steps will have revealed whether a given world is the homeworld for a sentient species. If so, then the "original settlement" of the planet was long before even the First Imperium. Otherwise, the planet was at some point colonized from elsewhere. Roll 3d on the Settlement Date Table to determine when this happened. Modifiers: subtract the planet's PR, +2 if the planet is not an Eden world, +2 if the nearest other world is 2 parsecs away, +6 if the nearest other world is 3 or more parsecs away.

Hygienic Customs

The fact that human beings live close together in sheltered areas forces us to be careful of our personal grooming and cleanliness. Most societies have some concept of personal cleanliness. *Food taboos* are common, causing certain foods to be avoided (or others to be required). Intoxicating substances are often the subject of elaborate customs, which sometimes forbid their use entirely, or at other times make use of them during social or religious rituals.

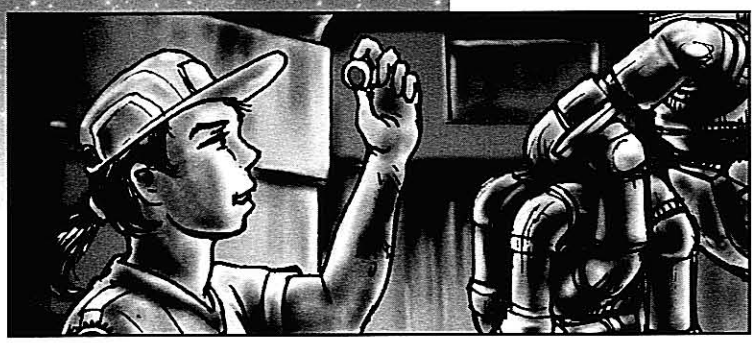
In many societies, physical cleanliness extends to a concept of *spiritual* cleanliness or ritual purity. *Pollution* occurs when the individual touches a ritually impure object or person. Biological functions are usually associated with pollution: eating, elimination, sex, menstruation, childbirth, and death. When an individual is polluted, he must undergo a ritual cleansing designed to place him back in his proper relationship with the divine. In extreme cases, there may be some form of pollution associated with almost every activity, forcing individuals to accompany every action with a small ritual.

When health fails, all cultures practice some form of formal medicine. All human cultures have some kind of pharmacology, and an array of surgical techniques. Childbirth is especially important to the continuation of the family and society, so all cultures develop customs regarding how childbirth is handled and how a new mother and child are to be cared for.

All cultures evolve a set of rituals around death and the process of dying. Such customs dictate how dying people are treated, how the newly dead are mourned, and how corpses are disposed of. These traditions are often interwoven with the society's dominant religious beliefs.

"Why did I take a transfer to Exploration? Well, a Marquis once asked me why his interests should take second place to those of a population of, quote, savages, unquote. I told him. It wasn't long before a field tour sounded like a good idea."

– overheard in an IISS base commissary



Settlement Date Table

Roll (3d)	Time of Settlement
2 or less	First Imperium
3-4	Second Imperium
5	Long Night
6-7	Third Imperium (0-299)
8-9	Third Imperium (300-599)
10-11	Third Imperium (600-899)
12	Third Imperium (900-1049)
13 or more	Third Imperium (1050 or later)

The Long Night

If a planet was first settled during the Vilani Empire or the Rule of Man, it will have suffered the effects of the Long Night (from Year -1776 to Year 0). Roll 3d or choose a result from the Long Night Events Table. Modifiers: subtract the planet's PR, +2 if the planet is not an Eden world. If the result indicates that the planet's population was "wiped out" or "evacuated," then the world must have been re-colonized by the Third Imperium.

Long Night Events Table

Roll (3d)	Events
-2 or less	Significant growth and technological advancement.
-1	Moderate growth with most technology retained.
0	Population and economy remain stable.
1	Gradual decline in population.
2-3	External attacks reduce population.
4-5	Technological failure reduces population.
6-7	Social collapse reduces population.
8	Natural disaster reduces population.
9	Population evacuated to another world.
10	Population wiped out by external attacks.
11	Population wiped out by technological failure.
12	Population wiped out during social collapse.
13 or more	Population wiped out by natural disaster.

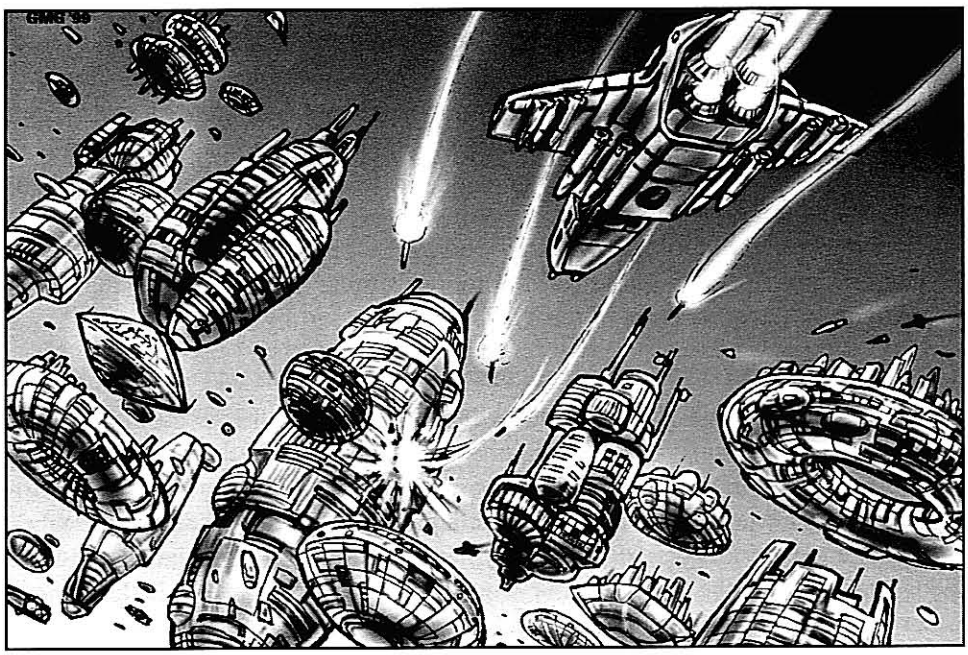
Recreational Customs

Every human culture seems to develop distinctive ways to spend leisure time. Athletic sports are common, although some societies have no tradition of individual athletics (others may have no team sports). For that matter, some societies have no *competitive* sports, valuing the game itself more than the victory.

All cultures have their own dances, games, and feasting customs. Humor seems to be another universal, although what one culture considers funny will often leave outsiders cold.

Humans enjoy spending time in each other's company. Every culture has visiting customs, setting out times and places for people to socialize. Traditions of hospitality define how guests must be treated, and how they must behave while visiting. Hospitality usually involves the sharing of food or other comforts, or an exchange of gifts. These exchanges can be highly ritualized, and difficult for an outsider to handle without giving insult.

Another aspect of local culture is the prevailing style in decoration. Humans seem to need to decorate their homes and their possessions, adding beauty or symbolic importance to everyday things. Humans also decorate themselves, using clothing, hairstyles, jewelry, or physical mutilation to pursue a local ideal of personal attractiveness. Personal decoration can be a status symbol, as upper-class individuals wear more elaborate costumes or groom themselves in such a way as to demonstrate freedom from manual labor. In more egalitarian societies, upper-class individuals may avoid elaborate personal adornment so that they can appear to be "ordinary." Styles of personal adornment are among the customs that will be noticed almost immediately by any outsider, although *understanding* those styles may take much longer.



The Early Imperium

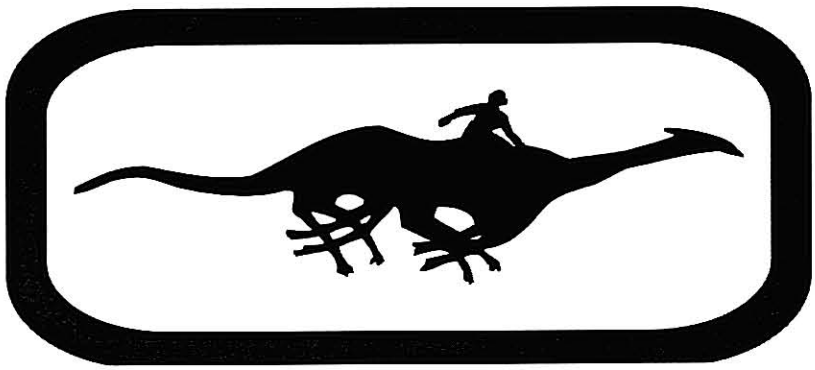
If a planet was settled (or abandoned and resettled) before about Year 600, it will have taken part in the coalescence of the Third Imperium. Roll 3d *twice* or choose two results from the Early Imperium Events Table.

Early Imperium Events Table

Roll (3d)	Events
3	Major center of activity (subsector capital).
4	Minor center of activity (scout or naval base).
5	Imperial integration was smooth and cordial.
6	World established secondary colonies.
7	Period of unusual cultural advancement.
8	Period of rapid technological advancement.
9	Period of unusual economic prosperity.
10	Roll *twice* on this table.
11	World had a legendary leader.
12	Period of internal warfare and revolution.
13	Period of conflict with a neighboring world.
14	World was battle zone during major interstellar war.
15	Original social or political structure collapsed.
16	Integration after long series of minor conflicts.
17	Integration after major or devastating conflict.
18	Devastating natural disaster.

Recent Events

If a settlement is only a few years old, it won't have gone through any significant historical events as yet (the colonists are still busy settling into their new world). The GM may roll 3d on the Recent Events Table, one or more times depending on how "exciting" he wants recent history to have been. The resulting events will have taken place within the last two generations (about 50 years).



Recent Events Table

Roll (3d)	Event
3	Natural disaster.
4	War with another world or society.
5	Civil war or insurrection.
6	Economic depression.
7	Minor economic depression or recession.
8	A strong or heroic leader boosts public confidence.
9	Period of economic prosperity.
10	Roll *twice* on this table.
11	Period of cultural advancement.
12	A series of scandals reduces public confidence.
13	A weak or unwise leader reduces public confidence.
14	Outbreak of social protests and political activism.
15	Outbreak of terrorism or other civil violence.
16	Massive riots and civil disorder.
17-18	Major new political, social or religious movement.

Metaphysical Concerns

Every human culture develops its own set of beliefs about the universe around it. *Cosmological* beliefs involve the nature of the universe: why it exists, how it is structured, what powers cause events to happen, and so on. *Eschatological* beliefs involve destinies and "last things," such as the nature of death or the fate of the world. Meanwhile, most societies have beliefs about human nature, such as a concept of the soul.

Naturally, every society has beliefs about how human beings can influence events. To predict the future, methods of divination are developed, some of these leading to omen-interpretation or "luck superstitions."

To actually direct the future, most societies develop some system of *magic*, hoping to influence the supernatural beings or other "powers" that are believed to cause events. These systems of ritual magic can become very elaborate, shading into systems of religious ritual. Even technically advanced societies have their own superstitions and religious beliefs.

GURPS Religion includes an extensive discussion of various systems of magical and religious belief. Any GM interested in developing unique metaphysical beliefs for his alien cultures should refer to that book.

Chapter Five
Starport Design

Paradigmatic Starports

Not everyone at a port is interested in the details of its design. For many visitors, what is important is not the price of refined fuel, but the *feel* of the place. Is it ornate or brutally functional? Placid or tense? Clean or grimy? A convenient way to get the ambience across to the players is to use a paradigm – an image already familiar to the players. (This is not necessarily the "best" method of presentation, if there even is such a thing. It's just one that works.)

The Thin Edge Ports

The great image here is the movie *Casablanca.* There's a constant tension, a real sense of danger – possibly a war not very far away. Everyone who was able – some would say, everyone with any sense – has packed up and gone. What's left are those who can't go, due to lack of money, possessing the wrong citizenship, the prospect of making a big semi-honest profit before the end comes, or worse prospects everywhere else. A few might even be trying to do some good.

The Thin Edge port will probably look shabby, though it may once have been elegant. Times being what they are, nobody sees much point in sweeping away the cobwebs or mending the cracked windows. This may even extend to traffic control: "Oh, we've got plenty of empty pads, Kilo Fox Niner. Take your pick. Don't hit anything on your way down, OK?" Conversely, the port personnel may desperately hold on to the highest standards in maintenance and protocol, in order to prop up their fading morale . . .

Good food and drink will be expensive, but "eat, drink, and be merry, for tomorrow we may die" is the philosophy of the day. If gambling is allowed – or even if it isn't – many people will play fast and loose with money they believe will shortly be worthless, as it always is when one is no longer alive to spend it.

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Previous chapters have detailed the many departments of a starport's organization and the many tasks its personnel are required to face. The *economic* and *physical* structure of a starport, from the design stage through construction and subsequent traffic patterns, are equally complex considerations.

General Guidelines

The components of Imperial starports usually are based on standard designs (see below), but a number of factors resist any effort to make the starports themselves truly "uniform." Planetary ecology and politics, the precise service needs of the star system, and available construction resources all conspire to make each port be a unique entity. Most important, an Imperial starport is a point of particular pride for most star systems – its overall design should reflect local aesthetics and will often be a grand synthesis of the best local architecture and Imperial prudence.

Despite the overwhelming logistics of starport construction, the Imperial Starport Authority has become adept at tailoring each starport to the system it serves.

Imperial Standards

The Starport Authority was in the forefront when the Imperium discovered one of the primary difficulties of maintaining an empire spanning thousands of worlds of varying tech levels: compatibility of parts. Market forces can informally standardize high-profile, big-ticket equipment such as military hardware (p. GT109), but the million-and-one inventory items of a starport demand more central planning. Otherwise, air filters made on a TL8 border world bear no resemblance to the air filters made on a TL11 core world.

In response to the need for uniform parts and equipment, "Imperial standards" were created for literally millions of items used by the SPA and other Imperial agencies. These standards define the physical properties of a piece of equipment, sometimes very rigidly (the familiar triangular hull of an Imperial Scout Service *Sulieman*-class scout/courier) and sometimes liberally (the Imperial standard bulldozer may have any weight within a range of several tons). They also define minimal acceptable performance; in some cases (particularly fare such as demolition charges) they will define *maximum* acceptable performance.

The Imperium bundles its standards for thousands of very common items into a data program called the Imperial Data Package. This Complexity 1 programs takes up 10 gigs and costs a government-subsidized $3,000 to those who desire a copy. Most commonly encountered *civilian* Imperial vehicles and heavy equipment can be found there – as well as the literal nuts and bolts of Imperial infrastructure, the aforementioned air filters, standard civilian starship components, and more. Military designs are not included.

While the Imperium never requires use of its standards, most member worlds design their infrastructure to meet them. This improves their ability to sell services to offworld interests, including the Imperium itself, and to receive Imperial aid.

Imperial standards are maintained throughout an SPA starport's construction. Not only does this allow SPA construction personnel from any part of the Imperium to assume instant familiarity with a project, it allows outside contractors and vendors the same advantage from one end of the Imperium to the other. To reflect this in his campaign, a GM might allow player characters with a background related to Imperial

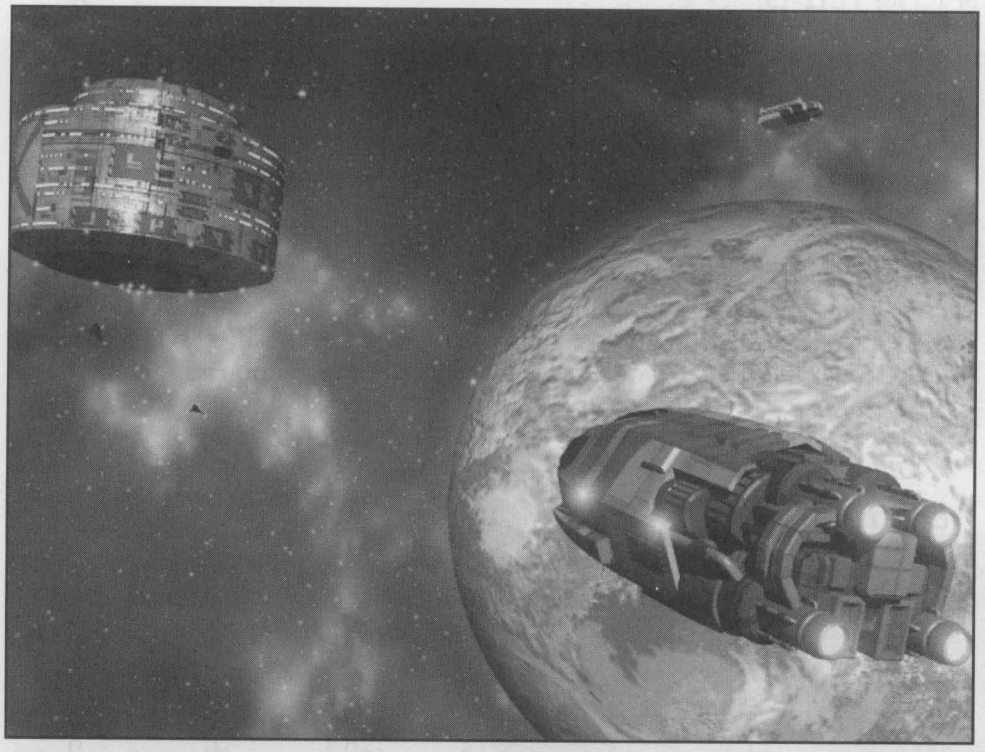
service to make Architecture, Engineer, or Mechanic rolls for "familiarity" with parts of a starport (or other Imperial facility), even if the PC has not previously visited the particular port. While each starport has many unique elements, Imperial standard components will be instantly recognizable to the experienced onlooker.

Cost

While a Class I port may be emplaced for as little as 5 to 10 Imperial megacredits, the price goes up steeply from there. Creating a Class II port usually costs GCr0.5 to GCr1, a Class III GCr1 to GCr2, a Class IV GCr2 to GCr6, and a Class V GCr6 on up. More detailed financial information can be found in the following design process.

Starport Design

A ***GURPS Traveller*** campaign may call for a custom, detailed starport design. Perhaps the building of the port is the focus of the campaign, or the campaign is based at the starport. The following design sequence allows for creating a custom port, and it also expands upon the information presented in Chapter 2.



Design Sequence

Starport design follows a step-by-step process, beginning with the characteristics of the planet it serves:

1. Gather planetary data (p. 58).
2. Determine World Trade Number (p. 58).
3. Calculate port size and estimated trade volume (p. 58).
4. Decide number and type of subports (p. 60).
5. Determine subport capacities (p. 61).
6. Determine starport population and income (p. 65).
7. Determine construction basics (p. 66).
8. Add starport components (p. 70).
9. Proof design vs. budget (p. 86).
10. Allocate personnel (p. 87).

The Thin Edge Ports

[Continued]

Security may be a joke, or the officers may feel a strong sense of duty to hold back the chaos. Even if *they* are not corrupt, there is certainly more corruption than they can control. Anything that can bring a price – valuables, secrets, people – will be for sale.

In the movie of the same name, Casablanca was technically independent (part of Vichy France), but in fact under German control. Something like this can happen at starports on the fringes of a war: The world has declared neutrality to avoid being overrun by one of the belligerents, at the price of having the port "placed at the disposal" of a military force. The "guests" will be carefully watching for signs of sabotage, espionage, or treachery, and the "hosts" may be well aware that their independence will last only as long as the bigger war goes on. The port could also be directly occupied by a hostile force.

The Thin Edge is a prime location for adventures. The characters may be trapped there, trying to get a passage offworld by any means possible. There will be plenty for a smuggler to do: running weapons, food, or medicine, or getting a spy or a political dissident out past the guards and the "guest" fleet. Visitors (PCs or not) may be agents for either side, or covert observers for officially uninvolved powers. If the big war is reaching a turning point, they may be able to help liberate the port.

These kinds of starports are fairly rare in Imperial-held territory. Most such ports are located outside the Imperium, where wars and occupying forces are more common occurrences. Nevertheless, there are a few locales where starports of this sort might flourish.

The most likely candidates are fringe sectors of the Imperium, like the Spinward Marches, Trojan Reach, or even Ley Sector. These regions are not wholly under the control of the Imperium and are thus places where warfare may occur. The Spinward Marches has a history of warfare with the Zhodani Consulate, the Sword Worlds, and the Vargr (not to mention Aslan *ihatei*). Worlds that saw action during the Fifth Frontier War, for example, might well have a Thin Edge port.

Several worlds in Jewell Subsector (Spinward Marches B) played significant roles in the recent war with the Zhodani. Chief among them is Esalin (Spinward Marches 1004), a world the Imperium and the Consulate traded back and forth over the course of two wars. During the wars, Esalin might well be home to a Thin Edge port.

The key to placing a Thin Edge port into an established sector is to determine why it would exist at all. The SPA does not allow its ports to degenerate to such a level without powerful outside factors.

Tortuga Ports

Pirate ports – facilities run by and for the sole benefit of ship-bandits – have not been common, but they have existed.

A Tortuga is likely to have excellent facilities and luxurious amenities. This is a place where people who are normally on the run can relax and enjoy their ill-gotten gains. The walls are likely to be hung with rare art – stuff too well known to fence easily – taken from yachts and passenger liners. The best food anyone has been able to steal will be served, and certainly much strong drink. There may well be strict rules governing violence against fellow Brethren of the Stellar Coast while in port: "Save your arms for the Imperial Customs!" Prices will be high – *very* high.

Within such restrictions, most anything goes here. Loot will be traded, with a percentage being claimed to pay for port operations. There may be an infirmary for injured buccaneers, but the quality of the medical staff may be questionable. The pleasures of the flesh will also be available in quantity, although this is the sort of thing that – no matter how well described by the GM – is never that much fun for the players . . .

A pirate base will survive primarily through secrecy: It will be located in a supposedly uninhabited system, and have identification signs for the legitimate (so to speak) users. Strangers jumping in may be attacked at once, though if there is any chance the intruders might escape, the pirates may simply lie low until they have refueled (or whatever) and gone. There might be a fake "mining camp" or "science station" in the system, both as cover and to allow visitors to be sized up before an attack. Another possibility is for everything except the actual physical structure to be designed with rapid departure in mind. The entire base can pack up and "bug out" very quickly should the need arise.

Even if the authorities locate the base, it will doubtless be well defended. Attackers will have to decide ahead of time what level of casualties is acceptable, and whether their primary goal is to capture or destroy the pirates, or simply to destroy their base of operations.

Piratical adventurers will have obvious use for a Tortuga. More lawfully inclined ones (or actual law enforcers) may be dispatched to locate the base. This dangerous undercover task will be made even more chancy if they also have to act from within to disable its defenses when the attack from space comes.

Continued on next page . . .

Step 1 – Gather Planetary Data

Information on the starport's host planet will be needed. In particular, note the starport class, tech level, and control rating of the planet that the starport serves, and whether it is on an Xboat route or a stellar main (a connected series of systems only one parsec apart; see p. GT48).

Example: *Throughout this section, we will use Mertactor (1537 Spinward Marches; see p. T:BC77) as our example. Mertactor has a starport class of IV, a TL of 9, and a CR of 1. It is on an Xboat route and a stellar main.*

Step 2 – Determine World Trade Number

In order to determine the amount of traffic that the planet receives each year, calculate the planet's unmodified world trade number, introduced in pp. T:FT11-12. This involves no more than adding two modifiers:

Unmodified World Trade Number

TL Modifier: This is -0.5 for TL0-2, 0 for TL3-5, 0.5 for TL6-8, 1 for TL9-11, or 1.5 for TL12-13.

Population Modifier: This is the world's Population Rating (see p. S166) divided by 2. (The Population Rating is simply the number of digits in the world's population minus 1. That is, 337 people would be PR 2, 5,712,322 people would be PR 6, etc.)

Example: *Mertactor is TL9 (for a TL modifier of 1) with a population of 60 million (for a PR of 7, divided by 2 to reach a population modifier of 3.5). Its unmodified world trade number is 1+3.5, or 4.5.*

World Trade Number

The planetary data already should indicate the class of the port. This modifies the world's interstellar trade, of course. Apply the appropriate modifier from the following table to the unmodified world trade number to determine world trade number.

PORT MODIFIER TABLE

	Starport Class					
UWTN	V	IV	III	II	I	0
7+	0	-1	-1.5	-2	-2.5	-5
6-6.5	0	-0.5	-1	-1.5	-2	-4.5
5-5.5	0	0	-0.5	-1	-1.5	-4
4-4.5	+0.5	0	0	-0.5	-1	-3.5
3-3.5	+0.5	+0.5	0	0	-0.5	-3
2-2.5	+1	+0.5	+0.5	0	0	-2.5
1-1.5	+1	+1	+0.5	+0.5	0	0
<1	+1.5	+1	+1	+0.5	+0.5	0

Example: *Comparing Mertactor's UWTN of 4.5 with its Class IV starport results in a port modifier of 0. Mertactor's WTN is 4.5.*

Step 3 – Calculate Port Size and Estimated Trade Volume

A port's size for *system traffic* (imports, exports, and passengers that are beginning or ending their journey in the port's star system) is based on the world trade number. Two modifiers affect this:

Distance: If the nearest star system is 1 parsec away, add 1.5. If it's two parsecs away, add 1.

Allegiance: Worlds that are not Imperial or client states subtract 0.5.

Round fractions up.

Example: *Mertactor is an Imperial world whose closest neighbors lie one parsec away. It adds 1.5 to its world trade number of 4.5 for a total of 6.*

Ports on established trade routes have a minimum size, because regardless of the local economy, a substantial volume of traffic will be flowing through the port (transshipping) to other destinations. This is called *transient traffic*.

GMs can establish their own trade routes (see p. T:FT18). Those who do not may simply consider jump-1 mains to be the major trade routes in their campaigns.

Ports on an Xboat route (or main trade route) have a minimum size of 6. Ports on a feeder trade route have a minimum size of 5. Ports on a jump-1 main or minor trade route have a minimum size of 4.

Example: *Mertactor is on an Xboat route, so has a minimum port size of 6. This is the same as its calculated port size, so no modification takes place.*

The overall port size number can be used as a shorthand designation for how large and busy the port is. Just append the port size number to the starport classification, for example: P/V-8, P/III-4, P/I-0.

Calculate Estimated Trade Volume

This determines the amount of trade a world enjoys from its port size number. These figures include both imports and exports.

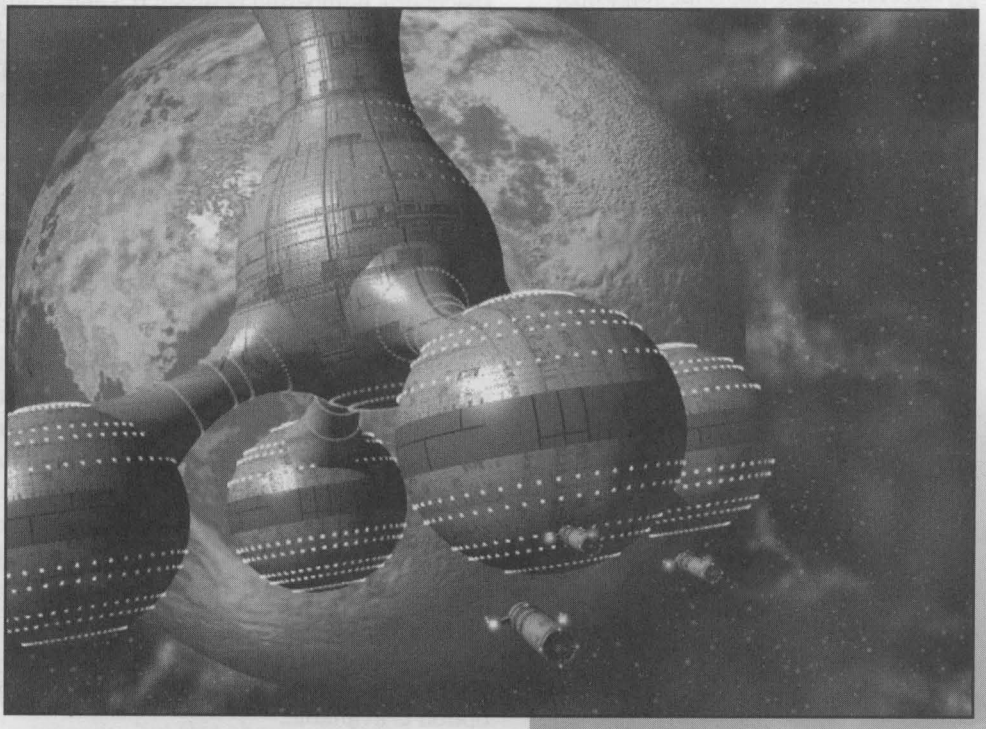
ESTIMATED TRADE VOLUME

Port Size	Dtons/Yr	Passengers/Yr	Revenues/Yr	Real Example
0	<10	<1	<KCr2.5	
1	10-100	1-5	KCr2.5-25	
2	100-1K	5-50	KCr25-250	
3	1-10K	50-500	MCr0.25-2.5	
4	10-100K	500-5K	MCr2.5-25	
5	100K-1M	5-50K	MCr25-250	Salisbury, MD
6	1-10M	50-500K	GCr0.25-2.5	Wellington, NZ
7	10-100M	500K-5M	GCr2.5-25	Houston, TX
8	100M-1G	5-50M	GCr25-250	
9	1-10G	50-500M	TCr0.25-2.5	

Average traffic for a port will be three times the minimum for that port size. For instance, the average port of size 5 will handle 15,000 passengers per year.

This value combines system and transient traffic. GMs should compare the port's "natural" size and trade-route minimum, then rule how much traffic falls into each category.

Certain characteristics will skew the number of system passengers per year toward the high end of the scale for a port's size number. All else being equal, a world with the Rich classification (see p. T:FT13) or a subsector capital will see three times as much system traffic as a comparable world. These are tourists and people doing business with the Imperial government. A sector capital usually approaches the upper end of passenger traffic for its port size.



Tortuga Ports

[Continued]

No Imperial world will be home to a Tortuga port. The Imperium looks on piracy and privateering as major offenses. Thus, most Tortuga ports will be located *outside* Imperial space, although many will be found just beyond its borders.

In the Spinward Marches, the Federation of Arden is notorious for providing safe haven to pirates. Two worlds in particular, Tremous Dex (Spinward Marches 1311) and Quare (Spinward Marches 0915) are believed by the Imperial Navy to contain significant Tortuga ports.

Trexalon (Spinward Marches 1339) is another notoriously anti-Imperial world, with a history of providing a safe haven for the Empire's enemies. Given the wild and untamed nature of District 268, Trexalon is in a unique position to use pirates to increase its own power in the subsector.

The Republic of Garoo (Spinward Marches 0130) may also be a supporter of piracy in the Marches. As recently as 1119, the Republic indicated its willingness to sanction privateering against the Darrian Confederation. While the Imperium has joined the Darrians in condemning this policy, it has done nothing to stop it. Imperial diplomats hope that calmer heads will prevail in the end. Thus far, there have been relatively few incidents of Garoo-sponsored piracy, but this could change in the future.

Ports Royal

For every pirate port, there are many more that do legitimate business, but ask no questions about why a ship needed repairs for battle damage, or where the large cash payments came from. The legitimate trader might not notice anything out of the ordinary other than inflated prices (though this might require a serious effort of not looking), but the entire operating hierarchy – administration, brokers, service, and of course security – is to some degree corrupt, kept in line by payoffs or fear of reprisals.

A Port Royal will likely be rich and fancy; plenty of money is coming in, much of which can't be shown on the official books, and as with Tortuga, the "special" customers will like living well in a place where they can feel fairly safe.

Ports Royal are similar to Tortuga ports, but there are enough differences to warrant discussion. Unlike Tortugas, Ports Royal do not *directly* condone the actions of pirates; they simply "look the other way." Naturally, the Imperium sees little distinction between the two positions. Even so, there are plenty of independent worlds (and a few client states!) on the fringes of Imperial space that indirectly support piracy.

Tarsus (Spinward Marches 1138) is a case in point. A client state of the Third Imperium, Tarsus officially condemns piracy, but its government is too caught up in internal affairs to do much good defeating piracy – even were it inclined to do so.

The same situation prevails among many of the Border Worlds. As clients of the Imperium, they cannot give comfort to privateers against Imperial shipping. However, their internal disorganization and lack of integration into the Imperial mainstream make it inevitable that they do.

The point to keep in mind is that almost any non-Imperial world can be a Port Royal. All that is really needed is a small population, a low tech level, or governmental indifference. Any one of these elements will allow wily pirates a place to fence stolen goods, rest, and repair their ships.

Grand Central Ports

Even the largest passenger ports don't actually "bustle" in the way that, say, a large airport does. Star passengers do not fly multiple "hops" in a day, sprinting between gates to make connections. Multiple-jump trips on a series of ships certainly take place, but the layovers are typically at least a day, if not several days.

The part of this paradigm that does work is the sense of crossroads: People from everywhere, going everywhere, pass through here with a limited time to meet, interact, deal, fall in love, come to blows . . .

Continued on next page . . .

Example: Mertactor's port would be size 6 even without its trade-route minimum of size 6, so the GM rules that it handles enough traffic to qualify as size 6 in each of the system and transient categories. He decides it handles 6 million displacement tons of freight per year, split evenly between system and transient goods. He also decides that, since Mertactor is a subsector capital, it handles 400,000 system passengers per year and 50,000 transient passengers per year.

Compatibility with *Far Trader*

For those who own ***GURPS Traveller: Far Trader*** and want more exact figures, use the following method to determine world trade:

Calculate the effective BTN separately for both passengers and freight for each world with which the planet trades. Consult the tables on p. T:FT16 for freight and p. T:FT17 for passengers, and determine the annual flow of each. Total this over all trading partners. This can be very tedious.

An alternate method is to find the largest BTN for passengers and freight (these may be different worlds) and add 0.5 to each to get an effective total BTN for each category. Consult the tables in this book using these numbers.

Starport Construction

GM's not requiring a detailed description of the starport and its facilities can stop here. The following steps provide more detailed information about starport facilities and traffic flow. This information will be needed later in this chapter to build a starport.

Step 4 – Decide Number and Type of Subports

The first step in building a starport is determining exactly how many ports that really is. Most starports consist of one highport and one downport. Some have several downports, to handle system cargo bound for far-flung destinations or to provide individual service to nations on balkanized worlds. A rare few – usually Class V ports with immense traffic patterns – have more than one highport.

All highports and at least one downport are covered by Imperial extrality; they will handle all transient traffic. A world with a starport often will possess several local spaceports, as described on pp. 13-14. These are almost always downports. Most worlds have spaceports numbering between 0.5 and 2 times the starport's class. For instance, a world hosting a Class III starport normally would have anywhere from one to six spaceports. High-tech, rich worlds may boast a few highports among their spaceports.

The GM should determine the number and quality of these installations, based on the following guidelines:

Highports

Almost all Class IV and V starports have an orbital facility. Most Class III starports at TL8 and above will have a highport. The highport serves primarily bulk, container, and LASH cargo, as well as transient passenger traffic. Lighter and shuttle service connects this port with the surface.

Unstreamlined ships carry approximately 60% of all interstellar shipping. Most traffic (by volume) consists of bulk freighters stopping to refuel en route to another system. The downport is probably more important to player characters, but the SPA considers the highport to be where the serious work of the starport is accomplished.

The orbital element of a starport tends to occupy a synchronous orbit above the equator at the longitude of the main downport. (For satellites of gas giants, a low orbit or Trojan point may be a better option.) Where a highport exists, it will play a major role in traffic control; its position usually allows it to maintain superior contact and line of sight with all traffic. Highports also provide facilities for moving cargo and passengers from larger vessels. All unstreamlined vessels must call at the highport, and most captains of larger streamlined ships prefer using the highport when the option is available.

A typical highport features docking bays, construction and repair facilities, refueling stations, accommodations for travelers not wishing to make the visit to the planet's surface, and extensive short-term cargo stowage for those periods when interstellar and ground-to-orbit shipping capacity don't match up well. Some highports also will have extensive shipyard facilities, but this is not always the case. Many highports will possess construction facilities sufficient only for routine jobs.

The size of a highport will vary greatly from world to world. The volume of traffic and the world's placement on interstellar trade routes will play a significant role in determining this. Worlds with naval or scout bases will tend to have larger and more extensive orbital facilities than those that do not.

Though there is rarely any need to construct more than one highport in a system, a handful of worlds utilize more than one highport. When it does occur, it is usually for the same reasons that there is more than one downport: balkanization or a large flow of traffic. In a similar vein, worlds with an extensive military presence might possess more than one highport, as the navy or scouts usually do not wish to share facilities (other than shipyards) with civilian and commercial vessels.

Worlds without highports serve unstreamlined ships with a combination of shuttles, lighters, and oilers (liquid-hydrogen tankers).

Downports

A surface downport is the most basic type of starport; all Class 1 starports are of this type, as are most starports on planets with non-hostile atmospheres. Downports handle some containers, but mostly breakbulk, lighter/shuttle, and passenger traffic. Worlds served by the SPA always possess at least one downport.

A downport usually consists of a very large parcel of land with several installations. These include (but are not limited to) a cargo-handling facility, berths, hangars, a service facility, and at least one control tower.

Subsurface Downports

These are facilities set into or beneath the surface of the planet. This is common on asteroids, vacuum and hostile planets, and planets with extreme temperatures. Underwater starports on water worlds also fall into this category.

Example: *Mertactor has a breathable (if hot) atmosphere, four continents, and the TL/starport combination to support an extensive orbital facility. We decide on one Imperial surface downport, one Imperial highport, and four local downports.*

Most starports above Class I possess both ground and orbital elements. Both elements are assumed to exist at a given starport unless otherwise noted.

Step 5 – Determine Subport Capacities

Subport capacities in cargo and passengers are based on traffic *per week*. Divide the figures determined in Step 3 for annual freight and passengers (both transient and system) by 50 to determine rough weekly capacity.

Example: *Mertactor requires the weekly capacity to handle 60,000 displacement tons each of transient and system freight, 8,000 system passengers, and 1,000 transient passengers.*

Divide Traffic by Type and Destination

Arrange cargo by handling category and destination.

All transient freight usually will be handled at the highport. (Since it's harder to expand capacity at a highport than a downport, the GM may rule that some percentage of transient freight traffic is handled on the surface, reflecting a local economy that has outstripped its highport's capacity, but this should be rare.)

Grand Central Ports

[Continued]

This paradigm is more common than the others, but still requires very specific conditions to exist. In general, a starport qualifies as a Grand Central port if it is located at the juncture of two or more major routes. A glance at the Xboat routes through the sector will indicate whether this condition exists.

Worlds like Jewell (Spinward Marches 1106) and Regina (Spinward Marches 1910) are excellent examples of this principle in action. Of course, simply because a world is at an Xboat hub does not necessarily qualify it as a Grand Central port. A GM should use common sense and a little forethought before assuming a world is a major site for starship traffic. Worlds with an Amber or Red zone classification, for instance, will rarely be traffic hubs.

Another consideration to bear in mind is that Grand Central ports tend to be Class IV or V starports. Exceptions do exist, but GMs should take into account the needs of a Grand Central port: hotels, shops, and other diversions to keep travelers occupied while they await their next starflight. These sorts of amenities aren't as readily available at Class III and lower ports.

Ghost Ports

Some ports are no longer in service. The world may be depopulated, due to war, plague, or economic collapse. The SPA may have decided to build a new port in a different area. A few ghost starports are located on worlds that have no record of occupation; these are archeological mysteries, and there are not enough archeologists to explore them all. Most ghost ports are spooky, empty, windblown places – acres of cracked concrete and rusting buildings. Some become smuggler's coves; others collect squatter populations, people who have rejected (or were rejected by) the other locals. Once in awhile a growing world will decide to redevelop the Old Landing as an industrial or housing complex.

After many centuries, it is unlikely that any "treasure," or even anything salvageable, remains at a ghost port. The odds rarely stop treasure hunters.

Ghost ports can be found almost anywhere. There is a greater likelihood of finding one on a well-established and populous world than there is on a new colony. Most likely the SPA has abandoned oversight of the port, so the locals have legal jurisdiction.

The manner in which Class I ports are created contributes to the existence of Ghost Town ports – the site rarely is chosen with much thought toward expansion needs in the far future.

Exchange Rates

Some Imperial member worlds maintain their own currency. Purchasing goods at the Imperial starport requires Imperial credits; purchasing them outside the XT line requires local credits. (Startown merchants, particularly the shady variety, generally accept both.)

The local currency may go by a name other than credits; this doesn't matter. What does matter is its purchasing power, which is determined by the local tech level (see below).

The following figures are averages; they assume that the average TL12 world maintains the same ratio of currency to population as the Imperium maintains in extraplanetary commerce. The GM should feel free to adjust the exchange rates on any particular world to suit local economic factors (i.e., his own needs . . .). Theoretically, a TL12 world's currency could be valued at a *premium* compared to Imperial currency, but the odds of this happening outside a period of Imperial upheaval are slight.

The bottom-line impact of these exchange rates is that, on worlds of less than TL12, Starport Authority employees enjoy a purchasing power above their salary level. Since most of them will be living, eating, and entertaining themselves outside the XT line, they will enjoy the necessity of converting Imperial-credit salaries to local credits.

This also benefits the SPA, as it hires local labor to build or improve its starports, but other factors reduce the exchange-rate benefit in this case. See p. 67.

Starport employees who live within the XT line will not benefit from the local exchange rate, nor will the SPA on construction projects that it handles with its own personnel and equipment.

Exchange Rate Table

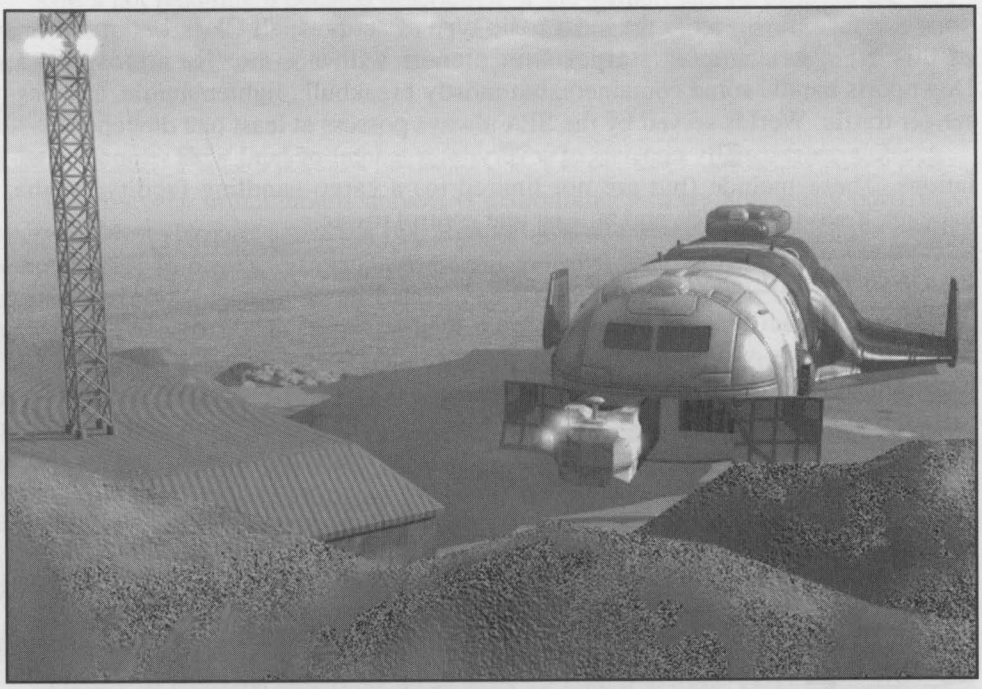
TL	Imperial Credits to Local Credits	Local Credits to Imperial Credits
12	1.0	1.0
11	2.0	0.50
10	3.2	0.31
9	5.0	0.20
8	8.0	0.12
7	13.0	0.075
6	20.0	0.05
5	33.0	0.03
4	50.0	0.02
3	100.0	0.01
2	145.0	0.007
1	200.0	0.005
0	330.0	0.003

Among system freight, bulk and containerized goods are usually transported by unstreamlined starships, routinely handled at the highport. Breakbulk and roll on/roll off goods will generally move directly to the downports. Of all the cargo that the typical system sees, 50% will be bulk, 30% breakbulk, 10% containerized, and 10% roll on/roll off. This means that on average 60% of system freight will be offloaded or onloaded at the highport and 40% at downports.

System freight handled at the highport becomes *transfer traffic*, requiring lighters to transport if from world surface to orbit or vice versa. It counts toward both highport and downport handling needs.

If there is only one port (which will be a downport), all traffic necessarily flows through it. Transfer-traffic needs will continue to exist, to service unstreamlined ships in orbit. Adding fuel resupply needs and the inconvenience of not being able to stage cargo at the highport, many more small crafts and lighters will be needed to perform this service.

Spaceports handle an average 13% of system traffic, but this percentage varies widely. In a system with no local spaceports, the SPA downport will handle all system traffic, of course, while in a system with 10 spaceports, the Imperial downport might handle only 30% of system freight, with 70% handled at the spaceports. Whatever the spaceports' percentage of traffic might be, it need not be divided equally among them, and usually isn't.



Example: *The GM rules that Mertactor's highport can handle all 60,000 displacement tons of transient freight each week. The highport must also handle 30,000 dtons of bulk and 6,000 dtons of containerized system freight prior to transfer, for a total weekly capacity of 96,000 dtons. The downports must handle 60,000 dtons of system traffic. We decide that 40,000 dtons pass through the starport and the remainder through the local spaceports. For simplicity, the GM rules that 5,000 dtons each pass through the four local spaceports.*

Among passengers, the highport will handle all transient traffic, but an average 10% will have a layover lengthy enough to take in the local sights, requiring that the main downport also process them. This counts as 20% of transient traffic, since it's always a round trip. The main downport must process all system passengers, and 90% will transfer to the highport in the process as well (to board large passenger vessels). Most local spaceports don't accommodate passenger traffic, other than perhaps a few local government officials.

Example: *Mertactor's highport sees 1,000 transient and 7,200 system passengers per week, for a total of 8,200 passengers. The downport sees 8,000 system and 200 transient passengers per week, for a (coincidentally identical) total of 8,200.*

Determine Tonnage of Starships Served

The average starport serves 1.5 displacement tons of starship per displacement ton of cargo each week (keeping in mind that most ships contribute to both import and export values on each visit), and 5 dtons per passenger (keeping in mind that for many purposes of starport services, ships' crews count as passengers, and once again each ship counts as bringing in one complement of passengers and leaving with another).

These figures do *not* count transfer traffic. Unless the GM has altered the standard arrangements, the highport handles the starships transporting all transient freight and passengers, 60% of system freight, and 90% of system passengers. The SPA downport handles 27% of starships carrying system freight and 10% of system passengers. The local spaceports divide up the starships carrying 13% of system freight.

Example: *Mertactor's starport serves 180,000 displacement tons of cargo capacity and 45,000 dtons of passenger capacity each week, for a total of 225,000 dtons of commercial starship traffic. Of this, the highport handles 185,000 dtons, the downport 28,300 dtons, and each of the four local starports 2,925 dtons.*

Determine Private Capacity

At this point, the GM should make a general ruling about how much cargo is handled by full-time private interests leasing starport space. While Imperial starports *house* all the cargo passing through a system, SPA personnel *handle* on average only 75% of the goods – the remainder is handled by employees of shipping companies at leased berth and warehouse space. This can vary from as little as 0% (at starports with no full-time tenants that employ their own freight handlers) to 90% (for starports serving the homeworld of a megacorporation).

Passengers also can be privately handled (for instance, by a megacorporation that maintains its own terminal for visiting and departing employees), but this is seen much less frequently.

Example: *The GM rules that private businesses hold full-time leases on a good percentage of Mertactor starport's warehouse capacity, but none handle their own freight. All employ SPA resources for the task. All passenger terminal and transport functions are also handled by the Imperial staff.*

Determine Shuttle and Lighter Requirements

People and cargo must move between highports and groundports on a regular basis. (This includes port employees – on high-tech worlds it is generally more efficient to house highport employees on the planet's surface and shuttle them to and from work every day – but these shuttle needs will be calculated later in this process.)

Most starports maintain regular shuttle flights to ferry people and cargo from ground to orbit or back again. SPA shuttle service tends to be quick and efficient.

A few worlds with immense traffic patterns, fragile ecologies, or poor industrial resources for supporting gravitic technology seek alternative methods. These sometimes employ orbital elevators (known colloquially as "beanstalks") built of ultratech materials. These are essentially skyscrapers that extend into orbit (though technically satellites that dangle to earth) and can handle a constant stream of passengers and cargo. Usually the highport is the "penthouse" of the orbital elevator with the primary downport as the "lobby." Another method is to shoot durable cargo (*not* passengers or anything that can't withstand *extreme* acceleration) into orbit using massive electromag guns with barrels hundreds of miles long. This is substantially cheaper than shuttle service though *far* less environmentally friendly.

Construction Times

Building a starport is a massive undertaking, often spread out over centuries. These design rules assume that the port is already complete; any "construction" is done by the GM! It may happen, however, that a starport must be built or extensively upgraded during the course of a campaign. Creation of Class I starports has been covered on p. 8. For other types of construction, use the following:

Total the cost of all new construction or upgrades. Convert Cr2,000 from local credits to Imperial credits (using the special SPA formula on p. 67, not the sidebar on p. 62) to get "credits per man-day." This is not actually a currency conversion, but a measure of relative productivity at different TLs. Divide the total cost by that amount to determine the number of man-days required to complete construction. Time to complete is this figure divided by the number of skilled workers available. For most worlds, skilled labor is at most 0.1% of population; new colonies may have up to 10 times more. The maximum number that can work on any project is a function of size: no more than 1 worker per dton (highport) or 9,600 workers per square mile (downport).

Additional workers can be brought in from outsystem. The maximum number that can be supported is 10% of the local population or 100,000 people, whichever is greater. Support personnel (cooks, clerks, supply, medics, etc.) equal to 1/2 the worker population in excess of 10% of the local population must be added. Each person, worker or support, in excess of 10% of the population requires 0.2 dton of imported supplies per month, at Cr10,000 per dton. Housing must also be supplied. Tents cost Cr100 per person and last for one year, after which they are worn out and discarded; they are erected at the same rate as buildings (Cr2,000 × exchange rate per man-day). Tentage for 7,500 people takes up 1 dton as cargo, weighs 8 stons, and costs MCr0.75; erected, it covers one-third of a square mile. Temporary housing for 100 (including services) is 200 dtons, 120 stons, and MCr0.3, and takes up a 120-yard by 120-yard square when erected.

Example: *The Mertactor starports collectively cost 17 billion credits. One laborer can build Cr2,000 × 0.2 = Cr400 per day at TL9. If Mertactor were to build similar facilities from scratch, the project would require 42.5 million man-days. Mertactor's population of 60 million can supply 60,000 skilled workers, who could complete the project in 708 days (just under two years). If desired, 40,000 additional workers could be brought in, along with 20,000 support personnel. Time to completion drops to 425 days (14 months), at a cost of MCr18 in housing and MCr120 per month in supplies.*

Other Design Considerations

The design information in this chapter is far from exhaustive. Local conditions always take precedence over any standard procedures mentioned therein. While SPA prefers to set protocols and employ standard designs, there are occasions when such things are insufficient. In these instances, innovation is required. A few of the more common considerations are discussed below.

Hostile Environments

With more than 11,000 worlds in Imperial possession, it's a certainty that not all of them are the most pleasant of places. Indeed, in some subsectors, a great many worlds possess environments that are not friendly to Human (or other sophont) life. At the same time, many of these hostile worlds possess something worth exploiting. And if there is something worth exploiting *on* the world, there's a good bet that it will also be worth exporting *off* the world.

This is where starports come in. Without a starport, it can be very difficult to arrange for the transport of anything off a planet's surface. It can be done, of course, but the cost is usually quite prohibitive.

At the same time, building a starport on a world with a hostile environment can be a risky business. Many of the verities taken for granted on more hospitable worlds do not hold true. For instance, the safe storage of HAZMATs and fuels is even more of a priority on a world with a dense or corrosive atmosphere. Likewise, traffic control and sensor nets need to be especially good on worlds where local conditions reduce visibility. Other examples are easy to imagine.

The point is that starports on environmentally hostile worlds are often designed differently than those elsewhere. They have most of the components described previously, but many of them will be altered or modified in a fashion to allow them to withstand local conditions. These alterations can (and frequently do) increase the cost of a starport. For this reason, hostile worlds often do not have the best starports that local technology would allow.

Of course, when a hostile world *does* possess a Class IV or V starport, there is a good reason. Even SPA's zeal only goes so far. Building an expensive and heavily modified port on a planet with an insidious environment will only be done if there is some need. Determining exactly what that need is can be an aid to a beleaguered GM looking for a way to spice up his campaign.

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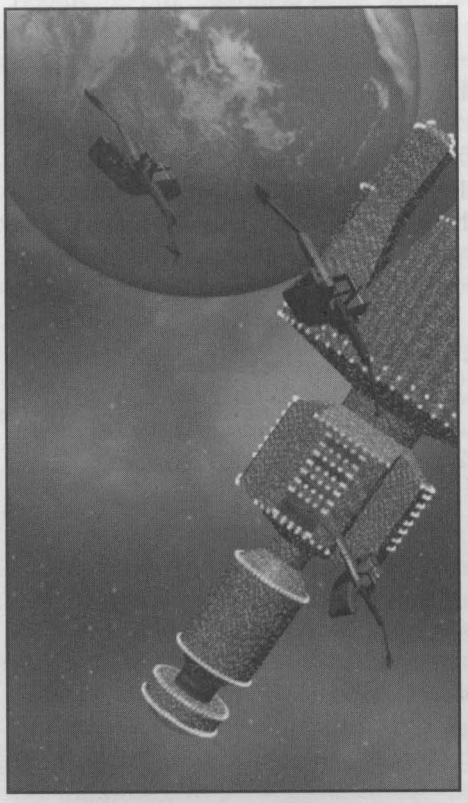
As mentioned previously, 60% of system freight, 90% of system passengers, and 20% of transient passengers will require transfer from highport to downport(s) or vice versa. Unless an alternate technology is used, the starport must possess lighters and shuttles to provide this service, minus whatever percentage of system freight and passengers are privately handled. On average, each displacement ton of cargo hold or passenger couch can serve 30 dtons of transfer cargo or 30 transfer passengers each week, assuming nonstop service and routine usage of capacity.



The GM should select appropriate small craft and non-starships from pp. GT139-143 and p. T:FT137 to fill these needs. In general, any one craft shouldn't provide more than half the capacity, and several crafts providing a small fraction of capacity should be used for convenience of service.

In a system without a highport, the same amount of traffic will require transfer from orbit, but the downport must provide *triple* the amount of small crafts and non-starships to meet this need; i.e., one cargo hold or passenger couch per 10 dtons of cargo or 10 passengers. In addition, fuel tankage equivalent to 1% of the starship displacement tons that would normally be served by a highport must be provided in oilers (see p. T:FT137) or similar shuttles.

Crew requirements for nonstop service will be five times the listed number.

Example: *Mertactor's starport must be able to transfer 36,000 displacement tons of cargo and 7,400 passengers each week. This requires 1,200 dtons of cargo hold and 247 passenger couches. The GM determines that a single 800-dton general purpose lighter (p. T:FT137) provides 548.5 dtons of cargo capacity, a single 30-dton ship's boat (p. GT140) provides 96 passenger couches and 8.5 dtons cargo space, two 50-dton modular cutters with passenger modules (p. GT142) provide 96 passenger couches and 39 dtons of cargo space, 25 50-dton modular cutters with cargo modules (p. T:FT137) provide 600 dtons cargo space, and two 10-dton launches (p. GT139) provide 72 passenger couches and 6 dtons cargo space. This totals 1,202 dtons of cargo capacity and 264 passenger couches. The 31 vessels require a staff of 485 for nonstop service. They cost MCr248.8.*

If Mertactor didn't have a highport, we would have had to provide 3,600 dtons of cargo hold and 741 passenger couches, plus 1,850 dtons of fuel tankage!

LASH Requirements

In LASH operations (as described on p. T:FT65), freighters carry lighters with them, unleashing the inbound non-starships on arrival and picking up the outbound replacements after transiting to their outbound jump point. The freighters avoid the delay required by visiting the starport itself, but a given lighter doesn't tend to return to any given system.

For this reason, LASH lighters almost always are private property, usually owned by the merchant line that set up the LASH operation. The SPA does count LASH cargo among a starport's tonnage totals, and likewise a small amount of LASH operations is assumed in the above starport small-craft needs. In a system with extensive LASH operations, the GM should reduce the starport's own small-craft needs to reflect the alternate means of transfer.

In general, combining LASH operations, other private handling, and business (such as conferences) not reflected in passenger and cargo tallies, the average SPA starport will be visited by two to four displacement tons of private small craft and non-starship for every dton of small craft and non-starship that it employs itself.

Step 6 – Determine Port Income and Population

A starport's rough annual income can be derived from its traffic. Multiply freight tonnage or passenger count by the given figure in each of the following categories:

System freight handled at Imperial downport	Cr170
System freight handled at local spaceport	Cr160
System freight handled privately	Cr150
Transient freight	Cr140
System passenger	Cr500
System passenger handled privately	Cr450
Transient passenger	Cr460

These figures only reflect Imperial revenue. They do not include local tariffs (nor Imperial tariffs, since none will exist unless the GM rules they do).

Example: *Mertactor's starport has no private handling of cargo or passengers, and the local starports handle 1 million displacement tons of the total 3 million dtons of annual system freight. Multiplying (Cr140×3 million) for transient freight, (Cr170×2 million) for system freight handled by the Imperial starport, (Cr160×1 million) for system freight handled by local downports, (Cr500×400,000) for system passengers and (Cr460×50,000) for transient passengers produces a grand total of 1,143 million credits or MCr1,143 in annual revenue.*

Divide the annual revenue by Cr200,000 (or MCr0.2) to estimate the number of Imperial employees at the port. (The average SPA employee costs about Cr25,000 annually in salary, benefits, transit costs, training, etc. Given the ultra-tech efficiencies enjoyed by SPA facilities, personnel costs represent a much smaller fraction of total expenses than they would for the average 21st century business.)

Example: *Mertactor's port employs MCr1,143/MCr0.2, or 5,715 people.*

Later on, when assigning personnel from the above pool to specific port functions, the GM should remember that most port services operate 24 hours a day, in three shifts. Multiply any personnel requirements by five to figure total workers required taking into account weekends, vacations, and the like. Administration offices often only stay open during the local equivalent of the "9 to 5" shift; in slack periods shipyards do the same. Small ports may have only part-time personnel.

Each worker will support a single dependent *on average* (many will be single and live alone, while others will be two SPA-employed parents supporting several children). Circumstances at the port will determine how many workers and family members are housed on the port itself, and how many beyond the XT line in the surrounding city. If on the port proper, housing will normally be located at the downport. Workers commute to the highport by shuttle.

It sometimes happens that the calculated port population exceeds that of the mainworld itself. In this case, the port employees are mostly transients, brought to the world specifically to work in the port. These guest workers will normally return home when their employment is done. Alternately, robots may do most of the manual labor at such a port; the "personnel" costs then go to maintenance and replacement of these devices.

Example: *The starport "community" on Mertactor numbers about 11,430 people. The GM rules that the world is politically very stable (since it belongs to an Imperial Navy admiral), and therefore the port director freely integrates SPA personnel with the local populace. All are housed outside the XT line.*

Other Design Considerations

[Continued]

Opposed Worlds

As mentioned previously, the SPA must occasionally operate starports on worlds that are politically opposed to the goals of the Third Imperium. Building a starport on such worlds can occasionally be another source of difficulty for SPA. Unlike environmentally hostile worlds, Opposed worlds present a subtler set of demands on starport architects and engineers. Starports on Opposed worlds tend to be Hardlined, having a fence or other barrier along the perimeter of the XT line. The height, width, and strength of these walls will vary according to the level of opposition encountered. Not all Opposed worlds are willing to use violence against an Imperial starport. Some are quite eager to do so.

The sophistication of any fence will vary with both the local tech level and control rating. Naturally, worlds with stricter control ratings often demand that the SPA install more extensive and elaborate fences, to suit the local agenda! The same holds for worlds with higher tech levels. Thus, a world with a low control rating will warrant only a simple fence to mark the XT line, while one with a high rating demands clearly marked mine fields and other destructive traps. A world with only low technology would require only the use of human guards, while a high-tech world might suggest the use of a neural activity sensor or something similar.

Again, the GM must carefully think about local conditions before determining design of a starport on an Opposed world. Doing so will not only save him trouble later, but may also provide details to add richness and depth to his scenarios.

Non-SPA Designs

While most starports encountered by interstellar travelers will be SPA-run, they are not the only possibilities.

Navy, scout, non-Imperial, private, megacorporate, and local ports also exist. These have already been touched upon (see pp. 11-16, and sidebars, pp. 66-68). More commonly, particular errands will take merchants to a planetary spaceport (see pp. 13-14).

Any of these non-SPA starports could embody radically different design philosophies – as could an SPA port that it inherited from a previous owner. For instance, intermingling Startown with the port grounds – something the SPA avoids – is very common at Vargr ports. Even stranger practices can be encountered. The inventive GM who thinks he has a better (or more fun) way of handling star traffic should feel free to implement it at any of these non-SPA ports.

Naval Bases

Though the SPA shares several star systems with naval bases, it does not build their facilities. Usually, the naval base will have its own, distinct highport and downport. The downport often will adjoin the SPA downport.

GMs can design naval bases with a few modifications of the rules in this chapter and the following guidelines. In general, naval bases store more fuel than similarly sized civilian installations. Their berthing needs vary widely as well. Hulls and downport buildings will be better armored and defended than SPA counterparts.

Bases are port facilities for the support, maintenance, repair, and refit of naval vessels. Surface facilities are generally provided for vessels of 5,000 displacement tons or less; orbital facilities handle larger ships.

Navy bases are the home of the Imperial Navy. They are much smaller than *depots* (which encompass entire star systems), but most naval vessels are serviced at bases rather than depots. Naval *stations* are smaller facilities, with no permanently associated squadrons, that provide the same types of support on a more limited basis. Naval bases are covered in more detail in the forthcoming ***GURPS Traveller: Imperial Navy***.

There are five classes of naval station or base. The figures reflect overall highport and downport capacity:

Class I Naval Station

Commanding Officer: commander
Provides: resupply and refueling for couriers and escorts; light maintenance
Civilian Starport: II
Size: 4-5
Military Personnel: 200-400
Civilian Personnel: 100-200
Family Members: 500-1,000
Marine Contingent: squad+ (usually detachment from embassy platoon)
Berthing Capacity: 20,000 dtons
Fuel Capacity: 12,000 dtons
Warehouse Capacity: 10,000 dtons
Cost: GCr1

Class II Naval Station

Commanding Officer: captain
Provides: resupply, refueling, light and heavy maintenance, and repair for all classes of vessel
Civilian Starport: III
Size: 5-6
Military Personnel: 1,000-2,000
Civilian Personnel: 500-1,000
Family Members: 2,500-5,000
Defenses: 8-10 fighters
Marine Contingent: platoon+
Berthing Capacity: 25,000 dtons
Fuel Capacity: 100,000 dtons
Warehouse Capacity: 25,000 dtons
Cost: GCr6

Continued on next page . . .

Highport vs. Downport Employment

At the average SPA starport, half of employees work at the highport and half at the downport. (Labor is flexible. Even though the highport handles a greater percentage of traffic in most systems, the "sticky" and labor-intensive jobs are delegated to the downport to minimize highport personnel needs. Likewise, transfer-craft crews are considered downport personnel, though they spend most working hours in flight.)

If a system has only a highport or downport, all employees work there, of course. If it has multiples of either, then all downport or highport personnel are spread among the appropriate ports. This will tend to skew the above half-and-half ratio as well; for instance, in a system with two downports and one highport, it's more likely that something like 40% of personnel work at the highport, with 30% each at the two downports.

Example: *Of our 5,715 personnel, we decide that 3,000 work at the highport and 2,715 at the downport.*

Employee Shuttles

Starports shuttling employees from ground residences to highport jobs must provide shuttles for the task. This is a very predictable traffic flow, so the shuttles' capacity is much more efficiently used than in the transfer traffic provided for previously. Most SPA starports also stagger work shifts to increase each shuttle's utility.

The highport requires one passenger couch for every eight highport employees. These could, theoretically, be all within a single large shuttle. These small craft do not require any stewards. Their crews are multiplied by five to represent nonstop service.

Example: *Mertactor starport requires (3,000/8) or 375 passenger couches in employee shuttles. Two 100-dton shuttles (p. GT141) provide this capacity. They require crews totaling 30 personnel and cost MCr26.8.*

Step 7 – Determine Construction Basics

The above steps breaking down traffic flow, and determining port income and personnel, give enough information to begin actually designing the physical starport.

Most Imperial starports will consist of two physical entities, of course, a highport and a downport. Highports are built using the starship design sequence on pp. GT149-162, taking into account their unique needs as essentially huge non-starships.

For simplicity, downports will be built using some simple modifications of those same rules. This also reflects that Imperial downports incorporate very sturdy construction. They also boast vacuum-, electronic warfare-, and NBC-proof seals on most buildings, and full life-support measures as further support against ultra-tech NBC warfare or natural disaster. In short, they're built to the standards of a non-starship that's permanently emplaced on the world's surface.

Determine Tech Level

An Imperial starport will be built to TL10 standards, except on TL12 worlds, where the SPA will use TL12 technology. This reflects the TL options available in the ***GURPS Traveller*** spaceship design process.

Example: *A TL9 world, Mertactor will possess a TL10 Imperial starport.*

Determine Construction Budget

Starports are normally financed by the issue of low-risk Imperial bonds. These bonds pay a 3% dividend per year, which the SPA must pay out of its annual revenues. Only about 10% of SPA revenues can be spent this way, so the total construction cost for the average starport is effectively limited to 3 1/3 times its *projected* annual revenues. The GM may simply decide that the Imperial economists nailed their trade projections, and make this figure 3 1/3 times the annual revenue determined on p. 65. Or he can adjust it up or down to reflect faulty forecasts and/or changes in trade patterns since the port's construction.

Starport services are billed in Imperial credits, but local contractors can be paid in local credits, effectively increasing the construction budget in line with the exchange rates discussed in the sidebar on p. 62. Unfortunately, this isn't a standard exchange conversion for several reasons. Some port components are too sensitive to be handled by outside contractors. As the tech level of the host world declines, its local labor can provide fewer services to the SPA. There's also an exchange "spike" created by the SPA's policy of building only TL10 or 12 ports.

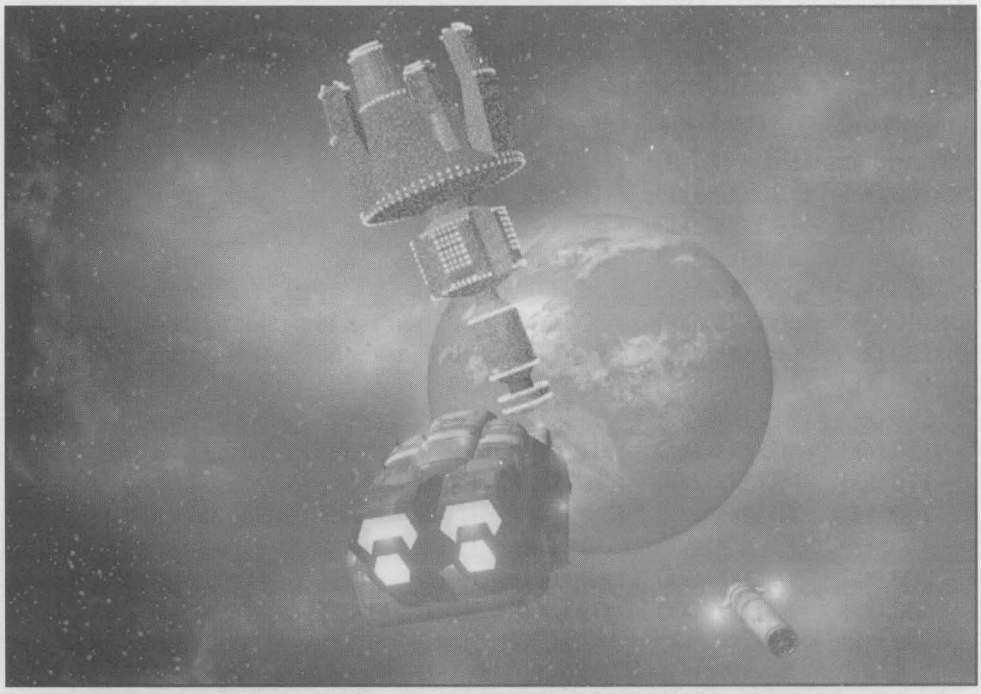
On Imperial worlds, multiply the construction budget by 1 on TL12 worlds, 1.5 on TL11 worlds, 2.75 on TL10 worlds, 3.75 on TL9 worlds, 4.8 on TL8 worlds, 5.85 on TL7 worlds, and 6 on TL6 or lower worlds. The GM should feel free to drastically reduce this multiplier on worlds with labor shortages (see sidebar, p. 63) or difficult Imperial relations.

Example: *Since we're not building a new port, but rather designing an existing port that's had time to expand to meet demand, we base Mertactor starport's construction budget on its real annual revenue of MCr1,143, giving a construction budget of 3.8 Imperial gigacredits. On TL9 Mertactor, local contracting increases this to an effective GCr14.29.*

Starport construction bonds are generally rolled over or reissued at the end of their term, so there is no need to consider paying off the bond principal.

This budget is often not adequate to pay for all required facilities, especially at small or infrequently visited ports. In this case, the SPA shifts surplus revenues from large, lucrative ports to subsidize the additional dividend payments.

The SPA normally does not pay for local spaceports; these are the local government's responsibility. They can be designed using this system; the GM should set a budget as he sees fit.



Determine Downport-Site Size and Cost

A downport must sit on physical property. Usually the local government gives this site to the Imperium free of charge, but in certain circumstances the SPA will have to pay. (The cost can vary so widely that the GM will simply have to rule what it will be.)

A comfortable size for a downport site would be (displacement tons served)/50,000 in square miles. This formula can safely ignore a normal amount of transfer traffic, but for downports that heavily service shuttles and non-starships (such as those with no highport), these tonnages will need to be added into the starship tonnages.

Naval Bases

[Continued]

Class III Naval Base

Commanding Officer: commodore
Supports: squadron (200,000-250,000 displacement tons)
Civilian Starport: IV+
Size: 6
Military Personnel: 4,000-5,000
Civilian Personnel: 2,000-5,000
Family Members: 12,000-25,000
Defenses: 2-4 SDBs, 10-20 fighters, 3-5 turrets, 1-2 bays
Marine Contingent: company+
Berthing Capacity: 25,000 dtons
Fuel Capacity: 100,000 dtons
Warehouse Capacity: 25,000 dtons
Shipyard: 6,000-10,000 dtons
Cost: GCr12

Class IV Naval Base

Commanding Officer: fleet admiral
Headquarters: subsector numbered fleet or reserve fleet
Supports: 4-6 squadrons (2 million-10 million dtons)
Civilian Starport: V
Size: 7-8
Military Personnel: 40,000-200,000
Civilian Personnel: 20,000-200,000
Family Members: 120,000-900,000
Defenses: 10-20 SDBs, 50-100 fighters, 4-6 bays, 1-2 deep meson sites
Marine Contingent: task force+
Berthing Capacity: 1 million dtons
Fuel Capacity: 4 million dtons
Warehouse Capacity: 1 million dtons
Shipyard Capacity: 100,000-400,000 dtons
Cost: GCr250-GCr400

Class V Naval Base

Commanding Officer: fleet or sector Admiral
Headquarters: sector named fleet
Supports: 12+ squadrons (10 million-75 million dtons)
Civilian Starport: V
Size: 8
Military Personnel: 200,000-1.5 million
Civilian Personnel: 100,000-750,000
Family Members: 600,000-4.5 million
Defenses: 100-200 SDBs, 500-1,000 fighters, 25+ deep meson sites, other weapons in proportion
Marine Contingent: regiment+
Berthing Capacity: 7.5 million dtons
Fuel Capacity: 30 million dtons
Warehouse Capacity: 7.5 million dtons
Shipyard Capacity: 1-2 million dtons
Cost: GCr1,600-GCr2,000

Scout Bases

Scout bases follow the same guidelines as in the *Naval Bases* sidebar, pp. 66-67.

Xboat Station

At each system in the Xboat network, an express boat station handles the message traffic and manages Xboat traffic.

Supports: Xboat tender, 3-5 Xboats, 2-3 scout ships
Civilian Starport: II+
Size: 3-4
Scout Personnel: 25-50
Family Members: 100-200
Berthing Capacity: 2,000 dtons
Fuel Capacity: 1,000 dtons
Warehouse Capacity: 100 dtons
Cost: MCr250

Scout Base

These tend to be downports with basic facilities for refueling and minor maintenance of scout ships of 1,000 dtons or less.

Supports: 3-4 survey ships, 5-12 scout/couriers
Civilian Starport: II+
Size: 4
Scout Personnel: 200-300
Family Members: 2,000-2,500
Berthing Capacity: 2,000 dtons
Fuel Capacity: 1,000 dtons
Warehouse Capacity: 100 dtons
Cost: MCr400

Scout Way Station

A large base devoted to the overhaul and refit of express boats at points in their journey, a way station can be converted to a Class I naval station (takes a team of naval engineers two weeks). The navy equipment is present at all times, mothballed if not in active scout usage.

Supports: 2-4 Xboat tenders, 200-250 Xboats, 15-20 scout/couriers
Civilian Starport: II+
Size: 5
Scout Personnel: 800-1,000
Civilian Personnel: 5,000-6,000
Family Members: 18,000-20,000
Berthing Capacity: 20,000 dtons
Fuel Capacity: 12,000 dtons
Warehouse Capacity: 10,000 dtons
Shipyard Capacity: 5,000 dtons
Cost: GCr2

Other Installations: Trade Stations

These serve as a clearinghouse for merchant dealings. Several Imperial agencies and private concerns maintain these.

Provides: language translation, brokerage, warehousing, local information, commodities exchange – all usually for free.
Civilian Starport: I+
Size: 3
Personnel: 15-20
Family Members: 45-60
Berthing Capacity: 600 dtons
Warehouse Capacity: 100 dtons
Cost: MCr18

A downport could make do with a site half this size, though noise pollution will be high on adjacent properties. It might *squeeze* into a space one-tenth the size (if built in a skyscraper fashion). Many downports feature sites much larger than this formula dictates, to provide security buffers, reduce noise pollution, and facilitate expansion.

Example: *Mertactor's downport has a comfortable site size of 28,300/50,000, or 0.566 square miles. We round this to 0.5 square miles, reasoning that it's beginning to get a little tight, having been in service for a while. Mertactor did not charge the SPA for the land.*

Determine Hull Sizes

Every highport has a hull, of course, and for purposes of SPA-standard construction every downport building is considered to have a hull, too.

A comfortable highport hull will measure 4 displacement tons for each dton of starship handled each week. A very cramped highport could be half that size. Most downports utilize freestanding starport berths, greatly reducing their need for "main buildings" volume. Those that use freestanding berths generally have 2 dtons of terminals per dton of starship served, and can get by with half that. Those that do not use freestanding berths use the highport formula.

Many downports fold all activities under one roof (a grand terminal), but for those that use several buildings, the total volume should add up to roughly the above guideline. Subsurface downports almost exclusively utilize a single, large facility. *Exception:* HAZMAT storage facilities usually are built as stand-alone buildings, which will be well separated (at least 100 yards) from other public areas.

These calculations create need for several varieties of hull size not covered in the table on p. GT151. The following hull sizes can be added to that table, both for the purposes of that book and for creating starships.

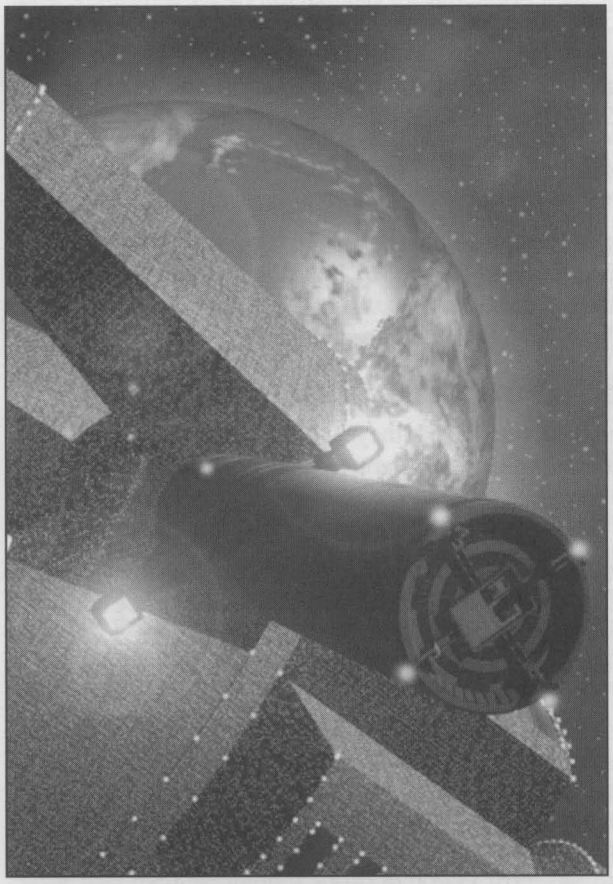
All starport hulls will be unstreamlined. (When using this table to create starships, note that ships of this size very rarely are streamlined, either.)

HULL TABLE ADDITIONS

Hull Tonnage	Volume (cf)	Hull Area	TL10 Mass	TL12 Mass	Hull Cost (in MCr)	Size Modifier
60,000	30,000,000	580,000	580	290	29/69.6	+13
70,000	35,000,000	640,000	640	320	32/76.8	+14
80,000	40,000,000	700,000	700	350	35/84	+14
90,000	45,000,000	760,000	760	380	38/91.2	+14
110,000	55,000,000	870,000	870	435	43.5/104.4	+14
120,000	60,000,000	920,000	920	460	46/110.4	+14
130,000	65,000,000	970,000	970	485	48.5/116.4	+14
140,000	70,000,000	1,020,000	1,020	510	51/122.4	+14
150,000	75,000,000	1,070,000	1,070	535	53.5/128.4	+14
175,000	87,500,000	1,180,000	1,180	590	59/141.6	+14
200,000	100,000,000	1,290,000	1,290	645	64.5/154.8	+14
250,000	125,000,000	1,500,000	1,500	750	75/180	+14
300,000	150,000,000	1,690,000	1,690	845	84.5/202.8	+15
400,000	200,000,000	2,050,000	2,050	1,025	102.5/246	+15
500,000	250,000,000	2,380,000	2,380	1,190	119/285.6	+15
750,000	375,000,000	3,120,000	3,120	1,560	156/374.4	+15
1,000,000	500,000,000	3,780,000	3,780	1,890	378/907.2	+16
1,250,000	625,000,000	4,390,000	4,390	2,195	219.5/526.8	+16
1,500,000	750,000,000	4,950,000	4,950	2,475	247.5/594	+16
1,750,000	875,000,000	5,490,000	5,490	2,745	274.5/658.8	+16
2,000,000	1,000,000,000	6,000,000	6,000	3,000	300/720	+16
3,000,000	1,500,000,000	7,860,000	7,860	3,930	393/943.2	+17

Highport Example: *With a weekly traffic of 185,000 displacement tons of shipping, Mertactor's highport ideally should have a 740,000-dton hull. We decide its age is showing and purposely purchase a cramped 500,000-dton hull for MCr119.*

Downport Example: *We decide Mertactor's downport will use freestanding berths, so it ideally should have 56,600 dtons in buildings given its 28,300 dtons of starship traffic. We keep going with the cramped, outdated starport concept, and decided it will feature a main passenger terminal of 20,000 tons (MCr14 per p. GT151), and a central cargo terminal of 20,000 tons (another MCr14). It handles no regular HAZMAT traffic, so requires no special warehouse for hazardous cargo.*



Downports require surface improvements such as access roads and a few parking lots, but these can be assumed to be part of the cost paid for its buildings' "hulls." The reasoning is that since surface construction should be cheaper than hull construction (there's no need to brace the structure for maneuver stresses, for starters, and much cheaper non-metallic materials may be used), the difference can simply be allotted to this uniquely downport need.

Covered within this "free" development, most SPA downports will be attached to the local transportation network, whether that's roads, monorails, grav air corridors, or some combination of elements. Usually, only SPA personnel will be able to drive or pilot personal vehicles across the XT line; others will need to use mass-transit to reach the port, or park at a commercial offsite lot, then cross the XT line on foot before using whatever mass transit the GM desires (usually slidewalks) to reach the passenger terminal if it's set back from the line. Cargo handling varies; usually port tenants can enter and exit the port with their own goods (still subject to customs inspection), while others will have to pay SPA freight handlers to bring the goods to the customs station just inside the XT line, then load it themselves once past customs.

Calculate Excavation Fees

Subsurface downports will require an additional expense for excavation. Add Cr25 per displacement ton to bury a downport in soil, or Cr100 to place it in rock.

Example: *Mertactor has no excavation expenses, but had we buried its downport buildings we would have spent MCr1 to excavate sufficient soil or MCr4 in rock. Of course, had we really decided upon a subsurface downport, one large building without freestanding berths may have been a better choice. This would have at least doubled our size needs, with a proportional increase in excavation costs.*

Build the XT Line

All Imperial downports must have an XT line. The first step in building the line is determining the downport's perimeter wall size. Calculate this as 211,200 sf times (the square root of the downport site size in square miles). Then divide by local gravity in gees, if local gravity is known.

Low-Tech Starports

No matter how small, Imperial starports are at least TL10, and often TL12. Other sorts of ports (see sidebar, p. 65, for examples) may be of much lower TL, particularly local spaceports that can't depend on Imperial support.

TL0-1

Offers unpaved "pads" only, with bonfire beacons. Fuel supply, if any, is a nearby water source. Hardly a true port.

TL2-3

Primitive radar reflectors add passive astrogational aid. Buildings of wood or stone – including unroofed small or standard berths, perhaps even a large berth – may be present, though rarely of large size. If need be, water for fuel can be carried to site via aqueduct, at incredible expense.

TL4

Telescopes and signal mirrors allow (extremely) primitive active traffic control, if the starship captain can interpret the messages. Unroofed large berths more likely. Door-roofed small berths feasible. Salt domes might allow storage of *uncompressed* hydrogen, though rarely.

TL5

Rotating searchlights and landing lights added to traffic control. First steel frames allow larger buildings, though vast terminals remain rare.

TL6

Radio (including radio astrogational beacons) and radar greatly improve traffic control. Buildings can be sized to meet most needs. Berths of all sizes can have door-roofs. Proper unrefined (or even refined) fuel can be stored, at great expense.

TL7

First highports feasible, if unlikely. Lasercomm, datalinks, IFF transponders, and GPS satellite nets allow first "real" traffic-control systems. Fuel storage no longer a technical or fiscal challenge.

TL8

PESA and AESA suites further advance traffic control. Highports built where essential, though logistics a challenge.

TL9

Highports built on need. Radscanners improve internal security. Most downports meet own needs with on-site power plants.

TL10+

Per this design system, with variations as suggested in various sidebars in this chapter.

Critical Locations

A "critical" area is any facility whose loss would severely impair or paralyze the port's functioning: power generation, central communications, Security control, the tower, etc.

Critical locations often are better protected than other parts of the port. Designers attempt to place them so that an accident at one will not endanger another. If terrorist or military attack is considered likely, the preferred strategy to dispersal may become concentration, since a single small perimeter is easier to guard than several separate ones. (This is known as "redoubt design.") However, physical hazards call for isolation; one does not put fuel storage next to the datacomm center.

Budget Items

Game Masters won't want to design every starport that enters their campaigns, even if that starport's construction budget comes into game play. In addition, budget practices parse expenses differently than this design process – architectural fees are broken out rather than assumed in the overall facility cost, for instance.

Should an adventure deal with a starport's construction budget, here are the line items typically associated with such a project, and their usual percentage of the overall funds available:

Standard Construction Expenses

Land* and highport hulls	25%
Administration offices	0.5%
Traffic control/navigational aids	0.5%
Berthing and ship-service facilities	10%
Shipyards	15%
Non-berth landing pads, taxiways	1%
Fuel tankage	10%
Warehousing	3%
Terminals**	2%
Port vehicles (internal transport, crash/fire/rescue, security)	2%
Port craft (shuttles, cutters, lighters)	7%
Plant maintenance, infrastructure, and perimeter fence†	2%
Technical specialists (architects, etc.)	7%
General conditions (overhead)	15%

* When land must be purchased. Highports generally pay nothing for orbital "space," though some worlds may ask for a payment.

** Combined figure for passenger and cargo facilities.

† For a "standard" XT line fence on a friendly or neutral world. Enhanced security or an opposed-world barrier with guard towers and alarm systems may take up a larger percentage of the budget. In such cases, some of the funds allocated to other areas will be transferred to this one.

Example: *Mertactor downport occupies 0.5 square miles. The square root of this is 0.707, Multiplying by 211,200 gives us 149,318 sf. We don't know the local gravity, but* ***GURPS Traveller: Behind the Claw*** *tells us it's a small world (1,927-mile diameter) and pp. T:FI57-58 let us calculate that local gravity's probably about 0.2 Gs! Our wall will mushroom to 149,318/0.2, or 746,590 sf.*

The XT line wall costs Cr10 per square foot; it's DR 40 at TL10 or DR 100 at TL12. Multiply the cost by 0.2 if the local CR is 0, 1 for local CR 1, 1.2 for CR 2, 1.3 for CR 3, 2.9 for CR 4, 3.5 for CR 5, or 5 for CR 6. This represents the cost of adding sensors, traps, and double walls as appropriate. At CR0 it represents an "open frame" wall akin to a wire fence, through which line of sight (and small items . . .) can freely pass. See the sidebar on pp. 72-73 for more detailed information.

Example: *The base cost of Mertactor's XT wall is Cr7,465,900, or MCr7.47. The local CR is 1, so that's the final cost as well.*

Should the downport be one of those rare few on which the local Startown straddles the XT line, halve the physical expenses for the XT line (the line becomes more of a formality, with few actual walls and gatehouses), and at least double the minimum number of security and Customs personnel normally needed (see p. 87).

Step 8 – Add Starport Components

Now that the basic hulls have been purchased, they will be filled with the required components. Keeping track of the mass of downport components isn't required.

Turrets and Bays

For good or ill, most SPA starports are unarmed. They depend on the planetary navy, the planetary army (particularly the Close Orbit and Airspace Control Command), and the Imperial Navy to provide whatever protection is required. Imperial naval bases will have their own defenses, however, and these usually extend to cover any nearby civilian starport.

In the event that a port needs to be equipped with its own armament, as sometimes happens in isolated or border areas or on Opposed worlds (where such weapons usually will be added *very* discreetly), the turrets and bays from pp. GT151-158 can be purchased and weapons installed. For downports, hardpoints are constructed out of reinforced concrete, but the price is the same.

Highports often need the space that would be allotted to turrets and bays for external cradles (see p. 103), anyway. A downport can simply add small buildings dedicated to housing weapons. Rarely will actual turrets or bays be added to a downport terminal.

Example: *Mertactor has no weapons installed at either port.*

Armor

Starports usually are armored. This deters terrorist attacks, offers some protection from star pilots with better confidence than judgment, and keeps the random mishap from becoming a tragedy and Imperial incident. Generally, minimum DR will be 100, but it can reach much higher figures for starports at the edges of Imperial space.

Armor is purchased normally per p. GT152.

Highport Example: *Mertactor is situated in a particularly dangerous portion of Imperial space, though not right at the laserburned edge. We decide to give the highport a DR of 300. This armor masses 35,700 tons and costs MCr428.4.*

Downport Example: *Armor isn't as important on the surface installations, since the primary threats to security on this world would manifest as hostile starship fleets. We decide to give the passenger terminal DR 200, at a cost of MCr33.6, and the cargo terminal DR 100 at a cost of MCr16.8.*

Other Surface Features

Sealing: Almost all installations should be sealed, just in case. This is purchased normally per p. GT152.

Highport Example: *Sealing the highport's hull costs MCr23.8.*

Downport Example: *Sealing each of the downport's buildings costs MCr2.8.*

Sensor Masking: Starports very rarely incorporate these options, although theoretically a highport in dangerous space with its own maneuver drives could benefit from being able to sneak out of orbit in times of war. In practice, this would be nigh impossible to accomplish – the port would never be unobserved long enough to break free of visual tracking. Cloaking devices for downport installations would verge on the silly.

Bridges

Highports have bridges proper; downport buildings generally have a control room that serves the same function. These shouldn't be confused with traffic control resources, which will be installed below. These almost always qualify as command bridges at Class II or larger ports.

Highport Example: *We install two bridges in Mertactor's highport (one as a backup), requiring 10 spaces with a mass of 41.8 tons and cost of MCr19.2.*

Downport Example: *The two downport buildings each get a single control room requiring 5 spaces and costing MCr9.6.*

Engineering

Each highport or downport building will usually have at least one engineering module. Any given structure could have more than one such module, representing two or more reactors providing power requirements. The "slices" of fusion plant that will be added on to these with additional modules can be judged to be divided evenly between them, or unevenly distributed. This backup system does not mean that, should one reactor fail, the other reactors can make up for the lost power generation. But a highport with two engineering modules (and thus two reactors) could survive failure of one reactor indefinitely by shutting down non-critical power consumption to the point that the remaining reactor can meet demand.

SPA policy is to provide onsite power generation at each major downport building. Minor buildings can draw power from a major building through underground power lines. (This can create some minor ***GURPS Traveller*** design-system breakdowns. For instance, one of the aforementioned downport weapons bunkers might incorporate a laser that the GM intends to draw power from the main terminal. The problem is that the additional reactor components required to provide the laser's energy will be installed in the bunker with the weapon, not in the site housing the reactor to which they belong. GMs who won't be happy with this misallocation of resources can consult ***GURPS Vehicles*** and shift the appropriate power-plant components back to the proper building. For others, the effect will be minor and can be safely ignored.)

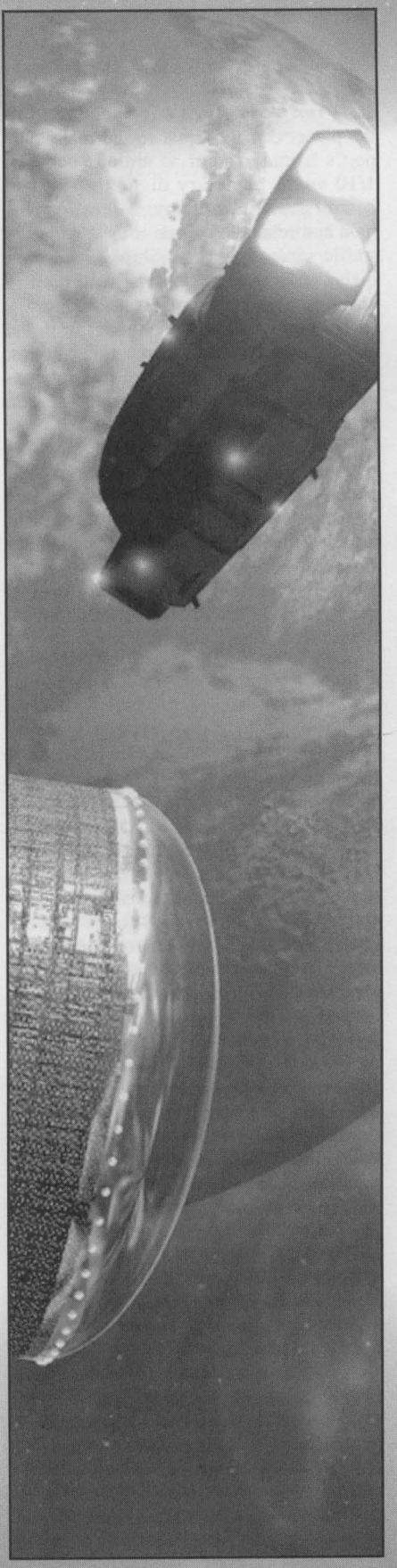
Downports can be assumed to be hooked up to the local power grid, as well. Most Imperial downports use their own power-generation resources, turning to the local supply only at times of reactor failure.

Highport Example: *We install two engineering modules in the highport, representing two fusion reactors. These take up 2 spaces, mass 8 tons, and cost MCr0.64. We decide that the reactors will be of equal size, each providing half of the highport's energy needs.*

Downport Example: *The two downport buildings each require a single engineering module, taking up 1 space in each building and costing MCr0.32 each.*

Traffic Control

Each highport or downport requires 1 traffic-control module (see p. 104) per 25,000 displacement tons of weekly traffic, rounded up. A port can get by with fewer modules, representing the traditional overworked and harried traffic-control staff, at -1 to related skill rolls per missing module. Ports pay 3 times the list cost for traffic-control modules; the other 400% investment pays for navigation satellites, landing beacons, etc.



Standard Orbits

A standard orbit is defined as a circular orbit from west to east (*prograde*), with an inclination to the planet equator equal to the main starport's latitude and at an altitude between 1/10 and 1 planetary diameter. Traffic control authorities (if any) will assign altitude and relative position to best maintain traffic separation. Even ships proceeding directly to the surface will intercept a standard orbit to begin their descent.

This convention is a remnant from the days when starships used reaction engines, and the extra velocity gained from operating in the direction of planetary rotation resulted in important cost savings.

Other, non-standard orbits are possible and may be requested when filing a flight plan. Polar orbits, with an inclination near 90 degrees, are useful for mapping because they cover more of the planet's surface. Retrograde (east to west) orbits are sometimes useful for maintaining more frequent (but brief) contact with parties on the surface.

Leaving the Port – The XT Line

The border between the Imperial extrality zone and the rest of the host planet is called the extrality or XT line. XT lines are usually designed to prevent smuggling contraband goods onto the planet, in defiance of local customs laws. On particularly repressive worlds, the planetary side of the line may be designed instead to keep the inhabitants in – a 57th-century Berlin Wall.

The XT line can be divided into two sections. First are the actual *access points*, where traffic (ground or grav) can move from one side to the other. Air, water, and space traffic will generally be met by customs officials where it lands, but security arrangements and level of scrutiny will be similar.

The rest of the XT line is called the "*fence,*" whatever its physical arrangement. Physical security measures will be similar to, but less strenuous than, those at the crossing points. Sensors will concentrate on area coverage to detect and locate a breach. At a minimum, there will usually be a literal fence or other physical barrier, even on planets with CR 0 – it prevents the inhabitants from wandering into the starport by accident.

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Highport Example: *The highport needs 8 traffic-control modules, taking up 32 spaces, massing 59.2 tons, and costing 8 × 3 × 12.66 or MCr303.84.*

Downport Example: *We decide to give the downport only 1 traffic-control module, as a character flaw, giving its traffic controllers a -1 to any skill rolls. This takes up 4 spaces and costs 3 × 12.66 or MCr37.98.*

Holds

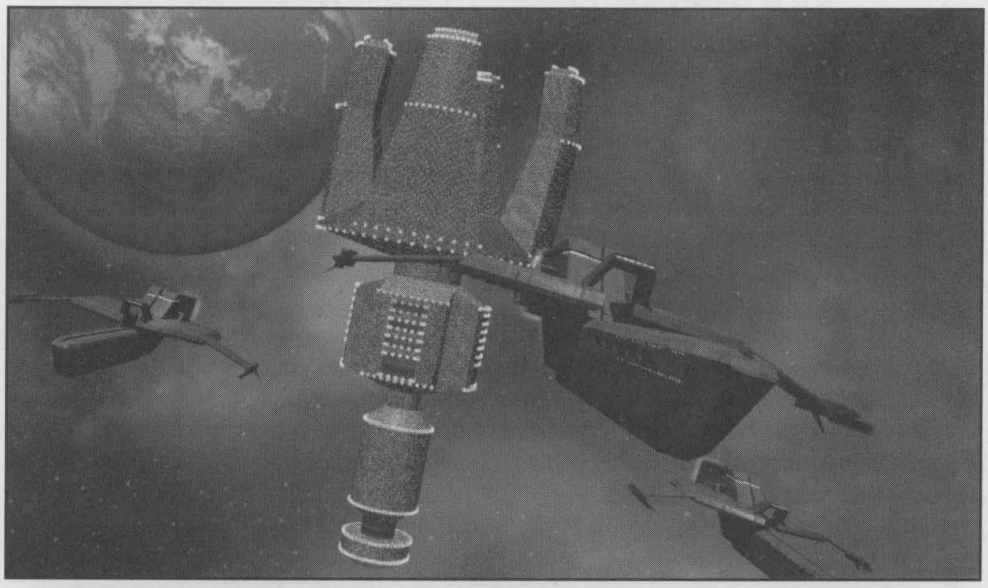
A large proportion of any port facility will consist of storerooms, warehouses, loading docks, transit sheds – holds, in starship terms. HAZMAT warehouses will be mostly holds, usually with just 4 or 8 spaces left over for offices.

The average downport with freestanding berths should have hold spaces equivalent to 0.5 times weekly cargo handled. The average highport, or downport with berths in the main building, should have hold spaces equal to 0.5 times weekly cargo handled *plus* 0.5 times weekly starship displacement tons served.

Ports off the beaten path may want to increase this percentage, to reflect increased turnover times. Assume the average cargo hold will mass 1 ton at any time (most of them will be empty at any given time, since much of this space actually goes to wharfs and similar cargo-handling rather than -storage needs).

Highport Example: *Mertactor is on a main trade route, so goods don't sit on its docks long. The highport needs (0.5 × 96,000 dtons of cargo) + (0.5 × 185,000 dtons of starship) or 140,500 displacement tons of holds, taking up 140,500 spaces and massing on average 140,500 tons.*

Downport Example: *The downport requires 0.5 × 40,000 dtons of hold, taking up 20,000 spaces. We decide that 75% (15,000 spaces) will go in the cargo terminal, with the rest representing luggage and parcel service in the passenger terminal.*



Jump Fuel

Fuel tankage is an important component of starports, since refueling starships is a primary service. The average port should incorporate tankage at least equal to 0.06 times the weekly displacement tonnage of starship served. This will average a three-day supply. Ports in remote locals or with fragile supply lines may need to *greatly* increase this tankage. Military or scout ports always store more fuel than this.

Highports hold fuel stores within their hull, but most downports bury the tankage on a remote corner of their site (preferably in rock), then pump the fuel to individual berths through a system of underground pipes (paid for in the infrastructure improvements assumed in their hull costs). For this reason, fuel-tankage spaces aren't counted against downport structures. Downports also use heavier, cheaper tanks, but given the costs of excavation end up paying the standard costs for tankage given on p. GT155.

Underground tanks are easier to insulate and contain leakage better (though a large escape of liquid hydrogen will create a major frost heave, compounding the problem). Aboveground tanks, suitable for small ports and temporary installations, cost MCr0.05 less per module.

At most minor ports, vessels must be moved to a specified fueling bay.

Class I ports will only have unrefined fuel, if that. Class II rarely offer refined, but rarely lack any fuel at all. Class III and IV ports routinely offer both refined and unrefined fuels, while Class V ports often do not offer to sell unrefined stores. See p. GT121 for more information.

Worlds with very hostile environments require special consideration when it comes to fuel storage of fuel. The GM may increase tankage expense accordingly.

Highport Example: *We decide that Mertactor's highport should incorporate more fuel tankage than normal, to serve as a small strategic reserve for Imperial forces in times of border tensions. The normal stores would be 0.06×185,000 or 11,100 tons. We double this to 22,200 tons. The filled tanks take up 22,200 spaces, mass 28,860 tons, and cost MCr3,552.*

Downport Example: *The downport needs to support 28,300 dtons of shipping, therefore we purchase 0.06 × 28,300 or 1,698 tons of tankage at a cost of MCr271.68.*

Fuel Processors

Major ports almost always take in unrefined fuel and process it themselves, as do minor ports when they offer refined fuel at all. Working full time, a fuel-processing module will refine the average fuel needs of 9,000 dtons of weekly shipping. Most SPA starports will boast processing sufficient to sell refined fuel to all visitors.

Downport fuel processors generally are placed underground, close to the fuel depot. Excavation costs and certain environmental concerns that starships and highports can ignore raise the per-module cost to MCr1.

Highport Example: *With 185,000 dtons of weekly traffic, the highport needs 21 fuel processors, taking up 21 spaces, massing 23.1 tons, and costing MCr17.85.*

Downport Example: *Limiting our investment to 3 fuel processors will still provide refined fuel for (3×9,000)=27,000/28,300, or 95% of weekly traffic. Since that's probably a far higher percentage than will be seeking refined fuel, we decide that's enough and invest the required MCr3.*

Fuel Collection

On water-rich worlds, starports can simply tap into local resources and ferry up the highport's needs. On worlds with restrictions on using water for fuel (usually any with a hydrographic percentage of 40% or less), "oilers" (small craft or non-starships dedicated to carrying fuel) will have to be purchased to mine local gas giants. Some of these will need to be able to transport fuel to the downport.

If neither source is available, liquid hydrogen may have to be imported from a nearby system, which will add Cr400 per dton to its cost! (The GM should note that a system with no fuel source would not be likely to generate enough trade to warrant a large starport; he should rule that *some* source exists if the system has a major port.) Oilers for downport service will be needed.

Imperial starports generally use the 800-dton oiler from p. T:FT137 to shuttle fuel between highport and downport. Each MCr113.7 oiler can shuttle enough fuel to service 125,000 dtons of weekly traffic. Each requires a crew of five, 25 for full-time service. The 40-dton fuel skimmer (p. GT140) serving 3,000 dtons or a 50-dton modular cutter with fuel skimmer (p. GT142) serving 4,500 dtons can be substituted for lesser needs.

Gas-giant mining varies widely depending on proximity (if the system's main world orbits a gas giant, the 800-dton oilers can be used). For longer trips, robotic "fuel blimps" (non-starships up to 10,000 dtons with no hull armor) are deployed. The GM should simply assign a small-craft cost of MCr0.001 to MCr1 (averaging MCr0.01) per dton of total weekly starship traffic, depending on how difficult the process is and lengthy the round trip. The blimps will require no crew, but will require highport-based technicians.

Leaving the Port – The XT Line

[Continued]

Physical security and strength will increase with both the TL and the CR of the host planet. Height of barriers will be at least 10′ divided by local gravity; planets with extensive air traffic will rely more on sensors (and in extreme cases anti-aircraft weapons) to enforce XT line restrictions.

The design sequence on p. 69 merely provides an abstract cost for erecting the XT line's physical features. When the XT line comes into play, the GM can get a better idea of just what it incorporates using the following tables:

Physical Security Measures

CR	XT Fence	Access Points
0	Single fence	Open gate
1	Single fence	Gate with gatehouse
2	Cleared buffer zone	Guards
3	Anti-intrusion fence	Random ID/ manifest checks
4	Double fence; sensors	100% ID/ manifest checks
5	Non-lethal traps; patrols	Random search
6	Lethal traps; deadly force	100% physical search

Higher level measures may be added during times of heightened alert.

Physical Security Technology

TL	Sensors	Barrier DR/HP
0-4	Mk. 1 eyeball; unaugmented hearing	4/10
5	Searchlights.	8/20
6	Radar; metal detector, microphone, rad counter	12/30
7	LLTV, thermograph, X-ray, geophone, MAD	16/40
8	PESA, AESA, chemsniffer	24/60
9-10	Radscanner	40/100
11	Densitometer, biosniffer	60/150
12	Neural activity sensor	100/250

Casinos

Gambling presents a special set of opportunities and problems for port administration. *The plus side:* Gambling is a profitable business with an unusually low overhead – you provide the opportunity, and the customers give you their money. *The downside:* Casinos handle a great deal of cash (more often than any other part of the port, including the banks). They attract cheats, thieves, and compulsive gamblers. (Casino management has no reason to discourage the last category until they are broke – at which point they become the port's problem, not the casino's.)

An additional factor is that if people are not given a place to gamble legally, they will find their own places to do it. Because casinos operate within regulations, and have licenses they do not wish to lose, many gamblers believe they are less likely to be cheated at a professional table than in a hotel-room pickup game. When a dispute does arise, the "formal" atmosphere, as well as the presence of casino and port security, means it is less likely to turn violent.

The port director has the final decision on whether to allow casino gambling. Only about 5% of major ports do not, and half of those ban casinos at the request of a nearby military base.

All Imperial starport casinos are concession operations. Locals run some, especially at smaller ports. Three-quarters of the casinos at major ports are operated by large gaming corporations, such as Provace, Firenze Ltd., and Schwarzbuch Recreations, LIC.

In the interest of respecting local laws, residents of worlds where gambling is forbidden are not permitted to own portside casinos. (The SPA cannot prevent them locals from gambling in them, though the casino operator may.) From time to time this rule is challenged, either directly as a matter of free trade law, or secretly, through offworld holding companies. The former case is routinely passed back by the line office to the local government, which may issue or deny a waiver (or change the law) as it sees fit. The second case requires a determination of whether Imperial securities law (which forbids false declarations of ownership) has been violated.

Example: *Mertactor has a 19% hydrographic percentage, so the water's probably off-limits to the Imperial port, and the system has no gas giants! (See p. T:FT131.) We decide that a nearby non-terrestrial world has significant hydrogen in its stew of an atmosphere (since we do have a major port serving the system). Total weekly traffic is 185,000+28,300=213,300 dtons. We assign a fuel-blimp cost of MCr0.005 per dton for a total expense of MCr1,066.5. We also need to shuttle fuel for 28,300 dtons of shipping to the surface. Though an 800-dton oiler costs more than the seven modular cutters that could also do the job, far fewer crew members (35 vs. 105) will be required and the excess capacity may prove handy in an emergency, so we purchase the oiler for MCr113.7.*

Berths/Spacedock Hangars

The single most core component of a starport is its ability to house starships and small craft, therefore a large percentage of its volume will be taken up with spacedock hangars (called berths at a starport).

The average port will have berth space to hold its weekly average traffic, or a little more. Since the average starship remains in port three days, this amounts to more than 200% of average need. There are several reasons for the extra capacity. First, some weeks will see far more traffic than the average. Second, star traffic does not arrive in smooth ratios of small, medium, and large ships; some weeks will see many small ships and others will see a surge of 20,000-dton liners. Third, the port's own small craft and private small craft will be using the smaller berths as available.

The SPA builds berths with capacities of 100, 800, 5,000, or 20,000 dtons. Vessels larger than 5,000 dtons usually call strictly at the highport. Using these standard designs boasts all the advantages of standard configuration (pp. 56-57): No custom design study is necessary, the supplies for a berth are available as a prepackaged "kit" (containing surfacing and wall materials, lighting, landing-beacon components, and wiring), and landing procedures for a specific berth size are also standardized.

The following is the standard SPA formula for determining how many berths of a given size that a given highport or downport needs. They are based on weekly displacement tons served. In certain cases (for instance, a core world that sees a higher proportion of 20,000-dton freighters than the norm, or a frontier world that rarely sees a commercial ship exceeding 800 dtons), this formula should be heavily modified.

BERTHS PER 100,000 TONS SERVED

1	20,000-ton (extra large)
6	5,000-ton (large)
40	800-ton (standard)
180	100-ton (small)

Downports substitute four large berths for each extra-large berth. Use these ratios to nearest 100,000 dtons. For remaining fraction of 100,000, assign berths as evenly as possible.

Highport Example: *We decide that since it serves 185,000 displacement tons, Mertactor's highport needs 2 20,000-ton berths, 11 5,000-ton berths, 70 800-ton berths, and 340 100-ton berths.*

Downport Example: *The downport serves 28,300 displacement tons weekly. At 10 large berths (using the extra-large berth substitution) per 100,000 dtons served, that works out to about 3 large berths needed. We go with that, adding 11 standard berths and 45 small berths to fill out our needs.*

Highports purchase standard spacedock hangars per p. GT154. Not all of them offer true berths for all of the ships they serve. Instead, they berth many ships in external cradles (see p. 103) or orbital berths (see below).

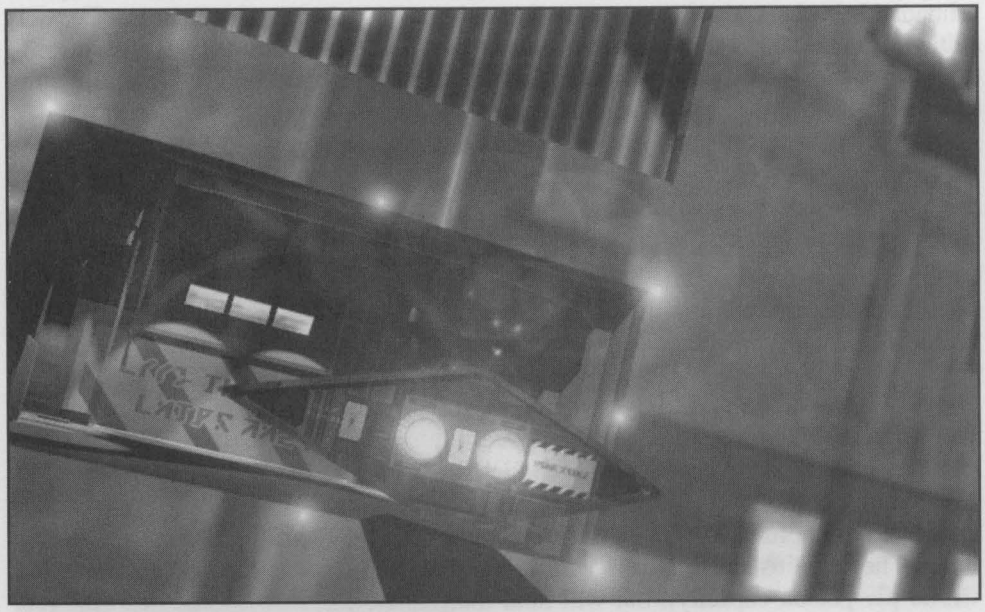
External cradles are preferred over simple airlock-to-airlock connections because the SPA doesn't like to leave large ships "floating" next to their highport hulls. By employing cradles for all external berths, the highport can undergo emergency maneuvers (whether via tug or its own maneuver drives) with minimal notice. Likewise, starship pilots can't attempt unwise close maneuver until traffic control releases their ship from its cradle. Still, many undercapitalized highports resort to airlock-to-airlock external berths if they lack both unfilled cradles or spacedocks, and the transfer craft required to support an orbital berth.

The SPA installs large external cradles to roughly match its standard berth capacities. These have the following characteristics:

CRADLE/BERTH EQUIVALENTS

Size	Spaces	Mass	Capacity (stons)	Cost (MCr)
Small	3 (1)	37.5	375	0.75
Standard	30 (10)	375	3,750	7.5
Large	160 (54)	2,000	20,000	40
X-Large	700 (234)	8,750	87,500	175

Spaces are the number of spaces within the port's hull that the external cradle takes up; most of the cradle is outside the ship's hull. The number in parentheses indicates the number of turrets that can't be installed because the cradle supplants them. *Mass* is the mass of the cradle itself, while *capacity* is the heaviest ship the cradle can hold, as measured in standard tons. Any given cradle can hold any ship lighter than its limit.



The SPA tries to avoid relying on orbital berths, in which the incoming ship is parked in an orbit adjacent to the highport and business is conducted via small craft and lighters. This system increases navigational woes, and small craft are more expensive in the long run than cradles or berths. Regardless, many older highports have seen traffic increase to the point where orbital berths are their only option. Each orbital berth requires the highport to add additional small craft to its transfer-craft fleet to meet the following needs:

ORBITAL BERTH TRANSFER CRAFT NEEDS

Size	Passenger Couches	Cargo Holds
Small	1	1
Standard	3	7
Large	30	75
X-Large	120	300

These figures assume that the transfer craft will simply be added to the pool established on pp. 63-64, and all crafts will serve both normal transfer and orbital-berth needs.

Highport Example: *Our highport hull is a little small for our needs, so we decide to purchase half of our berths as internal spacedocks, half as external cradles. Purchasing 1 extra-large, 6 large, 35 standard, and 170 small internal berths takes up 190,000 spaces, with a mass of 212 tons and cost of MCr1.06. Adding 1 extra-large, 5 large, 35 standard, and 170 small external cradles takes up 3,060 spaces, masses 38,250 tons, and costs MCr765. The cradles take up the hull space that 1,024 turrets normally would; since the highport could wield 5,000 turrets (were we to arm it), this suggests that cradles cover roughly 20% of its surface.*

Public Data/Comm

Imperial starports usually provide (for a small fee) public terminals that tap into the local communication networks. These terminals are typically computers of varying degrees of sophistication. On more primitive worlds, they may be old-fashioned telephones or videophones.

All public communications use their own lines, distinct from those of the starport's internal systems. While information about the starport and its functions is obtainable using these terminals, one cannot directly access any information stored there.

Chapels

Most major ports have at least two religious facilities, known generically as "chapels." One of these is nondenominational, a plain, quiet room where anyone may rest and meditate. The other has a collection of iconic objects and holographic projections representing many faiths, which can be set up, with a couple of hours' notice, to house a particular faith's services.

These two rooms, which typically seat 50-100 persons each, are provided and maintained by the SPA. They are not staffed, though large ports usually have a number of religious officials (minister, priest, rabbi, etc.) available via pager.

Religious organizations are permitted to lease space for dedicated chapels. The rents may, at the director's discretion, be discounted, since it is assumed that the chapel is not a profit-earning enterprise; however, this cheap space will not usually be in a prime commercial area. Leased chapels usually have a minister on duty part of the time.

The port chapel is thought of differently from the other public spaces. Quiet is maintained, and it is considered very bad manners to openly wear weapons inside (there are some fringe world sects that incorporate weapons in their observances, but even these observe the niceties when sharing space with others). It is also bad form to talk about anything non-spiritual, and that especially means conversations with shady contacts.

A chapel is not considered a "sanctuary" in the sense that lawbreakers can take refuge from pursuit. Security will remove such a fugitive with whatever force is necessary. A fugitive who wishes to surrender may choose the chapel to do so peacefully. When there's a serious shooting situation in the corridors, one way of declaring your non-involvement is to take a seat in chapel; the central tenet (i.e., not being shot) is very ecumenical. At the conclusion of the incident outside, enterprising deacons often stand by the exit holding a collection basket; people become surprisingly generous.

People's tendency to congregate in the chapels in emergencies leads some directors to install special safety features such as additional fireproofing or heavier walls.

Traffic Control

Traffic control at Imperial starports usually isn't a hectic, seat-of-the-pants process. Usually.

Traffic control's main tower will be located at the highport (if present), but every downport will also have its own "local" traffic-control tower. The highport tower (which usually is a towerlike extension of the highport's hull, but for security reasons sometimes isn't) has command authority over the downport towers, and senior officials usually will be based at the highport. Their offices usually will be adjacent to the traffic-control centers, often at the base of the tower.

Traffic control is always isolated from other port functions, for reasons of security and to ensure no interruption of its dedicated infrastructure needs (it wouldn't do if a janitor's vacuum cleaner blew a fuse that knocked out the main radar). Public access is always restricted. In addition to failsafe power supplies, traffic control will require a deal of communications equipment, both for speaking to traffic and for receiving data from its network of navigational-aid satellites. This often is located at the traffic-control tower, but also can be elsewhere on port property with a dedicated physical datalink to the tower proper.

Traffic Control Protocol

Imperial starports use a standard system for controlling flight space, depending on port class. All of Imperial space uses a single radio channel for flight control (with two backups for occasions when the main channel suffers interference). Ships arriving in a system administered by the SPA are expected to notify the starport at earliest opportunity. The port will then instruct the starship on any local variances from the standard control system; this data also can be obtained in commercial navigation software or a pilot with the appropriate Area Knowledge may already possess it. Class III or higher ports usually then assign the ship to a different traffic-control frequency, to keep the main channel relatively free of clutter.

Each starport provides the traffic control described for its class and all below it.

Class I: These starports usually possess minimal or no traffic-control sensors, and may not possess any full-time traffic-control personnel. All that they must maintain is an *advisory zone.* This zone usually extends from the planet's surface to 100 AU from the primary star or the orbit of the last charted planet in the system (whichever is greater). Starships maneuvering within this space are supposed to notify the port of their flight data.

The port will try to relay this information to any traffic with obviously converging courses. An advisory zone is considered uncontrolled space.

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Usually, downport main buildings only house a few small berths, for small craft performing transfer duties. At most SPA downports, each starship berth is a freestanding, paved area with a wall around it (for customs and inventory control). The landing starship drops right into the berth, and flies straight up and out when its business is done. These berths usually are located a prudent distance from any main buildings, an equally prudent distance from the XT line, and as far apart from each other as feasible. They generally ring the downport's main building(s), with the usual exception of a corridor that will be left clear for ground traffic.

A standard SPA downport starship berth has two doors in the wall, a small one for personnel and a large one for grav/ground vehicles. Generally, both doors remain locked until customs has cleared the vessel, at which time the starship captain is given control of both portals until his ship departs.

These berths are sufficiently large that the unused space within their walls can be used as a transit shed and staging area for offloading, sorting, and onloading cargo. Many feature retractable roofs that can completely enclose the berth once a ship has landed. Their physical characteristics are:

FREESTANDING STARSHIP BERTHS

Size	Volume (cf)	Diameter (ft)	Cost (MCr)	Size Modifier
Small	150,000	100	1.25/1.51/2.41	+9
Standard	1,200,000	225	4.38/5.26/8.41	+10
Large	7,500,000	450	14.38/17.26/27.61	+12

The first cost is for a basic berth with no roof and DR 25 walls and flooring. The second price is for the same berth with a DR 25 retractable roof. The third figure is for a high-security berth with DR 100 flooring, walls, and retractable ceiling. Berths with roofs can be considered sealed when the roofs and doors are closed.

Most starports should buy at least 5% of freestanding berths in each category with roofs, to be converted into hangars later in this design process.

Freestanding berths use underground leads from a nearby main building for power (for lighting and doors), water, sanitary sewer, and datalink. They almost always are connected to the fuel storage via underground pipes, so that starships can refuel within them. They are insulated; berths with roofs contain no life-support (unless added at Cr500 per person capacity), but will hold their temperature fairly well with the roof closed, and it will take quite some time to use up the air within one.

In a pinch, each larger berth can be used to house four vehicles that would fit into the next smaller berth. A large berth can house four starships up to 800 tons; a standard berth can fit four 100-dton starships. This is rarely done – any cargo (or personnel . . .) left lying about by an existing tenant could well be damaged during takeoff or landing procedures by another ship sharing the facility.

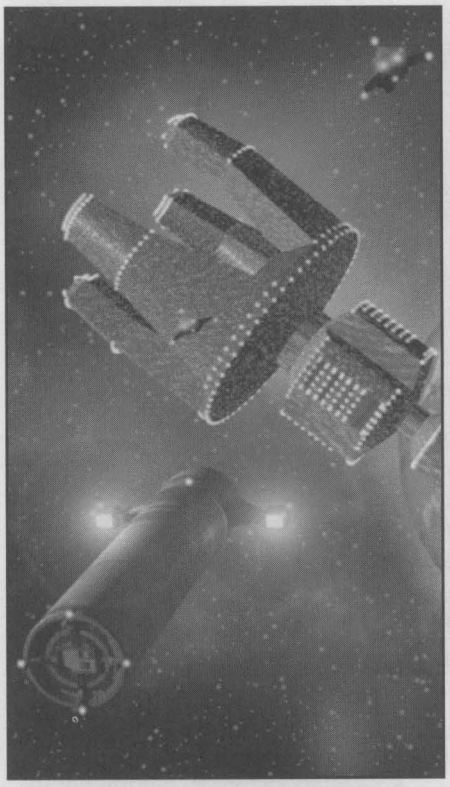
While freestanding berths are the usual style of downport starship support, they are by no means universal. Some downports feature a "dock tower," basically an immense skyscraper with spacedocks stacked one on top of the other and doors that require ships to enter and exit horizontally. (Build this as a massive passenger terminal, with all of the downports berths purchased as spacedocks in the main building.) The SPA tries to avoid this design (and the dozens of variant but similar concepts), because it makes traffic and hazard control much more difficult, but sometimes must yield to local pressures to build a more aesthetically pleasing and imposing downport facility.

Freestanding, scattered berths make traffic control as simple as it can be, and automatically isolate any flight-related disasters. Their major drawback is that same isolation – passengers and cargo must be moved from the berth to their terminals and back again. Some Imperial downports take care of this by linking each berth to the terminal(s) with large underground slidewalks. Others take the initially simpler route of providing a fleet of grav vehicles for passenger and cargo transfer. Usually, even berths equipped with underground slidewalks have personnel and cargo doors opening onto the surface, for emergencies and special cargo-handling circumstances.

A standard underground slidewalk system uses a 15′ by 15′ corridor (regardless of the size of berth to which it is attached), with a slidewalk that moves at 2 yards per

second and that is rugged enough to transport just about anything that could be placed upon it. It costs MCr0.1 per freestanding berth if the downport has 1-12 such berths, MCr0.15 per berth if 13-36 freestanding berths, MCr0.2 if 37-84 berths, MCr0.25 per berth if 85 or more berths. If each berth is to enjoy connections to each of more than one terminal, double the overall system cost for two terminals, triple it for three, etc. More often, a downport with multiple terminals simply connects each terminal with a massive array of slidewalks (costing MCr1 for two terminals, MCr3 for three terminals, MCr6 for four terminals, or MCr10 for five terminals), then connects each freestanding berth to the most convenient of those terminals. Note that the slidewalks will be used only to transport people and small lots of cargo – transfer of large cargo lots is handled by small craft and already figured into the transfer-traffic figures.

Downports with freestanding berths unconnected by slidewalks also use their existing small craft to shuttle large cargo lots, and TL10 utility grav sleds for small lots and people. These sleds carry 12 passengers or 1 displacement ton/5 standard tons of cargo, with statistics comparable to the sled found on p. 74 of ***GURPS Traveller Star Mercs***. (The larger cargo vehicles on pp. 100-101 can be substituted if there's enough traffic to justify them.) The standard sleds cost Cr50,000 each, with a crew of one driver (five drivers, total, to keep them in full-time service). The downport will need one per 3,000 displacement tons of starship served to keep people, small cargo lots, and the mail moving.



Custom berths may be constructed, generally at small private facilities where only one specific vessel (such as a noble's yacht) is expected to land; constructing, say, a 200-displacement ton berth can provide enough space savings over a 800-dton standard design as to be worth the trouble. Large berths are also constructed for specific vessels, mostly by the military; the practical limit is still 5,000 dtons. Larger vessels than this can generally call on a downport only by landing on open water.

Design a custom berth as a starship hull with twice the volume of its stated tonnage, or three times the volume if extensive freight handling is foreseen. A berth with a roof requires the MCr0.005 investment for a spacedock door, and is armored just like a starship. A roofless berth avoids the spacedock cost, and multiplies final armor cost by 0.83 (since the top one-sixth will have no armor).

Yet another alternative, at private ports and cash-tight Imperial minor ports, is the landing pad. A pad is nothing more than a paved area with minimal landing lights and a few mooring rings. A small pad costs MCr 0.25, a standard pad MCr0.87, and a large pad MCr2.87.

Starships can be landed on bare ground in a pinch. Except in the most rocky terrain, repeated landings and takeoffs will chew up the ground, rendering it useless for future landings.

Downport Example: *We decide that each downport terminal will have 5 small berths, for direct small-craft service. These take up 500 spaces and cost MCr0.025 in each terminal. The remaining 3 large, 11 standard, and 35 small berths will be purchased as freestanding berths with retractable roofs, at a cost of MCr162.49. We decide to use the underground slidewalks for moving people and cargo from berths to terminal. With 49 freestanding berths and two terminals, this costs MCr9.8 to link the berths to a terminal each, and MCr1 to link together the two terminals.*

Traffic Control

[Continued]

Class II: True traffic control is operating, with full-time staff and short-range sensors, which are usually ground-based unless the port has an orbital element. Traffic-control staff is divided into tower and ground-control operations.

These ports establish a *starport control zone* that covers the physical extent of the starport (on the surface and/or in orbit) and roughly a 10-mile radius around it in all directions other than below-ground.

The tower maintains *positive control* of all flying craft in the control zone. Positive control means that the vessel should not maneuver without instruction from traffic control. (If it does, without a good reason, the pilot will have to answer for it.) Ground control supervises all non-flying craft, from just after landing to just before takeoff.

Class III: Traffic control becomes much more advanced at this level. Staffing increases substantially, and the port operates at least three low-orbit navigational and meteorological satellites. These ports create an *airspace zone* from the planet's surface to 1/10 the planetary diameter above its surface.

The tower maintains *procedural control* within the airspace zone. Procedural control means that "lanes" are established to enter and exit port airspace, and ships with similar vectors line up for approach in these lanes. During procedural control, even if a pilot has excellent reason for maneuvering without instructions from traffic control, he *will* answer for it. The downport tower also provides weather data for surface operations.

Class IV: Staffing becomes even more extensive. The starport will operate satellites in low, medium, and high orbit. The amount of data being processed would make the job impossible for the most experienced human controller without the support of powerful computers and expert programs. These ports create a *transition zone* extending from the upper limit of the airspace zone to 100 planetary diameters. Procedural control is practiced throughout the transition zone. The airspace zone is under positive control.

Class V: This uses more satellites, even more powerful sensors, and the increased personnel and computer hardware to handle the exponentially increased data. Class V ports establish an *orbital zone* from the upper limit of the airspace zone to 10 planetary diameters above the surface; this is *inside* the transition zone but supersedes it. The tower maintains positive control throughout the orbital zone.

Navigational Aids

The Imperial Grand Survey maintains Imperial navigational charts and primary beacons (see p. T:FI10), but the SPA maintains the laws governing civilian star travel and a host of secondary navigational aids.

Continued on next page . . .

Traffic Control

[Continued]

Most navigational aids are based on satellites, generally called "navsats." Along with a powerful carrier signal, most can transmit verbal messages and respond to orders from their owning agency. Standard navsats include:

Anchor Beacons: These are the navsats maintained by the Imperial Scout Service. Every system with a rated starport will have one to orient starships upon breakout from jumpspace. Their signal incorporates a "time and date stamp," so that starships stranded in interstellar space can more easily fix their position by comparing the relative ages ofsurrounding anchor-beacon signals.

Terminal Beacons: These are the SPA's bread-and-butter navigational beacons. They often are housed on the same satellites that host the SPA traffic-control sensors.

At a Class I port, the terminal-beacon system consists of a single beacon located on or adjacent to the starport proper. Low tech, non-Imperial worlds may substitute other means of identification for a radio transmitter. This may be the only navigational aid of any kind.

Class II and higher ports will retain the port terminal beacons (one for each highport and groundport). Two additional beacons will be placed in the mainworld's orbit, one 60° ahead of and one 60° behind the main world (its Trojan points). These beacons serve to define the plane of the system's ecliptic and locate the mainworld if it is on the far side of the system's primary.

Additional terminal beacons are possible – for example, in orbit near a gas giant designated for fuel skimming.

Global Positioning System (GPS) Constellation: These small satellites (generally 36 in low orbit, to ensure complete coverage and sufficient redundancy) provide not only position data for users on the ground, but also accurate reference data to ships in orbit.

Marker Beacons: Marker beacons provide backup identification of specific navigational points and hazards. They are smaller and lower-powered than terminal beacons, because the required range is proportionally smaller. Placement varies from system to system, but typical uses include initial-approach fix, outer/middle/inner markers on approach, final-departure fix, holding points, floating hulks in orbit, small planetoids, and restricted space stations. A Class V starport may support thousands of marker beacons in its star system.

Data/Comm

Data/Comm is usually dispersed throughout a starport, using several different and mutually redundant nodes. Even within a single department, no one node is always used, except in the case of traffic control.

Continued on next page . . .

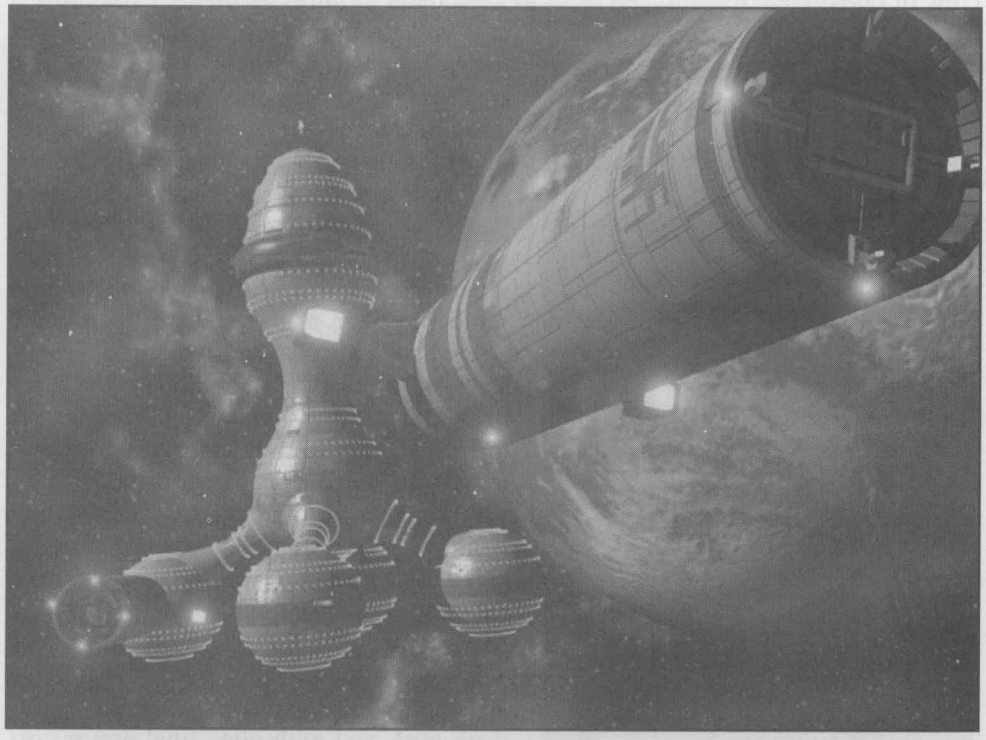
Hangars

In starport parlance, a hangar is a berth (almost always of an enclosed nature) with the necessary equipment for major repairs and refitting of the spacecraft that it houses.

For most maintenance performed in berth, the vessel requires more solid support than its own landing gear. Two kinds of external support are employed for this purpose, scaffolding and work cradles.

Scaffolding consists of lightweight but strong modular frames that can quickly be assembled under and around a grounded vessel. Small hydraulics snug them against the hull and raise the ship slightly, so that its weight is mostly or completely off its landing gear and spread around the scaffold frame. Scaffolding makes the ship very stable, and provides easy access to all parts of the hull for maintenance and repair.

Scaffolding can be moved from berth to berth, so in conjunction with a tool cart (see below) can transform any berth into a hangar. (In doing so, ease of cargo handling is strictly curtailed, since the maintenance gear takes up a great deal of space once set up. It's better to take care of offloading cargo before setting up scaffolding, then onload after the scaffolding is removed.)



It requires 15 minutes per 200 displacement tons to set up scaffolding, half that to take it down. The cost of scaffolding a ship is included in the cost of maintenance, or scaffolding may be rented by do-it-yourselfers for Cr20 per 100 displacement tons per day. A ship may carry its own scaffolding, for use either at ports or in the field.

Scaffolding costs MCr0.125 per 100 displacement tons of capacity. Stowed away, it takes up one cargo-hold space (500 cf) and masses 5 standard tons per 100 dtons capacity. In use, it takes up 25,000 cf per 100 dtons capacity (essentially half again the volume of the ship). Most ports keep enough scaffolding around to convert 10% of their internal or freestanding berths (measured by their maximum ship tonnage held) into hangars.

Work cradles are used when structural alterations to the ship are needed – anything that involves cutting or moving a bulkhead, or removal/change of primary components such as power plants or drives. These are analogous to dry docks: hydraulic frames that firmly support all parts of the vessel. They take all stress off the ship's internal structure, allowing bulkheads and load-bearing members to be relocated or temporarily removed for access.

It requires 12 minutes per 200 displacement tons or fraction to properly secure a vessel in a berthing cradle, and twice that time to release it. Its cost is included in the cost of

maintenance that requires a cradle, or starship crews can pay an extra Cr30 per 100 displacement tons per day to rent a hangar instead of a berth. (This is rarely done because they will still need the appropriate tools for such a large job, and renting a hangar doesn't include access to any SPA tools. The starship crew would have to purchase its own.)

Cradles are strictly located inside enclosed berths; they are not portable. Usually they are fitted within 5% of existing berths, spread as evenly among different berth sizes as possible. A cradle-equipped berth becomes a full-time hangar, used strictly for maintenance. (Cargo could be handled in a work-cradle-equipped hangar, but very inefficiently.) Cradles cost MCr0.25, take up 50 spaces, and mass 10 tons per 100 dtons of capacity. In freestanding berths, they simply supplant cargo-handling space.

Normally only Class IV and V ports install work cradles, and the berths so equipped are located adjacent to (and considered part of) the shipyard facilities (see pp. 80-81).

External cradles for berthing starships automatically fulfill the functions of a work cradle, except that the ship's exterior (and interior if hull integrity is not maintained) will be in vacuum. The necessity to wear vacc suits – and employ premium-salary zero-gee workers – for some or all of the job increases repair cost and time by an average 20%.

Highport Example: *Our highport can hold 95,000 displacement tons of ships in its internal berths, so needs scaffolding for 9,500 tons. This takes up 95 hull spaces when stored (and simply expands into the spacedock excess space when in use), masses 855 tons, and costs MCr11.88. The issue of work cradles is trickier, since theoretically the existing external cradles could fill all needs (though less efficiently since they're not sealed against vacuum). We decide to purchase work cradles for 1 large, 1 standard, and 9 small berths. These take up 3,350 spaces, mass 670 tons, and cost MCr16.75.*

Downport Example: *The downport needs scaffolding for 2,830 tons of shipping. This takes up 29 spaces in storage (we assign 28 spaces to the cargo terminal and 1 space to the passenger terminal) and costs MCr3.54. It doesn't appear that enough 5,000-dton ships are seeking major repairs to warrant a dedicated hangar (this makes sense given the capacities of the highport), so we purchase work cradles for 2 standard and 2 small freestanding berths. (This compensates for having no large work cradles by purchasing an extra standard cradle.) These cost MCr4.5.*

Shop Carts

For flexibility, SPA starports generally store all maintenance and repair tools in "shop carts." A shop cart is a simple grav sled about 15′ long by 5′ wide. It has a rail about 3′ high, custom-fitted to carry one each portable shops for use of the Mechanic, Engineer, Electronics, and Armoury skills. (These are stacked to about 6′ high.) The sled has no motive power; it is towed or hand-pushed to wherever it's needed. It operates for 18.75 hours on an E cell. (In practice this will be modestly lower, because technicians can use the cart's E cell to power equipment when convenient.) After unloading their tools, work crews often use the sled to maneuver heavy starship components; its maximum payload is 5.6 tons. (Note that the normal payload is 5.5 tons, meaning only very-light goof-offs can try to ride a loaded shop cart to work. This is an intentional design element . . .)

Note that a shop cart is not a true workshop – it carries the equipment required to transform any 10 cargo or spacedock spaces into a universal workshop. For jobs on external cradles, the carts are taken aboard the "job" ship and space to set up is found there.

Up to three technicians can work with each of the four kits. Jobs requiring more technicians in any of the four categories will require more shop carts.

In addition to tools, shop carts carry small parts such as fasteners and bearings, as well as a data terminal with access to standard ship plans and diagrams. The terminal also is used to order replacement parts from Central Stores.

SPA shop carts are always TL12, even at TL10 ports, to support all customer needs. Loaded with the portable shops, they cost MCr0.03, mass 5.66 tons, and take up 1.5 cargo spaces each.

Class III starports and above should have at least one shop unit per 2,000 dtons of starship serviced. P/Is have no maintenance, and P/IIs usually have one shop cart and one crew who may or may not be on duty at any time.

Traffic Control

[Continued]

Traffic control almost always boasts the best data/comm in a starport, maintains its own node shared with no one, and only switches to other data/comm linkages should its own suffer catastrophic failure.

Navigational Aids: Anchor or terminal beacons have a range of 100 million miles, and require 0.5 dton, 3 ston, and MCr1.3 each. Marker beacons have a range of 50,000 miles each and come in sets of 20, for MCr0.13 (volume and weight are negligible). A complete GPS constellation costs MCr2.6, takes up 0.5 dton and 0.6 ston as cargo, and must be replaced or re-seeded every 40 years (although some worlds have stretched it well beyond a century, with all of the accompanying problems that diferred maintenance causes). These items are generally provided and maintained by the IISS, who are then reimbursed from the SPA construction budget.

Retail Sales/Services

All ports of Class III and larger have some kind of retail area, usually operated by concessionaires (see p. 21).

The variety of consumer goods and personal services available at a major starport could take pages to list, without much practical purpose. Adventurers do not need to be impressed by the number of retailers in the shopping concourse; they want to know if the particular item they need is for sale.

General guidelines: At a P/V, or P/IV with significant passenger traffic, any consumer item one would expect to find in a shopping mall should be readily available: clothing, luggage, souvenir goods, and so on. From a GM's standpoint, the only reason to deny a character an item is if its lack affects the story. Unusual or rare items – multi-carat diamonds, Sevruga caviar – might cost several times their "normal" prices, especially far from the world of origin.

At a minor port, the necessities of life will be available (occasionally at inflated prices), as well as a few luxuries (always at inflated prices, unless they are "white elephants" the retailer simply wants to get rid of). Most Class I ports have no retail sales. If port/local relations are relaxed, shops will be set up just beyond the gate. These will sell travel essentials and the planet's produce, particularly fresh food.

The availability of services, such as barbers/beauticians, luggage repair shops, and financial services, is driven entirely by customer volume. Again, a major port is likely to have everything one would expect to find at a large hotel or shopping center, while small ports might have a starline ticket office, or nothing at all. An exception is Hardlined ports (see p. 43), where service operators can turn a profit on the trade of port employees.

Parts, and the Parts That They Play

Starport retail offerings for ship's crews are limited, by necessity. A free trader's crew could end up needing any of a *million* items, and even the largest starport can't be stocked for every contingency.

For star crew who need a particular tool or replacement part, roll against Scrounging skill. If the character is in a shop of some kind, Merchant skill may be used instead. Additional skill rolls, such as Language, may be imposed by the GM as appropriate.

- If the item both is commonplace and would normally be found in this location – a screwdriver in a hardware store – success is automatic *except* that on a critical failure, they've "just sold the last one" (which may lead to a chase after whoever bought it), or the last one on the shelf will turn out, later, to be defective.
- If the item is slightly rare or unlikely – a nonconductive 3/8″ Torx driver, or a screwdriver in a grocery – an ordinary success is needed. Both conditions at once put the roll at -2. Critical failure has the same effects as above.
- If the item is exceptionally rare – the *exact* hydraulic door actuator for your 50-year-old scout ship of unknown origin and modifications – a critical success is necessary, and don't even bother rolling if you're not in a service station, or at least a junkyard.

Naturally, the GM may always simply say, "Here it is," or "Nope, nothing like that 'round here." And search rolls should always take into account the plot *function* of the item, by which we don't mean driving screws.

As an example, suppose the party needs to cross a wilderness to continue their adventure, but their ATV has broken down, and they need a new steering linkage to get it going again.

If there's no other way to make the trip, the part is *essential,* and they'll eventually have to be given one, though it could cost a fortune, or require a subadventure.

If there's alternate transportation, by horseback or TL10 river sandals, the part is a *convenience,* and the GM may allow a die roll to find one; this is why characters have skills to use, after all.

Continued on next page . . .

Tools disappear easily. Most starports store shop carts in main buildings, taking them out to remote freestanding berths only on demand.

Highport Example: *The highport requires 93 shop carts, which cost MCr2.79, mass 526.38 tons, and take up 140 cargo spaces. (These cargo holds will be in addition to those designated earlier.)*

Downport Example: *The downport needs 15 shop carts, of which one will be stored at the passenger terminal and the remainder at the cargo terminal. They cost MCr0.45 and require 2 cargo spaces at the passenger terminal and 21 spaces at the cargo terminal.*



The Shipyard

Most major Imperial ports include commercial shipyards. These can build new small craft, non-starships, and/or starships from scratch. They also can supplement the starport's work-cradle-equipped hangars (see pp. 78-79) in serving as depots for major repairs.

Total shipyard capacity in displacement tons usually is equal to weekly trade tonnage divided by 12 at Class IV ports or 8 at Class V ports, then rounded up to the next standard hull size where applicable. Starports sharing a system with a naval base often have double this capacity, or more. The shipyard can produce one vessel at its capacity size per year, or any combination of smaller vessels totaling that tonnage in a year's production. In wartime (or other emergencies), this capacity can be extended by 50% at double standard employment, and used to accommodate military vessels.

Most SPA ports maintain coordinated shipyard facilities at both the downport and highport on host planets of TL10+. The downport specializes in ordering fabrication and parts from local resources, and building smaller ships. The highport orders and distributes any imported parts, and builds the unstreamlined and larger hulls. On lower TL worlds, the shipyard often is concentrated at the highport, since most parts must be imported anyway.

Stocking jump drives is the most costly aspect of shipyard operations. Class IV ports usually do not undertake this expense, and cannot build jump-capable starships.

Non-starship shipyards take up 5 spaces, mass 5 tons, and cost MCr0.2 per dton of capacity. Shipyards capable of producing jump-capable starships take up 6 spaces, mass 6 tons, and cost MCr0.3 per dton of capacity. This includes a spacedock (usually one vast space in which several smaller hulls can be worked on simultaneously if need be), work cradles, and tools. The mass, but not cost, of a proper parts inventory is included. (The cost of parts can be ignored as part of the production cost of goods.)

Since starship construction averages only a 5% profit margin on a rough ship price of MCr0.2 per dton, the average Class V shipyard takes 78 years to truly pay itself off if one anticipates a 3% rate of return on investment. Therefore, few private concerns find themselves attracted to the industry.

Example: *Mertactor starport probably could import many parts from its TL9 host world, thus justifying a downport branch of the shipyard, but we decide to go ahead and place the whole facility in the highport. (Mostly because our theme of old and cramped is filling up our downport buildings more quickly than our highport.) Together, the highport and downport service 213,300 dtons per week, so the shipyard should have a capacity of 17,775 dtons. Going with our theme of being a bit behind the times, we round down to 15,000 dtons, instead of up as would be standard. As a Class IV port, Mertactor will be limited to building small craft and nonstarships (perhaps 150 100-dton shuttles per year, perhaps 18 800-dton lighters, or any combination totaling no more than 15,000 dtons). The shipyard takes up 75,000 spaces, masses 75,000 tons, and costs MCr3,000.*

All worlds with sufficient population and TL are capable of constructing space vessels without a dedicated shipyard; production costs and time are doubled.

Runways

A small craft or starship could be loaded past the point where it can perform true vertical takeoffs or landings. This condition would require a runway for landing at or leaving a downport.

The SPA does not place runways on its downports – ships that don't have full control over their motion are considered far too dangerous to be flying about. Overloaded ships that must reach the surface usually have their cargo offloaded in orbit to make them light enough to perform a vertical descent. For extreme cases, the Starport Authority or local government might maintain a runway in a remote area somewhere, since cases this extreme tend to be emergencies and should be isolated. This runway will usually be very long. Given their designs, once a starship requires a runway, it rapidly requires a *lot* of runway!

Low-tech worlds usually have several airports close – but not *too* close – to the Imperial starport, but this traffic will not be allowed to fly over the starport itself.

Downports do usually have taxiways, to control ground traffic of ships that need to switch berths for whatever reason. (For instance, routine maintenance might reveal a bigger problem, requiring a starship switch from a standard berth to a fully outfitted hangar.) If present, taxiways are assumed to be paid for in the general improvements bought when paying starship hull costs for the ground buildings of a starport.

Maneuver Drives

Downport buildings cannot have maneuver drives. SPA policy is split on the utility of providing highport maneuver drives. A drive providing 0.001 Gs to 0.01 Gs of thrust can be useful for station-keeping. Otherwise, tugs must be used for this task. About two-thirds of Imperial highports feature their own maneuver drives, and most of those being built currently also incorporate them.

Example: *Mertactor's highport does have its own maneuver drives. Figuring that the port will end up massing about 1 ton per displacement ton, or 500,000 tons, we decide to give it 5,000 tons of thrust. Installing 125 spaces of maneuver drive provides this. The drives mass 425 tons and cost MCr20.*



Parts, and the Parts That They Play

[Continued]

If it is the GM's intention that the players cross the plains on foot, or by oxcart, or some other mode less comfortable and speedy than their ATV, the part is a *plot device*, and may simply be declared unavailable. ("You're 8 parsecs from the nearest drop-forge.") Or the price can be set sufficiently high that to pay it takes the story in an unexpected, but interesting, direction. ("I'll take you to a parts stash for all those laser carbines. Folks like you oughta cope without all that firepower.")

There's nothing wrong with allowing travelers to spend all their liquid assets on Stuff, especially since the GM is the ultimate arbiter of whether the Stuff is ever of any use or not. But remember that, just as a disadvantage that doesn't impair the character in play isn't one, a plot obstacle that can be overcome with an item from the ship's locker isn't one, either. And if it can be solved with a cash transfer, it doesn't count unless those credits (which are imaginary to begin with) could have been used for something just as important, like the overdue payment on the starship mortgage.

The Plumbing Factor

Some people find science-fictional restrooms fascinating, possibly because it's an intrusion of the alien into the extremely familiar, and possibly because it seems both a rather naughty and absolutely necessary topic.

Beyond the issue of Just What Do They *Do* In There, interior design for nonhumans extends to everything: lighting, chairs, corridor widths. This could be handled abstractly by the following rule: If a port routinely serves more than three major races, add 5% to the construction cost of all public facilities. This automatically applies to all Class V ports.

Staff Shortages

A port director (Imperial or otherwise) under pressure to reduce costs may decide to cut staff. This can lead to disputes with the laid-off workers (and their union, if any), and, unless the reduction is in response to a drop in traffic, service will suffer eventually.

Customer relations personnel tend to be the first to go, which means that the remaining ones get overloaded, tired, and unpleasant. The job may be taken over by someone from another office who still has that work to do, in which case they tend to go straight to unpleasant with no transition time. Staff providing "comforts," such as cafeteria workers, often go early, which spreads the grouchiness rapidly through the entire workforce.

Administrators traditionally get to hang onto their jobs through a lot of belt-tightening. Sometimes this is for just the reasons you might expect, but it is also true that the paperwork and incoming comms can't be reduced by executive order, and an operation paralyzed at the top is just as stuck as one that's run out of fuel.

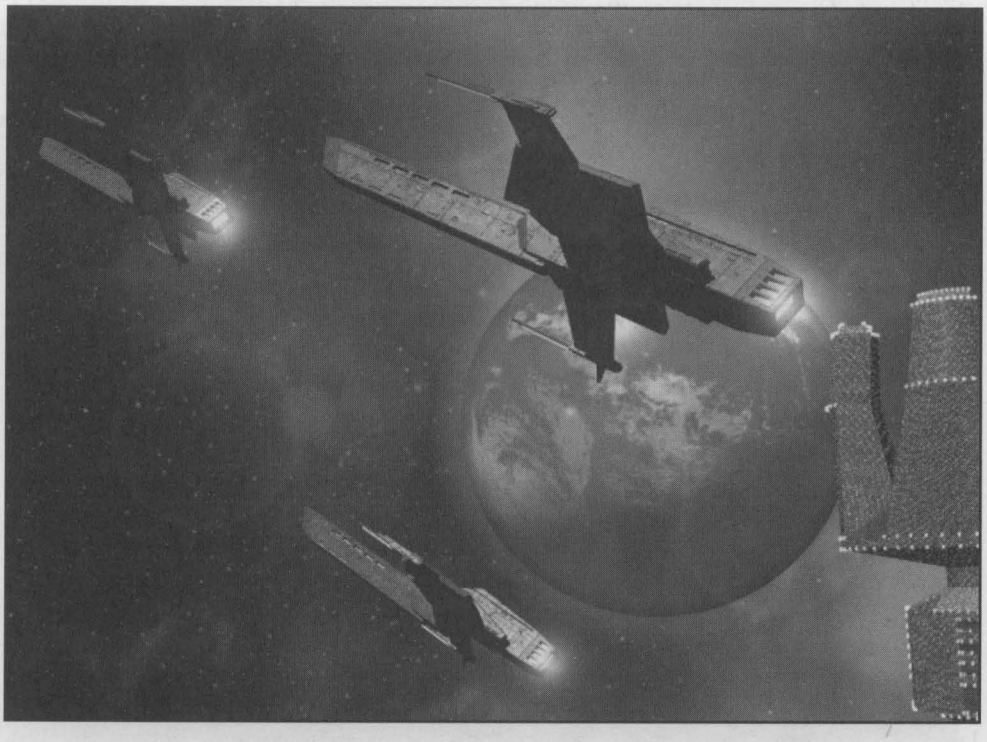
Ship mechanics can usually hold onto their jobs, for two reasons: Servicing is a key source of income for the port, and laid-off technicians are likely to hop the first ship to someplace with an opening, and may not be replaceable when times improve.

This is a second reason for labor shortages: a lack of properly trained personnel, especially in the technical trades. SPA can usually ship in enough brevet executives to cover any emergency, but there are only so many certified ship mechanics to be had.

Sometimes a shortage is due to industrial action. The issue of strikes, and of strikebreaking, may not be something GMs and players wish to deal with, but it can create unusual problems for travelers who thought they were just passing through. (See also *Union Dues* sidebar, p. 31.) Striking mechanics will probably not interfere with a ship's crew who do their own maintenance in a berth – the quarrel is with the port, not with them – but it may call for some polite explanations ("No, this is *our* ship.") and negotiations ("We don't have the right tools. We'd rather not rent them from the port while you people are out. That means we've got to buy them from somebody. Do you mind that?").

Sickbays

SPA ports feature complete medical facilities for port personnel and passengers alike. A sickbay module should be installed for at least every 1,000 weekly passengers and employees housed at each highport or downport building (round up). On worlds with limited medical resources, the SPA often will install larger sickbay complexes in its ports.



Highport Example: *Mertactor's highport has 3,000 employees serving 8,200 passengers weekly. It needs 12 sickbay modules taking up 12 spaces, massing 9 tons, and costing MCr1.92.*

Downport Example: *We decide to split the downport employees roughly evenly between the cargo and passenger terminals, with 1,500 in the cargo terminal and 1,215 in the passenger terminal. (Even though far more cargo comes through than passengers, passengers require a great deal more service, and many of the administration offices will be in the passenger terminal.) The cargo terminal needs 2 sickbay modules, taking up 2 spaces and costing MCr0.32. With 1,215 employees and 8,200 passengers, the passenger terminal needs 10 modules, taking up 10 spaces and costing MCr1.6.*

Utilities

Purchase these normally for highports, as well as downports that need to improve gravitational conditions.

Example: *The highport needs 1,000 utility modules, taking up 1,000 spaces, massing 11,500 tons, and costing MCr300. With a local gravity around 0.2 Gs, the downport (at least the passenger terminal) could stand to have utility modules as well, but we decide the need doesn't quite justify the expense.*

Meson Screens and Nuclear Dampers

Highports and downport buildings often have nuclear dampers installed, even if the last armed threat to the facility took place a century ago. The dampers work just as well against radioactive HAZMAT incidents as they do against warheads.

Meson screens are less common – an effective DR for installations as large as a highport would cost a great deal – but the Starport Authority has been known to justify the expense at certain key ports in the Spinward Marches. A common cost-cutting measure is to install meson screens for just critical nodes at the port.

These systems can be installed even at TL10 ports – the SPA retains access to TL12 components even when building at a lower TL, of course.

Highport Example: *Mercator can't really justify the expense of meson screens; each point of DR for the highport would cost about MCr0.26 and there's little cost-effectiveness in buying less than thousands of points of DR. We do install nuclear dampers, taking 1 space, massing 10 tons, and costing MCr4.*

Downport Example: *One nuclear-damper module protects a 10-mile radius, more than enough to cover all of the downport grounds. We install it in the passenger terminal at a cost of 1 space and MCr4.*

Vehicle Bays

Ports don't often incorporate vehicle bays; flexibility usually proves more important than saving space. Still, a major port built in an area with very regular starship schedules could realize substantial space savings by building custom bays rather than berths for regular customers.

More often, corporate tenants will sign a long-term lease for a given amount of space at the highport, then convert it to vehicle bays custom-fitted to their own craft. Starship lines with uniform fleets can enjoy substantial savings in port expenses using this strategy.

Example: *Neither the Mercator highport nor downport utilizes vehicle bays.*

Lab Modules

SPA ports rarely have any use for these, but other varieties of port may install vast laboratory complexes.

Example: *Neither the Mercator highport nor downport has lab facilities.*

Cockpit Systems, Low Berths, Jump Drives, and Passenger Couches

None of these starship and small-craft components usually have any place in a starport facility. Theoretically, a highport could mount a jump drive, but the practically nonexistent need would never justify the expense.

Naval highports sometimes incorporate great banks of low berths full of "frozen watch" personnel in times of crisis.

Stores and Supplies

Parts and logistical support for an entire year cost 0.5% of total starport revenue, and require 1 cargo hold (that will mass 1 ton when filled) for every MCr0.02 in value. These stores may be spread in any ratio among the port's various highports and downport buildings (to fill odd spaces that may begin creeping up at this point in the design process), though every installation should have at least 5% of the storage to fill immediate needs.

Example: *Mertactor's port needs MCr1,143× 0.005 or MCr5.72 in stores and supplies that will take up 286 hold spaces. We place 15 spaces worth in each of the highport and downport passenger terminal, with the remainder at the cargo terminal.*



Duty Free

"Duty free" shopping has puzzled travelers for centuries. It can be an outrage to buy a dozen bottles of good liquor on a trip only to be charged import duty on arrival at home.

What "duty free" means is that since the goods are intended to be consumed or used outside the country in which they are sold – indeed, they are only for sale to people who can prove they are about to leave the country – they are exempted from local use taxes. In many cases, the goods originate in another country, but since they have only been brought to the port, no import tax has been paid. In theory, this results in a lower price than the buyer would have to pay at retail.

Duty-free stores exist where local taxes (or outright bans) make them profitable. This is a matter both of the tax bite and the type of demand. If there is a 30% planetary luxury tax on fine wines, a portside store can sell bottles to departing travelers at the base price, or even 10% above, and do good business. This presumes that the wine will be drunk on the trip. If the tax were on, say, cameras, an item popular with leisure travelers, one would sell them only to people not expecting to return to this world – since local Customs would charge the tax anyway when the tourist got home. (The storekeeper might, of course, allow the tourist to buy the "cheap" camera without mentioning the homecoming surprise.)

There is no special advantage to duty-free shopping on worlds without import duties charged when leaving the port; thus they are never found on Imperial worlds.

Duty-free stores are usually owned by planetary locals, as most worlds do not charge import duty on money (corporate taxes are another matter). Others are run by interstellar, or at least off-world, corporations. Non-Imperial ports often operate duty-free for their own benefit (resulting in the curious situation of a government profiting from both its high import taxes and helping people to evade them).

The people who get the most out of duty-free shopping are starship crew members, who may go for years without ever crossing an XT line.

The Life of a Starport

Starports undergo a maturing process, reflecting the growth of the surrounding city, from an initial colony to a well-established facility with a history. This is true regardless of the size and type of port. This evolution follows five distinct stages; separate sections of the same port may be at different stages at the same time.

Development

When the starport is new, it has a raw, open vitality like nothing else. Every facility is either temporary or newly built, and construction is constant. People have to improvise and make do until full capabilities come online. Colony worlds grow up around the first (main) starport; the port city dominates growth in the early years and usually becomes the planetary capital in the end. The town outside the gate, therefore, is as raw and new as the port – entertainment is bound to be a little rough (the beginnings of Startown), but essentially open and not entirely unhealthy. This phase itself is temporary, but may be repeated in part at the groundbreaking of each new facility.

Maturity

As the city grows up, so does the starport. Construction is completed; eventually berthing capacity becomes saturated. The center of commercial and social activity in the city moves away from the old core around the starport. Outside the gate, the city gives way to purely starport-oriented businesses: warehouses, chandlers, freight consolidators, and an expanding Startown. The tone of the starport is businesslike and work proceeds with the utmost concern for efficiency. This is a stable phase, and many starports remain at their peak for centuries.

Decay

Eventually, the starport passes its peak. Perhaps demand exceeds the capacity to meet it, and a new facility is built, farther out from the city center. As the port ages, perhaps it becomes more economical to open a new facility than to continue to maintain the old one. Perhaps public perception of the port as seedy and run-down simply turns into self-fulfilling prophecy, as the former business of the port goes elsewhere. In its place come the marginals: old freighters, looking for a break on berthing costs; free traders who can no longer compete with the big liners at the main ports; and those whose business can least stand the scrutiny of the authorities.

Continued on next page . . .

Public, Staff, and Commercial Space

To this point, the port has everything it needs except "people space" – the facilities for passengers, SPA staff, and commercial tenants to go about their business. We'll add the essentials first, then leave the remaining space (if there *is* any remaining space, in the case of our cramped example port) for additional commercial exploitation.

Concourses

Concourses are the large passageways through which passengers move to reach their shuttle's or ship's gates, the nearest restroom, the baggage claim, etc. They tend to have high ceilings and are lined with rented-out retail outlets (bars, snack bars, newsstands, etc.). They also include departure lounges, though most passengers immediately board their ship and begin unpacking prior to departure. (Starships can't wait till the last minute to board everyone.)

Among the concessions, large starlines often have lounges reserved for the exclusive use of their passengers. All major ports have a VIP lounge for the use of any passenger requiring additional security: nobles, politicians, or sometimes criminals in custody.

Use the plaza habitat module (see p. 103) to represent concourses. Each major port should have 1 concourse per 5,000 weekly visitors, rounding up. (Alternatively, the GM may install fractions of a habitat module.)

Minor ports usually do not have concourses. They instead install 1 empty space (500 cf) per weekly visitor, representing hallways, probably a single waiting area, etc. Any retail presence will have to be installed individually for a minor port (whereas major ports can assume a certain number of shops are provided for in each concourse).

Highport Example: *Serving 8,200 passengers per week, the highport needs 2 plaza modules, taking up 20,000 spaces, massing 60,000 tons and costing MCr2.*

Downport Example: *Here's where our outmoded buildings begin to show their age. The passenger terminal doesn't have enough room left to fit the 2 concourse modules that it should have. For now we won't bother installing a fractional module; we settle for just one (leaving our downport passengers jostling elbow to elbow at the moment, but see p. 86). It takes up 10,000 spaces and costs MCr1.*

Offices and Work Areas

Every starport has a substantial percentage of administrators, many of whom only work the local equivalent of the "9 to 5" shift and leave an untended desk during other shifts. In addition, these modules suffice to represent more general work areas – employee cafeterias and dining halls, Security wardrooms, janitor's closets, and whatnot. In all, each major building must have 1 office module (see p. 103) for every 10 employees on site, including flight personnel,

Highport Example: *The highport employs 3,000, so it needs 300 office modules that take up 1,200 spaces, mass 1,062 tons, and cost MCr5.4.*

Downport Example: *We divided our downport employment pool into 1,500 at the cargo terminal and 1,215 at the passenger terminal on p. 82. The cargo terminal needs 150 office modules taking up 600 spaces and costing MCr2.7. The passenger terminal needs 122 taking up 488 spaces and costing MCr2.2.*

Equipment

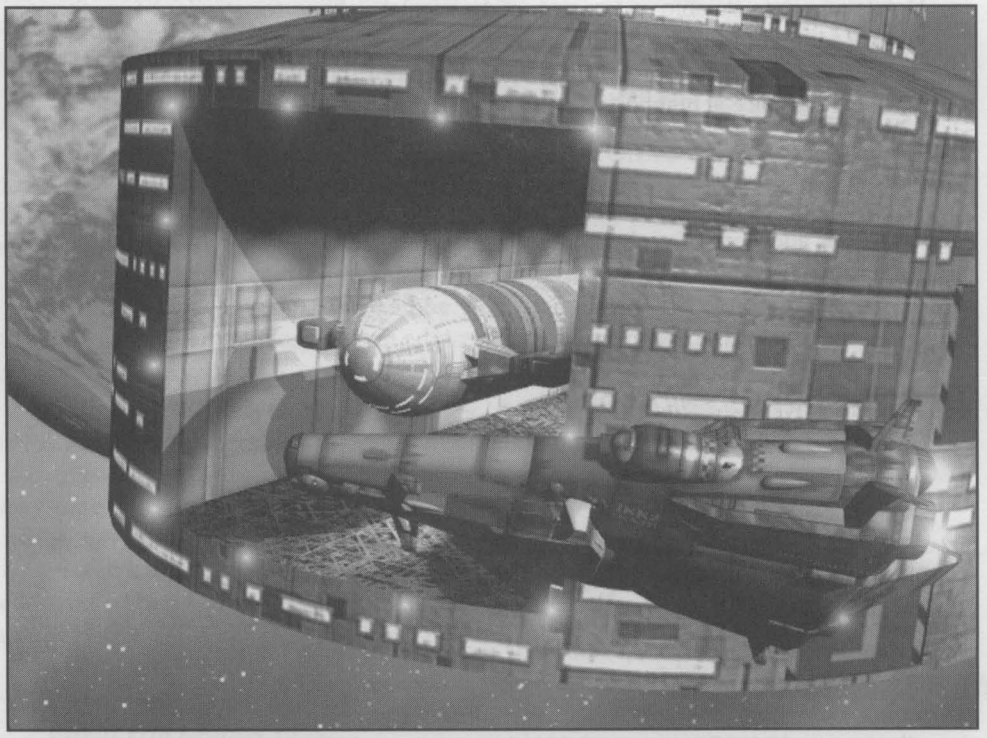
Starport staffs need the right equipment to do their jobs, from autobrooms for janitors to grav cruisers and sidearms for Security. Several examples of this gear can be found in Appendix A. Some equipment already has been purchased – most notably the small craft and non-starships needed to conduct starport business, and the tools port mechanics need to service visiting starships. Some equipment can be assumed to be present with the appropriate modules, but other examples won't be. For instance, a sickbay module will include "crash kits" and staple medical supplies, but a cargo module doesn't include a forklift.

Rather than catalog each additional item needed, the GM should spend 50% of annual revenue on general equipment. It has no volume, being stored in the already

purchased work areas when not in use. (For grav vehicles, work area becomes converted into a suitable berth area as appropriate.) Much of the heavy stuff (grav vehicles in particular) will be at the downport, so highport mass increases only 1 ton per MCr2 spent.

The GM may feel free to purchase actual inventory items from this fund, should he desire. Beyond this book, ***GURPS Traveller: Far Trader*** in particular describes useful stuff, as do the two ***Ultra-Tech*** books.

Example: *The Mertactor starport spends MCr571.5 on general equipment. This increases highport mass by 285.75 tons. All of the exoskeletons and ambulances, cookpots and laser pistols, will have to come from this fund.*



Detention Cells

Some starports will have cells for unruly patrons; some don't bother, contracting with local authorities to hold arrested personnel. Any existing cells are purchased as brig modules (see p. 103).

Example: *The Mertactor highport has two cells (8 spaces, 22.8 tons, MCr0.1).*

Housing

Highports that house staff (or others) on the grounds must provide housing. Most starports offer apartments purchased as starship staterooms at 8× normal volume. Starports with tight space offer small apartments treated as staterooms at 4× normal volume. Most downports, and those highports that can afford it, offer housing purchased as a housing habitat module (see p. 103) and are *very* popular with veteran SPA personnel.

Example: *The Mertactor starport includes no housing.*

Parks

Well-funded starports might offer a park to relieve traveler stress and anxiety. These are purchased as park habitat modules (see p. 103). Downports need not use interior space for the park unless on a hostile world.

Example: *The starport has no parks.*

The Life of a Starport

[Continued]

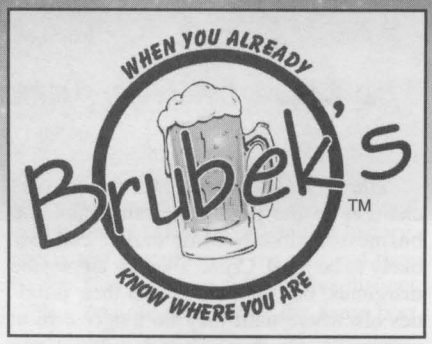
The city outside the gate reflects the changes in the port. Entertainments and businesses alike become darker and less likely to be legal. Crime abounds among the marginals, but the police keep their priorities elsewhere until they no longer dare to venture into the streets they abandoned long ago. This is the classic picture of startown, and the climax of its growth. This is also a stable state, and startowns have lasted unchanged long enough to become institutions in themselves.

Transition

Other, more legitimate but equally poor, elements move into the area eventually, seeking freedom and affordable infrastructure. Artists and students are the classic examples, but any marginal subculture might benefit. Whatever the motivation, the method is the same: Take over abandoned commercial property (perhaps even illegally, by squatting) and turn it into something new. Warehouses become studios, art galleries, and theaters; offices become funky little boutiques. The Startown begins to show a healthier side again – first at night, later in street festivals and open-air markets. As the light returns to the area around the port, the dregs move on to find the safe darkness again.

Renewal

The transition phase never lasts long – rarely even a single generation. As word spreads from the subculture to the mainstream, the investors and the imitators come. The startown becomes gentrified – the clubs and the shops are still there, but the real talent behind them is gone, driven out by rising property values, or co-opted. Now the old port receives back the life that it gave to the startown; investors restore the port, either to a facsimile of its "former glory" or to some wholly new vision. The "quaint, romantic" oldport becomes the principal passenger terminal in the starport complex. The rich and trendy board their private yachts, vacationers debark excursion shuttles from their orbiting liners, close to the new cultural center of the city. Small, general-purpose cargo vessels (read "free traders") may be diverted to the oldport when pads at the new commercial terminal are filled with larger (and more profitable) customers. This final stage may be stable as well, or may be followed by successive cycles of decay, transition, and renewal. This is especially the case when there are two or more competing "oldports."



Brubek's: "When You Already Know Where You Are"

Brubek's is a chain of starport taverns, located in Class V, IV, and a few III ports. Of the 200 units, half are in Solomani space, 20 in the Sword Worlds, and the rest scattered through the Imperium.

Along with food and drink, Brubek's sells familiarity. Every unit looks just like every other: same decor (dark wood, leather, and brass), same view (a holographic panorama of a Generic Big City by Night, on the wall to the left of the front door), same menu, same bottles behind the bar. It is a recreation of a romantic ideal . . . a neighborhood joint from the near-mythical pre-spaceflight days of Old Terra. Even the floorplan is always the same (see p. 87). The only difference is that some high-traffic locations get a slightly bigger Brubek's; the "modular expansion section" in the middle is repeated once or twice. Each module adds about 14′ of depth, giving room for four more tables and four more booths. But no Brubek's is ever *very* big. Behind the scenes, things will look different; the manager's office and the warehouse must fit into whatever space is available. Sometimes there's even a private room for very favored customers, maybe even with its own unmarked exit to the spaceport concourse. But most regulars not only don't know that, but wouldn't believe it unless they saw it.

All but a few of Brubek's employees are Human, and most of those are Solomani. There is no rule about this; it just reflects the "homeworld bar" nature of the place.

Brubek's brews its own beer (light, amber, dark, and porter) and ships it as a relatively stable concentrate. Patented machinery ensures precise reconstitution on-site; the device is backed up by the regulars (and Brubek's only has regulars) who know what the beer is supposed to taste like and will let everyone around know if it's "off."

The menu is basic: burgers with the usual options, skin-on fries, onion rings, and "bowl of red" chili (mild, hot, and fusion-core). There's also a green salad, but they don't serve many of them.

The clientele is mainly Solomani, with some other Humaniti and a number of Vargr (not surprising, given all that red meat).

Continued on next page . . .

Commercial Space

At this point we've completed our official needs for the starport. Whatever space is left will be available for tenants' commercial usage. Normally, this will be between 20% and 40% of the volume available in the highport hull and downport buildings.

If they wish, GMs can stop here, and assume an additional 2 stons highport mass per dton of commercial space. Or they can go ahead and figure out what commercial services are offered. Regardless, the SPA won't be paying the improvement costs, so the only concerns are volume and (at highports) mass.

Some common tenants and design notes about them:

Hotels

Hotels purchase starship staterooms, at 4× normal volume for standard fare, 8× normal volume for luxury suites, or half for slotshops. They may add bars, restaurants, conference rooms, swimming pools, etc. from the selection of modules on pp. 103-104. Hotels usually only rent space at highports, preferring to locate just off the downport site.

Warehouses

The SPA already offers long-term leases on the hold space already installed at each port, but additional freight storage taken from the commercially available space is not unknown. This usually consists of hold spaces and maybe one or two office modules. Particularly secure installations may add extra-tough walls and security systems; just add an appropriate mass (to represent the extra armor) to the highport mass.

Theaters/Entertainment

Stages and auditoriums may be purchased (and pooled if need be) on p. 104.

Factories

The SPA rarely places factories in its starports, other than shipyards, but many tenants do. The tenant would purchase these as factory habitat modules.

Highport Example: *The highport has 43,229 of its 500,000 spaces remaining. Hotel rooms numbering about 1,000 beds would be in order, so we add 900 standard rooms (14,400 spaces, 2,160 tons) and 100 luxury suites (3,200 spaces, 240 tons). A 10-module swimming pool (70 spaces including the precautionary spacedock modules described on p. 104, 270 tons) and 500 theater seats (100 spaces, 10.5 tons) will help entertain the guests. A factory habitat module (10,000 spaces, 50,000 tons) leased by a local consortium allows zero-gee manufacturing. An additional plaza module (10,000 spaces, 30,000 tons) will be dedicated solely to use as a shopping mall. The remaining 5,459 spaces will be rented out to the odd private shuttle service, warehouser, etc.*

Downport Example: *The cargo terminal has 3,087 spaces remaining and the passenger terminal 3,473. We decide that a single tenant has a partial factory habitat module installed at the cargo terminal, under a sweetheart deal agreed to by the local government to make duty-free export goods for Imperial Navy purchase. The commercial space in the passenger terminal will be filled with a partial plaza/concourse module, meeting some of the public-space needs we shortchanged on p. 84.*

Non-SPA Starport Needs

The proportions of various components in this chapter will vary at other starports, such as naval or scout bases, and some equipment not normally seen at commercial ports will be in place (see the modules list on pp. 103-104 for examples). The GM should freely adjust ports' contents to reflect their mission.

Step 9 – Proof Design vs. Budget

The starport does not need to meet its budget precisely, though any port well out of proportion to its budget will be a strain on SPA resources. Those under their budget will be a welcome relief, though one too far under suggests that it is underserving its system.

Example: *The Mercator highport ended up with a cost of MCr8,602.63. (And, incidentally, a mass of 479,095.53 tons.) The downport cargo terminal cost MCr46.57 and the passenger terminal MCr107.13. Various small crafts, non-starships, and other general expenses cost MCr2,496.95. The total is MCr11,253.28, or GCr11.25. Since our construction budget was GCr14.29, we're well under – but a major port on a relatively low-tech world* ***should*** *be well under, because it'll have to subsidize the same size of port on a higher-TL world.*

Step 10 – Allocate Personnel

Now that the physical port is finished, personnel can be distributed among the various departments. In doing so, usually the crew requirements for starship modules can be safely ignored – port personnel assigned to that function will greatly exceed the numbers given for safe starship operation. Still, these can be referenced as minimum staffing numbers should conflicts arise. Staffing can vary considerably, but in general each department has the following percentages of personnel:

Administration 8% (Executive 1%, The Line Office 0.5%, Concessions 1%, Legal 0.3%, Financial 1%, Personnel 1%, Labor Relations 1%, Records and Data Processing 0.2%, Public Relations 0.3%, Commercial Liaison 1%, Military Liaison 0.1%, Employee Residence 0.1%, and Contracting 0.5%).

Traffic 10% (Traffic Control 6%, Ship Registrar 0.3%, and Vehicular Control 3.7%).

Ship Services 25% (Berthing 1.5%, Fueling 0.5%, Stores and Provisioning 2%, Maintenance and Repair 4.5%, Housekeeping 1%, Certification 0.3%, Hiring Hall 0.2%, and Shipyard (if present) 15%).

Cargo 20%(Freight Handling 15%, Warehousing 4.5%, HAZMAT Storage 0.1%, Brokerage Office 0.3%, and Special Handling Unit 0.1%).

Passenger Services 12% (Hospitality 0.1%, Passenger Assistance 0.1%, Baggage 10%, and Passenger Transport 1.8%).

Security 2% (Tac teams vary widely and aren't often full time; Customs is separate service).

Medical 0.5%.

Emergency Services 0.5%.

Flight Operations 10%.

Physical Plant 12% (Engineering 5%, Power 2%, Data/Comm 1%, Transport 1.5%, Central Stores 1.5%, Commissary 0.5%, and Housekeeping 0.5%).

Example: *We can spot-check some numbers given what we already know of needs from our staff of 5,715. We've already kept a tally of flight crews, since they're best kept track of as the various small craft are purchased. We needed 485 personnel for transfer craft, 30 for employee shuttles, and 35 for the oiler that services the downport, for a total of 550 people. Comparing that to the formula's 10% of 5,715 suggests 572-550=22 personnel maintain the fuel blimps that supply the highport, which may be a bit low. Our nine traffic-control modules average needing six people each ×5 for full-time operation, or 270 people. The formula gives us 343, so 73 probably could be used elsewhere should the numbers appear low there.*

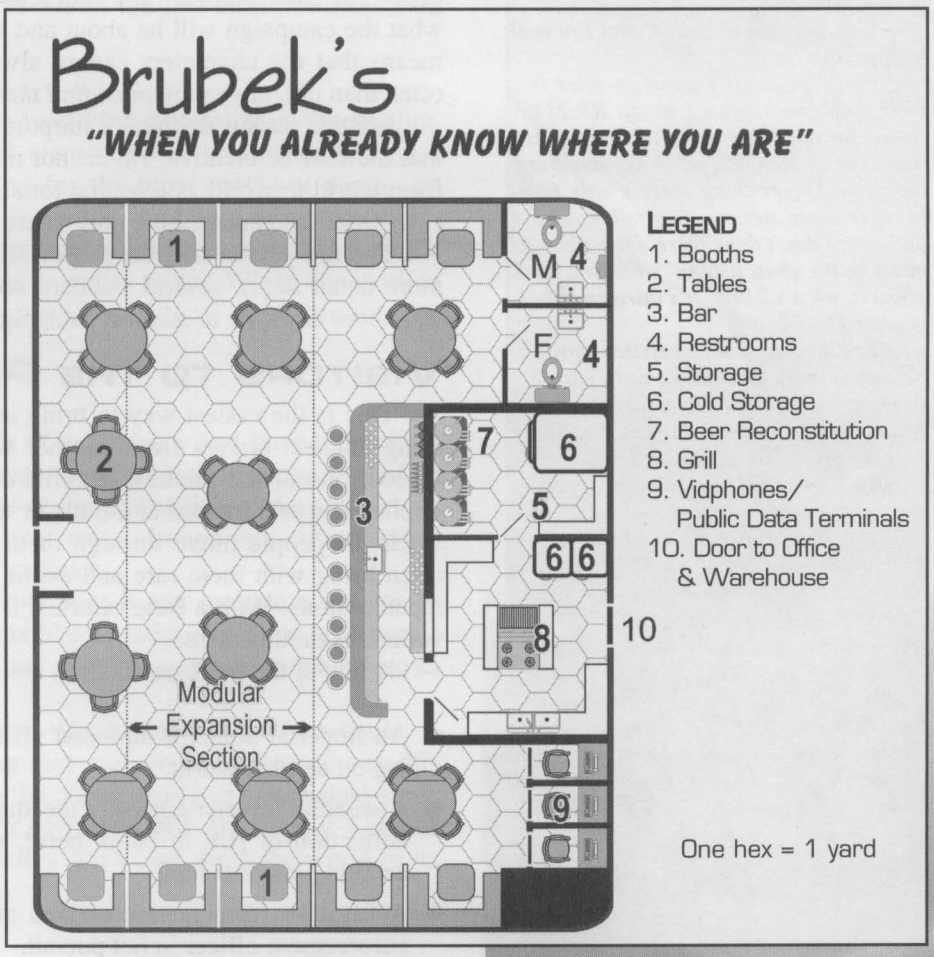
Brubek's

[Continued]

Weapons are tolerated in Brubek's, but violence is not, not even the typical starport-bar "brawling." People go there to relax; there are plenty of taverns one can visit for a fight. Lucky violators of this rule will be ejected by the staff; unlucky ones will get the bum's rush from the customers.

Because of this calm atmosphere, Brubek's is an excellent place to meet contacts or patrons. The bartenders hear a great deal of gossip – probably more than the average, since the customers feel more "at home" than at less familiar places – and while they're expected to politely keep secrets, they'll normally cooperate with legitimate investigators, or adventurers in a sufficiently noble cause.

For free traders, a contract to supply Brubek's branches (the "Brubek's Brew and Burger Bus") can be a good way to pay the bills; a typical major-port unit uses 500 gallons of beer concentrate and 1,000 pounds of ground beef a week (1 dton/month). Because of the standard nature of the units, a complete facility, including furniture, carpets, and the beer machinery ("Bek's in a Box"), can be shipped to a new franchise site in two 20′ 4C containers (8 displacement tons and 36 standard tons total).



Starport/Starship Components

Much of the following starship or small craft components will be found in use at Imperial starports.

Cutter/Modular Components

Base Station Module: This module is designed to be carried by a standard 50-dton modular cutter (see p. GT142).

One of these modules is the minimum configuration for a Class I starport. The module contains three staterooms, an office module (see p. 104), and a power/control room containing a fusion power supply, controls for landing lights and other external equipment, and a transmitter. It has unlimited endurance as long as food stores hold out. The general manager has single-occupancy quarters; any other officers take single or double as required. Unused staterooms are used for additional storage, and one may be removed for more living/working space. The other is usually retained for use by "visiting firemen" (scouts, couriers, and so on).

- **Crew:** None in flight. At least one in ground service.
- **Design:** 30-dton SL Hull, DR 100. Modules, 1 Basic Bridge, 1 Engineering, 4.5 Cargo.
- **Statistics:** EMass 47, LMass 70, Cost: MCr4.9, HP: 6,000. Size Modifier: +7.
- **Performance:** When attached to modular cutter, Accel 3.3 Gs, Air Speed 2,353.

Habitat Modules

In addition to starports, some large vessels (such as colony ships and space stations) contain large urban or green areas inside them. Each module described below is about the size of a city block and includes lighting, temperature control, air recycling, and a "slice" of power plant.

Housing

This module contains one or more apartment buildings or a few dozen houses, plus grounds, walkways, etc., providing long-term accommodation for up to 100 people (half that many in luxury, twice that many in cramped conditions).

Factory

A large industrial park, capable of operating efficiently with a few dozen workers or robots. Contains warehouses, minifacs, etc.

Farm

An acre or so of open space with a few buildings devoted to agriculture and food processing. Up to 10 people or robots can work it effectively; each worker can grow food to feed 10 people. Using crop rotation, the farm can serve as total life support (providing air, food, and water) for about 100 people.

Park

A landscaped green space, possibly with entertainment or exercise facilities (pool, stream, swings, etc.). In a pinch, it can provide camp grounds for about 100 people.

Plaza

A mall or concourse area, with about a dozen medium establishments, plus open space for several hundred people to congregate.

TL	Module	Space	Mass	Cost (MCr)
10+	Farm	10,000	20,000	0.5
10+	Factory	10,000	50,000	10.1
10+	Housing	10,000	40,000	1.0
10+	Park	10,000	20,000	0.2
10+	Plaza	10,000	30,000	1.0

Editor's Note: The habitat modules are based upon those in ***GURPS Space***, pp. 124-125. The above include "power-plant slices" to make them conform to ***GURPS Traveller*** needs, however. The relatively tiny increase in mass has been ignored, and the equally small volume requirements are assumed to be taken from existing access space. The cost of power requirements has been added where it applies.

Standard Modules

Brig: This is an ordinary stateroom equipped with reinforced walls and door (DR 200), restraints, and a high-security alarm and observation system. It normally holds 1-2 people. Up to 50 could be crammed in for a limited time, but this will overwhelm the two-person life support. A ship or starport with one or two brigs usually will monitor them from the bridge. A larger number of brigs probably will have its own dedicated security station.

Bunkroom: Bunks for 16 personnel, with life support, under very cramped conditions. Imperial protocol is to load only four passengers per bunkroom, except for missions of very short duration or emergencies.

Communications: A scout-base staple, this TL12 module contains a single massive laser communicator, with 10 million miles transmission range and 10 times that in reception. There are three hardened, high-capacity mainframe computers, 50 terabytes of hardened data storage with double backups, and an energy bank with five hours operational capacity. The module is designed for high redundancy, with the three computers all checking the others' results and the three sets of data stored in different locations. The laser communicator is used for its very high bandwidth. Even with the usual high level of encryption and error-correction on the signal, the module can upload or download its entire storage capacity in about an hour. The equivalent TL10 module has the same size and cost, but carries only 500 gigabytes of data.

External Cradle: These are placed on the hull of a starship or starport. Each module clamps 125 standard tons of another vehicle onto the hull. Modules can be combined to form larger cradles, or installed in 0.5-displacement ton increments for smaller versions. Vehicles carried this way aren't counted against the ship's internal spaces, but must still be included in any jump-drive requirements. They are not protected by the ship's armor.

Hall, Bar, or Conference Room: A large room with tables. Usable as a restaurant, bar, conference room, etc. It can comfortably accommodate 100 people per module (smaller lounges and conference rooms are included in stateroom volume). Weight and cost include furnishings.

Information Center: A TL12 high-tech military-style operations room for 10-20 people, this is often found in Imperial Navy starports. Has workstations, a sophisticated array of electronic mapping and display tables (which function as a fire direction center), plus several dozen digital cameras for video teleconferencing. The module also includes a hardened Complexity 8 macroframe computer and 10 terminals for running high-end analysis programs like Expert (Tactics), Transmission Profiling, and Traffic Analysis.

Morgue: This includes space for 20 sets of battledress and accessories such as flight packs, with room for maintenance and loading.

Office: Each office module holds four offices, with room for three visitors each, *or* 16 cubicles with no room for visitors. Includes full life-support for 16 and space for conference rooms, office-supply storage, etc.

Small-Craft Bridge Add-On: This module can be used *instead* of an engineering module on craft equipped with a basic bridge. Includes fusion-power startup, full life support for five, and a two-main airlock. The TL12 version also includes one bunk.

Stage: A 20′×20′ stage area with high ceilings, usable for dancing, plays, nightclub acts, and so on. Includes sophisticated lighting and sound systems. Normally attached to a hall or theater containing the audience.

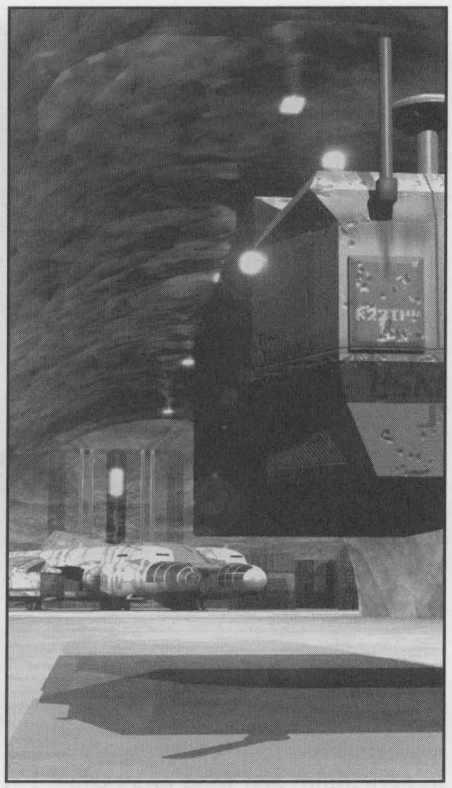
Swimming Pool: Starports and large commercial ships will often have swimming pools. Includes 100 sf of pool (10′ deep), 100 sf of deck area, and overhead clearance. Multiple modules can be combined to make larger pools. Finished design should add one spacedock module per complete pool, to contain the water in case of loss of artificial gravity.

Theater: A small auditorium with 100 roomy seats for the audience, a large holoprojector, and an operator's workstation. Can be used for entertainment, for presentations, or as a briefing or situation room. The holoprojector can be stowed, if desired, but a stage is not included.

Traffic Control: This module contains four sets of astronomical instruments, four high-resolution planetary survey arrays, a mainframe computer, eight roomy crew stations with computer terminals, and a "traffic center" with sophisticated holographic-projection devices. This allows the traffic controllers to create visualizations of incoming data.

MODULE TABLE

Type of Module	Spaces	Mass	Cost (MCr)	Crew
Brig (1-2 occupants)				
TL10	4	11.4	0.052	†
TL12	4	5.6	0.03	†
Bunkroom				
TL10	4	4.8	0.018	0
TL12	4	1.92	0.018	0
Communications	12	138.1	3.83	0-1
External Cradle	1*	12.5*	0.25*	0
Hall, Bar, Conference	10	0.2	0.003	†
Information Center	4	3	2.8	10-20
Morgue	1	28.75	0	0
Office				
TL10	4	3.54	0.018	†
TL12	4	1.92	0.009	†
Small-Craft Bridge Add-On				
TL10	0.5	1.96	0.32	0
TL12	0.5	1.4	0.16	0
Stage	16	0.5	0.004	†
Swimming Pool	6	27/1.5**	0.031	†
Theater	20	2.1	0.015	†
Traffic Control				
TL10	4	7.4	12.66	4-8
TL12	4	5.4	7.63	4-8



* per 125 standard tons of ship to be carried. External cradles count against the turret-mounted weapons limit at a rate of 3 modules per 1 turret.

** First figure is filled mass; second is empty. Should have 1 spacedock module per pool module in highport or starship.

† varies and/or GM's discretion. Many of these modules are passenger services, and usually the GM can safely rule that a ship's standard complement of stewards fulfills the crew needs. (For instance, a passenger liner with a swimming pool will require a lifeguard, but those swimmers would be requesting some other service if they weren't swimming. In terms of personnel needs, it's a wash.) In other circumstances, bartenders, actors, and such will need to be added to the standard ship's personnel, particularly on ships that normally carry only a handful of stewards.

Chapter One

Starships

Consider how often we take the parameters of interstellar technology for granted. It's true that the workings of the jump drive are so perplexing that very few civilizations have ever developed it independently. Aside from that obstacle, however, almost everything about interstellar travel is easy. Once the jump drive is known, it can be built by relatively primitive cultures. It requires no extraordinary skill to maintain or use. It can be installed in ships small and simple enough to be operated by a single crewman. Its operating costs are well within the reach even of individual entrepreneurs.

As a result, interstellar travel is within the reach of common individuals everywhere in Charted Space. We can afford to use it for the most prosaic purposes: warfare, trade in basic commodities, migration, even idle tourism.

There's no obvious reason why this had to be the case. Suppose interstellar travel cost the equivalent of billions of credits per ton-parsec, could not be accomplished by ships smaller than flying mountains, and required skills only a tiny fraction of Humans could master. History would have been utterly different – assuming that an interstellar civilization could be built at all, under such circumstances.

– Sir Shamash Thomas,
An Overview of Imperial History

Starships bind the Imperium together. Millions of starships are registered within Imperial space, carrying cargo and passengers, protecting the trade lanes, helping Imperial citizens go about their business. Most citizens will never travel from one world to another – but starship stories fill the Imperial news and entertainment channels, giving every citizen a picture of what life aboard is like. Every citizen knows *something* about the ships that carry goods and passengers, protect the trade routes, or explore new worlds. Starships are romantic, promising the freedom to travel widely, visit exotic places, take part in a millennia-old tradition, and make one's personal fortune.

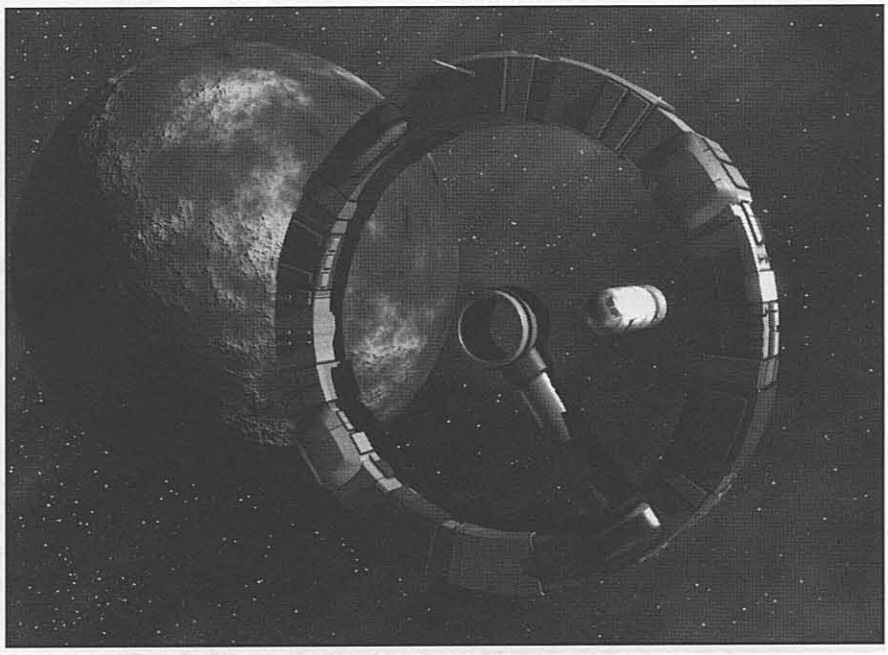
Traveller revolves around starships. Almost every adventuring party will spend much of its time making its way from one world to the next via starship. Perhaps only one member of the group will own a ship (or at least *control* it, in the case of a detached Scout). Or the adventurers may be part owners in a merchant starship. Or the GM may turn the acquisition of a ship into an adventure, making would-be starfarers earn their wings.

Adventuring without a ship is possible, but the campaign takes on a radically different nature (which some players may prefer). The focus changes from interstellar to interplanetary (or single-planet) situations, and the group tends to linger in one system or on one world. The group can take passage on NPC-operated starships, stow away, or otherwise arrange to travel from world to world – but this cannot always be done freely, at the will of the adventurers.

The Starship Environment

In ***Traveller***, a starship is defined as a spacecraft capable of faster-than-light travel. Because there is only one means of FTL travel in ***Traveller***, this specifically means any spacegoing vessel that has a jump drive. Slower-than-light generation ships can engage in interstellar travel, but are not called starships because they do not use jump drives. Such vessels are obsolete. Battle riders are large, extremely powerful ships of the line, but they have no jump drive, and thus are not starships.

A starship presents an artificial environment which spends much of its time utterly isolated from the wider universe. Crewmen and passengers coming aboard for the first time will find much of it unfamiliar, despite efforts to make it safe and comfortable.



Size Range

A starship must displace at least 100 dtons (see p. 12) in order to use a jump drive. The most common starship of this size is the *Suleiman*-class scout/courier, used by the IISS and by detached scouts throughout the Imperium and beyond. Coming in a close second is the 100-dton express boat (Xboat).

The upper limits of starship size have yet to be reached, but current theory places the maximum size of a starship between 1.5 million and 2.5 million dtons – although some engineers claim that there is no real upper limit.

Starship Structure

Every starship has a *hull*, a main body or shell which acts to contain the ship's components and payload. The hull always carries some armor to protect against meteor impact and other natural hazards. It may or may not carry extra armor to protect against combat damage.

The hull is internally divided into *compartments*, each of which contains some of the ship's components or provides space for payload. Compartments are separated by *bulkheads*, *decks*, and *partitions*. Decks are usually perpendicular to the onboard artificial gravity's "down" axis, while bulkheads and partitions are parallel to it. More intuitively, one walks on the decks and opens doors set into the bulkheads and partitions.

Bulkheads are structural elements of the ship and can withstand differences in air pressure on either side. A compartment which is sealed by bulkheads will maintain its internal environment even if there is a hull breach in an adjacent area. Bulkheads are used to surround very important or dangerous areas of the ship, such as the bridge, the engineering compartment, or the block of crew quarters. Bulkheads cannot be moved around the ship without a significant amount of work at a shipyard.

Partitions are simple walls, serving to divide compartments without being airtight. They can easily be moved from place to place by a mechanic-and-electrician team. As a result, different ships (even of the same class) can have different internal arrangements.

Common Ship's Systems

A variety of equipment and systems will be found inside the hull of any starship, all designed to provide basic support to the vessel and help fulfill its intended function. Each ship's internal design is different, but certain systems are common to almost all starships.

Almost all starships will have one or more *power plants*. In the present-day Third Imperium, these are usually reliable, long-lasting fusion installations. There may be backup power plants or energy banks using other technologies. The power plant is the basic energy source for all other ship's systems.

Most starships will have a *maneuver drive*. This system permits the vessel to travel under power through normal space. Maneuver drives can make use of a variety of technologies (see Chapter 4), but most Imperial starships use reactionless thrusters. Thrusters require no fuel, instead converting energy from the ship's power plant directly into motive thrust.

By definition, all ***Traveller*** starships will have a *jump drive*. The jump drive is the key to interstellar travel. It permits starships to traverse interstellar distances in reasonable time, by taking "short cuts" through an alternate dimension called *jumpspace*. Jump drives use power-plant energy, but they also use hydrogen fuel which is expended in the course of the jump. Jump drives are rated according to their operating range; a jump-1 drive can move its starship one parsec at a time, while a jump-6 drive can make six-parsec jumps. A controlled jump of more than six parsecs is theoretically impossible, although starships occasionally jump further as a result of "misjump" accidents. High-rated jump drives are very expensive and use vast quantities of fuel, so only courier and military vessels routinely use higher than jump-3.

Starships usually mount *communications* and *sensor* equipment. Most of this equipment uses very old technology for manipulating the electromagnetic spectrum: radios, communication lasers, telescopes, radar, and so on. More exotic electronics, such as meson communicators and gravitic sensors, are available on high-technology worlds. In ***Traveller***, all sensors and communications in normal space are restricted to lightspeed; as a result, interstellar communication is usually handled by courier starship.

Many starships are armed. Starships can use a variety of beam weapons such as laser cannon, particle accelerators, meson guns, plasma guns, or fusion guns. Many starships also use missiles. Small weapon systems can be mounted in *turrets* on a starship's hull. Large warships are often designed around *spinal mounts*, gigantic beam weapons that are aimed by turning the entire ship.

To defend against attack, starships use a variety of techniques. *Sandcasters* can be used to fill nearby space with prismatic particles, providing some protection against laser weapons. At high levels of technology, a ship can use force screens such as *meson screens* or *black globes* to protect against beam weapons. Ships' beams weapons also can be used in a defensive role, to shoot down any incoming missiles. Very advanced ships can use *repulsors* to deflect missiles or *nuclear dampers* to prevent nuclear explosives from working.

Many starships carry smaller craft on board as auxiliary vehicles. Auxiliaries give a starship greater flexibility, permitting cargo, fuel, or passengers to be carried where the starship itself can't go. Some starships (such as fighter-wing carriers) are designed entirely around their carried craft.

Internal Appearance

In Imperial starships, most spaces have carpeting on the floor; some have carpet on the walls as well (for greater comfort, and for safety in case of violent maneuvers). This carpet is usually in a neutral color, and is always designed to be easy to clean. The carpeting in crew or passenger living areas will usually be softer and more plush. Compartments which normally contain heavy machinery or cargo (especially the engineering compartment) will have gratings or bare deck plating, instead.

Living quarters will usually have "programmable walls," large vision screens that can display any pattern or image desired. The default setting for such walls may be "bare deck plating," but they can also simulate wood paneling or other attractive surfaces if desired. Programmable walls are tied into the Ship's Information System (p. 8) and can serve as elaborate display systems for games or passive entertainment. They also serve an important function during ship emergencies, displaying critical information or evacuation directions.

Most spaces have light panels recessed into the ceiling, providing soft indirect light. Emergency lights are also set into the ceiling, ready to activate using internal battery power should the ship's power grid shut down. A few compartments are normally set to "low lights," in order to make holographic imagery stand out more clearly.

Most compartments on any starship are kept bare and uncluttered – a messy area is inefficient, and can become a safety hazard in an emergency. Living areas will usually have a few pieces of furniture, often permanently fixed to the walls or floor. Some starships provide small hanging baskets, potted plants, aquaria, or other items to give a sense of nature amid the blatantly artificial environment. These are often affixed to stable surfaces using adhesive patches which have the strength of welds until released with a specific tool.

Noise

Starships are inherently noisy places, especially when certain areas are busy (such as cargo bays, flight decks, or weapons compartments). A ship's drives are particularly loud. In the drive compartments, engineers and mechanics normally wear soundproof ear protection with active noise suppression and built-in communications gear. Elsewhere in the ship, baffling and soundproofing tend to deaden the noise of the drives; experienced crew and passengers can still tell something of how the ship is maneuvering if they listen carefully.

Smells

Although life-support systems at TL10 and up are quite good, the problem of providing clean air is never-ending. Providing the proper gas mix is relatively easy, and the gas mix can even be varied from one airtight compartment to the next, if necessary. Making sure the ship *smells* pleasant can be much harder. No matter how much the air is filtered, no matter how well crew and passengers observe cleanliness rules, stale and unpleasant smells tend to build up throughout a voyage. Some ship classes (notably the *Suleiman*-class scout ship) are notorious for this, while others (especially passenger liners) are designed to minimize the problem.

A few ships use special measures to keep the air pleasant. Plant hangings and hydroponics equipment can provide some "natural" recycling. Some ships (notably those with K'kree crews) use artificial scents. Others use ionizers to push negative ions into the circulating air; most oxygen-breathing sophonts, especially Humans, find that this makes the air more bracing and agreeable to breathe.

Viewports

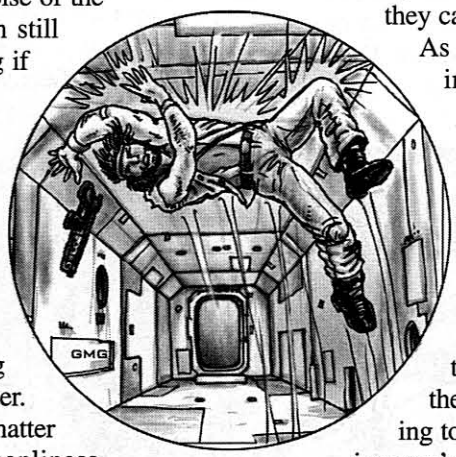
Many civilian ships include viewports, constructed of a high-strength polymer designed to be almost as resistant to damage as the hull (DR 80). This material is not strong enough to equal the protective armor used by military starships. All viewports are installed with opaque shutters, so that they can be closed while the starship is in jump space. Exterior displays in passenger compartments are usually electronic (and on some vessels are prerecorded in case weather conditions do not allow a perfect view of the takeoff).

On military vessels, viewports are unnecessary and dangerous weak spots in the vessel's hull. Views of the outside are provided by electronic displays, instead.

Gravity

All modern starships use artificial gravity plates in the decking. These systems can be very finely controlled, to the point of permitting every compartment to set the strength of its own gravity field. Most ships rarely make much use of this feature; indeed, crew and passengers are discouraged from changing gravity settings frivolously.

Sudden changes in gravity can be extremely dangerous. In fact, they can be used as a weapon in shipboard combat. Boarders or hijackers can be injured or effectively immobilized by being intermittently pulled to the floor, ceiling, and walls (this is sometimes called "grav pong" by Marines). Of course, if boarders gain control over ship's gravity, they can use the same tactic against the crew. As a result, the artificial gravity controls in each compartment usually include safety interlocks to prevent rapid changes in setting. These can be overridden from the bridge or other crew strongpoints, but the overrides themselves are carefully protected by access codes.



Merchant ships will often slowly adjust the internal gravity during the week of a voyage, matching that of the world of departure at first, then moving to match that of the destination world at journey's end. Imperial military ships usually maintain a consistent 1 G field at all times.

Shipboard Information Service

Every starship is run by computer, from the powerful mainframes that act as the ship's "main computer," to the swarm of small dedicated processors that are built into every workstation and stateroom. All of these computers are networked, and the entire network supports a software structure called the "Shipboard Information Service."

The SIS is a set of protocols and software applications that permit flexible information interchange among computers, crew, and passengers. Using it, those on board can call up a tremendous variety of information: systems readouts "echoed" from the bridge or engineering compartment; text or voice messages from other crewmen or passengers; information about scheduled events, entertainment programs, library data, or correspondence courses; and so on.

Whether the starship is a vast Imperial dreadnought or a small tramp trader, the SIS is a vital part of ship operations. It acts as a primary interface for ship's controls – but more importantly, it has a significant effect on crew and passenger morale. It can help a ship's inhabitants form a viable community. It can also *keep them occupied*, a critical factor when a dozen (or a thousand) sophonts are forced to live with one another in a tiny container for a week in jump space.

Compartments

A new crewman aboard any starship will soon learn how to find his way around. Within the Imperium, even the smallest starships use an alphanumeric system to "name" individual compartments, corridors, and other spaces. This system originates in the Imperial Navy, but is also maintained by the Imperial Ministry of Commerce as a standard for privately owned starships. As a result, even a new spacehand will soon find himself able to glance at a wall or door plate, determine where he is, and guess how to get to where he needs to be.

On any starship, many of the compartments are "generic" in nature, corridors or spaces that serve only as storage or as a means of moving around inside the hull. Other compartments serve special purposes of their own.

Bridge

The *bridge* is the primary control center of the starship, the place where all orders regarding the ship's movements and routine originate. It contains workstations for the pilot, astrogator, sensor officer, communications officer, and possibly a variety of other officers depending on the ship's size and function. (For instance, military starships often will have at least one weapons officer on the bridge.) The ship's computer and almost all of its important instruments will all have controls on the bridge.

When a starship is underway, the captain will spend most of his time on the bridge. When he can't be there, he will usually designate a watch officer (or "officer of the deck") to keep an eye on the controls and readouts. Other officers may be present, depending on the ship's current situation and how many workstations must be manned full-time (see *Watchbills*, p. 113).

Access to the bridge is often restricted. On large or military ships, non-watch crewmen must usually request permission to enter the bridge. Small private vessels are sometimes less formal, but even they usually avoid having too many unnecessary people on the bridge at any one time.

The captain usually maintains an office somewhere on the starship, either adjacent to the bridge or near (or in) his own quarters. On large ships, other senior staff will also have their own offices. Ordinary crewmen who don't have business on the bridge are more likely to seek out the senior officers in their offices.

While in theory the bridge functions could be decentralized, fast personal communication in emergencies outweighs any advantage of a decentralized nervous system. Large starships may decentralize somewhat by installing *auxiliary bridges*, either as a backup to the main bridge or to serve similar command-and-control functions. Large warships designed as command vessels may have a *flag bridge,* from which the admiral in command of a whole formation can work. Some ships also have a *combat information center* where large amounts of tactical information can be gathered, processed, and handed on to the captain or admiral in command.

At any time when a starship is manned but not under way, the bridge may be left empty while control shifts to another part of the ship. In such cases, a *quarterdeck* is defined – a marked-off area which is manned by the current watch officer and his staff.



Workstations

Every starship has one or more *workstations* on board. Critical ship's systems are controlled from workstations on the bridge and in the engineering spaces. Large starships may have workstations in many different compartments.

A workstation consists of a single acceleration couch and a set of displays and control panels, permitting a crewman to operate one or more ship's systems. Most workstations will be found in control areas like the bridge, auxiliary bridges, weapons stations, and the drive compartment. Large ships may have workstations dedicated to minor functions that are not treated independently on smaller ships.

Dynamic Configuration

Most starship workstations in the Imperium (at TL9 and up) use *dynamic configuration*. Such workstations do not have actual buttons or switches; instead, the entire control panel is a touch-sensitive pad, layered over a back-lighted display on which individual controls are marked. Some control areas or displays can also be projected holographically above the control panel. The placement of controls is managed by the workstation's local dedicated computer, and can be changed at will.

Under this system, each workstation panel has a default configuration, but each crewman can rearrange the controls and telltales to suit his own preferred work style. The goal is to make the controls as intuitive as possible for the crewman involved, minimizing mistakes and permitting him to watch the displays instead of his hands. Personal (or racial) preferences can easily be accommodated. Each configuration can be stored and called up at a moment's notice.

For example, the communications board may normally have radio tuning controls on the left, transmission controls in the center, and aiming controls for a laser communicator on the right. Regardless, the communications officer can rearrange things to suit his preferences. He could push the laser controls down to a lower "layer" of the display, making them invisible except when he actually needs them. Meanwhile, the radio-tuning and -transmission controls could be expanded to cover the entire panel, and rearranged to place the most-used controls under the officer's hands.

Dynamic configurations even allow workstation functions to be "shared," so that ship's systems can be controlled from different workstations as needed. In theory, the pilot could work from any workstation on the ship. Two or three major functions could be pushed onto a single workstation and handled by a single officer. In practice, such rearrangements are rarely used except in emergencies (such as when a ship is badly undermanned).

Engineering

Every starship's engineering department is responsible for maintenance and repair of systems all over the ship (and even outside the hull). As a result, many of a ship's compartments may be designated as "engineering spaces." The working heart of any starship, however, is the compartments containing maneuver-drive, jump-drive, and power-plant components. There can be several of these compartments, especially on large starships which may have multiple maneuver drives or power plants. All of them are under the control of the engineering department, and share similar features.

Drive and power-plant compartments are quite austere. Instead of carpeting, there will be bare deck plating or grillwork, with plenty of panels providing access to machinery in the decks themselves. There will be ladders and catwalks, giving access to hard-to-reach parts of the drive or power plant. The lighting will be bright and harsh, in comparison to the soft, indirect lighting found elsewhere on board. Aside from any workstations which are present, there will be no place to sit or lie down, and no extraneous furniture. The walls will be thick bulkheads, with soundproofing to help reduce noise; they will be broken up by tool bays, storage for spare parts, fire extinguishers, vacc suit lockers, and other utilitarian items.

Like the bridge, the drive compartments are usually off-limits to personnel who have no legitimate business there. The chief engineer (and his senior mates, on ships with large engineering crews) will maintain offices somewhere on the ship for routine business. On large starships, the engineering department will have whole compartments devoted to electrical shops, machine shops, and so on. These compartments will normally be more accessible to casual visitors.

Cargo Hold

Cargo holds are also very spartan places. The decks are bare plating, marked with guide lines for the placement of cargo containers. Ceilings are usually lattice-work, with lighting panels well inset so that mishandled cargo will not crush them. There will be plenty of mechanical fixture points, permitting cargo containers to be firmly locked to the deck or walls. An empty hold is a large space, full of echoes as sounds reverberate from the bare surfaces. A full hold is occupied by rows (or even stacks, on large freighters) of standardized cargo containers, each bearing its own corporate logo, handling markings, and manifest pad.

Each cargo ship usually has at least one "cargo office," placed close to the most likely entry point for cargo containers. This small office will contain a workstation, permitting the cargomaster to register cargo and plan how to place it in the hold. The cargo office is often designated as the quarterdeck (p. 8) when a ship is in port and the bridge has been left unmanned. In this case, the most critical readouts from the bridge are "echoed" to the cargo-office workstation, so that the captain or watch officer can deal with situations as they arise.

Cargo holds are rarely placed off-limits to any crew. Indeed, new apprentices on a merchant ship are likely to spend more time there than they would like!

Freshers

On most Human-designed starships, a "fresher" will be present in each stateroom, off each crew or passenger lounge, and in some other compartments, as well. A standard starship fresher is remarkably compact. Although it provides all the necessary equipment for a full-body shower or the relief of biological needs, it is rarely bigger than a coat closet. One person in a fresher will feel cramped. Two will feel crushed.

Although most Imperial starships have superb water-recycling systems, their water-*storage* capacity is limited. Freshers are usually engineered to use as little water as possible. Long, hot showers are usually possible, but actual bathing is out of the question except on the most luxurious (and expensive) passenger liners.

Crew Quarters

Crew members will spend almost all their off-duty time in crew quarters. In the Third Imperium, only the most cramped military starships will require crew to use bunkrooms. Most enlisted or apprenticed crewmen will live two to the stateroom, while senior officers will have their own staterooms (often with attached office space). On large ships, crewmen who work in the same department and are at about the same rank are usually assigned to bunk together.

In a crew stateroom, each crewman will have a single bed with a storage locker built into the base, and a computer terminal that can be used either for entertainment or for authorized access to ship's systems. (Of course, authorization varies widely depending on the crew position held.) There will be no loose furniture, but there may be at least one chair bolted to the floor, and there will probably be fold-down tables and locking cabinets set into the walls. Every crew stateroom will have a locker with vacc suits and other emergency gear.

Even a small starship will usually have at least one crew lounge, with tables, chairs, entertainment consoles, and exercise gear. Crew lounges are critical for crew morale, and often provide the best venue for formal meetings. If there is more than one crew lounge, each may be dedicated to a specific subset of the crew – an officers' lounge, a petty officers' lounge, an engineering department lounge, and so on. On military vessels, the largest officers' lounge is usually called the *wardroom.*

On small ships, a crew lounge may have an attached kitchen area. On larger ships, whole compartments are set aside for food storage and galley equipment. Away from the crew lounge, crewmen can still get small snacks or drinks, as needed. For example, the bridge and engineering spaces will often include small refrigerators and drink-making equipment for the convenience of crewmen on duty.

All but the smallest ships have a sickbay, usually attached to the crew quarters. If a starship has a bank of low berths, these are usually close to the sickbay (or to the crew lounge if there is no sickbay).

As one might expect, access to crew quarters is almost unrestricted. This is the crew's living space, and aside from the basics of onboard protocol, few social restrictions apply. Even passengers may be invited into crew quarters under certain circumstances.

Passenger Quarters

Passenger quarters are like crew quarters, but *more* – more spacious, more elegantly decorated, more devoted to entertainment, containing more storage space and more furniture. Instead of a pair of single beds, many passenger staterooms contain a single larger bed for the convenience of traveling couples.

The passenger lounge is the social center of any small starship, and is the space most often customized. Even if the crew lounge has no more than a small kitchenette, the passenger lounge will usually have a full galley. Large passenger ships may set aside large spaces for passenger entertainment and comfort: theaters, game rooms, exercise rooms, even swimming pools.

Access to passenger quarters is also unrestricted. Indeed, starships that carry passengers often encourage crewmen to visit the passenger spaces (although they insist that crew members present a good appearance and behave with courtesy when they do).



Culture and Naval Architecture

The fundamentals of naval architecture are a constant throughout Charted Space. Cultural traits can't change the laws of physics, so any civilization which manages star travel will build starships loosely similar in structure and appearance. On the other hand, the aesthetic values of a given culture will have an effect on the details of starship design.

Aslan Starships

The unique Aslan aesthetic shows clearly in their starship design. Aslan ships tend to be highly rounded, with almost no visible sharp angles or edges. Hull sections tend to be oval or circular in shape, and many designs make use of pods. Inside, the effect is even more pronounced. Almost all internal spaces are rounded and cave-like. Crew quarters are divided among many small spaces, so that every crew member can have his own enclosed room. Internal spaces tend to be more austere than on Imperial ships, although even workstations and wall space will sport subtle decoration.

Droyne Starships

Droyne ships tend to resemble those of their neighbors; Droyne ships in the Imperium follow Human conventions, in the Aslan Heirate they tend to mimic Aslan designs, etc. The main difference in internal arrangement involves the living quarters. Droyne ships have fewer staterooms, but they are up to three times the size of the Imperial standard stateroom, and several Droyne live in each. Quarters are arranged around a central area, which serves as both working area and crew lounge. All of these spaces will be connected with doors, even permitting Droyne to go directly from one stateroom to the next. These features are comfortable to the gregarious Droyne, but bother visitors who prefer privacy.

Hiver Starships

Hive Federation ships exhibit an aesthetic opposite that of the Aslan. They tend to be blocky, even cubistic, and very utilitarian in appearance. Unlike most other major races, Hivers tend to place control stations as deep in the hull as possible – the bridge will be in the center of the ship, not exposed at one end. Likewise, weapons will be fired from the bridge, not from turret stations close to the hull.

Inside, Hiver ships are very comfortable, but not ornately decorated. The cubic aesthetic continues, as most compartments will have straight walls meeting at strict 90° angles. Some observers find this peculiar, given that dirtside Hiver settlements are usually full of rounded buildings, tunnels, and chambers; the cubist design of Hiver starships may reflect a concern for efficiency.

K'kree Starships

K'kree starships are probably the most unusual in Charted Space, due to the oddities of Centaur psychology. First, they are *big*. Centaurs are physically large, hate traveling except in groups, and tend toward claustrophobia. All of this means that they need a *lot* of internal space, far more than a Human crew with the same number of individual members. The smallest of their manned starships is 1,000 dtons, and most are much larger. Almost all of them are built on a flattened-disk shape.

The entire working space of a K'kree starship is one big chamber, with consoles and equipment arranged around the rim. The crew lives and works in this space at all times, and uses robots if there's any need to work alone or in enclosed spaces. The working chamber is usually equipped with smart walls, holographic generators, and scent in the air circulation, all to give the illusion of being outdoors on a pleasant K'kree world.

Solomani Starships

Solomani Confederation ships are very close to the Imperial norm. They lack Vilani influences in their internal design and sometimes show Aslan touches, although they are always arranged to be comfortable for Humans. Solomani ships are rich with security features, and many of them have extensive internal-monitoring equipment.

Vargr Starships

Vargr starships have been described as "like Human ships, but with spiky bits." Although Vargr culture is too diverse to make general statements, most Vargr shipyards do tend toward angular designs, with plenty of radiator fins or sharp-edged projections. This is especially common in corsair or military vessels, which are intended to project an image of ferocity. Internally, Vargr ships can have widely varied arrangements and aesthetic styles, although they tend not to be too outrageous to a Human perspective.

Vilani Starships

Starships built to traditional Vilani designs have an aesthetic (or a lack thereof) all their own. Vilani starships look as if they were designed by engineers, not architects. They are blocky and solid-looking, and are considered ugly by most non-Vilani. Efficiency is the primary consideration, not attractiveness or comfort.

Internal spaces are close to the Imperial norm. A clear class distinction will be visible in staterooms and lounges. Passenger spaces are likely to be quite comfortable and well-appointed, while crew quarters will if anything be more austere and uncomfortable than in most Imperial ships.

Zhodani Starships

Zhodani ships are not far from the Imperial norm in design or aesthetics. Internally, they tend to be designed for greater comfort for crew and passengers (and most spaces have higher ceilings given typical Zhodani heights). The most significant difference is subtle – the presence of psionic switches in most of the ship's simple fixtures. A trained telepath of even modest power can use these switches to open and close doors, control lights, activate small items of equipment, and so on.

Chapter Two

Starship Design and Construction

Working the Yards

"Okay, now, listen up! I don't know where you came from, and I don't care. You're working at the Mora yards now, and we do things a little differently here.

"My name is Eirene Sennit, and for the next 30 days I'm your mother, father, and best friend. You may call me 'ma'am.' You may also call me 'sir' if you were in the military or think you've got the hackles to back up your attitude. If you're lucky enough, and good enough, you can call me Eirene when your orientation period is over. If not, you won't be around to call me anything.

"I know what you're thinking – 'What a hardcase!' You're right, and there's a reason for it. Look out that window, and what do you see? Girders. Forges. Deck plates. Work pods. The skeletons of starships. Looks like God's own erector set just went critical all over the place. This is the big league, boys and girls.

"You think you can build starships? Maybe you can, but that's old news. We don't build starships here, we ***produce*** *them. They're a commodity, a crop we harvest from asteroids and comets, the moons, and Mora herself. We give birth to dreadnoughts, freighters, fighters, SDBs – we crank out more copies of some designs in* ***one year*** *than some yards do in a decade.*

"Just because we can crank out the hulls does ***not*** *mean we skimp on quality! You will be a part of the best-trained, best-equipped, most professional shipbuilding team this Imperium has ever seen. We build ships that will outlive me, you, your kids, their kids – I fully expect some of our battlewagons to be in service when the next millennium rolls over. Your work is your legacy to the Imperium – make sure you give your best!*

"Once your orientation period is over, you will be assigned to your own work crews. You might get assigned to a destroyer squad, or one of the far-trader teams. We rotate assignments once every six months, so you won't get bored, and you'll gain experience working on every major design we produce here. We need well-rounded workers, girder monkeys who can lay a keel on any design in our inventory. You might pull duty on a specialty hull, a one-shot for some rich hunter or hush-hush corporate project. If you do, count yourself lucky. If not, we'll keep you so busy you won't notice.

"One thing – your head had better be screwed on tight 100% of the time. Out here, there's no margin for error. The workload is beyond anything most of you have ever experienced, and there are accidents all the time. There are no ***minor*** *accidents here. If you screw up, you* ***will*** *die, and I don't have time for that kind of paperwork.*

"There's no place to rest on your butt except the hardpoints on the construction gantries – those are for the architects and BuShip busybodies. Don't be surprised if they emerge from their caves every once in a while and peer over your shoulder. No matter how strong the urge, do ***not*** *use your torch to give them an attitude adjustment. If you do, you're liable to end up baby-sitting a bunch of newbies for 30 days."*

This chapter presents a comprehensive set of tools for designing and constructing vessels of virtually any type found within the Third Imperium and its predecessors. (The peculiarities of alien naval architecture are covered in their respective sourcebooks; see the ***GURPS Traveller: Alien Races*** series.)

Shipbuilding

Centuries of starfaring tradition have created a rather distinct set of definitions for some terms that are used in a much more general sense outside of the starship-building world.

Terminology

Vessel: Any spacecraft.

ston: A measure of weight and (conventionally) mass: a short ton; 2,000 pounds.

Displacement: Based on long-standing tradition dating back to the Ramshackle Empire, spacecraft are customarily recorded in official documents by their hull's "displacement." This refers to how many short tons of liquid hydrogen (the most common fuel) they would displace. One short ton of liquid hydrogen has a volume of 500 cf, which is referred to as one displacement ton, or dton. In this and other ***GURPS Traveller*** books, the word "ton" is used when the context makes it obvious that dtons are being discussed.

To avoid confusing these tons with the more familiar measures of mass and weight, these rules will call displacement tons "dtons." A short "ton" in this book generally refers to *stons,* above.

Note that a "space" in ***GURPS*** terms is also assumed to be about 500 cubic feet. The common names of ships often include the nomenclature *100-ton*, like the *Kugashin*-class 400-ton lab ship. In this example, the *Kugashin* has a displacement (or *hull class* – see below) of 400 dtons (but the ship's total mass is considerably more than 400 stons).

Total Displacement: The total volume of the ship, including the volume of all external stores (but not turrets and external bays) and vessels carried in cradles.

Hull Class: The volume of the main hull itself. Often simply called "displacement." Vessels are normally classified and referred to by their hull class, as in 200-ton *Beowulf*-class free trader.

Ship: A vessel of hull class 100 or larger.

Small Craft: A vessel of hull class below 100.

Starship: Any ship with a jump drive.

Non-starship: A vessel lacking a jump drive. Small craft are also non-starships.

cf: cubic foot or cubic feet.

Cr: A credit, the unit of currency in the Imperium. Dollar costs in ***GURPS Vehicles*** convert to credits on a 1-for-1 ($1 = Cr1) basis at the TL of the design. See p. T:FT48 for exchange rates between differing TLs. KCr is a thousand credits; MCr is a Megacredit, or a million credits. Because space vessels cost so much, they usually are priced in MCr.

HPs: Abbreviation for "hit points."

MW: A megawatt, or a thousand kilowatts; MJ is megajoule or megawatt-second (MWs); a thousand MW is a gigawatt (GW); a thousand megajoules is a gigajoule (GJ) also known as a gigawatt-second (GWs). Similarly, a million megawatts is a terawatt (TW); a million megajoules (a million million joules) is a terajoule (TJ). These last terms are normally used only in the description of extremely powerful ship's weapons.

Power Slice: Part of a power plant included in a module to simplify the design process.

Turret mount: A turret-mount weapon is a weapon built into a turret with a universal mounting system. It has a 180° arc of fire, though the turret itself allows a full 360° arc. This combination allows a full hemisphere to be covered.

Hull mount: A hull-mount weapon is a weapon built into the hull but with a casemate swivel-mount system. It has a 90° arc of fire (45° to either side). All weapons except spinal mounts can be hull-mounted.

Fixed mount: A fixed-mount weapon is a weapon built into the hull, with a 15° arc of fire. The only fixed-mount weapons in the *Module Tables* are spinal mounts as they are typically the only weapons to use this mounting system. See *Spinal Mounts*, p. 19, for more information.

Shipyard Facilities

All worlds with sufficient population and TL are capable of constructing space vessels within their industrial sector; such vessels cost double, due to limited production. Worlds with Class IV and V starports have shipyards attached to them, capable of turning out vessels in quantity (or at least able to take advantage of standardized production methods to keep costs down). Shipyards are also extensively used for annual maintenance, refits, upgrades, and overhauls (see p. 106).

Starports and their respective facilities are listed below. For more detail, see ***GURPS Traveller: Starports***.

Class V Starport

Installation of excellent quality. Annual maintenance overhaul available. Shipyard is capable of constructing starships and non-starships.

Class IV Starport

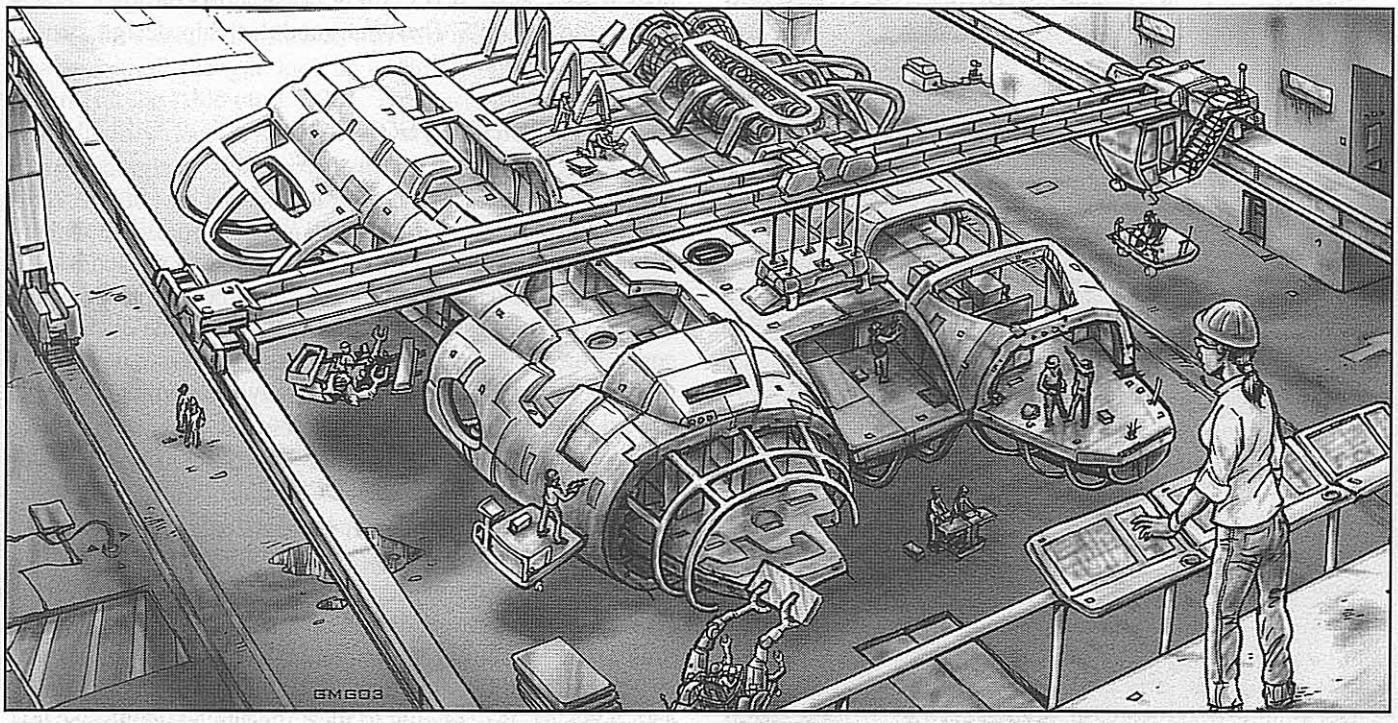
Installation of good quality. These also offer annual maintenance-overhaul services. Shipyard is capable of constructing non-starships.

Class III Starport

Shipyard facilities are standard or average. Reasonable repairs can be accommodated.

Class II, I, 0 Starports

No repair or shipyard facilities are present.

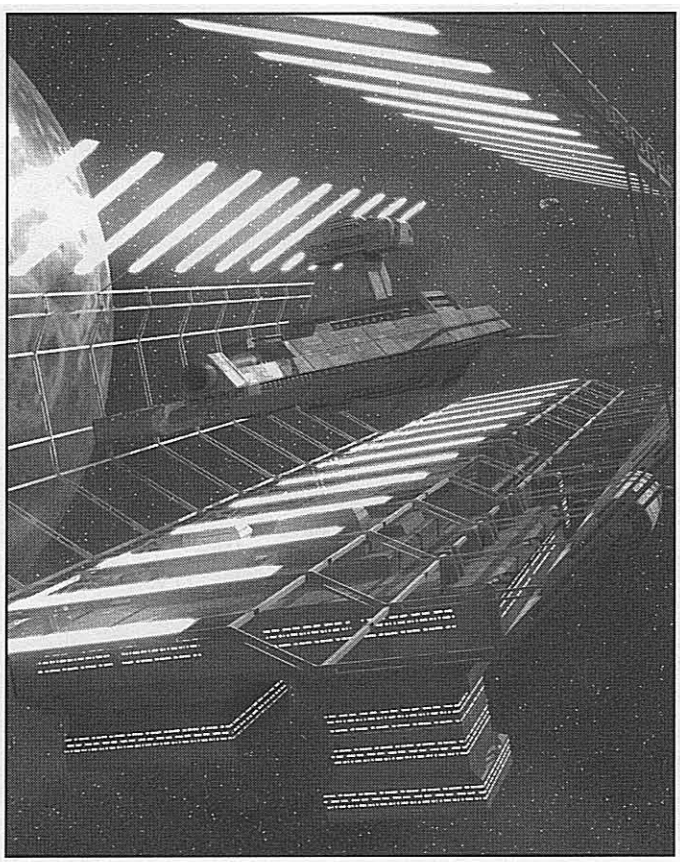


Standard Designs

Most starships are built to order from existing hull plans. Many standard classes (scouts, free traders, far traders, etc.) are centuries old and their designs are in "the public domain." These are included in the Imperial Data Package of industrial standards provided to member worlds. If the requirements are neither outlandish nor locally illegal, a builder can usually find plans for an appropriate ship; a set of plans would be about a 1 gig database costing Cr1,000. Some shipyards offer use of *their* standard plans, at a discount.

Buyers may specify reasonable variations from the plans on armor, surface features (stealth may be decreased or removed, but not improved), weapons, and non-vital interior components. Changes in hull size or drives should add considerably to the cost, at the GM's discretion.

The usual time to build a ship at a Class V port is calculated as (hull surface area in sf/2,000 days) with a minimum of six months due to ordering, lead time, and shipyard configuration. GMs may rule that if the vessel is common and produced locally, it takes a minimum time of one month. Both the actual and minimum construction times can be reduced by paying extra: doubling the price divides these times by 2, tripling it divides these times by 3, and so on. The absolute minimum time is 1/4 the standard time (never less than 6 weeks unless produced locally), costing four times the standard price and working around the clock. Military shipyards on a war footing use this speed; civilian shipyards require a reaction roll of Very Good or better (using influence and bribery as necessary). Anything not available locally must be imported, and special items might take extra time to install. For really radical new design concepts, refer to p. VE201.



Smaller shipyards also take longer. A Class IV port will take twice as long on any hull class over 400 and three times as long on anything over 2,000 dtons (if they will handle it at all). A Class III port isn't really equipped for shipbuilding at all. It can build a craft of up to 20 dtons, but takes four times as long. It can't build larger vessels.

The price for a ship built to standard plans is simply the sum of the prices of all its systems and components, plus labor.

Building Better Ships From the Ground (Clearance) Up

Why have construction guidelines? Few (if any) naval vessels are produced by a single designer working in isolation, without constraints on resources or fitness for purpose. Instead, they are designed by teams, to specifications drawn up by committees, to meet conflicting requirements of mission, flexibility, lethality, survivability, and cost. Creating an entirely new class of vessel requires extensive space trials to identify and to fix problems (see pp. VE201-202); even so, there is a limit to how much testing any organization will tolerate. Every vessel flying is the result of hundreds of compromises, large and small.

These guidelines represent the procurement standards published by the Imperial Navy's Bureau of Ships (BuShips). BuShips expects new ship designs that are offered in response to Requests for Proposals to adhere to these standards. Designs that do not meet these standards are considered "inadequate." Anything more is likely to be rejected as "excessive" or "not cost effective."

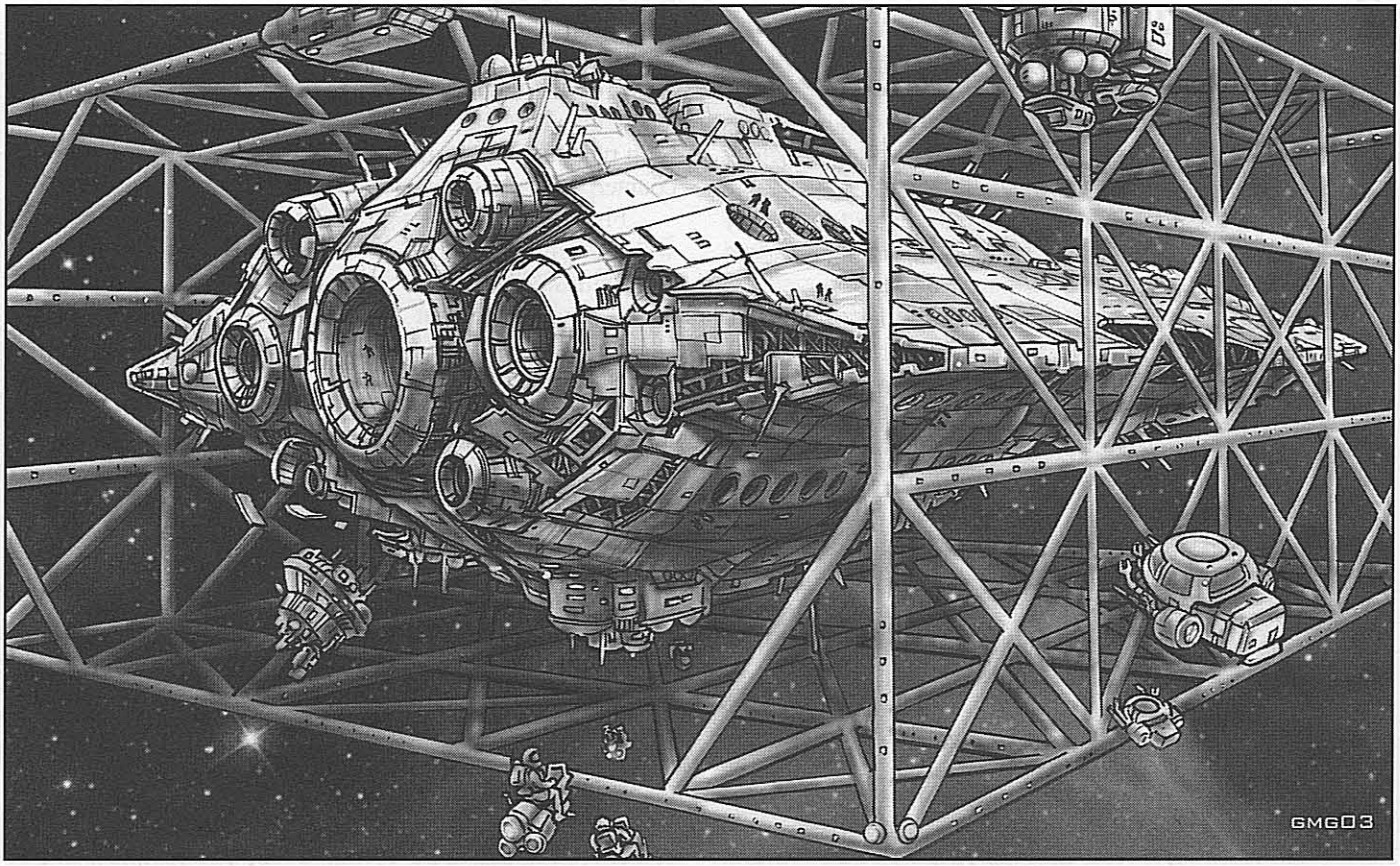
In game terms, this keeps the balance between naval weapons and armor within playable bounds, making for a faster, more interesting game. GMs are free to construct vessels with the modular design system that *exceed* these guidelines if they wish. It is entirely possible to construct vessels within the ***GURPS Traveller*** modular ship design system exceeding these guidelines.

The Modular System

While the ***GURPS Traveller*** starship design system is modular, in most cases the *ships* it produces are not. The components forming a specific module might be spread throughout a ship, rather than forming a compact bundle of the appropriate volume. The reverse is true of the ship's power plants, which are specific devices with controls in the requisite engineering compartment, but their volume is incorporated into many other modules for bookkeeping purposes only. That errant volume is termed a "power slice" or simply, "slice."

Hull and Armor Materials

The various classification societies (e.g., Lloyd's Register, Traveller's Aid Society, etc.) have determined through long experience that "Medium Frame, Standard Materials, Expensive Metal Armor" is the optimal combination of safety, utility, and economy for a particular TL. Anything more gets expensive, though some designs justify their cost. Anything less, however, is not going to meet the agreed-upon standards



(i.e., HP and structural HT). Bank financing will be nearly impossible to obtain, insurance rates will be astronomical, and government charters will be unavailable for such a shoddy operation. (Substantive differences between TLs are already factored into the exchange rates.) This sort of conservative approach is entirely consistent with the slow rate of technological progress within the Imperium and its neighbors.

How Big Is My Hull?

A ship's actual dimensions can vary greatly. For a rough idea of the hull's length, look up its Size Modifier in the Size column on the table on p. B201. This assumes a fairly average cylindrical ship, or a collection of disks, pods, and cylinders. Length varies from 1.5 to three times that in yards if it is long and skinny, dart-like, or a flattened disk or wedge. Diameter will be 2/3 that if the ship is ovoid or spherical. For examples, refer to *Suggested Hull Sizes,* p. S108.

How Big Is My Reactor?

When drawing deck plans, it is sometimes difficult to visualize just how large the reactor is. After all, you have all these neat modules but no information on just how large the power slice is other than a MW rating.

- Add up the total power (in MW) consumed by all modules included in the ship design.
- Determine the TL of the reactor (it's the same as the ship's overall TL unless specified otherwise).
- Multiply the total power (in MW) by the appropriate factor: TL7 = 0.96, TL8 = 0.48, TL9 = 0.12, TL10+ = 0.024.

The final answer is the reactor size in dtons. 1.5 dtons for TL7, 1/2 dton for TL8/10+, and 2.5 dtons for TL9 reactors should be added per core (there is one included in the Engineering modules, see p. 36). If a ship has more than one reactor core of the same TL, this final answer can be divided amongst them in any fashion desired to represent redundancy. Sometimes it is useful to include a secondary power core without the other elements of a complete engineering system. Installing a power plant core from a TL different from the ship's primary TL allows mixing systems from both TLs, for example. If a vessel has two reactor cores of different TLs, the power requirement for each TL must be determined separately.

Custom Building

If plans are not available, it will take (the square root of the final cost in MCr) days to draw up complete documents (regardless of ship size – although a very complex design may take more time, at the GM's option). The fee for this is usually Cr1 per dton of final displacement, with a minimum of Cr10,000. Triple the cost if the designer will not have the right to sell the plans as "standard" after he finishes.

New plans can be produced with Shipbuilding (Starship) skill. A shipbuilding program (see p. 70) will help! The GM makes a single skill roll. A failure wastes the effort for the time calculated above, but designers can start over. A critical failure produces a plan so subtly flawed that the builders won't notice . . . but the GM can provide a catastrophe as soon as the ship is first used.

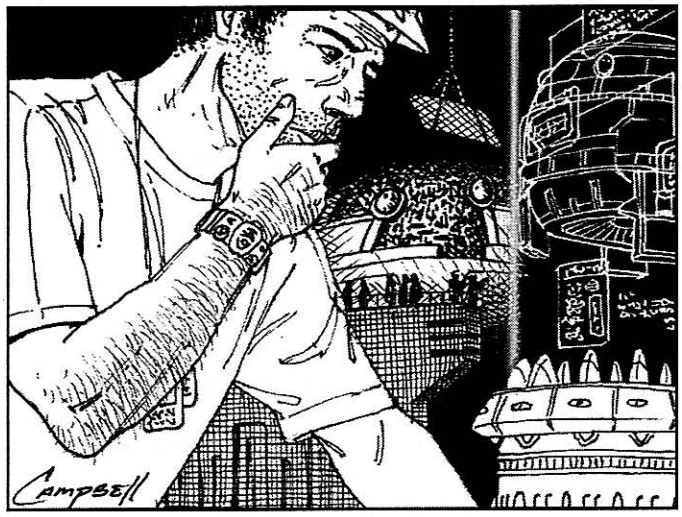
An advantage of custom-built ships is their anonymity; one cannot judge their capability from casual observations. A successful roll on Shipbuilding (Starship) skill will allow a determination of capacity and a good guess about power plant and weapons.

Starship Design Sequence

GURPS Vehicles offers a complete design system suitable for all types of vehicles including starships, but it is complex. To make ***GURPS Traveller*** more accessible, this book expands upon the modular-design system in ***GURPS Traveller,*** enabling players to assemble ships from standard hulls and components.

A starship "module" represents a collection of components usually scattered throughout the entire vessel. The "power slice" will actually be in the engine room, control stations might be located in the bridge, and so forth. They are not necessarily homogenous systems found in the same location on a vessel.

These hulls and modules were all created using ***GURPS Vehicles*** or ***GURPS Ultra Tech,*** so experienced GMs may use those books to design their own modules or to create custom-built designs, but see *Building Better Ships From the Ground (Clearance) Up,* p. 14, for some important considerations.



Design Overview

The next several pages provide a systematic spacecraft-design process. Calculations are simple and can be easily done on scrap paper. A calculator is useful but not essential. Many of the steps below have a corresponding chapter in this book to explain more details.

Step 1: Decide on the ship's concept and TL.
Step 2: Design the hull and record its characteristics.
Step 3: Designate turrets and/or bays.
Step 4: Select armor. Calculate mass, cost, DR, and PD.
Step 5: Select surface features.
Step 6: Fill all internal spaces with systems.
Step 7: Add turret and bay weapons (optional).
Step 8: Calculate basic statistics.
Step 9: Calculate performance and finalize the design.

As design choices are made, keep a running total of the vessel's weight (in stons), cost (in MCr) and power requirements (in MW). Power requirements are very useful if deck plans are to be created, but are not integral to the design process itself.

Naval Ship Classes

The starships operated by the navies of the galaxy range from 100 to 1 million dtons. There are no known ship designs larger than that, but that doesn't mean that they don't exist. Ship types of one TL tend to be smaller than their higher TL counterparts, sometimes by as much as 20% per TL.

Five broad types of warships are registered in service with the Imperial Navy: Scouts, Escorts, Cruisers, Carriers, and Battleships.

Scouts: The Scout Service controls a wide variety of craft up to cruiser class, but scouts proper are vessels up to 200 dtons designed for exploration, survey, and courier work. In times of war, such ships are pressed into military service but have negligible combat value except in reconnaissance.

Escorts: Escorts are small ships of up to 5,000 dtons and are meant to be light support craft for larger ships, primarily cruisers. Escorts are also widely used for convoy protection and commerce raids.

Cruisers: Cruisers are the smallest ships to carry the large spinal weapons needed to cause serious damage to armored ships. Most are too lightly armored to withstand heavy battle action. They form the cadre of task forces that raid commerce and provide fire support for planetary invasions. Hull sizes range from 20,000 to 100,000 dtons. Cruisers serving with a battle fleet are generally grouped in cruiser squadrons of four to eight ships, while individual ships or pairs of cruisers are used to form scouting or raiding teams.

Carriers: Carriers are designed to transport large numbers of combat boats (termed either "fighters" or "system defense boats"). The small ships are used in the screen of the battle fleet or in support of a planetary invasion. Given the limited weaponry of fighters and light boats, they are little more than a distraction in a major fleet action, but they can be extremely effective against ships of cruiser class or less.

Battleships: As their name suggests, battleships are jump-capable vessels, which are, due to their armament and protection, capable of standing in the line of battle. Also often called "dreadnoughts" (because their crews theoretically dread no opponent . . .), battleships generally have little better in the way of primary armament than cruisers, but their extensive secondary batteries render them virtually immune to missile and small-craft attack; their bulk also provides tremendous damage absorption, allowing considerable endurance in pressed attacks and long battles.

Other Naval Vessels

A wide variety of supporting ships and boats of the Imperial Navy are deployed in the Spinward Marches. Many don't fit into the five categories presented above, and they are commonly classed as auxiliaries. A battle rider is a non-jump-capable combatant generally carried on a large (up to 1 million dtons) fleet tender. A typical tender carries a complete battle squadron (BatRon) of six to eight vessels.

Commercial ships of 50,000 dtons or more are unknown in the Spinward Marches as of 1120, although 10,000- and 20,000-ton bulk carriers are fairly common.

Cruisers (including carriers) and battleships together are considered *capital ships*, a designation with historical and

social, as well as tactical, significance. Battleriders may or may not be considered capital ships, depending on who is doing the considering . . .

Step 1: Concept and Tech Level

First, come up with a general concept and mission for the vessel. Who's building it and for what purpose? Is it an interplanetary craft or a starship? A merchantman or a warship? This design system can also be used for space stations and satellites; just read "ship" as "station" and do not install maneuver or jump drives.

Next, decide on the vessel's TL. The design system presented here allows vessels to be designed at any TL from 7 to 12, with some items of TL13 supertechnology included for GM use. Crude and limited spacecraft are possible under special circumstances at TL5-6; these are best approached on a case-by-case basis using ***GURPS Vehicles***. Higher TLs are the realm of Ancient artifacts and alien superscience: GMs are encouraged to refer to ***GURPS Space*** or use their imagination.

When designing the vessel, do not install components higher than the vessel's TL without good reason (e.g., a TL10 hull upgraded with TL12 electronics and weapons); be sure to include an engineering module or a power core for the additional TL.

The strangest ship design I ever saw was some wealthy loon who wanted a yacht that duplicated a Terran surface ship named ***Henry Grace a Dieu****. The inside was normal (as much as any spaceship with black powder cannons can be called "normal"), but the outside had masts and sails with internal wires so they "billowed."*

– Loni Watt-Tukera,
Principles of Starship Design

TL7 Vessels

Generally homegrown for local conditions, TL7 vessels might service nearby markets or serve as an alternate to depending on foreign imports. TL7 will support routine space operations, but each vessel must normally be optimized for its specific role and/or mission profile due to the tight constraints imposed by the less robust technology base. Fission reactors are most often used to provide power.

TL8 Vessels

TL8 vessels are markedly more capable and versatile than TL7, primarily because they employ gravitic technology – contragravity (p. 40) – and reactionless thrusters (p. 37), but they are constructed for the same reasons. Fission power is standard.

TL9 Vessels

These ships use fusion power and are capable of mounting jump drives. The fusion power plants are crude and expensive, however; the capabilities and prices of TL9 vessels follow suit.

Naval vessels at TL8 and early TL9 are often equipped with dual maneuver drives: reactionless thrusters for long-haul operations, and reaction thrusters (or even reactionless thrusters powered by energy banks) for short-duration, high-thrust maneuvers (i.e., takeoffs and landings, and combat).

Historically, the First (Vilani) Imperium was TL9 for its entire history, as were the early Terran Confederation (-2431 to -2210) and the few remaining starfaring planets and polities during the Long Night (-1776 to -150).

TL10 Vessels

TL10 vessels are average for the present-day Imperium, often used by merchant lines, independent traders, and planetary and subsector navies. Many TL7-9 worlds also use TL10 designs, ordering them (and spare parts) from shipyards elsewhere in their sector, just as Third World nations of Terra's 20th century ordered ships from Europe, Russia, or the United States.

The Terran Confederation's achievement of jump-3 (early TL10) in -2210 was the edge they needed to finally defeat the Vilani Imperium and establish the Rule of Man (Second Imperium). After the technological regression of the Long Night, the Sylean Federation (precursor to the Third Imperium) was able to re-establish TL10 by around -150 and was fully TL10 following the upheavals of the Civil War (604 to 622). Empress Arbellatra (then still Regent) used the new jump-4 capability to establish the Xboat network (624 to 718).

TL11 Vessels

These ships are more advanced with improvements over TL10 in several areas. They serve as the "front line" vessels for most of the Imperium's potential adversaries: the Zhodani Consulate, the Solomani Confederation, top clans in the Aslan Hierate, and exceptionally well-equipped Vargr corsairs.

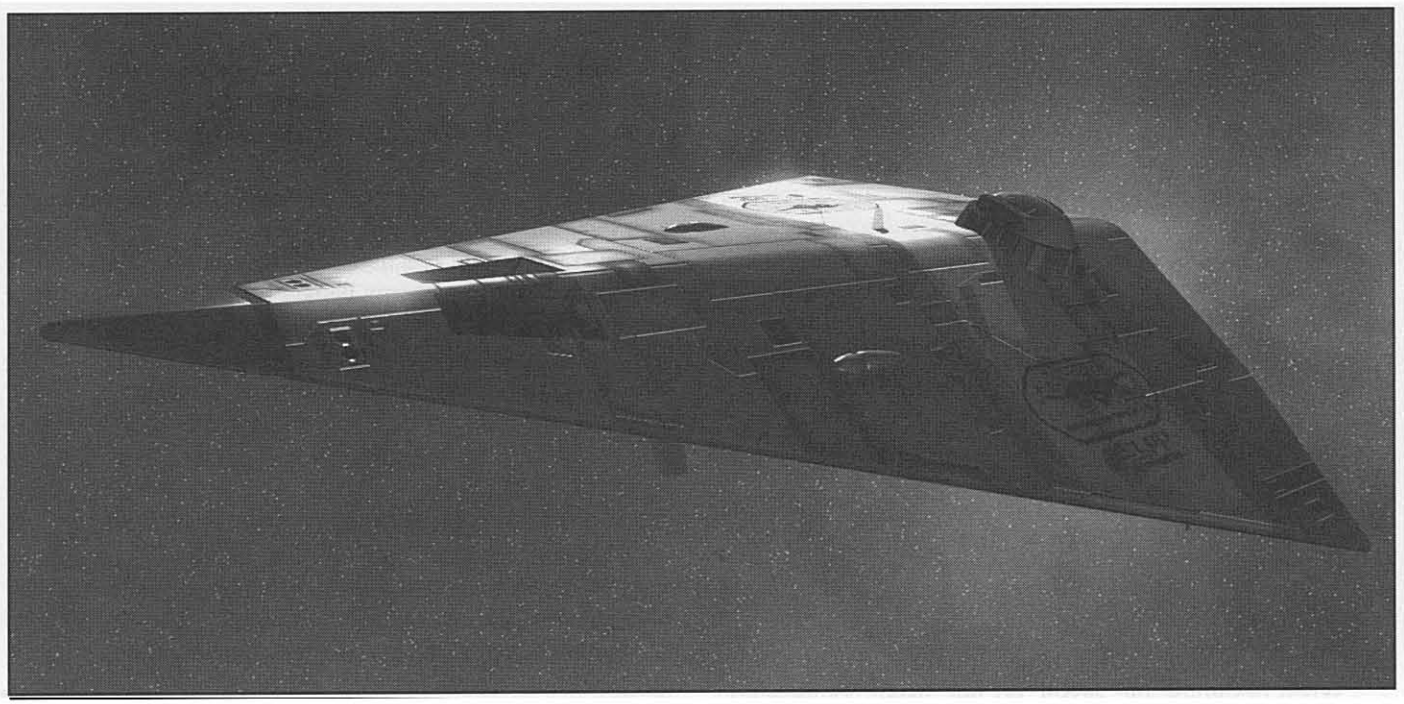
TL12 Vessels

These represent the cutting edge of naval architecture. The Imperial Navy is equipped at TL12, with a few TL10-11 vessels in service in backwater areas or as auxiliaries. Shipping lines and corporations use TL12 vessels as fast couriers and liners.

The Solomani Rim War (990 to 1002) provided the impetus the Imperium required to develop TL12.

Streamlining

Streamlining specifies how much attention was paid to airflow over the hull, and affects the ship's performance in an atmosphere. Although many different configurations and streamlining options are available, spacecraft streamlining can be grouped into three broad categories: streamlined, unstreamlined, and other (dispersed structure and planetoid hulls).



Streamlined

Atmospheric performance and airflow over the hull were prime considerations in the design of the hull. All protuberances were kept to a minimum and aerodynamic lifting and control surfaces are incorporated into the hull. The spacecraft has full atmospheric maneuverability, and generates lift so it can take off from worlds with a surface gravity greater than its G-rating. Streamlined hulls may skim gas giants for hydrogen fuel and can safely re-enter any atmosphere.

Unstreamlined

Airflow over the hull was considered as an afterthought, if at all. Sharp edges were rounded off and protuberances may have been covered by fairings. However, the hull does not generate lift and no aerodynamic control surfaces have been provided. Unstreamlined ships can skim for fuel and can enter a world's atmosphere but they do not have landing gear or any other facilities to relieve the stresses on the hull when set on the ground. This typically means that they can land once – and stay there indefinitely.

Other Hulls

Dispersed structure hulls are not designed to operate in an atmosphere. Sharp edges, antennae, bracing, and all kinds of other things stick out from the frame at various places. These hulls are extremely vulnerable to wind turbulence; they should never land on any planet and should never enter an atmosphere greater than trace (0.1 atmosphere), even with contragravity.

Planetoid hulls are not stable enough for atmospheric operations and are not normally designed for any type of planetary landing, but can land on airless worlds in extreme circumstances. Hulls intended for planetary landing are normally equipped with contragravity units.

Dispersed structure and planetoid hulls may not skim gas giants under any circumstances.

Step 2: Hull Design

The hull is the frame of the ship, but it is more than just a metal shell. It includes decks, cables, stress bracing, and other elements.

Streamlining

Decide whether the ship is streamlined (SL), unstreamlined (USL), planetoid (PL), or dispersed structure (DS). *Streamlined* ships are sleek lifting bodies (often dart-, teardrop-, wedge-, or disk-shaped) and may fly within a planetary atmosphere. *Unstreamlined* ships are usually cylindrical, spherical, or some other non-aerodynamic shape. *Planetoid* hulls are nickel-iron asteroids, hollowed out and mounted with ship systems. *Dispersed structure* hulls are open tubular frameworks, with some components in separate subhulls.

Hull Classes

Select a standard hull class from the Hull Table on p. 28 or design a custom hull (p. 29). See *How Big is My Hull?* (p. 15) to approximate ship dimensions. Multiply the listed weight, cost, and hit points by the factors shown under *Options,* p. 29. Record hull mass, hull cost, and Size Modifier (SM; p. B201). Hull areas and volume are for reference and will figure in later calculations.

Spaces

Calculate the vessel's *internal spaces.* An unstreamlined vessel has spaces equal to its hull class. A streamlined vessel has spaces equal to the volume factor (from the *Streamlining Table*) × hull class. Standard hulls with Very Good streamlining have spaces equal to 0.8 × hull class. Internal spaces will be used up by equipment and other options. Keep a running total of how many spaces remain; when they are all gone, nothing else can be installed in the vessel.

Step 3: Turrets, Bays, and Spinal Mounts

Decide how many turrets and/or bays the vessel has. Their mass, cost, and internal spaces are shown on p. 131. As with the hull, mass varies by TL and cost varies depending on whether the hull is streamlined or not.

See *Batteries,* p. 24, for a way to increase firepower by linking turrets or hull-mounted weapons. Batteries should be considered *after* the actual weapons are installed.

Turrets

Turrets are standard mounts for shipboard weapons. They have the most flexibility in terms of arc of fire because the entire turret is turned to aim it, along with all the weapons mounted in it, of course. They have effectively unlimited arcs of fire – as long as the ship's hull or appendages aren't in the way, the turret can fire at any target, independent of the attitude of the ship. For most configurations, that means the arc of fire is 180° in any direction – a complete hemisphere. For game purposes, assume turrets can fire at any vessel within range.

In ordinary 1-second combat turns, weapons in turrets may not fire on targets on the opposite side of the ship, and may be further restricted by the configuration of the hull (GM's decision). ***GURPS Traveller*** space-combat rounds (see p. GT163) represent 20 minutes, so GMs may ignore this targeting restriction due to ship maneuvers in zero gravity during that time scale.

A ship can have a maximum of one turret per 100 dtons of hull class, or it can have fewer or none at all. A small craft of at least 3 dtons may have one turret.

Instead of a turret, weapons can be built directly into a hull. A vessel can have 3 spaces of turret weapons installed in hull mounts in place of one turret. Hull-mounted weapons have reduced range of tracking due to the lack of a turret mechanism. Since they are inside the hull's armor belt, the degree of protection is greater than for turrets, but they can only fire on targets within a 45° arc to either side of the direction the mount is facing. Each hull-mounted weapon must be installed on one of the six faces of a ship (forward, aft, port, starboard, dorsal, or ventral).

The figures in the Module Tables (p. 124) are for medium frame, standard materials, with very good streamlining (VGSL) and unstreamlined (USL) prices (the two most common). Multiply turret *weight* by the same frame and material factors used to design the vessel's hull. To select a streamlining level other than VGSL, multiply the USL turret *cost* by the appropriate factor (3.6 for SSL, 6 for ESL, or 12 for RSL). Then multiply this cost by the same frame and material factors used to design the vessel's hull. (Use the USL cost if the turret is unstreamlined.)

Optionally, turrets purchased as unstreamlined can be placed on streamlined hulls, but they make the vessel unstreamlined as a result. Turrets on planetoid hulls may use any materials and have a frame strength equal to the hull. Turrets have 800 sf of surface area each and must be armored separately (see Step 4).

Pop Turrets

Pop turrets are identical to ordinary turrets, except they can be fully retracted into the hull when not needed. They are only protected by the hull's armor while retracted, but may still be separately armored. Pop turrets are often used on planetoid hulls to preserve the appearance of a natural asteroid. If a pop turret takes more than half of its HP in damage, it is locked in whatever its position was before the damage was inflicted. (It may still rotate.) Pop turrets are treated as hull-mounted when not extended.

Weapon Bays

Weapon Bays are large weapon mounts. They come in two varieties: external or internal. External bays are treated exactly like turrets, above (though they have the same surface area as a vessel of their size; see p. 28). Internal bays are treated exactly like hull-mounted weapons, as above. Bays on planetoid hulls are usually internal. Weapon bays may *not* be grouped as batteries.

Bays are available in large and small sizes (for 100-ton and 50-ton weapons, respectively). Bays must be installed during construction (though their weapons may be installed later). Weaponry in internal bays is easily removed and replaced at a suitable shipyard or spacedock as the need arises. It takes about two hours to replace a small internal bay weapon; double this time for large bays, and triple it for external bays. The 50-ton bay is the bay in the ***GURPS Traveller*** core book. It is referred to as a 50-ton or small bay here to prevent confusion with the 100-ton or large bay.

Empty internal bays may store cargo or hold small craft. *External* bays may not store cargo or craft – they are only capable of holding weapons due to a honeycomb structural arrangement designed to hold either missiles for the multiple missile racks or the components used to build energy weapons.

Vehicles and craft may be carried in otherwise unused internal bays at 50% space wastage (a 100-ton bay holds 50 dtons of vehicle or craft); a bay may launch one craft per turn (see p. 64).

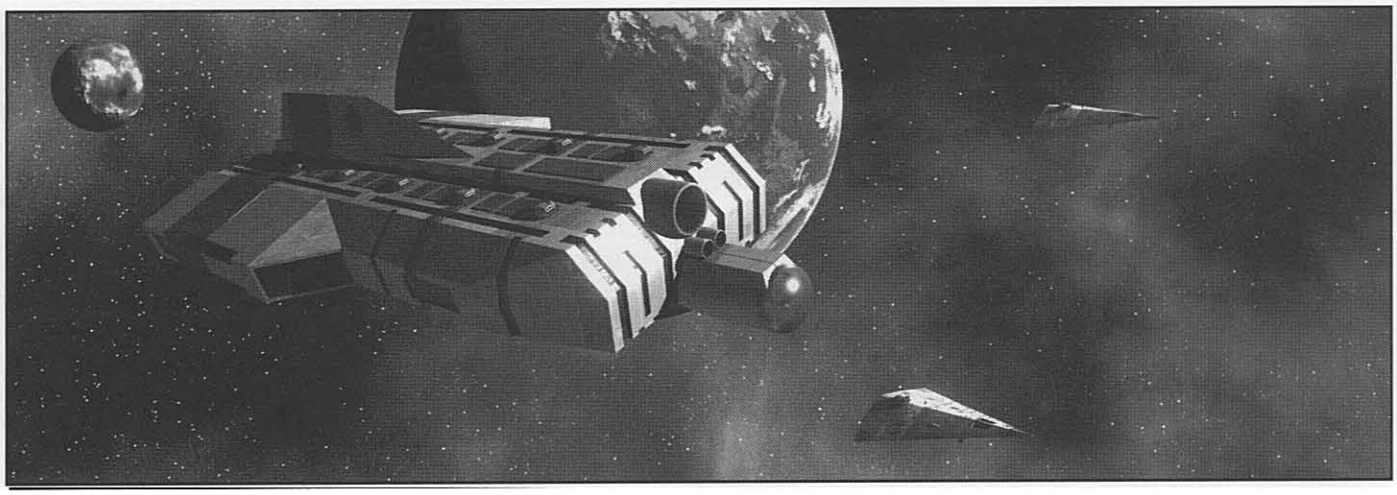
An internal bay may carry deadfall ordnance (p. 53); such a bay is useless in battle, but is used to bombard worlds.

A ship can install one bay for every 10 turrets *not* installed. For example, a ship with Hull Class 10,000 may have up to 100 turrets, but the designer could instead install 80 turrets and two bays. This effectively limits bays to ships of 1,000 dtons and larger.

Spinal Mounts

Spinal mounts are large enough to require special planning; they are considered fixed-mount weapons and basically become the main structural member for the ship. They have limited arc of fire – no more than 15° to either side of the direction the vessel is facing. Spinal mounts require that the entire ship be pointed in order to aim the weapon, but they have no overhead for mounting.

Spinal weapon mounts reduce the number of turrets possible by 1 for every 100 dtons they occupy. Other surface features (external grapples, etc.) also affect the number of turrets and bays that can be mounted; see p. 31.



Evolution vs. Revolution

Warships are expensive investments, especially large warships. This simple fact drives much of the design conservatism for which navies are notorious. Any officer who suggests radical design changes is placing his career on the line (especially after a victorious war). Navies tend only to adopt new technologies after they have been thoroughly proven and tested on smaller, less expensive vessels. It is a common naval paradigm that more than 25% novelty in a new design will lead to disaster. Therefore, new designs should be evolutions of older vessels rather than revolutions in design practice. Assume Imperial Navy ships last 80-100 years before undergoing a major overhaul/refit, and then are good for another 80-100 years before retirement. There will be instances where some ships last longer and some retire quite quickly, but on average, 180 years is the life expectancy of a warship due to HT loss (see below).

Aging Ships

So what happens at 180 years? Does the ship spontaneously combust? Not likely, but its chances of being fully operational are slim. When making a Structural HT check, make an *extra* check for every 50 full years that the ship has been in continuous service. This means that a ship 50 years old makes two HT checks, one 100 years old makes three HT checks, etc. Reset this to one check if the ship has had a major rebuild (see p. 106).

For every 200 years of service, a ship's HT permanently drops by 1; ships of that vintage are normally retired or used for light duties. TL13+ ships multiply the intervals by TL-10. However, regardless of how many times a ship is rebuilt, overhauled, prayed for, or glued back together, the maximum theoretical lifespan is 60 years at TL7 and doubled every TL after that. This puts a TL10 vessel at around 500 years and a TL12 vessel at around 2,000 years.

How Much Armor Do I Need?

Armor in ***GURPS Traveller*** can be divided into four types: Recommended Minimum (DR 100), Turret Invulnerable (can ignore hits from standard turret-mounted weaponry), Bay Invulnerable, and Spinal Mount Invulnerable. What is invulnerable at one TL may *not* be at the next. Depending on a ship's mission, it may only need enough to keep the dust off. When designing a warship, make a determination as to what class of weapon this type of vessel will be able to ignore or shrug off.

Step 4: Armor

Vessels are armored to protect against cosmic rays, micrometeors, and enemy weapons. Adding heavy armor will slow a ship down (due to the extra mass) but make it more "survivable." Choose both armor material and DR.

Most starships use expensive armor. Bulk transports and ore carriers may use cheaper materials as an economy measure, while prototypes might use advanced materials.

To figure out how much armor is needed, calculate the ship's *Total Surface Area:* This is the number shown in the area column of the *Hull Table* (p. 28) plus the surface area of all turrets and *external* bays. Each turret has an area of 800 sf. Each external bay has an area of 6,500 sf (small) or 10,000 sf (large). Internal bays, hull-mounted weapons, and spinal mounts do not take up surface area.

The minimum armor for manned vessels is generally considered DR 100 – military starships will have considerably more. As a rule of thumb, a light military vessel will be able to withstand a hit by turret lasers of its TL at 1/2D range, while a ship of the line will be completely impervious to turret beam weapons – and will frequently shrug off bay particle and plasma/fusion weapon hits as well! See *How Much Armor Do I Need?*, above.

Optionally, armor for the turrets may be calculated separately from hull armor. Turrets and bays are often designed with lighter armor than the hull itself. For a fast way to design this, just add *half* the turrets' and external bays' area to the vessel's area; afterward, they can be assumed to have half the DR the hull has. Military vessels also have suggested minimum and maximum armor requirements for turrets. The ***GURPS*** rules don't normally track armor volume because it is negligible, but placing huge amounts of DR on a relatively tiny turret will use up the space for weaponry (and would slow rotation speeds below the standards assumed in the space-combat system). To reflect this, turrets have maximum DR. They should have an absolute minimum of DR 100, and not exceed DR 250 at TL7, doubled every TL after that, or half the ship's armor, whichever is less.

Passive Defense (PD). Armor PD depends on DR, as follows: 1 if DR 1, 2 if DR 2-4, 3 if DR 5-15, 4 if DR 16+.

Step 5: Other Surface Features

Sealed: Vessels must be sealed. Dispersed structure hulls are unsealed; instead, individual subhulls are sealed separately. GMs may wish to ignore the cost of sealing on large, high-TL vessels, as it is so low as to be negligible.

Sensor Masking: Warships are usually the only vessels to use sensor masking. A ship may optionally be given *stealth,* making it harder to detect by active sensors (like radar), and/or *emission cloaking* to mask it from passive sensors (like infrared). Each type comes in three levels: "Modest," "Basic," and "Radical." A third type of sensor masking, *sound baffling,* is used only when in an atmosphere.

Step 6: Component Modules

A component module is a set of components grouped together into a system, like a bridge or a jump drive. Each module is rated for the *spaces* it takes up. Select modules whose total spaces are sufficient to fill the ship's hull spaces. Weapons and magazines are placed in turret spaces unless hull-mounted. Keep a running total of remaining space; when it's gone, no more modules can be installed inside the hull.

Cargo Space in Turrets

Although turrets aren't designed to carry cargo, they can – with great difficulty. Maintenance hatches must be removed, exposing wiring and conduits, and the cargo must be carried by hand. Safety regulations prohibit the use of turret access space for cargo storage. Players choosing to ignore safety regulations can store small cargo in them. This requires dismantling the turret from the hull side and most cargo in standard shipping format can't even be put in there without a major engineering chore. This is also backbreaking labor – imagine stowing cargo in the front seat of a hatchback, going in through the trunk – and the GM should roll for mishaps which may result in anything from static on the intercom to leaks in the turret's jump field causing jump fluctuations.

Carrying cargo in turrets is not normal practice. If crew members do risk the difficulties and the malfunctions, customs inspectors might decide to examine *every* access hatch and crawlspace, which could easily take days. GMs take note: While the volume of turrets is not counted as part of a ship's total volume when calculating jump, that is a simplification for accounting, *not* a loophole through which ships can get an extra 3% external cargo space "for free." Just the opposite, in fact: Starship owners often pay the price when stuffing things into areas where they don't belong.

So I get settled on the ship and the pilot calls me up to the bridge to sign autographs for the crew. While I'm there, I notice that one of the buttons has a light that says "Press to Test." I resist for about ten minutes, then I press it, and the light changes to "Release to Detonate."

Everybody's a comedian.

– Anton Wilson Peale

Every ship should have a bridge and an engineering or a cockpit/systems module. Other modules are more or less optional, although drives and quarters should be installed in nearly all vessels.

Where modules are available at different TLs, the TL is given after the name; for instance, "Maneuver Drive/10" means a TL10 maneuver drive. If no TL is given, assume the system is available at TL7+. If a series of modules tops out at a TL lower than the vessel's TL, assume the highest TL module is available at the vessel's TL. Modules are also rated for other statistics:

Spc: The spaces the module takes up.

Mass: The module's mass in stons.

Cost: The module's price in MCr.

Pwr: The module's power requirement in MW.

In some cases, a module is partially designed by the ship's builder: select a size in spaces, which then determines mass and cost. Some modules have additional statistics like thrust, power output, and fuel consumption; see the individual description for details.

Balanced Arrays

A balanced array of one missile rack, one laser, and one sandcaster per turret is normal for commercial vessels. On average, two sandcasters will buy a ship an additional laser hit before it takes major damage. Lasers are useful offensive/defensive (anti-missile) weapons, while missiles are the most effective purely offensive weapon. Because small ships in combat rarely have urgent tasks for all five bridge crew stations (the Pilot and Gunner certainly will be busy, and the Sensors station also should be, but a distinct Communications station and the Navigator may have time available), one useful technique is to hand off missiles after they are fired to another crew station, using the bridge's lasercomm for guidance and allowing gunners to concentrate on anti-missile/anti-ship fire.

Step 7: Turret and Weapon Bay Armament

Add each weapon's mass and cost to the running total of vessel mass and cost. Turret weapons may occupy a turret space (up to three spaces per turret) or take up space inside the hull (up to three spaces per turret not installed).

Bay weapons may occupy an entire external bay or take up space inside the hull (in an internal weapon bay).

Spinal mounts always take up space inside the hull.

See *Module Tables,* p. 124, for more information.

Step 8: Statistics

Once the various components that make up a vessel have been added together, it will be necessary to figure out what they can *do* . . .

Payload

Payload is:

- The weight of cargo carried. Assume 5 stons per dton of cargo hold (i.e., about 20 lbs./cf) unless you want to recalculate every time these vary. Exceptionally dense cargo may weigh up to 25 stons/dton; this is the maximum the holds can handle without special reinforcement.
- The mass of vessels carried in spacedocks, vehicle bays, and external grapples.
- The mass of all ordnance: missiles, sand canisters, etc.
- The mass of all non-jump fuel.

Total Empty Mass

Total the mass of hull, turrets/bays, armor, surface features, chosen modules, and weapons. This is the vessel's empty mass.

Total Loaded Mass or Weight (LWt.)

This is equal to empty mass plus payload.

Volume

This is the volume of the vessel in dtons, excluding turrets and external bays.



Maintenance Requirements

For any complete module (drop tank, cargo pod, etc.) that is unpowered and has no systems requiring power, an annual maintenance overhaul is usually sufficient to ensure peak performance. However, starships and small craft have different maintenance requirements. Starships require maintenance in an ongoing fashion, while small craft and non-starships not normally in continuous operation require maintenance only on a periodic basis.

To calculate a starship's maintenance requirement, use:

Maintenance = 4.8 × original purchase price in MCr / (square root of actual purchase price in MCr).

The result is number of man-hours per day required for maintenance.

To calculate the maintenance requirement for a small craft and non-starships in temporary service, use:

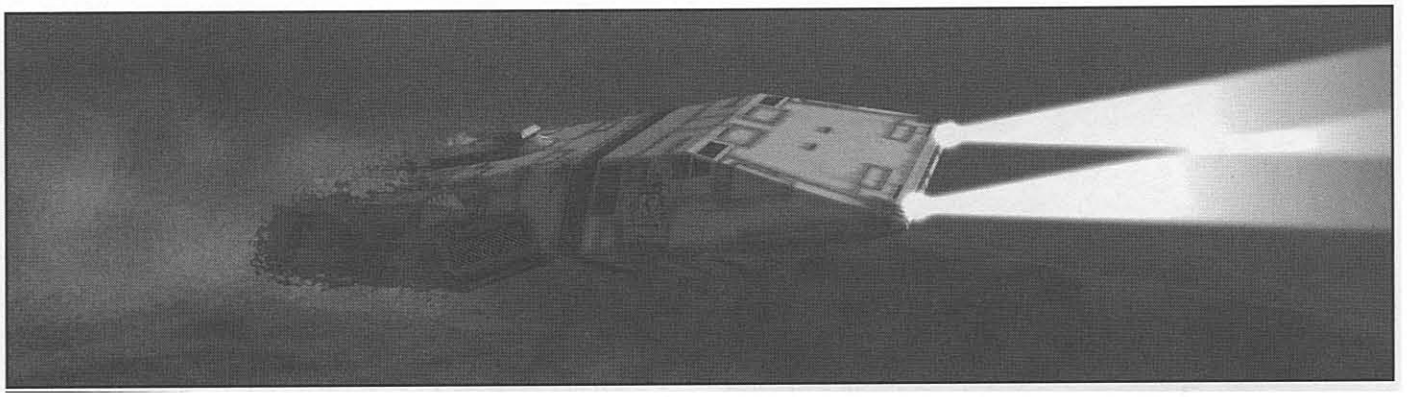
Maintenance = 20 × (square root of actual purchase price in MCr) / original purchase price in MCr.

The result is the maintenance interval, or the number of operating hours between 4-hour maintenance check-ups.

Customized Maintenance Requirements

Some ships also require more maintenance than other ships. Some require less. For every percentage more maintenance required by a vessel, increase its original purchase price by an equal percentage in the above formula. The reverse is also true. For every percentage less maintenance required, decrease the original purchase price of the vessel by an equal percentage in the above formula. *Note that the actual purchase price remains unchanged for purposes of use in the formula.* If the point system is used via the *Ship's Patron* advantage from ***GURPS Traveller: Far Trader***, increase or decrease the ship's point cost by the same amount, rounding *up*. Note that some shipyards (or even whole polities) may produce ships that require more or less maintenance than normal. Terran ships from early in the Interstellar Wars are known to have required 20% more maintenance.

Example: A particular shipyard produces ships that are known for their low maintenance. The GM decides these vessels require only 95% the normal routine maintenance. The team decides they want one of these vessels – it costs MCr25 as per the design sequence in this book. Using the formula above, 4.8 × (25 × 0.95) / (square root of 25) = 22.8 Man-Hours per day of maintenance. Normal maintenance on a ship costing MCr25 is 24 man-hours per day. GMs may also decide to increase the cost the players have to pay for a ship such as this, but the original purchase price and the actual purchase price must be based on what the ship normally costs as per the rules in this design system.



Total Cost or Price

Add together hull, turret/bay, streamlining, armor, surface features, modules, and weapon costs to get the vessel's cost.

Fitted-Out Cost or Payload Cost.

This is equal to the final cost of the ship once it has been fitted out (p. 26).

Structural Health (HT)

Ships in ***GURPS Traveller*** have a structural Health (HT) statistic to reflect their general condition and resistance to wear, fatigue, and breakdowns. Used ships may have reduced HT due to age and wear (see p. 20). If the purchase price was discounted to 50% or less, reduce HT by 1; 10% or less, reduce by 2.

A ship's basic HT is [75 × (internal space in dtons / loaded mass in stons)] + 5, rounded to the nearest whole number. Maximum HT is 12 or the ship's overall TL, whichever is higher. Multiply "internal space in dtons" by 0.1 for super-light frame, 0.25 for extra-light frame, 0.5 for light frame, 1 for medium frame, 2 for heavy frame and heavy asteroid frame, 4 for extra-heavy and extra-heavy asteroid frame, and 8 for super-heavy asteroid frame. See p. T:FT75 for more information.

Hit Points

Record hit points for the hull and each bay or turret. A hull, bay, or turret's hit points are its area × 1.5. Multiply this result by 0.1 for super-light frame, 0.25 for extra-light frame, 0.5 for light frame, 1 for medium frame, 2 for heavy frame and heavy asteroid frame, 4 for extra-heavy and extra-heavy asteroid frame, and 8 for super-heavy asteroid frame.

Damage Threshold

This is the point at which the ship takes major damage. Vessels designed with medium frames suffer a Major Damage result every time cumulative damage to the hull reaches a multiple of 10% of their hull points (HP), as per p. GT169. For vessels with other frame strengths, this "damage threshold" is different. It is equal to the hull's HP multiplied by 1 for super-light frame, 0.4 for extra-light frame, 0.2 for light frame, 0.1 for medium frame, 0.05 for heavy frame and heavy asteroid frame, 0.025 for extra-heavy and extra-heavy asteroid frame, and 0.0125 for super-heavy asteroid frame.

Step 9: Performance and Design Finalization

The final step in starship design involves computing performance and miscellaneous statistics. These bits of information will be handy during game sessions, where pilots will need them to fly their vessel!

Jump Number, Air Speed, and Space Acceleration

These statistics are determined as on p. GT159. To determine drag for airspeed calculations, divide surface area by 10 for superior streamlining, 20 for excellent streamlining, or 40 for radical streamlining.

Space Acceleration and Reaction Drives

If a vessel uses a reaction drive, it can only accelerate for a limited amount of time before running out of fuel. The accounting unit used to determine how long a vessel can accelerate is called a G-Round, or GRd for short. Calculation of GRd formulae is only necessary if a vessel uses a reaction drive; most vessels use reactionless thrusters. The GRd formulae determine the average acceleration over the complete burn time afforded by the available fuel on board. See *G-Round Calculations*, below, for the formulae used to calculate GRds.

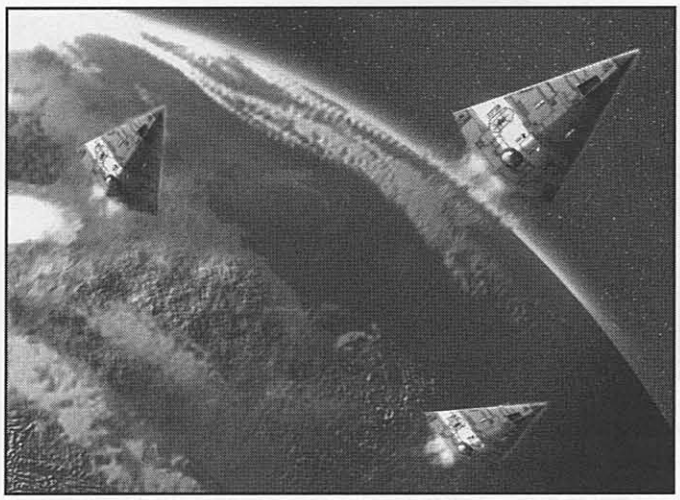
G-Round Calculations

For reaction-drive ships only, this statistic measures how long a ship can accelerate without running out of fuel. The format is *A G R GRds*. *A* is the vessel's maximum space acceleration in gravities; *R* is the number of gravities of acceleration that can be used before the vessel runs out of fuel.

A is reaction drive thrust in stons divided by (ship loaded mass in stons minus half the mass of reaction drive fuel in stons). This reflects the fact that drive fuel will be burned away as the ship accelerates, and thus gives an average result without much complication.

R is the spaces of fuel carried for the reaction drive divided by the drive's fuel consumption in spaces per hour, multiplied by *A* times 3.

Each space combat round, subtract the acceleration in G used by the ship from its remaining G-Rounds. When G-Rounds reach zero, the ship is out of reaction drive fuel and can no longer accelerate.



Example: A ship has a reaction drive with a thrust of 54 stons and a fuel consumption of 188 spaces/hour; the ship has a loaded mass of 600 stons. It carries 282 spaces of hydrogen fuel for its reaction drive; hydrogen masses 1 ston per space, so the fuel masses 282 stons.

A is 54 divided by [600 – (282/2)] = 0.12 G.

R is 282 (fuel spaces) divided by 188 (fuel consumption per hour) times 0.12 (A) times 3 = 0.54.

Its GRd statistic is written as 0.12 G 0.54 GRds. If the vessel accelerates at 0.1 G for two rounds, its GRds drop to 0.34.

Missiles are also rated in GRds; instead of fuel, they use electricity stored in power cells.

Underwater Performance

There may be occasions where the underwater performance of a spacecraft will be relevant (System Defense Boats hiding deep in the ocean, for example). In ***GURPS Traveller***, ships with vectored reactionless thrusters capable of more than 2 G of thrust, very good or better streamlining (see p. 29), and total compartmentalization (see p. 30) are assumed to have the equivalent of a submersible hull. A submersible hull is required for most underwater operations, but ships without one may still be able to function in this environment. For more information, see *Submerged Performance,* p. VE132.

There are two key parameters for underwater performance: Maximum Speed and Crush Depth.

To calculate Maximum Speed underwater (uSpeed), first determine:

Hydrodynamic Drag = 944 × cube root of (Total Displacement × Total Displacement).

Then:

uSpeed in MPH = 76 × cube root (Thrust/Drag).

Total Displacement is in dtons and Thrust is in stons.

Crush depth in yards is 10 plus the DR of the hull or turrets (whichever is lower), multiplied by 0.75 for super-light frames, 1.5 for extra-light frames, 3 for light, 6 for medium, 12 for heavy, and 24 for extra-heavy. Divide this final result by the size modifier of the ship (p. 28). If the ship does not have a submersible hull or the equivalent, divide again by 2. In ***GURPS Traveller,*** this supersedes the formula on p. VE133.

Underwater Action

UV and rainbow lasers have 1/500 their listed range underwater, X-ray lasers 1/1,000, and plasma and fusion guns are useless. TL8+ missiles use their uSpeed statistic as calculated above and can travel for one hour (though their crush depth is quite shallow). If combat occurs in this environment, ***GURPS Traveller: Ground Forces*** is recommended for the shorter combat rounds and distances involved.

Batteries

Up to 10 turrets, or 30 spaces of hull-mounted weapons, may be linked together to form a *battery,* aimed and fired by a single gunner. This is normally done to increase firepower and reduce crew requirements. All turrets must be on the same side of the ship and carry the same weapons. Each time the number of *weapons* is doubled, the battery's effective rate of fire is increased by 1. Battery assignments may be changed at will, so long as sufficient gunners are available. Batteries may not mix turrets and hull-mounted weapons. Weapon bays may not be grouped as batteries.

Directions and Numbering

Directions on shipboard can be both relative ("forward of bulkhead 30") and absolute ("the aft airlock").

Direction Terminology

Drive Axis – the principal direction on a ship is its drive axis, a line from the center of thrust of the primary drives through the center of mass of the ship. Some ships may have both a primary and a secondary drive axis if they have more than one drive configuration; if so, the primary drive axis is almost always meant.

Deck Orientation – Ships are defined as *belly-landers* if their main deck is parallel to the drive axis, or *tail-landers* if perpendicular. Belly-lander designs are common among freighters; this configuration maximizes the area for cargo hatches in proximity to a dock. Belly-landers are also suited to lifting-body designs for streamlining. Military and scientific vessels, and those designed purely for zero gravity, are often tail-landers (e.g., the Laboratory Ship, p. GT145, and Mercenary Cruiser, p. GT139).

Fore and Aft – Forward (fore) is in the direction of the drive axis (toward the nose); after (aft) is in the opposite direction, toward the "tail" of the vessel.

Port and Starboard – The left and right sides of the ship, respectively, always determined while facing forward. The term "port" refers to the Solomani custom of placing the primary airlock (and hence, access to the starport) on that side; Vilani-influenced designs show no particular preference.

Dorsal and Ventral – the top (back) and bottom (belly) of the ship, while facing forward and with port to the left. On tail-landers, port is arbitrarily defined by the location of the main airlock; ventral, starboard, and dorsal subsequently are defined from there.

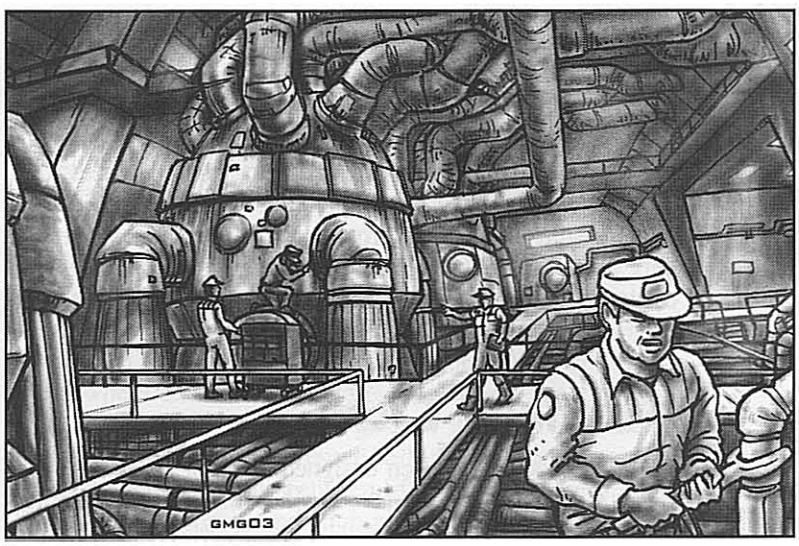
Outboard and Inboard – Outboard is away from the drive axis; inboard is toward the drive axis.

Numbering

Starships have many identical components located throughout the hull; when it is important to distinguish them clearly, a standard numbering system is used. Odd numbers are used on the port side, even numbers on the starboard. Numbering is consecutive, in order from inboard to outboard, fore to aft, dorsal to ventral. Items on the drive axis are numbered after any others of the same type.

For example, the cabins on a *Beowulf*-class free trader (pp. GT132-134) are numbered thusly: starting on deck 1, from top to bottom on the deck plan, numbers 1-3-5 on the left (port) side and 2-4-6 on the right (starboard). On deck 2, the captain's cabin on the port side is #7, while the double occupancy cabin is #8 and the remaining crew cabin #10 (the low berth compartment could be called #9). The two drive units are #1 on the left and #2 on the right; the dorsal turret is #1, the ventral turret #2.

Different ships may have slightly different conventions, and all components should be clearly labeled in any case to prevent confusion. But when the chief engineer tells a crewman to "cut off power to the #3 drive, and hurry!" he should at least know where to look!



Crew and Passengers

All (non-sentient) starships require a crew to operate and maintain the ship. In general, the crew of the ship must provide enough personnel to operate all machinery and man all weaponry. The actual number of crew personnel required for the ship is based on the drives, weaponry, and other equipment carried by the ship. If the ship is under 1,000 dtons, then the rules on pp. GT149-150 should be followed. For vessels 1,000 dtons and over, see *Crews on Large Ships,* below.

In general, crew should have a skill level of at least 12 in the skill(s) appropriate to their positions. Good computers can make up for a lot (especially at high TLs); a luxury yacht may be capable of interstellar travel even though nobody aboard knows anything about piloting, astrogation, or the engine room!

If the GM feels a ship is under-crewed, he should assess penalties to appropriate skill rolls, especially in stressful situations when one spacer has to be in three places at once. See p. GT165 for rules on penalties due to additional duties.

Crews on Large Ships

Typical crew requirements are given below, but these are *averages;* actual requirements can vary a great deal. Military ships will have larger crews to allow for multiple shifts and to replace losses in combat. Transports often run with a bare minimum of crew to save money. A civilian yacht might not have anyone with the titles listed below, but somebody needs to do the job. Ships with minimal crews call for talented people since several jobs are doubled up.

Command Section

The ship should have a commanding officer, an executive officer, a computer officer, two navigation officers, and a communications officer. The section should also have some support personnel, ratings equal to 50% of the total officers in the section. On ships over 20,000 dtons, the number of personnel in the command section should amount to five per 10,000 dtons of ship.

Engineering Section

Engineering crew requirements are listed in the descriptions of each drive and power module. Additional mechanics and technicians (life support, electronics, etc.) may be required to meet maintenance man-hour requirements (see p. 106). The section should include a knowledgeable chief engineer, a second engineer, and several petty officers. There should be 10% officers and 20% petty officers.

Gunnery Section

The ship should have a chief gunnery officer and at least one petty officer for each type of weapon aboard. A spinal mount should have a crew of one per 100 dtons of weapon (round to the nearest whole number); bay weapons should have a crew of at least two; turret weapons should have a crew of at least one per battery. The gunnery section should have 10% officers and 30% petty officers.

A weapon cannot be fired in combat unless it has an operator. However, this may be a gunner, a non-gunner operating at default, or a computer. Some weapons may be manned by ship's troops during combat operations.

Flight Section

If the ship has any small craft, it should have a flight-control officer, crew for each craft, and at least one technician per craft. Launch tubes should have a crew of at least 10, which will include a flight-supervision officer and a preponderance of petty officers.

Stewards on passenger liners are often given minimum certification as lifeboat operators for emergency evacuations.

How Many Medics Do I Need?

If a ship is 1,000 dtons or larger, see *Medical Section*, below. For smaller ships, here is a review of the different rules and guidelines.

- ***GURPS Traveller: Far Trader*** says one Certified Medical Technician is required for ships 200 dtons or larger and carrying paying passengers.
- ***GURPS Traveller*** states one Sickbay is required for every 120 staterooms, rounded up. It is recommended that the first Sickbay have two medics and then one medic for each additional one.
- ***GURPS Traveller*** states a medic with First Aid should be carried on ships without Sickbays but carrying passengers. This medic may be a steward with the required training.
- ***GURPS Traveller*** states a medic with Electronic Operations (Medical) at 10+ should be carried on ships to oversee cryogenic freeze capsule (low berth) operations. This may be a steward with the required training.

To sum up: If a ship is carrying paying passengers (awake or in low berth) and the ship is 200 dtons or larger, a certified medical technician is required with Electronic Operations (Medical) at 10+. If the ship doesn't have a Sickbay (or Emergency Aid Station) this medic can also be a steward. One full-time medic for each 60 people aboard is highly recommended. Automeds and chrysalis machines (p. S91) can replace medics, but a ship should retain at least one live medic per sickbay, military sickbay, or per two Emergency Aid Stations (see p. 65).

Medical Section

A chief medical officer, plus one full-time medic or assistant per additional 50 people aboard. Automeds and chrysalis machines (p. S91) can replace medics, but a ship should retain at least one sophont medic per sickbay or military sickbay, or per two Emergency Aid Stations (p. 65).

The rate at which low-berth passengers can safely enter or awake from cold sleep is critically dependent on the number of skilled medics available: one medic at Physician 10+ or Electronic Operations (Medical) 10+ can assist the entry of 12 or revival of 16 passengers per hour (p. GT108). Passenger ships with large numbers of low passengers often cross-train stewards to minimum standards to expedite this process.

Service Crew

The ship itself may have a requirement for additional sections which provide basic services including shops and storage, security (especially if there are no ship's troops aboard), food service, and other operations. Allow two per 1,000 dtons of ship or 100 other crew, whichever is more; three per 1,000 dtons or 100 crew if there are no ship's troops.

Luxury liners often have extensive housekeeping and service staffs for the comfort of passengers; see p. 56.

Ship's Troops

Most ships 1,000 dtons and over have a marine (or military) contingent aboard which ranges in size from a squad to a regiment. The size of contingents can range from three per 1,000 dtons of ship to three per 100 dtons. Such forces are organized according to the standards of the service from which they are drawn, but are assigned to the ship; their equipment should be consistent with the TL of the ship. Ship's troops often fill the role of security forces aboard the ship and are used for military exercises by the ship's commanding officer. They are also used for damage-control parties, manning of some weapons, and boarding actions.

Ship's troops often get bunkroom accommodations, though this is avoided whenever possible. They also require approximately one armory per 20 troops, in addition to special facilities for storing battledress (p. 55) if so equipped.

Specialists

Large ships, especially military vessels, will have full-time officers and specialists for intelligence, liaison, electronic warfare, etc. There may also be science crew, cargo specialists, etc.

Optional Crew

Entertainers of various sorts will be found on luxury liners – sometimes more entertainers than passengers. They may or may not have any actual "crew" skills.

Frozen Watch: If low berths provide enough places for a 50% overage in personnel (including ship's troops, if any), then the ship may have a "frozen watch." Fresh personnel are kept available in low berths for continuous replacement of casualties and battle losses; between battles, the frozen watch can be revived and used to restore lost crew.

Fitting Out

Once a ship has been designed, it is far from ready for flight. A variety of consumable supplies must be acquired, first.

Additional Expenses

Vessels may require these additional expenses not included in their cost:



- Computer programs (p. 70).
- Missiles (p. 52).
- Sand canisters (replacements cost Cr400).
- Spare parts: assumed at 0.1% of original purchase price of vessel per year.
- Berthing costs: Cr100 × hull class per week (or fraction thereof) to land or dock at any starport. For more detailed costs, refer to ***GURPS Traveller: Far Trader***.
- Fuel: depends on required type. See the table below:

Fuel Type	*Cr/dton*	*Abbreviation*
Refined LHyd	350	H
Unrefined LHyd	50	H
Hydrogen/Oxygen	333	HO
Jet Fuel	10,000	J
Metal/Oxide	50,000	MOX
Rocket Fuel	6,667	R
Water	0	W

- Fresh provisions: cost Cr60+ per person per week; required for high-passage accommodations. Also refer to p. 59.
- Annual maintenance: costs 0.1% of original purchase price and two weeks at any Class IV or V starport. See p. 106.

Outfitting the Ship

A starship costs tens of millions of credits, yet some owners will begrudge a few tens of thousands to keep their investment in top shape. Here are a few points to consider when outfitting a new ship.

Auxiliary Equipment

Auxiliary equipment includes every item not part of the ship's basic design. Freight-handling equipment (p. 62) is an investment – a self-sustaining ship is one that can make a profit where others can't. Environmental gear for the ship's locker (see p. 61) and survival gear for the crew and passengers (especially sufficient rescue balls in every compartment) can make the difference between life and death (see p. 116). Finally, buy shotguns and snub pistols enough to equip the crew, for repelling boarders and hijackers *without* frying the bulkheads (see p. 105).

Parts and Stores

Spare parts cost 0.1% of the ship's original purchase price per year; their volume is included in engineering. This is in addition to parts required for annual maintenance (p. 106).

Although ships' life-support systems can produce edible food from algae and mycoprotein, it is not too tempting; the product is a bland-tasting, dry, flaky paste or cake, often gray or brown. Flavor additives (100 single-meal packs weigh 5 lbs. and cost Cr 50) make it more palatable. Vats that produce fauxflesh (a product of artificial tissue-engineering technology) provide real animal protein, but ships with less than 50 staterooms may have room to grow only one variety ("Beef *again*? I'd kill for lamb!").

Fresh provisions are the alternative of choice, and a necessity on any ship intending to carry high passengers. Preserved provisions are 2 lbs., 0.04 cf, and Cr6 per person per man-day. Fresh *real* food ranges from two to four times the price (and up, although at the high end the quality of the product depends more on the Cooking skill of the chef), and has twice the weight and volume. Both are carried as cargo: 2,000 man-days of preserved provisions or 1,000 man-days of fresh food per dton; fresh provisions are also perishable.

Ammunition

Not all merchant ships need to be armed; in the core sectors of the Imperium, armed turrets are not only a waste of space, but attract unwanted attention as well. Ships operating on the fringes or contracted to carry mail, however, need some form of armament. Some captains elect not to buy ammo while they pray their weapons alone will act as a deterrent. Others swap out weapons in bays and turrets when available at starports or planetside.

There is no magic formula for how many missiles and sandcasters to buy. In general, the ship with the most ammo wins; buy as much as possible.

Cash

Don't forget to maintain a cash reserve. Ideally, this should be enough for three months' expenses – but no one ever manages to save that much. Just set something aside for quick speculations, battle-damage repairs, unforeseen equipment requirements, "contributions" to local economies and their officials, and so on.

Hiring Crew

As in most business ventures, personnel can represent the single top expense of a starship operator.

Salaries and Shares

Crew members must be paid monthly, usually at the first port of call each month. Non-player characters must be paid according to the Job Table on p. GT106. Player characters may bargain for better pay rates or elect to accept worse. In addition, crew members may participate with the owners and accept shares in the proceeds of the ship's activities in lieu of all or part of their salaries. Salaries (and shares) should be noted next to names on the crew manifest, though this detail might be neglected on pirate ships.

Working Passage

A starship captain with a crew shortage may fill the vacancy by offering passage instead of wages. Working passage may not continue for more than three jumps or the individual is considered "hired" for standard salary – retroactive to the date he joined the ship. Crew members that work for passage do not sign the ship's Articles; instead, an entry is made in the ship's log detailing the circumstances and terms of the contract. In order to sign on for working passage, the individual must have some expertise in the position for which he is hired (but might not be fully certified). Baggage totaling 2,000 lbs. or one dton is allowed. Working passage costs the individual nothing; he receives passage, room, and board in lieu of salary.

Chapter Three

Hulls

There are four types of hull: streamlined, unstreamlined (the hull type that ***Traveller*** calls "partially streamlined"), dispersed, and planetoid.

Standard hulls are constructed according to the hull tables below; custom hulls make use of several options for more efficient or specialized design.

Streamlined and Unstreamlined Hulls

Many vessels previously seen in the ***GURPS Traveller*** universe used standardized hull designs, either TL10 or TL12 medium frames with standard materials, and either a non-streamlined hull or very good streamlining with a lifting body.

Standard Hull Sizes

The following table is for TL10, non-streamlined hulls:

Hull Class (dtons)	Volume (CF)	Area (SF)	Hit Points	Mass (stons)	Cost (MCR)	Size Mod
10	5,000	2,000	3,000	2	0.1	+6
20	10,000	3,000	4,500	3	0.15	+6
25	12,500	3,500	5,250	3.5	0.175	+7
30	15,000	4,000	6,000	4	0.2	+7
40	20,000	5,000	7,500	5	0.25	+7
50	25,000	6,500	9,750	6.5	0.325	+7
60	30,000	7,000	10,500	7	0.35	+7
80	40,000	8,000	12,000	8	0.4	+8
90	45,000	9,000	13,500	9	0.45	+8
100	50,000	10,000	15,000	10	0.5	+8
200	100,000	15,000	22,500	15	0.75	+8
300	150,000	20,000	30,000	20	1	+9
400	200,000	25,000	37,500	25	1.25	+9
600	300,000	30,000	45,000	30	1.5	+9
800	400,000	40,000	60,000	40	2	+10
1,000	500,000	45,000	67,500	45	2.25	+10
1,200	600,000	50,000	75,000	50	2.5	+10
2,000	1,000,000	60,000	90,000	60	3	+10
3,000	1,500,000	80,000	120,000	80	4	+11
4,000	2,000,000	90,000	135,000	90	4.5	+11
5,000	2,500,000	110,000	165,000	110	5.5	+11
10,000	5,000,000	170,000	255,000	170	8.5	+12
15,000	7,500,000	230,000	345,000	230	11.5	+12
20,000	10,000,000	280,000	420,000	280	14	+12
30,000	15,000,000	360,000	540,000	360	18	+13
50,000	25,000,000	510,000	765,000	510	25.5	+13
60,000	30,000,000	580,000	870,000	580	29	+13
70,000	35,000,000	640,000	960,000	640	32	+14
75,000	37,500,000	660,000	990,000	660	33	+14
80,000	40,000,000	700,000	1,050,000	700	35	+14
90,000	45,000,000	760,000	1,140,000	760	38	+14
100,000	50,000,000	810,000	1,215,000	810	40.5	+14
110,000	55,000,000	870,000	1,305,000	870	43.5	+14
120,000	60,000,000	920,000	1,380,000	920	46	+14
130,000	65,000,000	970,000	1,455,000	970	48.5	+14
140,000	70,000,000	1,020,000	1,530,000	1,020	51	+14

Standard Hull Sizes (Continued)

Hull Class (dtons)	Volume (CF)	Area (SF)	Hit Points	Mass (stons)	Cost (MCR)	Size Mod
150,000	75,000,000	1,070,000	1,605,000	1,070	53.5	+14
175,000	87,500,000	1,180,000	1,770,000	1,180	59	+14
200,000	100,000,000	1,290,000	1,935,000	1,290	64.5	+14
250,000	125,000,000	1,500,000	2,250,000	1,500	75	+14
300,000	150,000,000	1,690,000	2,535,000	1,690	84.5	+15
400,000	200,000,000	2,050,000	3,075,000	2,050	102.5	+15
500,000	250,000,000	2,380,000	3,570,000	2,380	119	+15
750,000	375,000,000	3,120,000	4,680,000	3,120	156	+15
1,000,000	500,000,000	3,780,000	5,670,000	3,780	189	+16
1,250,000	625,000,000	4,390,000	6,585,000	4,390	219.5	+16
1,500,000	750,000,000	4,950,000	7,425,000	4,950	247.5	+16
1,750,000	875,000,000	5,490,000	8,235,000	5,490	274.5	+16
2,000,000	1,000,000,000	6,000,000	9,000,000	6,000	300	+16
3,000,000	1,500,000,000	7,860,000	11,790,000	7,860	393	+17

Custom Hull Sizes

Hulls can be constructed to any size. If a hull class falls between two classes on the table, treat it as the larger class for area, hit points, cost, mass, and size modifier. The volume (in cf) of the new hull is calculated by multiplying the Hull Class (dtons) by 500 (the number of cubic feet assumed to be in a space).

Options

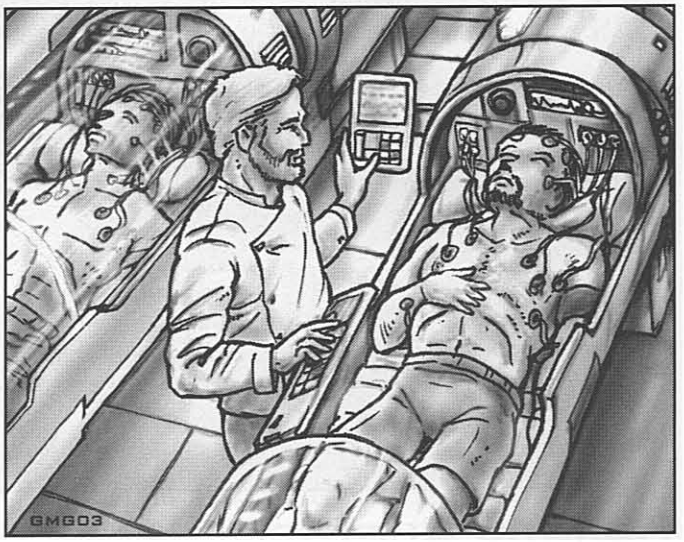
The naval architect can vary several structural factors, depending on the vessel's intended purpose.

Frame: Most ***GURPS Traveller*** vessels use medium frames, but other types are possible: racing vessels are often super-light, while warships are frequently reinforced. Multiply cost, mass, and HP by the values on the table. Ships with high accelerations, external cradles, or other abnormal loads should have heavy or extra-heavy frames to handle the additional stress this places on their hulls if gravitic compensation is below the acceleration the engines can provide. Hit point thresholds for determining major damage is not affected by frame strength (this means vessels with heavier frames will typically take more major damage before becoming disabled). See Chapter 2.

Materials: Most ***GURPS Traveller*** vessels use standard materials, which represent the optimum balance between mass and cost. Where one of these factors is overwhelmingly important, different materials can be used. Multiply mass and cost by the values on the table. All starports have standard materials readily on hand and are tooled to work with them. Starports may not have other options available; it will add to the construction time (and thus cost, at GM's discretion) if they have to retool for it.

TL: Improving materials technology reduces structural mass, as indicated on the table. TL10 hulls are the standard against which all others are measured.

Streamlining: Standard ***GURPS Traveller*** vessels have either no streamlining or very good streamlining. All streamlined vessels are lifting bodies (like the Space Shuttle or "flying wings" – see p. VE11). Better streamlining increases



a vessel's atmospheric speed. Multiply hull cost and internal spaces by the values from the table.

Tech Level

	7	8	9	10	11	12+
Mass	3	2	1.5	1	0.75	0.5

Frame

	Super Light	Extra Light	Light	Med	Heavy	Extra Heavy
Cost	0.1	0.25	0.5	1	2	5
Mass	0.1	0.25	0.5	1	1.5	2
HPs	0.1	0.25	0.5	1	2	4

Materials

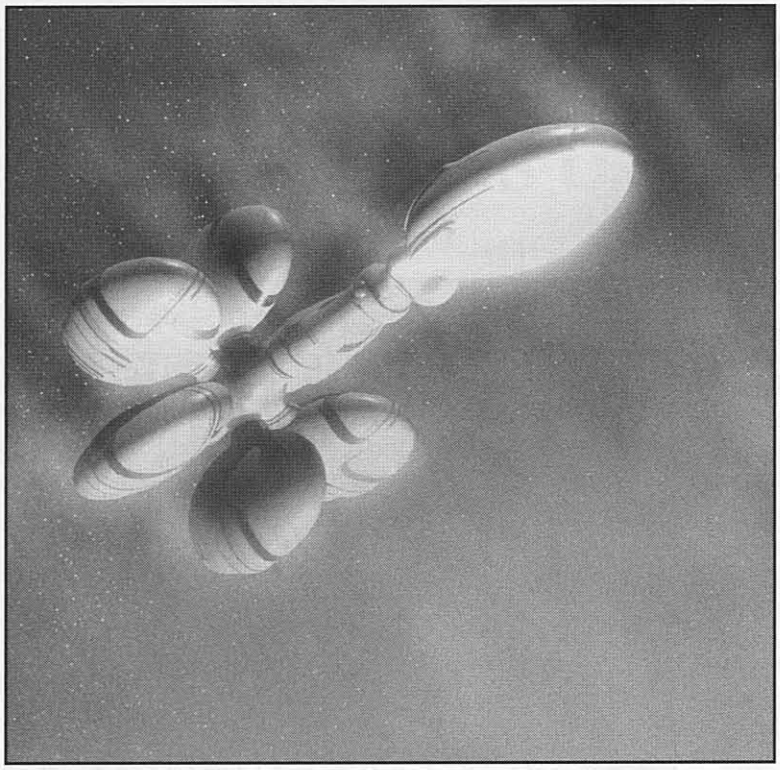
	Cheap			Exp.		Advanced
	Very Cheap		Standard		Very Exp.	
Cost	0.2	0.5	1	2	5	10
Mass	2	1.5	1	0.75	0.5	0.375

Streamlining

	Unstream.		Superior		Radical
		Very Good		Excellent	
Cost	1	2.4	3.6	6	12
Spaces	1	0.8	0.77	0.74	0.71

Compartmentalization

Vessels are already divided into airtight compartments with interior walls and pressure doors. For extra weight and cost, vehicles can have Heavy Compartmentalization (adds 10% of hull mass to total weight) or Total Compartmentalization (adds 20% of hull mass to total weight). Either type costs MCr0.01 per ton of weight added. Effects of compartmentalization are outlined on p. 31.



Robotic Ships

For a ship that can be run completely by computer, double hull cost (cumulative with the above modifiers) to include the necessary systems and internal data highways to enable the vehicle to be controlled entirely by a robot brain (see pp. VE61-63). A robotic ship still requires routine maintenance which can be performed by a human crew or with a crew of generic tinker-bots as described in ***GURPS Robots***.

Robotic vessels are severely restricted by Imperial safety regulations (starships cannot legally be operated on interstellar flights without a crew, for instance). There is nothing to prevent robotic provisions being added to a *crewed* ship, however; this represents a high degree of automation in the ship's systems. Robotic ships are commonly used as in-system gas and ore haulers on routine runs.

Other major powers and most independents have similar restrictions. The Hiver Federation is the notable exception: Hivers make extensive use of robotic vehicles and spacecraft.

In situations where a crew is required on a robotic ship, add up the total crew required to operate the maneuver drive as per the individual modules. The number of crew needed is the square root of the total, rounded up to the nearest whole number. This should also be done for the jump drive and the combination gravitics system if installed.

Dispersed Hulls

A dispersed hull is a structure with a minimum of open frame armor, to which components are attached. The hull itself cannot be sealed or pressurized; instead, separate sub-hulls are constructed and attached to the frame to provide pressurized environments. Dispersed hulls are common at low TLs (to save weight) and for military and commercial jump tenders, because a dispersed hull can launch and recover all carried craft at once.

Select a hull from the hull table; this provides the framework. Dispersed hulls cannot be streamlined or have any sensor masking or radiation shielding.

A maximum of (DR 100 × structural hit point factor) of "open-frame" armor may be added. Open-frame armor protects normally against collisions but provides no protection against explosions, beams, bullets, or other small projectiles (optionally, there is a 2 in 6 chance of hitting the frame). Open-frame armor has 20% of normal weight; since cost is based on weight, this makes it 20% as expensive.

All inhabited portions of the ship (bridge, engineering, staterooms, and any component with a power requirement) must be installed in pressurized sub-hulls. Turrets and weapon bays need not be included, as they already constitute separate compartments. Total all pressurized systems and design a single "hull" to contain them. This "hull" is framed (often of super-light strength), armored, and sealed normally. Total Compartmentalization allows this "hull" to be divided into as many sub-hulls as desired. The sub-hulls may be stealthed and cloaked at basic or lower levels (though it is pointless because the rest of the hull cancels any benefits gained). Sub-hulls may not have any other external surface features (hardpoints, external cradles, etc.) or streamlining, as they are contained within the primary hull. This sub-hull is still considered part of the overall vessel and not removable. It therefore does not require any special mounting hardware.

Planetoid Hulls

A planetoid may be used as a hull; they are available for the finding in any system with an asteroid or planetoid belt.

Planetoid hulls must be sealed, but may not be streamlined, nor have any sensor masking above basic. The inexpensive nature of planetoid ships would appear to be their major attraction, but they do provide other benefits, such as relatively inexpensive (though bulky) armor protection.

Hull: Select a hull from the hull table (or design a custom hull) using Medium Frame, Standard Materials. Multiply by the following factors:

Frame	Heavy	Extra Heavy	Super Heavy
Mass	18	24	36
HPs	2	4	8

Super-heavy frames are only available for planetoid hulls. They represent a hull that is mostly solid nickel-iron with compartments hollowed out of it.

Armor: Multiply DR by (surface area × 0.00035) to get armor weight in stons; planetoid armor is free. Minimum DR is 100; maximum DR = surface area.

Alternatively:

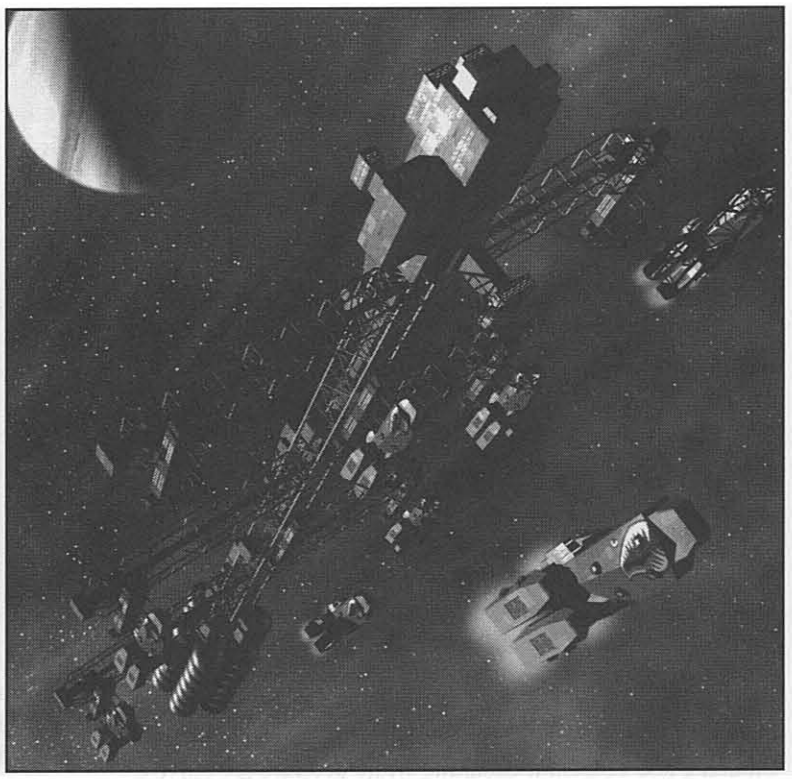
Planetoid DR = (armor weight in stons × 2,857) / surface area.

Planetoid hulls must still be sealed.

Cost: Starports charge a higher fee for "wrangling" a suitable planetoid, especially if it is located in a remote or dangerous system. Finding and moving a planetoid can kick off an adventure revolving around ship construction! Cr100 per space for hollowing, plus Cr2.5 to Cr40 per space for bringing in the planetoid.

Compartmentalization: Heavy Compartmentalization weighs 10% of hull mass; Total Compartmentalization weighs 20%. These don't have to be hollowed out (obviously), but they do count against the transportation cost. Their weight counts against the empty weight of the ship.

Volume: Unlike most vessels, the structural framework, armor, and compartmentalization of a planetoid hull are too bulky to ignore. Add up the total weight of the frame plus compartmentalization, divide by 125, and round up to get the number of *internal spaces* occupied by solid nickel-iron; these spaces are not available for other systems. Divide the total weight of armor by 125 to find its volume in spaces. Again, these spaces are not available for other systems.



Armor

Standard ***GURPS Traveller*** vessels use expensive metal armor. Select the DR level and material for the vessel's armor, then calculate the mass and cost. Metal armor is assumed to occupy no volume; planetoid armor is treated differently (see p. 31).

Armor Type at TL	Expensive		Cheap		
	Advanced		Standard		Mass
Steel or Aluminum Alloy	–	–	7	8	0.00025
High-Grade Steel or Aluminum Alloy	–	7	8	9	0.0002
Titanium Alloy	7	8	9	10	0.000125
Durasteel	8	9	10	11	0.000075
Crystaliron	9	10	11	12	0.00005
Superdense	10	11	12	13	0.00003
Bonded Superdense	11	12	13	–	0.00002
Cost (MCr/ston)	0.04	0.012	0.004	0.002	

Tech Level: The TL shown on the table is the TL at which each type of armor is considered Advanced, Expensive, Standard, or Cheap, respectively. A dash "–" means the armor is not available at that TL.

Mass: Multiply the figure in the table by total surface area and desired DR to get total mass of armor.

Cost: Multiply the cost factor for material and TL by total mass to get cost.

Surface Features

Surface features are components and options applied to the outside of the hull. They generally do not consume internal space, but almost always add to the vessel's cost and often add to weight.

Sealing

Vessel hulls must be sealed to retain internal atmosphere; crew and passengers will require vacc suits and their own oxygen supply in the very few classes of vessel that do not possess this feature. Multiply total surface area by MCr0.00004 to determine cost. Halve this cost at TL8 and halve it again at TL9+.

Sensor Masking

Warships are generally the only vessels to use sensor masking. A ship may be given *stealth* making it harder to detect by active sensors (like radar) and/or *emission cloaking* to mask it from passive sensors (like infrared). *Infrared cloaking* is an earlier version of emission cloaking. It is effective only against infrared, thermograph, or a PESA using thermograph mode but *not* any other type of PESA. Each type comes in three levels: "Modest," "Basic," and "Radical."

Stealth systems at TL8+ may incorporate, at no extra cost or mass (GM's discretion), a color-changing liquid crystal coating centrally controlled by the ship's computer. Civilian ships sometimes add this feature to their hulls separately and use it for camouflage (-2 to Vision rolls), decoration, or advertising.

Sensor Masking Feature	Mass	Cost	Power
Modest Infrared Cloaking/7	0.0005	0.00003	0
Basic Infrared Cloaking/7	0.001	0.0003	0
Radical Infrared Cloaking/7	0.002	0.003	0
Modest Stealth/7	0.0005	0.00003	0
Basic Stealth/7	0.001	0.0003	0
Radical Stealth/7	0.002	0.003	0
Modest Emission Cloaking/8	0.0005	0.00003	0
Basic Emission Cloaking/8	0.001	0.0003	0
Radical Emission Cloaking/8	0.002	0.003	0
Modest Sound Baffling/7	0.0005	0.00001	0
Basic Sound Baffling/7	0.001	0.0001	0
Radical Sound Baffling/7	0.002	0.001	0
Liquid Crystal Skin/8	0.0001	0.00004	Neg

Weight and cost are each equal to the vessel's total surface area times the number shown on the table above. Weight and cost are halved the TL after the system's introduction, and halved again 2 or more TLs after introduction. A vessel may not have two different versions (i.e. basic and radical) of the same feature.

Each level of cloaking, stealth, or sound baffling has a bonus associated with it. Modest is (TL-4) / 2 (round up). Basic is (TL-4). Radical is 2 × (TL-4). The bonuses for IR Cloaking and Emission Cloaking while in space are halved.

Infrared (IR) Cloaking subtracts its bonus from rolls to determine the success of IR sensor scans. Emission Cloaking subtracts its bonus from rolls to determine the success of passive sensor scans. IR and Emission Cloaking have no effect on vessels propelled by fusion air-rams or any other rocket.

A vessel with modest stealth has rudimentary smooth contours, but can pass as an ordinary design. A vessel with basic stealth has more smooth contours, but can also pass as an ordinary design. One with radical stealth always *looks* stealthy; think of a contemporary B-2 bomber or F-117 strike fighter. Either kind of stealth loses its effectiveness if the vessel has loaded external hardpoints (although empty hardpoints are fine); the vessel regains its stealth bonus after dropping its load. Stealth subtracts its bonus from rolls to determine the success of active sensor scans.

A vehicle with sound baffling is less noisy – system defense boats (SDBs) acting underwater or in a gas giant and atmospheric fighters often have sound baffling to make them harder to detect, but it can also reduce noise pollution! Sound baffling represents a variety of internal and surface measures to reduce the vehicle's noise level. Care is taken to mask sounds emitted from the vehicle, especially those of the engines. Equipment is carefully mounted so its vibrations are reduced. A vehicle with sound baffling may have modest, basic, or radical levels. Radical sound baffling is even more obsessive in its quest for noiselessness: the vehicle's surface may be covered with special tiles designed to degrade sonar detection. At higher TLs, the vehicle surface may actually be shaped to absorb sound. Sound baffling subtracts its bonus from rolls to hear the vehicle or detect it with any form of microphone, sound detector, or passive sonar. Radical sound baffling also subtracts TL-4 from attempts at active sonar sensing.

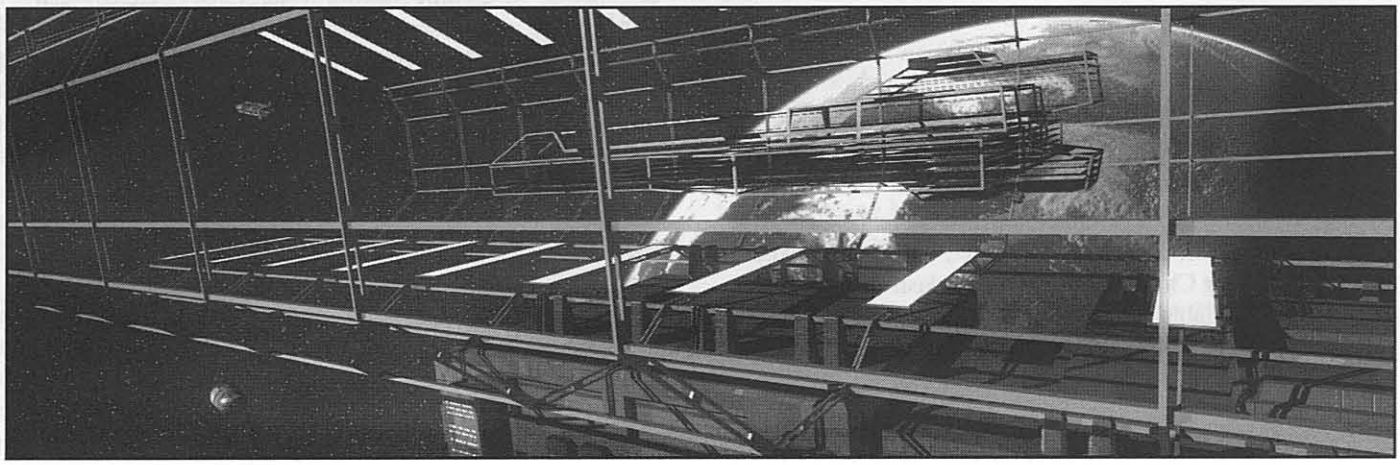
Each of these Sensor Masking options produces the ship's Detection Modifier. If a vessel is attempting to scan a ship with AESA (or another active sensor), its Detection Modifier is its Stealth Modifier. Likewise, its Detection Modifier against passive sensors is its Emission Cloaking Modifier.

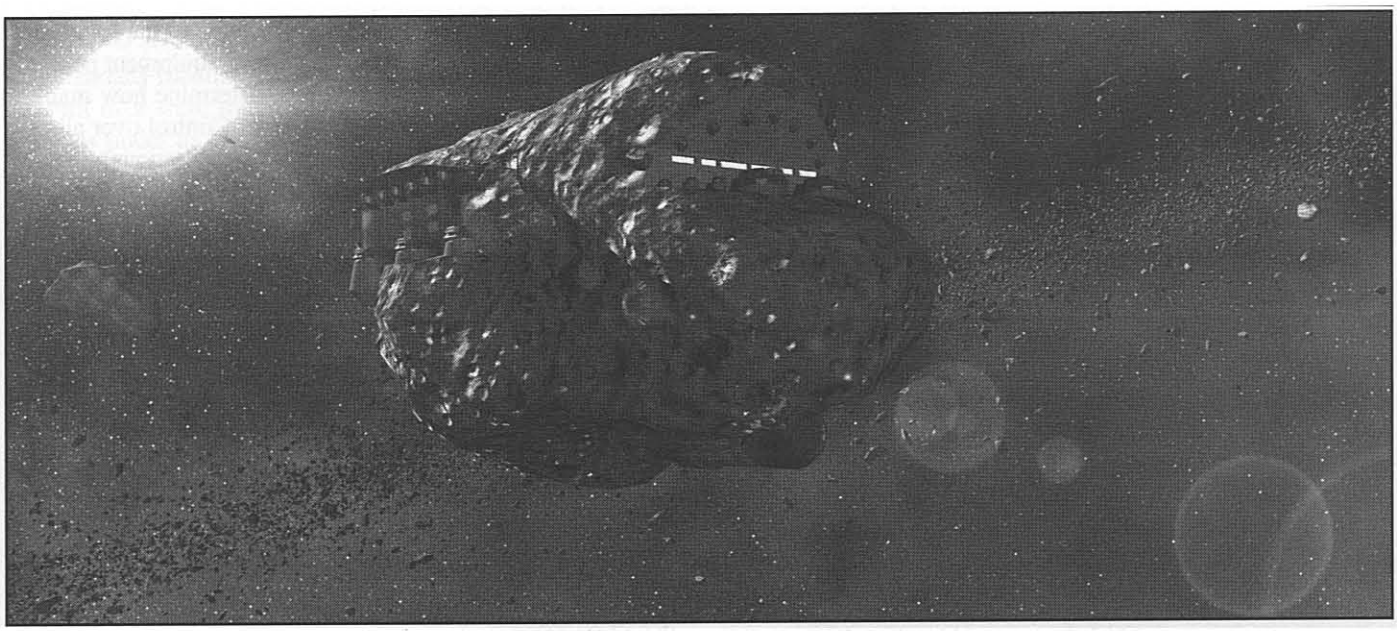
Typically, sensor masking can only be installed when the ship is designed. However, GMs may rule that *Modest* levels of sensor masking can be retrofitted to existing designs. This includes enhancements such as radar-absorbing paint, smoothing out some edges, and various tune-ups to the ship's systems.

Additional Shielding

Vessels likely to face certain hazards may have additional shielding installed. Alternatively, individual compartments may be shielded (brigs, bridges, staterooms, etc.). Find the surface area of individual compartments using the formula (spaces × 500) raised to the 2/3 power, multiplied by 6. The following types are available:

Electrified Surface: This feature is used to keep animals away or discourage people from tampering with the vessel. Conductive wires are embedded in the vessel's hull. The system can be set for "stun" or "kill." When turned on, any uninsulated object touching or touched by the outside of the hull takes 2d damage (if set to "stun") or 10d damage (if set on "kill"). Complete metal armor protects with only DR 1 against electrocution. A HT roll is required if any damage penetrates DR and the victim is still conscious; failure means he passes out for 25-HT turns (seconds). Electrical damage is covered more fully on pp. CII138-139.





Turning an electrified surface on or off can usually be accomplished from the bridge or main security station; it can be disabled from engineering or when the vessel loses power. An electrified surface can be designed to activate when an alarm system detects tampering with the locks or (if appropriate) by an operational Anti-Hijack program.

Radiation Shielding: Radiation shielding is typically ignored in ***GURPS Traveller*** but included here as an option. Detailed radiation rules are given on pp. S104-106. A vessel's hull has a natural radiation protection factor (PF). This is based on the DR of the hull facing the radiation. DR less than 100 gives PF 2. DR 100 gives PF 10 and every doubling of DR after that increases PF by a factor of 10 (e.g., DR 800 gives PF 10,000). In addition, double the PF if the vessel has superconducting armor, and the radiation is primarily X-rays, UV, or gamma rays.

Additional radiation shielding may be added if desired. PF for one layer is 10 at TL7, 100 at TL8, 1,000 at TL9-10, 10,000 at TL11-12, and 100,000 at TL13+, which adds to the natural PF above. Architects can add as many layers of shielding as desired, subject to the limitations of weight and cost.

Psi Shielding: Interferes with the use of telepathy (friendly or hostile) through the hull of the ship. Psi shields protect exactly as if it were a Mind Shield used by a telepath with a skill of 3 and a Power of (TL-2) × 2 (see p. B167).

Thermal Superconductor Armor: This coating may only be added over armor. It doubles DR up to an additional +DR 250 against shaped-charge (HEAT and HEDP) explosive warheads, lasers, X-ray lasers, and high-energy (plasma and fusion) weapons.

Shielding Feature	Mass	Cost
Electrified Surface	0.0001	0.00001
Radiation Shielding	0.001	0.00003
Psi Shielding/8+	0.00005	0.0001
Thermal Superconductor Armor/11+	0.000125	0.00025

Multiply mass and cost by the total surface area of the vessel. Weight and cost are halved 1 TL after the system's introduction, and again 2 or more TLs after introduction.

Turrets

Turrets come with a roomy built-in crew station (seat and console) with computer terminal and a Heads-Up Display/Weapon Aiming Computer (HUDWAC); at TL8+ they include a pupil scanner. Note that even though batteries of turrets (p. 24) do not require crew stations, naval experience has shown it is prudent to include them, anyway. If centralized battery control falls victim to battle damage, the only thing that might save a warship is crew members rushing to the turret stations and manning the weapons the old-fashioned way . . .

Turrets have three spaces available for weapons external to the main hull and consume one space internally for rotation room and the crew station. Pop turrets consume four spaces internally and three spaces externally when extended.

See p. 19 for more information on turrets. Turrets are Size Mod +5.

Weapon Bays

Weaponry in bays may be of five different types: meson guns, particle beams, high-energy weapons (plasma and fusion guns), repulsors, and missile racks. Bays don't come with crew stations – these crew stations are built into the actual weapons installed in the bay.

Small external bays have 50 spaces available for 50-ton bay weapons external to the main hull and consume 10 spaces internally for rotation space. Large external bays have 100 spaces available for 100-ton bay weapons external to the main hull and consume 20 spaces internally for rotation space.

If used as a sort of pop turret, small external bays consume 60 spaces internally (weapon space plus rotation space) and 50 spaces externally when extended. Large external bays consume 120 spaces internally and 100 spaces externally when extended.

Small internal bays have 50 spaces available for 50-ton bay weapons and consume 50 spaces internally. Large internal bays have 100 spaces available for 100-ton bay weapons and consume 100 internal spaces.

See p. 19 for more information on weapon bays. Weapon bays have a Size Mod equal to that of a vessel of their volume.

Modular Sockets

A modular socket is a space *in* a vessel designed to accept different component modules, and to allow them to be changed as needed without a shipyard facility or extensive reconstruction. A modular socket is rated for the exact volume of the module it can accept. It has no weight but costs MCr0.25 per dton. Its volume is exactly equal to its capacity. Modular sockets are available in half-space increments. The modular component (what fits in it) costs 20% more than its base cost.



External Store Mountings

External stores are anything carried outside the main hull and not stored in turrets or external bays. If a vessel does not have grav compensation, install enough mountings to hold the expected "weight" of the stores. This is determined by multiplying the mass of the stores by the expected acceleration of the vessel. This could result in small cradles capable of fitting large stores if the vessel is quite slow.

Hardpoints

Hardpoints are reinforced points on the exterior of a vessel's hull to which external stores such as drop tanks, missiles, or equipment pods are attached and jettisoned.

Each hardpoint (which is actually a set of related fittings) is rated for the maximum weight it can carry – its load capacity. Within these weight limits, a single hardpoint can be loaded with *one* drop tank, weapon, or equipment pod.

If a vessel will have hardpoints, determine how many it will have and the load capacity of each. Control over all of a vessel's hardpoints (which includes firing weapons) must be assigned to one of the vessel's crew stations, typically the pilot's.

The total weight of all hardpoint loads may not exceed (0.01 × the ship's hit points) in stons. Each hardpoint weighs 0.05 stons and costs MCr0.0002 per ston of load capacity. Hardpoints are assumed to be "tapped," allowing the vessel to draw liquid hydrogen from drop tanks and provide power to pods containing electronics.

Performance (jump number, acceleration) for ships with hardpoints must be calculated separately with and without external stores. Each 100 spaces of external stores on hardpoints obscures the arc of one turret. Each 1,000 spaces obscures the arc of one bay or 10 turrets. In either case, the weapons may be hull-mounted in lieu of losing their arcs completely.

Because hardpoints are generic and can carry any store within their weight limit, the stresses associated with atmospheric flight are unknown. Ships mounting loaded hardpoints may not enter an atmosphere without destroying the hardpoint and the stores attached. For atmospheric flight with external stores attached, see *Modular Couplings*, *Intrinsic Couplings*, and *External Cradles/Grapples*.

Modular Couplings

Modular couplings are linkages commonly used to affix a module to a modular craft. These linkages are simple connectors, far less elaborate and expensive than the robotics found in an external grapple. Conversely, modular couplings are not automated; a freight handler usually performs manual attachments and detachments. Modular couplings are also "dedicated" – only a module of the same "standard" can be attached to a given modular coupling. The most common standard in the Imperium is the "cutter coupling," used by the 30-ton modules for the modular cutter. Coming in a distant second is the "freight coupling" used by the standardized containers described on pp. T:FT56-57.

Modular couplings are designed exactly as *hardpoints* except they are dedicated to a specific external store.

Any couplings installed on a small craft take up the space normally available for a turret (but see *Intrinsic Couplings*, p. 35) due to the strengthened mechanical connection. For ships of 100 dtons or greater, each 100 stons of modular coupling *capacity* takes up the space usually available for one turret.

The standard coupling includes data and power leads. A "dead" coupling can be installed for half the cost of a linked coupling. For double cost, a linked coupling can be *remote-controlled*, allowing the modular ship operator to detach (but not attach) a module from his crew station. A linked coupling can be made *explosive* for 5 times normal cost; this allows the module to be released by remote control, though this disables the coupling until it is repaired.

The modules themselves require no extra cost or weight to fit a given coupling standard.

Intrinsic Couplings

Standard modular couplings simply tack the module to the hull of a ship, much like a TL7 fighter plane attaches weapons under its wings. An intrinsic coupling makes space for the module within the general outline of the modular ship itself; the module is "inserted" into its coupling like a battery into a radio.

Intrinsic couplings *quadruple* the weight of module a given coupling can carry because the module is held more snugly by the hull of the ship carrying it.

Several factors offset this advantage. First, an intrinsic coupling must be rated for dtons as well as stons of capacity. Thus, the standard modular cutter's intrinsic coupling must carry a 30-ton module. Modules of smaller size may be carried, but the coupling will have only one-quarter its usual weight capacity.

Second, a ship with intrinsic couplings may have restrictions placed on its sAccel rating when it is not carrying modules. The ship's structural integrity is just as dependent on the module as the module's fastening is dependent on the ship's structural integrity. To determine the sAccel limit of a ship with intrinsic couplings, divide the dton capacity of all intrinsic couplings by the displacement of the ship before the couplings are added. Look up the result on the table below:

dton Ratio	sAccel Limit
0.01 or less	None
0.011-0.5	3
0.51-1	2.5
1.01-1.5	2
1.51-2	1.5
2.01-2.5	1
2.51 or more	0.5

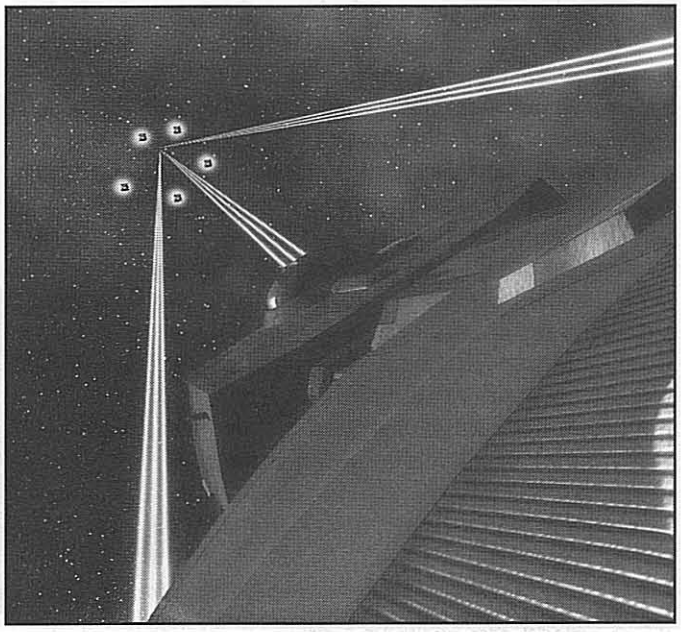
Each time the vessel exceeds its sAccel limit, the pilot should make a Piloting roll at -3, with a further -1 per 0.2 G over the limit. Roll once per hour for extended periods of high acceleration. Every failed roll does 6d×50 damage to the vessel's hull, bypassing armor.

Ships with two or more intrinsic couplings will have several sAccel limits, depending on whether all or some modules are missing. Modules in place count as host-vessel displacement when comparing empty intrinsic capacity to host-vessel displacement.

Third, in almost all circumstances ships with intrinsic couplings are considered to displace their own hull displacement *plus* the displacement of their intrinsic couplings. Therefore, the 50-ton modular cutter rates as 50 dtons of small craft when carried by another ship, whether or not the cutter is carrying a module. Standard Imperial practice is to even call the ship by this expanded displacement.

Intrinsic couplings must be added when a ship is designed; they cannot be retrofitted. They do not displace turret capacity as do standard modular couplings.

Example: The 50-ton module cutter is designed as a 20-ton small craft. This gives it 4,500 hit points. Its maximum intrinsic-coupling capacity in weight is up to (4,500/100×4) or 180 stons. We calculate that its intrinsic coupling will have the maximum 180 stons of capacity with (of course) 30 dtons of volume capacity. The coupling adds 2.25 stons to the cutter's weight and MCr0.009 to its cost. The craft now will be designated as a "50-ton" modular cutter, even though in combat it will be targeted as a 20-ton vessel (the 30-ton module would be targeted separately, unless using the alternate rules from ***GURPS Vehicles,*** p. 177). Dividing its 30 dtons of module capacity by its 20 dtons of hull size gives a dton ratio of 1.5, which limits sAccel to 2 G when a module is not carried. The cutter also takes up space as a 50-ton craft in all circumstances, unless a generous GM allows crafty space hands to stack cargo carefully around its odd configuration.



External Cradles/Grapples

These are multi-functional grapples capable of holding a wide variety of items – asteroids, small craft, cargo containers, etc. (for external craft in recessed vehicle bays, see p. 63). Each cradle consists of strong electromagnets, gravitics, or soft clamps attached to cables and winches, matched with articulated buffers to protect the hull. One cradle module holds an object of up to 125 stons on the outside of the ship's hull; total cradle capacity can be divided among as many actual cradles as desired but a cradle assembly can only hold one object. Cradle systems can be installed in increments of 1/2 space. Objects in cradles are not counted against the ship's internal spaces, but must still be included in jump drive requirements. They are also not protected by the ship's armor.

Grapples can also be used remotely, launched by a low-powered gas jet and attached to their target using Professional Skill (Grapple Operator). This provides rated force to pull objects toward the ship. Acceleration is pulling force divided by the mass of the smaller object (thus it is rarely necessary to have more capacity than the weight of the ship on which grapples are mounted); maximum speed is 4 yards/second. Stopping the grappled mass in zero-g is another matter, requiring the cradle's buffers or (for properly aligned, streamlined vessels) landing gear.

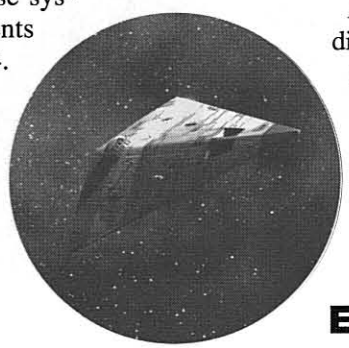
External cradle systems count against the turret-mounted weapons limit at a rate of one turret per three spaces.

Chapter Four

Propulsion, Power, and Fuel

Propulsion systems are the heart of any vessel – without them, a hull is just a cold, immobile hulk. Drives move the ship through space (or jump space). The power plants in engineering provide energy in the form of electricity; engineering and life-support systems also maintain a habitable environment inside the ship. Fuel systems collect, process, and store fuel used for jump and maneuver drives.

The number of engineering personnel on a vessel depends on the quantity and type of these systems installed. Specific crew requirements are noted in the *Module Tables*, p. 124. Add up all requirements (retaining fractions) and then round up to the next whole number. For systems that come in half-sized or small versions, divide all statistics by 2 unless otherwise noted and round any fractional spaces to the nearest 1/2 space.



Engineering Component Modules

Engineering systems package the basic requirements for power and life support into a single module. The power-plant and life-support cores are only the beginning, however. In the modular ship-design system, every module includes a "slice" of power plant sufficient to meet its own energy requirements (crew and passenger accommodations include a similar "slice" of life support). These power-plant slices must be taken into account when computing the total size of a ship's engineering spaces if designing deck plans. See *How Big Is My Reactor?* on p. 15.

Engineering Modules

All ships require a single engineering system (or equivalent); naval vessels often have more than one for redundancy and to allow for maintenance. Each system has a power core (the base "startup" weight, cost, and volume for a power plant) appropriate to the TL, total-life-support core, full fire-suppression system, and a six-man airlock. Included with the airlock is an inflatable 100'-passage tube (armored to DR 20) that can be erected in 30 minutes to connect two airlocks for passenger boarding, cargo transfer, and so on. Some smaller vessels have the same power requirements as larger vessels but have a much more limited volume requirement for their airlocks. The *small* modification (see *Module Tables*, p. 124) reduces the six-man airlock to a one-man version.

Airlocks

All TL13+ modules containing airlocks are assumed to have membrane airlocks to add a bit of a "wow" effect (see *Future Developments*, p. 72). Membrane airlocks are cell-like "curtain" membranes made of bioplastic that are selectively permeable to atmosphere. They work like normal airlocks but take only 2 seconds to cycle. GMs who feel this is too futuristic may assume standard airlocks, instead.

Any airlock rated for more than one person may be divided up into smaller units as needed. For example, a six-man airlock could consist of two three-man airlocks or one two-man airlock and four one-man airlocks. These divisions must be specified at design time (or when designing deck plans) if this level of detail is desired.

Small-Craft Bridge Add-Ons

This system includes a startup power plant, full life support for five, and a two-man airlock. The TL12+ version also includes one bunk. The design is compatible with the hardened bridge option (p. 42). It uses some of the waste space in the bridge systems. A craft with one of these add-ons still requires a Basic Bridge, but does not need an engineering system; this replaces the engineering module.

Power-Plant Cores

These modules are used when installing modules of different TLs in a single ship. The engineering module will, of course, provide the power-plant-core needs of whatever other modules are installed at the same TL as it, but a power-plant core will be required as the basis for the alternate-TL energy sources for other modules of higher or lower TL.

Each module includes one power core appropriate for the TL (fission at TL7-8 and fusion at TL9+) with long-term access space. The TL10+ versions may contain two cores for twice the cost and mass, with no additional volume.

Power Plant Slices

This module contains a power-plant slice of the type appropriate for the TL (fission at TL7-8 and fusion at TL9+) with long-term access space. They are used when a larger plant than the one built by adding the various modules to a ship is desired. A power-plant core of the same TL as this module must be installed. This core comes from either the engineering module or a power-core module.

Naval designers may install extra power capacity for several reasons, including emergency backup capacity, but usually this is done to improve the performance of lasers or other energy weapons. The higher a weapon's RoF, the better chance it has of hitting a target. Each doubling of the RoF increases hit probability by +1 without loss of range or damage capabilities (however, see *Double Fire* program, p. 72). The simplest way to determine how much extra energy is required is to add up the power requirements for each weapon and multiply by the desired RoF doubling. No RoF may be faster than 1/2.

Example 1: To take a 250-MJ Turret Laser from RoF 1/60 to RoF 1/30 (a single doubling), its energy bank requires recharging twice as fast. P. GT157 points out that the usual 60-second recharge takes 11.1 MW, so doubling will require 11.1 × 2 = 22.2 MW. The weapon already has a power slice rated at 11.1 MW, so it requires an additional one rated at 11.1 MW (22.2 – 11.1).

Example 2: To take a 250-MJ Turret Laser from RoF 1/60 to RoF 1/8 is a triple doubling (from 1/60 to 1/30 to 1/15 then finally 2/15, which rounds to 1/8). An energy bank requires recharging eight times as fast: 11.1 × 8 = 88.8 MW. The weapon already has an energy bank rated at 11.1 MJ, so it requires another one rated at 77.7 MW (88.8 – 11.1).

Energy Banks

A rechargeable energy bank is used to provide energy to systems whose transitory power requirements far outstrip the capacity of ordinary power plants. Energy banks are also used to store excess energy that is absorbed by black globes (see p. 50). Ships with any of these systems should be built with energy banks. Energy banks are available in full- and half-sized versions.

Jump Drives (TL9)

A ship requires a jump drive to make interstellar jumps. Each system includes the jump-drive machinery and power slices. Decide on the ship's Jump Drive number to a maximum of jump-1 at early TL9, jump-2 at late TL9, jump-3 at early TL10, jump-4 at late TL10, jump-5 at TL11, and jump-6 at TL12.

The number of jump-drive modules required is based on the ship's total displacement. See *Terminology*, p. 12, for information on total displacement. Whenever the total displacement changes (when jumping without craft carried externally or without other external stores, for example) the jump number must be recomputed based on the new displacement. The number of jump drive modules required is:

number of jump drive modules = 0.01 × total displacement × (jump number+1).

In some circumstances, this formula indicates a fractional value. Round up to the nearest space in those cases.

Short-Term Systems

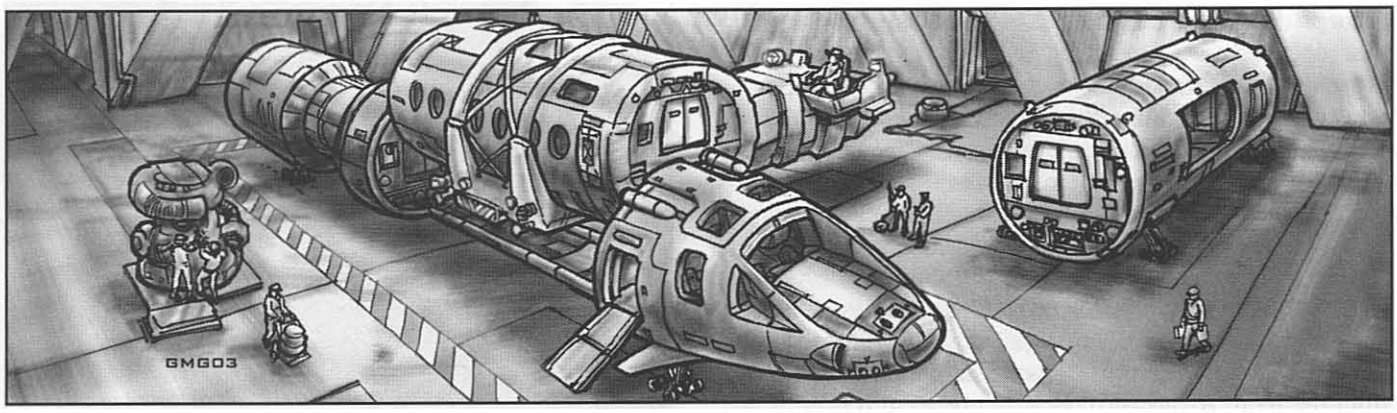
Small craft are generally used solely as short-duration vessels. Short-term modules utilize short-term access space instead of long-term access space. Vessels built with these modules are only serviceable groundside or from within a spacedock, and only when the craft is *not* in use – there is not enough access space within the vessel to get to the required systems. Small craft *do not* have to be built with these systems. They can be (and usually are) built with the normal long-term access modules, instead. Short-term systems start with "ST" to differentiate them from the long-term systems (see *Module Tables*, p. 124).

Reaction and Maneuver Drives

There are two kinds of normal space drives: reaction drives and reactionless maneuver drives. A vessel needs some type of normal space drive to adjust its course through space; even "immobile" space stations and platforms will often have weak drives to make small corrections in their orbits. All normal space drives are available with long-term access and most are available with short-term access for use with small craft.

Maneuver Drives

A maneuver drive (M-Drive) is a reactionless thruster that produces thrust without fuel or reaction mass. Each module has a vectored reactionless thruster and a power-plant slice to run it. Install as many M-Drive modules as desired. Short-term and half-sized modules are available, as well. See *Ships Without Vectored Thrust Engines*, p. GT174, for more information.



Solar Sails

The solar sail, though not really a standard maneuver drive, is a low-thrust space drive that uses the pressure of light (usually sunlight) for propulsion. Its main advantage is it requires no fuel. A solar sail is essentially a very large, ultra-thin steerable mirror. Unlike normal sails, it does not require a mast subassembly.

Light pressure is very slight and varies inversely with the square of the distance from the system's star. As such, a solar sail is most useful within the inner part of a star system. A solar sail can maneuver and propel the vessel in any direction, by tilting the sail and using stellar gravity to assist in changing course.

Solar sails are very fragile. A ship with an unfurled sail cannot use any other form of thrust without damaging the sail, nor can it come within 200 miles of any world with an atmosphere. Furling or unfurling a solar sail is a difficult maneuver requiring one hour to accomplish. A successful Piloting (Solar Sail) roll will cut this time to 15 minutes.

Reaction Drives

The reactionless maneuver drive is the most common form of slower-than-light propulsion in the ***Traveller*** universe, but far from the only one. At low TLs, reaction drives (rockets) of various sorts may be a better option or the only option available. Short-term modules are available for all except the HEPlaR drives and Solid Rocket Boosters. The Solid Rocket Booster has no access space, as it is disposable.

"Reaction drive" is a general term for any drive that involves throwing something out the back of the ship to make it go forward. The limiting factor on reaction drives is reaction mass – the material ejected as exhaust. A drive that uses a lot of reaction mass has limited acceleration, since carrying the reaction mass itself slows down the ship. But a ship which uses little mass, or which can pick up more while traveling, could in time accelerate to speeds approaching light speed.

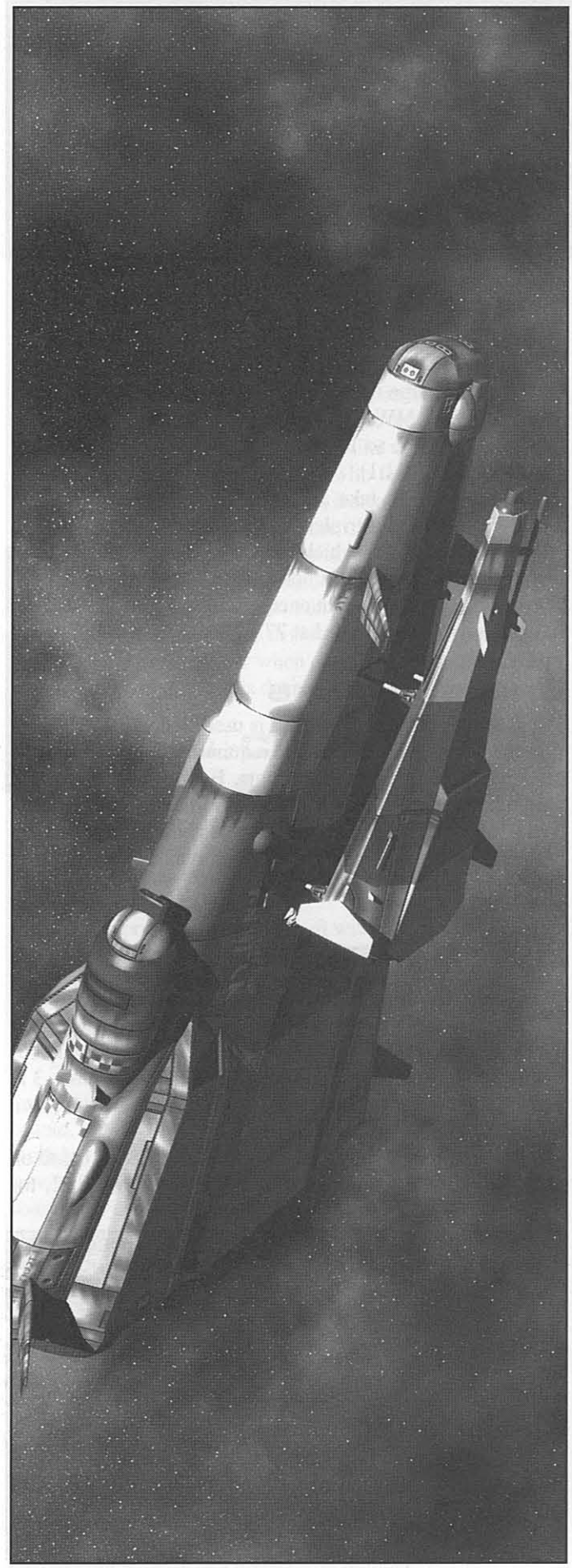
GMs that feel reaction drives are too archaic or too realistic may choose to ignore them completely. Alternatively, they may feel reactionless thrusters are too "super-science" and decide to use reaction drives exclusively (though this can substantially change the flavor of a ***Traveller*** campaign). Early discussions of campaign style can avert the use of inappropriate technologies.

Thrust, mass, cost, and fuel consumption (in dtons per hour) are *per module* of drive. All drives are *vectored thrust* (except the Bussard ramjets). Most are already in half-space increments.

Liquid Fuel Rockets are rocket engines that burn a mixture of fuel and oxidizer, and expel the resulting hot gas exhaust to create thrust. Liquid-fuel rocket engines are quite lightweight, but they are extremely fuel-thirsty.

Fission Rockets utilize a built-in fission reactor optimized to heat reaction mass and expel it to produce thrust. They are heavy and expensive. Their exhaust is also somewhat radioactive. Fission rockets require a Power Core appropriate for the drive TL (see p. 36).

Solid Rocket Boosters (SRBs, or solid fuel rockets) differ from the more advanced models of chemical rocket in that



the fuel is part of the rocket engine. Each module installed either adds 20 minutes burn time or the rated thrust (in stons). Alternatively, the thrust may be doubled, halving burn time. In either case, once the rocket fuel has burned away, the rocket is useless. The remaining weight of the rocket casing is 15% of the fueled rocket and is usually jettisoned. SRBs may be externally mounted in any of the available external mountings (see p. 34). Cradles are generally not used because guidance of the rocket requires control connections. Hardpoints may be mounted on a larger assembly containing the SRBs, to hold the actual spacecraft itself.

Example: If a ship is using a TL8 SRB (providing 7 stons of thrust for 20 minutes) and it requires 14 stons of thrust, cut the burn time of the booster by 10 minutes or add another SRB module. If a thrust of 28 tons (4×) is required, cut burn time to 5 minutes (1/4×) or add three more SRB modules.

HEPlaR drives (High Energy Plasma Recombustion) are an advanced and efficient fusion drive. They add a heat exchanger/recombustion chamber to any existing fusion power plant. Hydrogen injected into the chamber is heated to a plasma state, and then magnetically accelerated further to produce a high-velocity stream of reaction mass. HEPlaR thrusters *do* require input power. They are not available in short-term versions. They incorporate crude, first-generation elements of the technology that eventually becomes reactionless thrusters.

Total Conversion Rockets are a total conversion drive; see *Reaction Drives Table,* p. S117. They convert fuel directly into energy. It is marginally "harder" science than a reactionless thruster, since it does not violate the conservation of energy or momentum. It also requires ships to refuel occasionally even when the jump drives are not used.

Metal/Oxide Rockets burn a watery mixture of metal powder in liquid oxygen (Metal/LOX). The performance is substantially lower than other types, but they are sometimes used because fuel can be obtained by processing asteroids or lunar rocks.

Metal/LOX fuel (MOX) is a cryogenic slurry – the metal element may vary, though aluminum and magnesium perform about equally and are common in asteroids. It is a tricky fuel to burn, requiring tougher pumps and engine parts to resist abrasion from both the metal powder and the exhaust, which is essentially hot, fine sand. The advantage of Metal/LOX is that it can be produced from material commonly available on waterless vacuum moons and asteroids, where hydrogen is scarce.

Atmospheric Drives

Atmospheric drives are typically used at lower tech levels to allow spacecraft access to ground facilities. They are not able to function in a vacuum, so are only useful on worlds with an atmospheric pressure of 0.5 or higher. Short-term modules are available.

Turbo-Ramjets are turbojets with variable geometry inlets allowing them to function as ramjets once the vehicle is moving faster than sound, considerably increasing their thrust. TL8+ turbo-ramjets include turbo-scramjets (supersonic combustion ramjets, designed to operate at very high speeds).

Hyperfans are advanced, hydrogen-burning turbofans. They are common in places where petroleum-based jet fuel is unavailable or too expensive.

Fusion Air Rams are fusion rockets that suck in air, heat it using fusion reaction, then expel it as reaction mass. They operate for 2.5 years on an internal fuel supply. While they only work in an atmosphere, its type or density (beyond a mere trace atmosphere) is irrelevant. The air-ram includes a high-efficiency fusion reactor that serves only to power the engine.

Gravitic Systems (TL8)

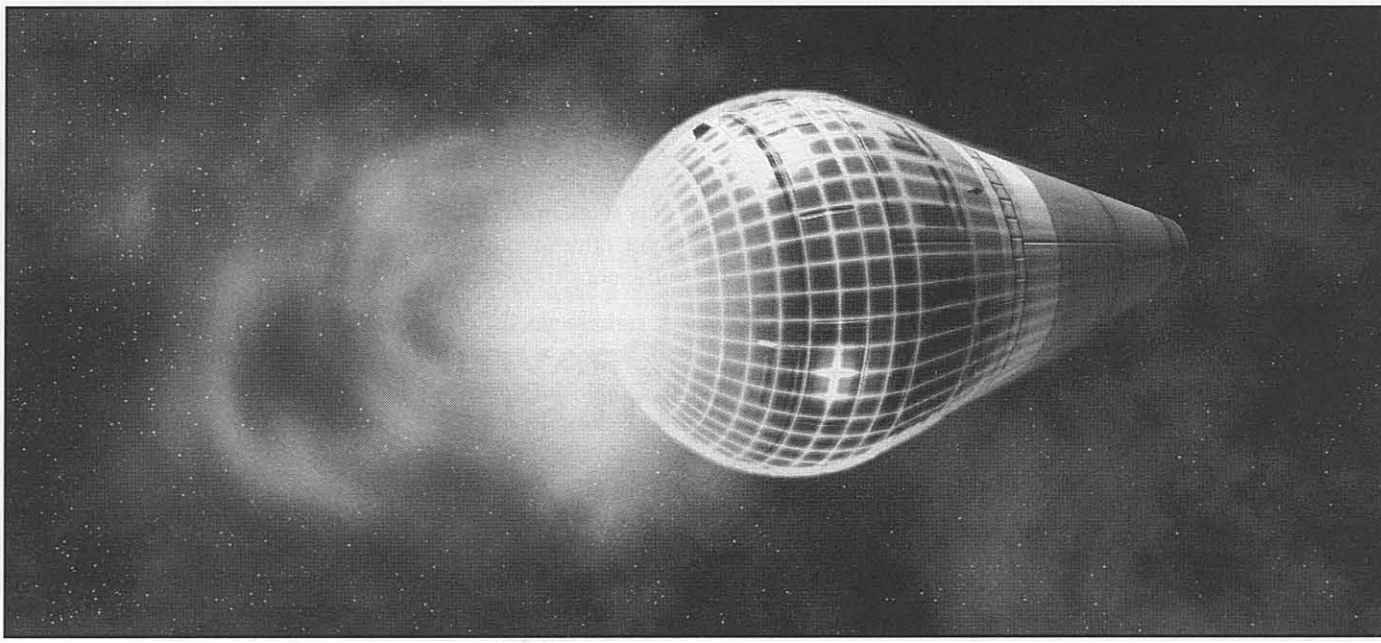
Gravitic systems are the product of scientific insight into the nature of the force of gravity, and the technical ability to manipulate the gravitic force to achieve specific effects, particularly counteracting the felt effect of high-G acceleration.

Maneuvering Without Grav Compensation

GURPS Traveller vessels, if equipped with artificial gravity, are assumed to have compensation for transient high-G maneuvers (see p. GT107). This relieves many of the stresses on the structure of a vessel, allowing it to perform at the fantastic accelerations found in the ***Traveller*** setting. But what happens when a ship suddenly loses this capability? Typically, external stores (cradles, drop tanks, and cutter modules) are at the highest risk as their mountings are usually only sized for the mass of the carried item under 1-G acceleration; exceed this and the mounting has to hold more "weight" than it was designed for. Cargo and stored vehicles may also suddenly "fall" against a bulkhead. The hull can also be affected (dented or even crushed) if acceleration is too high. Crew members may find it difficult to operate, as they are thrown against bulkheads and/or hit with "falling" objects.

A few guidelines:

- Can the crew operate under the high G? G-seats and G-suits help to reduce the effect of high-G maneuvers. See pp. CII131-132 or pp. VE152-155 for more information.
- Each time the vessel exceeds its "safe acceleration limit" (as imposed by the external mountings, p. 34), the pilot should make a Piloting roll at -3, with a further -1 per 0.2 G over the limit. Roll once per hour for extended periods of high acceleration. Every failed roll does 6d×50 damage to the external mountings, bypassing armor. Note this assumes a fully loaded mounting. Once HP have been reduced to 0, the mounting breaks and its payload is lost. The GM should determine if there is further damage caused as it bounces down the hull. External mountings are assumed to have a volume equal to mass/50 unless otherwise specified. Use the method under *Additional Shielding,* p. 32, to determine surface area, then multiply by 1.5 to get HP. Assume cargo containers and vessels stored in spacedocks or hangars are mounted with clamps that can hold twice the "weight" of the item contained; then apply the penalties above, if necessary. Should the item break free, treat this as a collision between the item and any bulkheads that it hits.



● The ship's structure itself has limits on how much stress it can take. The actual calculations and theory are quite intense and not appropriate for this book. As a guideline, if a crew can endure the acceleration, then the vessel can, as well.

Utility Systems (TL8)

This is an artificial-gravity generator that can vary gravity from 0 G to 3 G over a 500-dton volume via deck plating and other similar means. Artificial-gravity units include automatic compensation for transient high-G accelerations (separate "grav compensators" aren't needed) to 3 G at TL8-9, 6 G at TL10-12, and 9 G at TL13+ throughout the same volume. It also includes a two-person airlock. Utility systems are also available in half-sized, or *small*, versions, covering half the rated volume and only including a single airlock. Small craft normally omit utility systems, though there are also short-term versions presented covering 120 dtons (300 dtons at TL13) with a one-man airlock.

The grav compensation covers the total volume capacity of the module, permitting no more than 1 G of stress on structures fitted to the hull. This allows cradles, hardpoints, etc. to be rated at a minimum of 1 G without fear of undue stress from high acceleration. (See p. 39 for information on ship performance without grav compensation). Certain designs will still have other limits, such as those with *Intrinsic Couplings* (see p. 35).

Contragravity Systems (TL8)

Contragravity systems cancel out all natural gravitational forces acting on an object up to their rated lifting capacity, as discussed on pp. GT107 and S120. In ***GURPS Traveller***, where reactionless thrusters are common, such technology is available but only necessary in very specialized applications.

Each module counteracts 450 stons of weight at TL8, 1,500 stons at TL9, and 5,000 stons at TL10+. The module provides no lateral thrust.

Can My Vessel Really Fly?

For extra detail, a ship required to fly in an atmosphere must have enough lift to compensate for its weight. This lift can come from three different locations: the hull (via streamlining), contragravity, or vectored drives. One or both of the latter two are required if unstreamlined ships want to move around in an atmosphere – they don't get any lift from the hull (see *Streamlining*, pp. 17 and GT119).

The minimum required surface area to keep a *streamlined* ship in the air if its contragravity and/or vectored drive cannot totally compensate for the weight is 10 × LMass × square root of (LMass / Thrust), where LMass and Thrust are in stons. This formula indicates how much surface area is needed to stay in the air given the thrust of the vessel in one Earth atmosphere. If the CG or vectored drives can't keep it in the air and the hull's surface area is below this value, the design needs a bigger hull or to add more CG or drives.

Combination Gravitics Systems (TL8)

These systems combine contragravity, artificial gravity, and grav compensation in one module. These can be substituted for standard utility modules on most existing designs to provide contragravity lift on a 2-for-1 basis (two of these replace one existing *Utility Module*, above). Each module covers 250 spaces and provides 400 stons of lift at TL8. This decreases to 300 stons at TL9 (where each individual module becomes more compact, see above), then increases to 450 stons of lift at TL10+.

Fuel Tanks

These systems consist of a tank and appropriate pump mechanisms. They store the liquid hydrogen (H) used by jump drives and the reaction mass used by reaction drives. Strictly speaking, tanks should be required for all bulk liquid or gaseous cargoes, as well.

A ship with a j-drive requires a volume of H equal to its total displacement × jump number × 0.1. Typically, ships have enough fuel tanks to accommodate this volume.

Jump-Fuel Tanks

Ultralight self-sealing internal tanks permanently installed as part of a ship's design, these are available in half-sized versions. If the tank is designed to carry hydrogen, it includes the cryogenic equipment required; if the tank is carrying something other than hydrogen, this additional mass and cost is required to strengthen the tank structurally. Jump-fuel tanks are assumed to have fuel scoops for frontier refueling whether installed in a streamlined or unstreamlined vessel. Mass includes 1 ston of hydrogen fuel, so be sure to subtract it before using other fuel sources.

Collapsible Tanks

A 400,000-gallon collapsible self-sealing tank made of light folding polymers, this expands into an empty Hold or Spacedock module (which are required, to provide support and stability). It holds 120 dtons (and only 120 stons) of fuel when full. It can be installed in half-sized increments. A full tank will rupture and spill during maneuvers at least 1.5 G greater than that compensated by the utility systems.

Fuel from collapsible tanks must be pumped into the normal fuel tanks before it can be used; thus, a jump made with collapsible tanks may not use more fuel than the capacity of the normal interior fuel tanks. Pumping fuel before a jump takes about three hours. A typical use for collapsible tanks is to allow a short-jump ship to cross a long-jump "gap" in two or more jumps.

Demountable Tanks

Additional tankage can be installed or removed from cargo holds or space docks as required; the process takes 10 man-hours per dton at a suitable maintenance facility, at a cost of Cr10 per man-hour. Unlike the collapsible tanks, fuel stored here does not require pumping to the main tanks before use.

Drop Tanks

Disposable fuel tanks may be added to the ship. These jump-fuel tanks are fitted to the outside of the ship on hardpoints (see p. 34). The result is more interior space available for cargo and passengers, or increased jump number for military vessels. Such tanks may either be retained throughout jump or jettisoned just before jump (assign a -2 penalty to all jump checks if they are jettisoned, due to jump-field interference). Jettisoned tanks can only be replaced at a starport, base, or spacedock, so this operation is only practical on runs to civilized areas or for naval operations.

Drop tanks are constructed as sub-hulls; choose a hull from the hull table (or design a custom hull) and fill it with internal jump-fuel tanks. They need not be armored, but are very vulnerable to damage if not; military drop tanks normally carry at least DR 100. Drop tanks are often constructed for half price (using the "Cheap" quality option) if designed to be disposable. (The tanks themselves may be recovered, but are often irreparably damaged during the drop operation.)

Because drop tanks must be attached to hardpoints to jettison properly, there is a built-in limitation on the amount of fuel carried this way. This limit is highly dependent on the mass of the tank. See *Hardpoints*, p. 34.

Reaction Mass

A ship that uses a reaction drive requires fuel tanks in addition to those required for the jump drives.

To determine how many hours a particular reaction drive will operate, add up the total consumption of the drive in dtons and multiply it by the desired duration in hours. This is the total size of the fuel tank required (see *Module Tables*, p. 124). To increase the drive's endurance, add additional tankage. Liquid hydrogen from a starship's jump-fuel tanks can be used as reaction mass (and vice versa), but using too much may mean the ship cannot jump!

R-Mass Type	Cr/dton	ston/dton	Fire	Abbrev.
Refined LHyd	350	1	13	H
Unrefined LHyd	50	1	13	H
Jet Fuel	10,000	10.8	13	J
Metal/Oxide	50,000	20	13	MOX
Rocket Fuel	6,667	16.7	13	R
Water	0	15	0	W

Fire is explained under *Damage Control*, p. 116.

Fuel Collection and Purification

The hydrogen that starships use in their jump drives may be the most common element in the universe, but it isn't always the most accessible. Specialized equipment is often necessary to procure liquid hydrogen for a jump, or to refine it to remove destabilizing impurities.

Fuel Processors

This module purifies raw fuel (skimmed from a gas-giant atmosphere or from another source), turning it into refined fuel. Fuel processors use catalytic grids and molecular filters to extract the hydrogen from gas-giant atmospheres. Each system can process 1 dton (TL8), 3.5 dtons (TL9), or 8 dtons (TL10+) of raw gas-giant atmosphere every hour. Half-sized versions are available.

Some ships install combination electrolysis/processor modules that can more efficiently "crack" water and ice. Each module cracks 1/3 dton of water into 1/2 dton of liquid hydrogen (H) and 1/4 dton of liquid oxygen (LOX) and it refines 3 dtons of unrefined fuel per hour (1 dton at TL8). When finished, the ship should jettison the water or the hydrogen – or store each in separate fuel tanks.

Dedicated fuel-electrolysis systems are also available, though they are not as common as fuel processors except at low TLs due to their power consumption. Each module cracks 2/3 dtons of water into 1 dton of H and 1/2 dton of LOX.

Each system also includes necessary power components.

Chapter Five
Controls, Sensors, and Electronics

Spacecraft require sensors, controls, computers, and communicators. For safety, most spacecraft carry three redundant computer systems; these are included in Bridge and Cockpit components. Select the required electronics from this section and add them to the design.

Bridge Systems

The vessel's control, navigation, sensor, and communication systems are in the Bridge. All ships require at least one bridge system; larger vessels sometimes have an auxiliary bridge. Three types of bridge system are available: Cockpit/Systems, Basic Bridge, and Command Bridge.

Cockpit/Systems

A Cockpit/Systems component module is used on small craft instead of separate Bridge and Engineering modules. It provides two crew stations with computer terminals and HUDWACs, compact fire suppression, two advanced radar/laser detectors, one laser communicator, one radio communicator, a flight data recorder, one IFF, one inertial-navigation system, three microframe computers (Complexity TL-4), precision navigation instruments, active and passive sensors, a radscanner on all TL9+ versions, power startup, and a one-person airlock and two man-days limited life support.

The *Command* version is used on long-range fighters; it includes one hardened computer (Complexity is TL-2) and two hardened backup computers (Complexity is TL-3). It also has sensors and communications as listed for a Command Bridge of the same TL, except that it has only *one* communicator of each type. Full life support for two and two bunks are included for extended-patrol missions.

The *Light* version is a smaller, cheaper cockpit, with reduced sensor ranges. It is designed for short-duration commercial roles where sensor ranges and long-term pilot activity are not a key factor (e.g., orbital interfaces, runabouts, lifeboats, small private crafts). It occupies a niche between grav vehicles and full spaceships, as normal cockpits tend to cost far too much for private ownership of spacecraft.

Basic Bridges

A Basic Bridge is typical of civilian ships. It includes five crew stations with computer terminals and HUDWACs, full fire suppression, two advanced radar/laser detectors, one laser communicator, two radio communicators, a flight data recorder, two IFFs, two inertial-navigation systems, three mainframe computers (Complexity is TL-3), precision navigation instruments, and active and passive sensors. A radscanner is included at TL9+; one meson communicator is part of the system at TL11+.

Command Bridges

Some ships, especially military ships, will install a larger and better-equipped Command Bridge. It includes 10 crew stations with computer terminals and HUDWACs, full fire suppression, two advanced radar/laser detectors, four laser communicators, 10 radio communicators, two flight data recorders, two IFFs, two inertial-navigation systems, three macroframe computers (Complexity TL-2), precision navigation instruments, and active and passive sensors. At TL9+, the Command Bridge includes a radscanner; at TL10+, one meson communicator is included.

Bridge Options

Throughout the Imperium and beyond, there are many different bridge configurations. Below are just a few.

Compact: Bridges can be made more compact by removing crew stations. This is often done with command bridges on smaller military vessels to save space. For every *two* crew stations removed, reduce the size of the bridge by 0.5 spaces and the mass by 0.04 stons. There is no reduction in cost. If desired, bridges can add additional seating by increasing space and mass at the same rate.

Thermograph/LLTV: This option replaces the PESA sensor system in any of the above (except Command Cockpit/Systems) with Thermograph and LLTV of the same rating. This modification is common on low-end commercial ships.

Thermographs are high-resolution infrared sensors. Treat a thermograph as Infravision (p. B237) but there is no -1 penalty for night combat (or the darkness of space) and an extra +1 to Tracking bonus.

Dumb: This reduces complexity of all computers by 1.

Genius: This increases the complexity of all computers by 1. As this is an expensive option, it is typically only used by the military for high-precision targeting systems.

Hardened: All bridge/cockpit computers can be "hardened" (e.g., fiber-optic backup), making them immune to radiation (see *Radiation Shielding*, p. 33, and *Turret Particle Beam Weapons*, p. 48). The higher the TL, the more resistant even unshielded electronic gear becomes, though. Rad levels equivalent to an EMP kill are as shown:

TL	Rads
7	100
8	200
9	500
10	2,000
11+	10,000

Bridge Systems Modifications Table

System	Th./LLTV Mass	Th./LLTV Cost	Dumb Cost	Genius Cost	Hard Mass	Hard Cost
Cockpit/7	0	0	-0.114	2.28	0.6	0.48
Cockpit/8	-0.2	-1.63	-0.228	4.56	0.3	0.96
Cockpit/9	-0.187	-1.14	-0.057	1.14	0.3	0.24
Cockpit/10	-0.188	-0.838	-0.029	0.57	0.15	0.12
Cockpit/11	0.125	-0.375	-0.029	0.57	0.15	0.12
Command Cockpit/10+	0	0	0	49.4	0	0
Light Cockpit/7	0	0	-0.114	2.28	0.6	0.48
Light Cockpit/8	-0.017	-0.235	-0.114	2.28	0.6	0.48
Light Cockpit/9	-0.02	-0.294	-0.057	1.14	0.3	0.24
Light Cockpit/10	-0.019	-0.293	-0.029	0.57	0.15	0.12
Light Cockpit/11	0.013	-0.127	-0.029	0.57	0.15	0.12
Basic/7	0	0	-0.48	11.4	1.5	2.4
Basic/8	-0.338	-2.17	-0.48	11.4	1.5	2.4
Basic/9	-0.375	-1.68	-0.24	5.7	0.75	1.2
Basic/10	-0.425	-1.38	-0.12	2.85	0.375	0.6
Basic/11	0.187	-0.512	-0.12	2.85	0.375	0.6
Basic/12	0.188	-0.512	-0.12	2.85	0.375	0.6
Command/7	0	0	-4.8	114	12	24
Command/8	-0.525	-2.7	-4.8	114	12	24
Command/9	-0.9	-2.76	-2.4	57	6	12
Command/10	-0.937	-2.99	-1.2	28.5	3	6
Command/11	0.662	-1.47	-1.2	28.5	3	6
Command/12	0.65	-1.47	-1.2	28.5	3	6

Auxiliary Control Stations (Duplicate Controls)

This is a simple auxiliary control station with duplicate controls and a one-person airlock, but no fusion startup, navigation, nor independent life support. Various uses include:

- As another piloting position, similar to a cockpit, for docking the craft or other delicate maneuvers.
- As a security station.
- As a training/auxiliary workstation used to provide training on, or extra assistance with, an already installed module (e.g., Engineering).

Information Centers

A high-tech military-style operations room for 10-20 people, this has workstations, a sophisticated array of electronic mapping and display tables (which function as a fire direction center, p. VE58), plus several dozen digital cameras for video teleconferencing. The system also includes a hardened Complexity TL-2 macroframe computer and 10 terminals for running high-end analysis programs like Expert (Tactics), Transmission Profiling, and Traffic Analysis. It may also be called a *Command Center* or *Tactical Command Center*.

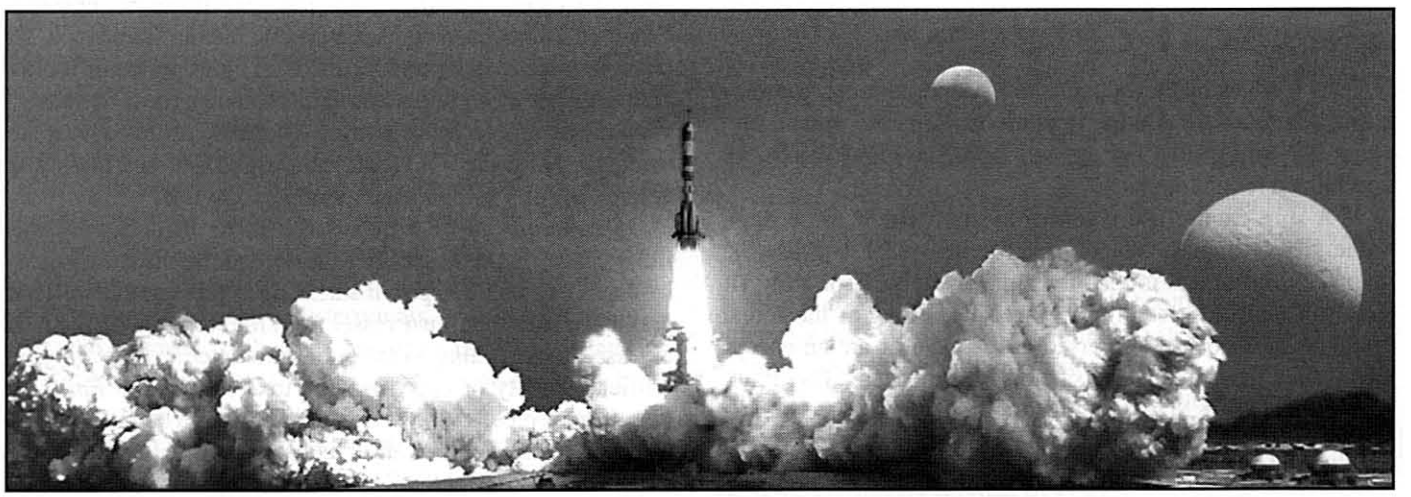
Comm Systems

All Bridges include a standard package of basic communications equipment, adequate for routine operations. Separate communications systems are available for applications with specialized requirements. The Underwater Electronics System (see p. 45) also has a radio.

Communications Suites

Communications suites are designed for vessels requiring additional communications longer-ranged than those included in the Bridges or Cockpits. These are generally found on warships (particularly carriers and flagships) but also have civilian applications.

Communications suites come in *enhanced* and *advanced* packages, and require that some form of bridge be installed on the vessel, as well. The bridge contains the crew stations, which the communications suites lack.



A maser is also known as a tight-beam radio. This is an ultra-high-frequency directional signal or an actual microwave beam. Only receivers within a 20° cone can pick up the signal. Maser signals are often sent up to satellites and then relayed down again. They also have military uses where a radio signal sent in all directions is not desirable.

Communications Systems

Module/TL	Number of Sets/Range (Millions of Miles)			
	Radio	Maser	Laser	Meson
Enhanced Comms/7	3/0.3	1/3	1/0.6	–
Enhanced Comms/8	5/1	2/10	2/2	–
Enhanced Comms/9	5/10	4/100	5/20	–
Enhanced Comms/10	5/50	2/500	1/100	1/1
Enhanced Comms/11	5/50	4/500	3/100	1/1.5
Enhanced Comms/12+	10/50	6/500	6/100	1/2
Advanced Comms/10	10/50	9/500	9/100	1/10
Advanced Comms/11	10/50	9/500	9/100	1/15
Advanced Comms/12+	10/50	9/500	9/100	1/20

Communications Modules (Xboat)

This system consists of a single massive laser communicator, three hardened computers, hardened mass-data storage capacity with double backups (5 TB at TL7, 50 TB at TL8-10, and then ×10 per TL after that), and an independent energy bank (5-hour supply). It is designed for high redundancy: the three computers check each other's results and three sets of data are stored in different locations. The laser communicator is used because of its very high bandwidth. Even with the usual high level of encryption and error correction on the signal, the system can upload or download its entire storage capacity in about an hour. It is used on the Xboat couriers of the Imperial Interstellar Scout Service as well as related ground and space-support installations. See ***GURPS Traveller: First In*** for further details.

The TL10+ versions have Imperial-grade high-security encryption systems. Reduce volume by 1.5 cf, mass by 12.1 stons, and cost by MCr2.44 for systems without the encryption equipment.

Sensor Systems

All Bridges include a package of standard sensory equipment, adequate for routine operations. Separate sensor systems are available for vessel applications that have specialized requirements.

A ship cannot use a sensor system which has a Scan value greater than the ship's Size Modifier +36, because the ship isn't big enough to mount a large enough sensor array. (It may still *install* a system this powerful, as long as the actual lesser Scan is noted.) Dispersed hull structures are an exception – they may mount any size of sensor system. The drawback is that their Size Modifier is increased to (Scan value -36) for detection purposes, due to the inclusion of booms, masts, or periscopes required by the oversized sensors.

Sensor Suites

Sensor suites contain a full array of sensors that extend the capabilities of standard bridge equipment. Some of these systems have a crew requirement that can be filled by regular bridge personnel, instead.

Enhanced and *Advanced* sensor suites each contain large PESA, AESA, and radscanner sensors. They are used to supplement the systems on existing bridges.

Survey Module/Traffic Control contains four sets of 10,000× astronomical instruments, four high-resolution planetary-survey arrays (medium resolution at TL7), a macroframe computer available at TL7-9, a mainframe computer at TL10+, eight crew stations with computer terminals, and a "survey center" featuring sophisticated holographic-projection devices (small movie screens at TL8-). This allows survey specialists to create elaborate visualizations of incoming data. Use of the survey system is detailed in ***GURPS Traveller: First In*** and the traffic-control system in ***GURPS Traveller: Starports***.

Planetary Survey Add-on modules contain one medium-resolution planetary survey array at TL9- or high-resolution at TL10+. Both fit within the waste space of a sensor system.

Astronomical Add-on contains one 200× astronomical-instrument array that fits in the waste space of a sensor system.

Long-Range Sensors (TL8)

These are military-grade sensors typically used on picket ships (vessels that patrol the edges of a fleet). Scan rating and nominal range in miles (divide by 10,000 to get number of combat hexes) is given for each. The PESA and Radscanner systems require negligible power, so they include nothing but the sensor. The AESA systems have the listed sensor and a slice of power plant. They are not mounted in a turret; thus, the ship must be pointed in the direction that they will scan.

Densitometers (TL11)

This device uses gravitic-imaging technology to map the interiors of objects. Effective range is 500 miles at TL11, 1,250 miles at TL12, and 2,500 miles at TL13. A successful Electronics Operation (Sensors) roll is required to make a clear scan, which takes 1 second per 27 cubic feet (18.5 seconds per dton). Failure means the scan must be repeated. When an object has been scanned, the data is stored as a 3D plan on standard computer media (0.037 gigs per cubic foot or 1.85 gigs per dton) accessed via a computer for a "cutaway" view of the object. More powerful versions of this device are available. For each +6 to scan, multiply range, cost, mass, and volume by 10. Power consumption is negligible.

Densitometers are very susceptible to disruption by artificial gravity fields (especially those under constant manipulation). They require special shielding to prevent the artificial gravity field in their *own* vessel from interfering with them. If a vessel is attempting to foil a densitometer scan by varying artificial gravity or contragravity, treat it as *Basic Emission Cloaking* (see p. 31) for defensive purposes. They are considered passive sensors for all practical purposes, but other densitometers can detect their use at 20× range.

Legitimate users might be very interested in a civilian ship carrying such equipment. Some GMs may opt to disallow densitometers in their games as they might too easily detect important clues in an adventure.

Underwater Electronic Systems

This component includes one active sonar system with the active/passive option, one passive system with the towed array option, one passive dipping array with the active/passive option, one roomy crew station, one hardened macroframe computer (a mainframe instead at TL9-), and one computer terminal.

A receive-only very-low-frequency (VLF) radio is also included. Ranges are 300,000 miles at TL7, 1 million miles at TL8-9, 5 million miles at TL10+. Divide ranges by 10 during atmospheric use. Divide ranges by 1,000 during underwater use and decrease capability to 10 characters per second. Typical operations call for the base station to send out a request for a communications link. The underwater craft then initiates a link when conditions permit, via either meson comms or tight-beam laser.

Each module also has a reactor slice to power it and a power cell permitting 5 hours of silent running at TL7-8 increased by 2.5 hours at each successive TL.

System	Range Active/Passive/Towed	Scan Active/Passive/Towed
Sonar/7	21/42/140	19/20/23
Sonar/8	24/48/160	19/21/24
Sonar/9	27/54/180	20/21/24
Sonar/10	30/60/200	20/21/25
Sonar/11	33/66/220	20/21/25
Sonar/12	36/72/240	20/22/25
Sonar/13+	39/78/260	20/22/25

Ranges are in miles.

Electronic Warfare Systems

Space combat takes place in more dimensions than simply the physical plane. Naval vessels must be able to attack and defend themselves from enemies using the electromagnetic spectrum. Electronic-warfare suites provide a wide range of offensive and defensive capabilities. At the ranges of most space battles, the effects of these systems are largely ignored. Let one side neglect its preparation in this arena, however, and their opponents will be quick to exploit the error.

Each suite consists of advanced radar/laser detectors, area jammers, blip enhancers, hardened macroframe computers (Complexity TL-2) with terminals, radio direction finders, radio jammers, 24-hour rechargeable power cell, and two crew stations. The listing for area jammers gives jammer rating/range in miles; the other listings are range in miles. See p. VE59 for further information on electronic-warfare systems. All area-jammer ranges are divided by 50 for use in an atmosphere; other ranges are divided by 10. See the table below for a list of what is included in each module. All ranges are in miles.

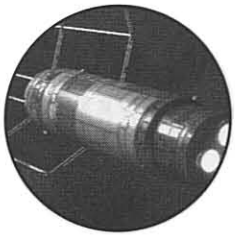
Electronic Warfare Systems Tables

System	TL7-8	TL9	TL10+
Adv. Radar/Laser Detector	1	1	2
Area Jammer	1	1	2
Blip Enhancer	1	1	2
Macroframe Computer	1	2	2
Radio Direction Finders	2	4	4
Radio Jammer	1	2	2

System	Area Jam. Rating/Range	Radio DF Range	Radio Jam. Range
Electronic Warfare/7	2/7.5	30K	300
Electronic Warfare/8	4/75	10M	1,000
Electronic Warfare/9	6/750	10M	10,000
Electronic Warfare/10	7/2,250	50M	50,000
Electronic Warfare/11	7/2,250	500M	50,000
Electronic Warfare/12	7/2,250	500M	50,000
Electronic Warfare/13	7/2,250	500M	50,000

Jammer Systems

This component is a smaller version of the Electronic Warfare module. While the general Electronic Warfare component can extend its protection to other vessels, the jammer unit is designed to cloak the carrying vessel alone. It contains a laser/radar detector, area radar jammer, deceptive radar jammer, chaff-decoy discharger (with 40 decoys), infrared jammer, and batteries. See p. VE59 for further information on area jammers. All area jammer ranges are divided by 50 for use in an atmosphere; other ranges are divided by 10. See the table below for specific information on capabilities. All ranges are in miles.



System	Duration Hours	All Jammers Rating/Range
TL7	1.5	6/1,500
TL8	3	6/1,500
TL9	6	7/2,250
TL10	12	7/2,250
TL11	18	7/2,250
TL12	24	7/2,250
TL13	28	7/2,250

Computer Systems

High-speed, high-complexity computer systems are at the heart of any naval vessel, particularly its fire-control network. This is common in large ships, which have a lot of weapons to control and want to be able to run numerous advanced targeting programs. Sophisticated computer systems are also vital to cutting-edge research and numerical analysis.

This system contains eight high-capacity (+50% to number of programs) computers for use in ships requiring more computing resources than the bridge can provide. Complexity of the computers is equal to TL-2.

Chapter Six

Weapons and Defenses

The universe is a dangerous place, and most ships mount some form of armament.

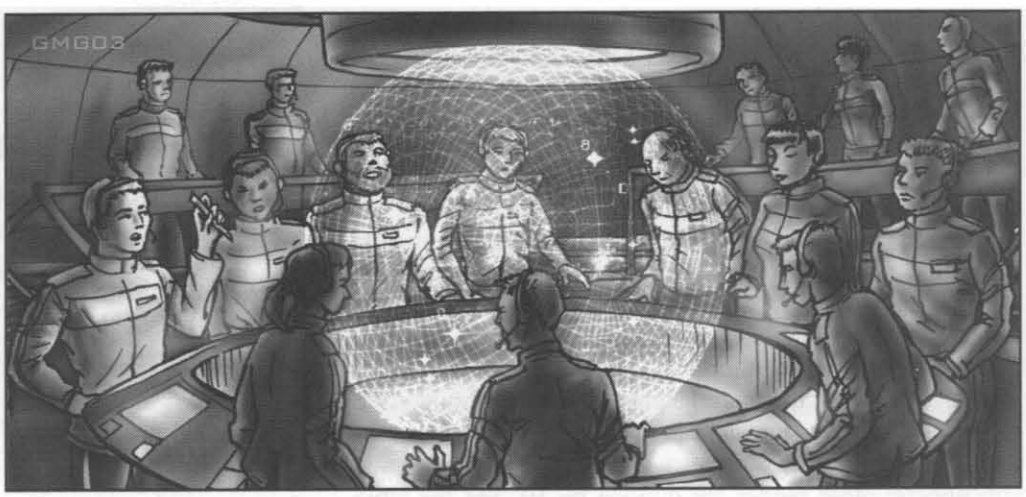
Each ship's turret has room for up to three spaces of turret weapons. Each bay has room for a single bay weapon of the same size; a 50-ton bay mounts a 50-ton bay weapon. Mounting a smaller 50-ton bay weapon in a 100-ton bay is feasible, but the remaining 50 dtons are lost due to the additional bracing required to hold the smaller weapon in place. The "portable" design of bay weapons just doesn't allow the possibility of mounting two 50-ton bay weapons in a 100-ton bay.

Armament need not be specified when a vessel is designed, as shipyards can leave turrets or bays empty for the owner to customize. Merchant ships in safe subsectors or on a tight budget may have empty turrets or mount only one or two rather than the full three weapons. (Crews often find creative uses for the unused 500-1,000 cf, like illicit stills.)

Hull-Mounted Weapons: Turret and bay weapons can be built directly into the hull. Such a hull-mounted weapon takes up space just as if it were a component module. If it is a turret-sized weapon, it is fired from the bridge/cockpit crew stations (often by the pilot). Hull-mounted turret and hull-mounted bay weapons (also called Internal Bays) are assumed to be installed in casemate swivel-mounts enabling them to fire in a 90° arc on one side of the ship (specified during construction).

Spinal Mounts: Spinal mounts are huge weapons built into the centerline of the vessel (sometimes called a fixed mount). They are limited to firing directly forward, and aimed by pointing the ship. A ship can only have one spinal-mount weapon (but multiple fixed-mount weapons).

Pulse Mode: A beam weapon's gunner can use a special computer program called *Double-Fire* to adjust the pulse rate of his weapon to fire at a higher rate at lower power. This "pulse mode" gives an increased chance of hitting a target, at the expense of decreased range and damage. There are three additional rates of fire available beyond the default 1/60; 1/30 (RoF Bonus +8) for 2/3 damage and range, 1/15 (RoF Bonus +9) for 1/2 damage and range, and 1/8 (RoF Bonus +10) for 1/3 damage and range. The last rate is mainly used for point defense. All fractional values are rounded down. Each weapon firing in pulse mode requires a running copy of the program *Double-Fire* (see p. 72). If pulse mode is used for the entire round (instead of just for point defense), the pulse rate must be specified at the beginning of the round.



Turret Weapons

Turret weapons are the universal tools of space combat. Even on large vessels, they still fulfill valuable point defense and close-defense roles vs. missiles and small vessels.

The Imperial Navy, in an attempt to make battlefield swaps between partially damaged and inoperative ships easier, has made 1,500-cf (3-ton) turrets their standard size. Imperial ships only mount turrets of those sizes, and most weapons manufacturers follow suit by only producing weapons to fit the standard Imperial sockets. Custom designs are possible using ***GURPS Vehicles***.

Missile Racks

Missiles are launched from standardized launchers; 250mm missiles are launched from 250mm tubes, while heavy missiles (500mm) are launched from 500mm tubes. These are Imperial standards, and there is no reason to expect other polities to use the same weapons. An easy way to represent this is to decide that a Vargr world (for example) uses 253mm missiles – these are functionally identical to their Imperial counterparts, but will not fit in Imperial launchers (and vice versa, of course). However, the actual diameter of the launch tube itself does not affect its mass, cost, or volume. The same statistics could easily be used to represent a Vargr missile rack of a different diameter.

250mm Missile Racks

A slow autoloading launch tube, rated to fire 250mm, 700-pound, 6 cf (0.35 stons, 0.012 dtons) missiles. Missiles as light as 290 lbs. can be launched from the launcher. The system also includes a laser communicator used to control operator-guided missiles, plus magazine space for 70 missiles at TL7, 75 at TL8, 76 at TL9, and 77 at TL10+. Range of the launcher's laser communicator is six hexes at TL7, 20 hexes at TL8, 200 hexes at TL9, and 1,000 hexes at TL10. Divide ranges by 10 for use in an atmosphere and by 1,000 for use underwater.

Reloading missile racks on any ship smaller than 800 tons is a chore, as the missiles are 11' long. Military vessels, if expected to carry reloads, are usually designed with the cargo hold near the missile magazine to facilitate the transfer of the missiles. Civilian ships usually restock missiles when grounded dirtside or docked at an orbital facility.

The 250mm Missile Rack is the missile rack as described in the ***GURPS Traveller*** core book.

500mm Missile Racks/ EW Drone Launchers

A slow autoloading launch tube, rated to fire 500mm, 4,000-pound, 30 cf (2 stons, 0.06 dtons) missiles. Missiles as light as 2,000 lbs. can be launched from the launcher. The system also includes a laser communicator used to control operator-guided missiles, and magazine space for 10 missiles (8 at TL7). As these missiles are 15' long, the restrictions on reloading 250mm missiles usually apply here, as well. Range of the laser is the same as on the 250mm missile rack. The 500mm missile rack and missile are Legality Class 0 within the Imperium.

This module also doubles as an Electronic Warfare (EW) Drone Launcher. Any number of 500mm missile racks may be grouped together as a dedicated *EW Drone Control Center* – if used as such they are *not* counted as hull-mounted weapons and cannot be used as such. If used in a turret, the 500mm rack may double as a combat launcher and drone controller, but not both simultaneously.

Energy Weapons

Lasers emit powerful beams of coherent light. Most ships mount them as a missile defense; they are the most common weapons on civilian ships due mostly to their long range and high penetration. All versions are available in standard (1 dton) and heavy (3 dton) versions.

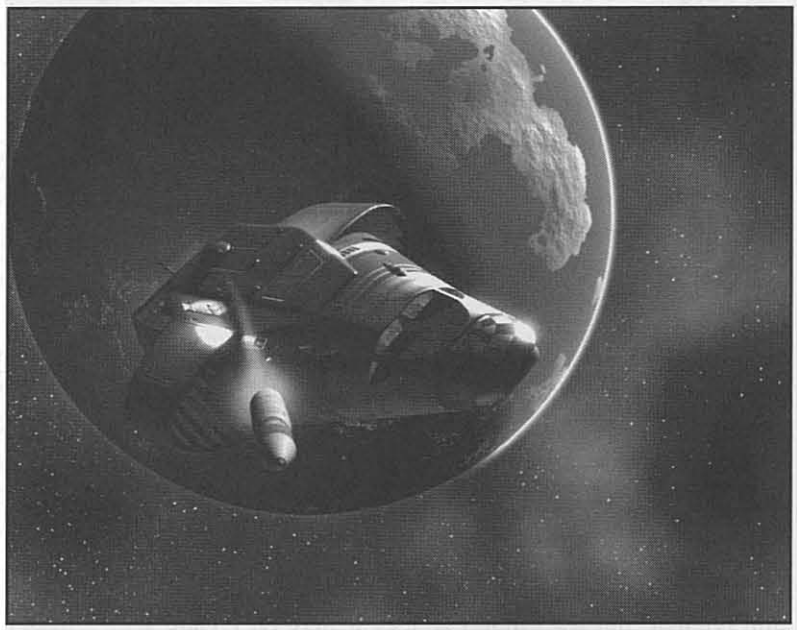
Turret Laser Weapons (TL8)

All turret laser weapons are constructed with a cyclic rate of 1/2 and the extreme-range option. A rechargeable power cell provides power for each shot while fusion-reactor components (fission at TL8) generate the power required to maintain the listed rate of fire. The laser is fully stabilized and installed in a universal mount (for turrets) or a casemate mount (if hull mounted). Turrets can fire in all directions, the casemate only to the side on which it is mounted.

Most weapons take up 1 space; the Imperial Navy also uses 3-ton "Heavy" Lasers on some ships to provide more power, range, and damage.

The UV Laser is one of the first ship-mounted energy weapons developed. Its range is very short by ***GURPS Traveller*** standards, being able to reach only 2,800 miles before its full energy dissipates by half. Most TL8 planetary navies mount lasers only as point-defense weapons because missiles are more effective as offensive armaments.

At TL9, lasers are designed to adjust their wavelength for optimal performance in various conditions such as adverse planetary atmosphere, dense fog, obfuscatory smoke, and even underwater. Such lasers are known as "rainbow" lasers. These become the first truly effective starship laser weapons. Their ranges measure in tens of thousands instead of just thousands of miles.



At TL10, lasers capable of X-ray wavelengths are developed. X-Ray lasers are able to penetrate through most conditions that hinder lasers at lower tech levels such as smoke, fog, bad weather, etc. X-Ray lasers can penetrate armor at least twice as thick as armor that can absorb a rainbow laser's damage, which makes them formidable weapons and the standard for most modern vessels.

At TL11, advances in optics technology produce a more powerful beam, and the costs of production are reduced; compact components become reliable and economically viable. TL11 lasers were used extensively by the Zhodani during the Fifth Frontier War, although they were not known to use the "heavy" versions adopted by some fleets in the Imperial Navy. The TL12 lasers used by the Imperial Navy utilize advanced optics and compact components so that they are the most powerful turret-mounted lasers in the Imperial arsenal. A few merchant companies and civilians who can afford them have been mounting TL12 lasers on their ships as well. The heavy version of this weapon is reserved exclusively for the Navy and is not for sale to civilians (Legality Class 1).



Turret High-Energy Weapons (TL9)

High-energy weapons are incredibly powerful. Plasma guns fire bolts of superheated gas, contained in a magnetodynamic "bottle." Fusion guns are similar but heat the plasma until it is actually fusing – getting touched by a fusion bolt is like skimming a star! Although their magnetic containment decays in a relatively short time, making them viable only as defensive weapons, the powerful bolts are strong enough to blow any missile or drone into slag. They are also very useful in ground attacks – some of these weapons could even give a grav tank a rough time.

Plasma and fusion guns do *Spcl* damage (burn with no damage modifier) to anything they hit. In addition, anything within two yards takes one-quarter the listed damage from splattering hot plasma, and flammable objects will usually catch fire. (This usually isn't a concern on the scale of starship combat, but for ground attacks it may be.) They are identical to the plasma blaster weapons described on p. UT58, except when the output is below 6,400 kJ, the cost multiplier jumps from ×1.5 to ×15.

Turret Particle Beam Weapons (TL8)

This development at TL8 places a particle-beam weapon in a turret or casemate mount. The purpose of this weapon is to provide heavy firepower to patrol or escort craft. Particle beams have the ability to disable electronics (like unhardened computers) due to the radiation they produce. Unhardened electronics are automatically disabled (EMP Kill) when they receive too many rads of radiation. The rads delivered are equivalent to the damage done by the weapon. See *Radiation Shielding*, p. 33, and *Hardened Computers*, p. 42, for more information. The main drawback to this weapon is its short range when compared to lasers of the same tech level.

These particular weapons come standard at 3 tons. However, at TL9+, they may be reduced to 1.5 tons by cutting power, volume, mass, cost, and price in half, cutting damage and distance by 1/3, and dropping Accuracy by 1. This series of modifications was implemented on the *Gazelle*-class close escort, but tests revealed the weapon was rather ineffective except at extremely close ranges.

Particle beams accelerate hydrogen nuclei to relativistic velocities, strip them of their charge, and fire them. P-beams have less range but are more powerful than lasers; plus, sandcasters don't affect them. *Neutral* particle beams are absorbed by atmospheres; particle beams that have been configured to fire *charged* beams aren't absorbed, but will dissipate in space. This makes p-beams useless as orbital bombardment weapons – except against vacuum worlds!

Sandcasters

Sandcasters launch tiny reflective/ablative crystals, commonly called "sand," as a defense against lasers. These crystals are distant relatives of the tiny transparent spheres used to make street signs, reflective paint strips, and the like. Such a sphere will bounce a beam of light back in the direction of the source with a small amount of spread. The advanced crystals used in "sand" work similarly. When the laser first hits the crystal, part of the energy is reflected back in the general direction of the firing ship and the rest is absorbed. As the beads absorb more of the pulse, they heat up and melt quickly. However, in free fall a liquid will keep its spherical shape, so the liquid bead continues to reflect a portion of the energy away. Eventually, the bead will start boiling, the energy absorption jumps dramatically, and it flashes into vapor. This vapor continues to absorb more of the laser pulse until it ionizes and forms plasma. How much the vapor absorbs, and how easily it ionizes, will depend on the composition of the bead.

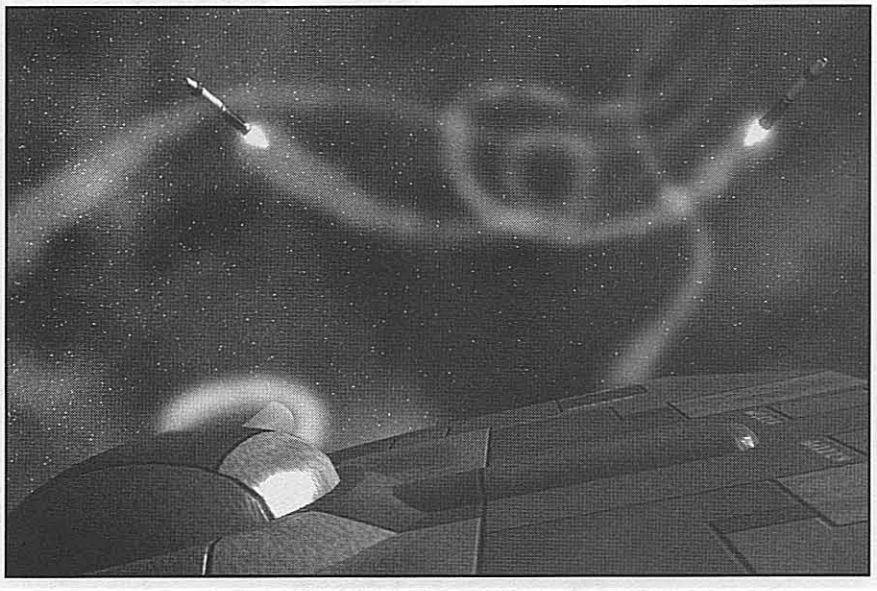
Once it becomes a plasma, it may be very transparent or very absorbent depending on the composition and the laser wavelength. Proper selection of crystal composition causes the plasma to be very opaque at common weapon-grade-laser wavelengths. At higher TLs, the efficiency of the sand continues to increase.

The crystals are shot out of the sandcaster so that a cloud is placed between the ship and enemy vessels that might fire on the ship. A single canister of sand provides the listed "effective DR" against laser attacks coming from a single enemy ship; defending against multiple ships requires multiple clouds of sand. As the sand absorbs an attack, its DR is reduced until it's gone. After each attack, the defender may choose to replenish the sand.

An enemy ship must be detected to be able to properly position the sand cloud. If the enemy isn't located before shooting, the ship won't be able to have sand in place. However, after the first hit, the defenders should know where the enemy is and be able to launch sand to protect against subsequent attacks.

Sandcasters must be targeted vs. a particular enemy vessel (or a group of vessels in *very* tight formation). A sandcaster adds an extra DR 400 vs. all laser fire originating from the targeted vessel, cumulative with armor DR. X-ray laser fire halves sandcaster DR just as it halves the DR of ordinary armor. Multiple sandcasters can concentrate on a single vessel's fire, but each extra 'caster only adds +50 DR. Each sandcaster holds 200 sand canisters.

Sandcasters also have useful melee applications. A sandcaster is treated as a grenade (albeit, a very large one) and does 10d fragmentation (cutting) damage to anyone in range – 300 yards, 30° cone. The base attack roll at point blank range (in front of the nozzle) is 24, -1 per hex distance.



Bay Weapons

Besides the weapon, power supply, and any ammunition, each bay weapon also includes a pair of roomy crew stations for two gunners (though the weapon can be fired by only one person), two hardened and dedicated mainframe computers (Complexity TL-3), a computer terminal, and a HUDWAC with pupil scanner. One of the mainframe computers runs a TL-2 Targeting program, the other runs a skill TL+5 Gunner program (pp. 71 and GT162).

Missile Bays

250mm Missile Bays

A 50-ton bay weapon housing 50 250mm missile racks plus magazine space for 3,500 missiles at TL7; 3,700 at TL8; 3,800 at TL9+. The missile bay can launch and control 50 250mm missiles per turn. This is the missile bay from ***GURPS Traveller***.

500mm Missile Bays

A 100-ton bay weapon housing 100 500mm missile racks plus magazine space for 800 500mm missiles at TL7; 1,000 at TL8-9; and 1,100 at TL10+. The 500mm missile bay can launch and control 100 500mm missiles per turn.

Energy Weapons

Bay weapons come in small (50-ton) and large (100-ton) varieties. Typically, only particle beams, plasma guns, fusion guns, meson guns, and repulsors are mounted in bays.

Particle Beam Bays (TL8)

This is a much bigger version of the turret particle-beam weapon (see p. 48). This powerful weapon is used on most large military ships to support their spinal weapons.

Particle beams were one of the first bay weapons to be deployed in space combat before the advent of meson guns. They are available starting as early as TL8 and improve continuously until TL11, where levels reach their peak and compact components are used to pack more weapon into a smaller space

Plasma Gun Bays (TL9) and Fusion Gun Bays (TL11)

High-energy-weapon bays hold larger, bay-mounted versions of the high-energy plasma and fusion guns. See p. 48.

Meson Gun Bays (TL12)

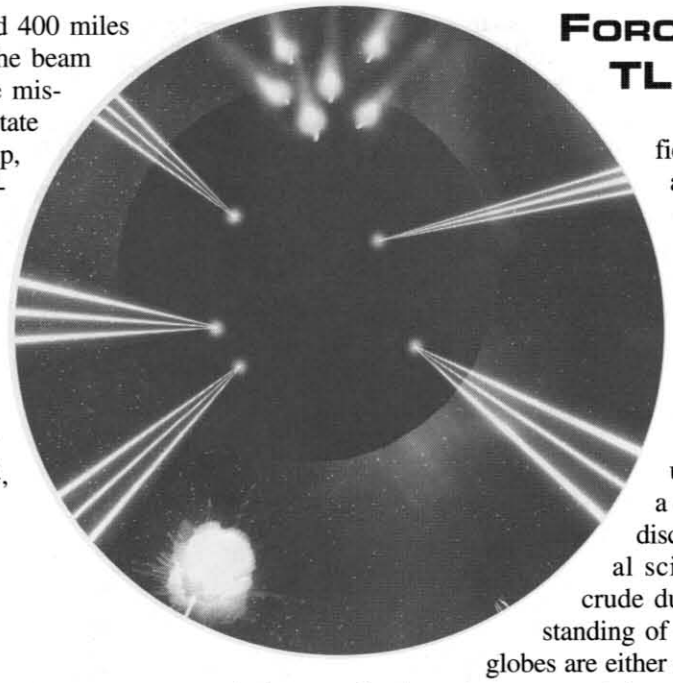
Meson guns use nuclear-damper and particle-beam technology to generate and aim a beam of high-energy mesons (subatomic particles that carry nuclear force). Mesons pass harmlessly through normal matter, but soon decay explosively in a storm of other energetic particles – with precise calculation a meson beam may be created and aimed so this explosion occurs inside an enemy vessel.

Repulsor Bays (Late TL9)

In order to supplement sandcasters and point-defense lasers, some large ships mount repulsor bays for point defense. These bays generate a beam of gravitic energy that can knock missiles off course. Repulsors are bay-mounted weapons and are capable of dispatching multiple missiles in a single round.

When the missile is around 400 miles away, the controller activates the beam and uses it to press against the missile. The missile is forced to rotate and thrust at an angle to the ship, causing it to bypass the defenders. These beams are only effective in the Collision and Point Defense Phase of the combat turn, as their range is extremely limited.

Repulsors are built as a ***GURPS Vehicles*** deflector screen, but their use is slightly different. See *Combat,* p. 104, for information on repulsor use.



Spinal Weapons

The most powerful beam weapons are mounted along the spine of a vessel – in many cases, the ship is literally built around the weapon. Spinal weapons are aimed by pointing the entire vessel, which may limit movement options (see p. 19). Spinal mounts include the weapon, a power slice (usually quite large), a rechargeable power cell (also quite large), one roomy crew station, a HUDWAC with pupil scanner, and two dedicated and hardened macroframe computers. One macroframe runs a TL-1 Targeting program; the other runs a skill TL+6 Gunner program (pp. 71 and GT162). Spinal particle beams are introduced at TL8, while spinal meson guns are introduced at TL10.

Screen Systems

In addition to targeted defenses like sandcasters and repulsors, large warships mount screens that protect against all attackers.

Nuclear Dampers (TL10)

A nuclear damper focuses a field that subtly interferes with the strong nuclear force, causing nuclear warheads to fail to detonate. A spacecraft damper field protects a 10-mile radius, increased by 5 miles each time the number of modules installed is doubled. A nuclear damper system requires four crew members to operate, regardless of the number of modules installed.

Meson Screens (TL10)

A meson screen disrupts incoming high-energy mesons. The system includes a screen generator and fusion-power components. The vessel's DR *vs. meson guns only* is 20.8 million times the number of meson-screen modules divided by its total surface area in sf. A meson screen requires four crew members regardless of the numbers of modules installed.

Force Fields (Late TL12)

Classic science fiction "force fields" or defensive screens come about at high tech levels because of an increased ability to manipulate subatomic particles and forces. Force-field generators project an energy-absorbing shell around a ship, and are known as *black globes.* The Third Imperium didn't acquire force-field technology until the late 11th century, when a cache of Ancient artifacts was discovered. Based on those, Imperial scientists were able to generate crude duplicates and gain some understanding of the technology involved. Black globes are either artifacts installed on a makeshift basis or temperamental experimental models installed on TL12 Imperial warships. The acquisition of any force-field generator is probably the result of a lucky find on the part of a government, individual, or corporation.

Since a black globe absorbs all energy, a ship with its field on is protected from all fire. Black globes store this energy in a capacitor bank. Unfortunately, the force field works in both directions; the ship may not fire, maneuver, or even see anything beyond the opaque darkness (except a few feet of light from the vessel if the GM thinks it's pertinent). These limitations would make the black globe of limited value in battle if not for the ability of the field generator to flicker – switch the field on and off many times per second – giving the ship part-time protection while still allowing it to fire, maneuver, and track enemy ships during the "off" intervals.

Using a black globe: Choose a flicker rate in multiples of 10%, up to the maximum listed for the globe installed. When flickering, the vessel can see normally, but sAccel is reduced by a percentage equal to the flicker rate. A flickering black globe increases the vessel's PD against all attacks, including meson guns, by (flicker rate/10%). If the globe's PD is responsible for an attack missing the vessel, the attack strikes the globe instead. See p. 104 for information on using a globe in combat.

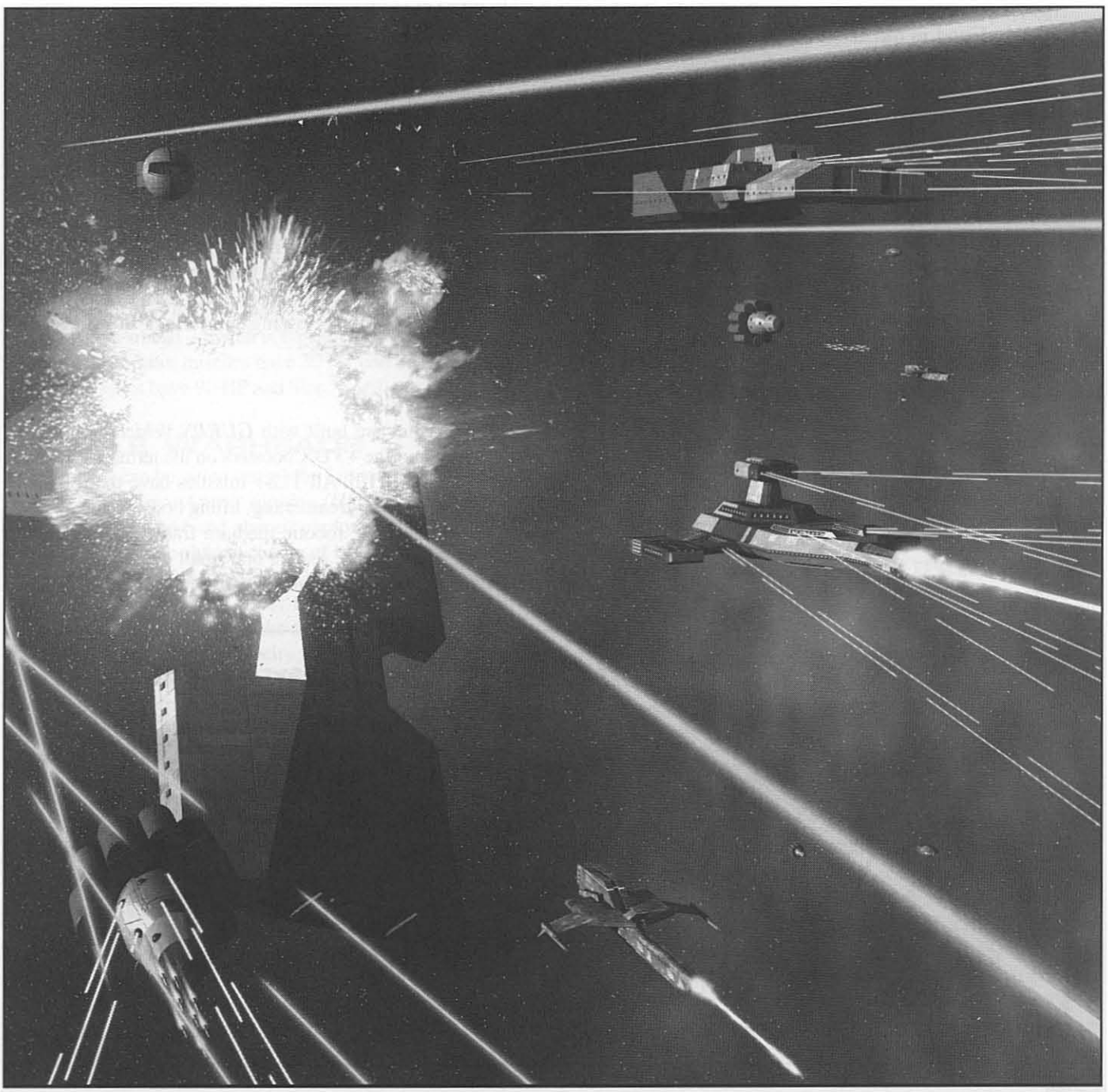
Damage points from attacks that strike the globe are absorbed by the globe's capacitors as hit points. The size of the capacitor bank is critical, as the globe will discharge catastrophically when it overloads. Stored hit points may be drained and converted to energy and stored in other energy banks or used to power the ship's systems (see *Energy Banks,* p. 37). Maximum conversion rate is 1% of capacity per second (240,000 HP or 960 MJ per dton per turn. See *Power Plant Slices*, p. 36, for information on increasing an energy weapon's RoF). Ships that do not have separate energy banks may use their jump accumulators. Each jump-drive module includes accumulators capable of storing 24 GJ (or 6,000 HP). Black globes come with a rudimentary capacitor bank able to store 10,000 HP worth of energy.

If the capacitors ever absorb more HP than their capacity, they discharge, releasing all their accumulated hit points at once against the ship as damage. Hull DR does not protect! The black globe and capacitor bank are automatically destroyed in the explosion.

Invisibility: Since a black-globe field absorbs all energy, a ship with its field turned on *without flicker* is, at any range over a few miles, effectively invisible. In battle, this will have little immediate effect, since a ship that suddenly disappears from enemy sensors in this way will have its current course predicted with 100% accuracy based on its last known position, speed, and facing. If the defenders maneuver to confuse the enemy, it is up to the GM as to how or when attacking ships can detect them. (Of course, the black globe would still show up visually if it had a backdrop of the system's main star, a planet, or even a particularly dense star cluster.)

However, the advantages to a team that has not yet been detected by the enemy are immense. Suppose that a task force were to jump into a system with its black globes on. It could drift unseen past an enemy fleet and drop its screens at a preplanned moment, to bombard a planet or to engage enemy squadrons by surprise. (Of course, this would require some precise pre-jump navigation that the GM might rule is particularly risky to pull off, in order to keep this from becoming a standard tactic.)

Quick Play Option: The preceding expands upon the description of black globes found in ***Alien Races 3***, p. 117. It adds more detail to use this cutting-edge technology. In so doing, it converts the globe's DR value to an ability to absorb hits of damage. GMs who don't desire this extra detail may continue to use the "quick and easy" version of the rules described there.



Chapter Seven
Launched Ordnance

Launched ordnance includes a variety of small, usually unmanned spacecraft. Other than as missiles, these also are used for roles in which larger vessels are unsuitable.

Missiles

The TL10+ 250mm missiles described in this book are usually only found in the hands of the military. All 500mm missiles are reserved exclusively for the Imperial Navy and are not for sale to civilians (Legality Class 0). The missiles from the ***GURPS Traveller*** core book (see pp. GT158-159) are legal for civilian usage within the Imperium.

All TL9+ missiles are semi-autonomous vehicles guided to their target by a gunner to within the range where the terminal guidance system takes over (anywhere from 400 miles to 1,000 miles depending on TL). TL7-8 missiles are handled as on p. GT169. While fire-and-forget missiles are possible, the technological limitations and sheer size of the required sensor system make a guided missile more practical than a completely robotic one. Missiles can cause damage by either exploding close to the target or by impacting the target at a high relative velocity. While some missiles are designed only for impact (or *kinetic*) kills, most missiles contain an explosive charge, giving the gunner two ways of causing damage – this flexibility outweighs the slight performance advantage of a purely kinetic-kill missile. (See pp. VE115-116 for more information on "terminal guidance.")

Missiles at TL7 use reaction thrusters and only have one round of thrust; at TL8+ they use reactionless thrusters and have three rounds of thrust.

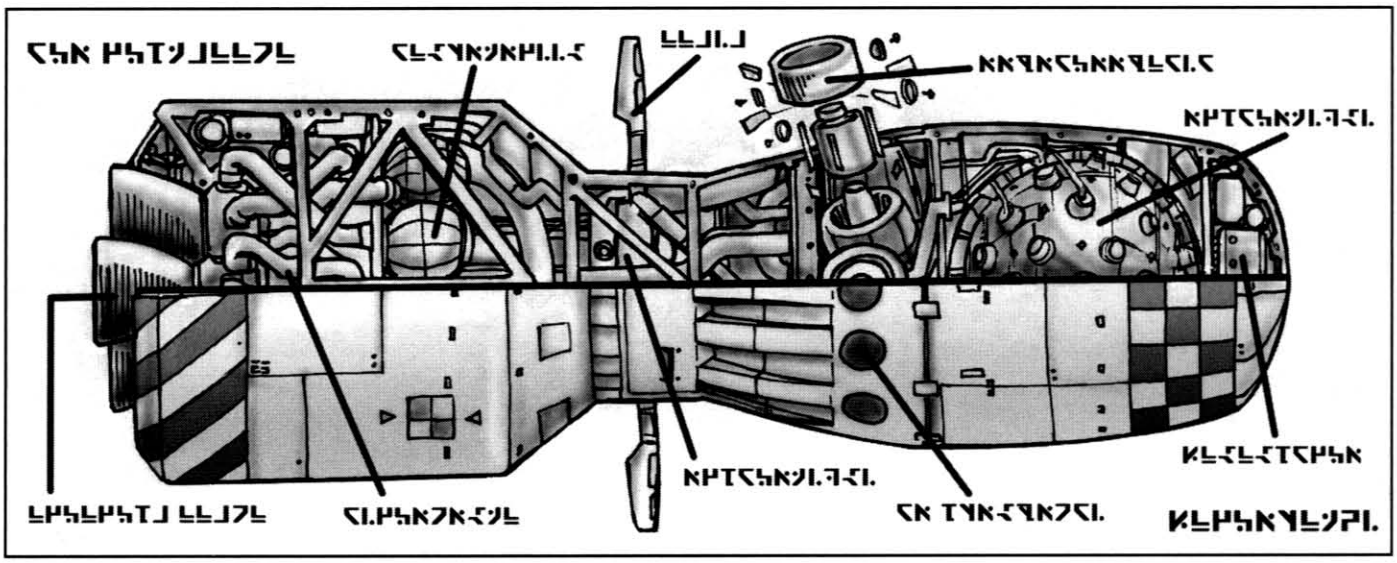
Extra missiles can be carried as cargo. Missile ammunition loaded as cargo will not be accessible during combat, but can be reloaded into missile launchers between battles (this takes about one man-hour per eight 500mm or 20 250mm missiles). Stored as cargo, each 250mm missile takes up about 9 cf (55 per dton of cargo), and each 500mm missile takes up 45 cf (11 per dton).

Missile Design

Missile design has evolved over the last few thousand years. Although there are more highly optimized designs, the designs presented in this book have proven to be the most effective. They are cheap enough to be a viable weapon either singly or in mass quantities, and their performance statistics are optimized in order to accomplish their mission: killing the enemy. However, most importantly, the specifications are generic enough to be built on nearly any planet in the Imperium. This doesn't mean there aren't other designs available. Keep the following guidelines in mind when designing custom missiles:

Nuts and Bolts

All missiles are built with ***GURPS Vehicles*** rules with the exception of the +3 DX boosters on the terminal guidance systems (see p. R10). All TL8+ missiles have the following options: Very Good streamlining, lifting body, standard metal armor and materials, robotic medium frame, basic emission cloaking, basic stealth, sealed, one small dedicated hardened robot-brain computer, one long-range receive-only laser



communicator, a rechargeable power cell for one hour of operation, and a vectored-thrust, reactionless thruster. TL7 missiles are identical except they use IR cloaking, a short-range laser, an advanced battery, and a 20-minute solid-fuel rocket. Missiles are either 250mm or 500mm. TL7-10 missiles use small High Explosive Armor-Tapping (HEAT) warheads; TL11-12 use modest HEAT; TL13 uses normal HEAT. All warheads have the self-destruct option.

All TL9+ missiles have terminal guidance systems consisting of two small hardened robot-brain computers (one with a +3 DX reflex booster) running Electronics Operations (Missile Sensors) and Piloting (Missile), and a cheap Passive Radar Homing (PRH) guidance system. One copy of each program must be purchased for the ship (then copies are downloaded to the missiles) if the terminal guidance system is to be used (program TL must match missile TL). Otherwise, the missiles must be guided manually (p. GT167). The combined programs cost: Cr6,000 at TL9-10, Cr10,500 at TL11, Cr43,000 at TL12, and Cr123,500 at TL13.

Standard Missiles

In the ***GURPS Traveller*** space-combat system, standard missiles maneuver like spacecraft under the control of the firing gunner. In a 20-minute combat round, a missile rack can fire and control one missile; a small missile bay may control as many as 50 missiles, while a large bay can control as many as 100.

When a missile ends its turn in a target vessel's hex, it may intercept and ram the target (doing impact damage) or detonate its warhead – which is typically an explosive-shaped charge. The 250mm missiles have 30 HP and Size Modifier 0; 500mm missiles have 90 HP and Size Modifier +1.

Missile Warheads

Missiles can be given one of the following warheads:

High-Explosive Armor-Tapping (HEAT) (TL7): This is a specially constructed and shaped explosive-charge warhead. It consists of a cone-shaped charge of high explosive which – detonated moments before impact by means of a remote control, fuse, or probe on the tip of the round – will explode in such a way that it transforms the metal liner of the round into a pencil-thin jet of hyper velocity metal traveling at up to the 25 times the speed of sound. The kinetic energy of this jet enables it to penetrate deep into very tough armor. Although the penetrating jet's diameter is very small, it is lethal by virtue of setting fire to fuel or ammunition, boring through vital components, or killing crew members. All missiles come equipped with HEAT warheads by default. Use the base cost on the *Module Tables*, p. 124.

Kinetic (TL9): A basic space-missile warhead; this is simply a dense rod that smashes into a target. A kinetic missile relies on the high relative speed gained from its own motor or from the launching ship's maneuvering. If reactionless thrusters are not available, kinetic weapons get *most* of their speed from the launching ship's maneuvering; their own drives are used mainly for steering. All TL9+ missiles come equipped with kinetic-kill capability in addition to any other warhead installed.

Nuclear (TL8): A fission, fusion, or antimatter explosive (the latter are not strictly nuclear, but possess equivalent effects), nuclear weapons are usually fused for proximity bursts. Typical yields are in the 10-kiloton range (250mm warhead) or 1-megaton range (500mm warhead). Nuclear weapons are of limited utility against capital ships equipped with nuclear dampers. Against smaller vessels (and spreads of missiles), their "one hit, one kill" capability can be devastating. Add MCr0.042 per 250mm missile, or MCr0.064 per 500mm missile to the base costs.

Concussion damage at the point of detonation for conventional nuclear munitions is 12d×20,000 for a 250mm warhead, and 12d×2 million for a 500mm warhead. In an atmosphere, quarter damage for every 256 yards (250mm) or 1,024 yards (500mm) from the point of detonation. In space, divide damage by the square of the distance to the target in *yards*.

X-ray Laser (TL9): These warheads detonate a small nuclear weapon in order to energize an X-ray laser beam – in fact, this is the only way such weapons can be built in the foreseeable future. The warhead consists of a nuclear bomb, an array of beam-generating laser rods, and a targeting system. Instead of physically intercepting the target, the missile stands off at a distance of several hundred miles, orients itself on the target, and detonates. The nuclear blast destroys the missile but also pumps energy into the laser array; as the rods vaporize, they produce powerful X-ray laser beams directed at the target. Consequently, X-ray laser warheads free missiles from having to close on their target and risk being shot down by point-defense weapons or suppression by nuclear dampers. This warhead is only available for 500mm missiles; add MCr0.11 at TL9, MCr0.064 at TL10, or MCr0.041 at TL11+.

X-ray laser warheads do 5d×200 (2) at TL9, 7d×200 (2) at TL10, and 9d×200 (2) at TL11+.

Nuclear and X-ray laser warheads are very hard to find (Legality Class -3) within the Imperium, but their use is not prohibited outright if restricted to space-to-space combat.

Deadfall Ordnance

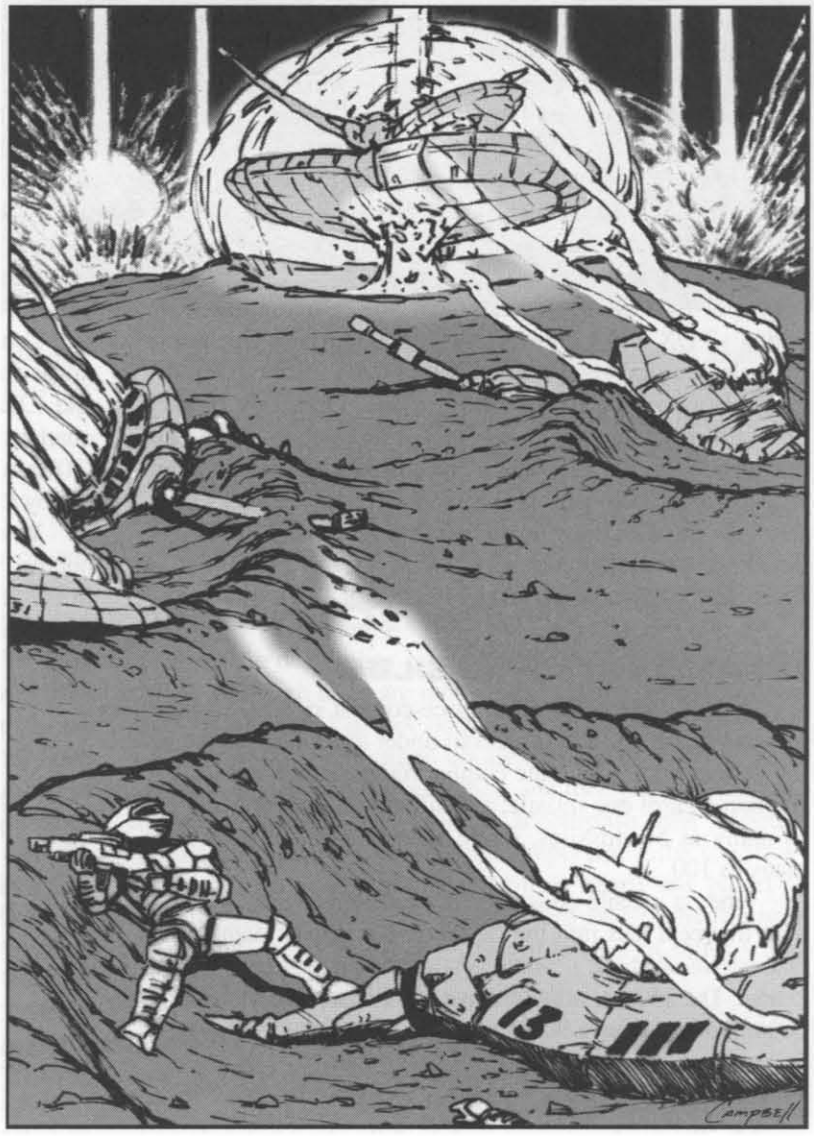
Missiles for planetary bombardment have different requirements than those intended for space combat. (For worlds with vacuum or trace atmospheres, use regular space combat missiles and rules.) Because they depend on some combination of gravity and aerodynamic braking, they are collectively referred to as *deadfall ordnance*.

Spike Submunitions (SSM)

Spikes are "smart" bombs – narrow (80mm) depleted uranium, superdense penetrators with a guidance package and steering fins strapped to their back. They are launched in clusters of seven (250mm) or 38 (500mm) using a standard space-combat missile as a delivery vehicle. The gunner maneuvers the missile to the release point, burns out its rocket motor to accelerate it toward the designated target area, and releases the spikes. The spikes fall the rest of the way to the target using their onboard sensors to lock onto and attempt to hit particular targets.

Guidance: Spike submunition missiles are laser command guided to their release point; they maneuver in the same manner as space-combat missiles. Standard spikes come equipped with infrared or optical homing sensors. Other options are available at additional cost (per missile, 250mm/500mm): imaging infrared (+MCr0.004/0.019), semi-active laser homing (+MCr0.021/0.12), or neutrino homing (TL10+, +MCr0.019/0.10).

Procedure: The launching vessel must be in low or high orbit over the target world. The gunner aims at a point on the ground called the *target reference point* or TRP. He attempts to fly the missile to a position 11 miles (20,000 yards) above the TRP, and releases the submunitions; this takes one space-combat turn (20 minutes). He rolls against his Gunner (Missile) skill (p. B116) to hit, adds the target size modifier as well as the weapon accuracy modifier and subtracts -23 for range. If the attack is successful, the submunitions are distributed around the desired TRP. If the attack missed, refer to the *Size and Speed/Range Table* (p. B201). Take the amount by which the attack roll was missed and look it up on the Speed/Range column, then read over to the adjacent Linear Measurement column. This is the distance by which the spread of submunitions will scatter from the TRP, to a maximum of 9,000 yards. For example, a miss by 16 would be a -16 on the speed/range column, and hence a miss by 1,000 yards. Determine scatter direction randomly (p. B119). Once the submunitions are released, each one may make one attempt to lock on targets according to the homing-missile rules (p. VE193), starting from the point to which they scattered. If the lock is successful, the spike will maneuver to impact the target. If not, it will impact the ground somewhere within a radius around the scatter point: 1,000 yards for 250mm missiles, 3,000 yards for 500mm.



Glide Bombs

Glide bombs are precision munitions. They are designed to be launched from the 250mm or 500mm missile launchers of a ship in close orbit, using a small booster motor to enter the upper atmosphere. Once there, the missile automatically glides to the target area, aerobraking all the while to kill its considerable orbital velocity. The aerobraking phase ends with the missile in a near-vertical descent over the TRP at an altitude of 5,000 yards. The missile then activates its onboard sensors and searches for a target as it continues to fall.

What happens in the terminal phase depends on the type of missile. *Kinetic kill* (KK) missiles fire a terminal rocket motor, accelerating to their maximum velocity in a matter of seconds before impacting on the target. *Explosive* and *nuclear* munitions use steering fins and a small motor to maneuver to the target, where they detonate. In either case, ground range is 8 miles (14,000 yards) from the original target reference point.

Guidance: All glide bombs are "brilliant" (p. T:GF119 or p. VE195) and use inertial guidance (p. VE195) to reach the target area. Standard glide bombs come equipped with either infrared or optical homing sensors. Other options are available at additional cost: semi-active laser homing (+MCr0.02), PESA homing (TL8+, +MCr0.03), or neutrino homing (TL10+, +MCr0.015).

Procedure: The missile must be launched from a vessel in low or high orbit. The selected target reference point must be 1/4 of the planet's circumference (3/4 planetary diameter) ahead of the vessel along the vessel's ground track (the path its orbit traces over the ground) at the time of launch, plus or minus 500 miles in range and 250 miles left or right of ground track.

The flight time of the missile is one space-combat turn (20 minutes). (See p. VE193 for rules on "homing missiles.")

Nuclear Ordnance: Nuclear warheads may be substituted on HEAT missiles, as discussed above (p. 53). At TL7-8, add MCr0.042 per 250mm missile or MCr0.064 per 500mm missile. Halve this extra cost at TL9-13.

Saturation Nuclear Cluster (SATNUC) munitions are also available at TL9+. Add MCr0.5 per 250mm missile, or MCr2 per 500mm missile.

Probes/Drones

An IISS long-range probe is a 6-cf missile with an instrument package instead of a warhead. They are used for many purposes: soundings of planetary atmospheres, close-range photographic sweeps of planetary surfaces, asteroid flybys, and wide-aperture astronomy.

Stealth Surveillance Drone (TL12)

This is the most common orbit-to-ground drone used by IISS exploration vessels. It comes with robot brain (Complexity 6), acute vision +3, night vision, peripheral vision, telescopic zoom (16×), thermograph, super-hearing, long-range radio, radiation shielding, intruder chameleon system, stealth and IR cloaking, flashlight, self-destruct device with 1 lb. of explosive, and inertial compass. A rechargeable D cell powers all systems, with endurance of 10 hours.

Statistics: Design weight 20.58 lbs., total volume 0.275 cf, price Cr7,745, aSpeed 77 mph, PD 4, DR 20 laminate armor, 5 HP, and Legality Class 2.

Electronic Warfare (EW) Drone (TL9)

An EW drone is a small robotic jammer node that runs alongside a larger vessel, projecting an area-effect jamming field. EW drones are based on the 500mm missile, with the warhead and power cell replaced by smaller engines, an area jammer, and a nuclear power unit (NPU). Drones are typically no faster than the ships of their respective TL. The jammer rating is 3 at TL9, 4 at TL10, 5 at TL11-12, and 6 at TL13. (See pp. VE59, VE171, and T:GF112 for further information on "area jammers" and "radar.")

Any 500mm operator-controlled missile launcher can launch the drone. There's no benefit to having more than one drone jamming the same area.

Short-Range Probe (TL12)

This probe is based on an advanced variant of the SIM-12 missile (p. GT159) with the warhead removed and an improved sensor suite added. A modular socket carries custom-built scientific packages. It comes with a receive-only, very-long-range laser communicator (1 million miles), passive electromagnetic sensor array (PESA) (20-mile range), an inertial navigation system, a modular socket with 0.2 cf capacity, and radiation shielding. Additionally, a rechargeable E-cell supplies enough power for one hour of operation.

Statistics: Ewt. 265 lbs., usual payload is 70 lbs., lwt. 335 lbs. (0.17 stons), volume 6 cf, Size Mod +0, price MCr0.070, HT 12, PD 4, DR 120, and 30 HP.

Water Performance: wSpeed 150 mph, wAccel 180 mph/s, wMR 1, wSR 4, wDecel 5 mph/s (100 mph/s), and draft 0.63 feet.

Aerial Performance: aSpeed 740 mph, aAccel 180 mph/s, aMR 6, aSR 3, and aDecel 24 mph/s.

Space Performance: sAccel 9 G.

Probe Launchers

This system is designed for the launch and control of short-range probes (but it is not an EW drone). A probe-launcher system consists of three launchers, each including a launch tube, laser communicator, computer terminal, and crew station for probe control. There is storage space for 13 probes, and 40 modular instrument packages. Depending on the exact composition of the load, the module with a full complement of probes would weigh roughly 4 stons and cost MCr2. This module may also be placed in a turret and operated remotely.

*Why **do** they call it a morgue anyway?*
– Anton Wilson Peale

Jump Troop Systems

Jump troops are lightly armed infantry equipped with *Reardon* medium battledress (T:GF86) and either PGMP-11 plasma guns or FGMP-11 fusion guns (p. GT110).

Their purpose is to assault from orbit, penetrating planetary defenses in small, one-man drop capsules.

Standard Drop Capsule

This is a generic, disposable atmospheric-reentry capsule. It has a compartment for 10 cf of specialized equipment including ECM gear or cargo; this equipment must be designed to fit the limited space. With additional buffers and padding, just about any size battledress can also be used in it, turning it into a meteoric assault capsule. There is an additional 5 cf (250 lbs.) of space for generic cargo. The standard drop capsule includes primitive controls and has Fair streamlining. (See p. T:SM62 for the "assault capsule" statistics used by the Imperial Marines.)

Capsule Racks

This module stores up to 16 capsules (with mass of up to 2,000 lbs. each) in ready racks with room for maintenance and (machinery for) launcher-loading operations. The component statistics do not include the mass or cost of the capsules.

Drop-Capsule Launchers

A pair of 700mm missile launchers in a fixed mounting. Rate of fire is 1/10 each, so in one space-combat phase the pair can launch 240 capsules. This system can also function as a pair of one-man airlocks.

Battledress Ready Rooms ("Morgues")

This module includes space for 20 sets of battledress (weighing up to 1,000 lbs. each) and accessories such as flight packs, with room for *minor* maintenance and loading equipment. The component statistics do not include the weight or cost of the carried suits.

Chapter Eight

Crew and Passenger Accommodations

When creating a ship, the designer must consider how many beings the ship will carry, and how much space and luxury they need. Quarters are not strictly *necessary*, even for long voyages – if there is sufficient life-support capacity, passengers can be carried in the hold. This is uncomfortable, and illegal within the Imperium. Captains only resort to this in emergencies or when shipping refugees, slaves, or animals. Most of the time, passengers travel in a combination of the modules described in this chapter.

For systems that come in half-sized or small versions, divide all statistics by 2 unless otherwise noted and round any fractional spaces to the nearest 1/2 space.



Modules for Crew and Passengers

There are many different ways in which the various sophonts of the Imperium travel. Everything from steerage to palatial multiroom suites are available – for a price. Typically, there are only three different levels of comfort: low, middle, and high passage. See ***GURPS Traveller: Far Trader*** for the various costs and requirements associated with these different modes. In addition to staterooms, there are also recreation facilities: gyms, swimming pools, large lounges and bars, and theater entertainment. Only the larger liners are capable of maintaining anything other than a simple lounge.

Life Support

Limited Life Support provides basic lights, air conditioning, heating and also provides additional "bottled" oxygen and water for as long as power and supplies last. This is the most common kind of life system on small craft. Its endurance is measured in man-days; i.e., 100 man-days of endurance sustains one man for 100 days, two for 50 days, three for 33.3 days, etc. Life support can be turned on or off, thus conserving it when not needed; a shuttle flying through a breathable atmosphere would have no need for it. At TL11+, these systems become obsolete in favor of full life support.

Full Life Support is a self-regenerating oxygen and water purification plant typically found on long-duration non-starships with minimal crew requirement. Full life support does not provide food, so supplies must be carried if the sophonts are to eat.

Total Life Support has all the benefits of full life support but also provides food (see *Parts and Stores*, p. 27). This is the standard aboard all starships and large non-starships in the Imperium.

Alien Environment Suites

This is an individually controlled environment designed for the comfort of up to two passengers (or livestock) with exotic atmospheric requirements. It includes a full life-support system for two (four at TL11+, with half of the standard capacity as backup), separate from and independent of the starship's main life system; a two-man airlock; and 24 hours of battery power (as a backup) to keep the occupants alive should repairs be required. As *total* life support is not provided, rations sufficient for the journey will have to be carried as cargo. At TL10 or less, two man-days of *limited* life support is provided, instead.

Note that alien races with different metabolisms, such as the Inheritors (see ***GURPS Traveller: Alien Races 3***), would consider quarters designed for humans to be "alien environment suites."

Bunkrooms

This type of room has bunks for six personnel at TL7; nine at TL8; 14 at TL9; and 16 at TL10+. All include total life support. Conditions are very cramped. Imperial protocol is to only load up to 25% capacity per bunkroom, except for missions of very short duration or emergencies.

Small-Craft Cabins

Also known as "small-craft staterooms," cabins are much like staterooms (see p. 58), but more basic and spartan – some would say cramped. In the Imperium, cabins are not considered suitable for passengers or crew on interstellar vessels (including Imperial Navy starships) due to these "cramped" conditions, but are often employed on interplanetary vessels and small craft (however, see *Traveling*, below).

Traveling

Aside from the bridge, the cargo deck, and engineering, passengers are normally allowed the run of the ship during the week in jump, although smaller vessels encourage them to remain in the staterooms or in the passenger lounge. Food service is provided as part of the passage, and is served in the lounge.

Low Passage is the fiscal and social equivalent of traveling steerage in a 19th-century passenger liner. Low passengers spend the entire trip in suspended animation, and thus have no life-support requirement other than a trickle of power to run the low berth (see below).

Middle Passage is a step up from low passage, and is substantially more expensive. On large passenger liners, middle- and high-passenger staterooms are segregated on different decks, each with separate lounge areas, galleys, and so on. Smaller vessels often mix the two types of passengers on the same level.

High Passage is more expensive than middle passage, and is virtually identical except for a higher standard of service and food. On large liners, high passengers have their own decks, lounges, and food service. Some ships give high passengers larger, more luxurious staterooms. On smaller ships, the main difference is in the quality of food and the behavior of the stewards. Converting middle-passage accommodations to high passage usually involves simply upgrading the fittings. Luxury fittings are available for just about any crewed compartment at 5× cost.

Some ships also have much more room than others. Some are crowded. To determine exactly how much room your vessel has for the crew, perform the following calculations. Divide the total number of dtons devoted to a crew's comfort (staterooms, bunkrooms, rec facilities, etc.) by the total crew not in low berths. Spartan accommodations are 2 to 2.25 dtons per person, average is 2.26 to 3, above average is 3.01 to 4, and luxurious is over 4. Anything below 2 dtons per person is considered cramped and results in a -1 penalty to all shipboard operations. For passengers (including troops) not in low berths, divide the total number of dtons devoted to passengers' comfort (staterooms, bunkrooms, rec facilities, etc.) by the total passenger count. Use the same descriptions as above.

Note that luxurious high passage may demand a higher price than average high passage . . .

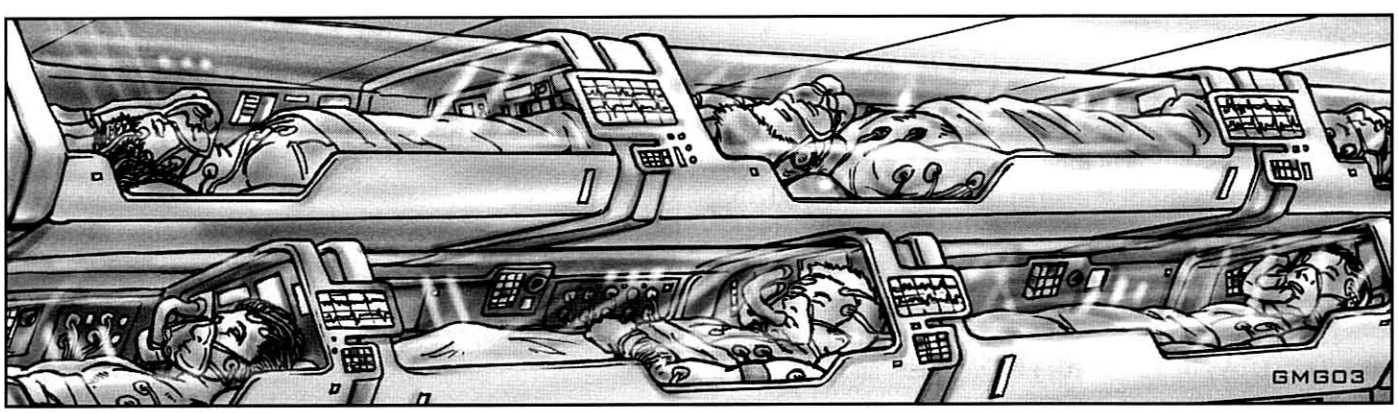
Low Berths (TL9)

A low-berth system contains four cryonic freeze capsules, each containing power components, and capable of holding one person in suspended animation ("low passage") and 10 cf of personal belongings. See pp. UT103, S91, or BIO115 for detailed rules. Low berths are often used to carry replacement crews (see *Frozen Watch*, p. 26) aboard naval vessels, or as emergency life support for disaster survivors or severely injured crew members. Also see *Low Berths*, p. GT108.

To convert a Low Berth to an Emergency Low Berth, add MCr0.004 at TL9 or MCr0.003 at TL10+ and 0.01 stons to the mass for both. It has an integral radiothermal generator or "RTG" (see p. VE85) providing enough power for 14 years. The RTG is usually refurbished during the annual maintenance overhaul. Each module also includes four dedicated, hardened, small computers to control the immersion procedure, allowing an occupant to enter unassisted at assisted speed (5 minutes). Emergency low berths do not have storage space for personal belongings.

Another form of low berth is used to transport livestock. Instead of four capsules, there are only two. Each is rated for 1,000 lbs. (1/2 stons). No supervision is required to put the animals in cryo-sleep, but anesthesia might be a good idea depending on circumstances. Animal Empathy or Animal Handling should give bonuses, if appropriate. Reviving livestock is the responsibility of the colony's veterinarians (usually recruited as professionals). Revival is very similar to the process for standard cryonic freeze capsules, but failure indicates that the livestock is dead (all occupants share the same revival roll). Whether the results of a failed revival are still suitable as food is left to the GM.

When sizing livestock berths, determine the mass of animals to be transported and refer to the following table.



That's Entertainment

"My best advice if you want to be a shipboard entertainer: don't. You're in for long hours of high-stress performance with no chance of getting away from your audience, even if they hate you – and believe me, after a week in jump some will. Still, nobody ever listens to that little nugget of wisdom, so here's my next-best advice.

"First, make sure you're doing it for the right reasons. ***Don't*** *do it just because you want to travel – though you need to like traveling – and don't do it for the money. Do it because you like meeting new people and making them happier.*

"Second, generalize. It doesn't matter if you're not the best singer in the Marches or the funniest comedian, so long as you can do a bit of both and half a dozen other things, and make them all entertaining. A week is a long time in jump space, and you can't get away with the same act every night.

"Third, know your audience. Check the manifest before launch; it'll tell you how many family groups you'll be dealing with, what races are on board, things like that. You don't want to be making Aslan jokes in front of one! Mingle during the flight to jump point and try to gauge the mood. Pick up every scrap of information you can.

"Fourth, make friends with the crew. Help them out and they'll come to your rescue when things get rough.

"I could go on, but those are the most important points. There's always too many of them and not enough of us, no matter how big the ship is – the only thing you can do is practice. Or quit.

"Don't say I didn't warn you."

– Enli Rivera, in an interview for the ***Spinward Times****, 137-1119*

Livestock Stowage Table

Size	Mass	Live	Cold	LS	Examples
Very Large	10,000	0.5	n/a	15	Elephant
Large	1,000	2	1	3	Horse, Cow, Camel
Medium	100	15	10	0.7	Pig, Goat, Dog
Small	10	30	100	0.1	Chicken, Duck, Cat
Very Small	1	160	1,000	0.03	Rat, Quail, Dove

Mass: Given in pounds.

Live: Animals that can be stowed per dton when not transported in a low berth.

Cold: Animals that can be stowed per low berth.

LS: Human-equivalent life-support needs per animal.

Generic livestock is worth approximately Cr1/lb. (Cr2,000/ston), but this may vary greatly (see pp. B140-145).

Passenger Couches

This system is only available for small craft. It incorporates 11 (TL7-9) or 12 (TL10+) roomy seats and one man-day limited life support per passenger, plus the necessary power components to operate the life-support system. All seat bottoms can be used as a flotation device in case of water landing or as a rescue bubble in the case of a vacuum evacuation. All seats fold up into the bulkhead, reducing their volume by 50%, and allowing the passenger compartment to be used as an ad-hoc cargo hold (at 20 cf stowed per seat). For systems without the added safety/fold-up features, divide cost by 10. Half-Sized versions are available; round down the number of passengers.

Staterooms

Staterooms are the long-term quarters called for by interstellar flight; they include 50% additional space for access and other facilities (galleys, rec areas, etc.). Standard passenger comfort demands a certain level of amenity in the stateroom. In order to meet this standard, staterooms are self-contained living areas which need never be left during a voyage. The stateroom contains a bed, a fresher, entertainment consoles, a small kitchen, and miscellaneous furniture. All basic items in the stateroom retract into the floor, wall, or ceiling when not in use.

Staterooms provide a standard bed which folds into the wall at a command. Grav plates (from a utility module, p. 40) can be adjusted to provide a range from 0 to 3 G for personal comfort, plus an intercom and controls for light and heat.

Meals may be taken on a collapsible table and storable chair. The stateroom is large enough for four people to eat around the table comfortably. Meals must be delivered by hand from the galley; there is no automated delivery system. A small refrigerator stores snacks and a small quantity of food for immediate availability. See *Ship's Galley*, p. 60, for another design option on vessels that have more than 20 staterooms.

Sanitary necessities are handled by the fresher, which includes a multifunction shower, a toilet, a sink, and a small washer/dryer (for the benefit of middle passengers). All components fold unobtrusively out of the way when not in use.

Storage of personal necessities is handled by several collapsible compartments and cabinets. Passengers can store up to 10 cf of baggage in their staterooms; high passengers can store an additional 500 cf in the cargo compartment. Note that stowage in cargo and access thereafter requires the assistance of the crew.

Install enough staterooms for the estimated crew and passengers – crew or middle-passage passengers often endure double-occupancy; high-passage passengers and (some) officers should have a room of their own. The staterooms themselves take up only about 50% of the rated volume; the rest is used for common areas (lounges, kitchen, meeting rooms, etc.), total life support, a power slice, and access ways. Staterooms are not available on small craft unless the craft is designed with bridge and engineering systems – not a cockpit/systems module.

Offices

Each office module holds four offices, with room for three visitors each, or 16 cubicles with no room for visitors. Includes full life-support for 16 and space for conference rooms, office supply storage, etc.



Life Support and Provisions

A manned ship should have at least one space of life support if it is intended to operate for more than a couple of days – unless it contains other systems that include life support (i.e., staterooms). Thus, short-range shuttles or fighters do not require life support.

A life-support system can be overloaded if necessary. Roll 3d after each day of overloading, at +1 per full 10% by which the number of people aboard exceeds current capacity. On an adjusted roll of 13 or more, the system begins to break down, losing 10% of its *current* capacity for each point by which the roll was missed. A Mechanic (Life Support) roll can be attempted once per day; if it succeeds, it will restore 10% of *full* capacity. Once the life-support system begins to fail, the effect snowballs. If the ship remains overloaded, life support will eventually reach 0% and fail. At that point, all the oxygen in the air will be used up within a few hours, and everyone will die. Those in cold sleep are unaffected if life support fails . . . as long as the power stays on.

Life-Support Module

This module contains extended accommodations for craft equipped with bridges but no staterooms. Includes full life support for five personnel, one folding bunk at TL7-8, two folding bunks at TL9, two bunks at TL10+, the associated power plant slice, and 9.5 cf of storage for personal gear.

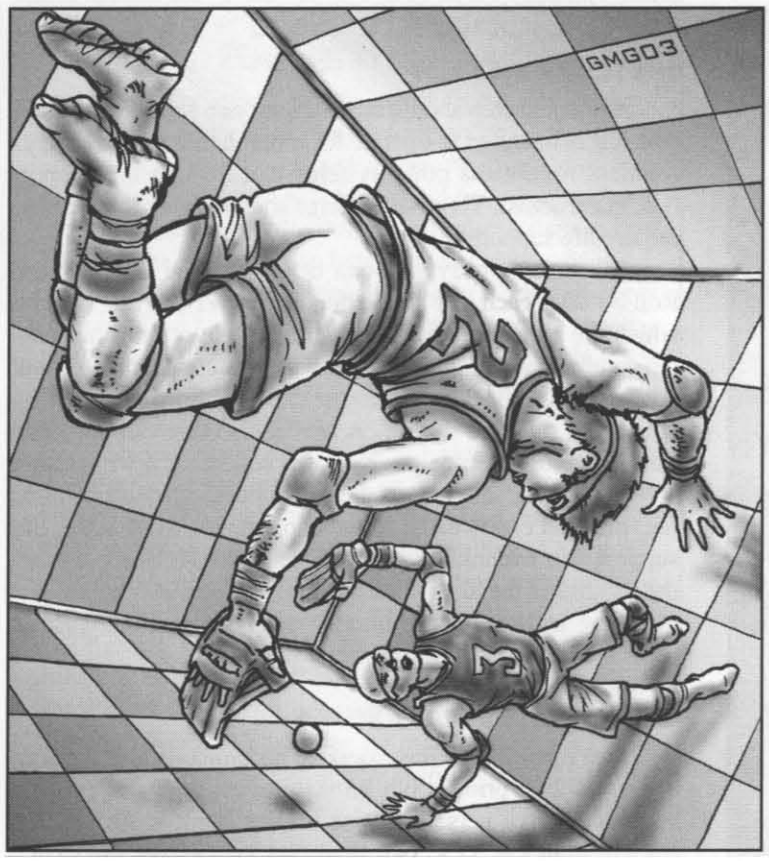
Luxury Fittings and Entertainment Facilities

Leisure activities are considered a necessary part of stateroom life. They relieve the boredom of long jump voyages by providing entertainment, research facilities, and computer access. The wide range of entertainment activities includes holographic theatrical productions, video shows, interactive drama, and audio programming. There are also games (played against a computer or against other passengers). The computer terminal also allows access (on a restricted basis) to the main computer for data processing, word processing, and library data inquiries.

While the phrase "entertainment facilities" conjures images of passenger liners, these modules are also useful in military vessels. The value of exercise rooms and shooting ranges are obvious, but even theaters have their place – not only for entertainment, but as briefing rooms and a place to stage activities between combat.

Gymnasiums/Exercise Rooms

A gym usually contains a wide variety of exercise machines and facilities for both strength and aerobic training. The standard gym can be used by up to four people at once. Gyms aren't necessarily a luxury – long voyages cooped up in a small starship can cause a significant loss of conditioning. Exercise is also a good way to relieve stress and deter psychological problems. Military ships usually have sufficient gym facilities to support 5% of the crew at once.



Halls, Bars, or Conference Rooms

A large room with tables that can serve as a restaurant, bar, conference room, casino, etc., this can comfortably accommodate 50 people per module (smaller lounges and conference rooms are included in stateroom volume). Weight and cost include furnishings.

Holoventures (TL9)

Civilian: A 1,200-square-foot holoventure zone with a roomy operator's crew station. The computer terminal at the station runs holoventure programs on a dedicated mainframe computer. It includes a fusion power slice to run it.

Military: As above, but with DR100 composite armor for training with live ammo.

Shooting Ranges

A 25-yard sighting/training range for two men with a single computer terminal. It is armored to DR100 and is most often used with plastic bullets. Troop ships use it to provide traveling soldiers some time on the trigger. Combining multiple ranges could provide a longer range or even a mock village for rehearsing house-clearing and hostage-rescue missions.

Stages

A 20'×20' stage area for dancing, plays, nightclub acts, and so on, this includes sophisticated electric lights and sound systems. Normally attached to a Hall or Theater containing the audience.

Swimming Pools

Large commercial ships (or those catering to aquatic sophonts) will often have swimming pools. Includes 100 square feet of pool (10' deep), 100 square feet of deck area, and overhead clearance. Multiple modules can be combined to make larger pools. The finished design should add one Space Dock system (1 ston, MCr 0.005) per complete pool, to contain the water in case of loss of artificial gravity. The module only weighs 1.5 stons when empty.

Theaters

A small auditorium with 100 seats for the audience, a large holoprojector (can be stowed), and an operator's workstation. Can be used for entertainment, for presentations, or as a briefing or situation room. A stage is not included – a Stage module may be attached if needed.

Null-G Handball Courts (TL8)

While artificial-gravity generators eliminate the need for space travelers to experience zero-G conditions, some travelers nevertheless like the challenge of experiencing those conditions for recreation. Null-G handball is typical of any number of null-gravity games that have become popular in most space-faring cultures. It is played in a court 20'×20'×40' by either two persons or two two-person teams. Players wear a lightly padded and webbed glove extending their reach by several inches, with which they strike a small resilient ball. The object of the game is to bounce the ball off of any three surfaces of the court (walls, floor, or ceiling) without the opposing player or team touching it. The Null-G Handball Court includes separate artificial-gravity generators to maintain the zero-G environment, a locker room with shower and facilities for the players, and a gallery for an audience of 12 (larger audiences require Theater seating).

Ship's Galleys

A compact food-preparation area with capacity for up to 770 lbs. of food (385 man-days if a life-support system is installed, 64 otherwise). Mass and cost both assume a full pantry at the appropriate TL. Each module provides cramped but usable space for preparation of up to 28 meals at a time. Exact features will depend on TL and may include rough-weather options for low-tech ocean vessels, zero-G options for pre-CG space vehicles, and/or refrigerators and freezers. Galley modules may be stacked to create a much larger facility.

This module should only be purchased for ships requiring more food preparation area than is included in staterooms (see p. 58). A galley may be consolidated from the total kitchen space provided by multiple staterooms. If a ship is designed and built in this manner, the "galley" is considered a common area separate from the staterooms. It would take 20-40 staterooms to make such a galley, depending on level of service and spaciousness desired.

Chapter Nine

Accessories and Unusual Items

In addition to all the equipment crew and passengers see just walking through the ship, ships require many more systems to operate smoothly and/or fulfill its mission: everything from cargo holds to weapon-storage lockers to medical systems is needed.

Cargo

Virtually every starship needs some cargo space. Even the most optimized military vessel will have a ship's locker to store equipment.

Cargo Holds

Each Hold module has space for 500 cf (18.5 cubic yards) of cargo. Multiple modules may represent a single large hold or a number of smaller holds. Holds in half-size increments (250 cf) may also be installed. Holds normally carry 5 stons per dton; maximum rated load is 25 stons per dton. See pp. 57-58 for information on transporting livestock.

Smuggler's Holds

If a vessel has cargo space, some or all of it may be divided into one or more concealed compartments (called *smuggler's holds*, after their most common use). If someone searches the vessel, a smuggler's hold can be found on a roll vs. Holdout or Shipbuilding (Starship) skill, whichever is *lower*. Subtract 10 from skill; add +1 for every 2% of the ship's hull class hidden. Smuggler's holds cost MCr0.005 per 1/2 dton.

Ship's Lockers

The Ship's Locker is a catchall name for the miscellaneous stores and supplies a ship maintains to support its operations and crew. On small ships, it may be a physical locker; on larger ships, it is a storeroom or hold. Contents of a ship's locker may include environmental and survival gear, personal convenience items and consumables for the crew (the *slop chest*), and medical supplies. Most equipment is issued as needed and remains the property of the ship's locker.

Slop chest items (junk food, mild recreational drugs and alcohol, toiletries, entertainment or education chips, T-shirts and even uniforms sometimes) are purchased in bulk by the Purser and sold to the crew at cost or charged against their unpaid salaries. On small merchant ships or those carrying only a few passengers in addition to their cargo, the passengers may have access to the slop chest through the Purser, but on a cash-only basis. Large liners run separate concessions for the convenience of their passengers.

See *Zero-Space Systems*, pp. 68-69, for more information on Ship's Lockers.

Weapon Storage

Small arms and most other conventional weapons are easily stored in cargo holds or the ship's locker. However, some weapons and accessories require special handling and storage if a vessel is to remain safe from accidents and terrorists. Nuclear warheads, antimatter warheads, and even conventional explosives all pose a serious risk to a ship's integrity if not handled correctly.

Anti-Blast Magazines

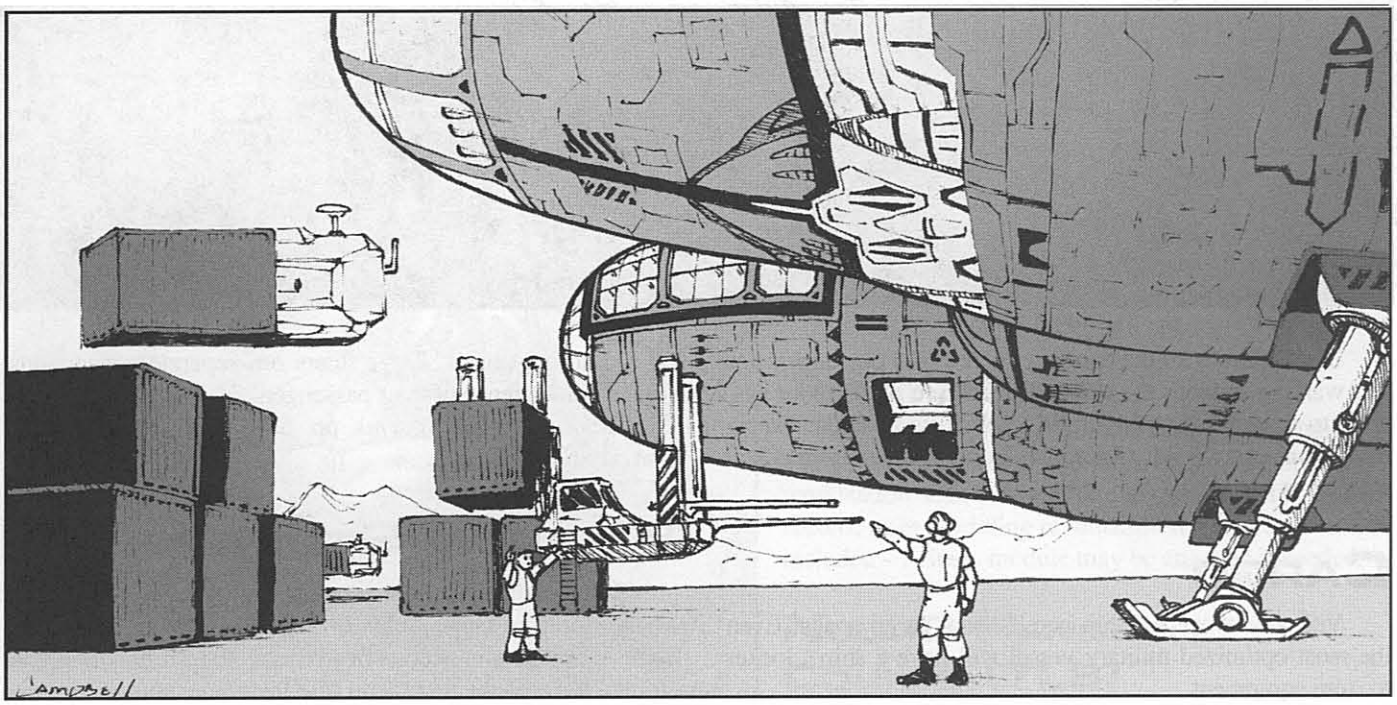
These magazines are special compartments used to store missiles and other hazardous goods. They are designed to channel the blast of an ammunition explosion away from other internal systems, reducing the severity of accidents. A magazine holds 55 250mm missiles, 11 500mm missiles, or 500 cf of other weapons. They should be installed near the outer hull of the ship to operate effectively.

Damper Boxes (TL11)

Damper boxes prevent radioactive decay of unstable isotopes. They weigh 80 lbs., take up 1.6 cf, cost kCr40 and require 0.16 MW for *each* cf of cargo capacity that they possess at TL11. Halve all attributes at each higher TL. The *Module Tables* contains a TL11, TL12, and TL13 box capable of holding 55 250mm or 11 500mm missiles equipped with nuclear warheads; each provides a nuclear power unit (NPU) to run it, allowing containment even when the ship loses power. Smaller units (holding no more than a couple of warheads) should be constructed using the *Zero Space Modules* (see pp. 68-69).

Antimatter Bunkers (TL12)

Antimatter cannot be produced or stored in useful amounts until TL12, and is not used in engines or reactors until late TL13. Antimatter bunkers (or "traps") each hold up to 50 grams of antimatter (usually anti-hydrogen). Since antimatter is worth several million credits per gram (assuming one could find it on the open market), larger bunkers are rarely required. They include a dedicated internal nuclear power unit; containment will be maintained even if the vessel loses power.



An antimatter fuel bunker will explode on a roll of 16 or less if it or the vehicle location containing it is disabled or destroyed. It can be made to self-destruct by turning off the containment system. Failsafe systems, each with the volume, mass, and cost of the original system, can be added. These backups make a damaged trap less likely to explode (-1 to explode per extra module). Damage from a bunker explosion is equal to 6d×25 million points *per gram* – enough to vaporize any ship in ***GURPS Traveller*** and pose a significant hazard to vessels nearby. (The crew's personal armor does protect normally if they are wearing it . . .)

Cargo-Handling Gear

All but the most primitive starports have equipment and facilities for loading and unloading cargo, available for a price. Large ships, or ships designed to access primitive starports, may include their own cargo-handling equipment. Usually, this will consist of winches and hoists, but very advanced ships may choose to include gravitic manipulators (see below).

External Cradles/Grapples

See *Surface Features, External Cradles/Grapples*, p. 35.

Gravitic Manipulators (TL11/13)

These devices generate a gravity field at a distance, pulling objects toward or pushing them away from the ship.

Repulsor Beam (TL11): Each repulsor-beam system generates a ST 8,500 repulsive force. Multiple systems can work together, adding their ST together.

Tractor Beam (TL13): As the repulsor beam, but generates a ST 8,500 attractive force, instead. Multiple systems can work together, adding their ST together.

Combination Beam (TL13): Usable as either a tractor beam or a repulsor beam, but not as both simultaneously. In either mode, the beam generates a ST 8,500 force. Multiple systems can work together, adding their ST together.

Mass Catchers (TL8)

A large cargo net and arrestor system designed to catch up to 625 stons of mass (typically shot by the *Mass Driver*, p. 64) as long as it is less than 1,500 spaces in size and traveling at less than 600 mph. Multiple units will either increase the speed, mass, *or* volume (choose one per additional unit).

It is designed for zero-G operations by producing a strong counter-force (usually thrusters) to catch a load without moving off its stationary position and axis. This system must be mounted on some other structure (at a minimum, a 2,000-ton vessel or platform of some type), as it is not a stand-alone unit.

Optional Detail: Hatches and Openings

Any ***Traveller*** campaign taking advantage of the cargo-handling equipment described here may benefit from information on standardized cargo hatches in the Imperium. Cargo vessels with 7 dtons of cargo space or less have a small cargo hatch, which is 12' wide by 12' high. Larger ships have one standard hatch per 25 dtons (or fraction) of cargo space; standard hatches measure 24' wide by 12' high. Very large ships may combine several hatches into a single opening that is a multiple of these dimensions.

Alien or unusual ship designs may have radically different cargo hatches, requiring some on-the-scene thinking for quick loading or offloading of cargo.

Additional Equipment

While too minor to be individually purchased or inventoried in the starship-design process, the following items are commonly found at starports or in large cargo vessels throughout the Imperium. See pp. T:SP102 and T:FT77 for more information. Any starport employee should know where to find one, and they'll often be lying about in the cargo-handling areas. Travelers should be able to get their hands on most of these without much difficulty.

Hand Truck: A two-wheeled dolly that carries up to 1,000 lbs. or 4 cf of breakbulk product. The speed at which it can be pushed depends on the user, but the weight is normally divided by 10 or 20 (see p. B89) for encumbrance purposes. $50, 30 lbs.

Dock Cart: A four-wheeled cart than can hold up to 4,500 lbs. or 180 cf of breakbulk product. The speed at which it can be pushed depends on the user, but the weight is normally divided as per the hand truck, above. $100, 300 lbs.

Bulk Liquid Pump: A rugged pump used to move liquids such as water, gasoline, milk, etc. For double cost and weight, a heavy-duty version can move cryogenic fuels. For quadruple cost and weight, increase transfer rate by 50%.

A TL7 unit can move 3,000 gallons per hour at a distance of up to 150 feet (multiply rate by 1.5 per TL after TL7). Multiple pumps may be connected in-line to move a liquid a longer distance. There are usually 4-6 of these pumps operating during shipboard cargo operations. The pump's price includes a short-range communicator and a dedicated computer so operators can control the pump at a distance.

The pump with hose weighs 185 lbs., costs $600, and takes up 5 cf. Both pump and hose have DR 5, HP 5.

The pump uses a D cell (or equivalent advanced battery at TL7) for every 12 hours of operation. It takes 15 minutes and a Freight Handling skill roll to set up.

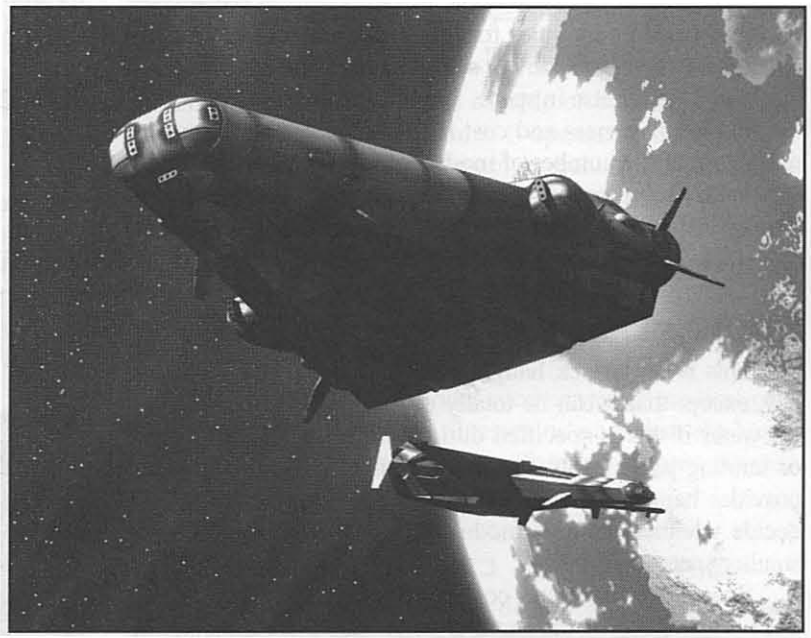
Dry Bulk Auger: As above, but uses a screw mechanism to move bulk dry goods like beans, wheat, rice, etc. A TL7 unit can move about 4,000 cf of bulk product per hour at a distance of up to 50' (multiply rate by 2 per TL after TL7). Multiple augers can be connected in-line to move a product a longer distance. These are often used during shipboard cargo operations. The auger's price includes a short-range communicator and a dedicated computer so operators can control the auger at a distance. An auger with hose weighs 320 lbs., costs $1,700, and takes up 10 cf. Both auger and hose have DR 5, HP 15.

The auger uses a D cell (or equivalent advanced battery at TL7) per 6 hours of operation. It takes 15 minutes and a Freight Handling roll to set up.

Conveyor Belt: A 15'×2' (or a multiple thereof) motorized conveyor belt. A TL7 unit can move up to 625 cf of breakbulk or bulk product per hour (multiply rate by 2 per TL after TL7). There are usually four to six of these conveyors operating during shipboard cargo operations. The conveyor's price includes a short-range communicator and a dedicated computer so operators can control it at a distance. Non-powered roller conveyors are half weight and one-tenth cost, but are obviously limited in utility.

The conveyor weighs 70 lbs., costs $500, takes up 3 cf, and has DR 5, HP 15. It uses a D cell (or equivalent advanced battery at TL7) per 12 hours of operation.

Portable Hydrogen Fueling Unit: This handy unit often supplements or replaces starship-standard fuel-processing modules for starport fuel-refining needs. Each unit produces its rated gallons per hour × 1.58 in liquid hydrogen and its rated gallons per hour × 0.76 in liquid oxygen. The TL7 unit uses a 4C55/7 container and the TL8 uses a 4C55/8 container (see p. T:FT57 for information on standard cargo containers). The TL9+ units each use a 4D55/8 container. The TL7-8 versions use a fission reactor, the TL9 version uses a NPU, and the TL10+ versions use a fusion reactor. A cutter can carry two HFUs (one at TL8-) and eight empty 4A70/8 fuel tanks in one trip.



Vehicle Storage

Starship designers have several options for storing smaller vessels within a larger one.

Vehicle Bays

A vehicle bay is custom-designed to snugly hold a single, specific small craft within the skin of the ship. It is not usable for other sorts of vehicle, except an externally identical variant of the original small craft.

To simulate the way that many small craft were carried in ***Traveller***, vehicle bays may be considered partially recessed into the hull. The full volume is still subtracted from available volume. The mass of any craft carried in this recessed vehicle bay plus any external stores still may not exceed the limits as imposed by hardpoints (see p. 34). Total volume of all recessed vehicle bays may not exceed 20% of hull class due to structural limitations. Use intrinsic modular couplings instead (p. 35) to overcome that limitation.

Example: A 100-ton ship has 12,150 HP and a recessed 20-ton vehicle bay. The external-store limit is 121.5 stons, therefore, the vehicle bay can only store a craft that does not exceed that mass. There would be no limit if the vehicle bay was fully enclosed.

Vessels in vehicle bays can only have maintenance performed that can be accomplished from within the vessel itself – since these vehicles often are short-duration small craft, that means they often cannot have large repairs made except at a starport or other dock facility.

Hangar Bays

A vehicle can be given a large bay in which other smaller vehicles can be stored, ready for instant launch. Unlike a vehicle bay, a hangar bay is not specific to a single vehicle type; any vehicle can be carried in it. The weight of a hanger bay includes all necessary elevators or ramps to move the vehicle or vehicles into launch position. Each module provides hangar space for 500 cubic feet (1 hull class) of vessel; decide if multiple modules form one large or several smaller hangars. Hangar bays are *not* sealed against vacuum and thus have very limited use in space.

Hanger bay mass and cost is paid only once per hangar, regardless of the number of modules from which it is formed – it mainly represents the mass and cost of the elevators and ramps. Hangar bays may be purchased in half-sized increments, but cost and mass remain unchanged.

Spacedocks

This is an airlock hangar bay; it is treated as a hangar bay, except that it can be totally evacuated or filled with air (or water if this is specified during construction) with doors or landing-pad elevators opening into space. Each module provides hangar space for 250 cf (1/2 hull space) of vessel; decide whether multiple modules form one large or several smaller spacedocks.

Spacedock mass and cost is paid only once per spacedock, regardless of the number of modules forming it – it mainly represents the mass and cost of the hangar doors and air pump. Spacedocks may be purchased in half-sized increments, but cost and mass remain unchanged.

Launch Tubes/ Mass Drivers (TL8)

A launch catapult (electromagnetic or gravitic) can be installed in any vessel intended to launch spacecraft (such as a carrier). They allow the fast deployment of fighters or other craft (40 per 20-minute space combat turn); see p. GT169 for information on recovering small craft. (The craft does not fly back into the launch tube, but is instead docked in its appropriate storage location.) Craft launched from one of these may use their full acceleration on the turn they are deployed (e.g., a 5-G fighter's vector is 5 hexes longer than the vector of its launching ship). One Launch Tube module is required for every 25 stons of the heaviest craft to be launched from the facility, then add enough spacedock/vehicle bay modules to contain the largest craft accommodated by the launch tube to make a complete launch tube. This additional bay is used to store the vessel until launched and contains the feeding mechanism to move the second and subsequent vessels into the launcher. When a vessel is launched, another vessel is moved into the bay.

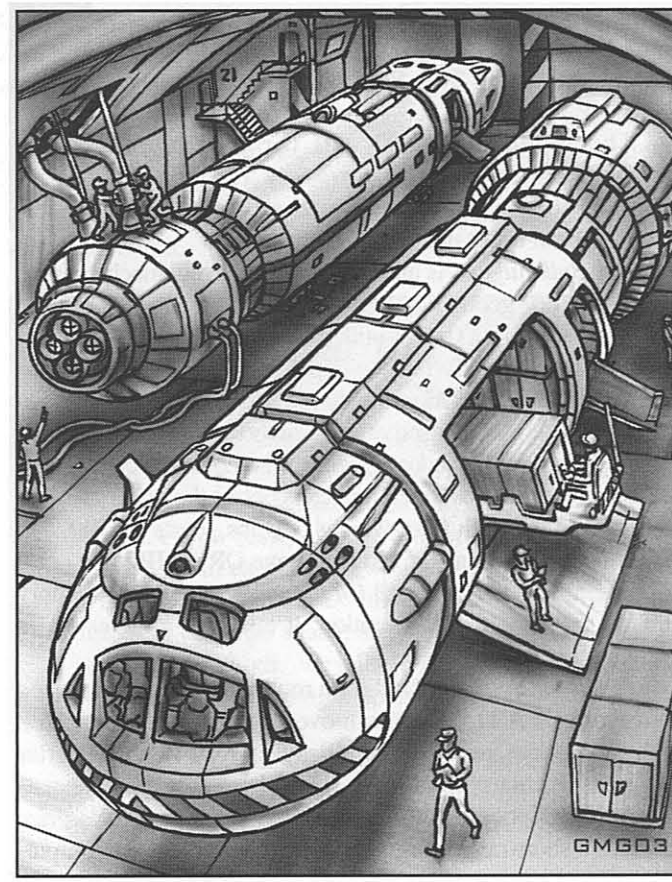
If used as a mass driver, the tube can launch up to 25 stons per module at 60 mph. Multiple modules will either increase the speed by 60 mph or increase the maximum mass that the tube can launch by 25 stons. Usually, a mass driver is designed for use in conjunction with a *Mass Catcher* (p. 62). Their performance should reflect one another's capabilities.

Labs and Workshops

A laboratory provides workspace and equipment for scientific research. A workshop includes workspace, tools, diagnostic equipment, raw stock, and bench parts for performing minor repair and construction work. Small parts can be made from scratch and medium-sized parts can be repaired or modified.

Laboratories

A laboratory dedicated to one scientific skill (e.g., Geology) as well as room for one or two scientists to work. For larger teams, multiple labs are a necessity! It gives +2 to skill in situations where the lab equipment would be beneficial; the GM can also rule a lab is required for a task – it gives no bonus, but work would be impossible without it. Physics laboratories are identical, but also include provisions for the increased power requirements of high-energy research.



Isolation Laboratories

A large, sealed laboratory with an airlock and other equipment certified to provide P4 protection (see p. BIO21). There is room for up to five people to work. It can be used for any sort of dangerous experiment: genetic engineering, chemical warfare analysis, psionics, nanotechnology, and so forth. Only in extreme cases (almost always the result of skilled sabotage) would any contamination spread beyond the lab.

Simulation Labs (TL9)

In scientific research and engineering design, the ability to visualize and manipulate data is often key to understanding and solving problems. The Simulation Lab is designed to assist in this visualization. It consists of a stand-alone holographic-imaging tank, a powerful macroframe computer (Complexity TL-2) to run it, and an operator's terminal. Although it can create images directly using data coming from onboard sensor systems, it is intended to accept and integrate large amounts of data from numerous science labs or design teams, and display it in a coherent, fully realized 3-dimensional picture. Multiple Sim Labs can be combined to create a much larger holographic-display volume (and more workstations) or enhanced displays may be added (see *Computer Lab*, below).

Computer Labs

These modules are designed for applications where reliable high-capacity number-crunching is needed. With a large number of associated workstations, they may also be used for archive and library functions. Each trio of macroframe computers is built as Compact, Genius, and Hardened with one level of High Capacity. Complexity is TL-1. Only dedicated scientific installations routinely use this costly module.

The *Enhanced Display* option consists of a 100 sf holoventure zone used to display the data instead of using flat screens (terminals are still included). These displays may be used with any of the listed laboratory modules as long as it has access to a computer of Complexity 7+. The required holographic program is included in the cost of the display system. Enhanced Displays may be also be used with Sensor Suites or Sim Labs to increase the display volume.

Workshops

Starships intended for long-range operation need to be somewhat self-sufficient, able to manufacture their own spare parts from found materials. The complete workshop contains all the tools needed for the Armory, Electronics, Engineering, and Mechanic skills, plus storage space. Workshops all have the same statistics though higher-TL shops will have better equipment. Up to three people can work in the workshop at the same time; one workshop should be provided for every 60 maintenance personnel onboard. Two of these workshops together make up the Logistics Module from p. T:FI35. Mini-workshops are similar, but not as capable; they are designed for vessels where space is at a premium (such as small craft).

Each complete workshop provides a +2 to repairs, while a mini-workshop negates the penalty for *not having* a workshop when making repairs.



Shipyards (TL7/9)

A shipyard or dry dock is capable of building or repairing 100 dtons of vessel at a time. It operates efficiently with 100 workers or robots and contains warehouses, workshops, offices, minifacs, etc., as well as a power element. There are two versions of this module, one for non-starships at TL7 and one for starships at TL9.

Medical Facilities

A normal sick bay provides workspace for medical personnel to treat wounds and illnesses on an outpatient basis. Other versions are dedicated to performing surgery, providing intensive care, or boarding inpatients.

Emergency-Aid Stations

Emergency-aid stations are designed for use in small ships where a full sick bay is not needed or space is at a premium. At TL7, it includes two bunks and a stretcher; at TL8, two bunks with emergency support units (ESUs) and a stretcher; and at TL9-13 one automed, one diagnosis table, one ESU, and one stretcher. All systems have a computer terminal and reactor slice to power it. See pp. UT94 or S87 for medical-equipment statistics. On ships without sick bays, one of these should be installed for every 60 staterooms or fraction thereof not covered by *Sick Bays*, below.

Sick Bays

Sick bays vary considerably by TL, as medical science advances. At TL7, each module consists of two beds, one operating table, and one stretcher; at TL8, an operating table and two beds equipped with ESUs; at TL9 and higher, an operating table, a diagnostic table, and either two (TL9-10) or three (TL11-13) automeds. All models include a computer terminal and sufficient power components to run all features. Ships should have one sick bay per 120 staterooms or fraction thereof.

Military Sick Bays/ Aid Stations

Naval vessels are often depressurized, either deliberately or because of battle damage. In order to maintain a habitable volume, military sick bays come with their own life support. This system is a sick bay as above (except the operating rooms are fully stabilized), with two 6-man airlocks, radiation shielding (PF 10 at TL7, ×10 for each additional TL), room for 10 ambulatory or two litter patients, and limited life support and energy banks for 15 man-days. A full fire-suppression system is included to augment those in the engineering spaces. Military sick bays are used individually as aid stations (often carefully placed along main corridors to act as blow-out shelters), or added to conventional sickbays to form a larger ward.

Evacuation Bays

Basic: Contains 12 stretchers and 12 Emergency Support Units (TL8+) with plenty of access space to move people in and out of them. Also includes 12 man-days of limited life support and a power slice. It is mostly used by small craft for medevac to a waiting starship.

Advanced (TL9): This contains 12 automeds and plenty of access space to move people in and out of them. Also includes 12 man-days of limited life support (*full* at TL11+) and a fusion power slice. Mostly used by small craft for medevac to a waiting starship.

Operating Theaters

This contains two complete, fully stabilized operating tables, two Emergency Support Units, 50 cf of storage space for medical supplies, and two computer terminals.

Habitat Modules

Some large vessels (such as colony ships and space stations) contain large urban or green areas inside them. Each module described below is about the size of a city block and includes lighting, temperature control, air recycling, and a power slice to run it.

Housing: This module contains one or more apartment buildings or a few dozen houses, plus grounds, walkways, etc., providing long-term accommodation for up to 100 people (half that many in luxury, twice that many in cramped conditions). Life support is not included. It should be supplied by a farm module (below).

Factory: A large industrial park capable of operating efficiently with a few dozen workers or robots. Contains warehouses, minifacs, etc.

Farm: An acre or so of open space with a few buildings devoted to agriculture and food processing. Up to 10 people or robots can work it effectively; each worker can grow food to feed 10 people. Using crop rotation, the farm can serve as total life support (providing air, food, and water) for about 100.

Park: A landscaped green space, possibly with entertainment or exercise facilities (pool, stream, playground, etc.). In a pinch, it can provide camping grounds for about 100 people.

Plaza: A mall or concourse area with about a dozen medium establishments, plus open space for several hundred people to congregate.

Null-G Handball Arena: Like a Null-G Handball Court (see p. 60) but represents either multiple courts or larger courts for bigger games (most often aboard stations rather than ships). For example, grav-ball (played by teams of seven armored players) uses a court 120'× 60'×60' (i.e., 27 handball modules, 20,000 Seats, 900-person Hall).

Security Systems

Civilian vessels require security measures against theft; exactly how many and what type will depend on the owner's paranoia and Imperial liability laws (no system is completely error-free). Warships often have lethal security measures, especially when on duty.

Electrified Surface

See *Surface Features*, pp. 31-35.

Locks, Alarms, and Security Systems

See p. 69.

Cells/Armories/Safes

This is a single cabin with reinforced walls (DR 200), restraints, and barred door – a place to hold unruly passengers, crew, etc.

The same module can be used to construct an armory for secure storage of small arms and ammunition, or a safe for high-value cargo. These versions are not interchangeable, however, and their use must be specified at the time of construction. All versions include an independent high-security alarm and an observation camera. Each module normally holds 1-2 people (up to 25 for a limited period), 4,000 lbs. of racked weapons and ammunition, or 400 cf of valuables.

Dedicated mail carriers should install as many safes as required for the service.

Brigs

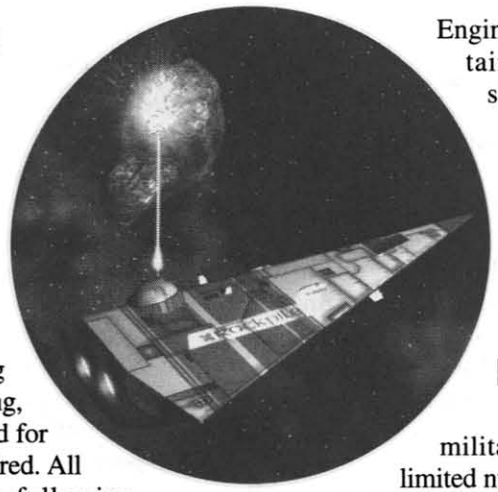
This is an ordinary stateroom equipped with reinforced walls and door (DR 200), restraints, and a high-security alarm and observation system. It normally holds 1-2 people. Up to 50 could be crammed in for a limited time, but this will overwhelm the two-person life support. A ship or starport with one or two brigs usually will monitor them from the bridge. A larger number of brigs probably will have its own dedicated security station (see *Auxiliary Control Station/Duplicate Controls,* p. 43).

Double-Cell Brigs

As per the brig, above, but does not contain the security station. Multiple double-cells are usually installed together with one or two security stations to form a much larger secure area or prison.

Miscellaneous Systems

These round out the many equipment needs of a starship, though many are useful only in specialized applications.



Turreted Mining Lasers (TL8)

This is a powerful mining or cutting laser used by ultra-tech mining, engineering, and rescue vehicles. Mining lasers are sized for continuous fire, so no energy bank is required. All mining lasers are constructed with the following options: close range, universal mount (or casemate if hull-mounted), energy drill, and no stabilization. All TL11+ mining lasers are built with the *compact* option to represent the advances in laser technology found in normal shipboard weapons. See p. B125, *Attacking Inanimate Objects,* for more information.

Although the mining laser can be used as a shipboard weapon, it is impractical to do so because damage is so low and range is so short. If a mining laser is used as a weapon, damage is calculated somewhat differently; the target is no longer a big dumb rock, but is theoretically trying to avoid being hit. All damage ratings are divided by 4 and the RoF becomes 4, subject to the laser-autofire rules. More damage is *not* possible; indeed, just the opposite, as all four shots must hit to do listed damage. The modified damage ratings thus become 6d at TL8, 12d at TL9, 5d×5 (2) at TL10, 7d×5 (2) at TL11, 9d×5 (2) at TL12, and 5d×10 (2) at TL13.

Ore Processors

This is a multi-stage facility for extracting valuable materials from raw ore and concentrating it for transportation or further processing. Fed a steady stream of ground rock, it produces bars of metal, glass rods or fibers, and tanks of condensed volatiles for storage. The system's power plant is self-contained for greater efficiency, and hold space for several hours' feedstock is provided.

Capacity is in dtons of ore processed per hour, for hard rock. For soft rock, rate is doubled. Products depend on concentrations present in ore: multiply input volume by concentration, and reduce by 10% for wastage.

Crew is per shift; three shifts are required for full-time operations.

Passage Tubes

This flexible tube connects the airlocks of two ships in space. It holds pressure, permitting occupants to move between the vessels without space suits. A standard tube is 600' long and 8' in diameter, and hooks to generic fittings around external airlocks. It normally takes an hour or so to rig in free fall (30 minutes with two or more people working) – this requires a Mechanic (Starships) roll. A standard tube has PD3, DR 12; the armored tube increases to DR 20. Engineering and entry modules each contain a 100' armored passage tube as standard equipment.

Entry Modules

An entry module consists of a 100' armored passage tube and either a four- (small module) or eight-man (large module) airlock.

Escape Capsules

Escape capsules are common on military vessels, which typically have a limited number of ship's boats and a crew difficult to assemble under combat conditions (commercial vessels use lifeboats, instead). Each capsule holds four crew members at TL7, six at TL8, eight at TL9, or nine at TL10+ and provides three days of limited life support at TL7-9, four days at TL10, or full life support at TL11+. They have 0.03 G and 0.003 GRds of thrust at TL7, 0.05 G at TL8, 0.6 G at TL9, 0.8 G at TL10, and 1 G at TL11+. A capsule also provides contragravity for landing at TL8+, plus survival packs as defined on p. T:FT70.

Escape capsules are installed under panels in the vessel's hull; to launch, explosive bolts blow the panel clear and the thrusters accelerate the capsule away from the ship (rockets at TL7). Reconditioning and reinstalling escape capsules is only possible at a shipyard or spacedock; they are used only in emergencies! There are normally 25% more seats provided in the capsules than a ship's regular personnel capacity not otherwise provided for in the ship's small craft or lifeboats.

Boarding Clamps

This is an advanced grapple designed to latch onto an enemy ship for boarding purposes. It differs from an ordinary grapple in its reach (12'), strength (ST 800), and the method in which it attaches to the target vessel. The boarding clamp does significant damage to the hull of the target vessel, whereas normal grapples are designed to attach without damage.

Survival Shelters

Survival shelters are reinforced and shielded rooms intended to protect occupants from environmental dangers (such as sudden decompression, fire, radiation, and extreme temperature). Each shelter provides limited life support and power for its rated number of occupants: eight days at TL7, 20 days at TL8, 25 days at TL9, 30 days at TL10, and unlimited duration at TL11+. A medium-range radio is provided to contact rescue personnel. In addition, at TL8 every multi-person shelter has a number of ESUs. At TL9-13, these ESUs are replaced with automeds.

Model	Capacity	Airlock Size	ESU/Automed
Locker	1	1	0
Small	4	2	1
Medium	8	4	2
Large	25	6	5

Optional: Zero-Space Systems

The modular ship-design system presented in this book is intended to be simple; efficiency is a secondary consideration. In particular, many modules contain varying amounts of empty space to bring them up to half- or full-space size. It is certainly possible to simply ignore this fact and assume the extra space makes ***GURPS Traveller*** starships more roomy and livable. It is also possible to infer that some of this space is taken up by items that, by their nature, are too small to add up to even half a dton on any but the largest ships, but are nevertheless important enhancements of the ship's capabilities.

This section details a selection of such items. On small ships – generally less than 1,000 dtons – one zero-space system (about 10 cf) can be added per dton of internal space *not* devoted to cargo holds, fuel, or vessel storage, at additional cost and mass but no extra volume. Remember that streamlining reduces internal volume.

This option is completely at the GM's discretion, however, due to its potential for abuse. Most systems are rated for the number of "units" that will fit in a 10-cf "zero space" or a 250-cf half-space module. Larger vessels should simply purchase these systems in half-space lots. The GM can justifiably insist that small ships do so, too.

Ship's Lockers

Normally, the ship's locker (or *slop chest*) should be separate from the ship's cargo holds. It contains things that the crew may need during flight or in an emergency, but aren't used every day. The cargo holds are inconvenient to dig through during an emergency and may be entirely inaccessible depending on the nature of the problem. The ship's locker usually contains small tools, vacc suits, equipment, survival gear, hull patches, etc. On small ships without an armory, it may also serve as a storage space for weapons, although it is not intended to be secure. (It's supposed to be easy to get into, for emergencies.) Each ship's locker is 10 cf, and holds up to 200 lbs. of gear.

Emergency Life-Support Packs

This is a portable air-supply apparatus. It provides 2 hours of air, weighs 10 lbs., and costs Cr100 (1 hour, 30 lbs. at TL7). One hour of oxygen-nitrogen, or ordinary compressed air, weighs 4.2 lbs., so most of the weight is the compressed air.

For game purposes, assume all adults breathe at the same rate and children under 12 use half as much. Thirty units will fit into 10 cf. See p. S61 for more information.

Tool Kits

Basic tool kits are described on p. GT116. These are normally installed behind panels in any workspace with the appropriate type of equipment. Mechanic or engineer tool kits are 15 cf, 300 lbs., Cr800. Armory or electronic tool kits are 7 cf, 100 lbs., Cr1,200. A half-space module contains five tool kits of each type, for a total of 20.

Damage-Control Lockers

A damage-control locker contains the various equipment used to perform emergency repairs to the ship: hull patches, environment suits, testing and sensing gear, emergency-power conduits, short-range radios, portable emergency-power generators, fuses, etc. An unstocked damage-control locker might as well be used for cargo; it won't help the crew at all in an emergency.

A standard damage-control locker is 50 cf, weighs 1 ston stocked, and costs MCr0.25 in equipment and parts, which must be replenished for every 2,000 HP restored. See pp. 106-107 for information on repairs.

Survival Kits

Imperial safety regulations require commercial ships to carry one survival kit per passenger in lifeboats designed for surface landings. They are a good idea on any craft that may be forced down on a planet with a (more-or-less) breathable atmosphere. Survival kits are standardized at TL10; any vessel in the Imperium will use the same type, regardless of TL. Their contents are described in detail on pp. T:FT69-70. Nine kits are 10 cf, 450 lbs., and cost Cr24,300.

Computer Terminals

Each crew workstation includes a computer terminal; each cabin or stateroom also comes with a monitor and keyboard to access the ship's computer (though access is typically restricted to library, communications, and entertainment functions). Additional terminals may be added for redundancy or to facilitate certain types of research. Five terminals are 10 cf, 200 lbs., and Cr5,000 at TL7-8; this becomes 10 terminals at TL9, and 20 at TL10+.

Heavy-Duty Fire-Suppression

A fully automatic array of extinguishers or hoses mounted inside the vehicle, this uses inert gases to put out fires in milliseconds. This system has the equivalent capability of both a full and compact fire-suppression system in one, giving an *additional* +5 bonus to putting out fires (Engineering, Cockpit, and Bridge modules each already contain a fire-suppression system; see pp. 42-43, p. 36). Each system is 5 cf, 250 lbs., and Cr5,500. See ***GURPS Vehicles***, p. 185, for information on fire suppression. Particularly on large vessels, the GM may rule that each of these systems only benefits a particular section of the vessel.

Security Systems

All ships come with electronic locks. Some starship owners install after-market intruder defenses (including digital cameras, motion sensors, and weapons) and a high-security alarm system (Cr3,000; effective skill 20).

All vessels also come equipped with an internal communications and security system, consisting of a microphone, loudspeaker, optical-data cable jack, and short-range radio repeater in each compartment. Each compartment also has its own pressure, temperature, smoke, and radiation detectors; these are connected through the communications system to the bridge. The microphone and radio pickups can be activated from the bridge, providing some additional information on events in other parts of the ship. Each door, including the external airlocks and sensitive-area access panels, has an electronic lock opened by a keypad, electronic card, or biometrics sensor (chosen before construction).

Communications and security systems are installed on the basis of one "unit" per compartment (room). For ships without detailed deck plans, a good rule of thumb is three compartments per crewman (quarters, workspace, and corridor), not including ship's troops or frozen watch.

The electronic locks cannot be picked. Bypassing the security system requires a contest of skills vs. the security system's skill of 15, using Electronics Operations (Security Systems)/TL or Traps/TL, with modifiers as per Lockpicking skill (p. B67). If the roll fails, the ship's computer alerts the crew and takes other actions as programmed.

Hardened Communications: Military vessels are normally equipped with a fiber-optic backup communications network. This can be assumed (at negligible weight and cost) unless the ship is low-tech or very large. Twenty-five units are 10 cf, 50 lbs., and Cr20,000 at TL7; 100 units are 10 cf, 100 lbs., and Cr16,000 at TL8. This becomes 200 units at TL9 or 400 at TL10+ at 10 cf, 50 lbs., and Cr800.

Basic Security: Internal sensors can be added for additional security. The basic security package upgrades the ship's intercom and internal sensors to include monocular color, low-light television (1×) and imaging ladar. An integral rechargeable B cell provides (TL-6)×360 uses for the ladar in the event of loss of ship's power. The security system's skill is improved to 20. The additional sensors allow the use of the Anti-Hijack program (see p. 71).

The basic package also includes a spray tank, capable of creating a cloud of any standard gas or liquid chemical 3 yards in diameter at a range of 10 yards. The spray automatically hits and lasts for 2 minutes in atmosphere (less in vacuum). Sprayers are normally loaded with sleep gas (p. S78: LC 2, Cr75 per unit for 20 shots; Cr45,000 per 600 units); this cost is not included with the security package.

Twenty units are 10 cf, 230 lbs., and Cr115,000 at TL8; 10 cf, 190 lbs., and Cr57,000 at TL9. Twenty-five units are 10 cf, 220 lbs., and Cr38,000 at TL10; Cr20,000 at TL11+.

Advanced Security: Advanced security systems are designed to actively resist hostile boarding actions and hijacking attempts, even if isolated from the ship's central computers. In addition to all the systems listed for the basic package, each unit incorporates a hardened, high-capacity, Complexity 4 robot brain running Targeting, Gunner, Internal Security, and Optical Recognition programs and a concealed snub revolver (p. GT110) on a retractable mount. Each chamber can be loaded with a different type of ammunition (ammo cost and mass is not included) and individually selected for firing. Sixteen units are 10 cf, 200 lbs., and Cr470,000 at TL9; 20 units are 10 cf, 220 lbs., Cr70,000 at TL10; or 10 cf, 190 lbs., and Cr28,000 at TL11+.

Automated defenses are of dubious legality within the Imperium (LC 0 or worse). Under laws modeled on the Shadusham Accords (p. GT59) and common throughout the Imperium, the owner of such a system is responsible for its actions as if he had performed them himself.

Window Boxes

These are greatly scaled-down versions of *Total Life Support* (see p. 56), designed to provide some greenery aboard ship as well as supplemental fresh vegetables and herbs for the galley, or to support a small pet (up to 2 lb.). Each window box (sometimes called a *terrarium*) includes an underpressure filter kit to prevent airborne contaminants from escaping into the general ship's environment. One window box is 10 cf, 100 lbs., and Cr1,000.

Beacons

A small sphere dotted with solar panels, a beacon holds a tiny battery/capacitor and transmitter. It is designed to emit a 1-second pulse each 10 seconds at 1 AU from a standard star, with both pulse length and interval varying if the beacon is closer or farther. Along with basic data on the local star, this yields the beacon's location; a receiver can intersect signal direction with indicated orbital path. (Technically, a receiver farther out than the beacon has *two* potential locations to choose from, but a skilled radio operator usually can determine which is correct by signal quality.)

A beacon can be set to transmit on emergency or standard navigation radio channels. They come in two sizes: small and large. The range depends on the size of the beacon and the TL at which it is built.

Size/TL	Lbs.	Cf	Cr	Range
Small Beacon/7	219	4	4,076	3
Small Beacon/8	108	2	2,040	10
Small Beacon/9	53.7	1	1,021	100
Small Beacon/10	26.7	0.5	519	500
Small Beacon/11	26.3	0.5	519	500
Small Beacon/12+	25.9	0.5	519	500
Large Beacon/7	2,091	40	12,315	30
Large Beacon/8	1,040	20	6,170	100
Large Beacon/9	518	10	3,090	1,000
Large Beacon/10	257	5	1,578	5,000
Large Beacon/11	256	5	1,578	5,000
Large Beacon/12+	254	5	1,578	5,000

Range is in Space Combat Hexes.

Computers and Programs

This section expands upon the computer rules on p. GT161, describing new programs and explaining what programs are usually used. A *dedicated* computer may only run one program, the one for which it is designed.

Using Programs

All ships in ***GURPS Traveller*** have bridges or cockpits; each has *three* computers. These computers run everything on board from the environmental controls to the weapons to the drives. Experienced captains know that it doesn't pay to skimp on good programs! A complete package for a free trader costs KCr240 (at TL10), and consists of three Datalink programs (one for each communicator), three Targeting (skill +8; one for each turret and one for a missile fire director on the bridge), Damage Control with ship's specifications in a database, Autopilot (normal space, skill of 12, Cr 2,000, Complexity 2), Astrogation (Jump-1), and Library Database. Add a Limited (Cr 2,000, Complexity 4) or Full (Cr 5,000, Complexity 5) Personality Simulation to make the ship more user-friendly, if desired.

There are four different types of programs that run on shipboard computers:

Utility Programs are used to perform many of the day-to-day operations of the ship. They usually require no input from the user and run autonomously in the background, consuming minimal resources. They are not scalable, but they can be tied to RVO programs or Bonus Programs (see below) to swap and/or enhance data. Only the ubiquitous programs or the ones most likely to be interfaced with the crew are included.

Routine Vehicle Operation (RVO) Programs are the programs that actually operate the ship and perform the "day-to-day" operations. They are scalable; more advanced versions of the programs are available, but at higher cost and higher computer complexity requirements. For each increase in skill level above the base level, double the base cost of the program and increase Complexity by 1.

Example: Anti-Hijack has a base Complexity 5 and Criminology-14. If the owner wants a skill level-16 program (an increase of two levels), he pays 4× the cost and increases the complexity of the program by 2.

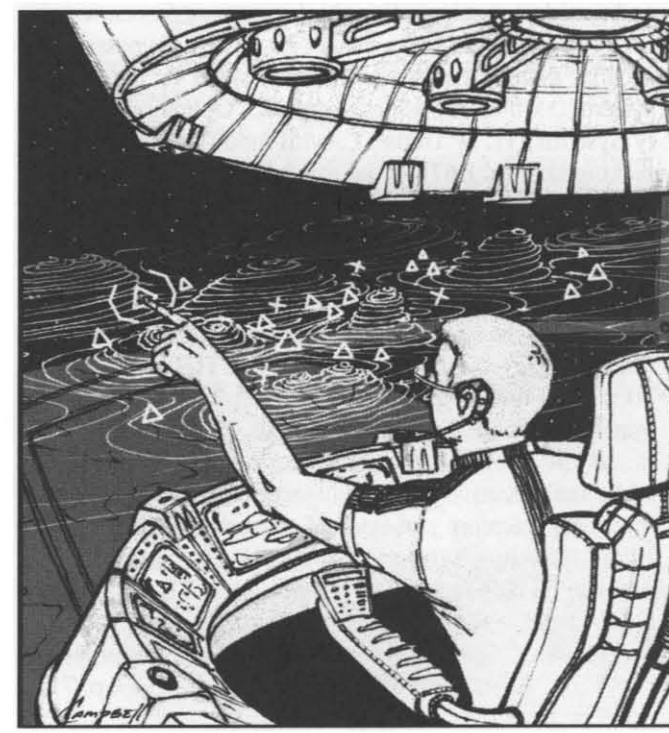
RVOs do not enhance a user's skill. If equipped with a database, they can also be used as an Expert System, but take twice as long to arrive at a solution as a human being would and are subject to the same flaws (e.g., incorrect assumptions). They also are not very good at "thinking outside the box." Databases can be shared between programs that are running concurrently. For more information on RVO programs, see pp. VE63 and T:FT68.

Skill Bonus Programs add a bonus to some skill a user possesses. Skill bonus programs, like RVO programs, are scalable. For each increase in bonus above the base level, double the base cost of the program and increase Complexity by 1. GMs are advised to prevent these programs from generating bonuses that may be too high.

Example: A Targeting program gives a +1 bonus to a human gunner. If he wants a +2 bonus (1 extra level) he pays 2× the cost and adds 1 to the Complexity.

Robot Skill Programs are used by ships equipped with robotic hulls and robotic brains. Considering their rarity in the ***Traveller*** universe, they are not described in detail here. See p. VE63 for more information.

GMs should be advised to not let RVO programs do the work of robot skill programs. The line between them is fine but distinct. The major difference between robot skills and RVOs is RVOs are a lot less forgiving if they encounter a situation even slightly outside their programming. For example, an Autopilot skill program will fly a fairly straight course, making minor corrections to ensure it arrives at a predetermined spot. In an emergency, it is capable of landing or docking the ship, but simple failure results in a mishap, and critical failure results in disaster. Wilderness landings are typically outside the range of "known circumstances" for autopilots, for example. Meanwhile, a robot piloting program is treated as a sophont pilot. Almost any RVO program can also be a robot skill program and vice versa – just remember the differences in capabilities.



GMs should also be advised not to let RVOs do the work of good, old-fashioned die rolls against the adventurers' skills. Anybody trusting his ship's Astrogation (Jump) program without checking the results first is asking for trouble.

All programs have a base TL. This is the earliest TL at which the program is available. For instance, a jump-5 Astrogation program is not available until TL11, whereas a jump-1 program is available at TL9.

The cost of all TL6-8 programs is halved at TL9 and halved again at TL10+.

The cost of all TL9-10 programs is halved at TL11 and halved again at TL12+.

The cost of all TL11-12 programs is halved at TL13+.

Utility Programs

Program	TL	Cost	Complexity
Astrogation (Jump-1)	9	10,000	2
Astrogation (Jump-2)	9	20,000	3
Astrogation (Jump-3)	10	30,000	4
Astrogation (Jump-4)	10	40,000	5
Astrogation (Jump-5)	11	50,000	6
Astrogation (Jump-6)	12	60,000	7
Astrogation (Normal)	7	3,000	2
Cartography	7	5,000	3
Computer Navigation	7	500	2
Datalink	7	400	1
Double-Fire	8	1,000	1
Library Data	7	100,000	1
Personality Sim (Full)	8	20,000	5
Personality Sim (Ltd.)	8	8,000	4
Transmission Profiling	7	8,000	3

RVO Programs

Program	TL	Cost	Complexity	Skill
Anti-Hijack	8	10,000	5	14
RVO Astrogation (J-1)	9	10,000	2	12
RVO Astrogation (J-2)	9	20,000	3	12
RVO Astrogation (J-3)	10	30,000	4	12
RVO Astrogation (J-4)	10	40,000	5	12
RVO Astrogation (J-5)	11	50,000	6	12
RVO Astrogation (J-6)	12	60,000	7	12
RVO Astro. (Normal)	7	3,000	2	12
Autopilot (Jump Space)	9	8,000	2	12
Autopilot (Normal)	8	8,000	2	12
Autopilot (Tactical)	9	200,000	3	12
Gunner	7	45,000	4	12
RVO Routine Skill (E)	8+	3,000	2	12
RVO Routine Skill (A)	8+	6,000	3	12
RVO Routine Skill (H)	8+	12,000	4	12
RVO Routine Skill (VH)	8+	24,000	5	12

Skill Bonus Programs

Program	TL	Cost	Complexity	Bonus
Damage Control	8	2,000	2	+2
Fire Direction	6	2,000	1	+2
Targeting	7	1,000	1	+2
Routine Skill (E)	8+	3,000	2	+1
Routine Skill (A)	8+	6,000	3	+1
Routine Skill (H)	8+	12,000	4	+1
Routine Skill (VH)	8+	24,000	5	+1

Anti-Hijack: This program constantly monitors conditions within the starship and automatically locks the access doors to the bridge and controls when a hijacking occurs (usually by accessing the various utility programs controlling the different subsystems). Because this system is not foolproof, would-be hijackers may gain access in spite of the program. Whenever a situation arises where the program must act or notices "suspicious activity," it alerts the captain. It requires the Basic Security package (see p. 69).

Astrogation (Jump Space): This program comes in two different versions. The RVO program is needed if the computer is to plot an interstellar jump course. The Utility program is required if the navigator is doing it himself. This is similar to the Navigation program in ***Traveller***.

Astrogation (Normal Space): This program comes in two different versions. The RVO program is needed if the computer is to plot a normal space course. The Utility program is required if the navigator is doing it himself. This is similar to the Generate program in ***Traveller***.

Autopilot (Normal Space): This RVO program enables the ship's computer to control the vessel in normal operations, especially en route to/from the jump/breakout point. The program will avoid obstacles and respond to simple instructions from traffic control, but will not perform dangerous maneuvers, "push the edge," or Dodge in combat. If a situation arises beyond its capacity to handle or at preset intervals or events, the program will sound an alarm and rouse the pilot to take over.

Autopilot (Tactical): This RVO program is a much more advanced version of the Autopilot (Normal) program. In addition to the basic version's capabilities, it *will* perform dangerous maneuvers, "push the edge," and Dodge in combat. If a situation arises beyond its capacity to handle, the program will attempt to flee, engaging targets with any weapons given it to control (via the gunner programs) if they try to prevent it from leaving the area; it has Tactics (3D) equal to its skill level. It borders on a true robot program and is Legality Class 0.

Autopilot (Jump Space): Needed for the computer to pilot the ship into jump.

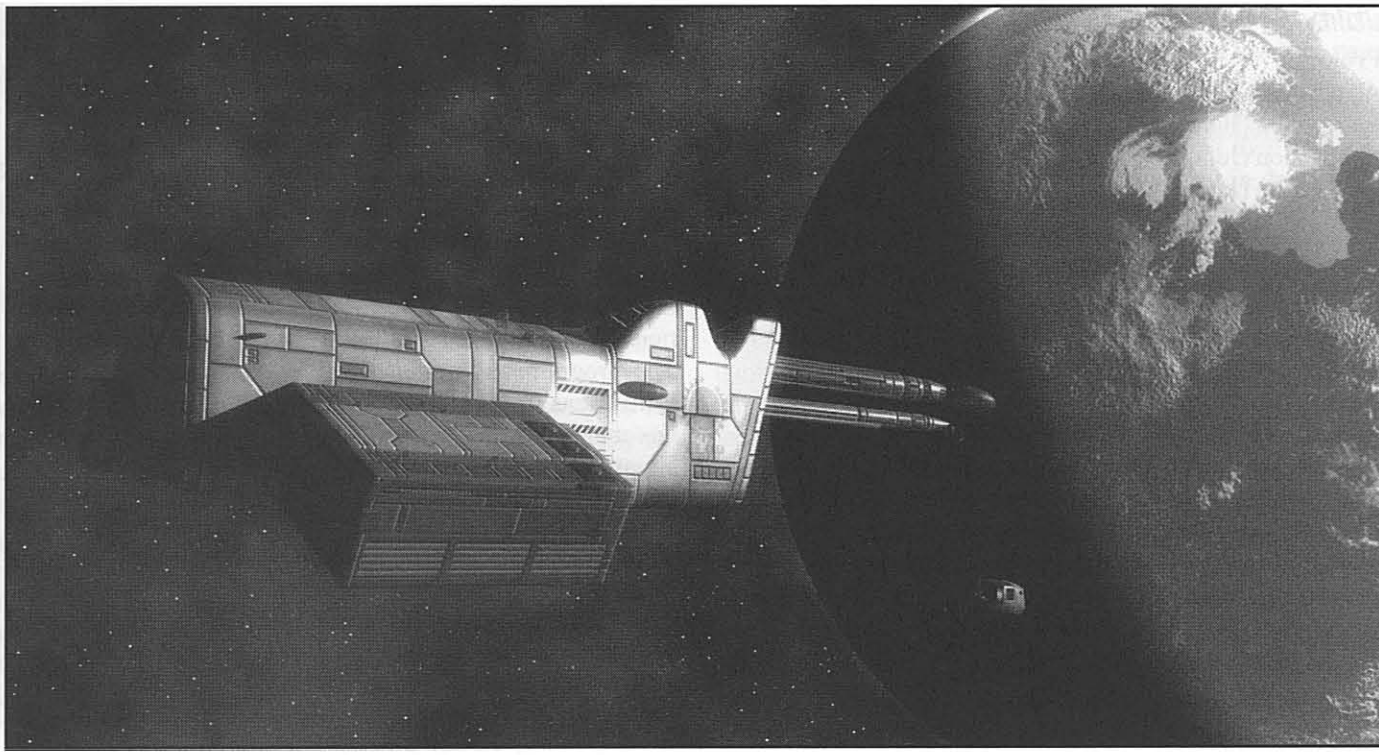
Gunner: In conjunction with a Targeting program (required), it lets the computer act as a gunner. The bonus to skill is *not* cumulative with a Targeting program – use the *lower* of the Targeting bonus or Gunner program skill. One program is required per gun or battery.

Routine Skill: This is a placeholder for any skill program not covered. It comes in four different levels of complexity, depending on the ***GURPS*** skill it is emulating: E for easy, A for average, H for hard and VH for very hard. This program comes in two different versions; the RVO program is needed if the computer is to perform the skill itself, while the skill-bonus version provides a bonus to a sophont using the skill.

Damage Control: Monitors systems status and gives bonuses to repairing ship damage. One is required per damage control (DC) party performing repairs. Also requires ship blueprints (1 gigabyte and Cr1,000 per ship). Multiple DC programs may share the same blueprint database.

Fire Direction: This is used to calculate trajectories for indirect-fire weapons, enabling more accurate aiming of artillery barrages or naval gunfire. This program is typically only found on ships carrying ballistic-type weapons (see ***GURPS Traveller: Ground Forces*** for more information). One copy per gun or battery is required.

Targeting: Predicts target positions and helps aim weaponry, adding a bonus to a gunner's skill equal to the program's Complexity+1. One is needed per human or computer gunner. Due to the long ranges at which spacecraft engage their opponents, a targeting program giving a +7 to +10 bonus is *strongly* recommended for all armed spacecraft!



Cartography: This is a package enabling aircraft equipped with radar or planetary survey arrays to map areas over which they fly. It also allows spaceships or satellites to produce entire planetary maps if orbiting within sensor range, provided they make enough orbits. See ***GURPS Traveller: First In*** for more information on mapping and surveys.

Computer Navigation: This software allows a computer to determine its position by comparing input from a high-resolution sensor with a map database of the region. It requires a LLTV, radar, ladar, AESA, thermograph, or PESA (if underwater, a ladar or active sonar), plus an accurate map database of the local terrain. Combined with a robot brain, this allows the vehicle to pilot itself to a specified location on the map automatically.

Datalink: Used to share real-time data with other computers, sensors, missiles, etc. One is required per active communicator (e.g., laser, radio, missile laser, maser, meson).

Double-Fire: This program allows any energy weapon to be fired at a much higher RoF. See *Pulse Mode*, p. 46. One copy must be running for each weapon so configured.

Library Data: An encyclopedia program containing detailed non-classified information on the Imperium. Not always up to date for all worlds, but licensed owners can often download supplementary data at local starports. 100 gigs.

Personality Simulation: A "persim" enables the ship's computer to simulate emotions, quirks, etc., and use highly idiomatic speech. The "limited" version gives the computer a simple personality (up to five quirks and a single mental disadvantage are appropriate). The "full" version gives the computer a simulation of a real or made-up personality with the same behavior (and quirks and mental disadvantages) as the person it simulates.

Transmission Profiling: This program takes input from a communications receiver, radar detector, or radscanner and compares it with a database to determine what sort of equipment produced the signal. This can be fairly detailed if the GM desires – e.g., "The transmitter is a Zloukalev Industries 500-kW Air Search Radar, from a lot with model numbers beginning with XJ3K4. It isn't using the frequency-shift pattern used by the Zhodani, which means it is probably one of the four sold to the Sword Worlds." Of course, information is critically dependent on the database!

Future Developments

"These aliens are just as fragile as we are. You just have to work through their technology, which is, I'm sad to say, far in advance of our own."

– anonymous scientist from old Solomani 2D movie

Most people assume the Ancients had technology bordering on magical. In reality, Ancient technology is far in advance of the best the Imperium has to offer. One Imperial think-tank, upon being tasked with determining the Imperium's chances of resisting an incursion by a TL13 society, responded after much deliberation, "*A full TL13 society is not to be trifled with.*" GMs should be aware of the extremely game-unbalancing effects of introducing even one of these higher tech fields into the game. ***GURPS Vehicles***, ***GURPS Space***, ***GURPS Ultra-Tech***, and many world books all contain many different technological marvels not common to the ***Traveller*** universe. That doesn't mean they don't exist . . .

TL13+ components (if they are available at all) could be artifacts, experimental prototypes, or in limited production; many are classified. Their prices should be increased by 100-400% to reflect this. Components purchased on the black market will cost at least 500% of this *increased* price.

Here are some guidelines for introducing TL13+ vessels into an existing campaign. In general, most ships are 50-100% faster, weapons do 50-100% more damage, and

metallurgical sciences have produced lighter armor and structural materials (or perhaps vessels don't use metal at all; new plastics or "living ships" may be the norm). Of course, the computers are much more powerful as well, enabling and controlling this new technology while changing many aspects of shipboard life, as well. Medical technology is capable of rebuilding a person from just a few scattered brain cells (see *Chrysalis Machine*, p. S91). The Emergency Aid Station/13, Sickbay/13, and Evacuation Bays/13 are built using these machines. GM may freely ignore these and use the TL12 versions of the modules, instead.

Aside from the typical "wow" effect surrounding TL13+ equipment, there is also the issue of survivability and endurance. The only fleet known to possess TL13 ships belongs to the Darrians in the Spinward Marches, and they are not new designs. The Imperium does not expect any of its TL12 warships to remain in service nearly as long as the Darrians' ships, even with heavy maintenance. The Darrian TL13 starships apparently have very advanced characteristics for survivability and endurance that are currently unknown to the Imperium.

Reactors and Energy Banks

There isn't much improvement in fusion reactors past TL11 other than less maintenance. However, at TL14 antimatter reactors become available (see below) and possibly cosmic power or total conversion at TL16. Both of these halve the size of most power-hungry modules.

Energy banks at TL13 and each successive TL pack more power in them for the same mass and volume but other differences are negligible.

Antimatter

Antimatter plants generate energy through the mutual annihilation of matter and antimatter (usually anti-hydrogen). A gram of anti-hydrogen powers a 1-MW plant for 2.5 years and costs MCr0.001 at TL14 (though in a TL10 society like the Imperium, 1 gram can run into the millions of credits). At TL15+, 1 gram powers the plant for 5 years. It is more expensive to run an antimatter power plant, but they are slightly smaller and cheaper to build. They are much more deadly to the crew if the reactor is injured.

Antimatter bombs (or warheads) are something to be feared; anyone with a magnetic bottle and a gram or two of antimatter is a threat to the safety of everyone and everything around him for miles. Antimatter bombs are simple to build – so simple in fact, that they tend to go off during their construction and are thus rarely used.

Megathrusters (Late TL13)

At late TL13, megathrusters come into being. The Darrians, being an early TL13 society, have yet to stumble onto the megathruster secret. Past TL13, GMs should feel free to make them even more efficient (requiring less power) with each successive TL.

Weapons

Meson-weapon technology tops out at TL14. Other possibilities are grasers and disintegrators at TL13. Missiles become so deadly and move so fast that ships of lower TL don't stand any chance of shooting them down or surviving more than a few hits. The late TL13 versions presented move at 55 G. Sensors may not even detect them until too late.

Turret Meson Gun, 1.39-GJ (TL13): An experimental weapon design based on the TL11 particle-beam turret weapon. This weapon was developed in order to produce small ships and fighters with meson capability. Results from testing the prototype have been favorable so far. It is rumored a few megacorps have produced a top secret "advanced" fighter using this weapon as its main gun. This unit consists of a TL13 meson gun with a 1,390-MJ output, cyclic rate 1/2, extreme range, and the compact option. A TL12 2,780-MJ rechargeable power cell provides the energy for each shot, and TL12 fusion-reactor components generate the 46.3 MW required to fully recharge it every minute. The weapon is fully stabilized and installed in a universal mount (for turrets) or a casemate if hull-mounted.

Teleporters (Late TL13)

Teleporters in the ***Traveller*** universe are based on "circumvention," using an alternate dimension or pocket universe to bridge the gap between two points. Circumvention does not violate the law of conservation of energy, but usually the pocket universe used for the transport contains a large mass, capable of absorbing or providing the extra energy. See pp. T:ARIII114-116 for more information about teleportation and portals. A portal is a circular frame, ranging from about 1-10 yards across. Portals are connected in a network of between two and 60 portals, all attached to the same pocket universe. Transport is allowed only between these portals. There is a control pad on each portal to select the destination portal. Changing the portal destination takes 1 minute.

Once connected, the portals remain open, allowing traffic in either direction. At TL13, the pocket universe is unstable, requiring a vast expenditure of energy to recreate it. The pocket universe lasts for a few days, never longer than one week. The generator module contains a fusion-power slice (antimatter at TL14) to recharge the power cells in 1 day. Generating the pocket universe requires 1 hour and a full power-cell charge. Charging the power cell takes a full day, and cannot be done while the portal is open; the pocket universe is inaccessible during cell recharges.

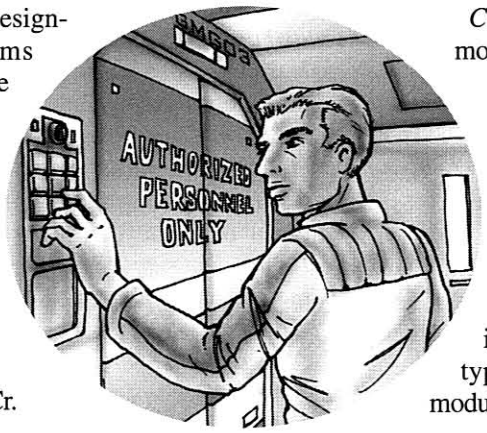
At TL14, the pocket universe is stable, no longer requiring the expensive generator modules. The stable pocket allows 95% of the portal machinery, including power supply, to be located in the pocket universe, but the remainder must be located on the ship or station where the portal is located. The remaining 5% is subsumed in the cost of the portal.

Item	Capacity (cf)	Range (miles)
Teleport Portal, Personal	1	200,000
Teleport Portal, Small Cargo	500	200,000
Teleport Portal, Large Cargo	5,000	200,000

Appendix A

Module Tables

The following tables provide the design-system data for the spaceship systems described in this book. Each general type of module begins with a paragraph giving page references elsewhere in this book for more detailed descriptions of the listed modules and their functions.



Key

Spaces is the number of spaces (dtons) taken up in the hull.

Mass is the mass in stons.

Cost is the cost in megacredits, or MCr.

Crew is the number of personnel that the module requires.

Power is the rating of the power slice in the module in MW. This is used to determine the final size of the reactor when designing deck plans. If deck plans are not being drawn for your vessel, you may ignore this column.

Special circumstances for other table values will be explained in the introductory paragraph for any general type, or in a special endnote for specific module types.

Engineering and Power Plants

See pp. 36-37 for descriptions of these systems that form the core of a vessel's ability to function.

Name	Spaces	Mass	Cost	Crew	Power
Engineering/7	3.5	16.6	4.42	0-1	0
Engineering/8	1.5	6.6	0.624	0-1	0
Engineering/9	3.5	13.4	5.02	0-1	0
Engineering/10	1	4	0.32	0-1	0
Engineering/11-12	1	3.6	0.16	0-1	0
Engineering/13	1	2.85	0.17	0-1	0
Small Mod./7-12	-0.5	-1.25			
Small Mod./13	-0.5	-0.625			

Name	Spaces	Mass	Cost	Crew	Power
Small-Cr. Bridge Add-On/7	3.5	15.2	4.49	0	0.05
Small-Cr. Bridge Add-On/8	1	4.85	0.629	0	0.05
Small-Cr. Bridge Add-On/9	2.5	11.4	5.02	0	0.05
Small-Cr. Bridge Add-On/10	0.5	1.96	0.32	0	0.05
Small-Cr. Bridge Add-On/11	0.5	1.65	0.155	0	0.001
Small-Cr. Bridge Add-On/12	0.5	1.40	0.16	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Power Core/7	2.5	10	4.4	0-1	0
Power Core/8	0.5	2	0.6	0-1	0
Power Core/9	2.5	10	5	0-1	0
Power Core/10	0.5	1	0.3	0-1	0
Power Core/11	0.5	1	0.15	0-1	0

Name	Spaces	Mass	Cost	Crew	Power
Power Plant Slice/7	0.5	2	0.8	0	0.5
Power Plant Slice/8	0.5	2	0.4	0	1
Power Plant Slice/9	0.5	2	0.8	0	4
Power Plant Slice/10	0.5	2	0.2	0	20
Power Plant Slice/11	0.5	2	0.1	0	20

Fuel Tanks

See pp. 40-41 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Collapsible Tank/7	1	20	0.4	0	0
Collapsible Tank/8	1	10	0.4	0	0
Demountable Tanks/7	1	0.33	0.64	0	0
Demountable Tanks/8	1	0.15	0.64	0	0
Jump Fuel/7	1	1.3	0.16	0	0

Gravitic Systems

See pp. 39-40 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Utility/8	8	101	5	0	10
Utility/9	2	15.5	2.2	0	10
Utility/10	1	11.5	0.30	0	10
Utility/11-12	1	11.5	0.25	0	10
Utility/13	1	11.3	0.254	0	10

Name	Spaces	Mass	Cost	Crew	Power
ST Utility/8	1.5	22.5	1.11	0	2.22
ST Utility/9	0.5	4.69	0.653	0	2.96
ST Utility/10	0.5	6.36	0.168	0	5.56
ST Utility/11-12	0.5	6.36	0.14	0	5.56
ST Utility/13	0.5	6.24	0.141	0	5.56

Name	Spaces	Mass	Cost	Crew	Power
Contragravity/8	0.5	2.26	0.385	1/6	0.9
Contragravity/9	0.5	2.56	0.616	1/17	3
Contragravity/10	0.5	3.51	0.15	1/25	10
Contragravity/11	0.5	3.51	0.101	1/50	10
Contragravity/12	0.5	3.51	0.101	1/100	10

Gravitic Systems (Cont.)

Name	Spaces	Mass	Cost	Crew	Power
Comb. Gravitics Sys./8	4	48.6	2.66	1/6	5.43
Comb. Gravitics Sys./9	1	7.65	1.14	1/80	5.23
Comb. Gravitics Sys./10	0.5	5.66	0.154	1/500	5.53
Comb. Gravitics Sys./11	0.5	5.66	0.126	1/1,000	5.53
Comb. Gravitics Sys./12	0.5	5.66	0.126	1/2,000	5.53
Comb. Gravitics Sys./13	0.5	5.54	0.127	1/2,000	5.53

Name	Spaces	Mass	Cost	Crew	Power
Repulsor Beam/10	1	10.4	0.107	0	8.5
Repulsor Beam/11	1	10.4	0.065	0	8.5
Tractor Beam/13	1	10.4	0.065	0	8.5
Comb. Beam/13	1	10.4	0.068	0	8.5

Energy Banks

See p. 37 for descriptions of these systems. Early TL7 is lead-acid battery, late TL7 and early TL8 are advanced battery, and all others are rechargeable power cells.

Name	Spaces	Mass	Cost	Crew	Power (MWs)
Energy Bank/Early 7	1	50	0.125	0	50,00
Energy Bank/Late 7	1	25	0.5	0	10,000
Energy Bank/Early 8	1	12.5	0.75	0	25,000
Energy Bank/Late 8	1	25	5	0	450,000
Energy Bank/9	1	25	5	0	675,000
Energy Bank/10	1	25	5	0	900,000
Energy Bank/11	1	25	5	0	1,125,000
Energy Bank/12	1	25	5	0	1,350,000
Energy Bank/13	1	25	5	0	1,565,000

Hydrogen-Fueling Units

See p. 41 for descriptions of these portable systems.

Name	Spaces	Mass	Cost	Crew	Power	Notes
Hyd. Fueling Unit/7	4	47.2	17	0	7.7	550 gph
Hyd. Fueling Unit/8	4	47.2	8.8	0	19.6	1,400 gph
Hyd. Fueling Unit/9	2	35.8	12.9	0	31.5	2,250 gph
Hyd.Fueling Unit/10	2	13.1	1.36	0	56	4,000 gph
Hyd. Fueling Unit/11	2	18.8	1.13	0	70	5,000 gph

Misc. Engineering Systems

See p. 41, p. 65 for descriptions of these systems.

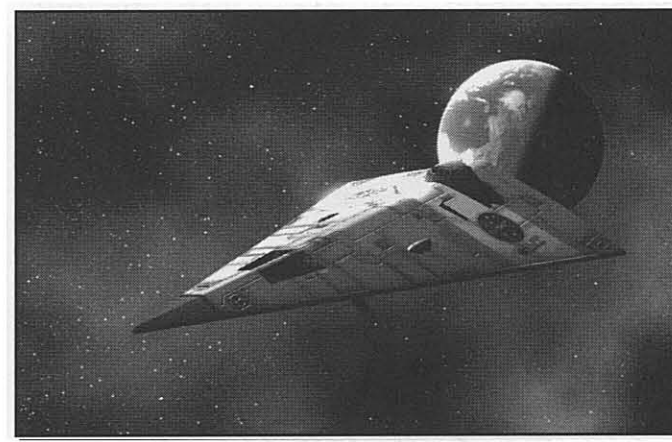
Name	Spaces	Mass	Cost	Crew	Power
Mini-Workshop/8	1	5.26	0.02	0	0
Complete Workshop/7	2.5	15	0.06	0	0

Name	Spaces	Mass	Cost	Crew	Power
Starship Shipyard/9	600	600	30	100	0
Non-starship Shipyard/7	500	500	20	100	0

Name	Spaces	Mass	Cost	Crew	Power
Fuel Processor/8	1	3.67	0.733	0	1
Fuel Processor/9	1	4.67	1.28	0	3.5
Fuel Processor/10	1	1.1	0.85	0	8

Name	Spaces	Mass	Cost	Crew	Power
Fuel Electrolysis/7	30.5	129	48.3	0	29.5
Fuel Electrolysis/8	15.5	64.4	12.3	0	29.5
Fuel Electrolysis/9	4.5	17.4	6.17	0	29.5
Fuel Electrolysis/10	1.5	5.59	0.559	0	29.5
Fuel Electrolysis/11	1.5	5.59	0.411	0	29.5

Name	Spaces	Mass	Cost	Crew	Power
Comb. Fuel Electro./Proc./8	8.5	35.8	6.91	0	15.8
Comb. Fuel Electro./Proc./9	3	12.7	4.19	0	17.8
Comb. Fuel Electro./Proc./10	1	4.35	0.56	0	17.8
Comb. Fuel Electro./Proc./11	1	4.35	0.471	0	17.8



Security

See p. 69 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Brig/7	4	34.1	0.177	0	0.02
Brig/8	4	27	0.122	0	0.02
Brig/9	4	17.4	0.081	0	0.02
Brig/10	4	11.4	0.052	0	0.02
Brig/11	4	8.04	0.04	0	Neg.
Brig/12	4	5.60	0.030	0	Neg.
Brig/13	4	4.44	0.026	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Double Cell/7	2	33.1	0.17	0	Neg.
Double Cell/8	2	26	0.115	0	Neg.
Double Cell/9	2	16.4	0.074	0	Neg.
Double Cell/10	2	10.4	0.045	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Double Cell/11	2	7.04	0.033	0	Neg.
Double Cell/12	2	4.64	0.023	0	Neg.
Double Cell/13	2	3.44	0.019	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Cell/Armory/Safe/7	1	21	0.096	0	Neg.
Cell/Armory/Safe/8	1	17	0.073	0	Neg.
Cell/Armory/Safe/9	1	11	0.048	0	Neg.
Cell/Armory/Safe/10	1	7	0.031	0	Neg.
Cell/Armory/Safe/11	1	5	0.023	0	Neg.
Cell/Armory/Safe/12	1	3.4	0.017	0	Neg.
Cell/Armory/Safe/13	1	2.6	0.013	0	Neg.

Security Station: See *Auxiliary Control Station/Duplicate Controls*, p. 43, p. 133.

Quarters and Life Support

See pp. 56-59 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Life Support/7	1	4.86	0.088	0	0.05
Life Support/8	0.5	2.51	0.028	0	0.05
Life Support/9	0.5	1.14	0.018	0	0.05
Life Support/10	0.5	1	0.008	0	0.05
Life Support/11	0.5	0.345	0.003	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Bunkroom/7	4	6.84	0.103	0	0.06
Bunkroom/8	4	5.58	0.046	0	0.09
Bunkroom/9	4	4.27	0.043	0	0.14
Bunkroom/10	4	4.80	0.018	0	0.16
Bunkroom/11	4	1.92	0.018	0	0.002

Name	Spaces	Mass	Cost	Crew	Power
Stateroom/7	4	4.08	0.044	0	0.02
Stateroom/8	4	3.04	0.02	0	0.02
Stateroom/9	4	2.41	0.016	0	0.02
Stateroom/10	4	2.4	0.012	0	0.02
Stateroom/11	4	2	0.012	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Small-Craft Cabin/7	2	3.08	0.037	0	0.02
Small-Craft Cabin/8	2	2.04	0.013	0	0.02
Small-Craft Cabin/9	2	1.41	0.009	0	0.02
Small-Craft Cabin/10	2	1.4	0.005	0	0.02
Small-Craft Cabin/11	2	1.04	0.005	0	Neg.

Medical

See pp. 65-66 for descriptions of these systems. *Beds* is the number of patients that a medical module can handle at once. Some of these "beds," such as operating tables, might not strictly be proper facilities for long-term care. Also, actual staffing of medical modules can vary considerably from the listed norm.

Name	Spaces	Mass	Cost	Crew	Power	Beds
Low Berth/9	0.5	2	0.22	0	Neg.	4

Name	Spaces	Mass	Cost	Crew	Power	Beds
Emerg. Aid Station/7	0.5	0.245	0.001	1/2	Neg.	2
Emerg. Aid Station/8	0.5	0.345	0.061	1/2	Neg.	2
Emerg. Aid Station/9	0.5	0.51	0.078	1/2	Neg.	2
Emerg. Aid Station/10	0.5	0.455	0.07	1/2	Neg.	2
Emerg. Aid Station/11-12	0.5	0.405	0.07	1/2	Neg.	2
Emerg. Aid Station/13	0.5	0.755	0.17	1/2	Neg.	2

Name	Spaces	Mass	Cost	Crew	Power	Beds
Sickbay/7	1	0.372	0.052	1	0.001	2
Sickbay/8	1	0.471	0.112	1	0.001	2
Sickbay/9	1	0.86	0.163	1	0.001	2
Sickbay/10	1	0.75	0.16	1	0.001	2
Sickbay/11-12	1	0.85	0.21	1	0.001	3
Sickbay/13	1.5	1.91	0.512	1	0.001	3

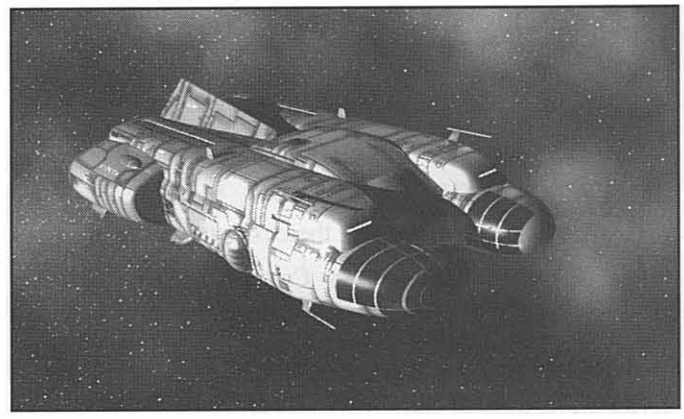
Name	Spaces	Mass	Cost	Crew	Power	Beds
Operating Theater/7	1	0.319	0.109	0	0.001	2
Operating Theater/8	1	0.417	0.167	0	0.001	2
Operating Theater/9	1	0.396	0.136	0	0.001	2
Operating Theater/10	1	0.385	0.121	0	0.001	2

Name	Spaces	Mass	Cost	Crew	Power
Alien Environ. Suite/7	4	10.3	0.184	0	0.021
Alien Environ. Suite/8	4	4.29	0.067	0	0.021
Alien Environ. Suite/9	4	3.28	0.047	0	0.021
Alien Environ. Suite/10	4	3	0.039	0	0.021
Alien Environ. Suite/11-12	4	2.54	0.024	0	Neg.
Alien Environ. Suite/13	4	2.29	0.026	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Passenger Couch/7	1	1.34	0.201	0	0.006
Passenger Couch/8	1	1.06	0.088	0	0.006
Passenger Couch/9	1	0.773	0.077	0	0.006
Passenger Couch/10	1	0.54	0.075	0	0.006
Passenger Couch/11	1	0.54	0.073	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Office/7	4	10.6	0.274	0	0.16
Office/8	4	6.32	0.082	0	0.16
Office/9	4	3.68	0.050	0	0.16
Office/10	4	3.54	0.018	0	0.16
Office/11	4	2.16	0.009	0	0.002
Office/12	4	1.92	0.009	0	0.002

Name	Spaces	Mass	Cost	Crew	Power
Luxury Modifications			×5		



Name	Spaces	Mass	Cost	Crew	Power	Beds
Evacuation Bay, Basic/7	2	1.52	0.023	1	0.006	12
Evacuation Bay, Basic/8	2	1.81	0.37	1	0.007	12
Evacuation Bay, Basic/9	2	1.5	0.189	1	0.007	12
Evacuation Bay, Basic/10	2	1.2	0.097	1	0.007	12
Evacuation Bay, Basic/11	2	1.02	0.097	1	0.002	12

Name	Spaces	Mass	Cost	Crew	Power	Beds
Evacuation Bay, Adv./9	4	4.2	0.61	1	0.007	12
Evacuation Bay, Adv./10	4	3.3	0.61	1	0.007	12
Evac. Bay, Adv./11-12	4	2.52	0.607	1	0.002	12
Evacuation Bay, Adv./13	4	6.72	1.81	1	0.001	12

Name	Spaces	Mass	Cost	Crew	Power	Beds
Military Sickbay/7	3	7.54	0.181	1	0.008	4
Military Sickbay/8	3	5.16	0.173	1	0.008	4
Military Sickbay/9	3	5.15	0.209	1	0.008	4
Military Sickbay/10	3	4.66	0.205	1	0.008	4
Military Sickbay/11-12	3	4.52	0.252	1	0.002	5
Military Sickbay/13	3	4.07	0.564	1	0.002	5

Recreation Facilities

See p. 60 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Hall/Bar/Conf. Room/7	10	0.2	0.003	0	0

Name	Spaces	Mass	Cost	Crew	Power
Civilian Holoventure/9	30	4.14	1.41	0	0.022
Civilian Holoventure/10	30	3.66	0.61	0	0.013
Civilian Holoventure/11	30	3.64	0.302	0	0.012

Name	Spaces	Mass	Cost	Crew	Power
Military Holoventure/9	30	34.1	1.71	0	0.022
Military Holoventure/10	30	23.7	0.81	0	0.013
Military Holoventure/11	30	15.6	0.422	0	0.012
Military Holoventure/12	30	11.6	0.384	0	0.012
Military Holoventure/13	30	8.63	0.351	0	0.012

Name	Spaces	Mass	Cost	Crew	Power
Shooting Range/7	10	40	0.451	0	Neg.
Shooting Range/8	10	25	0.301	0	Neg.
Shooting Range/9	10	15	0.201	0	Neg.
Shooting Range/10	10	10	0.15	0	Neg.
Shooting Range/11	10	6.01	0.11	0	Neg.
Shooting Range/12	10	4.01	0.09	0	Neg.
Shooting Range/13	10	2.51	0.075	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Null G Handball Court/8	35	7.17	0.3	0	0.593
Null G Handball Court/9	35	2.13	0.135	0	0.593
Null G Handball Court/10	35	1.89	0.022	0	0.593

Name	Spaces	Mass	Cost	Crew	Power
Stage/7	16	0.5	0.004	0	Neg.
Theater/7	20	2.1	0.015	0	Neg.
Ship's Galley/7	0.5	1.93	0.005	0-1	Neg.
Gymnasium/7	2.5	0.5	0	0	0
Swimming Pool/7	6	27/1.5	0.031	0	0

For swimming pools, the first mass value is when filled, the second when empty. Space vessels with pools should install one spacedock module per pool module to evacuate the water on demand.

Name	Spaces	Mass	Cost	Crew	Power
Luxury Modifications			×5		

Survival Shelters

See p. 67 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Locker Survival Shelter/7	0.5	4.5	0.079	0	0.001
Locker Survival Shelter/8	0.5	3.51	0.062	0	0.001
Locker Survival Shelter/9	0.5	2.82	0.058	0	0.001
Locker Survival Shelter/10	0.5	1.95	0.06	0	0.001
Locker Survival Shelter/11	0.5	0.963	0.04	0	Neg.
Locker Survival Shelter/12	0.5	0.776	0.04	0	Neg.
Locker Survival Shelter/13	0.5	0.651	0.041	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Small Survival Shelter/7	1.5	12.4	0.203	0	0.002
Small Survival Shelter/8	1.5	10.4	0.194	0	0.002
Small Survival Shelter/9	1.5	8.71	0.209	0	0.002
Small Survival Shelter/10	1.5	5.92	0.216	0	0.002
Small Survival Shelter/11	1.5	2.3	0.131	0	0.001
Small Survival Shelter/12	1.5	1.93	0.131	0	0.001
Small Survival Shelter/13	1.5	2.03	0.233	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Med. Survival Shelter/7	3	22.9	0.363	0	0.004
Med. Survival Shelter/8	3	19.4	0.355	0	0.004
Med. Survival Shelter/9	3	16.5	0.39	0	0.004
Med. Survival Shelter/10	3	11.2	0.404	0	0.004
Med. Survival Shelter/11	3	4.1	0.231	0	0.001
Med. Survival Shelter/12	3	3.5	0.231	0	0.001
Med. Survival Shelter/13	3	3.7	0.435	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Large Survival Shelter/7	8.5	64.8	1.02	0	0.013
Large Survival Shelter/8	8.5	55.7	0.983	0	0.013
Large Survival Shelter/9	8.5	47.1	1.08	0	0.013
Large Survival Shelter/10	8.5	31.4	1.12	0	0.013
Large Survival Shelter/11	8.5	9.7	0.578	0	0.003
Large Survival Shelter/12	8.5	8.2	0.578	0	0.003
Large Survival Shelter/13	8.5	9.2	1.08	0	0.003

Habitats

See p. 66 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Null-G Arena/8	5,000	591	10.1	0	16
Null-G Arena/9	5,000	455	5.65	0	16
Null-G Arena/10	5,000	448	2.61	0	16
Null-G Arena/11	5,000	448	2.53	0	16

Name	Spaces	Mass	Cost	Crew	Power
Farm/7	10,000	20,000	0.5	10	0
Park/7	10,000	20,000	0.2	0	0

Name	Spaces	Mass	Cost	Crew	Power
Factory/7	10,000	50,000	26	12	10
Factory/8	10,000	50,000	14	12	10
Factory/9	10,000	50,000	12	12	10
Factory/10	10,000	50,000	10.1	12	10

Name	Spaces	Mass	Cost	Crew	Power
Housing/7	10,000	40,000	1.16	0	0.1
Housing/8	10,000	40,000	1.04	0	0.1
Housing/9	10,000	40,000	1.02	0	0.1
Housing/10	10,000	40,000	1	0	0.1

Name	Spaces	Mass	Cost	Crew	Power
Plaza/7	10,000	30,000	1.16	0	0.1
Plaza/8	10,000	30,000	1.04	0	0.1
Plaza/9	10,000	30,000	1.02	0	0.1
Plaza/10	10,000	30,000	1	0	0.1

Miscellaneous Systems

See p. 67 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Boarding Clamp/7	3.5	40	36.7	0	0.4
Boarding Clamp/8	2.5	26	24.2	0	0.4
Boarding Clamp/9	1.5	19	18.1	0	0.4
Boarding Clamp/10	1	12.1	12	0	0.4
Boarding Clamp/11	1	9.34	9.02	0	0.4
Boarding Clamp/12	0.5	6.06	6	0	0.4

Name	Spaces	Mass	Cost	Crew	Power
Large Entry Module/7	1	3	0.011	0	0
Large Entry Module/13	0.5	2	0.019	0	0
Small Entry Module/7	0.5	2	0.007	0	0
Ext. Cradle/Mag. Grap./7	1	12.5	0.25	0	0

Name	Spaces	Mass	Cost	Crew	Power
Passage Tube/7	0.5	3	0.006	0	0
Pas. Tube, Armored/7	0.5	6	0.018	0	0

Name	Spaces	Mass	Cost	Crew	Power
Launch Tube/M. Driver/8	2	21	0.4	10	0.5
Launch Tube/M. Driver/9	2	20.3	0.3	10	0.5
Launch Tube/M. Driver/10	2	20.1	0.205	10	0.5

Name	Spaces	Mass	Cost	Crew	Power
Mass Catcher/8	0	5.83	3.02	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Vehicle Bay/7	1.05	0.5	0.003	0	0
Hangar Bay/7	1.5	1	0.005	0	0
Spacedock/7	1	1	0.005	0	0

Mass and cost are only paid once for the two bays; after that, empty space at mass and cost 0 is added at the given volume for each 1 dton of vehicle stowed. The same applies to the spacedock, except that *two* modules are required for each 1 dton of vessel stowed.

Name	Spaces	Mass	Cost	Crew	Power
Hold	1	0	0	0	0

Jump-Troop Systems

See p. 55 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Drop Capsule Ready Rack/7	1	4	0.05	0	0
Drop Capsule Ready Rack/8	1	3	0.05	0	0
Drop Capsule Ready Rack/9	1	2.5	0.05	0	0
Drop Capsule Ready Rack/10	1	2	0.05	0	0
Drop Capsule Ready Rack/11	1	1.75	0.05	0	0
Drop Capsule Ready Rack/12	1	1.5	0.05	0	0

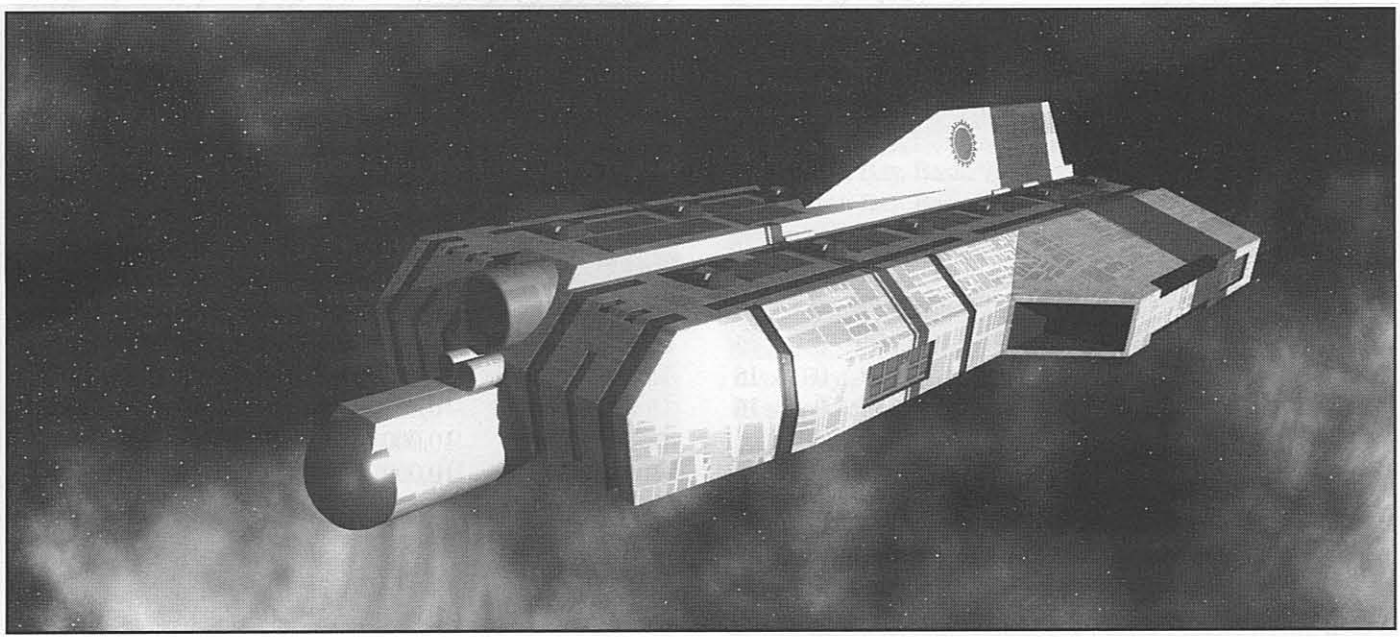
Name	Spaces	Mass	Cost	Crew	Power
B. Dress Ready Room/7	1	4.75	0	0	Neg.
B. Dress Ready Room/8	1	3.5	0	0	Neg.
B. Dress Ready Room/9	1	2.88	0	0	Neg.
B. Dress Ready Room/10	1	2.25	0	0	Neg.
B. Dress Ready Room/11	1	1.94	0	0	Neg.
B. Dress Ready Room/12	1	1.63	0	0	Neg.

These are also commonly called "the Morgue."

Name	Spaces	Mass	Cost	Crew	Power
Drop Capsule Launcher/7	1	12	0.519	0	Neg.
Drop Capsule Launcher/8	1	12	0.604	0	Neg.
Drop Capsule Launcher/9	1	12	0.302	0	Neg.
Drop Capsule Launcher/10	1	12	0.150	0	Neg.

Name	Spaces	Mass	Cost
Drop Capsule/7	0.034	0.925	0.012
Drop Capsule/8	0.034	0.517	0.009
Drop Capsule/9	0.034	0.353	0.008
Drop Capsule/10	0.034	0.269	0.007
Drop Capsule/11	0.034	0.203	0.007
Drop Capsule/12	0.034	0.169	0.007
Drop Capsule/13	0.034	0.145	0.006

Volume is *not* counted against ship's volume; the Drop Capsule Ready Rack module includes space for stowage. Mass and cost *do* count toward ship's loaded mass and fitted cost.



Ore Processors

See p. 67 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Capacity
Ore Processor/7	400	2,230	325	15	200	0.4 dtons/hr
Ore Processor/8	400	2,120	162	10	400	0.8 dtons/hr
Ore Processor/9	400	2,180	247	6	1,200	2.4 dtons/hr
Ore Processor/10	400	2,350	39.3	5	3,600	7.2 dtons/hr
Ore Processor/11	400	2,350	21.1	4	3,600	7.2 dtons/hr

Teleporters

See p. 73 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
T. Portal, Personal/13	1.5	9.6	1.68	1	16
T. Portal, Sm. Cargo/13	12	88.9	15.6	2	148
T. Portal, Lg. Cargo/13	116	889	156	4	1,480

Name	Spaces	Mass	Cost	Crew	Power
T. Poc. Univ., Personal/13	0	0.155	0.015	0	0
T. Poc. Univ., Sm. Cargo/13	0.5	1.44	0.14	0	0
T. Poc. Univ., Lg. Cargo/13	2.5	14.4	1.4	0	0

Name	Spaces	Mass	Cost	Crew	Power
T. Portal, Personal/14	0	0.4	1.6	1	16
T. Portal, Sm. Cargo/14	0.5	3.7	14.8	2	148
T. Portal, Lg. Cargo/14	4	37	148	4	1,480



Escape Capsules

See p. 67 for descriptions of these systems.

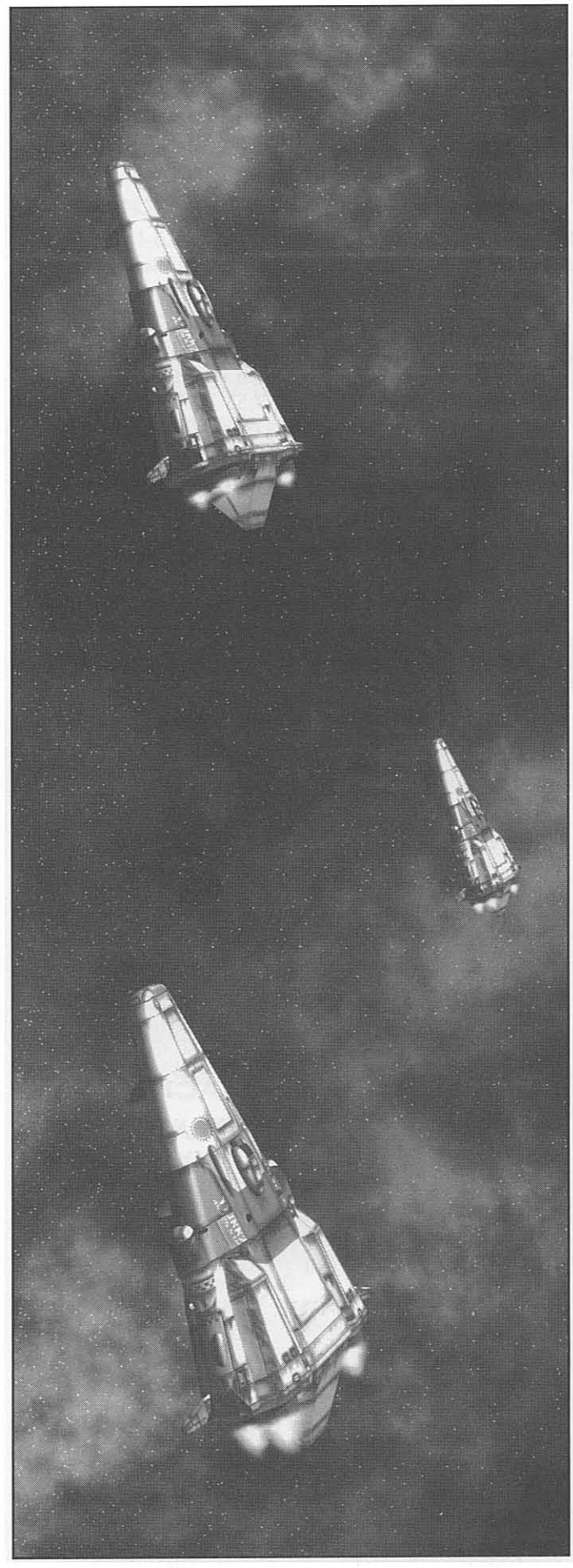
Name	Spaces	Mass	Cost	Crew	Power
Escape Capsule/7	0.5	8.82	1.05	0	0
Escape Capsule/8	0.5	5.4	0.297	0	0
Escape Capsule/9	0.5	3.56	0.17	0	0
Escape Capsule/10	0.5	2.51	0.13	0	0
Escape Capsule/11	0.5	1.29	0.112	0	0
Escape Capsule/12	0.5	1.14	0.111	0	0
Escape Capsule/13	0.5	1.07	0.11	0	0

Beacons

See p. 69 for descriptions of these systems.

Name	Spaces	Mass	Cost	Notes
Small Beacon/7	1	6.82	0.253	62 per case
Small Beacon/8	1	6.76	0.255	125 per case
Small Beacon/9	1	6.71	0.255	250 per case
Small Beacon/10	1	6.66	0.260	500 per case
Small Beacon/11	1	6.56	0.260	500 per case
Small Beacon/12	1	6.46	0.260	500 per case

Name	Spaces	Mass	Cost	Notes
Large Beacon/7	1	6.12	0.074	6 per case
Large Beacon/8	1	6.24	0.074	12 per case
Large Beacon/9	1	6.48	0.077	25 per case
Large Beacon/10	1	6.44	0.079	50 per case
Large Beacon/11	1	6.39	0.079	50 per case
Large Beacon/12	1	6.35	0.079	50 per case



Weapons

See p. 46 for descriptions of these systems. Note that ships often mount turrets with no weapons installed; purchasing and installing turret weapons after construction is relatively simple.

Turret Lasers

See p. 47 for descriptions of these systems.

Standard Lasers

Name	Spaces	Mass	Cost	Crew	Power
Tur. Laser, 43-MJ/8	1	6.69	0.875	0	1.43
Tur. Laser, 101-MJ/9	1	8.63	1.42	0	3.79
Tur. Laser, 250-MJ/10	1	8.3	0.82	0	11.1
Tur. Laser, 390-MJ/11	1	7.53	1.16	0	17.3
Tur. Laser, 405-MJ/12	1	7.8	0.68	0	18
Tur. Laser, 420-MJ/13	1	8.1	0.713	0	18.7
Tur. Graser, 390-MJ/14	1	8.46	1.3	0	19.5

Heavy Lasers

Name	Spaces	Mass	Cost	Crew	Power
Tur. Laser, 130-MJ/8	3	20.2	2.63	0	4.33
Tur. Laser, 303-MJ/9	3	25.9	4.25	0	11.4
Tur. Laser, 810-MJ/10	3	27.6	2.71	0	36
Tur. Laser, 1.3-GJ/11	3	25.1	3.8	0	57.7
Tur. Laser, 1.3-GJ/12	3	25.1	2.18	0	57.8
Tur. Laser, 1.3-GJ/13	3	25.1	2.18	0	57.8
Tur. Graser, 660-MJ/13	3	14.3	2.18	0	33
Tur. Graser, 1.18-GJ/14	3	25.6	3.88	0	59

Mining Lasers

Name	Spaces	Mass	Cost	Crew	Power
Tur. Mining Laser, 2.6-MJ/8	3	10.4	2.08	0	5.2
Tur. Mining Laser, 10.2-MJ/9	3	11.6	4.6	0	23
Tur. Mining Laser, 40-MJ/10	3	10.9	1.09	0	107
Tur. Mining Laser, 46.5-MJ/11	3	12.6	0.648	0	124
Tur. Mining Laser, 46.5-MJ/12	3	12.6	0.634	0	124
Tur. Mining Laser, 46.5-MJ/13	3	12.6	0.634	0	124

Turret Missile Racks

See pp. 46-47 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
250mm Missile Rack/7	1	1.88	0.1	1	Neg.
250mm Missile Rack/8	1	1.45	0.065	1	Neg.
250mm Missile Rack/9	1	1.45	0.033	1	Neg.
250mm Missile Rack/10	1	1.45	0.018	1	Neg.

Name	Spaces	Mass	Cost	Crew	Power
500mm Missile Rack/7	1	6	0.307	1	Neg.
500mm Missile Rack/8	1	4.5	0.23	1	Neg.
500mm Missile Rack/9	1	4.25	0.115	1	Neg.
500mm Missile Rack/10	1	4.13	0.058	1	Neg.

Turret Sandcasters

See pp. 48-49 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew
Sandcaster/7	1	5	0.25	0

High-Energy Turret Weapons

Name	Spaces	Mass	Cost	Crew	Power
Tur. Plasma Gun, 225-MJ/9	1.5	11.3	3.04	0	7.5
Tur. Plasma Gun, 430-MJ/10	1.5	15.8	1.7	0	14.3
Tur. Fusion Gun, 700-MJ/11	1.5	14	2.5	0	23.3
Tur. Fusion Gun, 700-MJ/12	1.5	14	2.5	0	23.3

Name	Spaces	Mass	Cost	Crew	Power
Tur. Par. Beam, 160-MJ/8	3	16	2.9	0	5.33
Tur. Par. Beam, 450-MJ/9	3	22.5	4.16	0	15
Tur. Par. Beam, 860-MJ/10	3	31.6	1.59	0	28.7
Tur. Par. Beam, 1.4-GJ/11	3	28	3.5	0	46.7

Name	Spaces	Mass	Cost	Crew	Power
Tur. Meson Gun, 1.39-GJ/13	3	27.8	3.47	0	46.3

Bay Weapons

See pp. 49-50 for descriptions of these systems.

50-ton Bay Weapons

Name	Spaces	Mass	Cost	Crew	Power
Plasma Gun Bay, 7.4-GJ/9	50	371	99.3	2	247
Plasma Gun Bay, 12.81-GJ/10	50	470	50.4	2	427
Fusion Gun Bay, 23.3-GJ/11	50	467	82.3	2	777
Fusion Gun Bay, 23.3-GJ/12	50	467	82.3	2	777

Name	Spaces	Mass	Cost	Crew	Power
Particle Beam Bay, 2.65-GJ/8	50	266	48.1	2	88.3
Particle Beam Bay, 7.4-GJ/9	50	371	68.4	2	247
Particle Beam Bay, 12.81-GJ/10	50	467	23.2	2	427
Particle Beam Bay, 23.3-GJ/11	50	467	58	2	777

Name	Spaces	Mass	Cost	Crew	Power
Meson Gun Bay, 12.81-GJ/12	50	467	21	2	427
Meson Gun Bay, 23.3-GJ/13	50	467	58	2	777

100-ton Bay Weapons

Name	Spaces	Mass	Cost	Crew	Power
Plasma-Gun Bay, 14.9-GJ/9	100	746	200	2	497
Plasma-Gun Bay, 28.5-GJ/10	100	1,050	112	2	950
Fusion-Gun Bay, 46.7-GJ/11	100	936	165	2	1,560
Fusion-Gun Bay, 46.7-GJ/12	100	935	165	2	1,560

Name	Spaces	Mass	Cost	Crew	Power
Part.-Beam Bay, 5.34-GJ/8	100	535	96.4	2	178
Part.-Beam Bay, 14.9-GJ/9	100	746	138	2	497
Part.-Beam Bay, 28.5-GJ/10	100	1,050	52.6	2	950
Part.-Beam Bay, 46.7-GJ/11	100	936	116	2	1,557

Name	Spaces	Mass	Cost	Crew	Power
Meson-Gun Bay, 28.5-GJ/12	100	1,050	52.6	2	950
Meson-Gun Bay, 46.7-GJ/13	100	936	116	2	1,557

Repulsors

Name	Spaces	Mass	Cost	Crew	Power	Notes
Lt. Repulsor Bay/9	100	400	344	2	720	+1 Dodge
Hv. Repulsor Bay/10	100	460	536	2	3,600	+3 Dodge

Repulsors (Continued)

Name	Spaces	Mass	Cost	Crew	Power	Notes
Md. Repulsor Bay/11	50	205	134	2	1,800	+2 Dodge
Hv. Repulsor Bay/11	100	410	268	2	3,600	+3 Dodge
Md. Repulsor Bay/12	50	193	71.6	2	1,800	+2 Dodge
Hv. Repulsor Bay/12	100	385	143	2	3,600	+3 Dodge
Hv. Repulsor Bay/13	50	193	71.6	2	1,800	+3 Dodge
Ehv. Repulsor Bay/13	100	385	143	2	3,600	+4 Dodge

Dodge bonus is vs. missiles only. See *Combat*, pp. 104-105.

Missile Bays

See p. 49 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
250mm Missile Bay/7	50	94.8	5.43	2	0.05
250mm Missile Bay/8	50	60.9	3.68	2	0.05
250mm Missile Bay/9	50	48.8	1.84	2	0.05
250mm Missile Bay/10	50	45.9	0.85	2	0.05

Name	Spaces	Mass	Cost	Crew	Power
500mm Missile Bay/7	100	601	31.1	2	0.10
500mm Missile Bay/8	100	451	23.4	2	0.10
500mm Missile Bay/9	100	425	11.7	2	0.10
500mm Missile Bay/10	100	413	5.85	2	0.10

Missiles

See pp. 52-54 for descriptions of these systems, including the magazine capacity for racks at different TLs.

Item	Spaces	Mass	Cost	Pilot	Performance
250mm Missile/7	0.012	0.32	0.02	–	0.15 G 0.15 GRds
250mm Missile/8	0.012	0.25	0.02	–	0.33 G 1 GRds
250mm Missile/9	0.012	0.23	0.03	12	5 G 15 GRds
250mm Missile/10	0.012	0.22	0.03	14	6 G 18 GRds
250mm Missile/11	0.012	0.18	0.04	15	8 G 24 GRds
250mm Missile/12	0.012	0.18	0.04	17	10 G 30 GRds
250mm Missile/13	0.012	0.24	0.20	18	55 G 165 GRds

Item	Spaces	Mass	Cost	Pilot	Performance
500mm Missile/7	0.06	1.45	0.07	–	0.2 G 0.2 GRds
500mm Missile/8	0.06	1.48	0.08	–	0.33 G 1 GRds
500mm Missile/9	0.06	1.26	0.08	12	5 G 15 GRds
500mm Missile/10	0.06	1.08	0.07	14	6 G 18 GRds
500mm Missile/11	0.06	1.59	0.15	15	8 G 24 GRds
500mm Missile/12	0.06	1.30	0.14	17	10 G 30 GRds
500mm Missile/13	0.06	1.33	1.02	18	55 G 165 GRds

Item	Spaces	Mass	Cost	Pilot	Performance
SIM-10 Missile	0.012	0.15	0.032	–	6 G 18 GRds
SIM-12 Missile	0.012	0.15	0.022	–	10 G 30 GRds

EW Drones

See p. 55 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew
EW Drone/9	0.06	1.48	0.27	0
EW Drone/10	0.06	0.99	0.16	0
EW Drone/11	0.06	1.74	0.27	0
EW Drone/12	0.06	1.18	0.17	0
EW Drone/13	0.06	1.34	0.55	0

Sand Canisters

See p. 48 for a description of this system. A standard sandcaster holds up to 200 canisters of ready ammunition.

Name	Spaces	Mass	Cost
Sand Canister/7	0.0048	0.06	0.0004

Weapon Storage

See p. 61-62 for descriptions of these systems. Note that the various missile platforms and sandcaster already include storage capacity in their integral magazine.

Name	Spaces	Mass	Cost	Crew	Power
Damper Box/11	4.5	35.6	26.1	0	0.079
Damper Box/12	2.5	13.9	11.5	0	0.04
Damper Box/13	2	6.93	5.74	0	0.02
Anti-blast Magazine/7	1	6.25	0.125	0	0
Anti-matter Bunker/12	0.5	12.5	0.25	0	0

Turrets

See p. 46 for descriptions of these systems. These standard turrets each hold up to 3 spaces of turret weaponry.

Name	Spaces	Mass	Cost (USL/VGSL)	Crew
Turret/7	1	2.45	0.046/0.11	1
Turret/8	1	1.64	0.043/0.103	1
Turret/9	1	1.23	0.042/0.101	1
Turret/10	1	0.825	0.041/0.097	1
Turret/11	1	0.625	0.041/0.097	1
Turret/12	1	0.425	0.041/0.097	1

50-ton External Bays

See p. 19 for descriptions of these systems.

Name	Spaces	Mass	Cost (USL/VGSL)	Crew
50-ton External Bay/7	10	19.5	0.325/0.78	0
50-ton External Bay/8	10	13	0.325/0.78	0
50-ton External Bay/9	10	9.75	0.325/0.78	0
50-ton External Bay/10	10	6.5	0.325/0.78	0
50-ton External Bay/11	10	4.88	0.325/0.78	0
50-ton External Bay/12	10	3.25	0.325/0.78	0

100-ton External Bays

See p. 19 for descriptions of these systems.

Name	Spaces	Mass	Cost (USL/VGSL)	Crew
100-ton External Bay/7	20	30	0.5/1.2	0
100-ton External Bay/8	20	20	0.5/1.2	0
100-ton External Bay/9	20	15	0.5/1.2	0
100-ton External Bay/10	20	10	0.5/1.2	0
100-ton External Bay/11	20	7.5	0.5/1.2	0
100-ton External Bay/12	20	5	0.5/1.2	0

Internal Bays

See p. 19 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew
50-ton Internal Bay/7	50	0	0	0
100-ton Internal Bay/7	100	0	0	0

Spinal Mount Weapons

See p. 50 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Spinal P-Beam, 250-GJ/8	4,460	22,424	4,488	45	8,333
Spinal P-Beam, 420-GJ/8	7,492	37,668	7,536	75	14,000
Spinal P-Beam, 670-GJ/8	11,951	60,085	12,020	120	22,333
Spinal P-Beam, 1-TJ/8	17,837	89,677	17,938	179	33,333

Name	Spaces	Mass	Cost	Crew	Power
Spinal P-Beam, 670-GJ/9	3,910	26,558	6,152	40	22,333
Spinal P-Beam, 920-GJ/9	5,369	36,467	8,447	54	30,667
Spinal P-Beam, 1.8-TJ/9	10,503	71,345	16,524	106	60,000
Spinal P-Beam, 3.1-TJ/9	18,088	122,870	28,457	181	103,333

Name	Spaces	Mass	Cost	Crew	Power
Spinal P-Beam, 569.5-GJ/10	1,513	15,126	1,035	15	18,983
Spinal P-Beam, 870-GJ/10	2,292	22,868	1,568	23	29,000
Spinal P-Beam, 1.7-TJ/10	4,478	44,783	3,063	45	56,667
Spinal P-Beam, 2.7-TJ/10	7,111	70,966	4,865	72	90,000

Name	Spaces	Mass	Cost	Crew	Power
Spinal P-Beam, 530-GJ/11	911	7,858	1,307	10	17,667
Spinal P-Beam, 840-GJ/11	1,443	12,454	2,071	15	28,000
Spinal P-Beam, 1.6-TJ/11	2,749	23,720	3,945	28	53,333
Spinal P-Beam, 2.8-TJ/11	4,810	41,509	6,903	49	93,333

Name	Spaces	Mass	Cost	Crew	Power
Spinal Meson Gun, 820-GJ/10	2,160	21,554	4,038	22	27,333
Spinal Meson Gun, 1.4-TJ/10	3,688	36,798	6,894	37	46,667
Spinal Meson Gun, 2.3-TJ/10	6,058	60,453	11,325	61	76,667
Spinal Meson Gun, 3.4-TJ/10	8,955	89,364	16,740	90	113,333

Name	Spaces	Mass	Cost	Crew	Power
Spinal Meson Gun, 670-GJ/11	1,765	17,603	1,792	18	23,333
Spinal Meson Gun, 1.1-TJ/11	2,897	28,900	2,941	29	36,667
Spinal Meson Gun, 2.3-TJ/11	6,057	60,425	6,149	61	76,667
Spinal Meson Gun, 3.1-TJ/11	8,164	81,442	8,287	82	103,333

Name	Spaces	Mass	Cost	Crew	Power
Spinal Meson Gun, 570-GJ/12	1,512	15,119	939	16	19,000
Spinal Meson Gun, 870-GJ/12	2,291	22,851	1,420	23	29,000
Spinal Meson Gun, 2.1-TJ/12	5,530	55,156	3,426	56	70,000
Spinal Meson Gun, 2.9-TJ/12	7,636	76,167	4,731	77	96,667

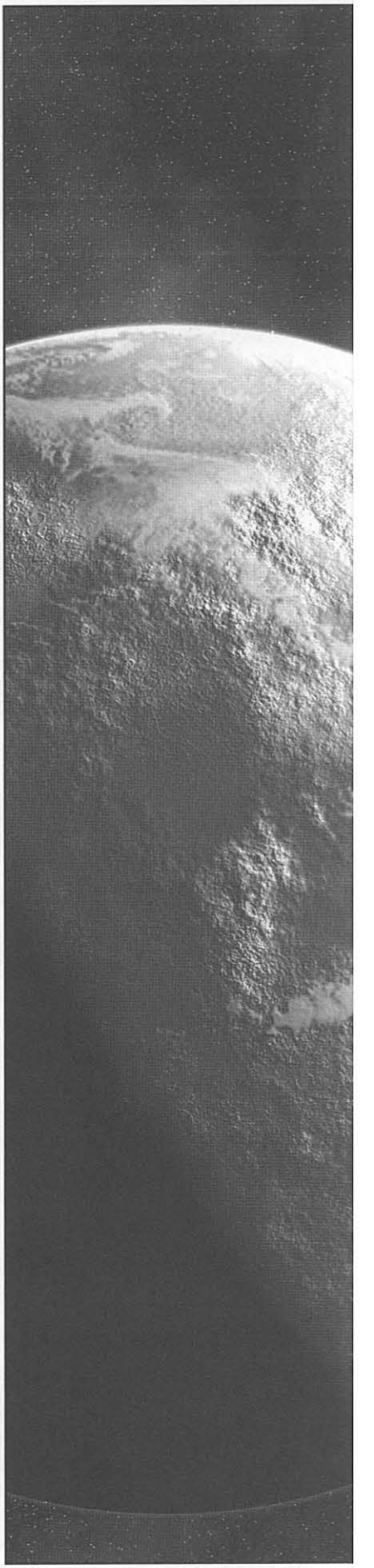
Name	Spaces	Mass	Cost	Crew	Power
Spinal Meson Gun, 870-GJ/13	1,495	12,888	2,143	15	29,000
Spinal Meson Gun, 2.3-TJ/13	3,950	34,070	5,665	40	76,667
Spinal Meson Gun, 2.9-TJ/13	4,980	42,957	7,142	50	96,667
Spinal Meson Gun, 3.4-TJ/13	6,869	59,250	9,851	69	133,333

Cockpits and Bridges

See pp. 42-43 for descriptions of these systems. *Scans* ratings are passive/active/radscanner.

Name	Spaces	Mass	Cost	Crew	Power	Scans
Cockpit/Systems/7	3.5	15.2	6.06	1-2	0.227	31/33/–
Cockpit/Systems/8	1	4.45	3.69	1-2	0.127	31/33/–
Cockpit/Systems/9	3	13.4	7.62	1-2	0.502	33/37/23
Cockpit/Systems/10	1	4.9	2.5	1-2	1.25	35/39/29
Cockpit/Systems/11	1	4.7	2.3	1-2	1.75	37/40/31

Name	Spaces	Mass	Cost	Crew	Power	Scans
Command Cockpit/7	5.5	30.5	31.3	1-2	0.773	32/36/–
Command Cockpit/8	2.5	14.6	27	1-2	0.773	34/38/–





Cockpits and Bridges (Cont.)

Name	Spaces	Mass	Cost	Crew	Power	Scans
Command Cockpit/9	5	28.9	24.5	1-2	2.52	37/41/31
Command Cockpit/10	2.5	19.1	11	1-2	4.79	39/42/32
Command Cockpit/11	2.5	17.3	10.2	1-2	6.02	41/43/38
Command Cockpit/12	2.5	16.9	10	1-2	6.02	41/43/38

Name	Spaces	Mass	Cost	Crew	Power	Scans
Light Cockpit/Systems/7	3	11.5	5.57	1	0.024	25/27/–
Light Cockpit/Systems/8	1	3.03	1.22	1	0.014	25/27/–
Light Cockpit/Systems/9	3	11.1	5.88	1	0.051	27/31/23
Light Cockpit/Systems/10	0.5	1.94	0.94	1	0.127	29/33/23
Light Cockpit/Systems/11	0.5	1.9	0.589	1	0.177	31/34/25
Light Cockpit/Systems/12	0.5	1.89	0.589	1	0.177	31/34/25

Name	Spaces	Mass	Cost	Crew	Power	Scans
Basic Bridge/7	2.5	11	4.78	1-5	0.355	31/34/–
Basic Bridge/8	2.5	8.07	5.21	1-5	0.505	33/37/–
Basic Bridge/9	2.5	11.6	6.1	1-5	1.75	35/40/29
Basic Bridge/10	2.5	8.6	4	1-5	2.51	37/41/31
Basic Bridge/11	2.5	7.55	3.22	1-5	3.76	38/42/35
Basic Bridge/12	2.5	7.3	3.1	1-5	3.76	38/42/35

Name	Spaces	Mass	Cost	Crew	Power	Scans
Command Bridge/7	7	34.5	12.8	1-10	0.788	32/36/–
Command Bridge/8	5.5	21.9	12.2	1-10	0.788	34/38/–
Command Bridge/9	5.5	23.7	12.4	1-10	2.54	37/41/31
Command Bridge/10	5	20.9	9.6	1-10	3.80	39/42/32
Command Bridge/11	5	20	8.96	1-10	5.05	41/43/38
Command Bridge/12	5	19.2	8.8	1-10	5.05	41/43/38

Name	Spaces	Mass	Cost	Crew	Power	Scans
Compact, Basic or Command only	-0.5	-0.04	0	-2		

Electronic Systems

See p. 43 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Aux. Control Station/Dup. Controls/7	0.5	0.355	0.013	0-2	Neg.
Aux. Control Station/Dup. Controls/8	0.5	0.355	0.004	0-2	Neg.
Aux. Control Station/Dup. Controls/9	0.5	0.335	0.003	0-2	Neg.
Aux. Control Station/Dup. Controls/10-12	0.5	0.300	0.003	0-2	Neg.
Aux. Control Station/Dup. Controls/13	0.5	0.200	0.004	0-2	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Information Center/7	4	7.66	10.5	10-20	0.01
Information Center/8	4	7.63	10.3	10-20	0.01
Information Center/9	4	4.51	5.28	10-20	0.01
Information Center/10	4	3	2.8	10-20	0.01

Sensor Systems

See pp. 44-45 for descriptions of these systems. *Scans* ratings for multifunction sensor suites are given as passive/active/radscanner values.

Name	Spaces	Mass	Cost	Crew	Power	Scans
Enhanced Sensor Suite/7	4	32.9	11.8	1	1.5	37/38/–
Enhanced Sensor Suite/8	4	31.2	16.1	1	3.25	37/41/–
Enhanced Sensor Suite/9	4	39.7	27.6	1	5	41/43/33
Enhanced Sensor Suite/10	4	41.2	27.3	1	11.3	43/45/37
Enhanced Sensor Suite/11	4	38.7	26.9	1	25	45/47/39

Sensor Systems (Continued)

Name	Spaces	Mass	Cost	Crew	Power	Scans
Advanced Sensor Suite/7	8	69.8	20.1	1	2.25	40/39/–
Advanced Sensor Suite/8	8	65.8	39.2	1	6.23	40/43/–
Advanced Sensor Suite/9	8	78.4	53.6	1	11.3	43/45/34
Advanced Sensor Suite/10	8	82.4	56.8	1	25	45/47/38
Advanced Sensor Suite/11	8	77.1	56.5	1	50	47/49/40

Name	Spaces	Mass	Cost	Crew	Power	Scans
Densitometer/11	1	12.5	6	1	Neg.	–/27/–
Densitometer/12	1	12.5	5.4	1	Neg.	–/29/–
Densitometer/13	1	12.5	5.2	1	Neg.	–/31/–

Screens

See p. 50 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Nuclear Damper/10	1.5	32.4	16	4	2
Nuclear Damper/11	1	16.4	8	4	2
Nuclear Damper/12	1	10	4	4	2
Nuclear Damper/13	0.5	4.4	2	4	2

Name	Spaces	Mass	Cost	Crew	Power
Meson Screen/10	2	12.5	9.05	4	72.8
Meson Screen/11	1	6.24	4.34	4	36.4
Meson Screen/12	1	5	2.26	4	36.4
Meson Screen/13	1	4.29	1.22	4	36.4

Name	Spaces	Mass	Cost	Crew	Power
Black Globe Capacitor/12	1	25	5	0	24 million HP
Black Globe-1/12	10	20.5	51	4	0.00001
Black Globe-2/12	15	41	102	4	0.00001
Black Globe-3/12	20	82	204	4	0.00001
Black Globe-4/12	25	164	408	4	0.00001

Volume, mass, cost, and power are per 8,200 sf of vessel protected for black globes *only*.

Electronic-Warfare Systems

See p. 45 for descriptions of these systems.

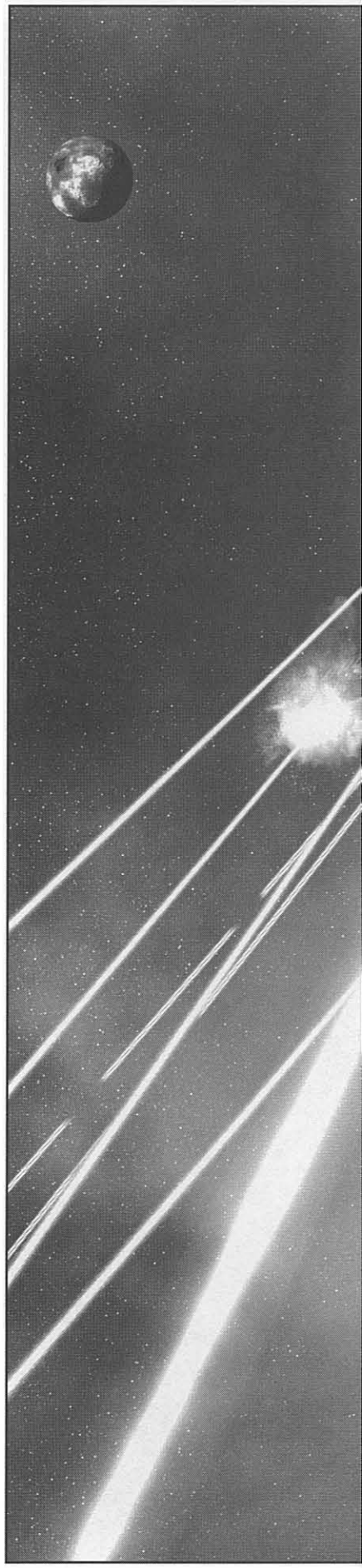
Name	Spaces	Mass	Cost	Crew	Power
Jammer/7	33	378	60.1	0	21
Jammer/8	6	31.5	13.8	0	10.4
Jammer/9	3	26.8	18.2	0	15.7
Jammer/10	1	14.5	11.3	0	7.88
Jammer/11	1	15.2	10	0	7.73
Jammer/12	1	16.5	10.3	0	7.73
Jammer/13	1	16.6	10.3	0	7.73

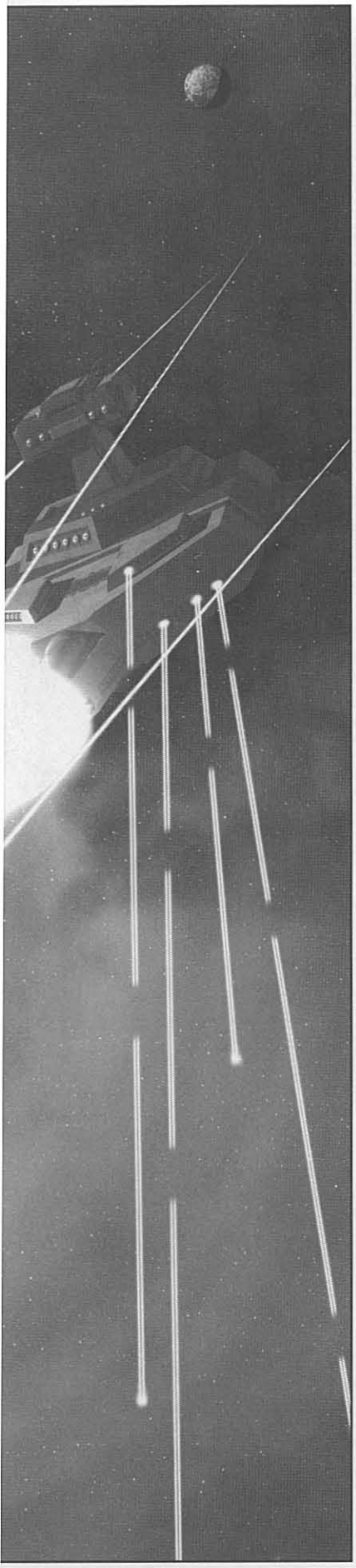
Name	Spaces	Mass	Cost	Crew	Power
Electronic Warfare/7	3	56.2	11.4	2	0.22
Electronic Warfare/8	3	33.6	11.4	2	1.02
Electronic Warfare/9	3	27.7	14.4	2	5.02
Electronic Warfare/10	3	43.7	13	2	15
Electronic Warfare/11	3	44.9	11.4	2	15
Electronic Warfare/12	3	40.4	10.5	2	15
Electronic Warfare/13	3	37.1	9.85	2	15

Long-Range Sensors

See p. 44 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
FLt. Radscanner/9	2	25	10.1	0	Neg.	Scan 35, Range 10k
MLt. Radscanner/9	3	37.5	15.1	0	Neg.	Scan 36, Range 15k
ULt. Radscanner/9	4	50	20.1	0	Neg.	Scan 37, Range 20k
SLt. Radscanner/9	6	75	30.1	0	Neg.	Scan 38, Range 30k





Long-Range Sensors (Continued)

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ELt. Radscanner/9	9	113	45.1	0	Neg.	Scan 39, Range 45k
Lt. Radscanner/9	14	175	70.1	0	Neg.	Scan 40, Range 70k
Md. Radscanner/9	20	250	100	0	Neg.	Scan 41, Range 100k
Hv. Radscanner/9	30	375	150	0	Neg.	Scan 42, Range 150k
EHv. Radscanner/9	40	500	200	0	Neg.	Scan 43, Range 200k
SHv. Radscanner/9	60	750	300	0	Neg.	Scan 44, Range 300k
UHv. Radscanner/9	90	1125	450	0	Neg.	Scan 45, Range 450k

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ELt. Radscanner/10	2.5	28.1	11.3	0	Neg.	Scan 39, Range 45k
Lt. Radscanner/10	3.5	43.8	17.5	0	Neg.	Scan 40, Range 70k
Md. Radscanner/10	5	62.5	25	0	Neg.	Scan 41, Range 100k
Hv. Radscanner/10	7.5	93.8	37.5	0	Neg.	Scan 42, Range 150k
EHv. Radscanner/10	10	125	50	0	Neg.	Scan 43, Range 200k
SHv. Radscanner/10	15	188	75	0	Neg.	Scan 44, Range 300k
UHv. Radscanner/10	22.5	281	113	0	Neg.	Scan 45, Range 450k

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
Md. Radscanner/11	1	12.5	5.01	0	Neg.	Scan 41, Range 100k
Hv. Radscanner/11	1.5	18.8	7.51	0	Neg.	Scan 42, Range 150k
EHv. Radscanner/11	2	25	10	0	Neg.	Scan 43, Range 200k
SHv. Radscanner/11	3	37.5	15	0	Neg.	Scan 44, Range 300k
UHv. Radscanner/11	4.5	56.3	22.5	0	Neg.	Scan 45, Range 450k

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
FLt. PESA Array/8	2.5	30	49.6	0	Neg.	Scan 42, Range 150k
MLt. PESA Array/8	3.5	40	65.6	0	Neg.	Scan 43, Range 200k
ULt. PESA Array/8	5	60	97.6	0	Neg.	Scan 44, Range 300k
SLt. PESA Array/8	7.5	90	146	0	Neg.	Scan 45, Range 450k
ELt. PESA Array/8	11.5	140	226	0	Neg.	Scan 46, Range 700k
Lt. PESA Array/8	16	200	322	0	Neg.	Scan 47, Range 1M
Md. PESA Array/8	24	300	482	0	Neg.	Scan 48, Range 1.5M
Hv. PESA Array/8	32	400	642	0	Neg.	Scan 49, Range 2M
EHv. PESA Array/8	48	600	962	0	Neg.	Scan 50, Range 3M
SHv. PESA Array/8	72	900	1442	0	Neg.	Scan 51, Range 4.5M
UHv. PESA Array/8	112	1400	2242	0	Neg.	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ULt. PESA Array/9	2.5	30	48.8	0	Neg.	Scan 44, Range 300k
SLt. PESA Array/9	4	45	72.8	0	Neg.	Scan 45, Range 450k
ELt. PESA Array/9	6	70	113	0	Neg.	Scan 46, Range 700k
Lt. PESA Array/9	8	100	161	0	Neg.	Scan 47, Range 1M
Md. PESA Array/9	12	150	241	0	Neg.	Scan 48, Range 1.5M
Hv. PESA Array/9	16	200	321	0	Neg.	Scan 49, Range 2M
EHv. PESA Array/9	24	300	481	0	Neg.	Scan 50, Range 3M
SHv. PESA Array/9	36	450	721	0	Neg.	Scan 51, Range 4.5M
UHv. PESA Array/9	56	700	1121	0	Neg.	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ELt. PESA Array/10	3	35	56.4	0	Neg.	Scan 46, Range 700k
Lt. PESA Array/10	4	50	80.4	0	Neg.	Scan 47, Range 1M
Md. PESA Array/10	6	75	120	0	Neg.	Scan 48, Range 1.5M
Hv. PESA Array/10	8	100	160	0	Neg.	Scan 49, Range 2M
EHv. PESA Array/10	12	150	240	0	Neg.	Scan 50, Range 3M
SHv. PESA Array/10	18	225	360	0	Neg.	Scan 51, Range 4.5M
UHv. PESA Array/10	28	350	560	0	Neg.	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
Md. PESA Array/11	3	37.5	60.2	0	Neg.	Scan 48, Range 1.5M
Hv. PESA Array/11	4	50	80.2	0	Neg.	Scan 49, Range 2M
EHv. PESA Array/11	6	75	120	0	Neg.	Scan 50, Range 3M
SHv. PESA Array/11	9	113	180	0	Neg.	Scan 51, Range 4.5M
UHv. PESA Array/11	14	175	280	0	Neg.	Scan 52, Range 7M

Long-Range Sensors (Continued)

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ULt. AESA Array/8	5.5	37.5	10.6	0	7.5	Scan 44, Range 300k
SLt. AESA Array/8	8.5	56.3	15.9	0	11.3	Scan 45, Range 450k
ELt. AESA Array/8	13	87.5	24.6	0	17.5	Scan 46, Range 700k
Lt. AESA Array/8	18	125	35.1	0	25	Scan 47, Range 1M
Md. AESA Array/8	27	188	52.6	0	37.5	Scan 48, Range 1.5M
Hv. AESA Array/8	36	250	70.1	0	50	Scan 49, Range 2M
EHv. AESA Array/8	54	375	105	0	75	Scan 50, Range 3M
SHv. AESA Array/8	81	563	158	0	112.5	Scan 51, Range 4.5M
UHv. AESA Array/8	126	875	245	0	175	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
ELt. AESA Array/9	4.5	35	12.3	0	17.5	Scan 46, Range 700k
Lt. AESA Array/9	6	50	17.6	0	25	Scan 47, Range 1M
Md. AESA Array/9	9	75	26.3	0	37.5	Scan 48, Range 1.5M
Hv. AESA Array/9	12	100	35.1	0	50	Scan 49, Range 2M
EHv. AESA Array/9	18	150	52.6	0	75	Scan 50, Range 3M
SHv. AESA Array/9	27	225	78.8	0	113	Scan 51, Range 4.5M
UHv. AESA Array/9	42	350	123	0	175	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
Md. AESA Array/10	3.5	31.9	9.78	0	38	Scan 48, Range 1.5M
Hv. AESA Array/10	4.5	42.5	13	0	50	Scan 49, Range 2M
EHv. AESA Array/10	6.5	63.8	19.5	0	75	Scan 50, Range 3M
SHv. AESA Array/10	9.5	95.6	29.3	0	113	Scan 51, Range 4.5M
UHv. AESA Array/10	15	149	45.5	0	175	Scan 52, Range 7M

Name	Spaces	Mass	Cost	Crew	Power	Scan/Range in miles
EHv. AESA Array/11	4.5	35.6	9.77	0	75	Scan 50, Range 3M
SHv. AESA Array/11	6.5	53.4	14.6	0	113	Scan 51, Range 4.5M
UHv. AESA Array/11	9.5	83.1	22.8	0	175	Scan 52, Range 7M

Special Sensors and Add-ons

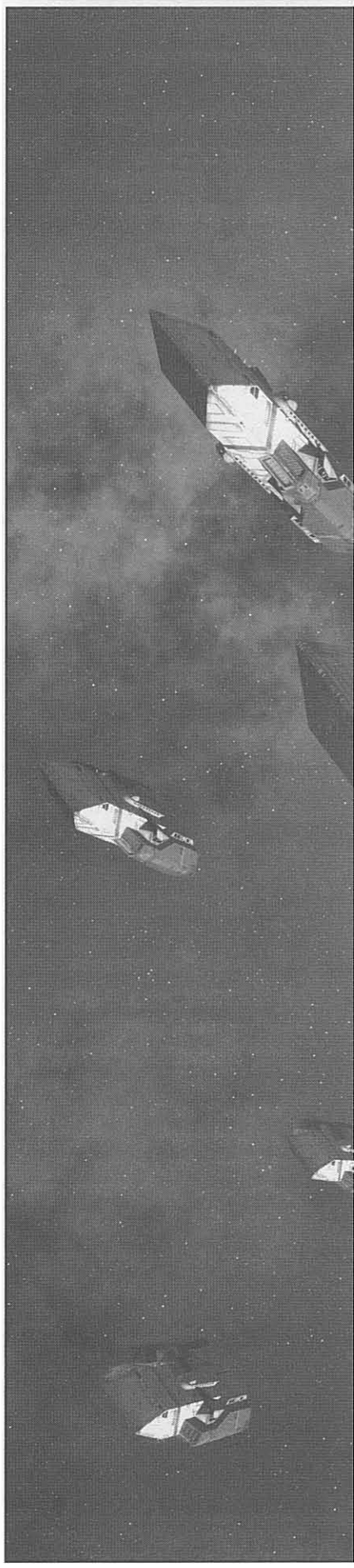
See pp. 44-45 for descriptions of these systems.

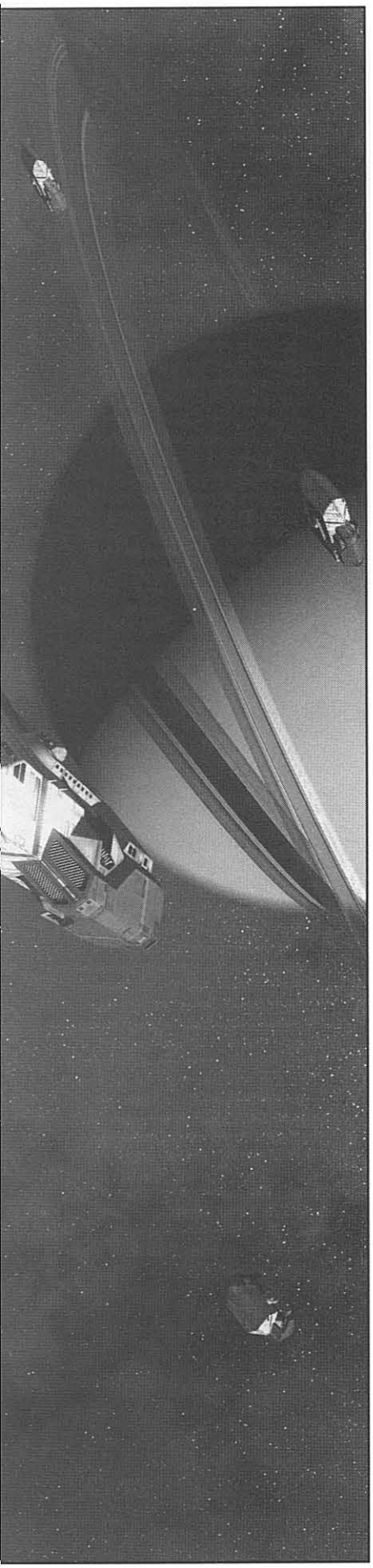
Name	Spaces	Mass	Cost	Crew	Power
Survey Module-Traffic Control/7	5	31.3	409	4-8	0.016
Survey Module-Traffic Control/8	4	21.8	124	4-8	0.034
Survey Module-Traffic Control/9	4	11.1	62.1	4-8	0.031
Survey Module-Traffic Control/10	4	5.31	30.6	4-8	0.022

Name	Spaces	Mass	Cost	Crew	Power
Underwater Electronics/7	1	7.83	4.05	1	0.106
Underwater Electronics/8	0.5	4.13	1.88	1	0.121
Underwater Electronics/9	0.5	2.89	1.45	1	0.136
Underwater Electronics/10	0.5	4.2	3.53	1	0.160
Underwater Electronics/11	0.5	4.47	3.63	1	0.175
Underwater Electronics/12	0.5	4.73	3.73	1	0.19
Underwater Electronics/13	0.5	4.99	3.84	1	0.205

Name	Spaces	Mass	Cost	Crew	Power
Astronomical Instruments/7	0	0.138	2.03	0	Neg.
Astronomical Instruments/8	0	0.055	0.51	0	Neg.
Astronomical Instruments/9	0	0.028	0.255	0	Neg.
Astronomical Instruments/10	0	0.014	0.128	0	Neg.

Name	Spaces	Mass	Cost	Crew	Power
Planetary Survey/7	0	0.25	0.5	0	0.001
Planetary Survey/8	0	0.125	0.25	0	0.001
Planetary Survey/9	0	0.063	0.125	0	0.001
Planetary Survey/10	0	0.5	1.25	0	0.005





Communications Suites

See pp. 43-44 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Enhanced Comms/7	1.5	18	0.257	0	0.006
Enhanced Comms/8	1.5	17.5	0.245	0	0.011
Enhanced Comms/9	1.5	18.8	0.268	0	0.024
Enhanced Comms/10	1.5	18.1	2.1	0	0.017
Enhanced Comms/11	1.5	14.4	1.09	0	0.026
Enhanced Comms/12	1.5	16.3	0.67	0	0.04

Name	Spaces	Mass	Cost	Crew	Power
Advanced Comms/10	13.5	168	6.25	0	0.084
Advanced Comms/11	7.5	93.1	3.25	0	0.084
Advanced Comms/12	4.5	55.6	1.75	0	0.084

Name	Spaces	Mass	Cost	Crew	Power	Notes
Comm. Module (Xboat)/7	81.5	1,010	13.6	0-1	0.023	60k/6M mi range
Comm. Module (Xboat)/8	41.5	514	12.8	0-1	0.023	200k/20M mi range
Comm. Module (Xboat)/9	20.5	252	3.38	0-1	0.023	2M/200M mi range
Comm. Module (Xboat)/10	12	138.1	3.83	0-1	0.023	10M/1B mi range

Computer and Scientific Systems

See p. 45 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power
Computer System/7	4	48.3	120	0	0.08
Computer System /8	4	48.2	120	0	0.08
Computer System /9	2	24	60	0	0.08
Computer System /10	1	12	30	0	0.08

Name	Spaces	Mass	Cost	Crew	Power
Computer Lab/7	2	18.2	900	1	0.03
Computer Lab/8	2	18.1	900	1	0.03
Computer Lab/9	1.5	9.08	450	2	0.03
Computer Lab/10	1.5	4.59	225	6	0.03

Name	Spaces	Mass	Cost	Crew	Power
Enhanced Display/9	2.5	0.3	0.1	0	0.001
Enhanced Display/10	2.5	0.3	0.05	0	0.001
Enhanced Display/11	2.5	0.3	0.025	0	0.001

Name	Spaces	Mass	Cost	Crew	Power
Simulation Lab/9	5	11.4	2.1	2	0.014
Simulation Lab/10	5	10.9	1.55	2	0.014
Simulation Lab/11	5	10.9	1.53	2	0.014

Name	Spaces	Mass	Cost	Crew	Power
Physics Lab/7	2.5	11.2	1.48	1	0.3
Physics Lab/8	2.5	10.6	1.12	1	0.3
Physics Lab/9	2.5	10.2	1.06	1	0.3
Physics Lab/10	2.5	10	1	1	0.3

Name	Spaces	Mass	Cost	Crew	Power
Isolation Lab/7	20	100	10	1	0.03
Lab/7	2	10	1	1	0.003

Name	Spaces	Mass	Cost	Crew	Power
Probe Launcher/Control/7	1	4.13	0.223	0-3	0.003
Probe Launcher/Control/8	1	2.38	0.132	0-3	0.003
Probe Launcher/Control/9	1	1.59	0.066	0-3	0.003
Probe Launcher/Control/10	1	1.2	0.033	0-3	0.003

Drives

See pp. 37-39 for descriptions of these systems. *Thrust* is measured in stons. *Fuel* is measured in dtons per hour (where applicable); see pp. 38-39 for fuel-type abbreviations.

Reactionless Thrusters

See pp. 37-38 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust
Maneuver Drive/8	1	4.13	0.825	1/3	1.5	1.5
Maneuver Drive/Early 9	1	4	1.3	1/10	5	5
Maneuver Drive/Late 9	1	3.75	0.69	1/17	3	30
Maneuver Drive/10	1	3.4	0.16	1/60	4	40
Maneuver Drive/11	1	4	0.65	1/50	10	100
Maneuver Drive/12	1	4	0.65	1/100	10	100
Maneuver Drive/13	1	4.03	4.38	1/25	35	350

Reaction Drives

See pp. 38-39 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Liquid Fuel Rocket/7	0.5	2.07	0.104	0	0	115	86.3 R
Liquid Fuel Rocket/8	0.5	2.1	0.105	0	0	140	92.4 R

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Fission Rocket/7	0.5	2.1	0.419	0	0	4.3	1.29 W
Fission Rocket/8	0.5	2.08	0.416	0	0	9.25	0.555 W

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Solid Rocket Booster/7	1	25.2	0.25	0	0	6	–
Solid Rocket Booster/8	1	25.2	0.25	0	0	7	–

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
HEPlaR/9	0.5	0.85	0.75	0	Neg.	3.75	0.0033 H
HEPlaR/10	0.5	3.7	0.16	0	Neg.	14	0.0125 H
HEPlaR/11	0.5	3.7	0.09	0	Neg.	14	0.0125 H

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Rocket Drive/8	0.5	2.1	0.42	0	0	2.8	0.000336 H
Rocket Drive/E9	0.5	2.1	0.42	0	0	7	0.00084 H
Rocket Drive/L9-10	0.5	2.1	0.084	0	0	28	0.00336 H
Rocket Drive/11-12	0.5	2.1	0.42	0	0	70	0.0084 H
Rocket Drive/13	0.5	2.1	16.8	0	0	1,400	0.168 H

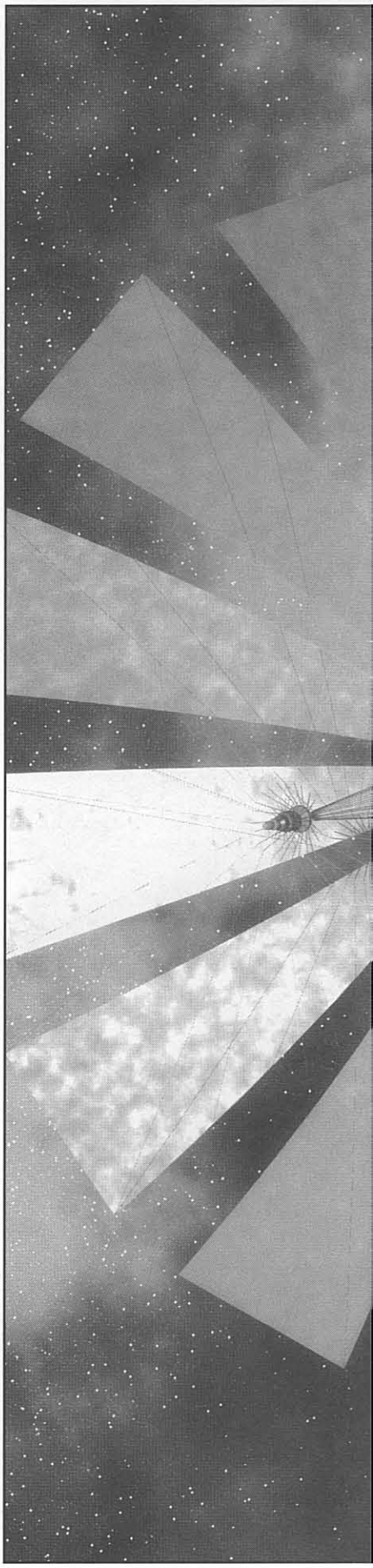
Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Metal/Oxide Rocket/8	0.5	2.06	0.412	0	0	55	35.6 MOX

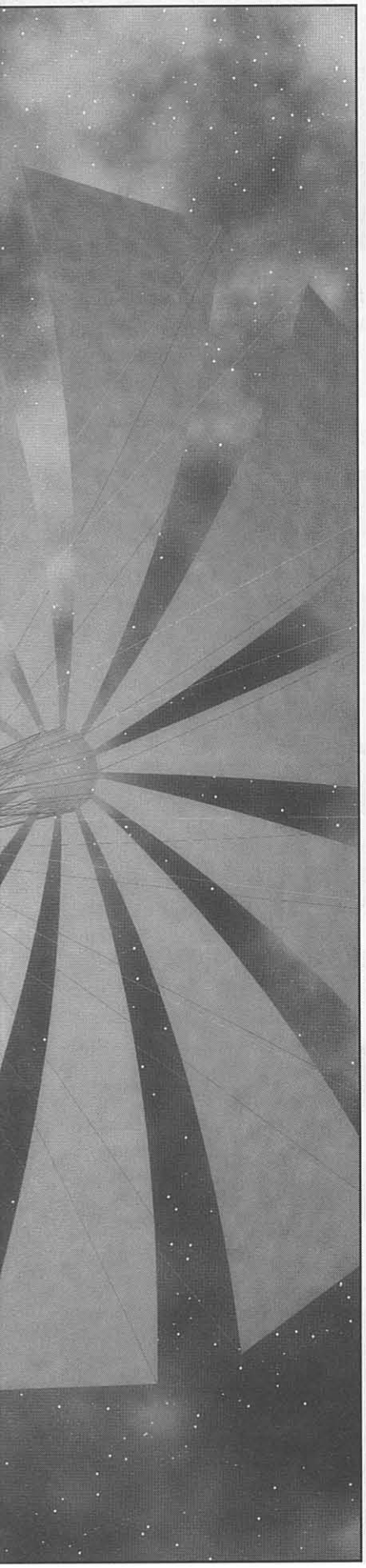
Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Bussard Ramjet/9	1	4	3.2	0	0	0.65	–
Bussard Ramjet/10	1	4	3.2	0	0	6.5	–

Atmospheric Drives

See p. 39 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
Turbo-Ramjet/7	1	4.16	0.833	0	0.35	17.5	0.525 J
Turbo-Ramjet/8	1	4.13	0.825	0	0.42	21	0.567 J
Hyperfan/9	1	4.16	0.416	0	0.55	27.5	3.3 H
Fusion Air Ram/9	1	4.2	0.84	0	0.55	27.5	–
Fusion Air Ram/10	1	4.16	0.833	0	1.1	55	–





Short-Term Reactionless Thrusters

See p. 37 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust
ST Maneuver Drive/8	0.5	3.03	0.605	1/5	1.1	1.1
ST Maneuver Drive/E9	0.5	2.8	0.91	1/14	3.5	3.5
ST Maneuver Drive/L9	0.5	3.13	0.575	1/20	2.5	25
ST Maneuver Drive/10	0.5	2.98	0.14	1/70	3.5	35
ST Maneuver Drive/11	0.5	3	0.488	1/66	7.5	75
ST Maneuver Drive/12	0.5	3	0.488	1/133	7.5	75
ST Maneuver Drive/13	0.5	2.88	3.13	1/40	25	250

Short Term Reaction Drives

See pp. 38-39 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
ST Liquid Fuel Rocket/7	0.5	3.15	0.158	0	0	175	126 R
ST Liquid Fuel Rocket/8	0.5	3.15	0.158	0	0	210	138.6 R

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
ST Fission Rocket/7	0.5	3.07	0.614	0	0	6.3	1.89 W
ST Fission Rocket/8	0.5	3.15	0.63	0	0	14	0.84 W

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
ST Rocket Drive/8	0.5	3	0.6	0	0	4	0.00048 H
ST Rocket Drive/E9	0.5	3	0.6	0	0	10	0.0012 H
ST Rocket Drive/L9-10	0.5	3	0.12	0	0	40	0.0048 H
ST Rocket Drive/11-12	0.5	3	0.6	0	0	100	0.012 H
ST Rocket Drive/13	0.5	3	24	0	0	2,000	0.24 H

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
ST Metal/Oxide Rocket/8	0.5	3	0.6	0	0	80	51.8 MOX

Short-Term Atmospheric Drives

See p. 39 for descriptions of these systems. Power generated is *per module*.

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Fuel
ST Turbo-Ramjet/7	0.5	3.04	0.608	0	0.25	12.5	0.375 J
ST Turbo-Ramjet/8	0.5	3	0.6	0	0.3	15	0.405 J
ST Hyperfan/9	0.5	3.04	0.304	0	0.4	20	2.4 H
ST Fusion Air Ram/9	0.5	3.08	0.615	0	0.4	20	–
ST Fusion Air Ram/10	0.5	3.04	0.608	0	0.8	40	–

Solar Sails

See p. 38 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Thrust	Notes
Solar Sail/7	0.5	22.4	11.2	0	0	0.003712	1.6-square-mile sail
Solar Sail/8	0.5	24.4	24.4	0	0	0.01886	7.5-square-mile sail
Solar Sail/9	0.5	25	25	0	0	0.3288	125-square-mile sail

Jump Drives

See p. 37 for descriptions of these systems.

Name	Spaces	Mass	Cost	Crew	Power	Notes
Jump Drive/9	2	8	5	1/5	10	Max Jump 2
Jump Drive/10	1	4	3.1	1/25	10	Max Jump 4
Jump Drive/11	1	4	3.05	1/50	10	Max Jump 5
Jump Drive/12	1	4	3.05	1/100	10	Max Jump 6

Appendix B

Weapon Tables

See p. GT158 for an explanation of these weapon combat values. The 1/2 and Max Range values for energy weapons are given in *miles* followed by *hexes*, for ease of use in the ***GURPS Traveller*** space-combat system.

Turret Energy Weapons

Standard Lasers

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Turret Laser, 43-MJ/8	1/60	5d×20	2,800/0	8,400/1	28	30
Turret Laser, 101-MJ/9	1/60	4d×40	14,000/1	42,000/4	33	30
Turret Laser, 250-MJ/10	1/60	5d×50 (2)	17,000/2	51,000/5	32	30
Turret Laser, 390-MJ/11	1/60	4d×100 (2)	23,000/2	69,000/7	32	30
Turret Laser, 405-MJ/12	1/60	5d×100 (2)	26,000/3	78,000/8	33	30
Turret Laser, 420-MJ/13	1/60	6d×100 (2)	29,000/3	87,000/9	33	30
Turret Graser, 390-MJ/14	1/60	6d×50 (5)	21,000/2	63,000/6	32	30

Heavy Lasers

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Turret Laser, 130-MJ/8	1/60	6d×30	4,900/0	15,000/1	30	30
Turret Laser, 303-MJ/9	1/60	7d×40	25,000/3	75,000/8	34	30
Turret Laser, 810-MJ/10	1/60	5d×90 (2)	31,000/3	93,000/9	33	30
Turret Laser, 1.3-GJ/11	1/60	7d×100 (2)	43,000/4	130,000/13	34	30
Turret Laser, 1.3-GJ/12	1/60	5d×170 (2)	47,000/5	140,000/14	34	30
Turret Laser, 1.3-GJ/13	1/60	5d×200 (2)	51,000/5	150,000/15	34	30
Turret Graser, 660-MJ/13	1/60	4d×100 (5)	28,000/3	84,000/8	33	30
Turret Graser, 1.18-GJ/14	1/60	5d×100 (5)	37,000/4	110,000/11	33	30

Mining Lasers

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Turret Mining Laser, 2.6-MJ/8	1	5d×5	22/0	66/0	11	25
Turret Mining Laser, 10.2-MJ/9	1	5d×10	140/0	420/0	16	25
Turret Mining Laser, 40-MJ/10	1	5d×20 (2)	210/0	630/0	15	25
Turret Mining Laser, 46.5-MJ/11	1	7d×20 (2)	250/0	750/0	15	25
Turret Mining Laser, 46.5-MJ/12	1	6d×30 (2)	280/0	840/0	16	25
Turret Mining Laser, 46.5-MJ/13	1	5d×40 (2)	300/0	900/0	16	25

High Energy Turret Weapons

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Turret Plasma Gun, 225-MJ/9	1/60	7d×100	1,600/0	4,800/0	27	30
Turret Plasma Gun, 430-MJ/10	1/60	7d×200	2,500/0	7,500/1	28	30
Turret Fusion Gun, 700-MJ/11	1/60	7d×300	3,400/0	10,000/1	29	30
Turret Fusion Gun, 700-MJ/12+	1/60	5d×500	3,700/0	11,000/1	29	30
Turret Particle Beam, 160-MJ,/8	1/60	8d×80	1,400/0	4,200/0	27	30
Turret Particle Beam, 450-MJ,/9	1/60	7d×200	2,500/0	7,500/1	28	30
Turret Particle Beam, 860-MJ,/10	1/60	8d×300	3,800/0	11,000/1	29	30
Turret Particle Beam, 1.4-GJ,/11+	1/60	5d×700	5,200/1	16,000/2	30	30
Turret Meson Gun, 1.39-GJ/13	1/60	6d×550 (!)	5,200/1	16,000/2	30	30

Bay Energy Weapons

50-Ton Bay Weapons

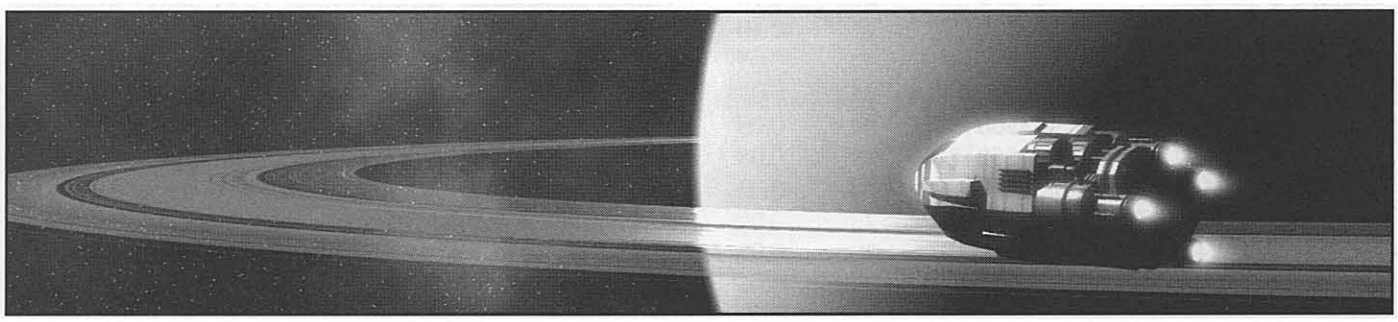
Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Plasma Gun Bay, 7.4-GJ/9	1/60	6d×500	9,300/1	28,000/3	32	30
Plasma Gun Bay, 12.81-GJ/10	1/60	6d×800	13,000/1	39,000/4	33	30
Fusion Gun Bay, 23.3-GJ/11	1/60	6d×1,200	20,000/2	60,000/6	33	30
Fusion Gun Bay, 23.3-GJ/12+	1/60	6d×1,400	21,000/2	63,000/6	34	30
Particle Beam Bay, 2.65-GJ,/8	1/60	5d×440	5,600/1	17,000/2	30	30
Particle Beam Bay, 7.4-GJ,/9	1/60	4d×1,000	10,000/1	30,000/3	32	30
Particle Beam Bay, 12.81-GJ,/10	1/60	6d×1,000	15,000/2	44,000/4	33	30
Particle Beam Bay, 23.3-GJ,/11+	1/60	8d×1,000	21,000/2	63,000/6	31	30
Meson Gun Bay, 12.81-GJ,/12	1/60	6d×1,000 (!)	15,000/2	44,000/4	33	30
Meson Gun Bay, 23.3-GJ,/13	1/60	4d×2,000 (!)	21,000/2	63,000/6	31	30

100-Ton Bay Weapons

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Plasma Gun Bay, 14.9-GJ/9	1/60	4d×1,000	13,000/1	39,000/4	33	30
Plasma Gun Bay, 28.5-GJ/10	1/60	7d×900	20,000/2	60,000/6	34	30
Fusion Gun Bay, 46.7-GJ/11	1/60	9d×1,000	28,000/3	84,000/8	34	30
Fusion Gun Bay, 46.7-GJ/12+	1/60	7d×1,500	30,000/3	90,000/9	35	30
Particle Beam Bay, 5.34-GJ,/8	1/60	7d×400	7,900/1	24,000/2	31	30
Particle Beam Bay, 14.9-GJ,/9	1/60	5d×1,000	14,000/1	42,000/4	33	30
Particle Beam Bay, 28.5-GJ,/10	1/60	8d×1,000	22,000/2	66,000/7	34	30
Particle Beam Bay, 46.7-GJ,/11+	1/60	5d×2,100	30,000/3	90,000/9	35	30
Meson Gun Bay, 28.5-GJ,/12	1/60	8d×1,000 (!)	22,000/2	66,000/7	34	30
Meson Gun Bay, 46.7-GJ,/13	1/60	5d×2,100 (!)	30,000/3	90,000/9	35	30

Spinal Mounts

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Spinal P-Beam, 250-GJ/8	1/60	5d×2,000	54,000/5	160,000/16	36	30
Spinal P-Beam, 420-GJ/8	1/60	6d×2,000	70,000/7	210,000/21	37	30
Spinal P-Beam, 670-GJ/8	1/60	7d×2,000	88,000/9	260,000/26	38	30
Spinal P-Beam, 1-TJ/8	1/60	8d×2,000	110,000/11	330,000/33	38	30
Spinal P-Beam, 670-GJ/9	1/60	6d×3,000	97,000/10	290,000/30	38	30
Spinal P-Beam, 920-GJ/9	1/60	5d×4,000	110,000/11	330,000/33	38	30
Spinal P-Beam, 1.8-TJ/9	1/60	5d×5,000	160,000/16	480,000/48	39	30
Spinal P-Beam, 3.1-TJ/9	1/60	6d×5,000	210,000/21	630,000/63	40	30
Spinal P-Beam, 569.5-GJ/10	1/60	7d×3,000	98,000/10	290,000/29	36	30
Spinal P-Beam, 870-GJ/10	1/60	6d×4,000	120,000/12	360,000/36	38	30
Spinal P-Beam, 1.7-TJ/10	1/60	6d×5,000	170,000/17	510,000/51	39	30
Spinal P-Beam, 2.7-TJ/10	1/60	7d×5,000	210,000/21	630,000/63	40	30
Spinal P-Beam, 530-GJ/11	1/60	6d×4,000	100,000/10	300,000/30	38	30
Spinal P-Beam, 840-GJ/11	1/60	7d×4,000	130,000/13	390,000/39	39	30
Spinal P-Beam, 1.6-TJ/11	1/60	7d×5,000	180,000/18	540,000/54	39	30
Spinal P-Beam, 2.8-TJ/11	1/60	7d×6,000	230,000/23	690,000/69	40	30



Spinal Mounts (Continued)

Name	RoF	Damage	1/2D Range	Max Range	Acc	SS
Spinal Meson Gun, 820-GJ/10	1/60	5d×3,000 (!)	98,000/10	290,000/29	38	30
Spinal Meson Gun, 1.4-TJ/10	1/60	6d×3,000 (!)	130,000/13	380,000/38	38	30
Spinal Meson Gun, 2.3-TJ/10	1/60	7d×3,000 (!)	160,000/16	480,000/48	39	30
Spinal Meson Gun, 3.4-TJ/10	1/60	6d×4,000 (!)	200,000/20	600,000/60	39	30
Spinal Meson Gun, 670-GJ/11	1/60	6d×3,000 (!)	97,000/10	290,000/29	38	30
Spinal Meson Gun, 1.1-TJ/11	1/60	7d×3,000 (!)	120,000/12	360,000/36	38	30
Spinal Meson Gun, 2.3-TJ/11	1/60	9d×3,000 (!)	180,000/18	540,000/54	39	30
Spinal Meson Gun, 3.1-TJ/11	1/60	6d×5,000 (!)	210,000/21	630,000/63	40	30
Spinal Meson Gun, 570-GJ/12	1/60	7d×3,000 (!)	97,000/10	290,000/29	36	30
Spinal Meson Gun, 870-GJ/12	1/60	6d×4,000 (!)	120,000/12	360,000/36	38	30
Spinal Meson Gun, 2.1-TJ/12	1/60	8d×4,000 (!)	190,000/19	570,000/57	39	30
Spinal Meson Gun, 2.9-TJ/12	1/60	6d×6,000 (!)	220,000/22	660,000/66	40	30
Spinal Meson Gun, 870-GJ/13	1/60	7d×4,000 (!)	130,000/13	390,000/39	39	30
Spinal Meson Gun, 2.3-TJ/13	1/60	8d×5,000 (!)	210,000/21	630,000/63	40	30
Spinal Meson Gun, 2.9-TJ/13	1/60	7d×7,000 (!)	240,000/24	720,000/72	40	30
Spinal Meson Gun, 3.4-TJ/13	1/60	6d×8,000 (!)	280,000/28	840,000/84	40	30

Missiles

Name	DR	HEAT Damage	KK Damage
250mm Missile/7	1	6d×60 (10)	–
250mm Missile/8	20	6d×60 (10)	–
250mm Missile/9	25	6d×60 (10)	6d×100 (5)
250mm Missile/10	40	6d×60 (10)	6d×100 (5)
250mm Missile/11	80	6d×80 (10)	6d×100 (5)
250mm Missile/12	120	6d×80 (10)	6d×100 (5)
250mm Missile/13	210	6d×100 (10)	6d×100 (5)

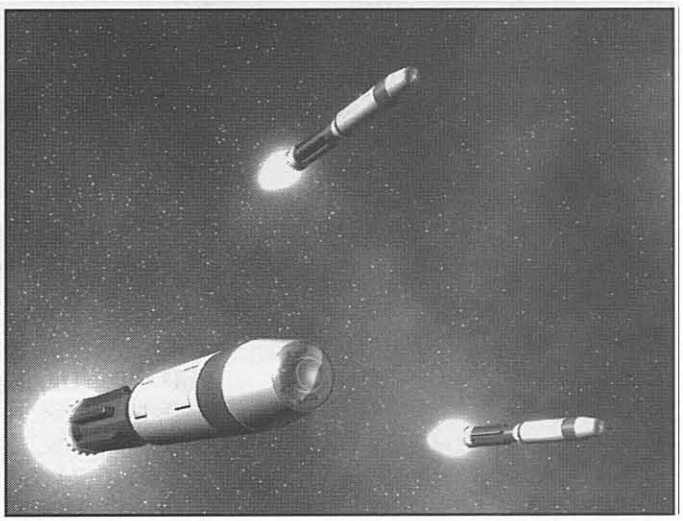
Name	DR	HEAT Damage	KK Damage
500mm Missile/7	1	5d×150 (10)	–
500mm Missile/8	60	5d×150 (10)	–
500mm Missile/9	65	5d×150 (10)	6d×300 (5)
500mm Missile/10	80	5d×150 (10)	6d×300 (5)
500mm Missile/11	300	6d×150 (10)	6d×300 (5)
500mm Missile/12	350	6d×150 (10)	6d×300 (5)
500mm Missile/13	400	6d×200 (10)	6d×300 (5)

Civilian Missiles

Name	DR	HEAT Damage	KK Damage
SIM-10 Missile	40	6d×60 (10)	6d×100 (5)
SIM-12 Missile	120	6d×80 (10)	6d×100 (5)

Deadfall Ordnance

Name	Damage	Skill	Cost
Lt. APDU SSM/10	6d×200 (3)	20	0.02
Lt. APSD SSM/11+	6d×240 (5)	23	0.02
Hv. APDU SSM/10	6d×200 (3)	20	0.10
Hv. APSD SSM/11+	6d×240 (5)	23	0.10
Lt. APDU GB/10	6d×310 (3)	20	0.03
Lt. APSD GB/11+	6d×340 (5)	23	0.02
Hv. APDU GB/10	6d×500 (3)	20	0.08
Hv. APSD GB/11+	6d×550 (5)	23	0.08
Lt. HEAT GB/10	5d×150 (10)	20	0.02
Lt. HEAT GB/11+	6d×150 (10)	23	0.02
Hv. HEAT GB/10	6d×200 (10)	20	0.07
Hv. HEAT GB/11+	6d×200 (10)	23	0.06



Notes

Abbreviations include *SSM:* Spike Submunition, *GB:* Glide Bomb, *APDU:* Armor-Piercing Depleted Uranium, *APSD:* Armor-Piercing Superdense, and *HEAT:* High Explosive Armor-Tapping. *Cost* is per complete missile. *Damage* is per missile for GBs, per submunition for SSMs. Each 250mm SSM carries seven submunitions, each 500mm 38. Also see pp. 52-54 for more information on how these function.

Nuclear Warheads: See p. 53 (and optionally, p. VE187) for damage and other considerations.

SATNUC Warheads: Each SATNUC submunition (seven per 250mm missile, 10 per 500mm) will attempt to attack a vehicle-sized target (size modifier +1 or more) within the burst radius of the round (1,300 yards for 250mm missiles, 3,400 yards for 500mm missiles). Each submunition rolls 3d vs. (warhead's TL + target's size modifier - IR cloaking) to hit. If successful, damage is 6d×2,000. Successful or not, all submunitions will explode on impact. Damage is 6d×200 to everything within the burst radius of the round, and 6d×20 to everything within twice its burst radius. Again, DR is squared against proximity blasts. (See p. VE193 for more information on SATNUCs.)

submersible option. Heavy compartmentalization in body. Roll stabilizers.

- **Hit Points:** Superstructure 876, Body 8,106.
- **Armor:** PD 4, DR 200 standard laminate.
- **Surface Features:** Basic chameleon system, basic sound baffling, electrified surface.
- **Vision:** No view. Vision is only available from the conning platform on the superstructure (if on surface) or via sensors.
- **Statistics:** Empty weight 47,201 pounds. Usual payload 8,879 pounds. Loaded weight 56,080 pounds (28.04 tons). Volume 3,500 cf. Submerged weight 218,750 pounds (109.38 tons). Size modifier +6. Price MCr2.416. Structural HT 12.
- **Water Performance:** Can float. Hydrodynamic drag 293. Aquatic motive thrust 72,000 pounds. Top speed 40 mph. wAccel 25 mph/s. wMR 0.75. wSR 6. wDecel 15 mph/s (27.5 mph/s). Draft 5.1 feet.
- **Submerged Performance:** Can submerge. Submerged hydrodynamic drag 363. Top speed 35 mph. uAccel 5 mph/s. Submerged draft 20 feet. Crush depth 8,400 yards.
- **Space Performance:** sAccel 1.3 G.

Starships

The Scout Fleet consists of an eclectic variety of highly specialized ships. These range from the *Suleiman*-class scout/courier and express boat, all the way up to *Ashanti High Lightning*-class frontier cruisers and *Kokirrak*-class dreadnaughts acquired as surplus from the Imperial Navy. This section covers some of the ships most likely to be encountered in IISS service.

New Modules

Scout Service ships have a number of special systems not often seen on merchant vessels or warships. In particular, the following types are referred to in the starship descriptions later in this chapter. The modules are described at TL12, but TL10 equivalents are given.

Communications Module: This module contains a single massive laser communicator, with 10 million miles transmission range (and 100 times that in reception). There are three hardened, high-capacity mainframe computers, 50 terabytes of hardened data storage with double backups, and an energy bank with enough capacity for five hours of full operation. The module is designed for high redundancy, with the three computers all checking each other's results and the three sets of data stored in different locations. The laser communicator is used for its very high bandwidth. Even with the usual high level of encryption and error-correction on the signal, the module can upload or download its entire storage capacity in about an hour. The module takes up 12 spaces. Mass: 138.1 tons. Cost: MCr3.830. Crew requirement: 0-1. The equivalent TL10 module has the same size and cost, but carries only 500 gigabytes of data.

Logistics Module: Starships intended for long-range operation need to be self-sufficient, able to manufacture their own spare parts from found materials. The logistics module contains two "complete" workshops, with all the tools needed for the Armoury, Electronics, Engineering, and Mechanic skills at the module's TL. Up to 6 people can work in the module at the same time. The module takes up 5 spaces. Mass: 30.0 tons. Cost: MCr0.12. Crew requirement: 0 (ship's engineers and support crew use the module on an occasional basis). The equivalent TL10 module has the same size and cost.

Probe Module: This module is designed for the launch and control of long-range probes (see p. 33). An IISS long-range probe is essentially a standard 0.15-ton missile, with the warhead replaced by some kind of instrument package. A probe module consists of three launch systems, each including a breech-loading launch tube, a very-long-range laser communicator, a computer terminal and a roomy crew station for probe control. There is storage space for 20 probes and 40 modular instrument packages. Depending on the exact load, a full complement of probes and modules would mass about 3 tons and cost about MCr2. The module takes up 1 space in the ship. Mass: 1.2 tons (empty). Cost: MCr0.033 (empty). Crew requirement: 0-3. The equivalent TL10 module has the same size and cost, although different probes may be used.



Survey Module: A survey module contains four sets of astronomical instruments, four high-resolution planetary survey arrays, a mainframe computer, eight roomy crew stations with computer terminals, and a "survey center" with sophisticated holographic-projection devices (built as a 100-sf "holoventure zone"). This allows the survey specialists to create visualizations of incoming data. Use of the survey module is detailed in Chapter 7. The module takes up 4 spaces in the ship. Mass: 5.4 tons. Cost: MCr7.63. Crew requirement: 4-8. The equivalent TL10 module masses 7.4 tons and costs MCr12.66.

Armor	F	RL	B	T	U
Body:	6/16,000 L	4/6,000 L	4/6,000 L	4/6,000 L	4/6,000 L
Tur:	4/16,000 L	4/6,000 L	4/6,000 L	4/6,000 L	
Cup:	6/16,000 L	4/6,000 L	4/6,000 L	4/6,000 L	

Weaponry

2×190mm Tactical ML [Tur:F] (18 each) +2.
4×511-MJ Light Fusion Gun [Tur:F] (64 each) +2.
2×PD Xaser [Cup:F] (388 each) +2.

Equipment

Body: Advanced Avionics, Airlock, 19 Heavy Energy Banks, Safety, 2×HUDWACs. *Tur:* Large AESA, Large PESA. *Cup:* Discharger Pack w/ 20 reloads, 14 Heavy Energy Banks, Large AESA, Large PESA, 3×Small PESAs (R, L, B), HUDWAC.

Statistics

Size: 12′×10′×15′ *Payload:* 4.1 tons *Lwt.:* 203.5 tons
Volume: 3.5 dtons *Maint.:* 4.3 hours *Price:* MCr22.7

HT: 8 *HP:* 3,600 [Body] 2,400 [Tur] 1,500 [Cup]

aSpeed: 600 *aAccel:* 4 *aDecel:* 16 *aMR:* 4 *aSR:* 5
CG lift 2.3 Gs.

Design Notes

Frames are extra-heavy for 2-dton sloped body, 1-dton turret, and 0.5-dton sloped cupola. Fusion plant is Core plus 30 Power. Base price is MCr21.4 prior to purchasing typical missile load described in main text. Missiles are all stored in the turret.

STARSHIPS

Delivering the troops to the fight is one of the most difficult tasks that the Navy faces. To help accomplish this mission, the Navy operates specialized troop transports.

Note that the following troop complements assume a war footing. The troops (and, for that matter, the Navy crews) will be crammed elbow to elbow, clearing just enough space for some exercise and training areas that must be carefully rotated among the platoons and squads.

In peacetime or for long patrols, two to four times as many transports would be used for the same number of troops.

NEW STANDARD MODULES

These modules are used in the following ships, but are not described in ***GURPS Traveller***. Many debuted in other ***GURPS Traveller*** supplements.

Brig: This is an ordinary stateroom equipped with reinforced walls and door (DR 200), restraints, and a high-security alarm and observation system. It normally holds 1-2 people. Up to 50 could be crammed in for a limited time, but this will overwhelm the two-person life support. A ship or starport with one or two brigs usually will monitor them from the bridge. A larger number of brigs probably will have its own dedicated security station.

Bunkroom: Bunks for 16 personnel, with life support, under very cramped conditions. Imperial protocol is to load only four passengers per bunkroom, except for missions of very short duration or emergencies.

External Cradle: These are placed on the hull of a starship or starport. Each module clamps 125 standard tons of another vehicle onto the hull. Modules can be combined to form larger cradles, or installed in 0.5-displacement ton increments for smaller versions. Vehicles carried this way aren't counted against the ship's internal spaces, but must still be included in any jump-drive requirements. They are not protected by the ship's armor.

Gym: An exercise room. Several may be fitted together to form a single, larger facility.

Hall, Bar, or Conference Room: A large room with tables. Usable as a restaurant, bar, conference room, etc. It can comfortably accommodate 100 people per module (smaller lounges and conference rooms are included in stateroom volume). Weight and cost include furnishings.

Morgue: Space for 20 battledress suits and accessories such as flight packs, with room for maintenance and loading.

Shooting Range: A target practice facility, armored so as to protect the rest of the ship, and including pop-up targets and the like. Each module provides 50 downrange yards for eight shooters; several may be combined for longer ranges or more shooters.

Stage: A 20′×20′ stage area with high ceilings, usable for dancing, plays, nightclub acts, and so on. Includes sophisticated lighting and sound systems. Normally attached to a hall or theater containing the audience.

MODULES

Type of Module	Spaces	Mass	Cost (MCr)	Crew
Brig (1-2 occupants)				
TL10	4	11.4	0.052	†
TL12	4	5.6	0.03	†
Bunkroom				
TL10	4	4.8	0.018	0
TL12	4	1.92	0.018	0
External Cradle	1*	12.5*	0.25*	0
Gym	2.5	0.5	0	0
Hall, Bar, Conference	10	0.2	0.003	†
Morgue	1	28.75	0	0
Shooting Range	10	10	0.15	†
Stage	16	0.5	0.004	†
Tactical Command Center	4	3	2.8	†
Theater	20	2.1	0.015	†

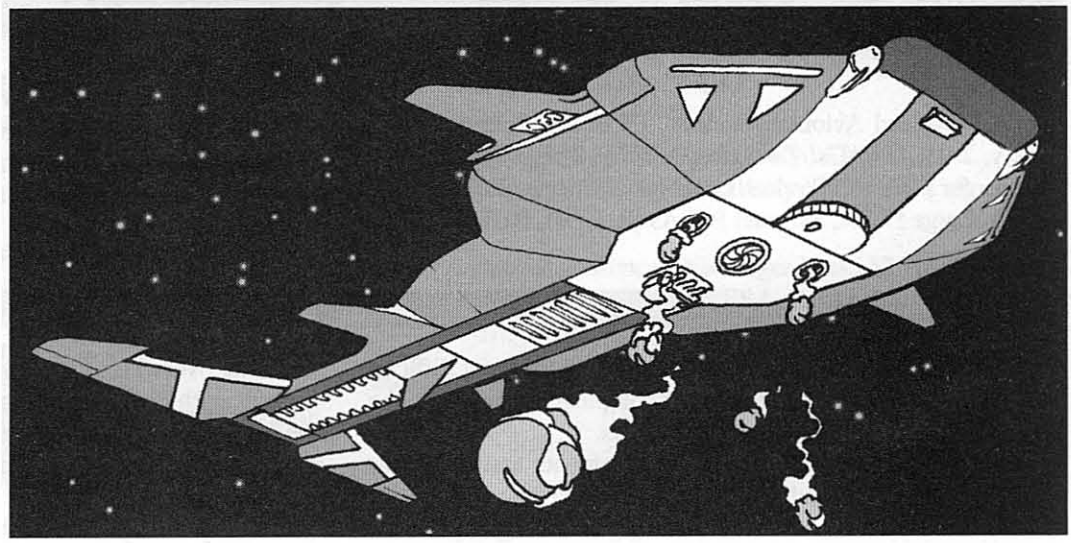
* per 125 standard tons of ship to be carried. External cradles count against the turret-mounted weapons limit at a rate of 3 modules per 1 turret.

† varies and/or GM's discretion. Many of these modules are passenger services, and usually the GM can safely rule that a military ship's standard complement fills the crew needs.

Tactical Command Center: TL12 operations room for 10-20 people. Includes fire direction center with mapping and display tables, dozens of cameras for video conferencing, and hardened Complexity 8 macroframe and 10 terminals.

Theater: A small auditorium with 100 roomy seats, a large holoprojector, and an operator's workstation. Can be used for entertainment or as a briefing or situation room. A stage is not included.

Keith-Class 30,000-ton Transport (TL12)



These giant vessels received their baptism of fire in the Fifth Frontier War, and performed far beyond all expectations. Shipyards are turning out new *Keiths* on a regular schedule, and the High Command hopes to be able to drastically reduce the Army's reliance on the older classes of cold-sleep "reefer" transports.

The heart of the transport is the mammoth central core, almost 900' long. Each of these huge transports can ferry a complete Army light infantry brigade, or a grav tank brigade and a rapid interface battalion.

All but one grav tank battalion of the brigade's vehicles are preloaded onto the transport's *Nakerkh* landers (see p. 97). The *Keith's* spacedock contains room for that grav tank battalion and any one other battalion's vehicles, in case some sort of mid-flight loading adjustment need be made (see below). Often this extra spacedock capacity is used to carry extra supplies.

Imperial doctrine calls for the *Keith* to close to within high orbit of the target world. When carrying a light infantry brigade, the six externally carried landers then disengage and begin a very high-speed descent with the command, three infantry, artillery, and support battalions. The grav tank squadron descends on its own power, since each *Intrepid* is a smaller, tougher target than a *Nakerkh*. When carrying a grav tank brigade, the non-armor battalions descend normally. The brigade commander decides whether to deploy the two *Nakerkh*-loaded grav tank squadrons rapidly in the landers or more safely in the usual dispersed fashion (by simply deploying from the still-moored lander in orbit). The third armor squadron must deploy on its own (or wait to board a returning lander).

Certain circumstances require deploying the landers farther out. In these cases, the undeployed armor squadron waits for a returning lander (or the brigade commander may choose to delay the landing of another battalion, often his support unit).

Keiths are crowded when filled with a full brigade, but the troops have space to train and prepare for their assignments.

The crew includes the captain, pilot, navigator, three sensors operators, three communications specialists, computer officer, 145 engineers, 21 medics, 125 gunners, and 80 frozen watch; the total of 210 staterooms houses up to 395 additional officers and the 230 bunkrooms house up to 3,398 additional NCOs and enlisted.

The *Keith*-class transport features heavy compartmentalization, sealed body, basic stealth, and basic emission cloaking.

Subassemblies: USL Hull +14, 120 Turrets +5, 3 Bays +7.
P&P: 5,100 Maneuver, 1,500 Jump.
Fuel/End: 12,000 Fuel.
Occ: See above. **Cargo:** 6,000 dtons.

Armor	**F**	**RL**	**B**	**T**	**U**
All:	4/2,500	4/2,500	4/2,500	4/2,500	4/2,500

Weaponry

100 Turrets w/ 3×Lasers (1 each) +2.
20 Turrets w/ 3×Sandcasters (200 each) +2.
3×Meson Gun Bays (1 each) +2.

Equipment

Modules: Hardened Command Bridge, Engineering, 30 Low Berths (120 tubes), 60 Utility, 20 Sick Bay, 4 Drop Capsule Launchers, 50 Capsule Racks (800 capsules), 120 Morgues (2,400 battledress suits), 2 Conference Rooms, 4 Stages, 10 Theaters, 5 Shooting Ranges, 7 Tactical Command Centers, 15 Gyms, 1,200-ton Spacedock (holds 600 dtons), 110-space Vehicle Bay (for 2 launches and 3 ship's boats), 926-space Meson Screen (DR 40,506), 10 Nuclear Dampers. *Hull:* 6×9,250-ton external cradles.

Statistics

Dim.: 125'×125'×960' *Payload:* 77,003 tons *Lwt.:* 163,581 tons
Volume: 30,000 dtons *Maint.:* – *Price:* MCr9,618

HP: 540,000 [Hull] 1,200 [each Tur] 9,750 [each Bay]

sAccel: 3.12 Gs/5.89 Gs empty *Jump:* 4 *aSpeed:* –

Design Notes

Data is for ship loaded with grav tank brigade. Lift infantry brigade is Lwt. 157,332, sAccel 3.24 Gs. Price does not include small craft or landers.

Grav Vehicle Modular Design

Sternmetal Horizons grav vehicle dealerships Imperium-wide are pleased to offer our innovative "Vehicle Builder" program where you design the customized Sternmetal Horizons grav vehicle of your choice. Select from an array of pre-designed component plug-ins and let Sternmetal's autofacs do the rest! Your custom-built modularized vehicle ready within 48 hours. (Some exceptions for large or milspec orders. Inquire first.)



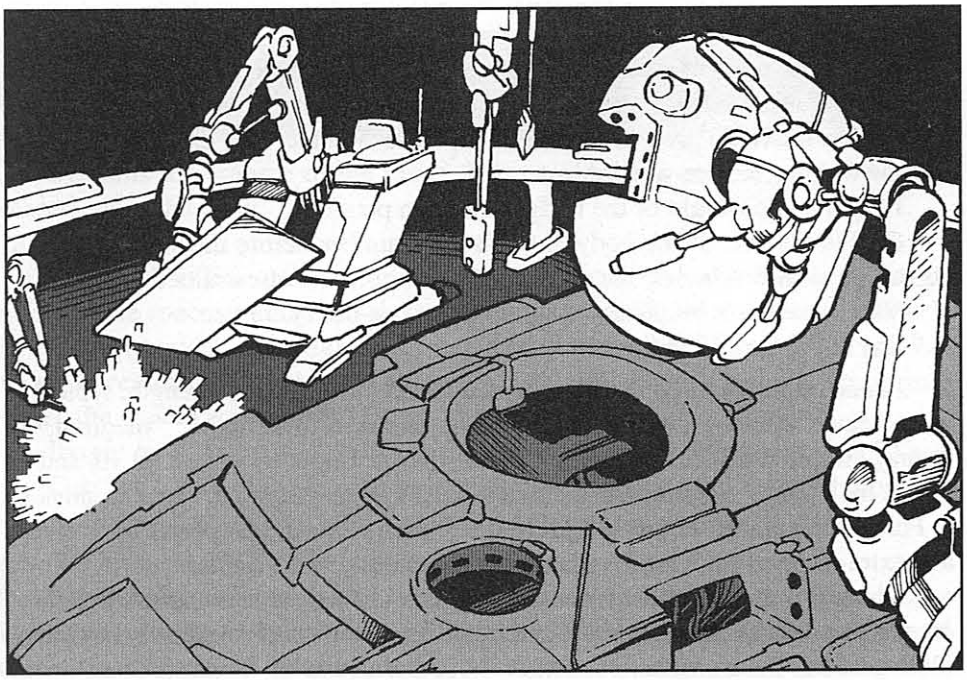
Design Sequence

This design system provides rules for the modular design of grav vehicles at TL9 to TL12, using a method similar to that of the starship design rules in ***GURPS Traveller.*** It is not intended to replace the far more detailed rules found in ***GURPS Vehicles***. Instead, the design rules presented here represent a simplification of ***GURPS Vehicles*** optimized for the ***Traveller*** setting.

To design a vehicle, follow the steps below and the instructions in each step, noting down design choices and keeping track of the cumulative weight (in lbs.), cost (in KCr, units of thousands of credits), and power requirements (in kilowatts, or kW).

Step 1: Concept and Tech Level

Decide what the purpose of the vehicle will be, and whether it will be built at TL9, TL10, TL11, or TL12.



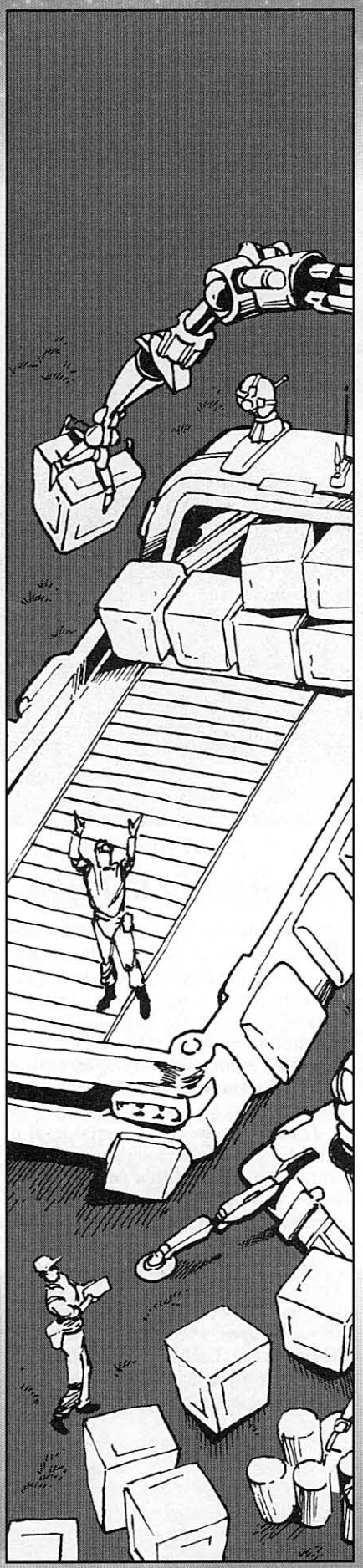
TL of Grav Vehicles

TL9 is the earliest tech level at which modern grav armor is mass-produced, and the TL at which grav vehicles replace most helicopters and tracked AFVs on the battlefield. Some interstellar mercenary units and many PDFs are equipped at TL9, as are the Sword Worlds and some Zhodani Army units.

TL10 is the average Imperial level of technology. New technology used in grav vehicles includes meson comms, X-ray lasers, and nuclear dampers. Most star merc forces are TL10, as is most of the Zhodani Army.

TL11 is an above average Imperial level of technology. At TL11, sensor, thruster, and fusion-power technology reaches its apex, while fusion guns replace plasma guns. The majority of Imperial Army formations are equipped with TL11 vehicles, as is the elite Zhodani Consular Guard.

TL12 is the peak of Imperial technology. Meson accelerators are now small enough for practical use in artillery grav vehicles. The Imperial Marines and a few Imperial Army units are equipped at TL12.



Step 2: Vehicle Body

First, pick one of these three configurations:

Normal: An ordinary vehicular body, typical of grav trucks, air/rafts, and some light armored vehicles.

Sloped: Body with radical front sloping, typical of the majority of grav tanks and grav APCs.

Streamlined: Body with very good streamlining, typical of speeders, fast-attack sleds, and sub-orbital interceptors.

Then select the body size from the table below. Size is given in displacement tons (dtons). As a rough guide, most air/rafts and grav cars are 0.1 to 0.5 dtons, a typical utility grav truck or g-carrier is 0.5-2 dtons, a light tank or APC is 0.5-1.5 dtons, a medium tank or APC is 2-4 dtons, while a heavy APC or tank is 6-15 dtons. Sizes can *substantially* decrease as TL advances (components get smaller).

VEHICLE BODYS

			weight						
DTons	Area	VSP	TL9	TL10	TL11	TL12	Cost	HP	Size
0.1	100	10/8	600	400	300	200	25/50	600	+2
0.15	125	15/12	750	500	375	250	31.25/62.5	750	+2
0.2	150	20/16	900	600	450	300	37.5/75	900	+2
0.3	175	30/24	1,050	700	525	350	43.75/87.5	1,050	+3
0.5	250	50/40	1,500	1,000	750	500	62.5/125	1,500	+3
0.7	300	70/56	1,800	1,200	900	600	75/150	1,800	+4
1	400	100/80	2,400	1,600	1,200	800	100/200	2,400	+4
1.5	500	150/120	3,000	2,000	1,500	1,000	125/250	3,000	+4
2	600	200/160	3,600	2,400	1,800	1,200	150/300	3,600	+4
3	800	300/240	4,800	3,200	2,400	1,600	200/400	4,800	+5
4	1,000	400/320	6,000	4,000	3,000	2,000	250/500	6,000	+5
5	1,200	500/400	7,200	4,800	3,600	2,400	300/600	7,200	+5
6	1,500	600/480	9,000	6,000	4,500	3,000	375/750	9,000	+5
10	2,000	1,000/800	12,000	8,000	6,000	4,000	500/1,000	12,000	+6
15	2,500	1,500/1,200	15,000	10,000	7,500	5,000	625/1,250	15,000	+6

Volume is the volume in cubic feet.

DTons is the volume in starship "displacement tons" (spaces) of 500 cf. Thus, a 0.5-dton vehicle has a volume of 250 cubic feet.

Area is the surface area in square feet.

VSP is the number of "vehicle spaces" of components that can be installed. The number after the slash applies to streamlined or sloped vehicles, which have less usable internal space. One VSP is equal to 5 cubic feet, exactly 1% of the volume of a "space" on a starship.

Weight is the weight of the body's frame in pounds.

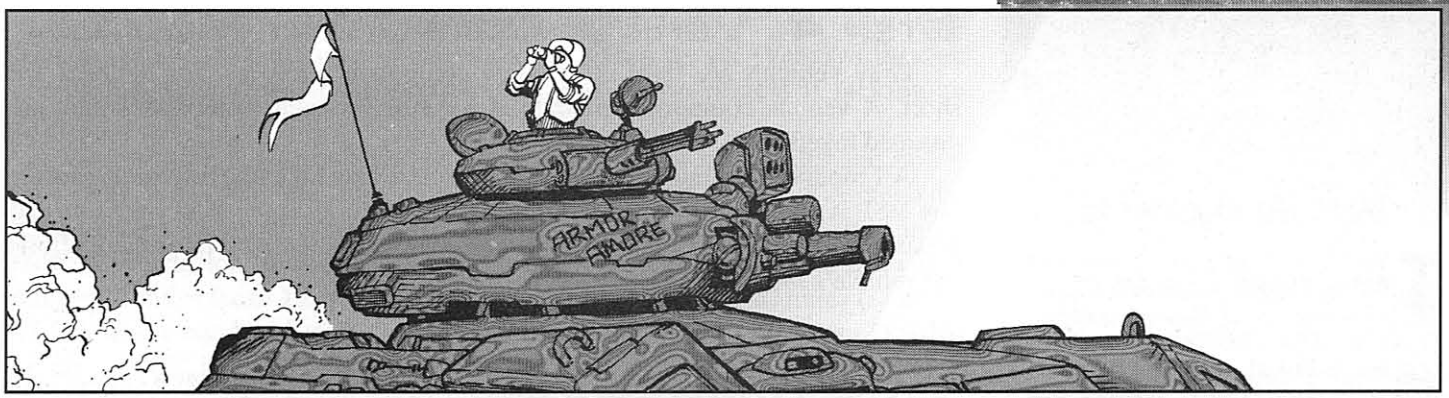
Cost is the cost of the body, in KCr. The number before the slash applies to normal or sloped vehicles; the number after it applies to streamlined vehicles.

HP are the body hit points, assuming an extra-heavy frame.

Size is the Size Modifier of the body.

Frame Options: The table assumes an extra-heavy frame strength, typical of most heavy tanks and APCs. This may be changed to a "light," "medium," or "heavy" frame if desired. For a light frame, divide weight by 4, cost by 10, and hit points by 8. For a medium frame, divide weight by 2, cost by 5, and hit points by 4. For a heavy frame, divide weight by 1.5, cost by 2.5, and hit points by 2. Heavy and extra-heavy frames are very common in grav armored vehicles.

Compartmentalization: For extra weight and cost, vehicles can have "heavy" compartmentalization (masses 10% of body mass) or "total" compartmentalization (20% of body mass). Either costs KCr 0.005 per pound of weight added. A compartmentalized vehicle is harder to depressurize and less vulnerable to fires.



Step 3: Add a Turret

A turret is optional, but is useful for mounting weapons or sensors. Several turret sizes are available. Select one or more turrets, but all turret volumes combined must be smaller than the body volume.

Decide whether the turret is attached to the top or underside of the vehicle. (A turret may be mounted atop another larger turret; the upper turret is then known as a cupola.) Turrets of 0.05 dton or larger size may also be *sloped*, sacrificing volume for an angular front face offering better defense.

VEHICLE TURRETS

			weight						
DTons	Area	VSP	TL9	TL10	TL11	TL12	Cost	HP	Size
+0.01	18	1	108	72	54	36	4.5/9	108	0
+0.02	30	2	180	120	90	60	7.5/15	180	0
+0.05	60	5/4 (-1)	360	240	180	120	15/30	360	+1
+0.1	100	10/8 (-2)	600	400	300	200	25/50	600	+2
+0.15	125	15/12 (-3)	750	500	375	250	31.25/62.5	750	+2
+0.2	150	20/16 (-4)	900	600	450	300	37.5/75	900	+2
+0.3	175	30/24 (-6)	1,050	700	525	350	43.75/87.5	1,050	+3
+0.5	250	50/40 (-10)	1,500	1,000	750	500	62.5/125	1,500	+3
+0.7	300	70/56 (-14)	1,800	1,200	900	600	75/150	1,800	+4
+1	400	100/80 (-20)	2,400	1,600	1,200	800	100/200	2,400	+4
+1.5	500	150/120 (-30)	3,000	2,000	1,500	1,000	125/250	3,000	+4
+2	600	200/160 (-40)	3,600	2,400	1,600	1,200	150/300	3,600	+4
+3	800	300/240 (-60)	4,800	3,200	2,400	1,600	200/400	4,800	+5
+4	1,000	400/320 (-80)	6,000	4,000	3,000	2,000	250/500	6,000	+5
+5	1,200	500/400 (-100)	7,200	4,800	3,600	2,400	300/600	7,200	+5

DTons is the volume of the turret. It is expressed as an addition to the displacement of the body.

Area is the area of the turret in square feet.

VSP refer to the spaces available in the turret. The number after the slash refers to the spaces available if the turret was sloped. The number in parenthesis is the spaces which are *subtracted* from the body for the turret rotation mechanism. *Exception:* in the case of a cupola, subtract spaces from the turret atop which the cupola is mounted.

Weight by TL is the weight of the turret in pounds, varying at different TLs.

Cost is the cost of the turret on an unstreamlined or sloped vehicle before the slash, or cost on a vehicle that is streamlined after the slash.

HP is the hit points of the turret.

Frame: As with the body, the turret is assumed to have an extra-heavy frame, but can be given a light, medium, or heavy frame to reduce weight and cost, at the expense of fewer hit points. Multipliers to weight, cost, and hit points are identical; see p. 108.

Vehicle Crew Requirements

A grav vehicle in combat should have the following crew (civilian needs will vary, of course):

Pilot: A vehicle requires one pilot with Piloting (Contragrav) skill. On vehicles with only one crew member, he may also act as gunner and commander, but will usually be too busy to be completely effective.

Commander: Most combat vehicles have a commander, who is in charge of the vehicle. Useful skills are Tactics and Leadership; the commander usually also handles sensors and communications using Electronics Operation (Sensors) and (Communications) and may act as gunner for a secondary weapon.

Gunner: An armed vehicle should have one gunner per weapon intended to be used simultaneously. Note that vehicles may have multiple weapons, but only use a couple at a time. The relevant skill usually is Gunner.

Less common crew requirements include:

Fire Direction Centers: A vehicle with an FDC should carry two fire-control officers per battery it will coordinate at once. They need Electronics Operation (Communications) skill.

Medics: Ambulances (vehicles with stretchers and/or ESUs) will usually have one or more often two medics assigned to them. The most useful skills are Diagnosis, First Aid, and Electronics Operation (Medical).

Nuclear Damper Operator: A vehicle with a nuclear damper should have one damper operator with Electronics Operation (Force Shields) skill.

Workshop Technicians: Vehicles with a workshop should have one mechanic or technician per workshop module, with appropriate skills. Otherwise, technicians are rarely necessary as (unlike starships) grav vehicles usually operate near garages or logistics bases. Even so, military vehicle crews often have modest skill levels in Armoury, Electronics Operation, and Mechanic skill to perform routine maintenance.

Vehicle Systems

This section provides additional details of some avionics, sensor, and crew/passenger module components.

AESA, PESA, Radscanner: These sensors are described on p. GT162. Aside from being shorter ranged, vehicular sensors are identical. Ranges of AESA and PESA sensors are multiplied by 10 if used to detect targets in space. Note that if AESAs (active sensors) are turned on, they can be used as range finders and provide a +2 bonus to hit.

Computer: All vehicles incorporate computers and computer terminals for each crew member. See p. GT161 for computer rules. Basic avionics systems do not use *hardened* computers; they are vulnerable to electromagnetic pulse from nuclear weapons. See ***GURPS Space*** or ***GURPS High-Tech*** for EMP rules.

Crashweb: An advanced "smart" airbag that reduces whiplash damage suffered by seated vehicle occupants involved in crashes or collisions, providing an effective DR equal to its TL against such damage. An activated crashweb will prevent the user doing anything until he gets free (DX-2 roll to do so each turn). If a collision is expected and the occupant is not worried about surviving it, he can turn off the crashweb.

Full Life Support: Provides air, water recycling, and temperature control (but not food) for as long as the vehicle has power.

GPS: A global positioning system receiver, designed to receive real-time satellite navigation data from friendly GPS satellite constellations (if any have been installed). Normal version accurate to +/-25 yards, military version to +/-5 yards.

IFF: An "identify friend or foe" system intended to prevent fratricide, warning the user if he is targeting or detecting a friendly target (provided that individual or vehicle has IFF as well). Brilliant missiles and drones are normally programmed to attack anything that does not give a proper IFF response.

Inertial Navigation System: Gyroscopic system used for "blind" navigation and fixing the vehicle's position. Adds (TL-2) to Navigation skill.

Continued on next page . . .

Step 4: Vehicle Component Modules

Grav vehicles are built in "vehicle component modules," or modules for short. A vehicle component module is a set of vehicular components that are grouped together.

All modules are rated for the internal space they take up (in vehicle spaces; one VSP is 5 cubic feet), along with their weight (in pounds), cost (in KCr), and power (in kW). Select precisely a number of modules with a total space that fills the vehicle's internal space.

Internal Space

A vehicle's internal space is equal to the vehicle body's VSP (minus any subtraction for turret rotation). In addition, components may also be placed in turrets/cupolas, which have their own VSP. If the vehicle has one or more turrets or cupolas, be sure to note which components are there, rather than in the body.

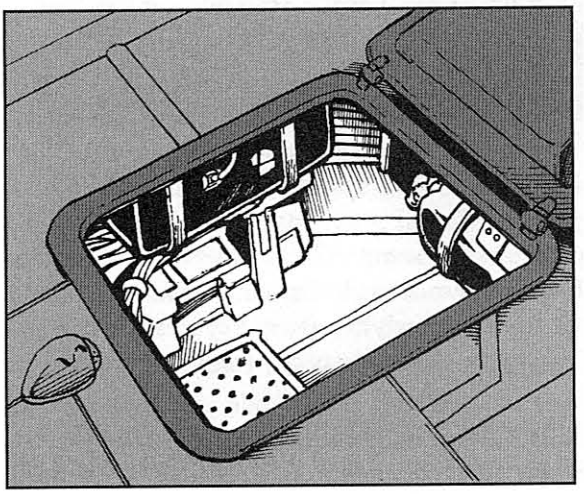
Required Modules

Certain modules are required for all vehicles. Specifically, every vehicle must take one or more Crew or Exposed Crew modules, one or more Thruster (or Ducted Fan) modules, and one or more Light, Medium, Heavy, or Extra Heavy CG modules. Vehicles must also have sufficient power modules (NPU Core, NPU Power, or Fusion Power) to power their other modules.

Lift: Grav vehicles are buoyed up by contragravity (CG) systems, allowing them to fly without wings or rotors, regardless of a planet's atmosphere or lack of one. CG modules are rated for how much *lift* they provide. To fly, the vehicle's final loaded weight (its basic weight in 1 gee times the local gravity) must not exceed contragrav lift. For most civilian vehicles, a single Light CG module is more than enough to ensure all necessary lift in most gravities, but if a great deal of armor or heavy cargo is added, a vehicle may need one or more Medium, Heavy, or Extra-Heavy CG modules.

Module Descriptions

These modules are commonly installed in grav vehicles. (For more details of Avionics and Crew/Passenger modules, refer to the *Vehicle Systems* sidebar).



Advanced Avionics: Instruments and electronics typical of heavy grav tanks or command vehicles. It includes computerized controls and three hardened microframe computers (complexity of TL-4), one scrambled extreme-range radio, four scrambled long-range radios, four long-range laser comms, and (at TL10+ only) one medium-range meson comm. Navigation systems are two terrain-following radars, a military global positioning system (GPS), two inertial navigation systems, and two IFFs. Sensors consist of a band of four PESAs with 5-mile range (scan 15) around the vehicle and a radscanner with range of 100 miles (scan 23, TL9), 200 miles (scan 25, TL10), or 1,000 miles (scan 29, TL11+).

Airlock: A pressurized chamber sealed with hatches or iris valve large enough for one man to enter or exit without spilling its air. (Vehicles that are compartmentalized will only depressurize part of the vehicle if lacking an airlock.)

Basic Avionics: Instruments and electronics typical of air/rafts and utility grav sleds. It has computerized controls, a mini computer with TL-5 complexity, a long-range radio, a terrain-following radar, a transponder, a GPS, and a radar/laser detector. Sensors are a low-res imaging radar (non-targeting) with a range of 5 miles (scan 15, TL9), 10 miles (scan 17, TL10), or 20 miles (scan 19, TL11+) and a band of four PESAs around it with a range of 0.5 miles (TL9-10) or one mile (TL11+).

Cargo: Five cubic feet of cargo space. Multiple cargo modules can be combined to form a single larger cargo hold. Cargo modules with fractional spaces are also possible.

Crew: A crew station is necessary for each desired crew member. It includes a roomy seat (cramped if used by someone in battledress) with a crashweb, and a computer terminal. It is enclosed within the vehicle and has life support (one man-day's worth at TL9-10, indefinite at TL11+).

Diagnosis Table: A computerized table equipped with scanners that adds +5 (TL9) or +6 (TL10+) to a medic's Diagnosis skill when examining a patient lying on it.

Discharger Pack: A pack of five dischargers for defensive launch of smoke, hot smoke, anti-laser "prism" aerosol grenades, or decoys such as chaff. Additional Reload Packs may be carried with 20 reloads. Effects are identical to the appropriate warheads (see sidebar, pp. 116-117); the grenades can be fired to burst at a point within 20 yards, affecting a burst radius of 20 yards for smoke/hot smoke/prism or 100 yards for chaff.

Drone Missile Bay: A small vehicle bay for launch of contragrav drone missiles (see sidebar, p. 123).

Ducted Fan: A low-tech alternative to reactionless thrusters, this is a vectored-thrust ducted fan assembly similar to that used in hovercrafts. It generates 1,500 lbs. (0.75 tons) of vectored thrust. It is only effective in a thin (or denser) atmosphere. It is sometimes used at TL8-9 in preference to reactionless thrusters for vehicles that do not have to operate in all planetary environments.

ESU: An emergency support unit capable of sustaining life in one mortally wounded stretcher casualty. (See p. VE68 for detailed rules.) Requires a Stretcher module.

Exposed Crew: A crew station is necessary for each desired crew member. This includes a roomy seat (cramped if someone in battledress is using it) with a crashweb, and a computer terminal. It is in an open-topped compartment exposed to the elements with partial side and no overhead cover.

Exposed Passenger: A roomy passenger seat (cramped for battledress) for one person in an open compartment (see *Exposed Crew*, above).

External Cradle: A large exterior grapple for attaching other craft to the exterior of the vehicle. The cradle is sized per ton of loaded mass of the other craft, so to carry a 5-ton vehicle, mount five external cradle modules. Do not forget to include the weight of the carried craft in the final loaded weight of the vehicle!

Extra Life Support: Increases the duration of the limited life support in the TL9-10 crew and passenger modules. Each Extra Life Support module adds 2.5 man-days of life support at TL9, or five man-days at TL10. Not needed at TL11+.

Extra-Heavy CG: A very powerful contragravity unit (suitable for a heavy grav tank) with 480,000 lbs. (240 tons) of lift.

Vehicle Systems

[Continued]

Laser Comm: A line-of-sight laser communicator; see p. GT160.

Limited Life Support: If the vehicle is sealed up, this system provides air for one man-day per crew or passenger module so equipped. (For example, if a vehicle has two crew and six passenger modules, it would have eight man/days of air, enough for one person to breath for eight days, or 16 people to breathe for 12 hours).

Low-Res Imaging Radar (no targeting): A radar capable of discerning and displaying the general shape of an object detected. It works like an AESA functioning in radar mode. It does not provide a targeting bonus for weapons.

Meson Comm: A meson communicator; see p. GT160.

Radio: A radio communicator. A long-range radio has (at TL10+) a 500,000-mile range, a very-long-range radio has 5 million-mile range, while an extreme-range radio has a 50 million-mile range. Radio use can be detected and located via radscanner; vehicles often transmit on lower-power, shorter-range settings as a result. *Scramblers* are transmission encryption systems (basically unbreakable at TL9+). A scrambled radio signal can still be detected, but its content is unknown.

Radar/Laser Detector: Warns if vehicle is being scanned by radar or ladar (from AESA) at up to twice the system's range, but, unlike a radscanner, does not locate the scanning system.

Terrain Following Radar: A radar or ladar that is slaved to altitude controls, assists the pilot in flying at high speed just above the ground without accident or fatigue. The ladar/radar pulses are very short range and (unless someone is directly below the vehicle) will not be detected by radscanners.

Transponders: An electronic beacon. If turned on, it automatically identifies the vehicle to allied civilian traffic-control systems or military sensors.

Gunnery Made Easy

A grav armor gunner firing at a target will have a *lot* of modifiers. To prevent play bogging down as the player or GM adds everything up, it is a good idea to calculate each gunner's adjusted skill beforehand with the weapons they are likely to use. Adjusted skill should be recorded as two numbers separated by a slash: the first for snap shots, the second for aimed shots. For snap shots, adjusted skill is equal to Gunner skill plus any bonus for Targeting programs used. For aimed shots, adjusted skill is equal to the snap shot adjusted skill plus half the weapon's Acc bonus (which may not exceed the gunner's base skill before targeting programs are added).

Accuracy is halved to reflect battlefield realities, as described on p. VE182. This can be ignored, if desired.

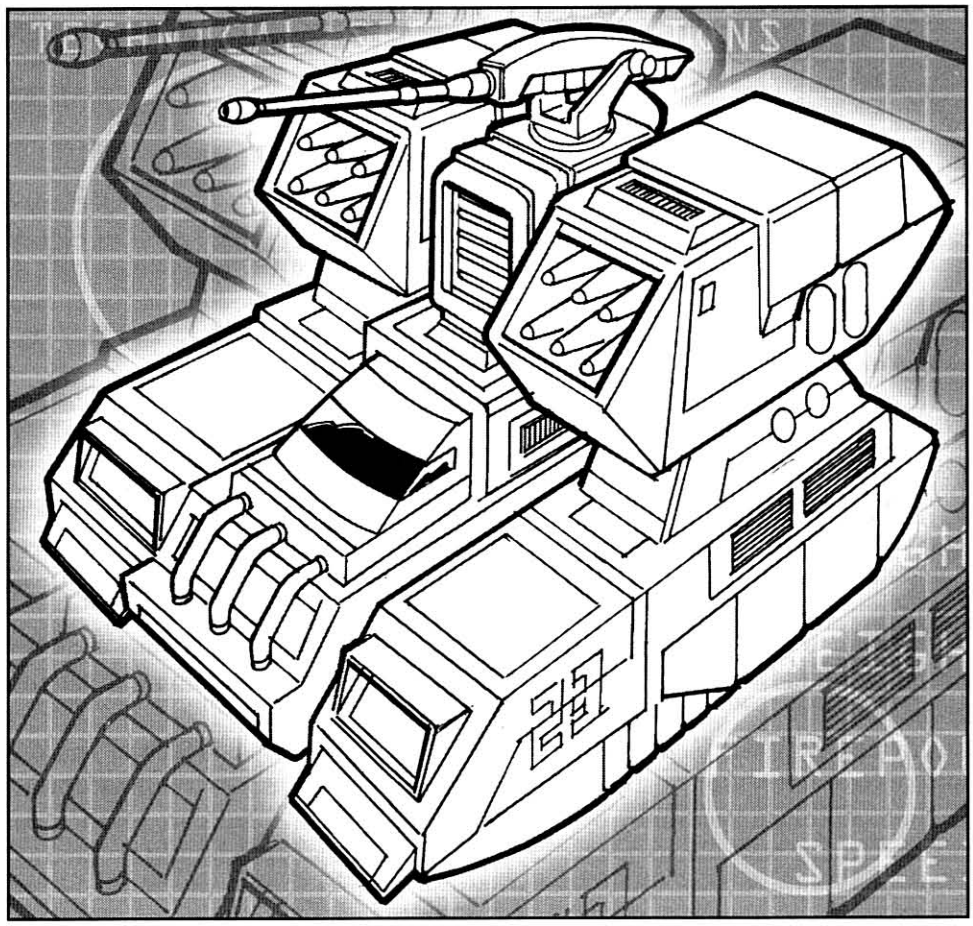
Example: *Sergeant Vlad Yakovich is a gunner on the Ace of Swords, a grav tank. He has Gunner (Beams)-14. Using the tank's 945 MW plasma cannon (Acc 24) and targeting program bonus (+7) his adjusted skill when firing a snap shot is 14 (skill) +7 (program) = 21. With an aimed shot, it is 21 + the Accuracy bonus. The plasma cannon has Acc 24, halved to 12; this Acc does not exceed Vlad's basic skill 14, so added to 21 it gives an adjusted skill of 33. Record this as (945 plasma) 21/33.*

Battlefield Scale

Various grav tanks can fly at 600 mph and feature weapons that can reach out to destroy targets miles away. For this reason, neither the one yard to a hex scale suggested in ***Basic Set*** nor the 5 yards/hex scale for ground vehicle combat (see ***GURPS Vehicles***) are easy to use. GMs are encouraged to either use abstract resolution (keeping track of ranges and locations on paper or in their heads) or to adopt a larger scale if using a hex grid.

As an alternative, a suggested hex map scale of 50 yards to a hex is recommended. At this scale, a small platoon level action can be played out on three or four ordinary ***GURPS*** hex grid maps (such as those included with the ***Basic Set.***). If using large-scale maps for combat, remember that ***GURPS*** is not a war game, and the emphasis should always be on the actions of the PCs. The GM should describe events from the perspective of the player-characters – use hex maps as spatial aids, not as a substitute for graphic description of what the troopers sense, hear, smell, and see.

If utilizing a 50-yard hex in combat, a quick way to calculate ranges is to mentally knock off two zeros, then double the remainder. Thus, a weapon with 1/2D range of 700 yards becomes 1/2D range 14 hexes.



FDC: A fire direction center with specialized map displays and systems for coordinating artillery fire. Adds a +4 bonus to any indirect fire plotted through it. An FDC requires minimum crew of two per battery it directs. Install the crew modules in addition to the FDC.

Fusion Core: The heart of a fusion reactor. It does not generate power, but one Fusion Core is a necessary prerequisite for installing any number of Fusion Power modules. The fusion reactor will function for 200 years on internal fuel.

Fusion Power: Generates 125 kW (TL9) or 625 kW (TL10+) of power output. The vehicle must have a reactor core, but only needs one such core regardless of how many Fusion Power modules are installed.

Heavy CG: A powerful contragravity unit with 230,000 lbs. (115 tons) of lift, suitable for a medium tank or APC.

Heavy Energy Bank: A set of 25 rechargeable E power cells storing 6,750 megawatt-seconds (MWS) at TL9, 9,000 MWS (TL10), 11,250 MWS (TL11), or 13,500 MWS (TL12). One MWS is 1,000 kWS.

Jammer: A battlefield or tactical-area electronic warfare device, this module affects a 60-mile radius and subtracts 12 from all rolls for radio communication and radar (not ladar) detection or lock-ons in the area, whether by friend or foe. It is only effective vs. radars of equal or lower TL. Location of the jamming field (but not what is in it) is detected automatically by any radar within 20 times the jamming range.

Large AESA: An active electromagnetic sensor array with active targeting (+2 bonus to hit) and search radar, imaging radar, and ladar capabilities – see p. GT161. The AESA must be mounted to look in one direction; for complete coverage, place it in a turret or install one facing in each compass direction. Its range is 750 miles (scan 28) at TL9, 1,500 miles (scan 30) at TL10, or 3,000 miles (scan 32) at TL11+.

Large PESA: An advanced passive electromagnetic sensor array including thermal imaging, passive radar (detection of low-level millimetric-band emissions), and a low-light television camera (see p. GT161). Range is 500 miles (scan 27) at TL9, 1,000 miles (scan 29) at TL10, or 2,000 miles (scan 31) at TL11+. The PESA must be mounted to look in one direction; for complete coverage, place it in a turret or install one facing in each compass direction.

Light CG: A modest contragrav generator with 30,000 lbs. (15 tons) of lift, suitable for a light grav vehicle.

Light Energy Bank: Contains a bank of five rechargeable E cells storing 1,350 MWS (TL9), 1,800 MWS (TL10), 2,250 MWS (TL11), or 2,700 MWS (TL12).

Medium CG: A contragrav generator with 80,000 lbs. (40 tons) of lift, suitable for a heavy grav truck, light tank, or APC.

Improved Avionics: Instruments and electronics typical of the majority of light and medium grav armor. It has computerized controls, one hardened computer (complexity of TL-5), one scrambled very-long-range radio, a laser comm, four long-range radios, two terrain-following radars, one military GPS, two inertial navigation systems, and two IFFs. Its sensors consist of a radscanner with a range of 10 miles (TL9), 20 miles (TL10), or 100 miles (TL11+) and a band of four PESAs with range of 1 mile (scan 11, TL9-10) or two miles (scan 13, TL11+) around it.

NPU Core: The core of a Nuclear Power Unit (an advanced radiothermal generator or micro-fusion reactor) plus power-generating components. Its output varies by TL; see *Vehicle Module Table*, pp. 114-115. The NPU will function for 1 year (TL9), 2 years (TL10), 5 years (TL11), or 10 years (TL12) on internal fuel before requiring replacement.

NPU Power: A vehicle that possesses an NPU Core that requires additional power output may add extra NPU Power units to the core. See above for duration. Output varies by TL; see *Vehicle Module Table*, pp. 114-115.

Nuclear Damper: This is a nuclear damper (p. GT51) capable of being focused to prevent nuclear fission or fusion detonations. Multiple modules increase area of effect; maximum range is a 5-mile radius times number of modules installed. It will require one crew member serving as the nuclear damper operator. It is available only at TL11+. See also *Nuclear Dampers*, sidebar, p. 122.

Open Cargo: Ten cubic feet of cargo space, in an open cargo bed (see *Exposed Passenger*, p. 111). Multiple cargo modules can be combined to form a single larger cargo hold, or fractional modules can be installed.

Passenger: A roomy passenger seat (cramped if used by battledress) with a crashweb and (optionally) a window. It is enclosed within the vehicle, and has life support (one man-day's worth at TL9-10, indefinite at TL11+).

Safety: Contains a fire-suppression system that senses fires and then floods the burning compartment with inert gas to extinguish them.

Small AESA: As Large AESA, but with a range of only 75 miles (scan 22, TL9), 150 miles (scan 24, TL10), or 300 miles (scan 26, TL11+). This is typical of systems mounted on light or medium grav armor. Civilian vehicles typically rely on the sensors built into the Basic Avionics module, instead.

Small PESA: As Large PESA, but range is only 50 miles (scan 21) at TL9, 100 miles (scan 23) at TL10, or 200 miles (scan 25) at TL11+. As with Small AESA, typical of light or medium grav armor, but most civilian vehicles just rely on Basic Avionics.

Stretcher: As per Passenger module, but contains a stretcher pallet (removable) for one casualty instead of a seat.

Other Attack Roll Modifiers

Vehicles take the usual modifiers for ranged fire (see p. B201). In addition, the following will often apply:

AESA: If activated, an AESA feeds targeting data to the gunner and thus adds +2 to hit with all weapons built into the vehicle.

Firing while Moving: As all built-in vehicular weapons are fully stabilized, vehicles suffer no penalties for firing "on the move." However, someone firing a hand weapon from a moving grav vehicle will suffer a -1 penalty, or a -5 if trying to hit another flying target.

Terrain and Concealment: Ground targets, or a grav vehicle that has landed or is flying "nap of the earth" can be concealed by terrain or poor visibility. Typical modifiers are:

- Target obscured by light woods -2
- Target obscured by dense forest or jungle -4
- Target in built-up area -4
- Target obscured by smoke, hot smoke, or prism -5
- Target has instant chameleon system -3, or -6 if stationary

Fire beyond 1/2D Range: Fully stabilized vehicle-mount weapons do not drop to zero Accuracy when performing direct fire at targets beyond 1/2D range. Unless noted, all weapons are fully stabilized.

Battlefield Scale Speed/Range Table

If using battlefield scale, use this table for speed/range modifiers. It is identical to the table on p. B201, except that distances are divided by 50 for ease of use. Equivalent distances are shown in yards for reference.

Speed/Range Modifier	*50-yd hexes*	*Linear yards*
-6	0	20
-8	1	45
-10	2	100
-11	3	150
-12	4	200
-13	5-6	300
-14	7-9	450
-15	10-14	700
-16	15-20	1,000
-17	21-30	1,500
-18	31-40	2,000
-19	41-60	3,000
-20	61-90	4,500
-21	91-140	7,000
-22	141-200	10,000

Indirect Fire

Indirect fire means the gunner is firing projectiles in a ballistic arc, like an artillery shell. Only guns or unguided rockets may use indirect fire. (Guided missiles may be fired in a high ballistic arc with similar effects – see *Inertial Guidance*, sidebar, p. 121). The target need not be in line of sight, provided the weapon has the range to shoot over it. The firing weapon should have a universal or high-angle mount, but in a pinch any gun can be sited for indirect fire by having it fire while on an upward slope or the like. Indirect fire multiplies the range of a gun by 2.5 and a rocket or missile by 5.

To attempt indirect fire, the gunner must be able to observe the target, or be in communication with a forward observer or fire direction center that can provide accurate target coordinates. Indirect fire is aimed at an area, not an individual. Indirect fire relies on having accurate map references and knowing the relationship of the weapon to the target area. For proper accuracy a vehicle should be fixed and sited – that is, stopped with its position precisely located on maps or via navigation systems. It takes a vehicle one minute to do this after moving, or 10 seconds if it has an inertial navigation system.

It takes a forward observer 2d+5 seconds to relay coordinates (2 seconds if datalinked) assuming absolutely ideal conditions. This assumes he is already in contact and the battery commander is ready and waiting for him to transmit the coordinates. In practice, a "call for fire" will usually take more like 10-60 seconds. After receiving coordinates or observing the target for himself, the gunner can fire an aimed shot at the target. Only range modifiers (not size or speed) apply as the target is firing at an area. Indirect fire is *always* treated as "beyond 1/2D range." For this reason, weapon Accuracy does not come into play. Instead, these special modifiers apply:

- Fire direction center coordinating +4
- Firing weapon fixed and sited +2
- Relying on observer to see target 0*

* Plus a bonus equal to the amount by which the observer makes a Forward Observer skill roll (see p. B243; use IQ-5 if the observer lacks this skill). If directing fire from multiple weapons on the same target, roll only once.

If a hit is achieved, it means the shot fired came in over the target hex (or burst above it, as appropriate). Given that weapon Accuracy bonuses are not added, the more likely result is a miss. If the attack missed, it will land elsewhere; use the *scattering* rules, p. VE176.

Continued on next page . . .

Thruster: A reactionless thruster system with vectored thrust that generates 160 lbs. (0.08 tons) vectored thrust at TL8, 1,600 lbs. (0.8 tons) at TL9-10, or 4,000 lbs. (2 tons) at TL11+.

Winch: A motorized winch. It can lift one ton (ST 100) at up to 4 yards/second or tow much greater weights.

Workshop: A portable repair shop, including spares and tools, allowing one person to work on one of Armoury, Electronics, Engineer, or Mechanic skill tasks. Each type of skill task requires its own shop.

Sensor Note: Sensors (except radscanners, which are omnidirectional) are assumed to face forward out of the turret or body unless otherwise specified. If installing PESAs or AESAs to face a different direction, specify this.

VEHICLE MODULES

Type of Module	TL	VSP	Wt.	KCr	Pow.
Adv. Avionics	9	9	2,201	711	-3.46
Adv. Avionics	10	6	1,416	597	-3.46
Adv. Avionics	11	5	1,233	384	-3.46
Adv. Avionics	12	5	1,205	333	-3.46
Airlock	7+	10	500	1	neg.
Basic Avionics	9	0.2	42.5	25.7	-2.54
Basic Avionics	10	0.1	31	22.8	-5.04
Basic Avionics	11+	0.1	30	22.3	-5.04
Cargo	0	1	0	0	0
Crew	9	9	165	1.2	-0.5
Crew	10	9	105	0.95	-0.5
Crew	11+	9	75	0.95	-0.1
Diagnosis Table	9+	16	250	12	neg.
Discharger Pack	6+	1	100	0.5	0
– 20 reloads	6+	1	100	(0.4)	0
Drone Missile Bay	12	0.16	7.5	0.01	0
– Heavy Drone Missile	12	–	(66)	(19.7)	0
Ducted Fan	8+	1	252	18	375
ESU	9	1	100	15	-1
ESU	10+	1	100	7.5	-1
Exposed Crew	9	5	65	0.7	neg.
Exposed Crew	10+	5	55	0.45	neg.
Exposed Passenger	10+	5	45	0.2	0
External Cradle	1+	0.8	200	2	0
Extra-Heavy CG	9+	1*	250	2.9	-480
Extra Life Support	9	1	250	1.25	0
Extra Life Support	10	1	250	2.5	0
FDC	7+	40	2,000	250	neg.
Fusion Core	9	160*	20,000	5,000	0
Fusion Core	10	16*	2,000	300	0
Fusion Core	11+	16*	2,000	150	0
Fusion Power	9	1*	125	25	+125
Fusion Power	10	1*	125	6.25	+625
Fusion Power	11+	1*	125	3.125	+625
Heavy CG	9+	0.5*	125	1.65	-230
Heavy Energy Bank	8+	1	500	50	0
Imp. Avionics	9	1	254	130	-0.58
Imp. Avionics	10	0.5	155	88.7	-0.58
Imp. Avionics	11+	0.5	152	88.2	-0.58
Jammer	9	2	500	100	-600
Jammer	10+	1	250	50	-300

Type of Module	TL	VSP	Wt.	KCr	Pow.
Large AESA	9	5	1,125	625	-187.5
Large AESA	10	5	1,125	500	-375
Large AESA	11+	5	1,125	437.5	-750
Large PESA	9	4	1,000	1,600	0
Large PESA	10	4	1,000	1,200	0
Large PESA	11+	4	1,000	1,000	0
Light CG	9+	0.1*	25	0.65	-30
Light Energy Bank	8+	0.2	100	10	0
Medium CG	9+	0.2*	50	0.9	-80
NPU Core	9	1*	250	50	+102.5
NPU Core	10	1*	250	50	+205
NPU Core	11	1*	250	50	+580
NPU Core	12+	1*	250	50	+1,205
NPU Power	9	1*	250	50	+125
NPU Power	10	1*	250	50	+250
NPU Power	11	1*	250	50	+625
NPU Power	12+	1*	250	50	+1,250
Nuclear Damper	11	32	8,000	4,000	-1,000
Nuclear Damper	12	16	4,000	2,000	-1,000
Open Cargo	0	1	0	0	0
Passenger	9	9	145	0.75	-0.5
Passenger	10	9	95	0.75	-0.5
Passenger	11+	9	65	0.7	-0.1
Safety	7+	1	200	5	0
Small AESA	9	0.5	112	187.5	-18.75
Small AESA	10	0.5	112	162.5	-37.5
Small AESA	11+	0.5	112	100	75
Small PESA	9	0.5	100	400	0
Small PESA	10	0.5	100	400	0
Small PESA	11+	0.5	100	280	0
Stretcher	9	9	155	0.75	-0.5
Stretcher	10	9	105	0.75	-0.5
Stretcher	11+	9	75	0.7	-0.1
Thruster	8	1*	120	2.4	-80
Thruster	9-10	1*	120	2.4	-80
Thruster	11+	1*	120	12	-200
Winch	8+	1	250	1	-0.5
Workshop	5+	27	3,000	4	-0.5
– if electronics	5+	22	1,500	7	-0.5

Module Type: The type of component module.

TL: Minimum tech level at which the module becomes available. Vehicle designs *may* mix modules of various TLs.

VSP: The vehicle spaces the module takes up. An * after spaces indicates that the module may only be installed in the body, not in turrets.

Wt. The weight of the module in pounds.

Cost: The cost of the module in KCr.

Pow: The power requirement (if a minus sign) or output (if a plus sign) of the component. The vehicle should be designed with a neutral or positive power output. Neg. means negligible power – as long as the vehicle has any power plant, the component will work.

Values in parenthesis are consumables; they are not counted toward empty weight and base cost of vehicle, but do count toward loaded weight or equipped cost.

Indirect Fire

[Continued]

Once an initial shot has fallen, fire can be corrected if the fall of shot can be observed. This takes the same time as aiming at a new target, but is made at +4 bonus for the first shot, +8 for the second, and a further +2 for later ones, up to a limit of the weapon's Accuracy.

Meson Guns: Meson guns can be used for indirect fire, but in this case the gun is firing *through* the ground or other obstacles. When a meson gun fires at an unseen target spotted by another observer, treat as indirect fire. The weapon's range is not increased, but no special mounting is required.

Open Cargo, Exposed Crew, and Passenger Seats

These provide no overhead cover, so cargo and occupants will also take damage (separately from the vehicle and unprotected by its PD/DR) if exposed to indirect fire, explosion, ICM, SATNUC, or (except from below) fragmentation damage. This includes "backblast" from plasma and fusion gun hits against the vehicle.

Angle of Fire

This depends on how the weapon was mounted; see *Weapon Module Descriptions*, p. 116. Usual mounts in this system are:

Universal Casemate in Body: A casemate is a trainable mount installed in a vehicle's body. A weapon in a casemate has a 180° vertical and horizontal arc of fire; i.e., it can be swiveled to fire up to 90° to either side, or up and down off the direction it is facing (usually forward).

Universal Casemate in Turret Atop Body, or Cupola Atop Turret: The turret can be rotated to fire in any direction except immediately below the vehicle. (And a grav vehicle can fire below itself by tilting nose downward.) Reverse this if the turret/cupola is mounted below the vehicle. Turrets are power-driven and can rotate in under a second, but the turret's facing at the end of the turn should be specified. Normally one crew member (gunner or commander) will control the rotation.

High Angle Casemate in Body/Turret: As above, but can't depress. Can only fire at targets above the vehicle, or in indirect fire.

Warheads

Guns, rockets, and missiles may fire munitions with warheads whose effects require various special rules. Warheads are indicated on weapon tables by cryptic abbreviations for the ammunition used, such as HE or ICM.

HE: High explosive warheads inflict explosive concussion effects as per p. B121. The area of large explosions is greater: if damage is 120d or more (e.g., 6d×20), the increment at which damage is quartered is 4 rather than 2 yards. If 1,200d or more, it is 8 yards. If 12,000d or more, it is 16 yards, etc. Sealed vehicle armor protects vs. explosive concussion damage with the square of its DR, but occupants of open-crew, open-passenger, or open-cargo spaces are unprotected and take damage separately. The warhead also scatters fragments over the area; see p. B122. Fragment damage for HE warheads is given in brackets after concussion damage, for example, 6d [2d] means 6d explosive concussion damage and 2d cutting fragmentation damage.

HEC: High explosive concussion warheads use the same rules as HE, but have a light non-rigid casing that does not inflict fragmentation damage.

HEAT: High explosive anti-tank warheads are shaped charges that inflict full damage on anyone directly hit (sealed armor is *not* squared) plus armor protects at one-tenth DR. In addition, they have the same effect as an HEC warhead on anyone nearby (sealed armor DR *is* squared against this secondary damage).

CHEM: Chemical warheads burst and spread whatever chemical agent (options include smoke, nerve gas, etc.) they were filled with over the radius of effect listed under damage. CHEM rounds usually persist for 300 seconds divided by wind speed in mph. As dumping offensive chemicals on targets is normally frowned on, the most popular CHEM warheads are:

Continued on next page . . .

Weapon Module Descriptions

The following weapon-module options are commonly available for grav vehicles at the TLs described. All weapons are fully stabilized, allowing fire while moving.

AutoRLs and MRLs are in high-angle mounts, and drills in standard mounts. All other weapons except the meson accelerator are in universal mounts (if in turrets or cupolas) or casemate mounts (if installed in the body). As with sensors, a weapon is assumed to face forward out of the turret or body in which it is placed. If installed to face a different direction, specify this.

Guns

4mm VRFGG: A very rapid fire Gauss gun. Its typical role is anti-personnel, but it can chew up poorly armored vehicles and has some utility as a point-defense weapon. Available in TL9 and TL10 versions. Use Gunner (Gauss gun) skill.

20mm ETC CG: A TL9 electrothermal chaingun ("ETC" guns use an electric charge to boost the efficiency of a chemical propellant). This is a typical auto-cannon designed for engaging infantry and light armor, normally firing armor-piercing discarding sabot (APDS) ammo. Use Gunner (Cannon) skill.

75mm EMC: A TL10 75mm electromagnetic ("Gauss") cannon firing depleted uranium (TL10) or hyperdense (TL11) darts at very high velocities. It is an alternative to a medium fusion cannon, with better penetration but a slower rate of fire. Use Gunner (Railgun) skill.

80mm RF Howitzer: A TL10 light rapid-firing electromagnetic gun-mortar artillery piece used for direct or indirect fire support. Use Gunner (Mortar) skill.

80mm 6-barrel Massdriver: A large six-barrel electromagnetic cannon. The Imperial Army calls its version the "Solar Wind." Use Gunner (Railgun) skill.

All guns also require ammunition modules. Anti-blast magazines are available for the 80mm howitzer and massdriver to reduce risk of ammunition explosions. If so, one should be installed per 200 howitzer or 39 mass-driver rounds carried.

Artillery Rocket Launchers

These are missile launchers mounted on high angle mounts for indirect fire. Along with meson accelerators, they are the mainstay of the Imperial Army's artillery batteries.

A frequent tactic is to precede bombardment with a lead volley of missiles with hot smoke, prism, and chaff warheads to degrade the effectiveness of point defense. Depending on guidance systems, following missiles' accuracy may suffer as well.

AutoRL: The automatic rocket launcher is a magazine-fed autoloading missile launcher designed for rapid sustained missile fire. The example included is the 160mm AutoRL built to fire the 160mm "Sunray" missile (the standard Imperial Army artillery missile). Anti-blast magazines are available for it; install one per eight missiles.

MRLs are artillery multiple rocket launchers with 20 (200mm) or 36 (160mm) launch tubes, some or all of which can be fired simultaneously in a devastating barrage. The disadvantage is that it takes a long time to reload them. MRLs are in high-angle mounts, suitable only for indirect artillery fire (see *Indirect Fire* sidebar, pp. 114-115).

All rocket launchers require ammunition modules. Use Gunner (Rocket launcher) if firing unguided rockets, or Gunner (Guided missile) if firing guided missiles.

Tactical Missile Launcher

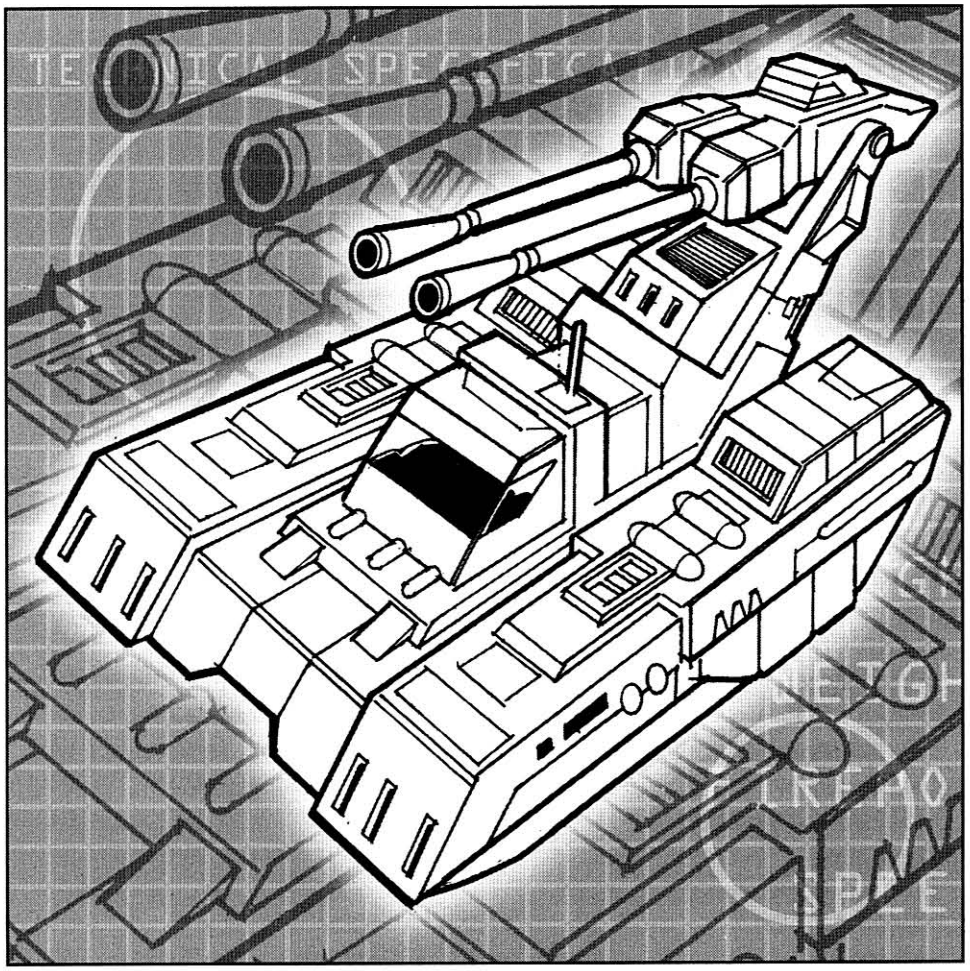
The TML is a standard direct-fire tactical missile launcher weapon. It requires an ammunition module, and needs Gunner (Guided missile) skill to fire.

Lasers and X-Ray Lasers

All lasers and X-ray lasers use Gunner (Beam) skill.

Laser Drill: A 2-megajoule rainbow laser energy drill used for mining operations or as a cutting torch for quickly opening up damaged vehicles to rescue their personnel.

PD Laser: These are rapid-fire "rainbow" (multi-frequency) laser weapons designed to shoot down incoming missiles or shells in point defense, but also effective against other lightly armored targets.



PD Xaser: A PD laser using a more powerful X-ray laser beam.

AD Laser, AD Xaser: A long-range "rainbow" laser or X-ray laser intended for theater aerospace defense against orbital bombardment, long-range missiles, and approaching aerospace craft.

Plasma and Fusion Guns

These high-energy weapons are the standard armament of grav AFVs, as their combination of high penetration and explosive area effect makes them ideal for engaging both point and area targets. Use Gunner (Beam) skill.

Rapid-Fire Plasma: Light weight, rapid-pulse energy weapons that fulfill a role similar to the 20mm autocannon. Their high rate of fire makes them good for killing infantry and intercepting missiles. They are often mounted on grav APCs.

Warheads

[Continued]

- *Smoke:* Obscures the area with dense but harmless chemical smoke. Infrared (included in PESA) and radar (in AESA) can see through it; otherwise, there is a -5 to vision and attack rolls. Takes five seconds to form.
- *Hot Smoke:* As smoke. Also impairs IR and thermograph sensors (including PESA). Lasts half as long as normal smoke.
- *Prism:* Prismatic anti-laser aerosol smoke. Same effect as ordinary smoke, but forms instantly and the shimmering cloud is impenetrable to TL7-9 lasers (including weapons, ladar, laser comms, etc).
- *Blackout:* Dense opaque cloud that combines effect of prism and hot smoke, with *double* penalties to normal vision.

CHAFF: Conductive strips that confuse radar returns. Covers a radius five times greater than that listed for a normal CHEM round. Gives a -10 penalty on radar detection into or through it, but only vs. systems of the same or a lower TL. Persists half as long as a CHEM round.

ICM: Scatters explosive bomblets over the listed radius, doing 6d explosive and 4d cutting fragment damage everywhere. Also, roll 3d for everything important in the area, and on a roll of (5+Size Modifier) or less a bomblet scores a direct hit. Use the same damage, but armor protects at one-tenth DR due to its shaped charge.

ICMTDX: An ICM variant replacing shaped charges with bomblets filled with altitude-fused gravitationally polarized two-dimensional explosive (the TDX described on p. T:SM67). The explosion has a normal radius but occurs in a flat plane, with the bomblets detonating at variable altitudes 2'-4' off the ground! Everyone in the area takes 6d×2 explosive and 4d cutting fragmentation.

SATNUC: An ICM round that scatters small nuclear bomblets! Generally, only interstellar governments will possess these. See pp. VE192-193 for the full, complex effects, or just assume everything in the burst radius takes 6d×200 explosive damage (6d×20 to twice the radius). The ground underneath the burst radius will also be contaminated with 50 rad/day of radiation (10/day out to twice the radius).

Drone Warhead, 160mm: A bus missile that will break up to release seven microdrones. It is designed for light anti-armor and anti-battledress roles, providing the mobile equivalent of land mines. See p. 122 for drone rules.



Light, Medium, and Heavy Plasma: Powerful plasma cannons usually installed as the main turret weapon of light, medium, and heavy grav tanks. They have a slower rate of fire than rapid-pulse weapons, but are more devastating.

Fusion: More powerful fusion guns of all types replace plasma guns at TL11+.

Meson Guns

Meson guns are the ultimate artillery weapons, but do not become compact enough for practical vehicular use until TL12. Use Gunner (Beam) skill.

10-GJ Meson: The standard TL12 battlefield meson accelerator.

WEAPON MODULES

Guns

Type of Module	TL	VSP	Weight	KCr	PPS
20mm ETC chaingun	9	0.6	144	15	0.12
1,250 rds. APS	9	0.4	200	12	0
4mm VRFGG	9	0.2	46.4	26.3	0.13
12,000 rds. APS	9	0.05	(25)	(1.5)	0
4mm VRFGG	10	0.25	46.4	13.3	0.13
12,000 rds. APS	10	0.05	(25)	(1.5)	0
75mm electromag cannon	10	33	8,160	586	95
45 rds. APFSDSDU	10	1	(495)	(68)	0
80mm RF howitzer	10	2	464	54.1	0.96
200 rds. HE	10	1	(500)	(12*)	0
anti-blast magazine	11	–	125	1.25	0
80mm 6-barrel massdriver	10	101.4	25,344	2,554.4	115.2
39 rounds HE	11	1.5	(750)	(5.8)*	0
anti-blast magazine	7	–	125	1.25	0

Launchers

Type of Module	TL	VSP	Weight	KCr	PPS
200mm MRL	9	12	2,580	60.55	0
20 rockets	9	16	(4,000)	(156/64*)	0
20 missiles	9	16	(4,000)	(796/64*)	0
200mm MRL	10	12	2,580	43.175	0
20 rockets	10	16	(4,000)	(156/64*)	0
20 missiles	10	16	(4,000)	(596/64*)	0
190mm TML	11	2.6	640	34.4	0
6 missiles	11	4.8	(1,200)	(201/6.6*)	0
anti-blast magazine	11	–	600	6	0
160mm AutoRL	10	3.7	915	14	0
8 missiles	11	12.4	(2,425)	(160/5.25*)	0
8 stealth missiles	11	12.4	(2,425)	(1,373/5.25*)	0
anti-blast magazine	7	–	1,250	12.4	0
160mm MRL	10	18.4	4,200	30	0
36 stealth missiles	11	44	(11,000)	(6,180/23.5*)	0
36 missiles	11	44	(11,000)	(722/23.8*)	0

Lasers

Type of Module	TL	VSP	Weight	KCr	PPS
Rainbow Laser Drill	9	23	0.09	6.45	4.5
PD Laser/9	9	1	240	24.65	3.6
PD Xaser/10	10	2	400	123	6
PD Xaser/12	12	1.5	320	29.2	3.84
50-MJ AD Laser	9	97	4,830	236	112.5
360-MJ AD Xaser	10	43	10,720	1,873	900

Plasma Guns

Type of Module	TL	VSP	Weight	KCr	PPS
141-MJ Lt. Plasma Gun	9	14	3,520	384	281.25
562-MJ Md. Plasma Gun	9	38	9,440	985	1,125
878-MJ Hv. Plasma Gun	9	59	14,560	1,500	1,757
10-MJ RF Plasma Gun	10	4.5	1,120	75	20
540-MJ Lt. Plasma Gun	10	18	4,480	952	1,080
945-MJ Med. Plasma Gun	10	30	7,520	782	1,800
1.35-GJ Hvy. Plasma Gun	10	45	11,200	2,177	2,700

Fusion Guns

Type of Module	TL	VSP	Weight	KCr	PPS
10-MJ RF Fusion Gun	11	4.5	1,120	31	20
511-MJ Lt. Fusion Gun	11	11	2,700	465	1,432
2.05-GJ Hvy. Fusion Gun	11	71	17,600	1,801	4,010
708-MJ Lt. Fusion Gun	12	24	5,920	634	1,416
1-GJ Md. Fusion Gun	12	34	8,320	867	2,000
2.3-GJ Hvy. Fusion Gun	12	77	19,200	1,932	4,600

Meson Accelerators

Type of Module	TL	VSP	Weight	KCr	PPS
10-GJ Meson Gun	12	308	77,000	1,770	20,000

Module Type, TL, Spc., Weight, Cost: As for p. 115. Values in parenthesis are ammunition costs and weights; they are not counted toward empty weight and base cost of vehicle but do count toward loaded weight or equipped cost. For missiles and rockets, two costs are given: the first is the cost of the missile/rocket body, the second the warhead; the latter cost may vary by ammo type.

* *Varies by ammo type:* select from HE or HEC (×1 cost), HEDP or HEAT (×1.5 cost), ICM (×3 cost), ICM TDX (×12), or CHEM (varies: ×1 for chaff or smoke, ×2 for prism or hot smoke). If 80mm RF, may also use solid (×0.5 cost) or APFSDSDU (×6 cost). If missiles/rockets, may also use SATNUC (×100 cost) or (for 160mm) APDU (×1.5 cost) or drone (no "warhead" cost, but add cost of seven microdrones).

PPS: The power requirement in MWS for a single shot. Thus, a weapon firing at RoF 20 (for instance) would multiply the PPS by 20. The power is drained from Energy Banks, requiring that the vehicle have Energy Banks installed. Power plants can recharge Energy Banks.

Features, Upgrades, and Options

These systems do not take significant space but may add extra expense. They can also easily be retrofitted.

Emergency Lights and Siren: Typical of police sleds, fire engines, and ambulances. KCr0.05.

Genius Option: Adds +1 to Complexity of computers in Avionics module. Cost is KCr22.5 for a Basic Avionics module, KCr112.5 for an Improved Avionics module, or KCr300 *per computer* for the three computers in an Advanced Avionics module. At TL9, price is *doubled.*

Lights, Doors, Ramps: Included in vehicle cost.

HUDWAC with Pupil Scanner: A head-up display which trains turret- or casemate-mounted weapons in whatever direction that the user looks, applying a -7 to the weapon's SS number. May be added to any gunner's Crew module. KCr1.

Beam Weapons

Plasma and fusion weapons do burn damage (no damage multiplier) to anything directly hit. In addition, anything within two yards takes one-quarter the listed damage from splattering hot plasma, and flammable objects will usually catch fire. Vehicular plasma or fusion weapons can also fire "hot shots" at 4 times PPS energy consumption doing ×1.5 damage.

Lasers fired through rain, heavy snow, or fog do half damage. Damage is also halved for every (1/2D range × 0.2) hexes of smoke (or fraction) that they cross. Lasers cannot penetrate blackout gas or prism clouds at all.

X-ray Lasers (Xasers) are not degraded by environmental conditions, smoke, prism, or blackout gas, and DR protects at half value against them.

Meson weapons do full damage to any target directly hit, and that target's DR does not protect it. They also inflict explosive concussion damage on everything else in the immediate area, just as if they were an HEC warhead with the same damage as the meson gun.

Guided Missiles

Guided missiles use different rules than other weapons. Vehicular missiles are generally "brilliant" semi-autonomous weapons that, once launched, look for targets on their own, or artillery missiles with inertial guidance systems that are fired vs. map coordinates, usually using a form of indirect fire. Some missiles have multiple guidance systems. If so, decide which is used at time of launch.

Brilliant Missiles

Brilliant missiles must be preprogrammed with a course (distance and bearing, up to 90% of its range), a point along its course at which to turn on its terminal guidance to start hunting for targets, and a target category. This programming can be changed before launch (takes 2 seconds; multiple missiles can be programmed with the same targets at once). The target category may be specific ("*Astrin* APC") or general ("any vehicle") provided the parameters are available in a database. Missiles with broad parameters may attack friendly targets, but can be programmed to respect friendly IFF signals.

Continued on next page . . .

Guided Missiles

[Continued]

Launching is an attack maneuver (unmodified Gunner+4 roll). Failure means the missile was misprogrammed and will crash the second after launching; critical failure means it may go after the wrong kind of target. After launch, the missile flies along its plotted course at its rated Speed. At the programmed point, it activates its terminal guidance and tries to lock on to potential targets in its arc of vision each turn, starting with the nearest ones that matches its target category.

One lock-on attempt can be made each turn vs. the nearest potential target in the missile's arc of vision. The missile rolls against the Electronics Operation (Sensors) skill of the programming gunner *plus* the missile's own guidance Skill rating. Apply range to target and target Size (but not Speed) modifiers as per p. B201, but other modifiers depend on the missile's guidance system (Guid.). Some typical guidance systems in use are:

Brilliant Infrared Homing (BIRH): The missile hunts targets with thermal emissions that match its programming. If the target has Emission Cloaking, apply the listed modifiers for it (e.g., subtract TL-6 if Basic Cloaking).

Brilliant Optical Homing (BOH): Uses a computer to recognize the target's silhouette and a night-vision-capable optical sensor for guidance. Apply the normal modifiers for a visually aimed attack (cover, visibility, vegetation, chameleon systems), except that darkness has no effect.

Brilliant Neutrino Homing (BNH): The missile can only track targets which are neutrino sources, but does so at a +4 bonus. Neutrinos are emitted by nuclear power systems (e.g., an NPU, or a powered-up fusion or fission reactor). TL8-9 Emission Cloaking is useless; TL10+ subtracts (TL-9)/2 if Minimal, (TL-9) if Basic, or (TL-9)¥2 if Radical.

Continued on next page . . .

Step 5: Armor

Vehicles are normally armored to provide some protection against accident or fire. Typically, the material used is either high-tech metal alloys (such as crystal iron or superdense) or more costly (but also somewhat more effective) composite laminates of metal alloys, synthetic materials, and ceramics. Decide on the vehicle's body DR and whether it will use metal or laminate armor.

Some typical DR ranges:

Air/raft, utility sled	DR 5-100
Artillery grav sled	DR 50-1,500
Light grav APC	DR 100-1,000
Medium grav APC	DR 200-2,000
Heavy grav APC	DR 500-5,000
Light grav tank	DR 1,000-5,000
Medium grav tank	DR 2,000-10,000
Heavy grav tank	DR 4,000-20,000

Figure armor weight (in pounds) as:

armor weight = body area × DR × M

M depends on the armor's material and TL, as follows:

TL9: 0.15 if metal, 0.1 if laminate.
TL10: 0.1 if metal, 0.06 if laminate.
TL11: 0.06 if metal, 0.04 if laminate.
TL12: 0.04 if metal, 0.025 if laminate.

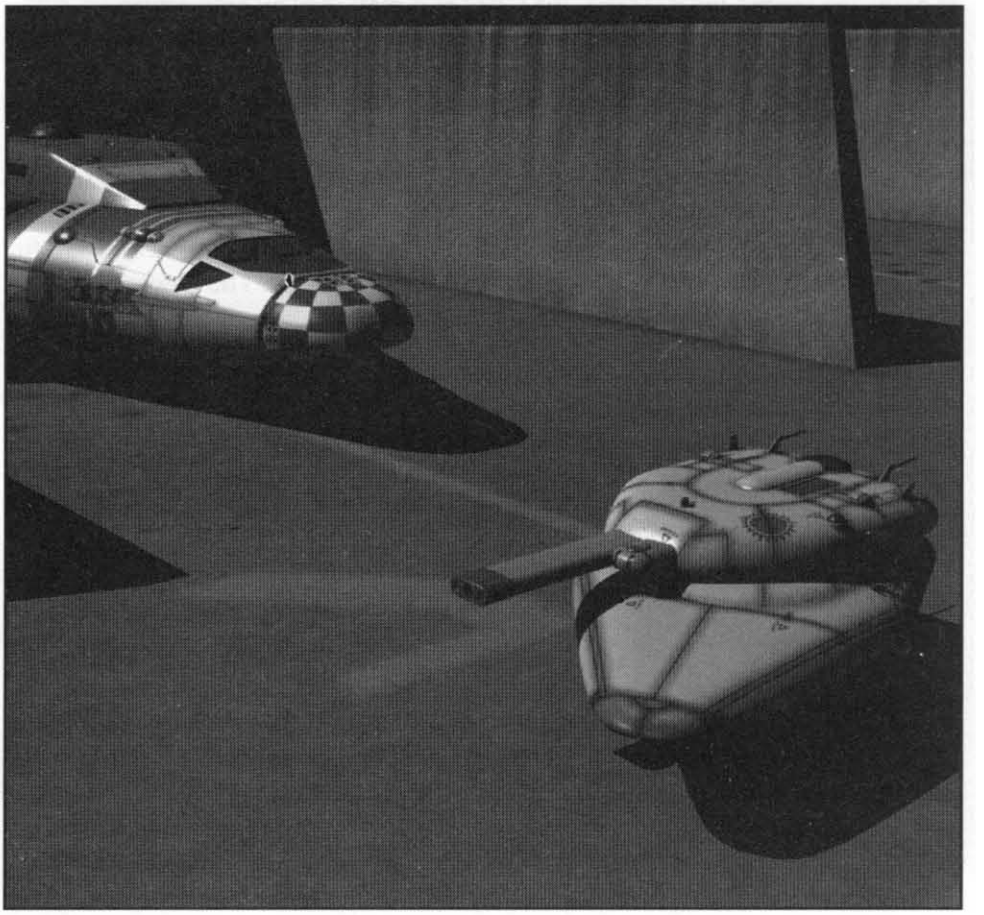
Calculate the armor cost in KCr using this formula:

cost = armor weight × KCr0.006 if metal or KCr0.03 if laminate

TL9-11 vehicles may also be given "advanced" armor. Treat it as one TL higher. Cost is KCr 0.04 for metal, KCr 0.2 for laminate.

It is common to vary the armor values on each face of the vehicle (front, back, right, left, top, underside). For example, a tank may have stronger front armor. If this is desired, multiply DR by 6, then redistribute "DR points" among each of the six sides.

Slope Effects: If the vehicle has a sloped body, its final front face armor DR is doubled to reflect the slope. This does not affect the armor's weight or cost.



Passive Defense: This depends on DR (after slope). DR 1 gives PD 1, DR 2-5 provides PD 2, DR 5-15 PD 3, and DR 16+ PD 4. Add +2 to front body PD if the vehicle is sloped.

Turret Armor

If the vehicle has one or more turrets (or cupolas), use the same procedure as above to armor each turret and calculate PD, with the exception that the turret's area is used rather than the body's area. DR may be the same, more, or less than the body.

If varying the turret armor by face, multiply DR by 5 rather than 6, as the turret face attached to the vehicle is not armored. As with a body, if a turret is sloped, double its front DR and add +2 to its PD.

Step 6: Surface Features

These are features that are added to the surface of a vehicle.

Sealed Vehicles

Sealing protects the vehicle's interior contents from hostile environments, vacuum, contamination, and water. Any vehicle with Crew or Passenger modules (as opposed to Exposed Crew or Passenger) should be sealed.

The cost to seal the vehicle is: KCr 0.01 × the sum of (body + turret area).

Bulldozer or Plow Blade

These are earth-moving blades attached to the front of the vehicle. When the vehicle is flying a foot or two off the ground, they can clear or plow a path as wide as the vehicle. Bulldozer blades or plows weigh 2 lbs. times vehicle body area and cost KCr 0.004 times vehicle body area.

Sensor Masking

A vehicle can be given sensor-masking systems to make it harder to detect.

Stealth protects against active sensors like an AESA's radar or ladar.

Sound Baffling muffles the vehicle's power plant and other noises, making it quieter.

Emission cloaking protects against passive sensors like infrared or a PESA's thermograph.

Each system comes in three levels: Modest, Basic, or Radical. Modest subtracts 0.5×(TL-4) (round up) from rolls to determine the success of appropriate scans or (for baffling) hearing rolls, as well as from lock-on attempts by guided missiles with appropriate guidance. Basic subtracts TL-4, and radical subtracts 2×(TL-4). Weight and cost are calculated as follows:

Type	Weight	Cost
Modest Stealth or Cloaking	0.1	0.03*
Basic Stealth or Cloaking	0.25	0.075*
Radical Stealth or Cloaking	0.5	0.75*
Modest Sound Baffling	0.1	0.01
Basic Sound Baffling	0.25	0.025
Radical Sound Baffling	0.5	0.25

Weight is the weight in pounds. Find it by multiplying the sum of the body and turret area by the number on the table.

Cost is the price in KCr. Find it by multiplying the sum of the body and turret area by the number on the table. Double cost if TL9 (only) emission cloaking.

Guided Missiles

[Continued]

Semi-Active Laser Homing: To track the target, the target must be detected and illuminated by a laser designator or AESA sensor when the seeker activates. If so, lock-on is automatic. Note that blackout gas, dense fog or snowfall, or prism will prevent lock-on.

If a lock-on roll fails, the missile will continue on its course (but may check again next turn, provided a target is still in its arc of vision) until it successfully locks onto something or its endurance (rated in seconds) expires.

If a lock-on roll succeeds, the missile will immediately alter course and attempt to intercept the target, closing on it at its best speed. If it reaches the target's position it hits automatically unless Dodged, in which case it can circle around and attempt an attack on a later turn, if it has sufficient endurance left.

Inertial Guidance

A missile with IG guidance is programmed with specific map reference coordinates (takes one turn, if they're in a database) for a fixed target (a city block, building, area of ground, etc.) and then is fired at them, using an integral inertial guidance system to keep it on course during flight. To determine how close it hits, roll against the gunner's skill and apply the Size Modifier of the target area (maximum +10). If the roll misses, the missile scatters.

The missile can also be fired on an indirect ballistic arc: Multiply range by five, but there is a -10 penalty to hit in addition to other modifiers.

Point Defense

Missiles can be shot at just as if they were other vehicles during a character's turn. In addition, on his turn a gunner may, instead of firing, dedicate himself and a vehicular weapon to point defense of his own vehicle (or some other target). This is essentially a "wait" action that allows him to fire in the missile's turn. If multiple missiles hit his vehicle from the same general direction (ahead, behind, etc.) and he has multiple attacks (due to a high RoF) he can divide his fire among them using the Area Effect rule on p. B121. Assume 10 points of damage is sufficient to deflect or destroy a missile.

Nuclear Dampers

A nuclear damper normally operates in a wide area mode, but is not completely omnidirectional. There's plenty of time to focus it in a 20-minute space-combat round, but in ground combat its use requires an Electronics Operation (Force Shields) skill roll for each nuclear weapon detonating in the area. A failed roll means that the weapon was not damped and instead will detonate. A damper can also be focused precisely on a single area of ground to eliminate residual radiation from a nuclear ground burst, or it can be focused on a single vehicle or building and "sterilize" all nuclear munitions that are carried within it (effectively transforming them into duds). Again, an Electronics Operation (Force Shields) roll is required to do this properly.

Drone Missiles

Drone missiles are semi-autonomous remote-controlled vehicles. Drones can always be directly controlled by an operator. This requires the operator to be in continuous communications with the drone. (For details, see sidebar, p. RO68.)

Operators may give simple commands to the drones, which may be changed at any time. Changing orders requires communication contact with the drone and takes one turn. Drones ordered to act as picket sensors are treated as having Electronics Operation (Sensors) skill of 18. Drones with warheads ordered to attack are treated as guided missiles (see p.00) using a sensor skill of 18 and a guidance skill of 13.

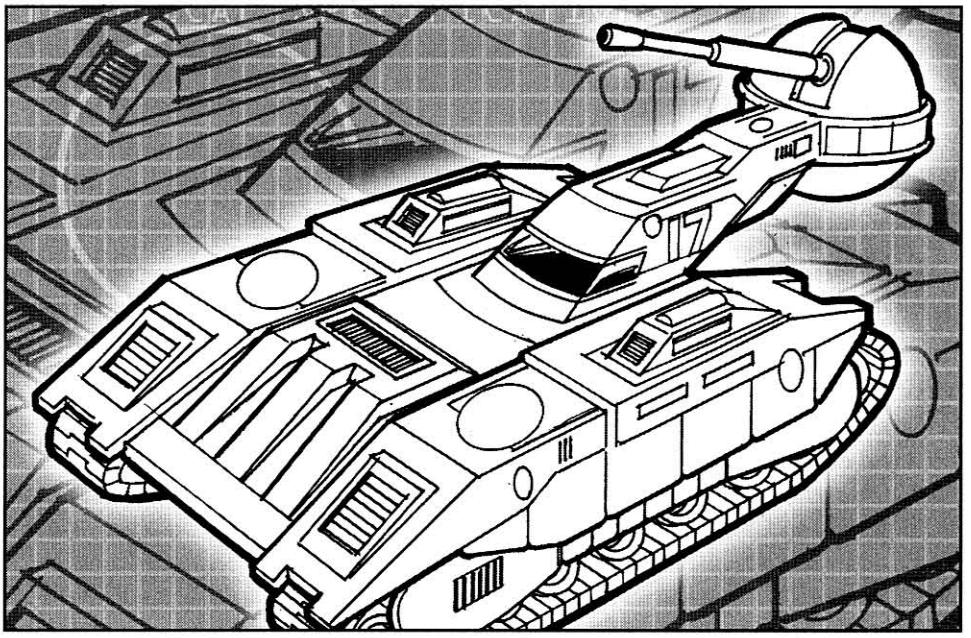
Drone missiles can be deployed via more conventional missiles for swifter delivery, the "carrier" missile warhead breaking apart to release the drones above the intended operational area. The 160mm Sunray missile carries seven microdrones.

Chameleon System

Vehicles may be equipped with chameleon hulls that allow them to electronically alter their color and hue, automatically camouflaging them against the local background. This gives a -6 penalty to rolls made to spot or attack the vehicle, or to detect it with ladar or lock-on with optical homing (OH) missiles; this penalty is reduced to -3 if the vehicle is moving.

Type	Weight	Cost
Instant Chameleon System, TL10	0.25	0.050
Instant Chameleon System, TL11+	0.125	0.025

Weight is the weight in pounds. Find it by multiplying the sum of the body and turret area by the number on the table. *Cost* is the price in KCr. Find it by multiplying the sum of the body and turret area by the number on the table.



Defensive Features

These defend against particular threats to the vehicle. Weight and cost are based on total vehicle area (the sum of the body and turret areas).

Psi Shielding interferes with attempts by psis to use telepathy on anyone inside the vehicle, as if such an effort had to penetrate a Mind Shield with a Power of 2×(TL-7). It weighs 0.025 lbs. and costs KCr 0.025 × total vehicle surface area.

Thermal Superconductor Armor is available at TL11+. It doubles armor DR (to a maximum of an additional DR 250) against laser, microwave, X-ray laser, and graser attacks, as well as plasma and fusion guns. At TL11 it weighs 0.25 lbs. and costs KCr 0.25 × total vehicle area. At TL12 it weighs 0.125 lbs. and costs KCr0.125 × total vehicle area.

Step 7: Statistics

The vehicle has now been designed. Calculate the following statistics for it:

Total Empty Mass (EMass): Add together the weight of body and turret frames, armor, surface features, and chosen modules. Divide by 2,000. This is the vehicle's empty mass in tons.

Total Loaded Mass (LMass): This is equal to empty mass plus these additional categories:

● *Ammunition* – As specified in the various modules lists, some expendable supplies do not count toward EMass but do count toward LMass.

● *Occupants* – Add 0.1 ton per passenger or crew member carried (assuming Human-sized occupants). If occupants are usually in battledress, add the weight of the suits.

● *Cargo* – Add the weight of cargo usually carried. If exact numbers are unknown, assume 0.0025 tons per space of cargo or 0.005 tons per space of open cargo (i.e., about 20 lbs./cf), which can allow for cargo holds that are not fully packed. A weight of up to five times that value is reasonable for vehicles that usually transport substantially heavier loads, such as an ammunition carrier.

● *Other Vehicles* – The mass of vehicles or robots carried aboard.

Total Cost: Add together body, turret, module, armor, and surface-feature costs to get the vehicle's cost in KCr at the TL that produced it.

Size Modifier: Record the Size Modifier for the body and each turret or cupola.

Hit Points: Record hit points for the body and each turret or cupola.

Health (HT): A measure of structural robustness, distinct from Hit Points. Structural HT=(0.1 × body hit points/Loaded Mass in tons) + 5. Max HT is 12.

Maintenance Interval (Optional): Multiply cost in KCr by 1,000, then find the square root. Divide 20,000 by the square root. The result is the maintenance interval in hours. A vehicle will require about 4 man-hours of maintenance by someone with Mechanic-9 or better and a tool kit or workshop every time the interval is passed to stay in peak condition. If a check-up is missed, roll vs. the Mechanic skill of the soldier who made the last checkup (-4 per additional checkup missed). If *that* roll fails, roll vs. the vehicle HT. Failure reduces the vehicle HT by 1 (wear and tear); critical failure also means a serious breakdown of some item of equipment (GM's choice as to what fails and when). Lost health or breakdowns can be regained; treat each point of HT or breakdown as a minor repair (see p. B54).

Step 8: Performance

Calculate the following performance statistics for the vehicle.

Lift: A grav vehicle can fly if the combined lift of its powered CG modules exceeds loaded weight under local gravity.

Top Air Speed: This depends on thrust and drag. If it can fly, a grav vehicle's drag is its total area/5 if streamlined or area otherwise. Add 10 to drag for each Exposed Crew or Exposed Passenger module. Its thrust is the combined thrust – in tons – of all powered Thruster or (in atmosphere) Ducted Fan modules. Its top air speed in mph is the square root of [15 million × (thrust/drag)]. However, top air speed may not exceed 600 mph if the vehicle is unstreamlined! Always round air speed to the nearest 5 mph.

aAccel: A grav vehicle's aerial acceleration rating in mph per second (mph/s) is its thrust (tons) divided by its loaded mass (tons) times 20 mph.

aMR: A grav vehicle's aerial maneuver rating (the number of gravities it can safely "pull" while maneuvering in atmosphere) is (1+TL-Size Modifier)/2. Round to the nearest half or whole number.

aDecel: A grav vehicle's aerial deceleration rating in mph/s is its aMR × 4 mph/s.

aSR: A grav vehicle's aerial stability rating comes into play when a Piloting (Contragrav) roll fails. If the roll fails by more than the aSR, the vehicle not only fails to perform the maneuver but the pilot loses control (no maneuvering next turn). Naturally, this can be hazardous in some circumstances. The aSR is 3 for vehicles under 0.2 dtons, 4 if at least 0.2 dtons but less than 2 dtons, and 5 if 2 dtons but under 20 dtons.

Microdrones

The 60mm microdrones are the smallest semi-autonomous drones used by the Imperium. They are mostly suited to attacking infantry or support vehicles, but within that limited role they are quite effective for their cost.

Subassemblies and Body Features: body with superior streamlining, no subassemblies.

Propulsion: 40-lb. vectored super reactionless thruster.

Weaponry: 60mm "small" self-destruct HEAT warhead – 6d×15 (10) damage.

Instruments and Electronics: short range radio w/scrambler, short range lasercomm receiver, 2-mile LLTV, 0.5-mile radscanner, DX+3 tiny robot brain (Complexity 5).

Programs: Computer Navigation, Datalink, Gunner (Missile)-12, Routine Vehicle Operation (Piloting).

Power: one rC cell sufficient for 45 minutes at maximum power or 4 hours hovering.

Volume: 0.066 cf. Area: 1 sf.

Structure: robotic.

Hit Points: 2.

Armor: front has PD 4/DR 50 expensive laminate; other faces PD 4/DR 20.

Surface Features: sealed, basic stealth, basic emissions cloaking, instant chameleon.

Statistics: Weight 4.98 lbs. Volume 0.066 cf. Size modifier -4. Price KCr1.33 (programs cost extra but may be assumed to not be purchased per missile . . .) ST 1, DX 13, IQ 8, HT 12/2.

Aerial Performance: Stall speed 0. Drag 0.1, Thrust 35 lbs., aMax 1,600 mph, aAcc 150 mph/s, aMR 8, aDec 32.

Space Performance: 8 Gs.

VEHICULAR ARMAMENTS

Guns

Weapon Name	Type	Damage	SS	Acc	1/2D	Max	RoF	TL
4mm VRFGG/9	Cr.	5d×3 (2)	20	14	1,500	7,200	100*	9
4mm VRFGG/10	Cr.	6d×3 (2)	20	15	2,300	9,200	100*	10
20mm ETC CG	Cr.	6d×13 (2)	20	17	3,400	12,000	20*	9
75mm EMC								
w/APFSDSDU	Cr.	6d×120 (3)	30	20	23,000	46,000	1/4	10
80mm RF Howitzer	Cr.	6d×12	20	16	2,500	8,500	4*	10
80mm 6-barrel Massdriver	Cr.	6d×64	30	19	16,100	31,000	25*	11
w/APFSDSDU	Cr.	6d×128 (3)	30	20	24,000	45,000	25*	11
other 80mm:								
w/CHEM	Spcl.	24 yd	var.	var.	var.	var.	var.	10-11
w/HE	Exp.	6d×24 [6d]	var.	var.	var.	var.	var.	10-11
w/HEC	Exp.	6d×32 [6d]	var.	var.	var.	var.	var.	10-11
w/HEAT	Exp.	6d×20 (10)	var.	var.	var.	var.	var.	10-11
w/HEDP	Exp.	6d×20 (5) [6d]	var.	var.	var.	var.	var.	10-11
w/ICM	Spcl.	48 yd.	var.	var.	var.	var.	var.	10-11

Lasers

Weapon Name	Type	Damage	SS	Acc	1/2D	Max	RoF	TL
AD Laser/9	Imp	6d×18	30	28	89,000	267,000	1	9
Laser Drill/9	Imp.	6d×7	22	14	2,900	8,700	1	9
PD Laser/9	Imp.	20d	20	22	8,000	24,000	12*	9
PD Xaser/10	Imp.	6d×4 (2)	20	25	28,000	84,000	16*	10
AD Xaser/10	Imp.	6d×50 (2)	30	32	200mi	600mi	1/2	10
PD Xaser/12	Imp.	6d×5 (2)	20	25	28,000	84,000	20*	12

Plasma Guns

Weapon Name	Type	Damage	SS	Acc	1/2D	Max	RoF	TL
141-MJ Light Plasma/9	Exp.	6d×100	25	21	5,600	17,000	1	9
562-MJ Medium Plasma/9	Exp.	6d×200	30	23	11,000	33,000	1/2	9
878-MJ Heavy Plasma/9	Exp.	6d×250	30	23	14,000	42,000	1/2	9
10-MJ RF Plasma/10	Exp.	5d×40	25	20	3,300	9,900	8*	10
540-MJ Light Plasma/10	Exp.	6d×250	30	25	12,000	37,000	1/2	10
945-MJ Medium Plasma/10	Exp.	8d×250	30	24	16,000	48,000	1/2	10
1.35-GJ Heavy Plasma/10	Exp.	6d×380	30	25	19,000	58,000	1/2	10

Fusion Guns

Weapon Name	Type	Damage	SS	Acc	1/2D	Max	RoF	TL
10-MJ RF-Fusion/11	Exp.	5d×50	25	20	3,600	10,800	8*	11
511-MJ Light Fusion/11	Exp.	6d×300	30	23	13,000	39,000	1/2	11
2.05-GJ Hv. Fusion/11	Exp.	6d×600	30	25	21,000	63,000	1/2	11
708-MJ Lt. Fusion	Exp.	5d×500	30	24	16,000	49,000	1/2	12
1-GJ Med. Fusion	Exp.	6d×500	30	24	19,000	58,000	1/2	12
2.3-GJ Hv. Fusion	Exp.	6d×650	30	25	30,000	90,000	1/2	12

Meson Accelerators

Weapon Name	Type	Damage	SS	Acc	1/2D	Max	RoF	TL
10-GJ Meson	Exp.	8d×900!	30	23	400mi	1,200mi	1/2	12

Malf. for all weapons is Ver.

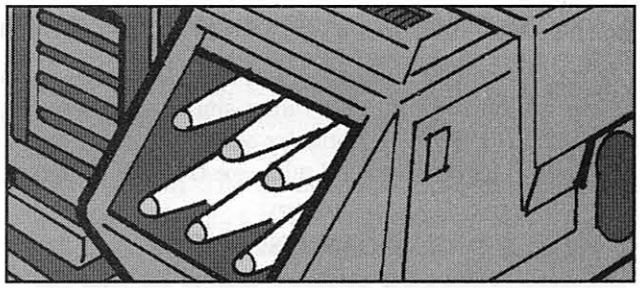
Damage Notes: The number in parenthesis is an armor divisor; divide armor DR by it before applying damage; e.g, (2) means DR is halved. *Exp.* means the attack is an explosion. The effects depend on the type of weapon or warhead. The effects depend on the type of warhead. *!* means a meson gun; it ignores armor DR completely. Base damage and type for 80mm RF/Massdriver is for solid ammunition; see "other 80mm" for options.

RoF Notes: RoF divided by a colon (for instance, 6:8) means the weapon uses multiple launch tubes. The first number is the number of tubes that can fire *simultaneously*; the second number is the time in seconds to reload *each* tube.

LAUNCHERS

Name	SS	RoF	Launches	TL
200mm MRL	25	6:8	200mm rocket or missile	9-10
190mm TML	20	1/5	190mm missile	11
160mm AutoRL	20	1	160mm missile	11
160mm MRL	30	36:8	160mm missile	11

Other statistics depend on the type of missile that is loaded and fired, as shown below:



ROCKET AND MISSILE STATISTICS

Name	Guid.	Type	Damage	Spd.	End.	Max	Acc	Skill
200mm rocket/9	none	Var.	Var.	800	36	28,800	15	–
200mm missile/9	BOH/IG	Var.	Var.	34	Var.	27,200	–	16/IG
200mm rocket/10	none	Var.	Var.	800	54	43,200	15	–
200mm missile/10	BOH/BNH/IG	Var.	Var.	800	53	42,400	–	17/16/IG
200mm warheads:								
w/CHEM	Var.	Spcl.	360 yd.	Var.	Var.	Var.	Var.	Var.
w/Chaff	Var.	Spcl.	1,800 yd.	Var.	Var.	Var.	Var.	Var.
w/HE	Var.	Exp.	6d×750 [12d]	Var.	Var.	Var.	Var.	Var.
w/HEAT	Var.	Exp.	6d×90 (10)	Var.	Var.	Var.	Var.	Var.
w/ICM	Var.	Spcl.	720 yd.	Var.	Var.	Var.	Var.	Var.
w/ICMTDX	Var.	Spcl.	1,080	Var.	Var.	Var.	Var.	Var.
w/SATNUC	Var.	Spcl.	1,440 yd.	Var.	Var.	Var.	Var.	Var.
190mm missile/11	BOH/BIRH/BNH/SALH	Var.	Var.	600	34	31,000	19/19/-/18	Var.
190mm warheads:								
w/HE	Var.	Exp.	6d×640 [12d]	Var.	Var.	Var.	Var.	Var.
w/HEAT	Var.	Exp.	6d×80 (10)	Var.	Var.	Var.	Var.	Var.
w/ICM	Var.	Spcl.	540 yd.	Var.	Var.	Var.	Var.	Var.
160mm missile/11	BOH/BNH/IG	Var.	Var.	1,700	105	178,500	–	19/18/IG
160mm warheads:								
w/APDU	Var.	Cr.	6d×60 (3)	Var.	Var.	Var.	Var.	Var.
w/Chaff	Var.	Spcl.	960 yd.	Var.	Var.	Var.	Var.	Var.
w/CHEM	Var.	Spcl.	192 yd.	Var.	Var.	Var.	Var.	Var.
w/Drone	Var.	Spcl.	7 drone	Var.	Var.	Var.	Var.	Var.
w/HEC	Var.	Exp.	6d×256	Var.	Var.	Var.	Var.	Var.
w/HEAT	Var.	Exp.	6d×64 (10)	Var.	Var.	Var.	Var.	Var.
w/ICM	Var.	Spcl.	192 yd.	Var.	Var.	Var.	Var.	Var.
w/ICMTDX	Var.	Spcl.	288 yd.	Var.	Var.	Var.	Var.	Var.
w/SATNUC	Var.	Spcl.	384 yd.	Var.	Var.	Var.	Var.	Var.

Damage: A number in yards is the burst radius. See the *Warheads* sidebar, pp. 116-117, for special rules for missile warhead effects.

Guid.: The guidance system used. *B* = brilliant, *OH* = optical homing, *NH* = neutrino homing, *SALH* = semi-active laser homing, and *IG* = inertial guidance. If multiple systems, select which to use at launch. See the *Guided Missiles* sidebar (pp. 119-121) for rules and descriptions. Missiles that use OH may be built instead as IRH (infrared homing); cost and skill is the same.

End. is the amount of time (in seconds) that the missile or rocket can fly.

Spd. is its speed in yards per second; double this to get speed in mph.

Max is the maximum range assuming horizontal flight. All artillery rockets (and missiles using IG) guidance can also be fired indirectly, with five times the listed Max range.

Acc/Skill: Rockets (being unguided) have an Acc rating, while missiles (being guided) have a Skill rating. For weapons with both BOH and BNH the first skill rating refers to BOH, the second to BNH. For weapons with BOH/BIRH/BNH/SALH the first skill rating applies to BOH, the second to BIRH, the third to BNH. SALH has no skill rating.

Malf. All missile Malf. numbers are Crit.

The 160mm stealth missile is identical to the 160mm missile but has Basic Stealth (p. 121) which subtracts TL-4 from its chance of being detected by radar, etc.

Grav Armor in Action

This section provides some rules for grav vehicle operations on the battlefield or in adventuring situations. These rules are optimized for ***GURPS Traveller*** vehicle designs created via this system; for more general rules, see ***GURPS Vehicles.***

Fire and Movement

A vehicle moves 1 yard per second for every 2 mph of speed. If using 50-yard hexes (see *Battlefield Scale* sidebar, p. 112) this converts neatly to one hex per 100 mph of top speed. Vehicles slower than 100 mph move one 50-yard hex every [100/top speed] turns; e.g., a vehicle with a 25-mph top speed would move one hex every 4 turns.

A grav vehicle retains its speed and direction of travel from turn to turn unless it accelerates or decelerates (or loses power and falls out of the sky). The pilot can add the vehicle's aAccel to its speed each second, or subtract its aDecel, provided it does not accelerate past its top air speed. The GM is free to ignore acceleration and simply have vehicles whiz about the battlefield at up to their top speed, or he can keep track of speed on scratch paper. Note that often all vehicles in a platoon will be moving at the exact same speed to keep formation; this reduces the recordkeeping.

Grav vehicles can use their vectored thrust to assist in maneuvering rather than accelerate. They can trade 2 mph/s of acceleration for 1 yard of up, down, or sideways movement (retaining its current facing), or add its acceleration to its deceleration.

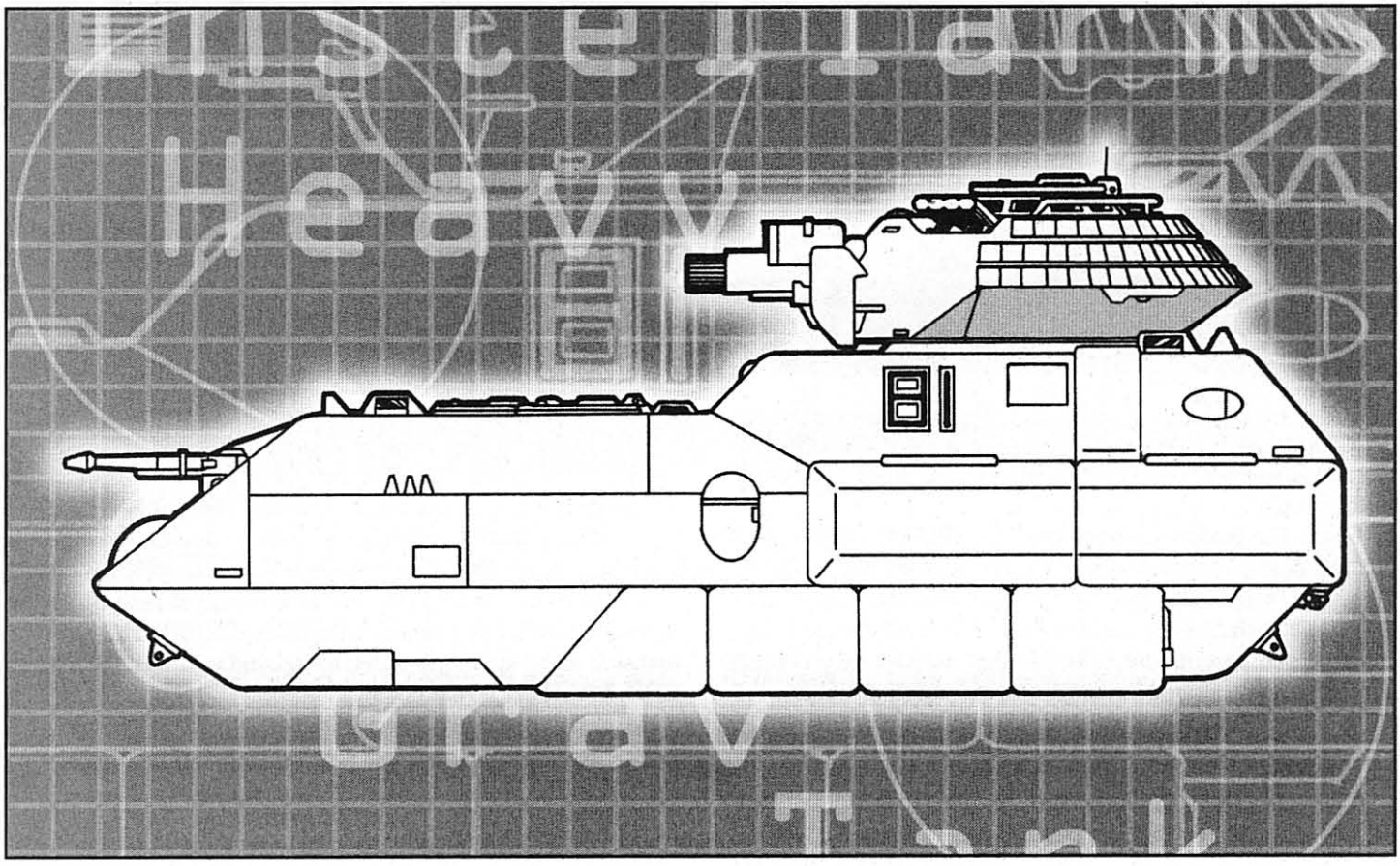
A sudden upward "pop-up" to carry the vehicle over concealing terrain and into a firing position is a common maneuver for high-acceleration vehicles. A grav vehicle can also trade acceleration for aMR: each 5 mph/s unused adds 0.25 to aMR. If the vehicle has decelerated to 0 speed, it can choose to accelerate backward or sideways, but does so at half aMR and cannot exceed 150 mph or half top speed, whichever is less.

A grav vehicle moving at high speed is not able to turn on a dime. The vehicle's aMR is the number of gravities it can "pull" in a turn. The GM can use the precise formula for turning radius found on p. B139 (or for more detail, ***GURPS Vehicles***).

Alternatively, the GM can ignore turn-radius questions and assume that contragravity allows grav vehicles to turn "on a dime" and maneuver much like spacecraft in zero gee, or fictional UFOs. If using the turning rules on p. B139 in conjunction with *battlefield scale* (sidebar, p. 112) 50-yard hexes, the table below shows the number of turns a vehicle must travel in a straight line after making a 1-hexside facing change. (This formula is derived from the turning-radius formula on p. B139.)

Turning Radius

	aMR								
Speed	**0.5**	**1**	**1.5**	**2**	**2.5**	**3**	**4**	**5**	**6**
At 100 mph:	10	5	4	3	2	2	1	1	1
At 200 mph:	20	10	7	5	4	4	3	2	2
At 300 mph:	30	15	12	8	6	5	4	3	2
At 400 mph:	40	20	15	10	8	7	5	5	3
At 500 mph:	50	25	19	13	11	9	7	5	4
At 600 mph:	60	30	22	15	12	10	8	6	5



Cross-index vehicle speed (round up) with aMR (round down) to find the vehicle's turning radius (the number of hexes it must travel in a straight line after each one-hexside turn).

Example: *Lt. Jen Riisha is driving her grav APC at 212 mph, allowing it to move two 50-yard hexes every second. Her vehicle has aMR 4. Rounding the speed up to 300 mph for this purpose, it means that after announcing a 1 hexside change in facing she must "fly straight" for the two following turns (moving four hexes directly ahead). Only then can she maneuver again.*

The limitations on turning radius show why grav vehicles flying at nap-of-the-earth altitudes (i.e., skimming the ground) will do so at slow speeds. If they don't, they risk being unable to turn in time to avoid ramming into a building or hill.

Crashing and Falling

For detailed rules for falls or collisions, see ***GURPS Vehicles.*** Generally, a vehicle hitting an immovable object (ground, big building, etc.) takes (its own body hit points× collision speed in mph)/200 dice damage, while one smashing into another vehicle *inflicts* damage equal to the above formula based on their relative velocity; the damage it *receives* is based on the other vehicle's results from the above formula.

A vehicle shoves aside the other vehicle if it inflicts twice the damage it took. In addition, anyone in a vehicle that crashed into something it couldn't smash through or shove aside will suffer whiplash or concussion damage if speed was 20 mph or more: 1d-2 crushing per 20 mph. Vehicle or personal armor does not protect, although Toughness and crashwebs do. Double damage for anyone not wearing a safety belt.

Attacking Vehicles

Attacks on a grav vehicle will normally be directed at the vehicle's body on the side facing the attacker. An attacker may choose to target a turret or cupola instead; if so, use the appropriate Size Modifier rather than that of the vehicle body.

Incoming indirect fire generally strikes the top of a vehicle (unless the vehicle is at a very high altitude); if the vehicle has subassemblies, roll randomly to determine the hit's location.

Passive Defense and Dodging: A grav vehicle that has been hit may attempt to Dodge, just like a person, provided it has aMR 1+. Its Dodge score is its pilot's Piloting (Contragrav) skill/3 (round down) plus its PD. If this gives Dodge over 14, treat it as 14. A vehicle that cannot Dodge may still roll vs. PD.

Active Sensors and Dodging: If an attacker is using an AESA or similar active sensor (laser sight, etc.) to aim or fire at a vehicle that has either a radar/laser detector or radscanner, the vehicle's defenses will warn the pilot, allowing him to add +1 to Dodge. Thus, it can be better to turn off the active system.

Damage and DR

A vehicle's DR normally works just like a character's DR, but it may vary depending on location (body, turret, cupola) and facing (front, back, right, left, top, underside) attacked. Some special circumstances also apply:

Armor divisors are present on some weapons, noted as a number in parenthesis; e.g., (10) or (2). Divide DR by the armor divisor. This only applies to direct hits, not any explosive concussion or fragmentation effects from near misses.

Sealed vehicles have their DR *squared* against any explosive concussion damage. This does *not* apply to *direct hits* from HEAT/HEDP warheads, ICM shaped-charges, or plasma, fusion, and meson guns. *Laminate armor* doubles DR against *direct hits* from HEAT or HEDP warheads, and vs. the shaped-charge effects of ICM. This is cumulative with any armor divisors the warhead has; e.g., a HEAT warhead with armor divisor (10) would divide laminate DR by 5. *Thermal superconductor armor* adds DR 250 or doubles armor DR (whichever is less) against laser, X-ray laser, or plasma/fusion gun direct hits.

Effects of Vehicle Damage

Damage is kept track of separately for the body and for each turret or cupola; each of these locations has their own individual hit point totals. If a location's hit points are reduced to 0 or less, it is disabled, but may later be repaired. If reduced to -5 × original hit points it is destroyed, and cannot be repaired.

Disabled/Destroyed Body: When a vehicle's body is reduced to 0 or fewer Hit Points, the entire vehicle is effectively knocked out. All components in it cease to work, including contragrav. If the vehicle is flying, it will begin to fall.

Disabled/Destroyed Turret/Cupola: When a vehicle's turret or cupola is disabled, only those components inside it are knocked out of action.

Unsealing Vehicles: If a sealed location loses 10% of its hit points (20% if it has heavy compartmentalization, 50% if total compartmentalization), it is no longer sealed. This exposes the occupants to any hostile environment outside.

Crew and Passenger Injuries: If a location is occupied and damage penetrates DR, roll 1d per 100 points (or fraction thereof) of penetrating damage. For each 6 rolled, one occupant in the location (determined randomly or by GM fiat) takes either 50 points of damage or half the penetrating damage suffered by the location, whichever is higher. *Exception:* If damage was greater than the location's original hit points, damage is inflicted on a 5-6, and the maximum damage is 100 points.

Fire: If a laser or explosive weapon penetrates vehicle armor, it may cause a fire in the penetrated location. This is automatic if damage is 18 or more points. Otherwise, roll 3d vs. penetrating damage. If a vehicle catches fire, the location takes 2d damage plus a further 2d every 10 seconds; DR is ignored, but heavy compartmentalization subtracts 2 points and total compartmentalization subtracts 4. Any time a fire does 8+ damage (after modifiers) it spawns another fire either affecting the vehicle or setting fire to a person in it (GM's option); if it does less than 4 hits, the fire goes out. A fire will fill a location with smoke (pp. B132-133). A Safety module puts out fires on a roll of TL+6 or less (-1 penalty per extra fire raging) on 3d; check immediately and again every 10 seconds for *each* fire separately. Occupants can take 10 seconds to put out a fire manually (roll 6 or less) or with handheld extinguishers (TL+2 or less); critical failure means they take 2d burn damage.

Ammunition Explosion: If a vehicle location is on fire and has explosive ammunition stored in it, roll 1d: on a 5-6 it "cooks off" and explodes. All ammunition is destroyed; use the damage of 1d shots (or whatever is left) to determine the damage to the vehicle, ignoring its DR. *Exception:* Ammo in an anti-blast magazine will be destroyed, but the explosion is vented safely out of the vehicle on a roll of TL+6 or less.

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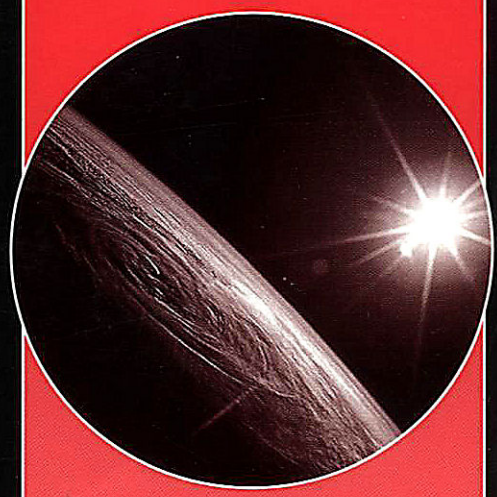

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